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MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) COMPLIANCE AUDIT

TOWNSHIP OF DEPTFORD, NEW JERSEY

FINAL Report Date: September 22, 2023

Audit Dates: July 26 – 27, 2023 (Virtual Audit), August 2, 2023 (Field Inspection)

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1.0 Introduction

In April 2023, the United States Environmental Protection Agency (EPA), Region 2, EPA contractors PG Environmental and Eastern Research Group, and the New Jersey Department of Environmental Protection (NJDEP) (collectively, hereinafter, the "EPA Audit Team"), conducted a compliance audit of Deptford Township's (hereinafter the "Township") Municipal Separate Storm Sewer System (MS4) program. The audit consisted of a virtual audit that took place on July 26 and 27, 2023 and a field inspection on August 2, 2023. The following are the primary representatives who participated in the audit:

Affiliation	Attendees
Township Representatives:	Rob Ritterson – Stormwater Program Coordinator & DPW Superintendent rritterson@deptford-nj.org Jon Bryson – Township Engineer jbryson@brysonyates.com
State Representatives:	Eileen Kull – NJDEP Southern Bureau, ES3 eileen.kull@dep.nj.gov
EPA Representatives:	Christy Arvizu – EPA Region 2, Environmental Scientist arvizu.christy@epa.gov
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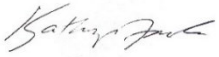
Name: Kate Forsmark	Signature: 	Date: 9/22/2023

The purpose of the audit was to obtain information that will assist EPA in assessing the Township's compliance with the requirements of the New Jersey Department of Environmental Protection (NJDEP) New Jersey Pollutant Discharge Elimination System (NJPDES) Tier A Municipal Stormwater General Permit, Permit No. NJ00152153 (hereinafter, the "Permit"). The Permit became effective January 1, 2023, with an expiration date of December 31, 2027, and is included as Appendix A. The Township is authorized to discharge in accordance with the terms and conditions in the Permit under Authorization to Discharge No. NJG00152153.

The audit focused on Permit Minimum Standards for:

- Public Involvement and Participation Including Public Notice;
- Local Public Education and Outreach;

- Post Construction Stormwater Management in New Development and Redevelopment;
- Pollution Prevention / Good Housekeeping for Municipal Operators; and
- MS4 Mapping, Scouring, and Illicit Discharge Detection and Elimination.

Construction site stormwater runoff was not evaluated as part of this audit. Part IV.D.1.a. of the Permit states "construction site stormwater runoff activities are authorized under a separate NJPDES permit, which is typically the Construction Activity NJPDES Stormwater General Permit No. NJ0088323 pursuant to N.J.A.C. 7:14A-25.6(b)2, or an individual permit pursuant to N.J.A.C. 7:14A-24.7(a)2."

The EPA Audit Team compiled information about the Township's MS4 Program through document reviews, interviews with Township representatives, and visits to Township facilities and MS4 infrastructure; this information is presented in this report as audit observations.

Appendix B, Photograph Log, contains photographs taken during the field inspection. Appendix C, Exhibit Log, contains the Stormwater Outfalls map, Stormwater Pollution Prevention Plan for Township of Deptford, Township of Deptford 2022 MS4 Annual Report and supplemental questionnaire, the Stormwater Control Ordinance, the Municipal Stormwater Management Plan, an example letter and violation to property owners and the 2021 MS4 Annual Report.

1.1 Inspection Procedure

On July 26, 2023, the first day of the virtual audit, and on August 2, 2023, the on-site field inspection, members of the EPA Audit Team presented credentials to Township representatives and conducted a brief opening conference, during which the overall objectives and plans for the audit and on-site field inspection were discussed. At the conclusion of the field inspection on August 2, 2023, the EPA Audit Team conducted a closing conference with Township representatives to review the preliminary findings of the audit and discussed the process for providing a written report to the Township. The Township was informed that the findings are preliminary.

1.1.1 Notification and Records Request

On July 6, 2023, the EPA Audit Team provided the Township with a formal notification via electronic mail that EPA would be conducting an inspection of the Township MS4 program. The formal notification included an EPA Records Request which asked the Township to make specific documentation available for review prior to and during the audit. The Township did not provide the EPA Audit Team with any of the requested documents prior to the start of the audit.

On July 26, 2023, the first day of the virtual audit, the EPA Audit Team informed the Township representative that they would provide a shared online folder to upload the requested documents. Following the first day of the virtual audit, the EPA Audit Team submitted a second records request via email to the Township.

On July 27, 2023, the EPA Audit Team submitted a third records request via email to the Township. On July 31, 2023, the EPA Audit Team submitted a fourth records request that noted which documents were not yet received.

During the field inspection, the Township provided outstanding records requested by the EPA Audit Team with the exception of the municipal board and governing body member training records.

1.2 History and Background

NJDEP originally issued the Township Authorization to Discharge and assigned the unique identifying number, NJG 0152153 in 2004. Upon expiration of the 2004 Permit, coverage was automatically carried over to subsequent NJPDES Tier A MS4 General Permits, including the current Permit. The Permit authorizes the Township to discharge stormwater runoff and certain non-stormwater flows from the Township's MS4 to surface water and groundwater.

The Township encompasses 17.57 sq miles in Gloucester County, bordered by Westville Borough to the north, Bellmawr Borough, Runnemede Borough, and Gloucester Township to the east, Washington Township to the southeast, Mantua Township to the southwest, Wenonah Borough, Woodbury Heights Borough, and Woodbury to the west. According to the 2020 U.S. Census, the total population of the Township was approximately 31,977. According to the Township representatives, the Township consists of approximately 40 percent residential structures, 40 percent commercial development, 10 percent agricultural land, and 10 percent open space.

During the field inspection, the Township representative stated that a comprehensive list of the receiving waters is included in the Municipal Stormwater Management Plan (MSWMP) (refer to Appendix C, Exhibit 1). The MSWMP states that the Township has the following three (3) receiving watersheds:

- Big Timber Creek
- Mantua Creek
- Woodbury Creek

During the field inspection, the EPA Audit Team noted that the Stormwater Outfalls map (refer to Appendix C, Exhibit 2) shows the following additional receiving waters:

- Almonesson Creek
- Monongahela Brook
- Big Timber Creek tributary
- Mantua Creek tributary
- Woodbury Creek tributary

The Township representatives concurred that these receiving waters should be on the MSWMP list.

2.0 Audit Observations

The EPA Audit Team made the following observations relative to the Township's MS4 program implementation and Permit requirements.

2.1 Overall Program Management

The Township's Stormwater Program Coordinator (SPC) role is filled by the Department of Public Works (DPW) Superintendent. The Township has contracted with Bryson & Yates Consulting Engineers LLC (Bryson & Yates) to fulfill the roles and responsibilities of the Township Engineer. Bryson & Yates has been under contract with the Township since 2020. The DPW is responsible for outfall inspections (stream scouring, dry weather, and illicit discharge), storm sewer system cleaning, and other MS4 maintenance activities.

The Township's MS4 program is funded through the Township's annual working budget. Township reviews of stormwater development and redevelopment plans for private developments are funded through an escrow accounts. The Township does not utilize a stormwater fee.

The Township's Stormwater Control Ordinance, Ordinance No. O.6.21 of the Township's Ordinances, and other Township Ordinances (e.g., litter control, property maintenance, parks, and open spaces) provide the Township with legal authority to enforce the MS4 program.

According to the Township representatives and the 2021 and 2022 MS4 Annual Reports, the Township has between 230 and 250 MS4 outfalls; however, that number includes Gloucester County's MS4 outfalls (refer to Appendix C, Exhibits 4 & 7). At the time of the audit, the Township representatives did not have an updated inventory that included just the Township's MS4 outfalls.

2.2 Stormwater Pollution Prevention Plan (SPPP)

In response to the EPA Records Request, the Township provided an electronic version of the Township's SPPP, which was originally developed in March 2005 and last updated in July 2023 (refer to Appendix C, Exhibit 3). The SPPP was developed using NJDEP's recommended SPPP forms and includes supplemental procedures, materials, and other information for implementing the program developed by the Permittee.

2.3 Public Involvement and Participation Including Public Notice

The EPA Audit team discussed public involvement and participation with Township representatives. The Township has a dedicated stormwater webpage on its municipal website with the minimum required elements of the permittee's MS4 stormwater program including the SPPP, Municipal Stormwater Management Plan (MSWMP), ordinances, and the MS4 outfall and infrastructure map. The link to the dedicated stormwater webpage was included in the 2022 MS4 Annual Report.

2.4 Local Public Education and Outreach

At the time of the audit, the Township was not implementing a formal public education and outreach program. Township representatives stated the only public education and outreach activities the Township performs is sending monthly brochures to residents with some information on stormwater.

The 2022 Annual Report and Supplemental Questionnaire states that the Township conducted two "School/Youth Educational Activities" during the 2022 reporting period. However, during

the audit, the Township representative stated that the Township does not coordinate with the schools to provide water-related educational presentations and/or activities.

The EPA Audit Team reviewed SPPP Form 4 – Public Education and Outreach (refer to Appendix C, Exhibit 3) and observed that the activities outlined in the SPPP include maintenance of a website, a mailing campaign, ordinance education, and a stormwater display do not add up to 12 points and do not include activities from at least three of the five categories as most of these activities are from Category 2: Targeted Audiences Outreach. During the audit, Township representatives stated an annual community clean-up takes place on Earth Day and is sponsored by the Township's Environmental Commission. This activity was not included in the SPPP.

At the time of the audit, the Township did not have a program in place to educate businesses or the public about the hazards associated with illicit connections and improper disposal of waste.

2.5 Post Construction Stormwater Management in New Development and Redevelopment

2.5.1 Municipal Stormwater Management Plan

The Township's MSWMP was developed in March 2006 and has not been updated since its development. The Township's MSWMP includes design and performance standards for stormwater management measures and stormwater facilities (refer to Appendix C, Exhibit 1).

2.5.2 Post Construction Stormwater Management Plan Review

The Township's Stormwater Control Ordinance contains design standards for stormwater facilities and erosion and sediment control (refer to Appendix C, Exhibit 5). Bryson & Yates assists the Township to ensure that all major development projects are constructed in accordance with the development plans. The Township Engineer (i.e., Bryson and Yates) additionally stated that the engineering design and the engineering review are always performed independent from one another. At the time of the audit, the Township had four (4) major development projects.

2.5.3 Post Construction Stormwater Management Facilities Maintenance

During the audit, Township representatives stated that the Township has an inventory of privately owned post-construction stormwater facilities within the MS4; however, the inventory is maintained by the Code Enforcement Department. The Township representatives stated that it is the Code Enforcement's responsibility to ensure that homeowner associations (HOAs) or private developers of residential or commercial developments are maintaining the privately-owned post-construction stormwater facilities within the Township.

The Code Enforcement Department inspects the privately owned post-construction stormwater facilities against their maintenance plans to determine if they are appropriately maintained and functioning properly. Following the inspection, Code Enforcement will issue letters to the owners informing them of inspections and issue violations if appropriate (refer to Appendix C, Exhibit 6). If the responsible parties do not complete the O&M and/or address a violation, the Township's Solicitor will then proceed with enforcement actions such as fines. The information is not readily communicated to the Stormwater Program Coordinator to document compliance

with the permit requirements.

The DPW Supervisor maintains an inventory of the Township-owned stormwater facilities. The Township representatives stated that Township's stormwater facilities are maintained by the DPW through tasks such as landscaping and cleaning of debris and O&M activities are documented. The Township did not provide copies of maintenance records to the EPA Audit Team.

2.6 Pollution Prevention / Good Housekeeping for Municipal Operators

2.6.1 Community Wide Ordinances

The Township has nine adopted ordinances, including the Stormwater Control Ordinance, which provide legal authority for enforcing the MS4 program. The Township maintains the following ordinances on the municipal website:

1. Pet Waste adopted on 4/2/2007
2. Wildlife Feeding adopted on 4/2/2007
3. Litter Control adopted on 4/2/2007
4. Improper Disposal of Waste adopted on 4/2/2007
5. Containerized Yard Waste / Yard Waste Collection Program adopted on 4/2/2007
6. Private Storm Drain Inlet Retrofitting adopted on 2/28/2011
7. Stormwater Control Ordinance adopted on 10/6/2006
8. Illicit Connection Ordinance adopted on 4/2/2007
9. Refuse Container / Dumpster Ordinance adopted on 2/28/2011

2.6.2 Community Wide Measures

Street Sweeping

According to the Township's SPPP Form 6 – Street Sweeping: "All of the municipal roadways within the Township are swept four (4) times a year. Sweeping records are kept at the Deptford Township Municipal Building – 1011 Cooper Street, Deptford, NJ. Logbooks are kept on file at the Deptford Township Public Works Facility" (refer to Appendix C, Exhibit 3). In response to the EPA's records request, the Township provided copies of the street sweeping logs.

Additional street sweeping information provided by the Township included:

- The Township representatives stated that the DPW conducts street sweeping five days per week and all streets are swept three times per year vs the four times a year in Form 6.
- The Township representatives stated they do not have different schedules for streets with or without storm drains and that the Township prioritizes streets where yard waste has been collected the day before due to the higher volume of debris on these streets.
- The Township's 2022 MS4 Annual Report states that the Township conducted 411 miles of street sweeping and collected 129 tons of debris (refer to Appendix C, Exhibit 4).

The DPW deposits sweeping tailings into stockpile at the DPW yard, and the debris is removed approximately every other month and disposed of at the Salem County landfill.

Catch Basin and Storm Drain Inlet Inspection and Cleaning

The Township representatives stated that catch basin cleaning is conducted on an as needed basis by DPW employees using a Township-owned vac truck and that all 1,432 Township catch basins are inspected annually. Catch basin cleaning and maintenance activities are documented on hardcopy forms. Catch basin debris is stored at the DPW yard with street sweeping debris before being disposed of at the Salem County landfill.

The Township's 2022 MS4 Annual Report states that the Township operates 1,432 catch basins and inspected 1,118 catch basins, cleaned 109 catch basins, and collected 5.4 tons of material (refer to Appendix C, Exhibit 4).

Storm Drain Inlet Labeling

According to the Township's SPPP Form 8 – Catch Bains and Storm Drain Inlets: "All inlets have been stenciled with the Township. The Township maintains a stencil and re-applies labels as needed" (refer to Appendix C, Exhibit 3). The 2022 MS4 Annual Report states that 100 percent of storm drains were labeled to indicate the drain empties into a local waterway (refer to Appendix C, Exhibit 4).

During the field inspection, the EPA Audit Team observed storm drain inlets that did not have labels to indicate that the storm drain emptied directly into a local waterway (refer to Site Visits #4 and #5, below).

Storm Drain Inlet Retrofits

The 2022 MS4 Annual Report states that 95 percent of storm drains had been retrofitted (refer to Appendix C, Exhibit 4). Catch basin retrofitting is completed when the roads are repaved and is completed by the contractor who is repaving.

2.6.3 Municipal Maintenance Yards and Other Ancillary Operations

The Township has a DPW, a police station, and a fire station and has developed an inventory of materials at municipally owned facilities and operations with the potential to pollute stormwater. The inventory is contained in the SPPP (refer to Appendix C, Exhibit 3).

All Township vehicles are fueled at the DPW Yard. The facility maintains two aboveground double walled storage tanks (ASTs) storing 7,000-gallons of gasoline and 3,000-gallons of diesel.

During the audit, the DPW representative stated he conducts daily visual inspections of the DPW yard and other employees conduct monthly inspections that they documented on hardcopy forms. During the field inspection, the EPA Audit Team reviewed copies of monthly inspections conducted during 2023. However, the monthly inspection forms provided were "Facility Hazard Identification Inspections" and did not have a specific focus on stormwater to identify conditions that would contribute to stormwater contamination, illicit discharges, or negative impacts to the permittee's MS4.

Employee Training

The Township's 2022 MS4 Annual Report states that the municipality conducted training during that calendar year (refer to Appendix C, Exhibit). The Township representatives provided copies of the sign-in sheets documenting the training. The Township Engineer took the Stormwater Management Design Review Course and provided a copy of his certificate of completion to the EPA Audit Team.

Township representatives stated that municipal and governing body board members have completed the "Asking the Right Questions in Stormwater Review Training Tool" through NJDEP, but documentation was not provided in response to the EPA Audit Team's July 6, 2023 and July 26, 2023 requests. Township representatives stated that the person who would have those records was not available at the time of the audit.

2.7 MS4 Outfall Pipe Mapping, and Illicit Discharge and Scouring Detection and Control

2.7.1 Outfall Pipe Mapping

The Township's Stormwater Outfalls Map shows some of the Township's MS4 outfalls, Gloucester County's MS4 outfalls, municipal boundaries, receiving waters, and roadways (refer to Appendix C, Exhibit 2). The map is reviewed and revised on an annual basis. At the time of the audit, the Township representatives did not have a definitive number of the Township's MS4 outfalls. According to the Township representatives and the 2021 and 2022 MS4 Annual Reports, the Township has between 230 and 250 MS4 outfalls; however, that number includes Gloucester County's MS4 outfalls (refer to Appendix C, Exhibits 2 and 7).

During the field inspection, the EPA Audit Team observed mapped MS4 outfalls that did not appear to meet the Permit definition of an outfall (refer to Site Visit #5, below). Specifically, the EPA Audit Team observed outfall B119, labeled as an outfall on the Township's hardcopy outfall location maps. Outfall B119 was observed to be a stormwater conveyance that transports stormwater from the roadway into an open sports field and not into a Water of the United States. The Permit defines an outfall as "any point source which discharges directly to waters of the United States and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the United States and are used to convey waters of the United States."

2.7.2 Stream Scouring

The Township Representatives stated that the DPW is responsible for conducting stream scouring investigations. Stream scouring inspections occur on a regular basis and are tracked to ensure all MS4 outfalls are inspected every five years with approximately 20% of the MS4 outfalls inspected each year. The 2022 MS4 Annual Report states that the Township has a prioritized list of outfall pipes requiring stream scouring remediation (refer to Appendix C, Exhibit 4).

SPPP Form 7, Section 4 (refer to Appendix C, Exhibit 3), states that "outfall pipes are inspected annually. There are no known scour issues within the Township. Records are kept at the publics works facility." During the field inspection, the EPA Audit Team visited a location in the Township where stream scouring had been occurring and the Township has remedied the issue by using bank stabilization methods (refer to Site Visit #4, below).

2.7.3 Illicit Discharge Detection and Elimination

The Township representative stated that the DPW is responsible for conducting dry weather outfall inspections; however, the Township has not conducted dry weather flow inspections at the MS4 outfalls. The Township representative stated that the DPW inspects outfalls known to have issues with debris build-up before and after storms and they try to inspect the outfalls around inclement weather.

According to the Township SPPP Form 7, Section 5 (refer to Appendix C, Exhibit 3):

"The Township's Public Works Department inspects outfalls annually and checking for illicit connections. The Township will use NJDES Illicit Connection Inspection Report to track any illicit connections."

The Township has developed an Illicit Connection Ordinance prohibiting illicit connections with or discharges to the MS4. The Township representatives stated if the public needs to report a possible illicit connection they would call the DPW. During the audit, the Township representative also stated they could not recall any complaints related to illicit connections in the duration they have worked with the Township.

3.0 Field Observations

The table below summarizes the EPA Audit Team's field observations from site visits conducted in the Township on August 2, 2023. The weather at the time of the site visits was sunny with temperatures ranging from approximately 70°F to 75°F.

Site Visit #1: Department of Public Works – 1710 Hurffville Rd, Deptford, NJ 08096	
Geographic Location: 39.795287°, -75.099094°	**Date:** 8/2/2023 **Time:** 8:00 AM (EDT) to 9:25 AM (EDT)
Notable Observations: • The DPW contains the DPW office building, a garage for storing equipment and vehicles, a maintenance garage, and a yard (refer to Appendix B, Photographs 1 through 3). The Township's Police Department also has buildings at the DPW for storage and a K9 kennel. • The maintenance garage is used for maintenance of municipal vehicles including small trucks and equipment. Maintenance activities include oil and vehicle fluids changes, battery changes, and other light maintenance. The garage does not contain any floor drains. • The EPA Audit Team observed the Township's salt storage (refer to Appendix B, Photograph 4). • The EPA Audit Team did not observe any catch basins or storm drains on the DPW property, and the surface gradient was east to west. • The DPW maintains two aboveground storage tanks (ASTs), one storing 7,000-gallons of gasoline and one storing 3,000-gallons of diesel (refer to Appendix B, Photograph 5). The EPA Audit Team observed a spill kit next to associated fuel pumps (refer to Appendix B, Photograph 6). The EPA Audit Team observed the signage at the fuel pumps did not include specific language required by the Permit (refer to Appendix B, Photograph 22). • The EPA Audit Team observed one roll-off dumpster centrally located at the yard holding used tires, the roll-off had a cover (refer to Appendix B, Photograph 7). • The DPW yard contains concrete bays used for storing street sweepings, scrap metal, aggregate materials, and wood waste (refer to Appendix B, Photographs 8 and 9). The DPW representative	

stated the bays had been emptied, and materials taken to their relative disposal locations, the week prior to the field inspection. The bays were observed without covers over the top or barriers at the front to prevent or minimize stormwater run-on or pollutant run-off.

- The DPW stores waste oil in one (1) 200-gallon tank outside the garage within secondary containment and under a cover (refer to Appendix B, Photographs 10 and 11).
- The DPW has an "e-waste recycling" area where residents can drop off used electronics and the DPW stores them under a cover before recycling or disposing of them (refer to Appendix B, Photograph 12).

Site Visit #2: Heritage Woods Basin – Deptford, NJ 08096

Geographic Location: 39.802140°, -75.084502°	**Date:** 8/2/2023 **Time:** 9:28 AM (EDT) to 9:38 AM (EDT)

Notable Observations:

- Heritage Woods Basin is a post-construction stormwater control, detention basin, located within a residential neighborhood. The detention basin has not gotten final approval of completion due to the basin not functioning as intended. According to the Township engineer, the ground beneath the basin contains a thick clay layer which causes water to pool in the basin as opposed to infiltrating. Additionally, the weir structure in the basin was constructed higher than the rest of the basin and water does not flow towards the weir.
- The EPA Audit Team observed the detention basin to have standing water at the time of the field inspection (refer to Appendix B, Photograph 13).
- At the time of the field inspection, the Township representatives did not have a timeframe for when the basin would be rebuilt or fixed.

Site Visit #3: Lake Bridge Community Outfall – Deptford, NJ 08096

Geographic Location: 39.835498°, -75.132866°	**Date:** 8/2/2023 **Time:** 10:52 AM (EDT) to 10:08 AM (EDT)

Notable Observations:

- The Township's Stormwater Outfalls map identifies outfalls in the Lake Bridge Community that discharge into the Woodbury Creek Tributary. Outfall B005 is located within the Lake Bridge Community and has been reported to the Township with scouring issues.
- The EPA Audit Team observed outfall B005 which had minimal erosional issues (refer to Appendix B, Photograph 14).

Site Visit #4: Carson Avenue Stream Scouring – Carson Ct & Carson Ave, Deptford, NJ 08096

Geographic Location: 39.838769°, -75.138970°	**Date:** 8/2/2023 **Time:** 10:19 AM (EDT) to 10:31 AM (EDT)

Notable Observations:

- The Township has an outfall south of Carson Avenue which discharges into Stewart Lake. The location is a location where stream scouring is a problem for the Township.
- The EPA Audit Team observed where the Township installed rip rap to mitigate stream scouring from the outfall (refer to Appendix B, Photographs 15 and 16).
- The EPA Audit Team additionally observed an unlabeled storm drain along Carson Avenue that connected to the outfall (refer to Appendix B, Photograph 17).

Site Visit #5: Deptford Sports Complex – Montague Ln, Deptford, NJ 08096

Geographic Location: 39.848890°, -75.106525°	**Date:** 8/2/2023 **Time:** 10:41 AM (EDT) to 10:58 AM (EDT)

Notable Observations:

- The Deptford Sports Complex is a municipally owned and maintained facility. The complex is bordered by wetlands to the south and the Big Timber River to the east. The Township's outfall map identifies outfalls B118 – B121 in at this location.
- The EPA Audit Team observed outfalls B119 and B118.
    - Outfall B119 was observed to be a stormwater conveyance from catch basins in the roadway into one of the sports fields (refer to Appendix B, Photographs 18 through 20). The outfall was observed approximately 300 feet away from the wetland.
    - The catch basin that conveys stormwater to Outfall B119 was observed to be unlabeled (refer to Appendix B, Photograph 20).
    - Outfall B118 was observed to be an outfall discharging stormwater from a parking lot into the wetland to the south (refer to Appendix B, Photograph 21).

4.0 Summary

4.1 Potential Non-Compliance Items

1. Part IV.C.1.a of the Permit states that "the permittee shall implement a Public Education and Outreach Program that focuses on educational and pollution prevention activities about the impacts of stormwater discharges on surface water and ground water and involves the public in reducing pollutants in stormwater and mitigating flow. The permittee shall:

    i. Annually conduct activities that total at least 12 points and include activities from at least three of the five categories as set forth in Attachment A;

    ii. At a minimum, at least one of the activities shall involve educating businesses and the general public of hazards associated with illicit connections and improper disposal of waste."

    At the time of the audit, the EPA Audit Team observed that the Township's SPPP did not include activities that totaled at least 12 points and included activities from at least three of the five categories as required, nor was the Township educating businesses and the general public of hazards associated with illicit connections and improper disposal of waste on an annual basis.

2. Part IV.E.1.c of the Permit states "the post construction stormwater management program established by the permittee shall require compliance with the applicable design, performance and maintenance standards established under N.J.A.C. 7:8 for "major development".

    During the field inspection, the EPA Audit Team observed a detention basin at Heritage Woods that was not functioning properly, nor had the detention basin received final approval of completion from the Township.

3. Part IV.E.2.a.i of the Permit states that the permittee shall "adopt, amend, and implement a written MSWMP" … and "conduct a re-examination of its MSWMP as part of the re-

examination of its municipal master plan in accordance with N.J.A.C. 7:8-4.3(c) and (d), at least every 10 years, or more often as necessary to reflect changes related to the permittee's stormwater management program.

At the time of the audit, the MSWMP provided to the EPA Audit Team was dated February 2006 and the Township representative stated that the document had not been re-examined or updated since its development.

4. Part IV.F.2.a.iii of the Permit states that the "permittee shall label all permittee owned or operated storm drain inlets that do not have permanent wording cast into the structure of the inlet to indicate that it empties directly into a local waterway."

   During the field inspection, the EPA Audit Team observed two storm drain inlets that did not have labels.

5. Part IV.F.5.b of the Permit states that the "permittee shall inspect the entire site, including the site periphery, monthly (under both dry and wet conditions, when possible), and identify conditions that would contribute to stormwater contamination, illicit discharges, or negative impacts to the permittee's MS4."

   At the time of the audit, the Township was not conducting site inspections at the DPW that focused on identifying conditions that would contribute to stormwater contamination, illicit discharges, or negative impacts to the permittee's MS4.

6. Part IV.F.5.l of the Permit states that the permittee "may store materials such as sand, gravel, stone, topsoil, wood chips, and finished leaf compost, provided these materials are:

   i. Stored a minimum of 50 feet from surface water bodies, storm sewer inlets, and/or ditches or other stormwater conveyance channels.

   ii. Stored in a manner as to minimize stormwater run-on and pollutant run-off via surface grading, dikes and/or berms (which may include sandbags, hay bales and curbing, among others) or three-sided storage bays."

   During the field inspection, the EPA Audit Team did not observe best management practices at the concrete bays used to store street sweepings, scrap metal, aggregate materials, and wood waste at the DPW.

7. Part IV.F.10 of the Permit states that permittees "shall ensure that municipal board and governing body members complete the "Asking the Right Questions in Stormwater Review Training Tool" posted at www.njstormwater.org/training.htm …" and "maintain a list of the dates and names of training program participants in its SPPP."

   The EPA Audit Team did not observe records documenting that Township of Deptford municipal board and governing body members had taken the required training.

8. Part IV.G.3.b of the Permit states that permittees shall:

   i. "Conduct visual dry weather inspection of all outfalls owned or operated by the permittee at least once every five years, with a minimum of 20% of the total number of outfalls per year, to determine if dry weather flow (flow occurring 72 hours after a rain event) or other evidence of illicit discharge is present."

The Township did not have documentation demonstrating that dry weather visual inspections are conducted at each MS4 outfall owned or operated by the permittee at least once every five years, with a minimum of 20 percent of the total number of outfalls per year.

4.2 Areas of Concern

1. According to the Township representatives and the 2021 and 2022 MS4 Annual Reports, the Township has between 230 and 250 MS4 outfalls.

   At the time of the audit, the EPA Audit Team observed that the Township representatives did not have an updated inventory of the Township's MS4 outfalls. In addition, during the field inspection, the EPA Audit Team observed a location identified on the Township's Stormwater Outfall maps which did not qualify as an outfall in accordance with Part IV Notes and Definitions in the Permit. Specifically, outfall B119 was observed to convey stormwater to a field, not to a Water of the United States.

2. According to the Township representatives, the responsibility of ensuring the O&M of privately owned post-construction stormwater facilities falls within the Code Enforcement Department. The Stormwater Program Coordinator is the individual who is supposed to be responsible for implementing the stormwater program and ensuring all departments that are involved in the implementation of the MS4 program provide information in a timely manner.

   At the time of the audit, the information about O&M of privately owned stormwater facilities was not readily communicated to the Stormwater Program Coordinator to document compliance with the permit requirements.

3. Part IV.F.5.g.iii of the Permit states that the permittee shall "clearly post, in a prominent area of the facility, instructions for safe operation of fueling equipment" and that the signage must include the following:

   - "Topping off of vehicles, mobile fuel tanks, and storage tanks is strictly prohibited"
   - "Stay in view of fueling nozzle during dispensing"

   During the field inspection, the EPA Audit Team observed signage in the area of fueling operations with standard operating procedures for fueling vehicles and the emergency contact information for spill response; however, the signage did not include the specific language required by the Permit.

State of New Jersey

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Mail Code - 501-02A
Bureau of NJPDES Stormwater Permitting and Water Quality Management
P.O. Box 420 – 501 E State St., 1st Flr.
Trenton, NJ 08625-0420
Phone: (609) 633-7021 / Fax: (609) 777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

SHAWN M. LATOURETTE
Commissioner

December 08, 2022

SENT VIA EMAIL to: rritterson@deptford-nj.org

Rob Ritterson
DEPTFORD TWP
1011 COOPER ST
DEPTFORD TWP, NJ 08096

Re: Stormwater Discharge General Permit Authorization Renewal
Category: R9 - MS4 - Tier A Municipal Stormwater (GP)
NJPDES: NJG0152153 / PI ID #: 189965
DEPTFORD TWP
Deptford Twp, Gloucester County

Dear Interested Party,

Enclosed is a **final** New Jersey Pollutant Discharge Elimination System (NJPDES) permit action identified above which has been issued in accordance with N.J.A.C. 7:14A. The Tier A Municipal Stormwater General Permit authorizes the discharge of stormwater from small municipal separate storm sewer systems (MS4). The permit was issued in response to USEPA's Phase II rules. The Tier A permit addresses stormwater quality issues related to both new and existing development.

A summary of the significant and relevant comments received on the draft action during the public comment period, the Department's responses, and an explanation of any changes from the draft action have been included in the Response to Comments document attached hereto as per N.J.A.C. 7:14A-15.16.

The final Tier A MS4 NJPDES permit and supporting documents are also posted at https://www.nj.gov/dep/dwq/tier_a.htm. Questions or comments regarding the final action should be addressed to Dan Kuti at Daniel.Kuti@dep.nj.gov.

Sincerely,

Gabriel Mahon

Gabriel Mahon, Bureau Chief
Bureau of NJPDES Stormwater Permitting and Water Quality Management

Enclosures
c: Permit Authorization
Response to Comments Document
Final Permit Document

New Jersey Department of Environmental Protection
Mail Code - 501-02A
Bureau of NJPDES Stormwater Permitting
and Water Quality Management
PO Box 420- 501 E. State St. 1st Flr
Trenton, NJ 08625-0420
Phone: (609) 633-7021
Fax: (609) 777-0432

AUTHORIZATION TO DISCHARGE
R9 - MS4 - Tier A Municipal Stormwater (GP)

Facility Name: DEPTFORD TWP

Permit Number: NJG0152153

Program Interest No.: 189965

Facility Address:
1011 COOPER ST
DEPTFORD TWP, NJ 08096-3090

Type of Activity: Stormwater Discharge General Permit Authorization Renewal

Owner:
DEPTFORD TWP
1011 COOPER ST
DEPTFORD TWP, NJ 08096

Operating Entity:
DEPTFORD TWP
1011 COOPER ST
DEPTFORD TWP, NJ 08096

Issuance Date:	Effective Date:	Expiration Date:
12/13/2022	01/01/2023	12/31/2027

Your Request for Authorization under NJPDES General Permit No. NJ0141852 has been approved by the New Jersey Department of Environmental Protection.

Gabriel Mahon

Date: 12/22/2022

Gabriel Mahon, Chief
Bureau of NJPDES Stormwater Permitting
And Water Quality Management

(Terms, conditions and provisions attached hereto)

Appendix B
Photograph Log

Photograph 1. *Department of Public Works* – General view, facing northwest, of the DPW yard and maintenance garage.

Photograph 2. *Department of Public Works* – View, facing northeast, of equipment storage in the yard.

Photograph 3. *Department of Public Works* – View, facing east, of the garage bays for storing equipment and vehicles.

Photograph 4. *Department of Public Works* – View, facing southwest, of the salt shed.

Photograph 5. *Department of Public Works* – View, facing northwest, of the 7,000-gallon gasoline and 3,000-gallon diesel double wall aboveground storage tanks.

Photograph 6. *Department of Public Works* – View, facing north, of the fuel pumps and spill kit (yellow).

Photograph 7. *Department of Public Works* – View, facing west, of the roll-off dumpster holding used tires. Note the permanent cover over the dumpster.

Photograph 8. *Department of Public Works* – View, facing northwest, of the concrete bays used to store street sweepings, scrap metal, aggregate materials, and wood waste.

Photograph 9. *Department of Public Works* – View, facing north, of the concrete bays storing street sweepings. The bays had been cleaned out prior to the field inspection. Note the lack of cover or berms at the front.

Photograph 10. *Department of Public Works* – View, facing southeast, of the structure housing the waste oil tank.

Photograph 11. *Department of Public Works* – View of the ground surface around the waste oil tank structure. Oil was observed spilled on the ground around the tank.

Photograph 12. *Department of Public Works* – View, facing south, of the structure that houses "e-waste recycling from residents".

Photograph 13. *Heritage Basin* – View, facing north, of the detention basin. The weir structure is in the northern corner (red). Note the standing water.

Photograph 14. *Lake Bridge Community*– View, facing southwest, of outfall B005.

Photograph 15. *Carson Avenue Stream Scouring* – View, facing south, of the rip rap installed to mitigate stream scouring.

Photograph 16. *Carson Avenue Stream Scouring* – View of the mouth of the outfall.

Photograph 17. *Carson Avenue* – View of an unlabeled storm drain on Carson Avenue.

Photograph 18. *Deptford Sports Complex* – View, facing north, of outfall B119. The outfall was partially filled with sediment.

Photograph 19. *Deptford Sports Complex* – View, facing south, of the field where outfall B119 conveys water to. The nearest receiving water is approximately 300 feet from the outfall.

Photograph 20. *Deptford Sports Complex* – View, facing south, of an unlabeled catch basin that discharges stormwater to outfall B119.

Photograph 21. *Deptford Sports Complex* – View, facing southeast, of the location of outfall B118. The vegetation around the outfall is overgrown making the outfall difficult to find and access.

Photograph 22. Department of Public Works – View of the signage in the area of fueling operations. The sign does not specifically state "Topping off of vehicles, mobile fuel tanks, and storage tanks is strictly prohibited" and "Stay in view of fueling nozzle during dispensing".

Township of
Deptford
Exhibit Log

Exhibit 1 - Township of Deptford Municipal Stormwater Management Plan

Watershed Based
Municipal Stormwater Management Plan

Deptford Township

prepared for

Gloucester County Improvement Authority

on behalf of

Gloucester County Board of Chosen Freeholders
and
Deptford Township

February 2006

William H. Fleming, Jr., P.E., P.P.
Professional Planner
NJ License No. 33LI00273900

prepared by:

Churchill Consulting Engineers
344 North Route 73 Suite A
Berlin, NJ 08009

Adams, Rehmann & Heggan
850 South White Horse Pike
Hammonton, NJ 08037

Melvin Kernan LLC
935 Kings Highway, Suite 300
Thorofare, NJ 08086

(The original of this report has been signed and sealed in accordance with the law)

Acknowledgements

Gloucester County Freeholders

Stephen M. Sweeney, Director
Robert M. Damminger, Deputy Director
Joseph A. Brigandi, Jr.
Frank J. DiMarco
William (Bill) Krebs
Helene M. Reed
Warren S. Wallace

Gloucester County Improvement Authority Board Members

Joseph A. Brigandi, Sr., Chairman
Charles Fentress, Vice Chairman
Sam Ferraino, Jr., Secretary/Treasurer
Chad M. Bruner, Commissioner
Jeanette Moyer, Commissioner

Gloucester County Planning Division

Charles Romick, Director

Gloucester County Improvement Authority Staff

David Shields, Executive Director
George Strachan, Assistant Administrator

Parker McCay

Joseph J. McGovern, Esquire

Federation of Gloucester County Watersheds

Suzanne McCarthy
Christine Nolan

Gloucester and Camden County Soil Conservation Districts

Victor DeVasto
Craig McGee

Rowan University

Joseph Orlins, PhD., PE, D WRE

Deptford Township

Deptford Township Planning Board

Deptford Township Stormwater Program Coordinator

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APPENDIX A. WATERSHED FIGURES

BIG TIMBER CREEK WATERSHED

MANTAU CREEK WATERSHED

WOODBURY CREEK WATERSHED

Section 1. Introduction

All New Jersey municipalities were required in early 2004 to obtain a NJPDES Municipal Stormwater General Permit for control of their stormwater discharges. The Gloucester County Board of Chosen Freeholders, through the Gloucester County Improvement Authority (GCIA), is committed to working with all of the municipalities in Gloucester County to cost-effectively accomplish the new stormwater management permit program's goals.

To that end, the GCIA has undertaken watershed-based municipal stormwater management planning throughout the County, and has prepared a Watershed Based Municipal Stormwater Management Plan (MSWMP) for Deptford Township that includes both municipal and watershed stormwater management information and evaluations. The location of Deptford Township, in relationship to the eight major watersheds in Gloucester County, is shown on Figure 1.

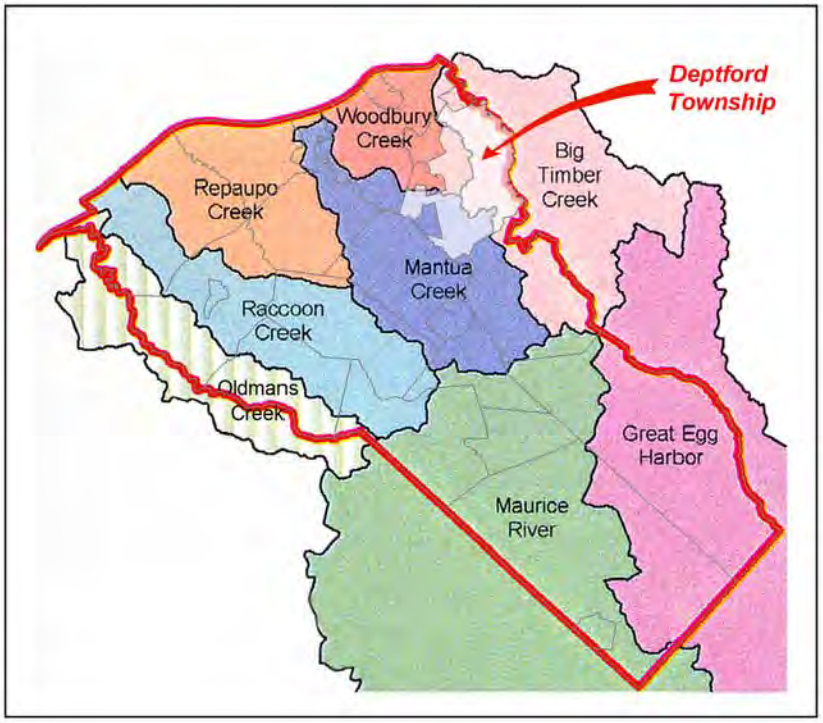


Figure 1. Deptford Township and Gloucester County Watersheds

The NJDEP's new Stormwater Management Rules in N.J.A.C. 7:8 have been developed to address the adverse impacts that unmanaged land development can have on groundwater recharge and stormwater runoff quality and quantity. Figure 2 shows the expansion of development within the Delaware Valley during the 70 year period from

1930 through 2000. Along with this development has come a corresponding increase in stormwater runoff, and increased impacts associated with non-point source pollution.

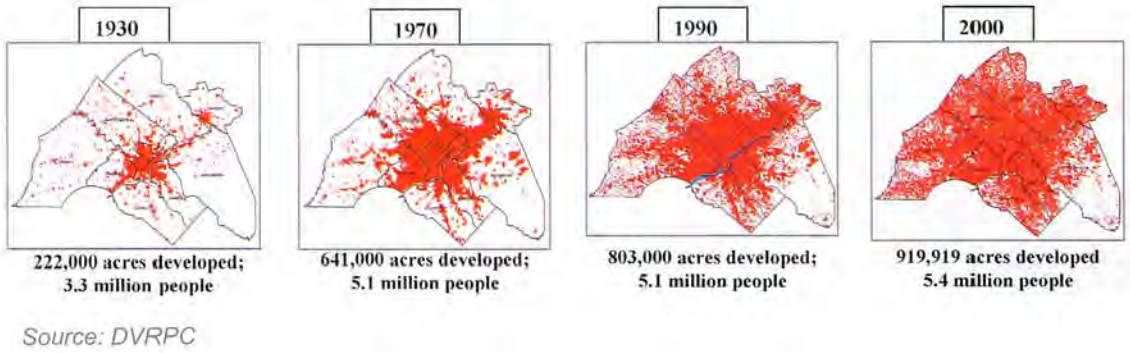


Figure 2. Delaware Valley Development Patterns (1930 – 2000)

The Deptford Township MSWMP was prepared as part of Gloucester County's Stormwater Management Program. The Sample Municipal Stormwater Management Plan included in Appendix C of the New Jersey Stormwater Best Management Practices Manual, dated February 2004, was utilized as a template for preparation of the plan.

The MSWMP provides strategies for Deptford Township to follow in addressing stormwater management. The plan is required by N.J.A.C. 7:14A-25, the Municipal Stormwater Regulations, and contains the elements required by N.J.A.C. 7:8, the Stormwater Management Rules.

The MSWMP addresses groundwater recharge and stormwater quantity and quality, by incorporating the stormwater design and performance standards for new major development (defined as projects that disturb one or more acres of land or increase the amount of impervious surface by one-quarter acre or more). These standards are intended to minimize the adverse impact of stormwater runoff on water quality, and to address water quantity and the loss of groundwater recharge that provides base flow in receiving water bodies.

The MSWMP also includes:

- Long-term operation and maintenance measures for stormwater facilities associated with new major development projects.
- A "build-out" analysis that is based upon existing zoning and the land available for development.
- Changes that should be made to existing ordinances, the Master Plan, and other municipal land use planning documents, in order to allow various low impact development techniques.
- Mitigation strategies for variances or exemptions from the design and performance standards, including the implementation of specific mitigation projects to offset the effects of such variances or exemptions.

Section 2. Goals

The Deptford Township MSWMP goals are:

1. The reduction of flood damage, including damage to life and property.

2. The minimization, to the extent practical, of increases in stormwater runoff from new development.

3. The reduction of soil erosion from construction activities.

4. The insurance of adequate stormwater facilities, including culverts, bridges, and other in-stream structures.

5. The maintenance of groundwater recharge.

6. The prevention, to the extent feasible, of non-point stormwater pollution.

7. The maintenance of surface waters to ensure their biological and stormwater management functions, including the restoration, enhancement, and maintenance of their chemical, physical, and biological integrity, in order to protect public health and safeguard aquatic life; the preservation of their scenic and ecological values; and the enhancement of their domestic, municipal, recreational, industrial, and other uses.

8. The protection of public health and welfare, through the planning, engineering, operation and maintenance of stormwater systems.

The MSWMP outlines specific stormwater standards for new development and proposes stormwater management controls that address impacts from existing development. Preventative and corrective maintenance strategies are included to ensure the long-term effectiveness of stormwater management facilities. The MSWMP provides recommendations for stormwater systems to protect the public health and welfare.

This watershed-based MSWMP includes a discussion of both Deptford Township and its watershed(s). Land use, zoning, impervious surfaces, and pollutant loadings were evaluated using a Geographic Information System. These efforts provide an initial understanding of surface water quality in the County's watersheds, and establish a basis for evaluating the impacts of future land use and zoning decisions.

Section 3. Stormwater and Development

Water moves continuously through the hydrologic or water cycle (see Figure 3). Water evaporates from water bodies and the earth's surface and transpires from vegetation into the atmosphere (these components of the water cycle are jointly referred to as

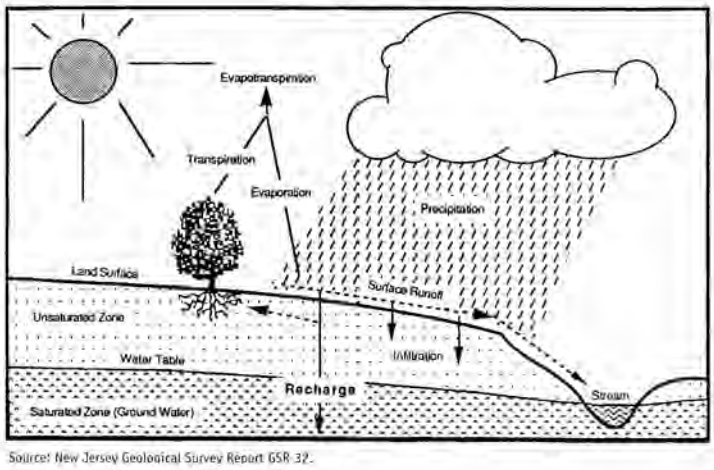


Figure 3. Groundwater Recharge in the Hydrologic Cycle

evapotranspiration). Water vapor in the atmosphere condenses to form clouds which produce precipitation that falls to the earth's surface. A small percentage of this precipitation falls over the land and runs off into streams and lakes flowing to the oceans.

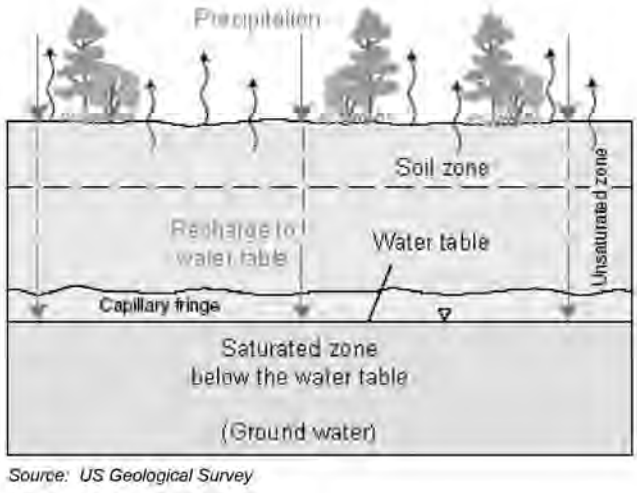


Figure 4. Subsurface Water

However, most of the precipitation that falls on land surfaces infiltrates into the ground (see Figure 4), where it either recharges shallow groundwater table aquifers and discharges to streams and springs, sustaining their base flow, or seeps into deeper

confined aquifers, where it is stored for long periods and discharges regionally (see Figure 5). Human activities and development of the land can interfere with the natural water cycle, and in doing so, impact a watershed in many ways.

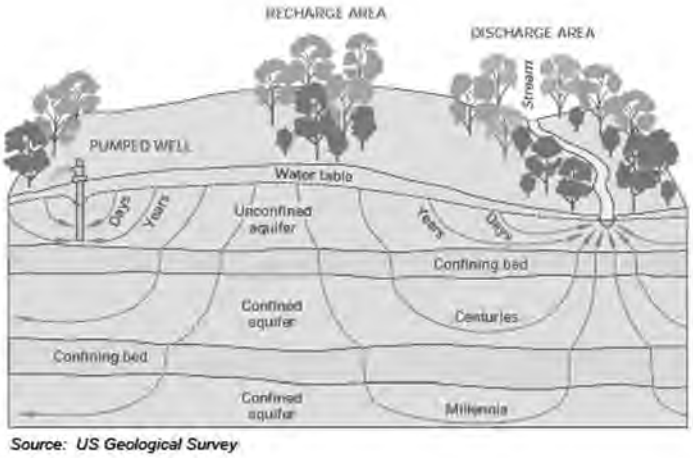


Figure 5. Groundwater Flow Paths

Development can remove beneficial vegetation; replacing it with lawns or impervious cover, thus reducing evapotranspiration and infiltration. Clearing and grading removes depressions that store rainfall and encourage infiltration. Construction activities can also compact the soil and diminish infiltration, resulting in increased volumes and rates of stormwater runoff.

Conversely, increased impervious areas that are connected to each other through gutters, channels, and storm sewers transport runoff more quickly than natural areas. Shortening runoff travel time increases the rainfall-runoff response in the watershed, causing flow in downstream waterways to reach peak rates faster and water levels to increase above natural conditions. These conditions aggravate downstream flooding and erosion and increase the quantity of sediment in stream flow and deposited in stream channels. Impervious areas and storm sewers reduce the potential for surface vegetation to filter and remove pollutants from runoff.

Increased impervious area from land development can also decrease infiltration, and in turn, reduce stream base flow and groundwater recharge. Reductions in stream base flow can dry up habitat in stream channels and adjacent wetlands, and in so doing, adversely impact the health of important biological communities that reside in or depend upon these stream channels and wetlands. Increased impervious area can also increase peak stream flow, channel erosion, and sedimentation and thus can destroy aquatic habitat.

Land development can result in the addition and accumulation of pollutants on the land surface. Runoff and infiltration can mobilize and transport these pollutants to groundwater and streams. Surfaces and cleared areas within a development can receive a variety of pollutants from the atmosphere and from runoff over land surfaces that mobilizes fertilizers, animal wastes, and leakage and corrosion from vehicles. The

pollutants may include suspended and dissolved solids containing metals, nutrients and other inorganic compounds; hydrocarbons, pesticides, herbicides and other organic compounds; and pathogens--all of which can become mobilized by precipitation falling on the land.

Land development can also adversely affect water quality and stream biota in subtle ways. Runoff stored in detention or retention basins can become heated, raising the temperature of the downstream waterway and adversely affecting cold water aquatic species, such as trout, and by providing conditions that support unwanted aquatic species. Additionally, development may remove trees along streams or cause stream bank instability that undermines nearby trees. These trees are valuable because they provide shade that maintains cooler water temperatures and increased dissolved oxygen levels during critical summer periods. Trees also help stabilize stream banks, preventing bank erosion, and their leaf litter provides habitat and food for aquatic communities.

Section 4. Background

DEPTFORD TOWNSHIP

Deptford Township is located in northern Gloucester County (see Figure 1). The Township's characteristics, as they relate to the stormwater management planning goals described in Section 2, are discussed in this background section of the MSWMP.

Zoning and Existing Land Use

Deptford Township is unique among the 24 municipalities in Gloucester County, for several reasons. In terms of both total area and land area (see Table 1), it is one of the larger municipalities in Gloucester County.

Table 1. Deptford Township Area

	Area (sq. mi.)
Total Area	17.58
Land Area	17.50
Water Area	0.08

With so much land area, its location in close proximity to Philadelphia, and its major highway access (Routes 55, 42 and I-295), Deptford Township has experienced significant development pressures. The Township's location makes it accessible to the major bridges into Philadelphia, as well as to the Atlantic City Expressway. The Deptford Mall has greatly increased employment opportunities in Deptford Township.

The existing zoning is shown on Figure 6, and the existing land use, based on the DVRPC 2000 aerial land use analysis is shown on Figure 7. During the time period of 1990-2000, the housing stock in Deptford Township grew by 24.5% and more than 4,000 housing units were added during the thirty year period of 1970-2000. As of 2002, it was anticipated that much of Deptford's housing growth would occur in the Locust Grove Planned Unit Development, with a maximum of 2,172 non age-restricted units and 219 age-restricted units planned.

The rate of development in Deptford Township has been fast, but the projected build-out development of the Township is still years away, given its geographic location, its size, and the amount of undeveloped land in the Township.

Figure 6. Zoning

Figure 7. Existing Land Use

Population and Housing

The population of Deptford Township (see Table 2) is the 3rd largest total population in Gloucester County. Table 2 provides the urban population and rural population (if any) breakdown. With respect to housing, the Township also has the 3rd largest number of total housing units in Gloucester County and the number of urban and rural housing units (if any) are shown (see Table 2).

Deptford Township is one of 11 municipalities in the County with no housing units classified as rural.

Table 2. Deptford Township Population and Housing (Year 2000)

	Population	Housing Units
Total	26,763	10,647
Urban	26,763	10,647
Rural	0	0

Source: U.S. Census Bureau

Deptford Township is 11th of 24 municipalities in Gloucester County in terms of population density.

Table 3. Deptford Township Population Density (1990 – 2003)

	Population	Population Density (persons/sq. mi.)
1990	23,852	1,363
2000	26,763	1,529
2003	28,055	1,603

Source: U.S. Census Bureau and N.J. Department of Labor

Deptford Township has been one of the faster growing municipalities in Gloucester County in recent years. Between 1990 and 2000, Deptford Township experienced 12 percent growth and the estimated growth from 2000 to 2003 is 1,292 or 5 percent (see Table 4).

Table 4. Deptford Township Population Growth (1990 – 2003)

	Population	Population Change	Percent Growth
1990	23,852		
2000	26,763	2,911	12
2003	28,055	1,292	5

Source: U.S. Census Bureau and N.J. Department of Labor

The Delaware Valley Regional Planning Commission (DVRPC) projects Deptford Township to grow by 3,477 people over the 30-year period from 2000 to 2030 (see Table 5), with an overall growth of 13.0 percent during those three decades.

Table 5. Deptford Township Projected Population Growth (2000 – 2030)

	Population	Population Change	Percent Growth
2000	26,763		
2010	27,630	867	3.2
2020	28,790	1,160	4.2
2030	30,240	1,450	5.0

Source: DVRPC

Surface Water

(a) Watersheds and Hydrologic Unit Codes (HUCs)

There are eight major Watersheds within Gloucester County. Each of these Watersheds and their land areas within the County are shown in Table 6. Also shown in Table 6 is a two character identification code used in this report to identify data tables and figures related to the individual watersheds.

Table 6. Watersheds Within Gloucester County

ID	Watershed	Area (acres)
BT	Big Timber Creek	12,925
GE	Great Egg Harbor River	36,997
MC	Mantua Creek	32,099
MR	Maurice River	47,177
OC	Oldman's Creek	14,558
RA	Raccoon Creek	31,822
RE	Repaupo Creek	26,222
WC	Woodbury Creek	13,787
		215,587

Deptford Township is within three of these major watersheds, as shown in Table 7.

Table 7. Deptford Township Watersheds

ID	Watershed	Area (acres)
BT	Big Timber Creek	5,574.34
MC	Mantua Creek	3,530.56
WC	Woodbury Creek	2,139.13
	Total	11,244.03

The NJDEP requires that municipalities evaluate the impacts of their small municipal separate storm sewer systems (small MS4s) on surface waters at the HUC14 sub-watershed level (these watershed and sub-watershed divisions were developed by the United States Geological Survey (USGS) using a coding system called Hydrological Unit Codes, or HUCs).

Figure 8 shows the HUC14s located partially or entirely within the municipal boundaries of Deptford Township. The names of the HUC14s are shown in Table 8.

(b) New Jersey Surface Water Quality Standards

The Federal Clean Water Act requires that states maintain surface water quality in high quality waters and restore water quality in impaired waters. Surface Water Quality Standards (SWQS) have been developed by the NJDEP (and Delaware River Basin Commission (DRBC) for the Delaware River) to accomplish this goal. These standards establish "designated uses" to be achieved for surface water bodies and specify the water quality criteria necessary to achieve these uses.

Designated uses established by the NJDEP for New Jersey water bodies include potable water supply (drinking water use), propagation of fish and wildlife (aquatic life use), recreation in and on the water (primary and secondary contact), agricultural and industrial supplies, and navigation. The NJDEP has established stream classifications and antidegradation designations for all of the state's surface water bodies. New Jersey's Water Quality and Monitoring Standards homepage can be found at the following link:

http://www.state.nj.us/dep/wmm/

The Surface Water Quality Standards can be found in N.J.A.C. 7:9B at these links:

http://www.state.nj.us/dep/wmm/sgwqt/swqsdocs.html
http://www.state.nj.us/dep/wmm/sgwqt/sgwqt.html.

In addition, because the Delaware River is an interstate water body, the Delaware River Basin Commission (DRBC) has established interstate zones, designated uses for each zone, and water quality standards to achieve the designated uses along the entire length of the river. Gloucester County adjoins the very lowest end of Zone 3, Zone 4 and the upper

Figure 8. HUC14s

Table 8. Deptford Township Watersheds and HUC14s

Watersheds	HUC14 Sub-Watersheds	
	No.	Name
Big Timber Creek	02040202120040	Big Timber Creek SB (including Bull Run to Lakeland Road
	02040202120050	Big Timber Creek SB (below Bull Run)
	02040202120060	Almonessen Creek
	02040202120080	Big Timber Creek (below NB/SB confluence)
Mantua Creek	02040202130020	Mantua Creek (road to Sewell to Rt 47)
	02040202130040	Mantua Creek (Edwards Run to road to Sewell)
	02040202130060	Mantua Creek (below Edwards Run)
Woodbury Creek	02040202120100	Woodbury Creek (above Rt 45)
	02040202120110	Woodbury Creek (below Rt 45)/Lower Delaware River to Big Timber Creek

most portion of Zone 5. The DRBC's 2004 Delaware River and Bay Integrated List Water Quality Assessment Report, which contains the water quality standards for each zone (see Section 2.2), and the results of their 2004 Delaware River and Bay Water Quality Assessment, can be found at the following link:

http://www.state.nj.us/drbc/04IntegratedList/index.htm.

The Surface Water Quality Criteria for all classified waterways in the State depend on their designated uses and reflected Surface Water Classification. The Surface Water Quality Criteria are detailed in N.J.A.C. 7:9B-1.14 and are too voluminous to include in this report.

(c) Impaired Waters

States are required to prepare and submit to the USEPA a report that identifies waters that do not meet or are not expected to meet surface water quality standards (SWQS). This report is commonly referred to as the 303(d) list. In accordance with Section 305(b) of the CWA, the States are also required biennially to prepare and submit to the USEPA a report addressing the overall water quality of the State's waters. This report is commonly referred to as the 305(b) Report or the Water Quality Inventory Report. Those water bodies, which are listed on the 303(d) list, are referred to as "water quality limited" water bodies and a total maximum daily load (TMDL) must be developed for each individual pollutant in these impaired water bodies.

In November 2001, the USEPA issued guidance that encouraged states to integrate 305(b) Report and the 303(d) List into one report. The New Jersey Department of Environmental Protection (NJDEP) chose to develop an Integrated Report for New Jersey starting in 2002. The 2004 Integrated List of Waterbodies combines these two assessments and assigns water bodies to one of five sublists. Sublists 1 through 4 include water bodies that are generally unimpaired. Sublist 5 of the 2004 Report supersedes Sublist 5 of the 2002 Integrated List and the new sublist presents all water quality limited waters and includes waters for which TMDL development is occurring or will occur within two years. The Sublists of water bodies in New Jersey are categorized as follows.

Sublist 1 - water bodies that are attaining the water quality standards and no use is threatened.

Sublist 2 - water bodies that are attaining some of the designated uses; no use is threatened; and insufficient or no data and information is available to determine if the remaining uses are attained or threatened.

Sublist 3 - water bodies where there is insufficient or no data and information to determine if any designated use is attained.

Sublist 4 - water bodies that are impaired or threatened for one or more designated uses but do not require the development of a TMDL [for the reasons described in Sublists 4A, 4B and 4C below].

Sublist 4A. - TMDL has been completed.

Sublist 4B - other pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future.

Sublist 4C - impairment is not caused by a pollutant.

Sublist 5 - the water quality standard is not attained. The waterway is impaired or threatened for one or more designated uses by a pollutant(s) and requires a TMDL.

The link to the most recent 2004 NJDEP Integrated Water Quality and Assessment Report is:

http://www.state.nj.us/dep/wmm/sgwqt/wat/integratedlist/integratedlist2004.html

For the purposes of evaluating surface water quality in Gloucester County, the Integrated Lists (Sublists 1-5) were abridged and sorted to include only those locations within the County. (See Watershed Surface Water Quality discussion(s) that follow)

(d) Total Maximum Daily Loads (TMDLs)

TMDLs are required, under Section 303(d) of the federal Clean Water Act, for water bodies that cannot meet surface water quality standards after the implementation of "technology-based" effluent limitations. TMDLs may also be established to help maintain or improve water quality in waters that are not impaired. Based on the 2002 and 2004 integrated list, the NJDEP entered into a Memorandum of Agreement with USEPA that sets out a schedule for completion of TMDLs.

A TMDL allocates the load capacity to point sources in the form of waste load allocations (WLAs) and to non-point sources in the form of load allocations (LAs), and may also identify reserve capacity and a margin of safety. WLAs result in Water Quality Based Effluent Limits for point source Wastewater Treatment Plants and requirements based on Best Management Practices (BMPs) for regulated stormwater point sources, such as Combined Sewer Overflows (CSOs). Because non-point source pollution does not come from discrete sources, LAs generally identify broad categories of non-point sources that contribute to the parameters of concern. The LA then includes specific load reduction measures, through Best Management Practices (BMPs), that may include local ordinances for stormwater management and non-point source pollution control, headwaters protection practices, or other mechanisms for addressing the parameters of concern.

A separate TMDL calculation must be prepared for each pollutant listed for each impaired stream segment or lake. A TMDL is considered "proposed" when the NJDEP publishes the TMDL Report as a proposed Water Quality Management Plan Amendment in the New Jersey Register (NJR) for public review and comment. A TMDL is considered "established" when the NJDEP finalizes the TMDL Report and formally

submits it to EPA Region 2 for a thirty (30)-day review and approval. The TMDL is considered "approved" when the NJDEP-established TMDL is approved by EPA Region 2. The TMDL is considered "adopted" when the EPA-approved TMDL is adopted by the NJDEP as a water quality management plan amendment and the adoption notice is published in the NJR. The link to New Jersey's TMDLs and their status is:

http://www.nj.gov/dep/watershedmgt/tmdl.htm#intro

In the process of establishing a TMDL, an implementation plan is developed to identify how the various sources will be reduced to their designated allocations. Implementation strategies for non-point sources may include: improved stormwater management, the adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other Best Management Practices to control stormwater runoff loadings.

(e) Gloucester County's Impaired Waters

There are about 27 different water bodies within Gloucester County that are considered impaired for their designated use, because they do not meet their respective water quality standards for one or more pollutant parameters. The impaired parameters include phosphorus, mercury, copper, silver, PCBs, dioxin, benthic macroinvertebrates, pH, fecal coliform, total coliform, and total suspended solids. The NJDEP has prepared or will prepare TMDLs for each water body and impaired parameter. . (See Watershed Surface Water Quality discussion(s) that follow)

(f) Gloucester County's TMDLs

At this time, the NJDEP has proposed 17 TMDLs that address impaired water bodies in Gloucester County. The full text of these proposals can be found and downloaded at the following link:

http://www.nj.gov/dep/watershedmgt/tmdl.htm#intro .

Fourteen of the 17 TMDL proposals were proposed by the NJDEP in April 2003 and were based on the 2002 Integrated Report. These TMDLs were approved in September 2003, but have not yet been adopted. Three of the 17 TMDL proposals were proposed by the NJDEP in May and July 2005, and these TMDLs have not yet established.

Ground Water

Gloucester County is located in the Atlantic Coastal Plain Physiographic Province. Beneath Gloucester County are a series of geologic units that form aquifers or aquifer systems and confining units (aquitards). The geologic units consist largely of layers of unconsolidated sediments of clays, silts, sands and gravels, deposited over many millions of years, and extending from the land surface, hundreds or thousands of feet to bedrock. These sand and gravel layers and units when grouped together form the aquifers or aquifer systems and the layers and units containing higher amounts of silts and clays

when grouped together form the confining units.
The geologic units in the County dip gently to the south-east, and they outcrop (and are exposed) in broad, irregular, northeast-southwest trending bands on the land surface. The oldest formations outcrop along and under the Delaware River, and progressively younger units outcrop in sequence, moving southeasterly towards the Atlantic Coast.

There are several major coastal plain aquifers or aquifer systems which outcrop and are exposed in Gloucester County. Starting with the oldest and most westerly, they are: the Potomac-Raritan-Magothy (PRM) aquifer system, which outcrops along and under the Delaware River; the Englishtown aquifer system; the Wenonah-Mount Laurel aquifer; and the Kirkwood-Cohansey aquifer system.

The Wenonah-Mount Laurel, Englishtown, and PRM aquifers are exposed in their respective outcrops, but dip into the subsurface, becoming semi-confined or confined at depth in a southeasterly direction. The Kirkwood-Cohansey aquifer system remains exposed throughout its outcrop and is exposed and unconfined within Gloucester County.

There are a few other minor geologic units outcropping in the County that may yield very small amounts of water, including the Merchantville, Marshalltown and Vincentown Formations. However, because of their low permeability's, these formations are more often regarded as confining units. In addition to these minor geologic units, small, shallow, deposits of more recent sands with gravel from the Bridgeton, Pennsauken and Cape May Formations can be found on the surface in the County, particularly capping hills and along stream banks.

The aquifers or aquifer systems in Gloucester County are separated by relatively impermeable geologic confining units that vary in thickness and in their confining ability, ranging from semi-confining to confining. These confining units also outcrop in broad, highly irregular, northeast-southwest trending bands on the land surface and are located between the aquifers' outcrops.

Confining geologic units in the County, starting with the oldest and most westerly outcropping, are: the Woodbury-Merchantville (between the PRM and the Englishtown); the Marshalltown (between the Englishtown and the Wenonah-Mount Laurel); and the Hornerstown-Navesink-Vincentown (between the Wenonah-Mount Laurel and the Kirkwood-Cohansey). Water in the subsurface tends to move very slowly, if at all, from one aquifer system to another, because of the confining units between the aquifers.

Minimizing the impacts of stormwater runoff on the ground water of Deptford Township is a primary goal of this MSWMP, as is protecting Deptford Township's surface waters.

(a) Stormwater Runoff and Ground Water Recharge

In New Jersey's Atlantic Coastal Plain, precipitation averages about 43.75 inches per year. On average, about 45 percent of the annual precipitation results in runoff (or about 19.75 inches per year), and about 55 percent of the precipitation is lost into the

atmosphere as evapotranspiration. The infiltration, or groundwater recharge, component of runoff provides the base stream flow in the Atlantic Coastal Plain. At an average runoff rate of 19.75 inches per year, the maximum recharge rate of 15 inches per year indicates that as much as 75 percent of the runoff will recharge the ground water.

The northwestern corner of Deptford Township is located on the outcrop of Woodbury Formation, a confining unit. The remaining portion of the Township west of the New Jersey Turnpike is located on the outcrop of the Englishtown Formation, a minor aquifer. A narrow band of the Marshalltown Formation confining unit outcrops just east of the New Jersey Turnpike. The central portion of Deptford Township east of the New Jersey Turnpike is located on the outcrop of the Wenonah-Mount Laurel aquifer. The southern portion of Deptford Township is located on the outcrops of the Navesink and Hornerstown Formations, which are confining units. A very small area along the southern boundary of the Township is located on the outcrop of the Kirkwood Formation. The Englishtown, the Wenonah-Mount Laurel and the Kirkwood aquifers' outcrops are susceptible to ground water contamination and their protection is important.

The Englishtown, Wenonah-Mount Laurel and Kirkwood aquifers in Deptford Township may realize some minor benefit locally from ground water recharge in the outcrop, provided the recharge water is good quality. This recharge will also supplement nearby stream base flow. Ground water recharge on the outcrops of the confining units (Woodbury, Marshalltown, Navesink and Hornerstown Formations) will be minimal or non-existent.

(b) Well head Protection Areas (WHPAs)

Water supply wells in exposed unconfined aquifers depend on surface recharge to maintain groundwater levels and groundwater quality, thereby directly linking stormwater management and recharge with water supply. Largely because of this linkage, unconfined public community water supply (PCWS) wells and public non-community water supply (PNCWS) wells have designated "wellhead protection areas" (WHPAs). Water supply wells in the confined portions of aquifers, away from the exposed outcrop area, are not directly linked to surface recharge, and have no WHPAs.

WHPAs establish the approximate area within which contamination, released on the surface, will travel to the well head, over the prescribed period of time. WHPAs include three tiers; the inner boundary, Tier 1, includes an area with a 2 year travel time, the middle boundary, Tier 2, includes an area with a 5 year travel time and the outer boundary, Tier 3, includes an area with a 12 year travel time. WHPAs serve as warning zones, within which high risk activities should be avoided, and further provide aprioritization for clean-up of surface and groundwater contamination that occurs within a WHPA.

Geology (surficial) and Wellhead Protection Areas in Deptford Township are shown on Figure 9. Deptford has ten confined PCWS wells which have no associated WHPAs. There are three small unconfined PNCWS wells with small WHPAs; one is at the intersection of the North-South Freeway and Hurffville Road, and two are along the southern boundary of the township.

(c) New Jersey Groundwater Quality Standards

The NJDEP's has established Ground Water Quality Standards (GWQSs) for all of the ground waters in the State of New Jersey (N.J.A.C. 7:9-6). Like the SWQSs, the GWQSs establish the designated uses for the State's ground water, and specify the ground water quality criteria for specific constituents, including toxic pollutants, consistent with those designated uses.

The GWQSs establish classification areas according to the geographic extent (both vertical and horizontal) of geologic formations, or units, within which ground water is classified for the designated uses. Designated uses may include any human withdrawal of ground water (for example, for potable, agricultural or industrial water), the discharge of ground water to surface waters of the State which support human use or ecological systems, or the direct support of ecological systems.

The GWQSs include three major classes of ground water:

Class I	Ground Water of Special Ecological Significance
Class II	Ground Water for Potable Water Supply
Class III	Ground Water With Uses Other Than Potable Water Supply

Under the NJDEP GWQSs, the primary designated use for Class I ground waters is the maintenance of special ecological resources supported by the ground water within the classification area; secondary designated uses of Class I waters is use for potable water, agricultural water and industrial water, if these uses are viable using water of natural quality and do not impair the primary use (for example, by altering ground water quality).

Class I ground water is further designated as either Class I-A (Exceptional Ecological Areas) or Class I-PL (Pinelands). Ground water within watersheds of FW-1 surface waters (a Category One surface water classification), and certain "Natural Areas" designated by the NJDEP in the GWQSs, are designated as Class I-A ground waters.

Figure 9. Geology and Well Head Protection Areas

Class III ground waters are ground waters that are not suitable for potable use due to their natural hydrogeologic characteristics, such as aquitards - Class III-A ground water, or due to their natural water quality that is unsuitable for conversion to potable water, such as saline ground water (Class III-B).

All ground waters in New Jersey not designated as Class I or Class III are designated as Class II ground waters. Class II ground waters are further classified as either Class II-A or Class II-B. The designated uses of Class II-B waters are any reasonable use other than potable use; however, the NJDEP has not designated any ground waters as Class II-B.

Because of the different ground water quality criteria, the necessary stormwater management measures may vary among these areas. However, the three contaminants for which the NJDEP has required a projection of build-out stormwater pollutant loading are nitrogen, phosphorus and total suspended solids (see Section 5). These three pollutants are of particular significance with regard to surface water quality, but are not included in the list of constituent criteria for ground water. It is anticipated that ground water quality issues will not be a significant concern for new major development projects, if the projects comply with the new design and performance standards in N.J.A.C. 7:8.

Soils

One of the main objectives of the new NJDEP Stormwater Management Rules is to promote ground water recharge in order to replenish aquifers, maintain base flow in streams and assist in maintaining the groundwater supply. Ground water recharge is significantly affected by land use (e.g., commercial vs. agricultural uses), as well by the type of natural soil present on the ground surface. The National Resource Conservation Service (NRCS) has grouped soil types throughout the United States into four different Hydrologic Soil Groups (HSGs): A, B, C and D, depending on their infiltration ability and the potential rate of ground water recharge.

Group A soils have high infiltration rates and recharge potential and provide little direct runoff. They generally include well-drained and sorted sands and gravels. Group B soils have moderately high recharge potential, while Group C soils have lower infiltration rates and generally include more silt and clay particles with higher direct runoff potential. Group D soils have very low recharge rates and a high direct runoff potential. Some soils may have two classifications depending on whether or not they contain soil layers with different infiltration characteristics. For example, a soil classified as A/D has both a Group A soil layer that is well-drained and a Group D soil layer that is poorly drained.

The NJDEP's new stormwater regulations encourage new development in areas with soils that do not recharge significant amounts of water to aquifers; that is, in Group C and D soil areas. The regulations encourage the protection of the natural condition, infiltration and recharge rates in Group A or B soil areas. However, many Group D soil areas are located in wetlands or adjacent to wetlands and water bodies and these areas are not developable. It may not be possible to completely avoid disturbance and new development in Group A and B soil areas. But, the NJDEP's new stormwater regulations

require equal amounts of ground water recharge before and after new development.

Figure 10 depicts the hydrologic soil groupings in Deptford Township. Deptford Township soils are primarily moderately well draining Group B soils. The eastern end of the Township is characterized by more poorly draining Group B/D soils, which are also present in pockets in the central portion of the Township.

Figure 10. Soils

BIG TIMBER CREEK WATERSHED

Topography

Figure BT-1 (see Appendix A) provides an aerial photograph (2000) of the Big Timber Creek Watershed and depicts general land use and other planimetric relationships within the watershed. It is a "birds-eye" view of the watershed that allows a quick assessment of watershed conditions as they existed at that time. This watershed appears generally to be an urbanized watershed.

Figure BT-2 (see Appendix A) provides the USGS Quadrangle (topographic map) for this watershed. Relief (elevation difference) within the Big Timber Creek Watershed is about 194 feet, with elevations ranging from a low of 3.3 to a high of 197 feet above mean sea level. Lower elevations occur along the waterways and wetlands and higher elevations occur along the watershed's boundaries. The land surface elevations and relief in this watershed have been sculpted by surface runoff and erosion of the unconsolidated coastal plain sediments at the land surface. But, the relief in this watershed is generally small, although there are a few localized land areas with steeper slopes. Hills with steeper slopes, often capped by more erosion resistant sediments (gravels), can generally be found within the watershed, providing some structural control and forming drainage boundaries.

The creek is about 17 miles long, and the average stream gradient (slope) along the length of the watershed's stream channel (the long profile) is 0.0014 (excluding any estuarine portions). In general, stream slopes within the watershed are extremely flat.

In this watershed, surface drainage has eroded the land surface in dendritic drainage patterns that exhibit little structural control because of the relatively uniform resistance to erosion from the underlying sediments. Generally, the streams in the watershed consist of short straight sections connected by bends and kinks. For the most part, there is little or no stream braiding or meandering and stream channels are not heavily incised. The streams in the watershed appear to be "graded." Stream base level, stream gradient, channel section, sediment load and flow are in relative dynamic equilibrium. Uncontrolled development within the watershed could, however, change this equilibrium.

Hydrology

The main stem of Big Timber Creek and the south Branch form much of the boundary between Gloucester and Camden Counties. Because over 50 percent of the Big Timber Creek Watershed is outside of the County, neighboring municipalities in Camden County also impact the hydrology and water quality in the watershed.

The area of Gloucester County which drains into Big Timber Creek is approximately 20 square miles. The only major tributary of the Creek within Gloucester County is Almonesson Creek. The River and its tributaries are shown on Figure BT-3 (see

Appendix A). In Gloucester County, this watershed contains six HUC14 sub-watersheds, and these are listed in Table BT-1.

Surface Water Quality

(a) Surface Water Classifications

The surface waters in the Big Timber Creek Watershed are classified FW2-NT or FW2-NT/SE2.

The designated uses for surface water classification FW2-NT (non-trout fresh surface waters not designated as FW1 or PL) as described by the N.J.A.C. 7:9B-1.12(c) are:

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

The designated uses for surface water classification SE2 (saline waters of estuaries not designated as SE1 or SE3) as described by N.J.A.C. 7:9B-1.12(e) are:

1. Maintenance, migration and propagation of the natural and established biota;
2. Migration of diadromous fish;
3. Maintenance of wildlife;
4. Secondary contact recreation; and
5. Any other reasonable uses.

The designated uses for surface water classification FW2-NT/SE2 are a combination of two classifications due to a salt water/fresh water interface. The location of the interface is determined by the salinity measurements. It is located where the salinity is equal to 3.5 parts per thousand (ppt) at mean high tide. This location can change dependent on a number of factors, such as tidal effects, rainfall amounts, evapotranspiration and freshwater input. The fresh water portions or where the salinity is below or equal to 3.5 ppt at mean high tide, are classified as FW2-NT and take on the designated uses as described above. The saline portions or where the salinity is above 3.5 ppt at mean high tide, are classified as SE-2 and take on the designated uses as described above.

(b) Surface Water Quality Data

Ambient Biomonitoring Network - The NJDEP has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sampling sites throughout the state of New Jersey. These

Table BT-1. Big Timber Creek Watershed HUC14s

Municipality	HUC14 Sub-Watershed	
	No.	**Name**
Deptford	02040202120040	Big Timber Creek SB (including Bull Run to Lakeland Road
	02040202120050	Big Timber Creek SB (below Bull Run)
	02040202120060	Almonessen Creek
	02040202120080	Big Timber Creek (below NB/SB confluence)
Washington Township	02040202120030	Big Timber Creek SB (above Lakeland Rd)
	02040202120040	Big Timber Creek SB (including Bull Run to Lakeland Rd)
West Deptford Township	02040202120080	Big Timber Creek (below NB/SB confluence)
Westville Borough	02040202120080	Big Timber Creek (below NB/SB confluence)
Woodbury City	02040202120080	Big Timber Creek (below NB/SB confluence)

sites are sampled for benthic macroinvertebrates by the NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired, based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. The AMNET sites within this watershed are shown in Figure BT-4 (see Appendix A) and the most recent AMNET scores for Impaired Waters within this watershed are included in Appendix B.

Conventional Water Quality Data – The NJDEP utilizes conventional surface water quality data from a number of sources to bi-annually evaluate the impairment of surface water bodies. These water quality data include the federal Storage and Retrieval repository (STORET) data and other Existing Sources. The STORET and Existing Sources sampling locations within this watershed are shown in Figure BT-4 (see Appendix A) and the most recent data for Impaired Waters within this watershed are included in Appendix B.

(c) Impaired Waters

For the purpose of evaluating surface water quality in this watershed, the NJDEP Integrated List (Sublists 1-5) were abridged and sorted to provide the locations of impaired waters within this watershed and these are listed in Table BT-2. A map showing the locations of impaired water is included as Figure BT-4 (Appendix A). There are seven (7) different sites within this watershed that are considered impaired for their designated uses, because they do not meet their respective water quality standards for one or more pollutant parameters. The impaired parameters include: phosphorus, mercury, benthic macroinvertebrates, and fecal coliform.

Table BT-2. Big Timber Creek Impaired Waters List

No.	Location	Parameter	Priority
1.	Big Timber Creek	Mercury	High
2.	S. Br. Big Timber Creek at Almonesson Rd. in Blenheim	Phosphorus	Medium
3a.	S. Br. Big Timber Creek at Blackwood Terrace	Phosphorus	Medium
3b.	S. Br. Big Timber Creek at Blackwood Terrace	Fecal Coliform	High
4.	S. Br. Big Timber Creek at Turnersville - Sicklerville Rd in Washington	Benthic Macroinvertebrates	Low
5.	Grenloch Lake	Phosphorus	Medium
6.	S. Br. Big Timber Creek at Grenlock	Fecal Coliform	High
7.	Blackwood Lake	Phosphorous	Medium

(d) TMDL Proposals

The NJDEP has proposed four (4) sets of TMDLs that address impaired water bodies in this watershed. The full text of these proposals can be found and downloaded at the following link:

http://www.nj.gov/dep/watershedmgt/tmdl.htm#intro .

Three of the four sets of TMDLS were proposed by the NJDEP in April 2003 and were based on the 2002 Integrated Report. These TMDLs were approved in September 2003, but have not yet been adopted. One of the four sets of TMDLs was proposed by the NJDEP in July 2005 and is not yet established.

A list of this watershed's TMDL proposals including the impaired water bodies, the addressed parameter and their current adoption status is included in Table BT-3. The locations of TMDLs in this watershed are shown on Figure BT-4 (Appendix A).

Table BT-3. Big Timber Creek TMDL Proposals

Location	Parameter	Status
S. Br. Big Timber Creek at Grenlock	Fecal Coliform	Approved September 2003
S. Br. Big Timber Creek at Blackwood Terrace	Fecal Coliform	Approved September 2003
Blackwood Lake	Phosphorus	Approved September 2003
S. Br. Big Timber Creek at Blackwood Terrace	Phosphorus	Proposed July 5, 2005

TMDLs were proposed for fecal coliform for the South Branch Big Timber Creek at Grenlock and the South Branch Big Timber Creek at Blackwood Terrace. Waste load allocation reductions were proposed. The TMDL proposals describe the possible sources of fecal coliform as well as the method for developing the TMDL and remediation plan. (See Section 8 Water Quality-TMDL Stormwater Management Strategies.)

TMDLs were proposed for phosphorous for the South Branch of Big Timber Creek at Blackwood Terrace and for Blackwood Lake on the South Branch of Big Timber Creek. Waste load allocation reductions were proposed. The TMDL proposal describes possible sources of phosphorous and the method for developing the TMDL and remediation plan. (See Section 8 Water Quality-TMDL Stormwater Management Strategies.)

Category One Waters

There are no Category One waters in the Gloucester County portion of this watershed. However, there are Category One waters in the Camden County portion of the watershed.

Hydrogeology

The eastern half of the Big Timber Creek Watershed within Gloucester County, to approximately the Washington Township/Deptford Township boundary, is in the exposed outcrop of the Kirkwood-Cohansey aquifer system, which is unconfined at the surface and provides the water table aquifer in this watershed.

Moving west across the watershed, the other aquifers and confining units in the County outcrop in narrow irregular bands. The Wenonah-Mount Laurel, Englishtown, and PRM aquifers or aquifer systems are exposed in their respective outcrops, but dip into the subsurface, becoming semi-confined or confined at depth in a southeasterly direction.

In this watershed, the exposed outcrops of these four aquifers are susceptible to contamination from development, stormwater runoff and the quality of groundwater recharge.

Soils

Over half of the drainage area of Big Timber Creek is covered by Group B or moderately well-draining soils. These Group B soils are predominant in the eastern side of the watershed. Between Route 47 and the boundary between Deptford and Washington Townships, there is an area of Group C and C/D soils, as in the area in Deptford Township between Route 544 and the New Jersey Turnpike. Figure BT-5 (see Appendix A) shows the potential amounts of infiltration and ground water recharge throughout the watershed.

Critical Habitats

The NJDEP Division of Fish and Wildlife Endangered Nongame Species Program developed a Geographic Information System (GIS) called the *Landscape Project*, which is described as a "pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey." Version 2 of the Landscape project is now available interactively on the web and for download. According to the NJDEP's Metadata, "Version 2 was created by intersecting imperiled and priority species data with NJDEP 1995/97 Land Use/Land Cover update. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat statewide. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation."

The NJDEP Division of Fish and Wildlife describes the *Landscape Project* and the importance of preserving natural habitat as follows:

> New Jersey is the most densely populated state in the nation. One of the consequences of this distinction is the extreme pressure that is placed on our natural resources. As the population grows, we continue to lose or impact the remaining natural areas of the state. As more and more habitat is lost, people are beginning to appreciate the benefits and necessity of maintaining land in its natural state.
>
> For example, we know that wetlands are critical for recharging aquifers, lessening the damage from flooding and naturally breaking down contaminants in the environment. Forests and grasslands protect the quality of our drinking water, help purify the air we breathe and provide important areas for outdoor recreation. Collectively, these habitats are of critical importance to the diverse assemblage of wildlife found in New Jersey, including more than 70 species classified as threatened or endangered.
>
> Many imperiled species require large contiguous tracts of habitat for survival. The consequence of the rapid spread of suburban sprawl is the loss and fragmentation of important wildlife habitat and the isolation and degradation of the smaller habitat patches that remain. Small patches of fields, forests and wetlands interspersed with development provide habitat for common species that do well living near humans, but do not provide the necessary habitat for most of our imperiled wildlife. We need to protect large, contiguous blocks of forest, grassland and wetlands to assure the survival of imperiled species over the long-term.
>
> In addition to providing habitat for the conservation of imperiled species, protecting critical wildlife areas will result in more open space for outdoor recreation. Recent surveys by the U.S. Fish and Wildlife Service show that more than 60% of Americans participate in some form of wildlife-related recreation. Open spaces provide places where people can escape the confines of urban and suburban living.

Most critical habitats are supported in part or in total by the surrounding surface and ground water resources, and they are consequently impacted by development, non-point source pollution and stormwater runoff. Critical Habitats mapped by the NJDEP's Landscape Project within this watershed are shown on Figure BT-6. These Critical Habitats within this watershed may include Grassland, Forest, Forested Wetland, Emerging Wetland, Beach, Bald Eagle Foraging, Urban Peregrine Falcon Nesting, and Wood Turtle habitats that should, to the extent practical, be conserved and protected from the adverse impacts caused by uncontrolled development and stormwater runoff.

MANTUA CREEK WATERSHED

Topography

Figure MC-1 (see Appendix A) provides an aerial photograph (2000) of the Mantua Creek Watershed and depicts general land use and other planimetric relationships within the watershed. It is a "birds-eye" view of the watershed that allows a quick assessment of watershed conditions as they existed at that time. This watershed appears generally to be an urbanized and rural watershed.

Figure MC-2 (see Appendix A) provides the USGS Quadrangle (topographic map) for this watershed. Relief (elevation difference) within the Mantua Creek Watershed is about 160 feet, with elevations ranging from a low of 3.3 to a high of 164 feet above mean sea level. Lower elevations occur along the waterways and wetlands and higher elevations occur along the watershed's boundaries. The land surface elevations and relief in this watershed have been sculpted by surface runoff and erosion of the unconsolidated coastal plain sediments at the land surface. But, the relief in this watershed is generally small, although there are some localized land areas with steeper slopes. Hills with steeper slopes, often capped by more erosion resistant sediments (gravels), can generally be found within the watershed, providing some structural control and forming drainage boundaries.

The stream is about 18 miles long, and the average stream gradient (slope) along the length of the watershed's stream channel (the long profile) is 0.0015 (excluding any estuarine portions). In general, stream slopes within the watershed are extremely flat.

In this watershed, surface drainage has eroded the land surface in dendritic drainage patterns that exhibit little structural control because of the relatively uniform resistance to erosion from the underlying sediments. Generally, the streams in the watershed consist of short straight sections connected by bends and kinks. For the most part, there is little or no stream braiding or meandering and stream channels are not heavily incised. The streams in the watershed appear to be "graded." Stream base level, gradient, channel section, sediment load and flow are in relative dynamic equilibrium. Uncontrolled development within the watershed could, however, upset this equilibrium.

Hydrology

From its headwaters in Glassboro, Mantua Creek flows 18.6 miles northwest to the Delaware River at Paulsboro, draining an area of 50 square miles. Major tributaries include the Chestnut Branch (7 miles long), Edwards Run (6.9 miles long) and Duffield Run (Federation of Gloucester County Watersheds). Mantua Creek and its tributaries are shown on Figure MC-3. This watershed contains 6 HUC14 sub-watersheds and these are listed in Table MC-1.

Table MC-1. Mantua Creek Watershed HUC14s

Municipality	HUC14 Sub-Watershed	
	No.	Name
Mantua Township	02040202130020	Mantua Creek (road to Sewell to Rt 47)
	02040202130030	Chestnut Branch (above Sewell)
	02040202130040	Mantua Creek (Edwards Run to road to Sewell)
	02040202130050	Edwards Run
Washington Township	02040202130010	Mantua Creek (above Rt 47)
	02040202130020	Mantua Creek (road to Sewell to Rt 47)
	02040202130040	Mantua Creek (Edwards Run to road to Sewell)
Deptford Township	02040202130020	Mantua Creek (road to Sewell to Rt 47)
	02040202130040	Mantua Creek (Edwards Run to road to Sewell)
	02040202130060	Mantua Creek (below Edwards Run)
Glassboro Borough	02040202130010	Mantua Creek (above Rt 47)
	02040202130020	Mantua Creek (road to Sewell to Rt 47)
	02040202130030	Chestnut Branch (above Sewell)
East Greenwich Township	02040202130040	Mantua Creek (Edwards Run to road to Sewell)
	02040202130050	Edwards Run
	02040202130060	Mantua Creek (below Edwards Run)
West Deptford Township	02040202130040	Mantua Creek (Edwards Run to road to Sewell)
	02040202130060	Mantua Creek (below Edwards Run)
Harrison Township	02040202130030	Chestnut Branch (above Sewell)
	02040202130050	Edwards Run
Pitman Borough	02040202130010	Mantua Creek (above Rt 47)
	02040202130020	Mantua Creek (Road to Sewell to Rt 47)
	02040202130030	Chestnut Branch (above Sewell)
Paulsboro Borough	02040202130060	Mantua Creek (below Edwards Run)
Wenonah Borough	02040202130040	Mantua Creek (Edwards Run to road to Sewell)
Greenwich Township	02040202130060	Mantua Creek (below Edwards Run)
Monroe Township	02040202130010	Mantua Creek (above Rt 47)
Woodbury Heights Borough	02040202130040	Mantua Creek (Edwards Run to road to Sewell)

Surface Water Quality

(a) Surface Water Classifications

The surface waters in the Mantua Creek Watershed are classified FW2-NT/SE2.

The designated uses for surface water classification FW2-NT (non-trout fresh surface waters not designated as FW1 or PL) as described by the N.J.A.C. 7:9B-1.12(c) are:

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

The designated uses for surface water classification SE2 (saline waters of estuaries not designated as SE1 or SE3) as described by N.J.A.C. 7:9B-1.12(e) are:

1. Maintenance, migration and propagation of the natural and established biota;
2. Migration of diadromous fish;
3. Maintenance of wildlife;
4. Secondary contact recreation; and
5. Any other reasonable uses.

The designated uses for surface water classification FW2-NT/SE2 are a combination of two classifications due to a salt water/fresh water interface. The location of the interface is determined by the salinity measurements. It is located where the salinity is equal to 3.5 parts per thousand (ppt) at mean high tide. This location can change dependent on a number of factors, such as tidal effects, rainfall amounts, evapotranspiration and freshwater input. The fresh water portions or where the salinity is below or equal to 3.5 ppt at mean high tide, are classified as FW2-NT and take on the designate uses as described above. The saline portions or where the salinity is above 3.5 ppt at mean high tide, are classified as SE-2 and take on the designated uses as described above.

(b) Surface Water Quality Data

Ambient Biomonitoring Network - The NJDEP has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sampling sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by the NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired, based on the AMNET data. The data is used to generate a New Jersey Impairment Score

(NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. The AMNET sites within this watershed are shown in Figure MC-4 (see appendix A) and the most recent AMNET scores for Impaired Waters within this watershed are included in Appendix B.

Conventional Water Quality Data – The NJDEP utilizes conventional surface water quality data from a number of sources to bi-annually evaluate the impairment of surface water bodies. These water quality data include the federal Storage and Retrieval repository (STORET) data and other Existing Sources. The STORET and Existing Sources sampling locations within this watershed are shown in Figure MC-4 (Appendix A) and the most recent data for Impaired Waters within this watershed are included in Appendix B.

(c) Impaired Waters

For the purpose of evaluating surface water quality in this watershed, the NJDEP Integrated List (Sublists 1-5) were abridged and sorted to provide the locations of impaired waters within this watershed and these are listed in Table MC-2. A map showing the locations of impaired water is included as Figure MC-4 (Appendix A). There are eight (8) different sites within this watershed that are considered impaired for their designated uses, because they do not meet their respective water quality standards for one or more pollutant parameters. The impaired parameters include: phosphorus, mercury, benthic macroinvertebrates, and fecal coliform.

Table MC-2. Mantua Creek Impaired Waters List

No.	Location	Parameter	Priority
1(a).	Edwards Run at Jefferson	Fecal Coliform	High
1(b).	Edwards Run at Jefferson	Phosphorous	Medium
2.	Edwards Run at Jessup Mill Rd in Mantua	Benthic Macroinvertebrates	Low
3.	Mantua Creek at Mantua Ave in Wenonah	Benthic Macroinvertebrates	Low
4.	Mantua Creek at Rt 45 in W. Deptford	Phosphorus	Medium
5(a).	Alcyon Lake	Mercury	High
5(b).	Alcyon Lake	Phosphorous	Medium
6.	Chestnut Branch at Mantua Blvd. in Mantua	Benthic Macroinvertebrates	Low
7.	Plank Run at Rte. 322 in Harrison	Benthic Macroinvertebrates	Low
8.	Bethel Lake	Phosphorous	Medium

(d) TMDL Proposals

The NJDEP has proposed two TMDLs to address impaired water bodies in this watershed. The full text of these proposals can be found and downloaded at the following link:

http://www.nj.gov/dep/watershedmgt/tmdl.htm#intro .

The first TMDL was proposed by the NJDEP in April 2003 for fecal coliform and is based on the 2002 Integrated Report. This TMDL was approved in September 2003, but has not yet been adopted. The other TMDL was proposed by the NJDEP in May 2005 for phosphorous and is not yet established.

A list of this watershed's TMDL proposals is included in Table MC-3. The locations of TMDLs in this watershed are shown on Figure MC-4 (Appendix A).

Table MC-3. Mantua Creek TMDL Proposals

Location	Parameter	Status
Edwards Run at Jefferson	Fecal Coliform	Proposed May 2, 2005
Bethel Lake	Phosphorous	Approved September 2003

The fecal coliform TMDL was proposed for Edwards Run at Jefferson. Waste load allocation reductions were proposed for the affected waterway. The proposal discusses the possible sources of fecal coliform, as well as the method for developing a TMDL and remediation plan.

The TMDL for phosphorous was proposed for Bethel Lake. Waste load allocation reductions have been proposed. The TMDL proposal discusses possible sources of phosphorous as well as the method for developing the TMDL and remediation plan.

Category One Waters

The Mantua Creek Watershed does not have any Category One Waterways.

Hydrogeology

The eastern portion of the Mantua Creek Watershed (to approximately the Washington Township/Deptford divide) is underlain by the Kirkwood-Cohansey aquifer system, which is unconfined at the surface and provides the water table aquifer in this portion of Gloucester County.

Moving west across the watershed, the other aquifers and confining units in the County outcrop in narrow irregular bands. The Wenonah-Mount Laurel, Englishtown, and PRM aquifers or aquifer systems are exposed in their respective outcrops, but dip into the subsurface, becoming semi-confined or confined at depth in a southeasterly direction.

In this watershed, the exposed outcrops of these four aquifers are susceptible to contamination from development, stormwater runoff and the quality of groundwater recharge.

Soils

Soils in the Mantua Creek Watershed are non-uniform in their distribution. The municipal centers of Pitman and Glassboro contain mostly urban soils. Poorly draining Group D soils dominate near the mouth of Mantua Creek. Otherwise, moderately well-draining patches of Group B soils are scattered amongst soils with lower recharge capacities. Figure MC-5 (see Appendix A) shows the potential amounts of infiltration and ground water recharge throughout the watershed

Critical Habitats

The NJDEP Division of Fish and Wildlife Endangered Nongame Species Program developed a Geographic Information System (GIS) called the *Landscape Project*, which is described as a "pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey." Version 2 of the Landscape project is now available interactively on the web and for download. According to the NJDEP's Metadata, "Version 2 was created by intersecting imperiled and priority species data with NJDEP 1995/97 Land Use/Land Cover update. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat statewide. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation."

The NJDEP Division of Fish and Wildlife describes the *Landscape Project* and the importance of preserving natural habitat as follows:

> New Jersey is the most densely populated state in the nation. One of the consequences of this distinction is the extreme pressure that is placed on our natural resources. As the population grows, we continue to lose or impact the remaining natural areas of the state. As more and more habitat is lost, people are beginning to appreciate the benefits and necessity of maintaining land in its natural state.
>
> For example, we know that wetlands are critical for recharging aquifers, lessening the damage from flooding and naturally breaking down contaminants in the environment. Forests and grasslands protect the quality of our drinking water, help purify the air we breathe and provide important areas for outdoor recreation. Collectively, these habitats are of critical importance to the diverse assemblage of wildlife found in New Jersey, including more than 70 species classified as threatened or endangered.
>
> Many imperiled species require large contiguous tracts of habitat for survival. The consequence of the rapid spread of suburban sprawl is the loss and fragmentation of important wildlife habitat and the isolation and

> degradation of the smaller habitat patches that remain. Small patches of fields, forests and wetlands interspersed with development provide habitat for common species that do well living near humans, but do not provide the necessary habitat for most of our imperiled wildlife. We need to protect large, contiguous blocks of forest, grassland and wetlands to assure the survival of imperiled species over the long-term.
>
> In addition to providing habitat for the conservation of imperiled species, protecting critical wildlife areas will result in more open space for outdoor recreation. Recent surveys by the U.S. Fish and Wildlife Service show that more than 60% of Americans participate in some form of wildlife-related recreation. Open spaces provide places where people can escape the confines of urban and suburban living.

Most critical habitats are supported in part or in total by the surrounding surface and ground water resources, and they are consequently impacted by development, non-point source pollution and stormwater runoff. Critical Habitats mapped by the NJDEP's Landscape Project within this watershed are shown on Figure MC-6 (see Appendix A). The Critical Habitats within this watershed may include Grassland, Forest, Forested Wetland, Emerging Wetland, Beach, Bald Eagle Foraging, Urban Peregrine Falcon Nesting, and Wood Turtle habitats that should, to the extent practical, be conserved and protected from the adverse impacts caused by uncontrolled development and stormwater runoff.

WOODBURY CREEK WATERSHED

Topography

Figure WC-1 (see Appendix A) provides an aerial photograph (2000) of the Woodbury Creek Watershed and depicts general land use and other planimetric relationships within the watershed. It is a "birds-eye" view of the watershed that allows a quick assessment of watershed conditions as they existed at that time. This watershed appears generally to be an urbanized watershed.

Figure WC-2 (see Appendix A) provides the USGS Quadrangle (topographic map) for this watershed. Relief (elevation difference) within the Woodbury Creek Watershed is about 95 feet, with elevations ranging from a low of 3.3 to a high of 98 feet above mean sea level. Lower elevations occur along the waterways and wetlands and higher elevations occur along the watershed's boundaries. The land surface elevations and relief in this watershed have been sculpted by surface runoff and erosion of the unconsolidated coastal plain sediments at the land surface. But, the relief in this watershed is generally small, although there are a few localized land areas with steeper slopes. Hills with steeper slopes, often capped by more erosion resistant sediments (gravels), can generally be found within the watershed, providing some structural control and forming drainage boundaries.

The Creek is about 5 miles long, and the average stream gradient (slope) along the length of the watershed's stream channel (the long profile) is 0.001 (excluding any estuarine portions). In general, stream slopes within the watershed are extremely flat.

In this watershed, surface drainage has eroded the land surface in dendritic drainage patterns that exhibit little structural control because of the relatively uniform resistance to erosion from the underlying sediments. Generally, the streams in the watershed consist of short straight sections connected by bends and kinks. For the most part, there is little or no stream braiding or meandering and stream channels are not heavily incised. The streams in the watershed appear to be "graded." Stream base level, gradient, channel section, sediment load and flow are in relative dynamic equilibrium. Uncontrolled development within the watershed could, however, upset this equilibrium.

Hydrology

The Woodbury Creek Watershed is the smallest watershed fully contained in Gloucester County, draining an area of approximately 21.5 square miles into this five mile-long stream. Woodbury Creek's two major tributaries are Hessian Run and Matthews Branch. The River and its tributaries are shown on Figure WC-3 (see appendix A). In Gloucester County, this watershed contains 3 HUC14 sub-watersheds and these are listed in Table WC-1.

Table WC-1. Woodbury Creek Watershed HUC14s

Municipality	HUC14 Sub-Watershed	
	No.	**Name**
West Deptford Township	02040202120110	Woodbury Creek (below Rt 45)/Lower Delaware River to Big Timber Creek
	02040202120120	Main Ditch / Little Mantua Creek
Deptford Township	02040202120100	Woodbury Creek (above Rt 45)
	02040202120110	Woodbury Creek (below Rt 45)/Lower Delaware River to Big Timber Creek
Woodbury City	02040202120100	Woodbury Creek (above Rt 45)
	02040202120110	Woodbury Creek (below Rt 45)/Lower Delaware River to Big Timber Creek
Woodbury Heights Borough	02040202120100	Woodbury Creek (above Rt 45)
	02040202120110	Woodbury Creek (below Rt 45)/Lower Delaware River to Big Timber Creek
National Park Borough	02040202120110	Woodbury Creek (below Rt 45)/Lower Delaware River to Big Timber Creek
	02040202120120	Main Ditch/Little Mantua Creek

Surface Water Quality

(a) Surface Water Classifications

The surface waters in the Woodbury Creek Watershed are classified FW2-NT/SE2 or FW2-NT.

The designated uses for surface water classification FW2-NT (non-trout fresh surface waters not designated as FW1 or PL) as described by the N.J.A.C. 7:9B-1.12(c) are:

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

The designated uses for surface water classification SE2 (saline waters of estuaries not designated as SE1 or SE3) as described by N.J.A.C. 7:9B-1.12(e) are:

6. Maintenance, migration and propagation of the natural and established biota;
7. Migration of diadromous fish;
8. Maintenance of wildlife;
9. Secondary contact recreation; and
10. Any other reasonable uses.

The designated uses for surface water classification FW2-NT/SE2 are a combination of two classifications due to a salt water/fresh water interface. The location of the interface is determined by the salinity measurements. It is located where the salinity is equal to 3.5 parts per thousand (ppt) at mean high tide. This location can change dependent on a number of factors, such as tidal effects, rainfall amounts, evapotranspiration and freshwater input. The fresh water portions or where the salinity is below or equal to 3.5 ppt at mean high tide, are classified as FW2-NT and take on the designate uses as described above. The saline portions or where the salinity is above 3.5 ppt at mean high tide, are classified as SE-2 and take on the designated uses as described above.

(b) Surface Water Quality Data

Ambient Biomonitoring Network - The NJDEP has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sampling sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by the NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired, based

on this AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. The AMNET sites within this watershed are shown on Figure WC-4 (see Appendix A) and the most recent AMNET scores for Impaired Waters within this watershed are included in the data in Appendix B.

Conventional Water Quality Data – The NJDEP utilizes conventional surface water quality data from a number of sources to bi-annually evaluate the impairment of surface water bodies. These water quality data include the federal Storage and Retrieval repository (STORET) data and other Existing Sources. The STORET and Existing Sources sampling locations within this watershed are shown in Figure WC-4 and the most recent data for Impaired Waters within this watershed are included in the data in Appendix B

(c) Impaired Waters

For the purpose of evaluating surface water quality in this watershed, the NJDEP Integrated List (Sublists 1-5) were abridged and sorted to provide the locations of impaired waters within this watershed and these are listed in Table WC-2. A map showing the locations of impaired water is included as Figure WC-4 (Appendix A). There are four (4) different sites within this watershed that are considered impaired for their designated uses, because they do not meet their respective water quality standards for one or more pollutant parameters. The impaired parameters include: phosphorus, PCBs, dioxin and pH.

Table WC-2. Woodbury Creek Impaired Waters List

No.	Location	Parameter	Priority
1.	Bell Lake	Phosphorous	Medium
2.	Woodbury Lake	Phosphorous	Medium
3a.	Stewart Lake	PCBs	High
3b.	Stewart Lake	Dioxin	High
4.	Woodbury Creek at Rte. 45, Woodbury Ck. Park in Woodbury	pH	Medium

(d) TMDL Proposals

The NJDEP has proposed two (2) sets of TMDLs that address impaired water bodies in this watershed. The full text of these proposals can be found and downloaded at the following link:

http://www.nj.gov/dep/watershedmgt/tmdl.htm#intro .

Both of the sets of TMDLS were proposed by the NJDEP in April 2003 and were based on the 2002 Integrated Report. These TMDLs were approved in September 2003, but have not yet been adopted.

A list of this watershed's TMDL proposals is included in Table WC-3. The locations of TMDLs in this watershed are shown on Figure WC-4 Water Quality (Appendix A).

Table WC-3. Woodbury Creek TMDL Proposals

Location	Parameter	Status
Bell Lake	Phosphorous	Approved September 2003
Woodbury Lake	Phosphorous	Approved September 2003

There are TMDL proposals for phosphorous in Bell Lake and Woodbury Lake. Waste load allocation reductions have been proposed for the affected waterways. The TMDL proposals discuss possible sources as well as the methods used to develop the TMDLs and remediation plan. (See Section 8 Water Quality-TMDL Stormwater Management Strategies).

Category One Waters

There are no Category One waters in the Woodbury Creek Watershed.

Hydrogeology

The western portion of the Woodbury Creek Watershed, to approximately the eastern edge of National Park Borough, is in the exposed outcrop of the PRM aquifer system, which is unconfined at the surface and provides the water table aquifer in this portion of the watershed. The central portion of the watershed is on the outcrop of the Woodbury-Merchantville confining unit. The eastern portion of the Woodbury Creek Watershed is on the outcrops of (west to east) the Englishtown aquifer, the Marshalltown confining unit (beginning at about the New Jersey Turnpike and the Wenonah-Mount Laurel aquifer near the eastern headwaters of the aquifer.

In this watershed, the exposed outcrops of these aquifers are susceptible to contamination from development, stormwater runoff and the quality of groundwater recharge.

Soils

The Woodbury Creek watershed is highly developed, with approximately one third of its soils categorized as "Urban". The watershed has over one third of its area covered by moderately well-drained Group B soils, primarily in the eastern portion of the watershed and in the northern corner. There is a significant area of National Park and east of National Park characterized by high recharge or Group A soils. Hydric soils and

wetlands are scattered throughout the watershed. Figure WC-5 (see Appendix A) shows the potential amounts of infiltration and ground water recharge throughout the watershed.

Critical Habitats

The NJDEP Division of Fish and Wildlife Endangered Nongame Species Program developed a Geographic Information System (GIS) called the *Landscape Project*, which is described as a "pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey." Version 2 of the Landscape project is now available interactively on the web and for download. According to the NJDEP's Metadata, "Version 2 was created by intersecting imperiled and priority species data with NJDEP 1995/97 Land Use/Land Cover update. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat statewide. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation."

The NJDEP Division of Fish and Wildlife describes the *Landscape Project* and the importance of preserving natural habitat as follows:

> New Jersey is the most densely populated state in the nation. One of the consequences of this distinction is the extreme pressure that is placed on our natural resources. As the population grows, we continue to lose or impact the remaining natural areas of the state. As more and more habitat is lost, people are beginning to appreciate the benefits and necessity of maintaining land in its natural state.
>
> For example, we know that wetlands are critical for recharging aquifers, lessening the damage from flooding and naturally breaking down contaminants in the environment. Forests and grasslands protect the quality of our drinking water, help purify the air we breathe and provide important areas for outdoor recreation. Collectively, these habitats are of critical importance to the diverse assemblage of wildlife found in New Jersey, including more than 70 species classified as threatened or endangered.
>
> Many imperiled species require large contiguous tracts of habitat for survival. The consequence of the rapid spread of suburban sprawl is the loss and fragmentation of important wildlife habitat and the isolation and degradation of the smaller habitat patches that remain. Small patches of fields, forests and wetlands interspersed with development provide habitat for common species that do well living near humans, but do not provide the necessary habitat for most of our imperiled wildlife. We need to protect large, contiguous blocks of forest, grassland and wetlands to assure the survival of imperiled species over the long-term.

> In addition to providing habitat for the conservation of imperiled species, protecting critical wildlife areas will result in more open space for outdoor recreation. Recent surveys by the U.S. Fish and Wildlife Service show that more than 60% of Americans participate in some form of wildlife-related recreation. Open spaces provide places where people can escape the confines of urban and suburban living.

Most critical habitats are supported in part or in total by the surrounding surface and ground water resources, and they are consequently impacted by development, non-point source pollution and stormwater runoff. Critical Habitats mapped by the NJDEP's Landscape Project within this watershed are shown on Figure WC-6 (see Appendix A). The Critical Habitats within this watershed may include Grassland, Forest, Forested Wetland, Emerging Wetland, Beach, Bald Eagle Foraging, Urban Peregrine Falcon Nesting, and Wood Turtle habitats that should, to the extent practical, be conserved and protected from the adverse impacts caused by uncontrolled development and stormwater runoff.

Section 5. Build-Out Analysis and Pollutant Loading Projections

Build-out analyses and pollutant loading projections have been prepared for each municipality, HUC14 and watershed within Gloucester County, generally in accordance with the NJDEP's methodology described by their guidance and regulations. The build-out analyses and pollutant loading projections are tools to assess the potential impacts from development and stormwater runoff within each of the County's municipalities and watersheds.

Some municipalities in Gloucester County are essentially fully developed ("built–out"); little new development can or will occur in these municipalities. However, the potential for significant redevelopment exists in these highly developed municipalities, and the existing development in built-out municipalities contributes pollutants to the watershed. Thus, all of the municipalities in the County, regardless of their remaining developable land areas were evaluated in the County's build-out analyses and pollutant loading projections.

Furthermore, in order to add more meaning to the pollutant loading projections, the County has compared present land use and future (build-out) land use by projecting the pollutant loadings under both conditions. The County utilized powerful GIS data management and mapping software to perform these analyses for each municipality, HUC14 and watershed.

The build-out analyses and pollutant loading projections allow municipalities, the County and others to quantifiably project the impacts from development on surface waters. Using this tool, municipalities and the County are in a better position to develop strategies to minimize, manage and/or mitigate these impacts through improved stormwater management and construction practices and potentially through modifications to the land use and zoning, before build-out occurs.

Build-out analyses and pollutant loading projections are a tool and an initial step for assessing and quantifying adverse impacts from development and stormwater runoff. There are, however, a number of reservations associated with the NJDEP's Build-out methodology, and with build-out and pollutant loading analyses in general.

1. The methodology over-simplifies the complex hydrologic and pollutant transport mechanisms associated with these processes and development.

2. The methodology does not account for the transient nature of development within a given municipality and watershed. It ignores the differences in time over which build-out will occur. For example, one municipality or portion of a watershed

might take 10 years to essentially build-out, while another might take 100 years or more.

3. The impervious surface coverage analyses presume that all development within a zone occur at the maximum impervious coverage permitted within the zone. Although it would be reasonable to assume an average impervious coverage, the maximum permitted impervious coverage is the extreme. Furthermore, many municipal land use zones do not specify a maximum impervious coverage and an assumption must be used that may not be optimal (similar zones in other municipalities within the County were used to estimate impervious coverage).

4. The NJDEP presented very little information about the origin and conditions that apply to their land cover pollutant loading coefficients for total phosphorus, total nitrogen and total suspended solids. For example, what are the climatic, soils, hydrologic, geologic, topographic, and vegetative conditions that these coefficients represent, and even more importantly, what stormwater runoff controls were employed that generated these coefficients? Without this information, it is not possible to fully understand the implications of pollutant loadings using these coefficients. The methodology is highly sensitive to these coefficients.

5. Because the NJDEP's methodology projects pollutant loadings for only three parameters, total phosphorus, total nitrogen and total suspended solids, the pollutant loading projections are biased against agricultural land uses. For example, changes in land use from agriculture to low density rural development occurs throughout much of Gloucester County. The NJDEP's pollutant loading coefficients for agriculture are two to three times greater than those for low density residential development. The resulting annual pollutant loadings will then be two to three times lower for land transitioning from agriculture to residential development.

   This might be misconstrued to imply that the loss of agricultural lands to residential development is somehow desirable. Furthermore, because of the significant amount of agricultural land in some municipalities and watersheds in Gloucester County, the method makes residentially and commercially developed municipalities and watersheds appear less prone to the impacts of nonpoint source pollution, which is not the case.

   In Gloucester County and other similar areas in New Jersey, agriculture is recognized as being fundamentally important and vital to society, and as such the County does not advocate transitioning from agricultural land uses to residential or other more intense forms of development.

6. The NJDEP's land cover coefficients do not appear to consider or incorporate the new stormwater management techniques now required by the new New Jersey stormwater regulations and the new LID BMP strategies. Furthermore, most

municipalities have required some form of stormwater runoff control in new development for 20 years or more. The NJDEP land cover coefficients may, therefore, be very conservative with respect to present development conditions and greatly overestimate the adverse impacts at build-out.

7. In addition to nitrogen, phosphorous and suspended solids there are a number of other pollutants associated with non-point source pollution and stormwater runoff from development. These include among other parameters, petroleum hydrocarbons, metals and pathogenic organisms which are not currently accounted for by the NJDEP's methodology.

8. Malfunctioning and/or inadequate onsite wastewater disposal systems are believed to be a major source of non-point pollution. The NJDEP's method does not account for pollution resulting from onsite systems.

Despite these reservations, the build-out analyses and pollutant loading projections are valuable tools for assessing the potential impacts from development and stormwater runoff. The build out analyses and pollutant loading projections in Gloucester County have been developed with the flexibility to easily adjust the pollutant loading coefficients, zoning and other elements of the analyses and projections. The County utilized powerful GIS data management and mapping software to perform these analyses and create this flexibility for each municipality, HUC14 and Watershed. In the future, municipalities and the County may choose to make adjustments that will better project the impacts of stormwater runoff and development.

The following GIS-based method was used for the build-out analyses and pollutant loading projections and to prepare the figures presented in this report.

1. Using GIS digital coverages from the NJDEP and DVRPC (existing land use), the eight Watersheds, 54 HUC14 areas and the 24 municipalities within the County were identified, their boundaries delineated and the results saved as a GIS feature layers. ESRI's ArcGIS mapping software was then used to provide the land areas of existing land uses within each of the HUC14s, watersheds and municipalities.

2. Using the Gloucester County Planning Department's GIS data, municipal zoning areas were integrated with the HUC14 drainage areas to establish the zoning within each municipality and HUC14 drainage area. Municipal zoning is highly variable throughout the County. A "crosswalk" was used to associate all municipal zones with the zones provided by the NJDEP for pollutant loading projections.

3. Existing (present) impervious land coverage was determined for each HUC14 and municipality using aerial mapping techniques.

4. Constrained areas were determined from the NJDEP's and the County's GIS coverages, including surficial water bodies, wetland areas, Category One resource

protection areas and their associated 300 foot buffers, designated open space and protected park areas. These were saved as GIS feature layers and integrated with the existing land use, HUC14 and municipal zoning feature layers. The build-out amount of impervious land coverage within each HUC14 and municipality was then calculated from the zoning layer.

Build-out land areas available for new development and redevelopment were calculated by subtracting the constrained areas from the developable areas based on zoning for each HUC14, Watershed and municipality. In essence, the land available for new development is agricultural, forest and/or barren lands and the land available for redevelopment consists of the existing residential, commercial and industrially zoned areas.

5. The build-out (future) impervious surface coverage was calculated by multiplying build-out land areas available for new development and redevelopment by the maximum impervious surface coverage, using (whenever available) the maximum impervious surface coverage percentages specified within each municipal zoning ordinance for that area.

6. Pollutant loading projections were calculated for each municipality and HUC14, using the pollutant loading coefficients provided by the NJDEP Stormwater BMP Manual and shown in Table 9. Pollutant loading projections were made for all 24 municipalities, 54 HUC14s and the eight Watersheds for both the existing land use (present) and build-out (future) conditions.

Table 9. Pollutant Loads For Various Land Cover Types

Land Cover	Total Phosphorus Load (lbs/acre/year)	Total Nitrogen Load (lbs/acre/year)	Total Suspended Solids Load (lbs/acre/yr)
High, Medium Density Residential	1.4	15	140
Low Density, Rural Residential	0.6	5	100
Commercial	2.1	22	200
Industrial	1.5	16	200
Urban, Mixed Urban, Other Urban	1.0	10	120
Agricultural	1.3	10	300
Forest, Water, Wetlands	0.1	3	40
Barrenland/Transitional Area	0.5	5	60

Source: NJDEP Stormwater BMP Manual 2004.

DEPTFORD TOWNSHIP

Build-Out, Impervious Cover and Pollutant Loading Projections

The results of the Deptford Township Build-out analysis, including the existing and build-out (future) conditions, are presented in Table 10. This table provides the total area, constrained area, and developable area in acres for each HUC14 within Deptford Township.

Table 10 also provides the impervious areas in acres and percent for both existing and build-out conditions, in order to allow comparison of the results for these conditions. In general, impervious percentages greater than about 10 to 15 percent may indicate potential watershed impairment from stormwater and development. The total pollutant loadings for phosphorous, nitrogen and total suspended solids are projected in pounds per year for both the existing and build-out conditions, in order to allow comparison of the pollutant loadings.

Included in this plan and in the New Jersey Stormwater Management Regulations and guidance are strategies to minimize, manage and/or mitigate build-out impacts, through improved stormwater management and construction practices. In addition, modifications to current land use and zoning will change the build-out impacts and the County's GIS can be used to evaluate the results of such changes.

Table 10. Deptford Township Pollutant Loading Projections

Watershed	HUC14 Sub-Watershed		Area (Acres)			Impervious Area				Total Pollutant Load (Lbs/Year)					
	No.	Name	Total	Constrained	Developable	Acres		Percent		Phosphorus		Nitrogen		Total Suspended Solids	
						Existing	Build-Out	Existing	Build-Out	Existing	Build-Out	Existing	Build-Out	Existing	Build-Out
Big Timber Creek Watershed	02040202120040	Big Timber Creek SB (including Bull Run to Lakeland Road	302.32	31.06	271.24	42.19	96.61	13.96%	31.96%	163	403	1,639	4,298	28,556	39,941
	02040202120050	Big Timber Creek SB (below Bull Run)	688.15	164.83	523.32	98.97	301.32	14.38%	43.79%	321	760	3,435	7,898	46,919	78,787
	02040202120060	Almonessen Creek	2,433.16	351.71	2,081.46	488.70	967.01	20.08%	39.74%	1,769	2,949	18,332	30,311	236,152	312,329
	02040202120080	Big Timber Creek (below NB/SB confluence)	2,206.28	867.81	1,338.45	347.34	683.34	15.74%	30.97%	1,109	2,016	11,063	21,308	163,221	205,954
		Sub-Total	**5,629.91**	**1,415.41**	**4,214.47**	**977.20**	**2,048.28**	**17.36%**	**36.38%**	**3,362**	**6,127**	**34,468**	**63,815**	**474,848**	**637,012**
Mantua Creek Watershed	02040202130020	Mantua Creek (road to Sewell to Rt 47)	120.24	23.94	96.30	3.85	45.53	3.20%	37.87%	94	77	790	720	20,467	10,583
	02040202130040	Mantua Creek (Edwards Run to road to Sewell)	3,403.39	436.74	2,966.64	447.80	1,374.58	13.16%	40.39%	2,187	3,690	20,952	37,701	362,776	406,912
	02040202130060	Mantua Creek (below Edwards Run)	1.15	0.00	1.15	1.04	0.92	90.43%	80.00%	2	2	22	25	211	230
		Sub-Total	**3,524.78**	**460.68**	**3,064.09**	**452.69**	**1,421.03**	**12.84%**	**40.32%**	**2,283**	**3,770**	**21,764**	**38,446**	**383,454**	**417,725**
Woodbury Creek Watershed	02040202120100	Woodbury Creek (above Rt 45)	2,102.21	446.96	1,655.28	346.82	594.01	16.50%	28.26%	1,036	2,122	10,565	22,097	155,162	226,120
	02040202120110	Woodbury Creek (below Rt 45)/Lower Delaware River to Big Timber Creek	37.12	3.84	33.28	10.49	13.36	28.26%	35.99%	27	49	253	519	3,668	4,874
		Sub-Total	**2,139.33**	**450.80**	**1,688.56**	**357.31**	**607.37**	**16.70%**	**28.39%**	**1,063**	**2,171**	**10,818**	**22,616**	**158,830**	**230,994**
		Total	**11,294.02**	**2,326.89**	**8,967.12**	**1,787.20**	**4,076.68**	**15.82%**	**36.10%**	**6,707**	**12,067**	**67,051**	**124,876**	**1,017,132**	**1,285,731**

BIG TIMBER CREEK WATERSHED

Build-out, Impervious Cover and Pollutant Loading Projections

The Big Timber Creek watershed is located in the northwestern portion of Gloucester County and includes municipalities in Gloucester and Camden Counties. Gloucester County occupies less than 50 percent of the watershed. These build-out projections include only those portions of Gloucester County's municipalities in the watershed (portions of Washington Township, Deptford Township, Westville Borough, West Deptford Township and Woodbury City). Figure BT-7 (see Appendix A) shows the existing land use, based on DVRPC 2000 land use data. Figure BT-8 (see Appendix A) shows the constrained areas in the watershed.

The Gloucester County portion of the watershed is largely developed; only about 25 percent remains as developable lands (agriculture, woodlands, vacant, etc.). The results of the Big Timber Creek Watershed build-out analysis, including both existing and build-out (future) conditions, are presented in Table BT-4. This table provides the total area, constrained area, and developable area in acres for each HUC14 within the watershed and County.

Table BT-4. Big Timber Creek Watershed Pollutant Loading Projections

Municipality	HUC14 Sub-Watershed		Area (Acres)			Impervious Area				Total Pollutant Load (Lbs/Year)					
	No.	Name	Total	Constrained	Developable	Acres		Percent		Phosphorus		Nitrogen		Total Suspended Solids	
						Existing	Build-Out	Existing	Build-Out	Existing	Build-Out	Existing	Build-Out	Existing	Build-Out
Deptford Twp	02040202120040	Big Timber Creek SB (including Bull Run to Lakeland Rd)	302.32	31.06	271.24	42.19	96.61	13.96%	31.96%	163	403	1,639	4,298	28,556	39,941
	02040202120050	Big Timber Creek SB (below Bull Run)	688.15	164.83	523.32	98.97	301.32	14.49%	44.12%	321	760	3,435	7,898	46,919	78,787
	02040202120060	Almonesson Creek	2,433.16	351.71	2,081.46	488.70	967.01	20.10%	39.76%	1,769	2,949	18,332	30,311	236,152	312,329
	02040202120080	Big Timber Creek (below NB/SB confluence)	2,206.28	867.81	1,338.45	347.34	683.34	15.93%	32.03%	1,109	2,016	11,063	21,308	163,221	205,954
		Sub-Total	**5,629.91**	**1,415.41**	**4,214.47**	**977.20**	**2,048.28**	**17.36%**	**36.38%**	**3,362**	**6,127**	**34,468**	**63,815**	**474,848**	**637,012**
Washington Twp	02040202120030	Big Timber Creek SB (above Lakeland Rd)	4,373.35	655.87	3,717.47	990.62	979.42	22.73%	22.49%	3,049	5,362	29,469	56,248	435,986	547,895
	02040202120040	Big Timber Creek SB (including Bull Run to Lakeland Rd)	1,739.64	475.00	1,264.62	286.70	358.04	16.70%	20.90%	903	1,569	8,859	16,175	139,571	185,093
		Sub-Total	**6,112.99**	**1,130.87**	**4,982.09**	**1,277.32**	**1,337.46**	**20.90%**	**21.88%**	**3,952**	**6,931**	**38,328**	**72,423**	**575,557**	**732,988**
West Deptford Twp	02040202120080	Big Timber Creek (below NB/SB confluence)	392.66	102.99	289.66	61.16	190.95	15.58%	48.63%	289	449	3,079	4,782	38,873	55,829
Westville Borough	02040202120080	Big Timber Creek (below NB/SB confluence)	774.58	247.40	527.19	191.24	267.83	24.69%	34.58%	479	763	4,686	8,185	62,086	80,696
Woodbury City	02040202120080	Big Timber Creek (below NB/SB confluence)	14.80	0.53	14.27	9.96	8.29	67.30%	56.01%	19	21	204	226	2,567	2,694
		Total	**12,924.94**	**2,897.20**	**10,027.68**	**2,516.88**	**3,852.81**	**19.47%**	**29.81%**	**8,101.50**	**14,290.85**	**80,765.23**	**149,429.86**	**1,153,931.74**	**1,509,217.95**

MANTUA CREEK WATERSHED

Build-out, Impervious Cover and Pollutant Loading Projections

The Mantua Creek watershed is located in the central western portion of Gloucester County. These build-out projections include Gloucester County municipalities and their relative contribution to the watershed: Mantua Township (31%), Washington Township (20%), Deptford Township (11%), Harrison Township (8%), East Greenwich Township (8%), West Deptford Township (8%), Harrison Township (5%), Pitman Borough (5%), Paulsboro Borough (3%), Wenonah Borough (2%), Greenwich Township (.3%), Monroe Township (.3%), and Woodbury Heights Borough (.2%). Figure MC-7 (see Appendix A) shows the existing land use, based on DVRPC 2000 land use data. Figure MC-8 (see Appendix A) shows the constrained areas in the watershed.

The watershed is partially developed and Mantua, Washington and Deptford Townships are expected to develop further in the future. The results of the Mantua Creek Watershed build-out analysis, including both existing and build-out (future) conditions, are presented in Table MC-4. This table provides the total area, constrained area, and developable area in acres for each HUC14 within the watershed and County.

Table MC-4 also provides the impervious areas in both acres and percent for existing and build-out conditions, in order to allow comparison of the results. In general, impervious percentages greater than about 10 to 15 percent may indicate potential watershed impairment from stormwater and development. The total pollutant loadings for phosphorous, nitrogen and total suspended solids are projected in pounds per year for both the existing and build-out conditions, in order to allow comparison of the pollutant loadings.

Table MC-4. Mantua Creek Watershed Pollutant Loading Projections

Municipality	HUC14 Sub-Watershed		Area (Acres)			Impervious Area				Total Pollutant Load (Lbs/Year)					
	No.	Name	Total	Constrained	Developable	Acres		Percent		Phosphorus		Nitrogen		Total Suspended Solids	
						Existing	Build-Out	Existing	Build-Out	Existing	Build-Out	Existing	Build-Out	Existing	Build-Out
Deptford Twp	02040202130020	Mantua Creek (Sewell Road to Rte. 47)	120.24	23.94	96.30	3.85	45.53	3.20%	37.87%	94	77	790	720	20,467	10,583
	02040202130040	Mantua Creek (Edwards Run to Sewell Rd)	3,403.39	436.74	2,966.64	447.80	1,374.58	13.16%	40.39%	2,187	3,690	20,952	37,701	362,776	406,912
	02040202130060	Mantua Creek (below Edwards Run)	1.15	0.00	1.15	1.04	0.92	90.43%	80.00%	2	2	22	25	211	230
		Sub-Total	**3,524.78**	**460.68**	**3,064.09**	**452.69**	**1,421.03**	**12.84%**	**40.32%**	**2,283**	**3,770**	**21,764**	**38,446**	**383,454**	**417,725**
East Greenwich Twp	02040202130040	Mantua Creek (Edwards Run to Sewell Rd)	184.29	62.94	121.36	5.70	42.47	3.09%	23.05%	73	170	714	1,820	16,159	16,990
	02040202130050	Edwards Run	1,236.65	248.54	988.10	66.67	313.54	5.39%	25.35%	846	863	7,374	8,315	180,335	112,451
	02040202130060	Mantua Creek (below Edwards Run)	1,090.39	395.70	694.69	109.98	293.02	10.09%	26.87%	585	854	5,189	8,658	110,335	95,438
		Sub-Total	**2,511.33**	**707.18**	**1,804.15**	**182.35**	**649.03**	**7.26%**	**25.84%**	**1,505**	**1,888**	**13,277**	**18,793**	**306,829**	**224,878**
Glassboro Boro	02040202130010	Mantua Creek (above Rte. 47)	1,191.56	187.75	1,003.78	312.49	440.91	26.23%	37.00%	844	1,489	8,073	15,873	124,744	148,059
	02040202130020	Mantua Creek (Sewell Road to Rte. 47)	1.39	0.58	0.80	0.80	0.32	57.55%	23.02%	1	1	7	12	80	112
	02040202130030	Chestnut Branch (above Sewell)	1,416.80	137.40	1,279.40	351.65	537.32	24.82%	37.92%	1,030	1,541	9,909	15,847	151,786	169,667
		Sub-Total	**2,609.75**	**325.73**	**2,283.98**	**664.94**	**978.55**	**25.48%**	**37.50%**	**1,874**	**3,031**	**17,989**	**31,733**	**276,611**	**317,838**
Harristown Twp	02040202130030	Chestnut Branch (above Sewell)	327.59	15.67	311.92	27.73	228.21	8.46%	69.66%	371	637	3,050	6,659	77,623	61,129
	02040202130050	Edwards Run	1,167.15	125.05	1,042.10	70.14	204.25	6.01%	17.50%	931	703	7,779	6,120	203,985	109,085
		Sub-Total	**1,494.74**	**140.72**	**1,354.02**	**97.87**	**432.46**	**6.55%**	**28.93%**	**1,302**	**1,340**	**10,829**	**12,778**	**281,608**	**170,214**
Mantua Twp	02040202130020	Mantua Creek (Sewell Road to Rte. 47)	782.02	89.06	692.97	108.23	331.03	13.84%	42.33%	560	951	5,596	9,644	95,094	103,374
	02040202130030	Chestnut Branch (above Sewell)	2,340.22	496.28	1,843.93	209.50	735.60	8.95%	31.43%	1,385	2,065	12,894	20,666	253,695	249,585
	02040202130040	Mantua Creek (Edwards Run to Sewell Rd)	2,626.31	371.56	2,254.74	320.60	807.82	12.21%	30.76%	1,543	2,739	15,147	28,365	258,007	304,663
	02040202130050	Edwards Run	4,094.62	552.07	3,542.57	222.47	1,003.49	5.43%	24.51%	3,087	2,746	26,734	25,186	653,715	389,295
		Sub-Total	**9,843.17**	**1,508.97**	**8,334.21**	**860.80**	**2,877.94**	**8.75%**	**29.24%**	**6,574**	**8,500**	**60,371**	**83,861**	**1,260,511**	**1,046,917**
Monroe Twp	02040202130010	Mantua Creek (above Rte. 47)	79.74	14.56	65.18	3.03	16.30	3.80%	20.44%	47	91	436	978	9,917	9,126
Pitman Boro	02040202130010	Mantua Creek (above Rte. 47)	90.34	1.00	89.33	24.65	28.01	27.29%	31.01%	57	125	503	1,340	8,921	12,506
	02040202130020	Mantua Creek (Sewell Road to Rte. 47)	421.05	22.35	398.72	104.27	168.14	24.76%	39.93%	336	593	3,295	6,313	45,763	62,592
	02040202130030	Chestnut Branch (above Sewell)	929.74	104.53	825.19	231.84	313.80	24.94%	33.75%	583	1,136	5,405	12,028	88,852	120,385
		Sub-Total	**1,441.13**	**127.88**	**1,313.24**	**360.76**	**509.95**	**25.03%**	**35.39%**	**976**	**1,854**	**9,204**	**19,681**	**143,536**	**195,483**
Washington Twp	02040202130010	Mantua Creek (above Rte. 47)	2,511.58	327.95	2,183.64	487.97	599.03	19.43%	23.85%	1,712	2,234	15,563	22,293	282,831	266,956
	02040202130020	Mantua Creek (Sewell Road to Rte. 47)	3,826.24	827.69	2,998.55	666.63	787.35	17.42%	20.58%	2,320	3,870	21,998	39,760	366,607	428,725
	02040202130040	Mantua Creek (Edwards Run to Sewell Rd)	49.73	0.95	48.78	7.12	22.52	14.32%	45.28%	79	93	812	977	8,596	9,757
		Sub-Total	**6,387.55**	**1,156.59**	**5,230.97**	**1,161.72**	**1,408.90**	**18.19%**	**22.06%**	**4,111**	**6,196**	**38,373**	**63,030**	**658,034**	**705,437**
Wenonah Boro	02040202130040	Mantua Creek (Edwards Run to Sewell Rd)	645.49	111.99	533.49	112.02	203.16	17.35%	31.47%	306	645	2,861	6,927	49,946	68,080
West Deptford Twp	02040202130040	Mantua Creek (Edwards Run to Sewell Rd)	633.56	122.35	511.20	90.52	198.61	14.29%	31.35%	445	559	4,192	5,696	78,150	63,893
	02040202130060	Mantua Creek (below Edwards Run)	1,779.62	712.31	1,067.29	161.88	549.62	9.10%	30.88%	1,016	1,359	9,718	14,164	175,124	163,216
		Sub-Total	**2,413.18**	**834.66**	**1,578.49**	**252.40**	**748.23**	**10.46%**	**31.01%**	**1,460**	**1,918**	**13,910**	**19,860**	**253,274**	**227,109**
Greenwich Township	02040202130060	Mantua Creek (below Edwards Run)	90.35	0.98	89.38	39.93	65.28	44.19%	72.25%	120	133	1,268	1,416	15,871	17,046
Paulsboro	02040202130060	Mantua Creek (below Edwards Run)	980.53	420.70	559.83	157.02	320.90	16.01%	32.73%	464	843	4,458	8,990	64,594	91,107
Woodbury Heights Boro	02040202130040	Mantua Creek (Edwards Run to Sewell Rd)	77.24	6.26	70.98	12.70	29.67	16.44%	38.41%	42	101	421	1,081	6,454	10,902
		Total	**32,098.98**	**5,816.90**	**26,282.01**	**4,358.23**	**9,661.40**	**13.58%**	**30.10%**	**21,062**	**30,310**	**195,160**	**307,574**	**3,710,638**	**3,501,861**

WOODBURY CREEK WATERSHED

Build-out, Impervious Cover and Pollutant Loading Projections

The Woodbury Creek Watershed is located in the northwestern portion of Gloucester County. These build-out projections include Gloucester County municipalities and their relative contribution (area) to the watershed: West Deptford Township (61%), Deptford Township, (17%), Woodbury City (11%), Woodbury Heights Borough (6%) and National Park Borough (5%). Figure WC-7 (see Appendix A) shows the existing land use, based on DVRPC 2000 land use data. Figure WC-8 (see Appendix A) shows the constrained areas in the watershed.

The Woodbury Creek watershed is substantially developed and close to reaching its build-out potential. Approximately 10 percent of the land is undeveloped (agriculture, wooded land, vacant). The results of the Woodbury Creek Watershed build-out analysis, including both existing and build-out (future) conditions, are presented in Table WC-4. This table provides the total area, constrained area, and developable area in acres for each HUC14 within the watershed and County.

Table WC-4 also provides the impervious areas in both acres and percent for existing and build-out conditions, in order to allow comparison of the results. In general, impervious percentages greater than about 10 to 15 percent may indicate potential watershed impairment from stormwater and development. The total pollutant loadings for phosphorous, nitrogen and total suspended solids are projected in pounds per year for both the existing and build-out conditions, in order to allow comparison of the pollutant loadings.

Table WC-4. Woodbury Creek Watershed Pollutant Loading Projections

Municipality	HUC14 Sub-Watershed		Area (Acres)			Impervious Area				Total Pollutant Load (Lbs/Year)					
	No.	Name	Total	Constrained	Developable	Acres		Percent		Phosphorus		Nitrogen		Total Suspended Solids	
						Existing	Build-Out	Existing	Build-Out	Existing	Build-Out	Existing	Build-Out	Existing	Build-Out
Deptford Twp	02040202120100	Woodbury Creek (above Rte. 45)	2,102.21	446.96	1,655.28	346.82	594.01	16.50%	28.26%	1,036	2,122	10,565	22,097	155,162	226,120
	02040202120110	Woodbury Creek (below Rte. 45) / Lower Delaware River to Big Timber Creek	37.12	3.84	33.28	10.49	13.36	28.26%	35.99%	27	49	253	519	3,668	4,874
		Sub-Total	**2,139.33**	**450.80**	**1,688.56**	**357.31**	**607.37**	**16.70%**	**28.39%**	**1,063**	**2,171**	**10,818**	**22,616**	**158,830**	**230,994**
National Park Boro	02040202120110	Woodbury Creek (below Rte. 45) / Lower Delaware River to Big Timber Creek	773.20	460.42	312.78	110.90	126.42	14.34%	16.35%	184	477	1,670	5,080	28,164	50,851
	02040202120120	Main Ditch / Little Mantua Creek	153.91	143.99	9.91	0.16	6.19	0.10%	4.02%	5	15	49	155	585	1,930
		Sub-Total	**927.11**	**604.41**	**322.69**	**111.06**	**132.61**	**11.98%**	**14.30%**	**189**	**491**	**1,719**	**5,235**	**28,750**	**52,780**
West Deptford Twp	02040202120110	Woodbury Creek (below Rte. 45) / Lower Delaware River to Big Timber Creek	5,023.96	1,960.23	3,063.78	697.85	1,557.11	13.89%	30.99%	2,495	4,299	24,356	45,438	362,047	477,244
	02040202120120	Main Ditch / Little Mantua Creek	3,445.01	1,717.40	1,727.62	431.04	1,166.71	12.51%	33.87%	1,905	2,547	18,253	27,102	327,021	328,740
		Sub-Total	**8,468.97**	**3,677.63**	**4,791.40**	**1,128.89**	**2,723.82**	**13.33%**	**32.16%**	**4,400**	**6,846**	**42,609**	**72,540**	**689,068**	**805,984**
Woodbury City	02040202120100	Woodbury Creek (above Rte. 45)	540.60	89.86	450.74	117.70	220.90	21.77%	40.86%	394	682	3,848	7,269	50,783	69,304
	02040202120110	Woodbury Creek (below Rte. 45) / Lower Delaware River to Big Timber Creek	790.50	76.87	713.63	257.31	392.59	32.55%	49.66%	665	1,102	6,387	11,712	85,594	109,475
		Sub-Total	**1,331.10**	**166.73**	**1,164.37**	**375.01**	**613.49**	**28.17%**	**46.09%**	**1,058**	**1,784**	**10,234**	**18,981**	**136,377**	**178,779**
Woodbury Heights Boro	02040202120100	Woodbury Creek (above Rte. 45)	467.74	63.62	404.11	91.19	173.05	19.50%	37.00%	297	601	2,982	6,417	41,943	62,333
	02040202120110	Woodbury Creek (below Rte. 45) / Lower Delaware River to Big Timber Creek	257.80	4.08	253.71	77.66	108.54	30.12%	42.10%	214	392	2,075	4,175	28,572	38,949
		Sub-Total	**725.54**	**67.70**	**657.82**	**168.85**	**281.59**	**23.27%**	**38.81%**	**511**	**993**	**5,056**	**10,592**	**70,515**	**101,282**
		Total	**13,592.05**	**4,967.27**	**8,624.84**	**2,141.12**	**4,358.88**	**15.75%**	**32.07%**	**7,221**	**12,285**	**70,437**	**129,964**	**1,083,539**	**1,369,820**

Section 6. Design and Performance Standards

Deptford Township must amend its land use ordinances to incorporate 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. This requirement will be met by adopting a Municipal Stormwater Control Ordinance that meets these requirements or by amending an existing stormwater control ordinance to meet these requirements.

The design and performance standards in the adopted or amended ordinance must include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins.

After adoption or amendment of the ordinance, it must be submitted to the County, along with this MSWMP, for approval.

Furthermore, during construction of major development within the Deptford Township, municipal inspectors must observe the construction of stormwater management measures to ensure that they are constructed and function as designed.

The New Jersey stormwater design and performance standards represent an initial effort to control non-point sources of pollution and to improve groundwater recharge. The effective control of point sources of pollution took many years. The USEPA and the NJDEP believe that further water quality improvements can now best be achieved by controlling non-point sources of pollution and stormwater runoff.

New stormwater management measures and design and performance standards will emerge over the ensuing years. The stormwater rules, NJPDES stormwater permits, and municipal stormwater plans and ordinances will similarly evolve and require amendments. Municipalities will be expected to control stormwater runoff, to improve or maintain surface water quality and groundwater recharge and to continue to utilize appropriate stormwater design and performance standards to achieve this goal.

With the increasing emphasis on non-point source pollution and concerns over the adverse impacts of uncontrolled land development, effective alternatives to the centralized stormwater conveyance and treatment strategies have been developed that are the basis for many of the new stormwater management standards in the State. New strategies have been developed to minimize and even prevent adverse stormwater runoff impacts from occurring.

Such strategies, known collectively as Low Impact Development techniques or LIDs, reduce and/or prevent adverse runoff impacts through sound site planning and both nonstructural and structural techniques that preserve or closely mimic a site's natural or pre-developed hydrologic response to precipitation. These new stormwater management strategies are explained in more detail in Section 8 of this MSWMP.

Section 7. Plan Consistency

There are no approved Regional Stormwater Management Plans (RSWMPs) in Gloucester County at this time. However, Regional Stormwater Management Planning is being conducted by the County Planning Department, NJ Soil Conservation Districts/Program and Rowan University in portions of a number of the County's watersheds. These include portions of the Maurice River (upper portions, including Scotland Run, Little Ease Run and Still Run), Raccoon Creek (upper portions) and Mantua Creek (Chestnut Branch).

The Gloucester County Stormwater Management Program is working closely with these regional efforts. When these or any future RSWMPs are approved by the appropriate regional water quality management planning agency and NJDEP, and adopted as part of the regional water quality management plan, the new New Jersey stormwater management regulations require that municipal stormwater management plans be revised to provide consistency.

Presently, TMDLs have been proposed for certain surface water bodies in Gloucester County. Section 4 of this MSWMP addresses impaired surface waters, TMDLs and supporting surface water quality data. When these ongoing TMDL proposals or any future TMDLs proposals are finally approved, the new New Jersey stormwater management regulations require that municipal stormwater management plans be revised to provide consistency.

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

Furthermore, Deptford Township's stormwater management ordinance(s) will require all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, municipal inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the Gloucester County Soil Conservation District.

Section 8. Stormwater Management Strategies

Low Impact Development Techniques

The NJDEP's new Stormwater Management Rules include the specific provisions that must be addressed in a municipal stormwater management plan (N.J.A.C. 7:8-4.2(c)). One of these requirements is that the plan include an evaluation of the extent to which the master plan (including the land use element), official map, and development regulations (including zoning ordinances) implement the principles of the Stormwater Management Rules relating to nonstructural stormwater management strategies (N.J.A.C. 7:8-5.3(b)).

New stormwater management techniques have been developed that minimize and prevent adverse stormwater effects from land disturbance. These techniques are referred to by the NJDEP as Low Impact Development techniques (LIDs) and include both nonstructural and structural Best Management Practices (BMPs). LID-BMPs first minimize quantitative and qualitative changes to a site's pre-developed hydrology (i.e., employ nonstructural techniques first) and then provide stormwater management through smaller sized structural techniques distributed throughout the site. The link to the NJDEP website to download the BMP Manual is:

http://www.njstormwater.org/bmp_manual2.htm

Nonstructural LID-BMPs include such practices as minimizing site disturbance, preserving important site features, reducing and disconnecting impervious cover, flattening slopes, utilizing native vegetation, minimizing turf grass lawns and maintaining natural drainage features. It may be possible at some sites to satisfy all stormwater management requirements through nonstructural LID-BMPs. Structural BMPs are considered LIDs if they are located close to the source of runoff. Structural LID-BMPs include various types of basins, filters, devices and permeable surfaces located within residential lots and otherwise throughout residential, commercial, industrial or institutional development.

Because LIDs rely on nonstructural or relatively small structural BMPs distributed throughout a land development site, ownership and maintenance may be similarly distributed to an array of property owners. The new Stormwater Management rule requires the use of deed restrictions for LID-BMPs to ensure that property owners fully recognize, understand and support the continuing use of LID-BMPs for stormwater management.

The NJDEP believes that effective, state-wide use of such practices can best be achieved through modifications to municipal master plans and land use ordinances to include LID goals and to provide for the use of specific LID-BMPs. The Stormwater Management Rules require municipalities to review their master plans and ordinances in order to incorporate LID techniques to the maximum extent practicable.

The NJDEP Stormwater Management Rules (N.J.A.C. 7:8) require, in Section 5.2(a) that Major Development (disturbing one acre or more or increasing impervious surface by 1/4 acre) incorporate nonstructural stormwater management strategies "to the maximum extent practicable." Nonstructural LID-BMPs are to be given preference over structural BMPs. Where it is not possible to fully comply with the Stormwater Management Rules through nonstructural LIDs, structural LID-BMPs are to be used in conjunction with standard structural BMPs to meet the Rules' requirements.

N.J.A.C. 7:8-5 further requires that an applicant seeking approval for major development or redevelopment specifically identify which and how these nine nonstructural strategies are incorporated or provide an engineering, environmental, or safety reason for their non-incorporation.

The NJ BMP manual contains a LID checklist which planning boards and development applicants can use to ensure LID techniques are being applied. This checklist is available in Appendix D.

(a) Nonstructural LID-BMPs

The NJDEP's new Stormwater rule's design and performance standards require the maximum possible use of nine nonstructural strategies.

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

The nonstructural LID-BMPs have been grouped by the NJDEP into four general categories:

I. Vegetation and Landscaping – reduces runoff volumes and peaks through infiltration, surface storage, and evapotranspiration, provides pervious surface for groundwater recharge and removes pollutants from stormwater. Key techniques include:

A. **Preservation of Natural Areas** – preserve areas with significant hydrologic functions including forested areas, riparian corridors and soils/geology with high recharge potential.
B. **Native Ground Cover** – reduce the use of turf grass and preserve areas that naturally minimize runoff.
C. **Vegetative Filters and Buffers** – provide native ground cover and grass areas to filter stormwater runoff from pervious areas and to provide locations for runoff to infiltrate.

II. Minimizing Land Disturbance – reduces runoff volume and pollutant loads and maintains existing recharge rates and other hydrologic functions. Key techniques include:

A. Planning and design to fit the development to the terrain, limiting clearing and grading.
B. Evaluating site conditions and constraints including soil types, geology, topography, slopes, drainage areas, wetlands, and floodplains to maintain high recharge areas and provide runoff storage areas.
C. Utilizing construction techniques that limit disturbance and soil compaction.
D. Restricting the future expansion of buildings and other improvements that will adversely affect runoff volumes and rates or recharge rates.

III. Impervious Area Management – reduces water quality impacts, runoff volume and peak rates, runoff velocity, erosion and flooding. Key techniques include:

A. **Streets –** use minimum acceptable pavement widths and incorporate pervious vegetated medians and islands with curb cuts for runoff access.
B. **Sidewalks –** use pervious pavement with infiltration storage beneath and disconnect from the street drainage system.
C. **Parking and Driveways –** use pervious pavement wherever practical **and** reduce parking space requirements by sharing requirements in mixed uses and by reducing parking space lengths by allowing for overhang into pervious areas.
D. **Pervious Paving Materials –** Use pervious materials in parking spaces, driveways, access roadways and sidewalks, including pavers, porous pavement and gravel.
E. **Unconnected Impervious Areas –** Disconnect impervious areas and runoff form the site's drainage system allowing the sheet flow to cross pervious areas through curb cuts or by eliminating curbing and using shoulders and swales.
F. **Vegetated Roofs –** install lightweight vegetative planting beds on new or existing roofs.

IV. Time of Concentration Modification – minimize reductions to the time of concentration caused by changes in hydrologic characteristics in order to minimize the peak runoff rate. Key techniques include:

A. **Surface Roughness Changes –** increase surface roughness through the use of land cover and decrease the amount of connected smooth surfaces in order to increase runoff travel time throughout the drainage area.
B. **Slope Reduction –** reduce slopes in graded areas and/or provide terraces and reduced slope channels to increase runoff travel length and time.
C. **Vegetated Conveyance –** use vegetated channels and swales to increase roughness and runoff travel time and to provide opportunities for runoff treatment and infiltration.

In order to assure to the maximum extent possible the use of Nonstructural LIDs in new major development, the NJDEP prepared a Nonstructural Strategies Evaluation Worksheet, and this worksheet is included in Appendix D.

(b) Structural LID-BMPs

In addition to these nonstructural LID-BMPs, structural stormwater management measures can be LID-BMPs. These structural BMPs become LID-BMPs by storing, infiltrating, and/or treating runoff close to the source of the stormwater. Unlike standard structural BMPs that are located along a site's drainage system, structural LID-BMPs are normally dispersed throughout a development and more closely mimic the hydrology. LID-BMPs are typically standard structural BMPs, but their location, closer to the runoff source, allows them to be smaller in size. Standard structural BMPs that can be implemented at a LID scale include: drywells, infiltration systems, bioretention basins, and both surface and subsurface detention basins; downsized, to address stormwater close to its source as LIDs.

There are a number of structural stormwater BMPs that may be used to address the groundwater recharge and stormwater quality and quantity requirements of the NJDEP Stormwater Management Rules in N.J.A.C. 7:8. The structural BMPs include the following techniques (see also *New Jersey Stormwater Best Management Practices Manual,* February 2004, which includes the planning, design, construction, and maintenance guidelines for these structural BMPs):

1. Bioretention Systems
2. Constructed Stormwater Wetlands
3. Dry Wells
4. Extended Detention Basins
5. Infiltration Basins
6. Manufactured Treatment Devices
7. Pervious Paving Systems
8. Rooftop Vegetated Cover
9. Sand Filters

10. Vegetative Filters
11. Wet Ponds

Other BMPs that possess similar levels of effectiveness, efficiency, and endurance may also be utilized, provided that such levels can be demonstrated.

Deptford Township will review the Master Plan and local land use ordinances and incorporate structural stormwater management strategies (LID and standard structural stormwater BMPs) to the extent practicable and in accordance with sound planning, science, engineering and construction principles, as they apply to its unique environment.

Other Stormwater Management Strategies

BIG TIMBER CREEK WATERSHED

(a) Gloucester County Stormwater Management Program's Watershed Workshop

The Gloucester County Stormwater Management Program held a Big Timber Creek Watershed workshop, inviting representatives from each municipality in the watershed to an evening discussion of stormwater management issues and strategies. The resulting issues and recommended strategies are presented below.

- **Localized Flooding**: Westville Borough has experienced an increase in flooding in recent years. The long term loss of natural storage areas (tidal marshes) in the watershed was suggested as one possible cause for this problem. Westville's location in the watershed, along the confluence of Big Timber Creek and the Delaware River, places it in a particularly vulnerable position. Further evaluation of flooding potential in this area of the watershed is warranted, particularly in lieu of potential future sea level increases.

- **Well Head Protection Areas and Aquifer Outcrops**: Additional stormwater treatment may be needed for recharge in Well Head Protection Areas and/or aquifer outcrop areas, in order to prevent drinking water and ground water contamination. Further evaluation of stormwater recharge quality and the natural attenuation of contaminants are needed. State and federal assistance may be required for these evaluations.

- **Stormwater BMP Maintenance**: BMPs required by the new stormwater regulations require long term maintenance, if they are to remain effective. The NJDEP's stormwater permits require municipalities to ensure and annually certify that this maintenance is being carried out. Municipalities and their planning boards must develop a method of securing the long term maintenance of these facilities and an inspection and/or certification process that will allow them to ensure maintenance and provide the annual certification.

(b) Regional Stormwater Management Planning

There is no Regional Stormwater Management Plan (RSWMP) for the Big Timber Creek Watershed. However, a Regional Stormwater Management Plan was prepared for the upper portion (above Grove Street in Haddonfield) of the adjacent Cooper River Watershed. The Cooper River Watershed RSWMP was developed by the Camden County Soil Conservation District (CCSCD) in cooperation with the New Jersey Department of Agriculture, State Soil Conservation Committee (SSCC) and the Burlington, Cape-Atlantic and Gloucester Soil Conservation Districts and is dated May 2004. Conditions (size, density, soils, geology, topography and land use) in the Big Timber Creek Watershed and the Cooper River Watershed are sufficiently similar to permit the extrapolation of applicable stormwater management recommendations from the Cooper River RSWMP to the Big Timber Creek watershed.

The South and North Branch of Big Timber Creek join together at Clements Bridge Road, in Deptford Township, about four miles from the main stem's confluence with the Delaware River. The main stem and the South Branch form the northern border of Gloucester County. Thus, all of the North Branch and about half of the South Branch of the Big Timber Creek watershed are in Camden County. The main stem and the South Branch are tidally influenced from the Delaware River up to Blackwood Lake in Washington Township.

A significant percentage of the Big Timber Creek watershed has been developed and is defined as urban land. Stormwater management practices throughout the watershed have evolved, from the simple collection and discharge of direct runoff to the extended detention and water quality treatment practices required by the new state stormwater design and performance standards. Appropriate stormwater management strategies for the Big Timber Creek watershed are presented below.

- **Stormwater Basin and Existing Development Retrofit** – Older under-maintained stormwater basins may not adequately provide mitigation for the most frequently occurring rain storms nor provide stormwater quality treatment. To improve the water quality and mitigate peak flows during these high frequency storms, existing stormwater basins can be retrofitted. Additionally, existing development retrofit strategies can be implemented during stormwater infrastructure improvements or as a separate retrofit project, including such techniques as roof water infiltration or reuse, stormwater inlet modifications, roadside rain gardens or infiltration structures and bio-retention facilities.

- **Stream and Streambank Stabilization** – Erosion is significantly accelerated by human activities and development in the watershed. Streambank erosion introduces excess sediment loads to the stream and in turn chokes lakes and ponds with sediment. Watershed-wide stream and stream bank restoration and stabilization priorities and guidelines should be adopted by all involved municipalities and agencies working in the watershed in order to improve water quality, upgrade in-stream and riparian habitat and reduce sedimentation in receiving waterbodies.

- **Regional Storage** – Runoff from older developed areas in the watershed may not be adequately managed on site. Peak flows and the volumes of runoff generated from even a small rainfall event may be adequate to cause immediate responses in the streams and contribute significantly to the stream bank erosion and sedimentation. Stream response should be evaluated and regional storage options thoroughly investigated prior to initiation of stream restoration and lake dredging. Regional storage includes strategies to store excess runoff in either newly constructed wetlands or ponds or the rehabilitation of existing, but inadequate or failed facilities. Though costly, regional storage may provide the best opportunity to avoid continuing degradation and maintenance costs

- **Redevelopment:** – Although much of the watershed is developed, during redevelopment, stormwater runoff from previously unmanaged or under-managed sites will be mitigated. All municipalities must adopt the required stormwater control ordinances for new development and redevelopment and requiring control of runoff from nearly 90 percent of the average annual rainfall on site, groundwater recharge and an 80 percent removal of total suspended solids.

- **Low Impact Development Techniques** – Low Impact Development (LID) techniques provide a variety of stormwater control measures to maintain or restore the pre-developed hydrologic characteristics of a site. (See LID recommendations above)

- **Stormwater Outfall Restoration** –Failing outfalls are a concern for public safety and they may contribute excess sediment to the receiving waterway. Degraded outfalls and resulting stream bank erosion will be identified during the Gloucester County Stormwater Management Program's outfall mapping and stream bank condition assessment efforts. Repairs can be prioritized throughout the watershed.

- **Geese Management**: Increasing geese populations have become a problem throughout both the suburban and rural portions of southern New Jersey. Stormwater detention ponds, grass and lawn areas and farm fields provide habitat for geese. Although the populations sometimes add to the areas aesthetics, there are adverse impacts to water quality and the land that result, especially with over population.

  The new New Jersey Stormwater regulations require municipalities to pass ordinances prohibiting the feeding of waterfowl. In addition, municipalities should encourage land cover types and practices in new development that discourage geese from resting, nesting and feeding in areas that would otherwise provide attractive habitat, such as stormwater management facilities.

- **Lake and Pond Management and Maintenance** – Ponds and lakes in the Big Timber Creek Watershed provide significant aesthetic benefit, and these waterbodies reduce stream slopes, provide storage and attenuate peak runoff rates and serve as sediment basins, trapping sediment carried by the streams. They also provide a diverse aquatic habitat for certain species not found in streams. Programmatic

management and maintenance of public and privately held lakes and ponds, including dam maintenance, dredging and vegetation management, is needed to sustain these benefits.

(c) Water Quality-TMDL Stormwater Management Strategies

The NJDEP has proposed four (4) sets of TMDLs that address impaired water bodies in this watershed. The full text of these proposals can be found and downloaded at the following link:

http://www.nj.gov/dep/watershedmgt/tmdl.htm#intro .

Three of the four sets of TMDLs were proposed by the NJDEP in April 2003 and were based on the 2002 Integrated Report. These TMDLs were approved in September 2003, but have not yet been adopted. One of the four sets of TMDLs was proposed by the NJDEP in July 2005, and is not yet considered established.

The TMDL remediation plans and stormwater strategies are summarized below.

TMDLs were proposed for fecal coliform for the South Branch Big Timber Creek at Glenloch and for the South Branch Big Timber Creek at Blackwood Terrace. Waste load allocation reductions have been proposed for these affected waterways. The TMDL proposals describe possible sources of fecal coliform, as well as the method of developing the TMDL and remediation plan.

Fecal Coliform: Fecal Coliform contamination may have either point or non-point sources or both. Point sources generally involve sewage discharges. Because sewage treatment plants have permits that require disinfection to levels well below water quality standards, the proposed TMDLs address non-point sources, involving stormwater runoff. These non-point stormwater sources include runoff from various land uses that transport fecal coliform from geese and other wildfowl, farms, and domestic pets to the receiving water. Non-point sources also include "illicit" sources, such as failing onsite disposal systems and the illegal connections of sanitary drains from buildings to storm sewers.

- **Phase II NJPDES Permits and the Municipal Stormwater Regulation Program**: Fecal Coliform loadings may be reduced by the new requirements to enforce a pet waste ordinance and an ordinance prohibiting the feeding of wildfowl on public property. The NJPDES permit requirements also require the annual inspection and cleaning (if necessary) of catch basins, the performance of good housekeeping practices at maintenance yards and public education and employee training aimed at reducing non-point sources of pollution, including fecal coliform. Additional reductions in fecal coliform levels may result from the elimination of illicit connections and failing on-site sewage disposal systems. Fecal coliform contributions from agricultural activities can be controlled by the implementation of agricultural conservation management plans and best management practices.

- **Geese Management**: Grenlock Lake attracts large populations of Canadian Geese. Remediation methods suggested include community based goose management programs.

TMDLs were proposed for phosphorous for the South Branch of Big Timber Creek at Blackwood Terrace and for Blackwood Lake. Waste load allocation reductions have been proposed. The TMDL proposals describe possible sources of phosphorous, as well as the method of developing the TMDL and remediation plan. (See Section 8 Water Quality-TMDL Stormwater Management Strategies)

Phosphorous: Phosphorous sources include domestic and industrial wastewater treatment plants that discharge to surface waters as well as stormwater discharges subject to regulation under the New Jersey Pollutant Discharge Elimination System (NJPDES) municipal stormwater permitting program. Non-point sources include stormwater runoff from land surfaces, malfunctioning sewage conveyance systems, failing or inappropriately designed septic systems and direct contributions from wildlife, livestock and pets.

- **Phase II NJPDES Permits and the Municipal Stormwater Regulation Program**: Phosphorous loadings may be reduced through the activities required by the Phase II permits.

- **Low Phosphorous Fertilizer Ordinance:** As an additional measure to their NJPDES stormwater permits, Deptford Township and Washington Township are required to adopt an ordinance that prohibits the outdoor application of fertilizer, other than low phosphorous fertilizer. The ordinance must be consistent with a model ordinance provided by the NJDEP.

(d) Lower Big Timber Creek Regional Stormwater Management Strategies:

Big Timber Creek and the South Branch of Big Timber Creek are tidally influenced up to Blackwood Lake in Washington Township. These lower tidally influenced portions of the watershed present a different hydrologic regime. The stormwater management strategies developed for the upper portions of the watershed, may not in some cases, be relevant or appropriate for the lower tidal portions of the watershed.

Water quality and stormwater management in the lower portions of the Big Timber Creek watershed are significantly influenced by conditions in the Delaware River. The complex nature of the interactions between the Delaware River, the Delaware Estuary and the tidally influenced lower portions of the Big Timber Creek Watershed are beyond the scope of this plan and this stormwater management strategy discussion.

MANTUA CREEK WATERSHED

(a) Gloucester County Stormwater Management Program's Watershed Workshop

The Gloucester County Stormwater Management Program held a Mantua Creek Watershed workshop, inviting representatives from each municipality in the watershed to an evening discussion of stormwater management issues and strategies. The resulting issues and recommended strategies are presented below.

- **Localized Flooding and Stormwater Infrastructure Maintenance**: Localized flooding occurs at a number of locations in the watershed, including Delsea Drive in Glassboro, north of Pitman-Downer Drive (Mars Court) in Washington Township, the Westville Oaks area between Peach, Gilbert and Florence roads in Deptford, and Chestnut Branch in Glassboro near Rowan University. Furthermore, there are floodgates on Mantua Creek at the Delaware River behind the Hercules industrial facility that are critical elements in the watershed's flood protection and security. Localized flooding occurs about one to four times per year and sometimes reaches a few feet in depth.

  A number of the flooding problems are thought to be the result of siltation and obstructions in culverts and stream channels. Particularly at locations where state, county and municipal roadways intersect, runoff from state and county roadways sometimes becomes a burden to local roads and stormwater systems, and ownership and responsibility for its management is sometimes unclear and neglected.

  The new New Jersey stormwater regulations and the design and performance standards, address this issue for all new major development (defined as projects that disturb one or more acres of land or increase the amount of impervious surface by one-quarter acre or more), including new roadway construction and reconstruction. State, County and local roadway agencies must comply with these new regulations and control their stormwater runoff accordingly. Unfortunately, the new regulations can not resolve already existing, localized roadway flooding.

  Most municipalities and the County Highway Division do not have plans or maps of their stormwater system, nor is there a method in place for State, County or local agencies to share stormwater system information, even though these systems must frequently work together. Furthermore, there are typically few if any systems for inspecting and recording the stormwater system's condition or maintenance activities.

  The Gloucester County Stormwater Program includes an extensive outfall mapping component for Gloucester County's municipalities and the County Highway Division. The program is using GPS dataloggers to map and record data in a digital format for stormwater outfalls throughout the County. The County program will produce outfall maps for each municipality and the County Highway Division and the County program is storing the digital data in a GIS for easy sharing, updates and retrieval.

  The outfall maps are a first step in defining the County's stormwater systems. In order to assist municipalities with stormwater system management, the County will be purchasing dataloggers for use by municipalities in mapping the other components

of their stormwater systems (inlets, pipes, ditches, culverts, basins etc.). An understanding of the stormwater systems and drainage may help resolve existing localized roadway flooding, and it will assist the municipalities and County in providing the maintenance assurances required by their new stormwater NJPDES permits. A better understanding of the stormwater system and their conditions will also reduce the likelihood of sudden stormwater infrastructure failures.

(b) Regional Stormwater Management Strategies

There is no Regional Stormwater Management Plan (RSWMP) for the Mantua Creek Watershed. The Gloucester Soil Conservation District (GSCD) with the New Jersey Department of Agriculture, State Soil Conservation Committee (SSCC) and the Burlington, Camden and Cape-Atlantic Soil Conservation Districts prepared an Upper Maurice River Regional Stormwater Management Plan dated October 2004 and a Draft Characterization and Assessment (C&A) for the Raccoon Creek Watershed. The Maurice River and Raccoon Creek watersheds are adjacent to the Mantua Creek Watershed. Conditions in the Mantua Creek Watershed, particularly in the less developed upper portions, are sufficiently similar to those in the Raccoon Creek and Maurice River Watersheds to permit some extrapolation of applicable stormwater management strategies.

The regional stormwater management strategies proposed for the Mantua Creek Watershed are described below:

- **Stormwater Recharge**: Changes in land use from rural agricultural to emerging suburban/urban development invariably alter the natural runoff and infiltration capabilities of the soil. As the landscape is altered in the construction process, the natural soil horizons are disturbed, forested areas are removed and the capacity of the soils in the post-development condition to mimic pre-development water retention and infiltration is severely impaired and reduced. This reduction results in increased overland flow, a decrease in retained moisture, and ultimately reduction in stream base flow. Stormwater recharge through infiltration or in combination with detention should be used as much as possible for stormwater management.

- **Low Impact Development Techniques** – Low Impact Development (LID) techniques provide a variety of stormwater control measures to maintain or restore the pre-developed hydrologic characteristics of a site. (See LID recommendations above)

- **Adoption of DelMarVa Peak Rate Factor:** As part of more accurately modeling existing conditions in the Mantua Creek Watershed, utilizing regionalized factors in the calculation of stormwater runoff is critical. The DelMarVa peak rate factor (PRF) replaces the national average PRF in the dimensionless unit hydrograph used by the NRCS stormwater runoff prediction methodologies. The DelMarVa hydrograph has been formally recommended for use in the coastal plain of New Jersey and should be required for all hydrologic analyses in this watershed.

- **Deicing Sand:** Sand used during snow storms makes its way to stormwater inlets, pipes and outfalls, where it causes both hydraulic and water quality problems. In order to reduce the maintenance costs from cleaning sand from stormwater facilities and to reduce the suspended solids loading to streams, municipalities can minimize or eliminate the use of sand for snow storms.

  The Gloucester County Stormwater Program includes an extensive anti-icing and deicing component for Gloucester County's municipalities and the County Highway Division. The program includes the provision of salt storage sheds and liquid anti-icing and deicing agents in bulk storage at five locations throughout the County, as well as liquid application equipment for county and municipal salt trucks. An anti-icing and deicing education program is part of this effort. The County's program will help municipalities and the County Highway Division minimize or eliminate the use of sand for snow storms and also reduce the amount of salt used for deicing.

- **Geese Management**: Increasing goose populations have become a problem throughout both the suburban and rural portions of southern New Jersey. Stormwater detention ponds, grass and lawn areas and farm fields provide habitat for geese. Although the populations sometimes add to the areas aesthetics, there are adverse impacts to water quality and the land that result, especially with over population.

  The new New Jersey Stormwater regulations require municipalities to pass ordinances prohibiting the feeding of waterfowl. In addition, municipalities should encourage land cover types and practices in new development that discourage geese from resting, nesting and feeding in areas that would otherwise provide attractive habitat, such as stormwater management facilities. Changes to state and federal laws regarding hunting were discussed and recommended at the workshop.

- **Stormwater Basin and Existing Development Retrofit** – Older under-maintained stormwater basins may not adequately provide mitigation for the most frequently occurring rain storms nor provide stormwater quality treatment. To improve the water quality and mitigate peak flows during these high frequency storms, existing stormwater basins can be retrofitted. Additionally, existing development retrofit strategies can be implemented during stormwater infrastructure improvements or as a separate retrofit project, including such techniques as roof water infiltration or reuse, stormwater inlet modifications, roadside rain gardens or infiltration structures and bio-retention facilities

- **Lake and Pond Management and Maintenance** – Ponds and lakes in the Mantua Creek Watershed provide significant aesthetic benefit, and these waterbodies reduce stream slopes, provide storage and attenuate peak runoff rates and serve as sediment basins, trapping sediment carried by the streams. They also provide a diverse aquatic habitat for certain species not found in streams. Programmatic management and maintenance of public and privately held lakes and ponds, including dam

maintenance, dredging and vegetation management, is needed to sustain these benefits.

- **Stream and Streambank Stabilization** – Erosion is significantly accelerated by human activities and development in the watershed. Streambank erosion introduces excess sediment loads to the stream and in turn chokes lakes and ponds with sediment. Watershed-wide stream and stream bank restoration and stabilization priorities and guidelines should be adopted by all involved municipalities and agencies working in the watershed in order to improve water quality, upgrade in-stream and riparian habitat and reduce sedimentation in receiving waterbodies.

- **Stormwater Outfall Restoration** –Failing outfalls are a concern for public safety and they may contribute excess sediment to the receiving waterway. Degraded outfalls and resulting stream bank erosion will be identified during the Gloucester County Stormwater Management Program's outfall mapping and stream bank condition assessment efforts. Repairs can be prioritized throughout the watershed.

- **Well Head Protection Areas and Aquifer Outcrops**: Additional stormwater treatment may be needed for recharge in Well Head Protection Areas and/or aquifer outcrop areas, in order to prevent drinking water and ground water contamination. Further evaluation of stormwater recharge quality and the natural attenuation of contaminants are needed. State and federal assistance may be required for these evaluations.

- **Stormwater BMP Maintenance**: BMPs required by the new stormwater regulations require long term maintenance if they are to remain effective. The NJDEP's stormwater permits require municipalities to ensure and annually certify that this maintenance is being carried out. Municipalities and their planning boards must develop a method of securing the long term maintenance of these facilities and an inspection and/or certification process that will allow them to ensure maintenance and provide the annual certification.

(c) Lower Mantua Creek Regional Stormwater Management Strategies:

Mantua Creek is tidally influenced on the main stem up to a point in Wenonah. Edwards run is tidally influenced up to the NJTPK in East Greenwich and Chestnut Run is tidally influenced to Mantua Boulevard in Mantua. These lower tidally influenced portions of the watershed present a different hydrologic regime. The stormwater management strategies developed for the upper portions of the Mantua Creek watershed may not in some cases, be relevant or appropriate for the lower tidal portions of the watershed.

Water quality and stormwater management in the lower portions of the Mantua Creek Watershed are significantly influenced by conditions in the Delaware River. The complex nature of the interactions between the Delaware River, the Delaware Estuary and the tidally influenced lower portions of the Mantua Creek Watershed are beyond the scope of this plan and this stormwater strategy discussion.

(d) Water Quality-TMDL Stormwater Management Strategies

The NJDEP has proposed two TMDLs to address impaired waters in this watershed. The full text of these proposals can be found and downloaded at the following link:

http://www.nj.gov/dep/watershedmgt/tmdl.htm#intro .

The first TMDL was proposed for Edwards Run at Jefferson in April 2003 for fecal coliform and is based on the 2002 Integrated Report. This TMDL was approved in September 2003, but has not yet been adopted. A TMDL for phosphorous was proposed for Bethel Lake in 2005. This TMDL is not yet established.

Fecal Coliform: Fecal Coliform contamination can be derived from either point or non-point sources or both. Point sources generally involve sewage discharges. Because sewage treatment plants have permits that require disinfection to levels well below water quality standards, the proposed TMDLs address non-point sources, involving stormwater runoff. These non-point stormwater sources include runoff from various land uses that transport fecal coliform from geese and other wildfowl, farms, and domestic pets to the receiving water. Non-point sources also include "illicit" sources, such as failing onsite disposal systems and the illegal connections of sanitary drains from buildings to storm sewers.

A number of stormwater management strategies were included in the TMDL Fecal Coliform proposal to remediate the affected waterways.

- **Phase II NJPDES Permits and the Municipal Stormwater Regulation Program**: Fecal Coliform loadings may be reduced by the new requirements to enforce a pet waste ordinance and an ordinance prohibiting the feeding of wildfowl on public property. The NJPDES permit requirements also require the annual inspection and cleaning (if necessary) of catch basins, the performance of good housekeeping practices at maintenance yards and public education and employee training aimed at reducing non-point sources of pollution, including fecal coliform. Additional reductions in fecal coliform levels may result from the elimination of illicit connections and failing on-site sewage disposal systems. Fecal coliform contributions from agricultural activities can be controlled by the implementation of agricultural conservation management plans and best management practices.

- **Manure**: The application of manure in agricultural areas may be a concern. There are farms with horses, cows, goats, and chickens along the stream corridor. Buffers along the stream are generally less than fifty feet, although access is limited by thick undergrowth. Agricultural BMPs may be needed to reduce these impacts.

- **Further Source Identification**: Monitoring was recommended to locate and identify significant sources of fecal coliform.

Phosphorous: Phosphorous sources include domestic and industrial wastewater treatment plants that discharge to surface waters, as well as stormwater discharges subject to regulation under the New Jersey Pollutant Discharge Elimination System (NJPDES) municipal stormwater permitting program. Non-point sources include stormwater runoff from land surfaces, malfunctioning sewage conveyance systems, failing or inappropriately designed septic systems and direct contributions from wildlife, livestock and pets.

- **Phase II NJPDES Permits and the Municipal Stormwater Regulation Program**: Phosphorous loadings may be reduced through the activities required by the Phase II permits.

- **Low Phosphorous Fertilizer Ordinance:** As an additional measure to their NJPDES stormwater permits, Deptford Township and Washington Township are required to adopt an ordinance that prohibits the outdoor application of fertilizers, other than low phosphorous fertilizer. The ordinance must be consistent with a model ordinance provided by the NJDEP.

WOODBURY CREEK WATERSHED

(a) Gloucester County Stormwater Management Program's Watershed Workshop

The Gloucester County Stormwater Management Program held a Woodbury Creek Watershed workshop, inviting representatives from each municipality in the watershed to an evening discussion of stormwater management issues and strategies. The resulting issues and recommended strategies are presented below.

- **Lake and Stream Sedimentation**: A number of lakes and some stream sections in Woodbury City are filling with sediment including Bell Lake, the lake near St. Patrick's school and Woodbury Creek itself near Underwood Hospital. Dredging has been done on Bell Lake (twice) and these other areas are currently in need of dredging. The upstream source of the sediment has not been determined. Stream bank stabilization measures have been installed in some areas. Additional sediment control measures enforced through the soil conservation district were suggested.

  The New Jersey stormwater regulations now require the control and removal of 80 percent of the suspended solids from stormwater in new development and redevelopment. This should reduce the sediment load from new development and redevelopment. However, the watershed is already highly urbanized and it may be necessary to reduce the sediment loading from existing sources in order to reduce the sediment loading to the lakes and streams in this watershed.

- **Localized Roadway Flooding**: Localized roadway flooding occurs at a number of locations in the watershed, including Evergreen Avenue near the railroad overpass, and in the neighborhood near Cooper Street and the Burger King . Particularly at

locations where state, county and municipal roadways intersect, runoff sometimes becomes a burden to local roads and stormwater systems. Ownership and responsibility for stormwater management is sometimes unclear and neglected.

The New Jersey stormwater regulations and the design and performance standards, address this issue for all new major development (defined as projects that disturb one or more acres of land or increase the amount of impervious surface by one-quarter acre or more), including new roadway construction and reconstruction. State, County and local roadway agencies must comply with these new regulations and control their stormwater runoff accordingly. Unfortunately, the new regulations can not resolve already existing, localized roadway flooding.

Most municipalities and the County Highway Division do not have plans or maps of their stormwater system, nor is there a method in place for State, County or local agencies to share stormwater system information, even though these systems must frequently work together. Furthermore, there are typically few, if any, systems for inspecting and recording the stormwater system's condition or maintenance activities.

The Gloucester County Stormwater Program includes an extensive outfall mapping component for Gloucester County's municipalities and the County Highway Division. The program is using GPS dataloggers to map and record data in a digital format for stormwater outfalls throughout the County. The County program will produce outfall maps for each municipality and the County Highway Division and store the digital data in a GIS for easy sharing, updates and retrieval.

The outfall maps are a first step in defining the County's stormwater systems. In order to assist municipalities with stormwater system management, the County will purchase dataloggers for use by municipalities in mapping the other components of their stormwater systems (inlets, pipes, ditches, culverts, basins etc.). An understanding of the stormwater systems and drainage may help resolve existing localized roadway flooding, and it will assist the municipalities and County in providing the maintenance assurances required by their new stormwater NJPDES permits.

- **Sanitary Sewer Overflows:** There are two areas in Woodbury where sanitary sewer overflows have occurred that may have affected surface water quality on a temporary basis. The sanitary sewer on Lake Drive may not have adequate capacity and has backed-up and overflowed. Also, the County interceptor sewer near the high school has experienced back-ups and has overflowed into Woodbury Creek. The nature and frequency of these problems should be investigated by their respective owners and appropriate corrective actions taken to minimize potential water quality impacts.

(b) Regional Stormwater Management Planning

There is no Regional Stormwater Management Plan (RSWMP) for the Woodbury Creek Watershed. However, a Regional Stormwater Management Plan was prepared for the

upper portion (above Grove Street in Haddonfield) of the Cooper River Watershed. The Cooper River Watershed RSWMP was developed by the Camden County Soil Conservation District (CCSCD) in cooperation with the New Jersey Department of Agriculture, State Soil Conservation Committee (SSCC) and the Burlington, Cape-Atlantic and Gloucester Soil Conservation Districts and is dated May 2004. Conditions (size, density, soils, geology, topography and land use) in the Woodbury Creek Watershed and the Cooper River Watershed are sufficiently similar to permit the extrapolation of applicable stormwater management recommendations from the Cooper River RSWMP to the Woodbury Creek watershed.

The Woodbury Creek Watershed is the smallest watershed fully contained in Gloucester County, draining an area of approximately 21.5 square miles into this five mile-long stream. Woodbury Creek's two major tributaries are Hessian Run and Matthews Branch. Woodbury Creek is tidal up to dam at Broad Street in the Woodbury City.

A significant percentage of the Woodbury Creek watershed has been developed and is defined as urban land. Stormwater management practices throughout the watershed have evolved, from the simple collection and discharge of direct runoff to the extended detention and water quality treatment practices required by the new state stormwater design and performance standards. Appropriate stormwater management strategies for the Woodbury Creek watershed are presented below.

- **Stormwater Basin and Existing Development Retrofit** – Older under-maintained stormwater basins may not adequately provide mitigation for the most frequently occurring rain storms nor provide stormwater quality treatment. To improve the water quality and mitigate peak flows during these high frequency storms, existing stormwater basins can be retrofitted. Additionally, existing development retrofit strategies can be implemented during stormwater infrastructure improvements or as a separate retrofit project, including such techniques as roof water infiltration or reuse, stormwater inlet modifications, roadside rain gardens or infiltration structures and bio-retention facilities.

- **Stream and Streambank Stabilization** – Erosion is significantly accelerated by human activities and development in the watershed. Streambank erosion introduces excess sediment loads to the stream and in turn chokes lakes and ponds with sediment. Watershed-wide stream and stream bank restoration and stabilization priorities and guidelines should be adopted by all involved municipalities and agencies working in the watershed in order to improve water quality, upgrade in-stream and riparian habitat and reduce sedimentation in receiving waterbodies.

- **Regional Storage** – Runoff from older developed areas in the watershed may not be adequately managed on site. Peak flows and the volumes of runoff generated from even a small rainfall event may be adequate to cause immediate responses in the streams and contribute significantly to the stream bank erosion and sedimentation. Stream response should be evaluated and regional storage options thoroughly investigated prior to initiation of stream restoration and lake dredging. Regional

storage includes strategies to store excess runoff in either newly constructed wetlands or ponds or the rehabilitation of existing, but inadequate or failed facilities. Though costly, regional storage may provide the best opportunity to avoid continuing degradation and maintenance costs

- **Redevelopment:** – Although much of the watershed is developed, during redevelopment, stormwater runoff from previously unmanaged or under-managed sites will be mitigated. All municipalities must adopt the required stormwater control ordinances for new development and redevelopment and requiring control of runoff from nearly 90 percent of the average annual rainfall on site, groundwater recharge and an 80 percent removal of total suspended solids.

- **Low Impact Development Techniques** – Low Impact Development (LID) techniques provide a variety of stormwater control measures to maintain or restore the pre-developed hydrologic characteristics of a site. (See LID recommendations above)

- **Stormwater Outfall Restoration** –Failing outfalls are a concern for public safety and they may contribute excess sediment to the receiving waterway. Degraded outfalls and resulting stream bank erosion will be identified during the Gloucester County Stormwater Management Program's outfall mapping and stream bank condition assessment efforts. Repairs can be prioritized throughout the watershed.

- **Geese Management**: Increasing geese populations have become a problem throughout both the suburban and rural portions of southern New Jersey. Stormwater detention ponds, grass and lawn areas and farm fields provide habitat for geese. Although the populations sometimes add to the areas aesthetics, there are adverse impacts to water quality and the land that result, especially with over population.

  The New Jersey Stormwater regulations require municipalities to pass ordinances prohibiting the feeding of waterfowl. In addition, municipalities should encourage land cover types and practices in new development that discourage geese from resting, nesting and feeding in areas that would otherwise provide attractive habitat, such as stormwater management facilities.

- **Lake and Pond Management and Maintenance –** Ponds and lakes in the Woodbury Creek Watershed provide significant aesthetic benefit, and these waterbodies reduce stream slopes, provide storage and attenuate peak runoff rates and serve as sediment basins, trapping sediment carried by the streams. They also provide a diverse aquatic habitat for certain species not found in streams. Programmatic management and maintenance of public and privately held lakes and ponds, including dam maintenance, dredging and vegetation management, is needed to sustain these benefits.

(c) Water Quality-TMDL Stormwater Management Strategies

The NJDEP has proposed two (2) sets of TMDLs that address impaired water bodies in this watershed. The full text of these proposals can be found and downloaded at the following link:

http://www.nj.gov/dep/watershedmgt/tmdl.htm#intro .

Both of the sets of TMDLS were proposed by the NJDEP in April 2003 and were based on the 2002 Integrated Report. These TMDLs were approved in September 2003, but have not yet been adopted. There are TMDL proposals for phosphorous in Bell Lake and Woodbury Lake. Waste load allocation reductions have been proposed for the affected waterways. The TMDL proposals discuss possible sources as well as the methods used to develop the TMDLs and remediation plan.

Phosphorous: Phosphorous sources include domestic and industrial wastewater treatment plants that discharge to surface waters as point sources, as well as stormwater non-point source discharges subject to regulation under the New Jersey Pollutant Discharge Elimination System (NJPDES) municipal stormwater permitting program. Non-point sources include stormwater runoff from various land uses, deposition from the air, malfunctioning sewage conveyance systems, failing or inappropriately designed septic systems and direct contributions from wildlife, livestock and pets.

The NJDEP Bell Lake TMDL proposal estimates that about 70 percent of the phosphorus load on Bell Lake is from medium and high density residential land use and that 26 percent is from commercial land use. The NJDEP TMDL proposal for Woodbury Lake indicates that about 51 percent of the phosphorous load is from medium and high density residential land use, 11 percent is from low and rural residential land use and 16 percent is from commercial land use. The NJDEP's TMDL percent reduction in phosphorous load required from all land uses to meet water quality standards is 94 percent for Bell Lake and 85 percent for Woodbury Lake.

The NJDEP TMDL proposals indicate that additional monitoring is required in order to develop Lake Restoration Plans to implement the TMDLs. Woodbury Lake is scheduled for characterization by the NJDEP for the summer of 2007 and Bell Lake is scheduled for the summer of 2009. Development of lake restoration plans, based on the lake characterizations, is then scheduled for the spring of the proceeding year.

Typical stormwater management strategies that may be employed include:

- **Phase II NJPDES Permits and the Municipal Stormwater Regulation Program**: Phosphorous loadings may be reduced through the activities required by the Phase II permits.

- **BMP Implementation**: Additional phosphorous loadings from new development and redevelopment may be reduced through LID - BMP implementation.

- **Low Phosphorous Fertilizer Ordinances:** As an additional measure to their

NJPDES stormwater permits, municipalities may be required to adopt an ordinance that prohibits the outdoor application of fertilizers, other than low phosphorous fertilizer. The ordinance must be consistent with a model ordinance provided by the NJDEP.

Section 9. Mitigation Plans

Section 6 of this MSWMP addresses the design and performance standards for stormwater management measures applicable to major development projects. In some instances, however, site specific conditions may prevent strict compliance with these standards. In accordance with N.J.A.C. 7:8-4.2(c)11, such projects may be granted a variance or exemption from these standards by the Municipal Zoning Board or Planning Board, if a mitigation plan is approved by the Board and mitigation plan implementation is a condition of the major development project approval.

To the extent possible, a mitigation plan should offset the impacts on groundwater recharge, stormwater quantity control, and/or stormwater quality control that would be created by granting the variance or exemption to the development project. In addition, to the extent possible, the proposed mitigation project(s) should be located within the same HUC14 sub-drainage basin(s) as the major development project, and if not, within the same Watershed Management Area.

A mitigation plan may include more than one mitigation project, in order to achieve the objectives of location and/or impact offsets. The Municipal Stormwater Coordinator Public Works Director (if different), and Engineer (if different) will develop and maintain a list of mitigation projects that can be implemented in order to comply with the mitigation plan provisions of this MSWMP. Included as part of the list of projects will be quantitative estimates of the offsets to groundwater recharge, stormwater quantity control, and/or stormwater quality control for each of the mitigation projects.

The mitigation plan must include a detailed plan and schedule for implementation of the mitigation project(s). Implementation may be accomplished as a part of the major development project, or the Municipality may accept funding for the project(s), at the discretion of the Municipality. If the Municipality chooses to accept funding in lieu of implementation, such funding shall include any costs that must be incurred by the Municipality in implementing the mitigation project(s), including design, permitting, land and/or easement acquisition, construction, and provisions for the long-term operation and maintenance of the mitigation project(s).

A mitigation plan must clearly demonstrate that strict compliance with the design and performance standards for stormwater management measures cannot be achieved. Before submitting a mitigation plan that does not meet the objectives of the MSWMP with regard to mitigation project location and/or impact offsets, the developer shall request that the Municipality determine whether it can identify other projects, consistent with those objectives, that the Municipality can add to its list.

A mitigation plan that includes a mitigation project or projects not taken from the Municipality's list may be submitted for review by the Municipality. Such projects must be reviewed and accepted by the Municipality, before a mitigation plan including such projects can be submitted to the Zoning Board or Planning Board for review. A mitigation plan including projects not already listed by the Municipality must include quantitative estimates of the offsets to groundwater recharge, stormwater quantity control, and/or stormwater quality control for each of those unlisted mitigation projects.

The mitigation plan must include provisions for ensuring the long-term operation and maintenance of the mitigation project(s), by clearly identifying the party responsible for the operation and maintenance of each mitigation project. If the Municipality accepts a mitigation plan that designates the Municipality as the responsible party for mitigation project operation and maintenance, provisions for funding the associated costs by the developer shall be included in the mitigation plan.

If implementation of a mitigation plan is a condition of approval for a major development project by the Municipal Zoning Board or Planning Board, such approval shall also include the requirement that the developer execute a funding agreement with the Municipality for mitigation plan implementation, as a further condition of approval. The funding agreement, in form acceptable to the Municipality, shall provide for funding by the developer of all costs to implement the plan that will be incurred by the Municipality, including the cost of long-term operation and maintenance of any mitigation projects.

Section 10. Gloucester County Stormwater Management Program

The Gloucester County Board of Freeholders, in an effort to help municipalities address non-point source pollution and stormwater management, has established a Gloucester County Stormwater Management Program that provides assistance with many of the NJPDES permit requirements. The Gloucester County Stormwater website at http://www.gcstormwater.com provides a web link to learn more about the new NJDEP stormwater management rules, the NJPDES stormwater management permit requirements and the ongoing Gloucester County Stormwater Management Program.

The purpose of the program is to help municipalities meet the NJDEP's permit requirements through a regional effort in a fiscally responsible manner.

The County is addressing a number of each town's permit requirements to help alleviate the financial burden, while providing coordinated efforts that will better manage our environment. By utilizing a countywide watershed based approach; the end product will be a plan for each municipality tailored to the specific needs of the watershed.

The Gloucester County Freeholder Board's watershed-based approach to stormwater management is unique in the state of New Jersey. Through economies of scale and the use of technology, not necessarily available at the local level, the regional plan saves local taxpayers more, by coordinating preparation of the NJDEP required MSWMP for each of the 24 municipalities. The County not only saves time and money, but is better prepared to control non-point source pollution and to encourage improvements in water quality throughout Gloucester County.

The overall long term goal of stormwater management is to have all waters in New Jersey meet water quality standards for their designated uses. That is, ensure that our rivers, lakes and coastal waters are fishable, swimmable, and support healthy ecosystems. The *New Jersey Nonpoint Source and Stormwater Management Program Plan*, (NJDEP, December, 2000) indicates that "Nonpoint sources of pollution from stormwater runoff have long been thought to be major contributors to the degradation of water quality in New Jersey." It further states:

> The task ahead will not be easy. Controlling point sources of pollution took many years, many new governmental and private partners and billions of federal and private dollars. Successfully managing nonpoint sources of pollution and stormwater runoff can be expected to require a similar if not greater commitment.

APPENDIX A. WATERSHED FIGURES

BT-1	MC-1	WC-1
BT-2	MC-2	WC-2
BT-3	MC-3	WC-3
BT-4	MC-4	WC-4
BT-5	MC-5	WC-5
BT-6	MC-6	WC-6
BT-7	MC-7	WC-7
BT-8	MC-8	WC-8

Figure 9 for Appendix A

APPENDIX B. WATER QUALITY DATA

Big Timber Creek Watershed
AMNET Scores

Watershed	Site Name	Site Number	Location	Municipality	Impairment Score 1995/1996	Impairment Score 2000/2001	Habitat Score 2000/2001	Impairment Rating 1995/1996	Impairment Rating 2000/2001	Chironomid Larvae Abnormalities	Site Activity
Big Timber Creek	Almonesson Ck	AN0665	Clements Bridge Rd	Deptford Twp	6	6	123	Severe	Severe	False	True
Big Timber Creek	Bg Timber Ck S Br	AN0659	Almonesson Rd	Deptford Twp	15	9	135	Moderate	Moderate	False	True
Big Timber Creek	Bg Timber Ck S Br	AN0658	Turnersville - Sicklerville Rd	Washington Twp	15	21	160	Moderate	Moderate	False	True

Impairment Score	Impairment Rating
24 - 30	Non-Impaired
9 - 21	Moderately Impaired
0 - 6	Severely Impaired

Non-Impaired

Sublist 5

Big Timber Creek Watershed
Phosphorous Data

Watershed	Site Name	Site ID	HUC	Sampling Agency	Sample Date	Sample Type	Result Value (mg/l)	Standard (mg/l)
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	02/15/94	Unfiltered	0.08	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	02/15/94	Filtered	0.02	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	04/18/94	Unfiltered	0.16	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	04/18/94	Filtered	0.04	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	06/23/94	Unfiltered	0.2	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	06/23/94	Filtered	0.04	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	08/09/94	Unfiltered	0.15	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	08/09/94	Filtered	0.04	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	11/14/94	Unfiltered	0.07	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	11/14/94	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	02/01/95	Unfiltered	0.01	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	02/01/95	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	04/04/95	Unfiltered	0.11	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	04/04/95	Filtered	0.02	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	05/30/95	Unfiltered	0.07	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	05/30/95	Filtered	0.02	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	07/31/95	Unfiltered	0.08	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	07/31/95	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	11/21/95	Unfiltered	0.05	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	11/21/95	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	02/21/96	Unfiltered	0.16	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	02/21/96	Filtered	0.03	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	04/02/96	Unfiltered	0.09	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	04/02/96	Filtered	0.02	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	06/05/96	Unfiltered	0.11	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	06/05/96	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	07/25/96	Unfiltered	0.09	0.1

Big Timber Creek Watershed
Phosphorous Data

Watershed	Site Name	Site ID	HUC	Sampling Agency	Sample Date	Sample Type	Result Value (mg/l)	Standard (mg/l)
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	07/25/96	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	11/06/96	Unfiltered	0.05	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	11/06/96	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	01/21/97	Unfiltered	0.03	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	01/21/97	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	03/25/97	Unfiltered	0.05	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	03/25/97	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	06/02/97	Unfiltered	0.1	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	06/02/97	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	06/16/97	Unfiltered	0.04	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	06/16/97	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	08/04/97	Unfiltered	0.08	0.1
Big Timber Creek	Big Timber Creek at Blackwood Terrace	01467329	02040202	USGS	08/04/97	Filtered	0.08	0.1

Non-Impaired

Impaired

Big Timber Creek Watershed
Fecal Coliform Data

Watershed	Site Name	Site ID	HUC	Sampling Agency	Sample Date	Result Value (CFU/100mL)	Standard (CFU/100mL)
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	02/15/94	540	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	04/18/94	79	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	06/23/94	1,100	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	08/09/94	2,400	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	11/14/94	790	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	02/01/95	49	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	04/04/95	49	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	05/30/95	790	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	07/31/95	490	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	11/21/95	490	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	04/02/96	240	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	06/05/96	330	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	07/25/96	1,700	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	11/06/96	110	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	01/21/97	280	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	03/25/97	9	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	06/02/97	9,200	400
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	08/04/97	50	400

Non-Impaired

Impaired

Big Timber Creek Watershed
Phosphorous Data

Watershed	Site Name	Site ID	HUC	Sampling Agency	Sample Date	Sample Type	Result Value (mg/l)	Standard (mg/l)
Big Timber Creek	Big Timber Creek at Amonesson Rd in Blenheim	01467331	02040202	NJDEP	11/28/00	Total Actual	0.21	0.1
Big Timber Creek	Big Timber Creek at Amonesson Rd in Blenheim	01467331	02040202	NJDEP	01/11/01	Total Actual	0.39	0.1
Big Timber Creek	Big Timber Creek at Amonesson Rd in Blenheim	01467331	02040202	NJDEP	04/11/01	Total Actual	0.11	0.1
Big Timber Creek	Big Timber Creek at Amonesson Rd in Blenheim	01467331	02040202	NJDEP	07/19/01	Total Actual	0.11	0.1
Big Timber Creek	Big Timber Creek at Amonesson Rd in Blenheim	01467331	02040202	NJDEP	10/17/01	Total Actual	0.17	0.1
Big Timber Creek	Big Timber Creek at Amonesson Rd in Blenheim	01467331	02040202	NJDEP	01/02/02	Total Actual	0.28	0.1
Big Timber Creek	Big Timber Creek at Amonesson Rd in Blenheim	01467331	02040202	NJDEP	04/11/02	Total Actual	0.094	0.1
Big Timber Creek	Big Timber Creek at Amonesson Rd in Blenheim	01467331	02040202	NJDEP	07/24/02	Total Actual	0.387	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	02/15/94	Unfiltered	0.08	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	02/15/94	Filtered	0.02	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	04/18/94	Unfiltered	0.16	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	04/18/94	Filtered	0.04	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	06/23/94	Unfiltered	0.2	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	06/23/94	Filtered	0.04	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	08/09/94	Unfiltered	0.15	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	08/09/94	Filtered	0.04	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	11/14/94	Unfiltered	0.07	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	11/14/94	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	02/01/95	Unfiltered	0.01	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	02/01/95	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	04/04/95	Unfiltered	0.11	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	04/04/95	Filtered	0.02	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	05/30/95	Unfiltered	0.07	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	05/30/95	Filtered	0.02	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	07/31/95	Unfiltered	0.08	0.1

Big Timber Creek Watershed
Phosphorous Data

Watershed	Site Name	Site ID	HUC	Sampling Agency	Sample Date	Sample Type	Result Value (mg/l)	Standard (mg/l)
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	07/31/95	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	11/21/95	Unfiltered	0.05	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	11/21/95	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	02/21/96	Unfiltered	0.16	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	02/21/96	Filtered	0.03	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	04/02/96	Unfiltered	0.09	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	04/02/96	Filtered	0.02	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	06/05/96	Unfiltered	0.11	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	06/05/96	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	07/25/96	Unfiltered	0.09	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	07/25/96	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	11/06/96	Unfiltered	0.05	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	11/06/96	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	01/21/97	Unfiltered	0.03	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	01/21/97	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	03/25/97	Unfiltered	0.05	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	03/25/97	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	06/02/97	Unfiltered	0.1	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	06/02/97	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	06/16/97	Unfiltered	0.04	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	06/16/97	Filtered	0.01	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	08/04/97	Unfiltered	0.08	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	USGS	08/04/97	Filtered	0.08	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	NJDEP	01/12/00	Total Estimated	0.03	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	NJDEP	01/12/00	Dissolved Estimated	0.27	0.1

Big Timber Creek Watershed
Phosphorous Data

Watershed	Site Name	Site ID	HUC	Sampling Agency	Sample Date	Sample Type	Result Value (mg/l)	Standard (mg/l)
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	NJDEP	01/13/00	Total Actual	*Non-detect	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	NJDEP	01/13/00	Dissolved Actual	*Non-detect	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	NJDEP	01/18/00	Dissolved Actual	*Non-detect	0.1
Big Timber Creek	Big Timber Creek S Br at Blackwood Terrace	01467329	02040202	NJDEP	01/18/00	Total Actual	0.05	0.1

Non-Impaired

Impaired

Big Timber Creek Watershed
Mercury Data

Watershed	Site Name	Species	Date	N	Total Weight (g)	Total Length (cm)		Age (years)		Sex	Hg Concentration (mg/kg wet weight)
						Avg.	Range	Avg.	Range		
Big Timber Creek	Big Timber Creek	Ameiurus catus	1992	2		31.5	29.6 - 33.4	5	5 - 5		0.09
Big Timber Creek	Big Timber Creek	Ameiurus nebulosus	1992	2		30.2	29.4 - 31	4.5	4 - 5		0.06
Big Timber Creek	Big Timber Creek	Ictalurus punctatus	1992	1		42.3	42.3	6	6		0.09
Big Timber Creek	Big Timber Creek	Micropterus salmoides	1992	3		28.9	25.5 - 33	2	2 - 2		0.09
Big Timber Creek	Big Timber Creek	Pomoxis nigromaculatus	1992	1		15.5	15.5	9	9		0.07
Big Timber Creek	Big Timber Creek	Channel Catfish	8/19//92		610.3	42.3				F	0.09
Big Timber Creek	Big Timber Creek	Largemouth Bass	8/19/1992		599.4	33				M	0.10
Big Timber Creek	Big Timber Creek	Largemouth Bass	8/20/1992		323.4	28.2				F	0.12
Big Timber Creek	Big Timber Creek	Largemouth Bass	8/21/1992		286.7	25.5				U	0.06
Big Timber Creek	Big Timber Creek	White Catfish	8/19/1992		539.4	33.4				M	0.08
Big Timber Creek	Big Timber Creek	White Catfish	8/19/1992		398.5	29.6				F	0.09
Big Timber Creek	Big Timber Creek	Black Crappie			77.8	15.5					0.07
Big Timber Creek	Big Timber Creek	Brown Bullhead			417	31					0.06
Big Timber Creek	Big Timber Creek	Brown Bullhead			372.6	29.4					0.05
Big Timber Creek	Big Timber Creek	Channel Catfish			610.3	42.3					0.09
Big Timber Creek	Big Timber Creek	Largemouth Bass			599.4	33					0.10
Big Timber Creek	Big Timber Creek	Largemouth Bass			323.4	28.2					0.12
Big Timber Creek	Big Timber Creek	White Catfish			539.4	33.4					0.08
Big Timber Creek	Big Timber Creek	White Catfish			398.5	29.6					0.09

Women of reproductive age and children:

< 0.08 ppm	No Advisories
0.08 - 0.18 ppm	Limited Consumption (Less than one meal per week)
0.19 - 0.54 ppm	Limited Consumption (Less than one meal per month)
> 0.54 ppm	No consumption advised

Others:

< 0.35 ppm	No Advisories
0.35 - 0.93 ppm	Limited Consumption (Less than one meal per week)
0.947 - 2.81 ppm	Limited Consumption (Less than one meal per month)
> 2.81 ppm	No consumption advised

Non-Impaired

Impaired

Mantua Creek Watershed
AMNET Scores

Watershed	Site Name	Site Number	Location	Municipality	Impairment Score 1995/1996	Impairment Score 2000/2001	Habitat Score 2000/2001	Impairment Rating 1995/1996	Impairment Rating 2000/2001	Chironomid Larvae Abnormalities	Site Activity
Mantua Creek	Chestnut Br	AN0671	Mantua Blvd	Mantua Twp	12	18	135	Moderate	Moderate	True	True
Mantua Creek	Chestnut Br	AN0670	Lambs Rd	Mantua Twp	18	21	181	Moderate	Moderate	False	True
Mantua Creek	Edwards Run	AN0674	Jessups Mill Rd	Mantua Twp	15	12	116	Moderate	Moderate	False	True
Mantua Creek	Edwards Run	AN0673	Pitman - Jefferson Rd	Harrison Twp	3	12	128	Severe	Moderate	False	True
Mantua Creek	Mantua Ck	AN0672	Mantua Ave	Wenonah Boro	12	18	139	Moderate	Moderate	False	True
Mantua Creek	Mantua Ck	AN0669	Lambs Rd	Mantua Twp	9	18	174	Moderate	Moderate	False	True
Mantua Creek	Mantua Ck	AN0668	Greentree Rd	Glassboro Boro	15	24	176	Moderate	None	False	True

Impairment Score	Impairment Rating
24 - 30	Non-Impaired
9 - 21	Moderately Impaired
0 - 6	Severely Impaired

Non-Impaired

Sublist 5

Mantua Creek Watershed
Mercury Data

Watershed	Site Name	Species	Date	N	Total Weight (g)	Total Length (cm)		Age (years)		Sex	Hg Concentration (mg/kg wet weight)
						Avg.	Range	Avg.	Range		
Mantua Creek	Alcyon Lake	Esox niger	1992	1		44.9	44.9			U	0.40
Mantua Creek	Alcyon Lake	Micropterus salmoides	1992	4		29.53	27.8 - 33.7	4.3	4 - 5	U	0.48
Mantua Creek	Alcyon Lake	Pomoxis nigrosmaculatus	1992	2		17	16.9 - 17.1	4.5	4 - 5	U	0.24
Mantua Creek	Alcyon Lake	Black Crappie	11/9/1992		66.9	17.1				IM	0.29
Mantua Creek	Alcyon Lake	Black Crappie	11/9/1992		63.7	16.9				IM	0.19
Mantua Creek	Alcyon Lake	Chain Pickerel	11/9/1992		547.6	44.9				M	0.40
Mantua Creek	Alcyon Lake	Largemouth Bass	11/9/1992		559.2	33.7				U	0.41
Mantua Creek	Alcyon Lake	Largemouth Bass	11/10/1992		270.2	28.6				U	0.67
Mantua Creek	Alcyon Lake	Largemouth Bass	11/11/1992		308.5	28				U	0.33
Mantua Creek	Alcyon Lake	Largemouth Bass	11/12/1992		294.3	27.8				U	0.51

Women of reproductive age and children:

< 0.08 ppm	No Advisories
0.08 - 0.18 ppm	Limited Consumption (Less than one meal per week)
0.19 - 0.54 ppm	Limited Consumption (Less than one meal per month)
> 0.54 ppm	No consumption advised

Others:

< 0.35 ppm	No Advisories
0.35 - 0.93 ppm	Limited Consumption (Less than one meal per week)
0.947 - 2.81 ppm	Limited Consumption (Less than one meal per month)
> 2.81 ppm	No consumption advised

Non-Impaired

Impaired

Mantua Creek Watershed
Phosphorous Data

Watershed	Site Name	Site ID	HUC	Sampling Agency	Sample Date	Sample Type	Result Value (mg/l)	Standard (mg/l)
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	11/28/00	Unfiltered	0.152	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	11/28/00	Filtered	0.06	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	02/22/01	Unfiltered	0.104	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	02/22/01	Filtered	0.025	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	05/23/01	Unfiltered	0.38	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	05/23/01	Filtered	0.18	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	08/23/01	Unfiltered	0.119	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	08/23/01	Filtered	0.056	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	11/27/01	Unfiltered	0.088	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	11/27/01	Filtered	0.026	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	02/20/02	Unfiltered	0.065	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	02/20/02	Filtered	0.023	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	06/20/02	Unfiltered	0.44	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	06/20/02	Filtered	0.26	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	08/27/02	Unfiltered	0.19	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	08/27/02	Filtered	0.08	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	01/24/01	Total Actual	0.12	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	04/26/01	Total Actual	*Non-detect	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	07/19/01	Total Actual	0.17	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	10/03/01	Total Actual	0.07	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	01/02/02	Total Actual	0.07	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	04/11/02	Total Actual	*Non-detect	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	07/24/02	Total Actual	0.246	0.1

Non-Impaired

Impaired

Mantua Creek Watershed
Fecal Coliform Data

Watershed	Site Name	Site ID	HUC	Sampling Agency	Sample Date	Result Value (CFU/100mL)	Standard (CFU/100mL)
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	7/10/2001	**940**	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	7/17/2001	**1,100**	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	7/24/2001	**16,000**	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	7/31/2001	**940**	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	8/7/2001	**24,000**	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	**2001 Avg**	**8,596**	200
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	5/29/2002	**1,100**	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	6/5/2002	**500**	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	6/12/2002	**5,000**	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	6/26/2002	230	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	**2002 Avg**	**1,708**	200

Non-Impaired

Impaired

Woodbury Creek Watershed
AMNET Scores

Watershed	Site Name	Site Number	Location	Municipality	Impairment Score 1995/1996	Impairment Score 2000/2001	Habitat Score 2000/2001	Impairment Rating 1995/1996	Impairment Rating 2000/2001	Chironomid Larvae Abnormalities	Site Activity
Woodbury Creek	Woodbury Ck	AN0667	Rt 45	Woodbury City	12	9	118	**Moderate**	**Moderate**	True	True

Impairment Score	Impairment Rating
24 - 30	**Non-Impaired**
9 - 21	**Moderately Impaired**
0 - 6	**Severely Impaired**

Woodbury Creek Watershed
pH Data

Watershed	Site Name	Site ID	HUC	Sampling Agency	Sample Date	pH
Woodbury Creek	Woodbury Creek ar Rt. 45, Woodbury Ck Park in Woodbury	01474730	02040202	NJDEP	10/25/00	8.7
Woodbury Creek	Woodbury Creek ar Rt. 45, Woodbury Ck Park in Woodbury	01474730	02040202	NJDEP	10/03/01	8.5
Woodbury Creek	Woodbury Creek ar Rt. 45, Woodbury Ck Park in Woodbury	01474730	02040202	NJDEP	01/11/01	6.7
Woodbury Creek	Woodbury Creek ar Rt. 45, Woodbury Ck Park in Woodbury	01474730	02040202	NJDEP	01/02/02	7.3
Woodbury Creek	Woodbury Creek ar Rt. 45, Woodbury Ck Park in Woodbury	01474730	02040202	NJDEP	04/11/01	7.1
Woodbury Creek	Woodbury Creek ar Rt. 45, Woodbury Ck Park in Woodbury	01474730	02040202	NJDEP	01/02/02	7.6
Woodbury Creek	Woodbury Creek ar Rt. 45, Woodbury Ck Park in Woodbury	01474730	02040202	NJDEP	06/17/02	8.7
Woodbury Creek	Woodbury Creek ar Rt. 45, Woodbury Ck Park in Woodbury	01474730	02040202	NJDEP	08/29/02	7.8

Impaired

Non-Impaired

Woodbury Creek Watershed
PCB Data

Watershed	Site Name	Scientific Name	Common Name	Sex	Total Length (cm)	Total Wet Weight (g)	Lipid %	Total PCBs (ppm)
Woodbury Creek	Stewart Lake	Ameiurus nebulosus	Brown Bullhead	F	25.4	182.65	0.08	22
Woodbury Creek	Stewart Lake	Ameiurus nebulosus	Brown Bullhead	F	27.3	250.4	1.19	12
Woodbury Creek	Stewart Lake	Ameiurus nebulosus	Brown Bullhead	U	31.1	409.5	3.09	34
Woodbury Creek	Stewart Lake	Chelydra serpentina	Turtle	U	N/A	3500	0.29	26
Woodbury Creek	Stewart Lake	Cyprinus carpio	Common Carp	F	43.8	1133.6	1.73	40
Woodbury Creek	Stewart Lake	Cyprinus carpio	Common Carp	M	49.3	1681.1	6.26	235
Woodbury Creek	Stewart Lake	Cyprinus carpio	Common Carp	M	54.5	2135	2.38	464
Woodbury Creek	Stewart Lake	Cyprinus carpio	Common Carp	M	59.8	2808.2	5.04	526
Woodbury Creek	Stewart Lake	Cyprinus carpio	Common Carp	F	65.8	3850	0.28	231
Woodbury Creek	Stewart Lake	Lepomis macrochirus	Bluegill	U	15.9	79.7	0.54	55
Woodbury Creek	Stewart Lake	Lepomis macrochirus	Bluegill	U	16.4	90.4	0.8	27
Woodbury Creek	Stewart Lake	Micropterus salmoides	Largemouth Bass	M	35.9	632.5	0.48	49
Woodbury Creek	Stewart Lake	Micropterus salmoides	Largemouth Bass	M	38.9	934.9	0.18	80
Woodbury Creek	Stewart Lake	Micropterus salmoides	Largemouth Bass	F	43.5	1492.3	0.16	137
Woodbury Creek	Stewart Lake	Pomoxis nigromaculatus	Black Crappie	F	18.3	74.1	0.46	15

APPENDIX C. MUNICIPAL REGULATION CHECKLIST

New Jersey Stormwater Best Management Practices Manual

February 2004

http://www.state.nj.us/dep/watershedmgt/bmpmanualfeb2004.htm

APPENDIX B

Municipal Regulations Checklist

A checklist for incorporating nonstructural stormwater management strategies into local regulations

As part of the requirements for municipal stormwater management plans in the Stormwater Management Rules at N.J.A.C. 7:8-4, municipalities are required to evaluate the municipal master plan, and land use and zoning ordinances to determine what adjustments need to be made to allow the implementation of nonstructural stormwater management techniques, also called low impact development techniques, which are presented in *Chapter 2: Low Impact Development Techniques*. *Chapter 3: Regional and Municipal Stormwater Management Plans* provides information on the development of municipal stormwater management plans, including the evaluation of the master plan, and land use and zoning ordinances. This checklist was prepared to assist municipalities in identifying the specific ordinances that should be evaluated, and the types of changes to be incorporated to address the requirements of the Stormwater Management Rules.

Part 1: Vegetation and Landscaping

Effective management of both existing and proposed site vegetation can reduce a development's adverse impacts on groundwater recharge and stormwater runoff quality and quantity.

A. Preservation of Natural Areas

Municipal regulations should include requirements to preserve existing vegetated areas, minimize turf grass lawn areas, and use native vegetation.

❑ Yes ❑ No Are applicants required to provide a layout of the existing vegetated areas, and a description of the conditions in those areas?

❑ Yes ❑ No Does the municipality have maximum as well as minimum yard sizing ordinances?

❑ Yes ❑ No Are residents restricted from enlarging existing turf lawn areas?

❑ Yes ❑ No Do the ordinances provide incentives for the use of vegetation as filters for stormwater runoff?

❑ Yes ❑ No Do the ordinances require a specific percentage of permanently preserved open space as part of the evaluation of cluster development?

B. Tree Protection Ordinances

Municipalities often have a tree ordinance to minimize the removal of trees and to replace trees that are removed. However, while tree ordinances protect the number of trees, they do not typically address the associated leaf litter or smaller vegetation that provides additional water quality and quantity benefits. Municipalities should consider enhancing tree ordinances to a forest ordinance that would also maintain the benefits of a forested area.

❑ Yes ❑ No Does the municipality have a tree protection ordinance?

❑ Yes ❑ No Can the municipality include a forest protection ordinance?

❑ Yes ❑ No If forested areas are present at development sites, is there a required percentage of the stand to be preserved?

C. Landscaping Island and Screening Ordinances

Municipalities often have ordinances that require landscaping islands for parking areas. The landscaping islands can provide ideal opportunities for the filtration and disconnection of runoff, or the placement of small LID-BMPs. Screening ordinances limit the view of adjoining properties, parking areas, or loading areas. Low maintenance vegetation can be required in islands and areas used for screening to provide stormwater quality, groundwater recharge, or stormwater quantity benefits.

❑ Yes ❑ No Do the ordinances require landscaping islands in parking lots, or between the roadway and the sidewalk? Can the ordinance be adjusted to require vegetation that is more beneficial for stormwater quality, groundwater recharge, or stormwater quantity, but that does not interfere with driver vision at the intersections?

❑ Yes ❑ No Is the use of bioretention islands and other stormwater practices within landscaped areas or setbacks allowed?

❑ Yes ❑ No Do the ordinances require screening from adjoining properties? Can the screening criteria require the use of vegetation to the maximum extent practicable before the use of walls or berms?

D. Riparian Buffers

Municipalities may have existing buffer and/or floodplain ordinances that require the protection of vegetation adjacent to streams. Municipalities should consult existing regulations adopted by the Department to ensure that riparian buffer or floodplain ordinances reflect the requirements of the Department within these areas. The municipality should consider conservation restrictions and allowable maintenance to ensure the preservation of these areas.

❑ Yes ❑ No Is there a stream buffer or floodplain ordinance in the community?

❑ Yes ❑ No Is the ordinance consistent with existing state regulatory requirements?

❑ Yes ❑ No Does the ordinance require a conservation easement, or other permanent restrictions on buffer areas?

❑ Yes ❑ No Does the ordinance identify or limit when stormwater outfall structures can cross the buffer?

❑ Yes ❑ No Does the ordinance give detailed information on the type of maintenance and/or activities that is allowed in the buffer?

Part 2: Minimizing Land Disturbance

The minimization of disturbance can be used at different phases of a development project. The goal is to limit clearing, grading, and other disturbance associated with development to protect existing features that provide stormwater benefits. Zoning ordinances typically limit the amount of impervious surfaces on building lots, but do not limit the amount of area that can be disturbed during construction. This strategy helps preserve the site's existing hydrologic character, as well as limiting the occurrence of soil compaction.

A. Limits of Disturbance

Designing with the terrain, or site fingerprinting, requires an assessment of the characteristics of the site and the selection of areas for development that would minimize the impact. This can be incorporated into the requirements for existing site conditions and the environmental impact statement. Limits of disturbance should be incorporated into construction plans reviewed and approved by the municipality. Setbacks should be evaluated to determine whether they can be reduced. The following maximum setbacks are recommended for low impact development designs:

- front yard – 20 feet;
- rear yard – 25 feet; and
- side yard – 8 feet.

❑ Yes ❑ No As part of the depiction of existing conditions, are environmentally critical and environmentally constrained areas identified? (Environmentally critical areas are areas or features with significant environmental value, such as steep slopes, stream corridors, natural heritage priority sites, and habitats of threatened and endangered species. Environmentally constrained areas are those with development restrictions, such as wetlands, floodplains, and sites of endangered species.)

❑ Yes ❑ No Can any of the existing setbacks be reduced?

❑ Yes ❑ No Are there maximum turf grass or impervious cover limits in any of the setbacks?

❑ Yes ❑ No Do the ordinances inhibit or prohibit the clearcutting of the project site as part of the construction?

❑ Yes ❑ No Is the traffic of heavy construction vehicles limited to specific areas, such as areas of proposed roadway? Are these areas required to be identified on the plans and marked in the field?

❑ Yes ❑ No Do the ordinances require the identification of specific areas that provide significant hydrologic functions, such as existing surface storage areas, forested areas, riparian corridors, and areas with high groundwater recharge capabilities?

❑ Yes ❑ No Does the municipality require an as-built inspection before issuing a certificate of occupancy? If so, does the inspection include identification of compacted areas, if they exist within the site?

❑ Yes ❑ No Does the municipality require the restoration to compacted areas in accordance with the Soil Erosion and Sediment Control Standards?

B. Open Space and Cluster Development

Open space areas are restricted land that may be set aside for conservation, recreation, or agricultural use, and are often associated with cluster development requirements. Since open space can have a variety of uses, the municipality should evaluate its open space ordinances to determine whether amendments are necessary to provide improved stormwater benefits.

❑ Yes ❑ No Are open space or cluster development designs allowed in the municipality?

❑ Yes ❑ No Are flexible site design incentives available for developers that utilize open space or cluster design options?

❑ Yes ❑ No Are there limitations on the allowable disturbance of existing vegetated areas in open space?

❑ Yes ❑ No Are the requirements to re-establish vegetation in disturbed areas dedicated for open space?

❑ Yes ❑ No Is there a maximum allowable impervious cover in open space areas?

Part 3: Impervious Area Management

The amount of impervious area, and its relationship to adjacent vegetated areas, can significantly change the amount of runoff that needs to be addressed by BMPs. Most of a site's impervious surfaces are typically located in the streets, sidewalks, driveway, and parking areas. These areas are further hampered by requirements for continuous curbing that prevent discharge from impervious surfaces into adjacent vegetated areas.

A. Streets and Driveways

Street widths of 18 to 22 feet are recommended for low impact development designs in low density residential developments. Minimum driveway widths of 9 and 18 feet for one lane and two lanes, respectively, are also recommended. The minimum widths of all streets and driveways should be evaluated to demonstrate that the proposed width is the narrowest possible consistent with safety and traffic concerns and requirements. Municipalities should evaluate which traffic calming features, such as circles, rotaries, medians, and islands, can be vegetated or landscaped. Cul-de-sacs can also be evaluated to reduce the radius area, or to provide a landscape island in the center.

❑ Yes ❑ No Are the street widths the minimum necessary for traffic density, emergency vehicle movement, and roadside parking?

❑ Yes ❑ No Are street features, such as circles, rotaries, or landscaped islands allowed to or required to receive runoff?

❑ Yes ❑ No Are curb cuts or flush curbs with curb stops an allowable alternative to raised curbs?

❑ Yes ❑ No Can the minimum cul-de-sac radius be reduced or is a landscaped island required in the center of the cul-de-sac?

❑ Yes ❑ No Are alternative turn-arounds such as "hammerheads" allowed on short streets in low density residential developments?

❑ Yes ❑ No Can the minimum driveway width be reduced?

❑ Yes ❑ No Are shared driveways permitted in residential developments?

B. Parking Areas and Sidewalks

A mix of uses at a development site can allow for shared parking areas, reducing the total parking area. Municipalities require minimum parking areas, but seldom limit the total number of parking spaces. Table 1 shows recommendations for minimum parking space ratios for low impact design:

Table 1: Low Impact Development Parking Space Ratios

Use	Parking Ratio per 1000 sq. ft. of Gross Floor Area
Professional office building	Less than 3.0
Shopping centers	Less than 4.5

❑ Yes ❑ No Can the parking ratios be reduced?

❑ Yes ❑ No Are the parking requirements set as maximum or median rather than minimum requirements?

❑ Yes ❑ No Is the use of shared parking arrangements allowed to reduce the parking area?

❑ Yes ❑ No Are model shared parking agreements provided?

❑ Yes ❑ No Does the presence of mass transit allow for reduced parking ratios?

❑ Yes ❑ No Is a minimum stall width of 9 feet allowed?

❑ Yes ❑ No Is a minimum stall length of 18 feet allowed?

❑ Yes ❑ No Can the stall lengths be reduced to allow vehicle overhang into a vegetated area?

❑ Yes ❑ No Do ordinances allow for permeable material to be used in overflow parking areas?

❑ Yes ❑ No Do ordinances allow for multi-level parking?

❑ Yes ❑ No Are there incentives to provide parking that reduces impervious cover, rather than providing only surface parking lots?

Sidewalks can be made of pervious material or disconnected from the drainage system to allow runoff to re-infiltrate into the adjacent pervious areas.

❑ Yes ❑ No Do ordinances allow for sidewalks constructed with pervious material?

❑ Yes ❑ No Can alternate pedestrian networks be substituted for sidewalks (e.g., trails through common areas)?

C. Unconnected Impervious Areas

Disconnection of impervious areas can occur in both low density development and high density commercial development, provided sufficient vegetated area is available to accept dispersed stormwater flows. Areas for disconnection include parking lot or cul-de-sac islands, lawn areas, and other vegetated areas.

❑ Yes ❑ No Are developers required to disconnect impervious surfaces to promote pollutant removal and groundwater recharge?

❑ Yes ❑ No Do ordinances allow the reduction of the runoff volume when runoff from impervious areas are re-infiltrated into vegetated areas?

❑ Yes ❑ No Do ordinances allow flush curb and/or curb cuts to allow for runoff to discharge into adjacent vegetated areas as sheet flow?

Part 4: Vegetated Open Channels

The use of vegetated channels, rather than the standard concrete curb and gutter configuration, can decrease flow velocity, and allow for stormwater filtration and re-infiltration. One design option is for vegetated channels that convey smaller storm events, such as the water quality design storm, and provide an overflow into a storm sewer system for larger storm events.

❑ Yes ❑ No Do ordinances allow or require vegetated open channel conveyance instead of the standard curb and gutter designs?

❑ Yes ❑ No Are there established design criteria for vegetated channels?

APPENDIX D. LOW IMPACT DEVELOPEMNT CHECKLIST

New Jersey Stormwater Best Management Practices Manual

February 2004

http://www.state.nj.us/dep/watershedmgt/bmpmanualfeb2004.htm

APPENDIX A

Low Impact Development Checklist

A checklist for identifying nonstructural stormwater management strategies incorporated into proposed land development

According to the NJDEP Stormwater Management Rules at N.J.A.C. 7:8, the groundwater recharge, stormwater quality, and stormwater quantity standards established by the Rules for major land development projects must be met by incorporating nine specific nonstructural stormwater management strategies into the project's design to the maximum extent practicable.

To accomplish this, the Rules require an applicant seeking land development approval from a regulatory board or agency to identify those nonstructural strategies that have been incorporated into the project's design. In addition, if an applicant contends that it is not feasible to incorporate any of the specific strategies into the project's design, particularly for engineering, environmental, or safety reasons, the Rules further require that the applicant provide a basis for that contention.

This checklist has been prepared to assist applicants, site designers, and regulatory boards and agencies in ensuring that the nonstructural stormwater management requirements of the Rules are met. It provides an applicant with a means to identify both the nonstructural strategies incorporated into the development's design and the specific low impact development BMPs (LID-BMPs) that have been used to do so. It can also help an applicant explain the engineering, environmental, and/or safety reasons that a specific nonstructural strategy could not be incorporated into the development's design.

The checklist can also assist municipalities and other land development review agencies in the development of specific requirements for both nonstructural strategies and LID-BMPs in zoning and/or land use ordinances and regulations. As such, where requirements consistent with the Rules have been adopted, they may supersede this checklist.

Finally, the checklist can be used during a pre-design meeting between an applicant and pertinent review personnel to discuss local nonstructural strategies and LID-BMPs requirements in order to optimize the development's nonstructural stormwater management design.

Since this checklist is intended to promote the use of nonstructural stormwater management strategies and provide guidance in their incorporation in land development projects, municipalities are permitted to revise it as necessary to meet the goals and objectives of their specific stormwater management program and plan within the limits of N.J.A.C. 7:8.

Low Impact Development Checklist

A checklist for identifying nonstructural stormwater management strategies incorporated into proposed land development

Municipality: _____

County: _____ Date: _____

Review board or agency: _____

Proposed land development name: _____

Lot(s): _____ Block(s): _____

Project or application number: _____

Applicant's name: _____

Applicant's address: _____

_____

Telephone: _____ Fax: _____

Email address: _____

Designer's name: _____

Designer's address: _____

_____

Telephone: _____ Fax: _____

Email address: _____

Part 1: Description of Nonstructural Approach to Site Design

In narrative form, provide an overall description of the nonstructural stormwater management approach and strategies incorporated into the proposed site's design. Attach additional pages as necessary. Details of each nonstructural strategy are provided in Part 3 below.

Part 2: Review of Local Stormwater Management Regulations

Title and date of stormwater management regulations used in development design:

_____

Do regulations include nonstructural requirements? Yes: _____ No: _____

If yes, briefly describe: _____

_____

_____

List LID-BMPs prohibited by local regulations: _____

_____

_____

Pre-design meeting held? Yes: _____ Date: _____ No: _____

Meeting held with: _____

_____

_____

Pre-design site walk held? Yes: _____ Date: _____ No: _____

Site walk held with: _____

_____

_____

Other agencies with stormwater review jurisdiction:

Name: _____

Required approval: _____

Name: _____

Required approval: _____

Name: _____

Required approval: _____

Part 3: Nonstructural Strategies and LID-BMPs in Design

3.1 Vegetation and Landscaping

Effective management of both existing and proposed site vegetation can reduce a development's adverse impacts on groundwater recharges and runoff quality and quantity. This section of the checklist helps identify the vegetation and landscaping strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to help maintain existing recharge rates and/or minimize or prevent increases in runoff quantity and pollutant loading.

A. Has an inventory of existing site vegetation been performed? Yes: _____ No: _____

If yes, was this inventory a factor in the site's layout and design? Yes: _____ No: _____

B. Does the site design utilize any of the following nonstructural LID-BMPs?

Preservation of natural areas? Yes: _____ No: _____ If yes, specify % of site: _____

Native ground cover? Yes: _____ No: _____ If yes, specify % of site: _____

Vegetated buffers? Yes: _____ No: _____ If yes, specify % of site: _____

C. Do the land development regulations require these nonstructural LID-BMPs?

Preservation of natural areas? Yes: _____ No: _____ If yes, specify % of site: _____

Native ground cover? Yes: _____ No: _____ If yes, specify % of site: _____

Vegetated buffers? Yes: _____ No: _____ If yes, specify % of site: _____

D. If vegetated filter strips or buffers are utilized, specify their functions:

Reduce runoff volume increases through lower runoff coefficient: Yes: _____ No: _____

Reduce runoff pollutant loads through runoff treatment: Yes: _____ No: _____

Maintain groundwater recharge by preserving natural areas: Yes: _____ No: _____

3.2 Minimize Land Disturbance

Minimizing land disturbance is a nonstructural LID-BMP that can be applied during both the development's construction and post-construction phases. This section of the checklist helps identify those land disturbance strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to minimize land disturbance and the resultant change in the site's hydrologic character.

A. Have inventories of existing site soils and slopes been performed? Yes: _____ No: _____

If yes, were these inventories factors in the site's layout and design? Yes: _____ No: _____

B. Does the development's design utilize any of the following nonstructural LID-BMPs?

Restrict permanent site disturbance by land owners? Yes: _____ No: _____

If yes, how: _____

_____

Restrict temporary site disturbance during construction? Yes: _____ No: _____

If yes, how: _____

_____

Consider soils and slopes in selecting disturbance limits? Yes: _____ No: _____

If yes, how: _____

_____

C. Specify percentage of site to be cleared: _____ Regraded: _____

D. Specify percentage of cleared areas done so for buildings: _____

For driveways and parking: _____ For roadways: _____

E. What design criteria and/or site changes would be required to reduce the percentages in C and D above?

_____

_____

_____

F. Specify site's hydrologic soil group (HSG) percentages:

HSG A: _____ HSG B: _____ HSG C: _____ HSG D: _____

G. Specify percentage of each HSG that will be permanently disturbed:

HSG A: _____ HSG B: _____ HSG C: _____ HSG D: _____

H. Locating site disturbance within areas with less permeable soils (HSG C and D) and minimizing disturbance within areas with greater permeable soils (HSG A and B) can help maintain groundwater recharge rates and reduce runoff volume increases. In light of the HSG percentages in F and G above, what other practical measures if any can be taken to achieve this?

_____

_____

_____

I. Does the site include Karst topography? Yes: _____ No: _____

If yes, discuss measures taken to limit Karst impacts:

_____

_____

_____

_____

_____

_____

3.3 Impervious Area Management

New impervious surfaces at a development site can have the greatest adverse effect on groundwater recharge and stormwater quality and quantity. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into a proposed development's design to comprehensively manage the extent and impacts of new impervious surfaces.

A. Specify impervious cover at site: Existing: _____ Proposed: _____

B. Specify maximum site impervious coverage allowed by regulations: _____

C. Compare proposed street cartway widths with those required by regulations:

Type of Street	Proposed Cartway Width (feet)	Required Cartway Width (feet)
Residential access – low intensity		
Residential access – medium intensity		
Residential access – high intensity with parking		
Residential access – high intensity without parking		
Neighborhood		
Minor collector – low intensity without parking		
Minor collector – with one parking lane		
Minor collector – with two parking lanes		
Minor collector – without parking		
Major collector		

D. Compare proposed parking space dimensions with those required by regulations:

Proposed: _____ Regulations: _____

E. Compare proposed number of parking spaces with those required by regulations:

Proposed: _____ Regulations: _____

F. Specify percentage of total site impervious cover created by buildings:

By driveways and parking: _____ By roadways: _____

G. What design criteria and/or site changes would be required to reduce the percentages in F above?

_____

_____

_____

_____

H. Specify percentage of total impervious area that will be unconnected:

Total site: _____ Buildings: _____ Driveways and parking: _____ Roads: _____

I. Specify percentage of total impervious area that will be porous:

Total site: _____ Buildings: _____ Driveways and parking: _____ Roads: _____

J. Specify percentage of total building roof area that will be vegetated: _____

K. Specify percentage of total parking area located beneath buildings: _____

L. Specify percentage of total parking located within multi-level parking deck: _____

3.4 Time of Concentration Modifications

Decreasing a site's time of concentration (Tc) can lead directly to increased site runoff rates which, in turn, can create new and/or aggravate existing erosion and flooding problems downstream. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to effectively minimize such Tc decreases.

When reviewing Tc modification strategies, it is important to remember that a drainage area's Tc should reflect the general conditions throughout the area. As a result, Tc modifications must generally be applied throughout a drainage area, not just along a specific Tc route.

A. Specify percentage of site's total stormwater conveyance system length that will be:

Storm sewer: _____ Vegetated swale: _____ Natural channel: _____

Stormwater management facility: _____ Other: _____

Note: the total length of the stormwater conveyance system should be measured from the site's downstream property line to the downstream limit of sheet flow at the system's headwaters.

B. What design criteria and/or site changes would be required to reduce the storm sewer percentages and increase the vegetated swale and natural channel percentages in A above?

_____

_____

_____

C. In conveyance system subareas that have overland or sheet flow over impervious surfaces or turf grass, what practical and effective site changes can be made to:

Decrease overland flow slope: _____

_____

_____

Increase overland flow roughness: _____

_____

_____

3.5 Preventative Source Controls

The most effective way to address water quality concerns is by pollution prevention. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to reduce the exposure of pollutants to prevent their release into the stormwater runoff.

A. Trash Receptacles

Specify the number of trash receptacles provided: _____

Specify the spacing between the trash receptacles: _____

Compare trash receptacles proposed with those required by regulations:

Proposed: _____ Regulations: _____

B. Pet Waste Stations

Specify the number of pet waste stations provided: _____

Specify the spacing between the pet waste stations: _____

Compare pet waste stations proposed with those required by regulations:

Proposed: _____ Regulations: _____

C. Inlets, Trash Racks, and Other Devices that Prevent Discharge of Large Trash and Debris

Specify percentage of total inlets that comply with the NJPDES storm drain inlet criteria: _____

D. Maintenance

Specify the frequency of the following maintenance activities:

Street sweeping: Proposed: _____ Regulations: _____

Litter collection: Proposed: _____ Regulations: _____

Identify other stormwater management measures on the site that prevent discharge of large trash and debris:

_____

_____

E. Prevention and Containment of Spills

Identify locations where pollutants are located on the site, and the features that prevent these pollutants from being exposed to stormwater runoff:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Part 4: Compliance with Nonstructural Requirements of NJDEP Stormwater Management Rules

1. Based upon the checklist responses above, indicate which nonstructural strategies have been incorporated into the proposed development's design in accordance with N.J.A.C. 7:8-5.3(b):

No.	Nonstructural Strategy	Yes	No
1.	Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.		
2.	Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.		
3.	Maximize the protection of natural drainage features and vegetation.		
4.	Minimize the decrease in the pre-construction time of concentration.		
5.	Minimize land disturbance including clearing and grading.		
6.	Minimize soil compaction.		
7.	Provide low maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides.		
8.	Provide vegetated open-channel conveyance systems discharge into and through stable vegetated areas.		
9.	Provide preventative source controls.		

2. For those strategies that have not been incorporated into the proposed development's design, provide engineering, environmental, and/or safety reasons. Attached additional pages as necessary.

APPENDIX E. DEPTFORD TOWNSHIP MITIGATION PROJECTS

Exhibit 2 - Township of Deptford Stormwater Outfalls Map

DEPTFORD TOWNSHIP, NJ

STORMWATER OUTFALLS

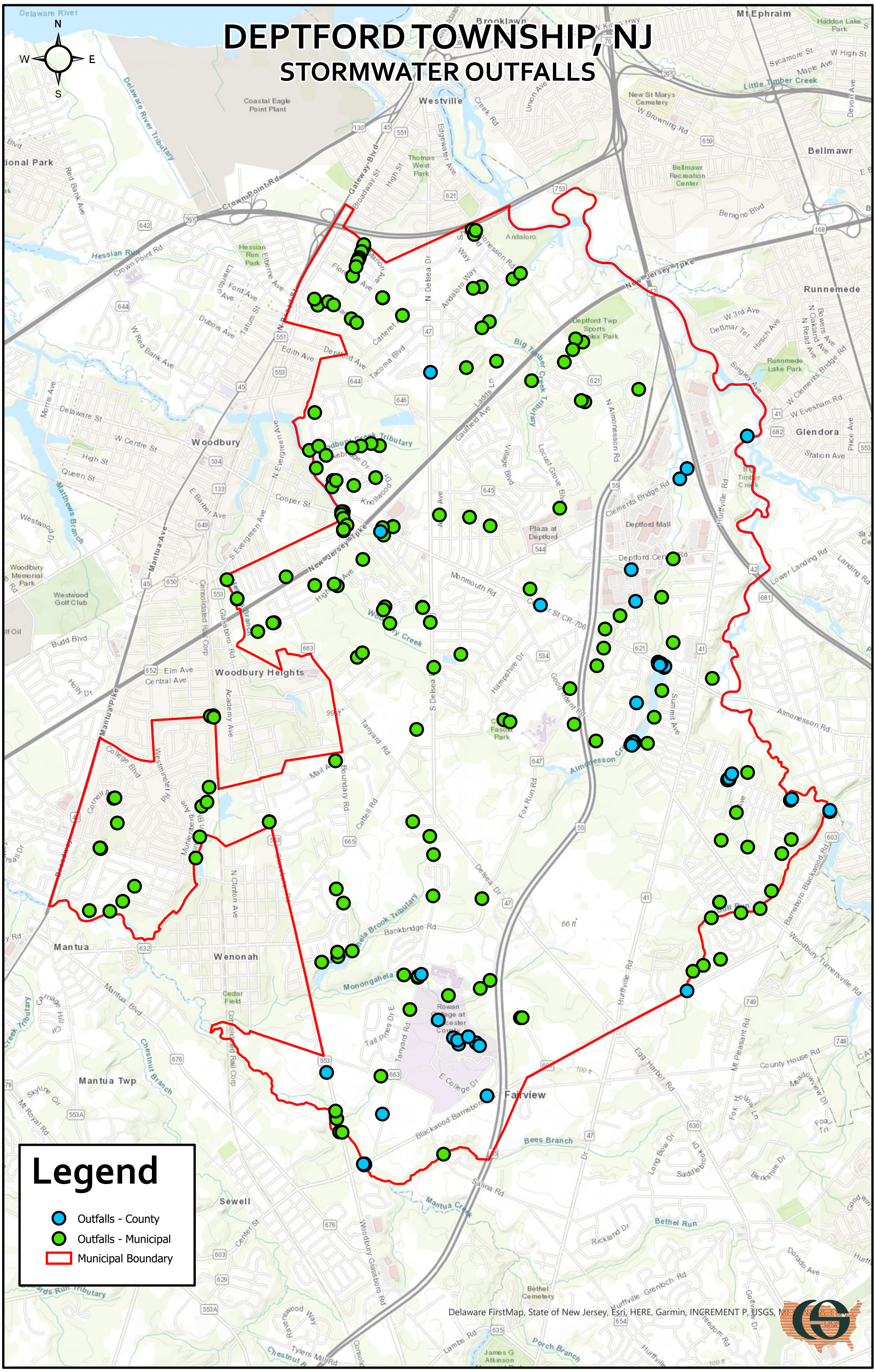


Exhibit 3 - Township of Deptford Stormwater Pollution Prevention Plan

STORMWATER POLLUTION PREVENTION PLAN

Deptford Township
Gloucester County
NJPDES #NJG 0152153

April 2, 2020

SPPP Table of Contents

SPPP Form 1 – SPPP Team Members

All records must be available upon request by NJDEP.

Stormwater Program Coordinator (SPC)	
Print/Type Name and Title	Rob Ritterson, Public Works Superintendent
Office Phone # and Email	(856) 228-4719/rritterson@deptford-nj.org
Signature/Date	
Individual(s) Responsible for Major Development Project Stormwater Management Review	
Print/Type Name and Title	Jonathan Bryson, Township Engineer
Print/Type Name and Title	Brian Slaugh, Township Planner
Print/Type Name and Title	
Print/Type Name and Title	
Print/Type Name and Title	
Other SPPP Team Members	
Print/Type Name and Title	Thomas Newman, Jr., Township Manager
Print/Type Name and Title	Dina Zawadski, Township Clerk
Print/Type Name and Title	Donald Banks, Director of Community Development
Print/Type Name and Title	

SPPP Form 2 – Revision History

All records must be available upon request by NJDEP.

	Revision Date	SPC Initials	SPPP Form Changed	Reason for Revision
1.	04/02/2020			Updated Contacts/Team Members
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				

SPPP Form 3 – Public Involvement and Participation Including Public Notice

All records must be available upon request by NJDEP.

1. Website URL where the Stormwater Pollution Prevention Plan (SPPP) is posted online:	https://deptford-nj.org/content/15948/16118/default.aspx
2. Date of most current SPPP:	April 2, 2020
3. Website URL where the Municipal Stormwater Management Plan (MSWMP) is posted online:	https://deptford-nj.org/content/15948/16118/default.aspx
4. Date of most current MSWMP:	April 2, 2020
5. Physical location and/or website URL where associated municipal records of public notices, meeting dates, minutes, etc. are kept:	1011 Cooper Street, Deptford, NJ

6. Describe how the permittee complies with applicable state and local public notice requirements when providing for public participation in the development and implementation of a MS4 stormwater program:

For meetings where public notice is required under the Open Public Meetings Act ("Sunshine Law," N.J.S.A. 10:4-6 et seq.), Deptford Township provides public notice in a manner that complies with the requirements of that Act. Also, in regard to the passage of ordinances, Deptford Township provides public notice in a manner that complies with the requirements of N.J.S.A. 40:49-1 et seq. In addition, for municipal actions (e.g., adoption of the municipal stormwater management plan) subject to public notice requirements in the Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq.), Deptford Township complies with those requirements.

Digital copies of the Stormwater Pollution Prevention Plan and the Municipal Stormwater Management Plan are available to view on the Deptford Township website.

SPPP Form 4 – Public Education and Outreach

All records must be available upon request by NJDEP.

1. Describe how public education and outreach events are advertised. Include specific websites and/or physical locations where materials are available.

In accordance with the MS4 Permit requirements, the Township must conduct various public education activities and accumulate a minimum of 12 points worth of activities within a permit year (January 1st through December 31st). Based on a review of activities provided, the Township will conduct the following:

- **WEBSITE** – The Township will maintain a stormwater related page on their municipal website that includes stormwater related information and links to the Clean Water website and the NJDEP stormwater website.

- **MAILING CAMPAIGN** – The Township will distribute the NJDEP provided brochure to all residents and businesses along with one of its quarterly tax bills. Additional copies will be made available to the public at the Municipal Building and posted on the Township website.

- **ORDINANCE EDUCATION** – The Township will distribute a letter from the Mayor to all residents and business along with one of its quarterly tax bills highlighting the requirements and benefits of the stormwater related ordinances adopted.

- **STORMWATER DISPLAY** - The Township will coordinate a display at a host of events throughout the year. Township personnel will setup a table and distribute the DEP provided brochure and other educational materials provided by the NJDEP.

2. Describe how businesses and the general public within the municipality are educated about the hazards associated with illicit connections and improper disposal of waste.

The Illicit Connection Elimination program focuses on the elimination of improper connections to the storm sewer system, elimination of illegal dumping into storm sewers, and minimizing the amount of seepage into the storm water system form the sanitary and sewer systems.

To meet this goal, the Township's Public Works Department will inspect its outfalls annually and check for illicit connections. They will use the NJDES Illicit Connection Inspection Report Form to track any illicit connections.

3. Indicate where public education and outreach records are maintained.

The Township maintains a copy of the public education and outreach materials on file and are also posted on the Township website. Electronic copies are kept as well.

SPPP Form 5 – Post-Construction Stormwater Management in New Development and Redevelopment Program

All records must be available upon request by NJDEP.

1. How does the municipality define 'major development'?	
Any development that provides for ultimately disturbing one or more acres of land. "Disturbance" for the purpose of this chapter is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting or removing of vegetation.	
2. Does the municipality approach residential projects differently than it does for non-residential projects? If so, how?	
There is no difference to the approach of residential versus non-residential projects. All projects are reviewed in accordance with the standards set forth within the NJDEP's BMP manual(s).	
3. What process is in place to ensure that municipal projects meet the Stormwater Control Ordinance?	
All projects must follow the guidelines listed in section IV Stormwater Control Ordinance. All projects must go through municipal standards set forth in this chapter by incorporating the nonstructural strategies in Subchapter 5 of the NJ Stormwater Management Rules (N.J.A.C. 7:8-5) and set forth in our Chapter 280-2C(4)(a).	
4. Describe the process for reviewing major development project applications for compliance with the Stormwater Control Ordinance (SCO) and Residential Site Improvement Standards (RSIS). Attach a flow chart if available.	
The applicant's site development stormwater plan shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from whom 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. (Ord. No. O.9.06 § II).	
5. Does the Municipal Stormwater Management Plan include a mitigation plan?	Yes, in section IV. 2. H. of the ordinance.
6. What is the physical location of approved applications for major development projects, Major Development	Municipal Building 1011, Cooper Street, Deptford, NJ 08096

Summary Sheets (permit att. D), and mitigation plans?	

SPPP Form 6 – Ordinances

All records must be available upon request by NJDEP.

Ordinance permit cite IV.B.1.b.iii	Date of Adoption	Website URL	Was the DEP model ordinance adopted without change?	Entity responsible for enforcement
1. Pet Waste permit cite IV.B.5.a.i	04/02/07	https://deptford-nj.org/filestorage/15948/16118/Illicit_Connection_Ordinance.pdf	Yes	Police Department Code Enforcement
2. Wildlife Feeding permit cite IV.B5.a.ii	04/02/07	https://deptford-nj.org/filestorage/15948/16118/Illicit_Connection_Ordinance.pdf	Yes	Police Department Code Enforcement
3. Litter Control permit cite IV.B5.a.iii	04/02/07	https://deptford-nj.org/filestorage/15948/16118/Illicit_Connection_Ordinance.pdf	Yes	Police Department Code Enforcement
4. Improper Disposal of Waste permit cite IV.B.5.a.iv	04/02/07	https://deptford-nj.org/filestorage/15948/16118/Illicit_Connection_Ordinance.pdf	Yes	Police Department Code Enforcement
5. Containerized Yard Waste/ Yard Waste Collection Program permit cite IV.B.5.a.v	04/02/07	https://deptford-nj.org/filestorage/15948/16118/Illicit_Connection_Ordinance.pdf	Yes	Police Department Code Enforcement
6. Private Storm Drain Inlet Retrofitting permit cite IV.B.5.a.vi	02/28/11	https://deptford-nj.org/filestorage/15948/16118/Private_Storm_Drain_Inlet_Retrofitting_Ordinance.pdf	Yes	Police Department Code Enforcement
7. Stormwater Control Ordinance	10/06/06	https://deptford-nj.org/filestorage/15948/16118/St	Yes	Police Department

permit cite IV.B.4.g and IV.B.5.a.vii		ormwater_Control_Ordinance.pdf		Code Enforcement
8. Illicit Connection Ordinance permit cite IV.B.5.a.vii and IV.B.6.d	04/02/07	https://deptford-nj.org/filestorage/15948/16118/Illicit_Connection_Ordinance.pdf	Yes	Police Department Code Enforcement
9. Optional: Refuse Container/ Dumpster Ordinance permit cite IV.E.2	02/28/11	https://deptford-nj.org/filestorage/15948/16118/Refuse_Containers_Dumpster_Ordinance.pdf	Yes	Police Department Code Enforcement
Indicate the location of records associated with ordinances and related enforcement actions:				
Municipal Building 1011 Cooper Street, Deptford, NJ 08096				

SPPP Form 7 – Street Sweeping

All records must be available upon request by NJDEP.

1. Provide a written description or attach a map indicating which streets are swept as required by the NJPDES permit. Describe the sweeping schedule and indicate if any of the streets are swept by another entity through a shared service arrangement.
All of the municipal roadways within the Township are swept four (4) times a year. Streets are swept by the Township. There are no shared service agreements in place.
2. Provide a written description or attach a map indicating which streets are swept that are NOT required to be swept by the NJPDES permit. Describe the sweeping schedule and indicate if any of the streets are swept by another entity through a shared service arrangement.
None
3. Does the municipality provide street sweeping services for other municipalities? If so, please describe the arrangements.
The Township of Deptford does not provide sweeping services for other municipalities.
4. Indicate the location of records, including sweeping dates, areas swept, number of miles swept and total amount of wet tons collected each month. Note which records correspond to sweeping activities beyond what is required by the NJPDES permit, i.e., sweepings of streets within the municipality that are not required by permit to be swept or sweepings of streets outside of the municipality.
Records are kept at the Municipal at the Municipal Building – 1011 Cooper Street, Deptford, NJ. Logbooks are kept on file at our Public Works Facility.

SPPP Form 8 – Catch Basins and Storm Drain Inlets

All records must be available upon request by NJDEP.

1. Describe the schedule for catch basin and storm drain inlet inspection, cleaning, and maintenance.
Inlets are inspected annually in the Winter and Fall, after leaf season, each year. Cleaning is performed on an as-needed basis. In particular, inlets impacted/clogged by leaves are cleaned each Fall.
2. List the locations of catch basins and storm drain inlets with recurring problems, i.e., flooding, accumulated debris, etc.
None.
3. Describe what measures are taken to address issues for catch basins and storm drain inlets with recurring problems and how they are prioritized.
Westville Grove Oak Valley Almonesson Blackwood Terrace Woodbury Gardens North Woodbury
4. Describe the inspection schedule and maintenance plan for storm drain inlet labels on storm drains that do not have permanent wording cast into the design.
N/A. All inlets have been stenciled within the Township. The Township maintains a stencil and re-applies labels as needed.
5. Indicate the location of records of catch basin and storm drain inlet inspections and the wet tons of materials collected during catch basin and storm drain inlet cleanings.
Logbooks are kept at our Public Works Facility

SPPP Form 9 – Storm Drain Inlet Retrofitting

All records must be available upon request by NJDEP.

1. Describe the procedure for ensuring that municipally owned storm drain inlets are retrofitted.
Retrofitting is performed in conjunction with any municipally funded project (i.e. a road re-paving or reconstruction project).
2. Describe the inspection process to verify that appropriate retrofits are completed on municipally owned storm drain inlets.
Retrofits are inspected by the Township Engineer.
3. Describe the procedure for ensuring that privately owned storm drain inlets are retrofitted.
Any change to any private site requiring approval by the Planning/Zoning Board of the Township will be required to retrofit their existing systems in conjunction with any Board approval.
4. Describe the inspection process to verify that appropriate retrofits are completed on privately owned storm drain inlets.
Inspections of any retrofits are performed by the Township Engineer.

SPPP Form 10 – Municipal Maintenance Yards and Other Ancillary Operations

All records must be available upon request by NJDEP.

Complete separate forms for each municipal yard or ancillary operation location.

Address of municipal yard or ancillary operation:
Public Works Facility – 1702-1704 Hurffville Road, Deptford, NJ

List all materials and machinery located at this location that are exposed to stormwater which could be a source of pollutant in a stormwater discharge:

Raw materials – Leaves, brush

Intermediate products – Dense Graded Aggregate, No.57 Stone

Final products – Topsoil

Waste materials – Street sweepings

By-products – Waste Oil (stored in waste oil tank)

Machinery – See attached

Fuel – Gasoline and Diesel Fuel

Lubricants – None outside

Solvents – None outside

Detergents related to municipal maintenance yard or ancillary operations – None

Other – None

For each category below, describe the best management practices in place to ensure compliance with all requirements in permit Attachment E. If the activity in the category is not applicable for this location, indicate where it occurs. Indicate the location of inspection logs and tracking forms associated with this municipal yard or ancillary operation, including documentation of conditions requiring attention and remedial actions that have been taken or have been planned.
1. Fueling Operations
Gasoline and Diesel Fuel
2. Vehicle Maintenance
Vehicle maintenance is performed inside
3. On-Site Equipment and Vehicle Washing *See permit attachment E for certification and log forms for Underground Storage Tanks.*
All vehicle are washed off-site at a designated and permitted vehicle wash facility. Logs are located at the Public Works Facility 1702-1704 Hurffville Road
4. Discharge of Stormwater from Secondary Containment
N/A
5. Salt and De-Icing Material Storage and Handling
N/A All are bagged materials and stored inside.
6. Aggregate Material and Construction Debris Storage
N/A

7. Street Sweepings, Catch Basin Clean Out and Other Material Storage
Materials are limited to 15CY
8. Yard Trimmings and Wood Waste Management Sites
Materials are limited to 15CY
9. Roadside Vegetation Management
Materials are limited to 15CY

SPPP Form 11 – Employee Training

All records must be available upon request by NJDEP.

A. **Municipal Employee Training:** Stormwater Program Coordinator (SPC) must ensure appropriate staff receive training on topics in the chart below as required due to job duties assigned within three months of commencement of duties and again on the frequency below. Indicate the location of associated training sign in sheets, dates, and agendas or description for each topic.

Topic	Frequency	Title of trainer or office to conduct training
1. Maintenance Yard Operations (including Ancillary Operations)	Every year	**Public Works**
2. Stormwater Facility Maintenance	Every year	**Public Works**
3. SPPP Training & Recordkeeping	Every year	**Public Works**
4. Yard Waste Collection Program	Every 2 years	**Public Works**
5. Street Sweeping	Every 2 years	**Public Works**
6. Illicit Connection Elimination and Outfall Pipe Mapping	Every 2 years	**Public Works**
7. Outfall Pipe Stream Scouring Detection and Control	Every 2 years	**Public Works**
8. Waste Disposal Education	Every 2 years	**Public Works**
9. Municipal Ordinances	Every 2 years	**Township Clerk**
10. Construction Activity/Post-Construction Stormwater Management in New Development and Redevelopment	Every 2 years	**Township Engineer**

B. **Municipal Board and Governing Body Members Training:** Required for individuals who review and approve applications for development and redevelopment projects in the municipality. This includes members of the planning and zoning boards, town council, and anyone else who votes on such projects. Training is in the form of online videos, posted at www.nj.gov/dep/stormwater/training.htm.

Within 6 months of commencing duties, watch *Asking the Right Questions in Stormwater Review Training Tool*. Once per term thereafter, watch at least one of the online DEP videos in the series available under Post-Construction Stormwater Management. Indicate the location of records documenting the names, video titles, and dates completed for each board and governing body member.

C. **Stormwater Management Design Reviewer Training:** All design engineers, municipal engineers, and others who review the stormwater management design for development and redevelopment projects on behalf of the municipality must attend the first available class upon assignment as a reviewer and every five years thereafter. The course is a free, two-day training conducted by DEP staff. Training dates and locations are posted at www.nj.gov/dep/stormwater/training.htm. Indicate the location of the DEP certificate of completion for each reviewer.

SPPP Form 12 – Outfall Pipes

All records must be available upon request by NJDEP.

1. **Mapping:** Attach an image or provide a link to the most current outfall pipe map. Maps shall be updated at the end of each calendar year.

   Note that ALL maps must be electronic by 21 Dec 2020 via the DEP's designated electronic submission service. For details, see http://www.nj.gov/dep/dwq/msrp_map_aid.htm.

2. **Inspections:** Describe the outfall pipe inspection schedule and indicate the location of records of dates, locations, and findings.

   Outfall pipes are inspected annually. Records are kept at the Public Works Facility.

3. **Stream Scouring:** Describe the program in place to detect, investigate and control localized stream scouring from stormwater outfall pipes. Indicate the location of records related to cases of localized stream scouring. Such records must include the contributing source(s) of stormwater, recommended corrective action, and a prioritized list and schedule to remediate scouring cases.

   N/A
   There are no known scour issues within the Township.

4. **Illicit Discharges:** Describe the program in place for conducting visual dry weather inspections of municipally owned or operated outfall pipes. Record cases of illicit discharges using the DEP's Illicit Connection Inspection Report Form (www.nj.gov/dep/dwq/tier_a_forms.htm) and indicate the location of these forms and related illicit discharge records.

   Note that Illicit Connection Inspection Report Forms shall be included in the SPPP and submitted to DEP with the annual report.

The Illicit Connect Program focuses on the elimination of improper connects to the storm sewer system. Elimination of illegal dumping into storm sewers and minimizing the amount of seepage into the storm water system from the sanitary and sewer systems. To meet this goal, the Township's Public Works Department inspects outfalls annually and checking for illicit connections. The Township will use the NJDES Illicit Connection Inspection Report to track any illicit connections. Any sightings will be inspected and forms exist in the Stormwater Log Book under illicit connections.

SPPP Form 13 – Stormwater Facilities Maintenance

All records must be available upon request by NJDEP.

1. Detail the program in place for the long-term cleaning, operation and maintenance of each stormwater facility owned or operated by the municipality.
Facilities are inspected annually. Work is performed as required in accordance with the BMP.
2. Detail the program in place for ensuring the long-term cleaning, operation and maintenance of each stormwater facility NOT owned or operated by the municipality.
Private facilities are required to submit their logs in accordance with the MS4 and BMP. Code enforcement can cite owners not maintaining their systems.
3. Indicate the location(s) of the Stormwater Facilities Inspection and Maintenance Logs listing the type of stormwater facilities inspected, location information, inspection dates, inspector name(s), findings, preventative and corrective maintenance performed.
Public Works Facility – 1702-1704 Hurffville Road, Deptford, NJ
Note that maintenance activities must be reported in the annual report and records must be available upon request. DEP maintenance log templates are available at http://www.nj.gov/dep/stormwater/maintenance_guidance.htm (select specific logs from choices listed in the Field Manuals section). *Additional Resources: The NJ Hydrologic Modeling Database contains information and maps of stormwater management basins. To view the database map, see https://hydro.rutgers.edu. To download data in an Excel format, see https://hydro.rutgers.edu/public_data/.*

SPPP Form 14 – Total Maximum Daily Load Information

All records must be available upon request by NJDEP.

1. Using the Total Maximum Daily Load (TMDL) reports provided on www.nj.gov/dep/dwq/msrp-tmdl-rh.htm, list adopted TMDLs for the municipality, parameters addressed, and the affected water bodies that impact the municipality's MS4 program.
N/A
2. Describe how the permittee uses TMDL information to prioritize stormwater facilities maintenance projects and to address specific sources of stormwater pollutants.
N/A

SPPP Form 15 – Optional Measures

All records must be available upon request by NJDEP.

1. Describe any Best Management Practice(s) the permittee has developed that extend beyond the requirements of the Tier A MS4 NJPDES permit that prevents or reduces water pollution.
None at this time.
2. Has the permittee adopted a Refuse Container/Dumpster Ordinance?
Yes. Deptford Township Ordinance 0.3.11

Exhibit 4 - Township of Deptford 2022 Annual Report

Tier A MSRP Annual Report Summary

Service ID: 1552618
Facility Name: DEPTFORD TWP
Reporting Period: January 1, 2022 through December 31, 2022
NJPDES Permit #: NJG0152153
Activity ID: DST220001

Contacts

Name: Rob Ritterson
Title: Superintendent of Public Works
Contact Type: Stormwater Coordinator
Organization Name: DEPTFORD TWP
Organization Type: Municipal
E-Mail: rritterson@deptford-nj.org
Phone: (856) 228-3654 (Fax Number)
(856) 628-0274 (Cell Phone Number)
(856) 228-4719 (Work Phone Number)
Contact Address: 1011 COOPER ST
Deptford Twp, New Jersey 08096

Uploaded Attachments

Attachment Name	Attachment Description	File Name
Storm Water		tier_a_ms4_annual_supplemental_questionnaire_2022.pdf

Annual Report Details - Part A

Municipality Information

Team member responsible for completing the report:	Rob Ritterson
Team member email address:	Rritterson@deptford-nj.org

Stormwater Pollution Prevention Plan

1. Has the municipality revised its Stormwater Pollution Prevention Plan during the last calendar year?	No
2. Date of the last revised SPPP:	

Public Notice

1. Is the municipality complying with applicable State and local public notice requirements when providing for public participation in the ongoing development and implementation of the stormwater program?	Yes

Report Details - Part B

Post-Construction Stormwater Management in New Development and Redevelopment

1. Is the municipality reviewing and approving major development residential projects in accordance with the Residential Site Improvement Standards (RSIS)?	Yes
2. Did the municipality adopt a municipal stormwater management plan?	Yes
3. Most recent date of adopted municipal stormwater management plan:	09/11/2006
4. Status of this plan (if not adopted):	
5. Did the municipality adopt the municipal stormwater control ordinance provided by NJDEP without change?	Yes
6. Most recent date the municipality adopted a municipal stormwater control ordinance:	09/11/2006
7. What is the current status of the ordinance?	
8. Did the municipality submit the adopted municipal stormwater management plan to the appropriate county review agency for approval?	Yes
9. Most recent date the adopted Municipal Stormwater Management Plan was submitted to the appropriate county review agency for approval:	09/11/2006
10. If yes, did the municipality send the adopted municipal stormwater control ordinance to the appropriate county review agency for approval?	Yes
11. Most recent date the adopted Municipal Stormwater Control Ordinance was submitted to the appropriate county review agency for approval:	09/11/2006
12. Status of county review:	Approved

13. Did the municipality adopt the review agency's required amendments and resubmit to the county review agency?	
14. Is the Stormwater Control Ordinance in effect?	Yes
15. Most recent effective date of Stormwater Control Ordinance:	09/11/2006
16. Ordinance Number(s):	0.09.06
17. What is the current status of the adopted plan and ordinance?	
18. Are you reviewing projects as part of your site plan and sub-division approval process to ensure that they comply with your municipality's effective municipal stormwater control ordinance(s)?	Yes
19. How many projects that were subject to either the municipal stormwater control ordinance or the stormwater provisions of RSIS did the municipality approve?	0
20. Does the municipal stormwater management plan contain a mitigation plan?	Yes
21. Has the municipality granted any variances or exemptions from the design and performance standards for stormwater management measures set forth in the approved municipal stormwater management plan and stormwater control ordinance(s)?	No
22. If yes, how many variances or exemptions from the design and performance standards has the municipality granted?	

23. If granted any variances or exemptions, did you submit a written report to the county review agency describing the variance or exemption and the required mitigation?	
24. Does the municipality's plan review evaluate storm drain inlet protection for solids and floatables in accordance with Attachment C of the permit?	Yes
25. Does the municipality require plans for long-term operation and maintenance for stormwater BMPs?	Yes
26. Are you ensuring that adequate long-term operation and maintenance of stormwater BMPs is being performed on property that you do not own or operate? **Please keep an inventory of stormwater BMPs indicating type, function and location in a format provided by the Department onsite and available for inspection or upon request.**	Yes
27. Briefly indicate how this is being accomplished (e.g., ordinance requiring operation and maintenance by private entity; operation and maintenance by you or other governmental entity):	Inspections by township Engineer
28. Is the municipality's stormwater management plan re-examined at each re-examination of the master plan in accordance with N.J.A.C. 7:8-4?	N/A - we did not re-examine our master plan this year
29. Date re-examination report was last adopted:	

Report Details - Part C

Local Public Education Program and Outreach

1. Has the municipality developed a Local Public Education Program?	Yes
2. Has the municipality conducted educational activities that total the minimum number of points required by the permit?	Yes

Storm Drain Inlet Labeling

1. Has the municipality established a storm drain inlet labeling program?	Yes
2. Indicate the percentage labeled to date:	100%
3. Other Amount:	
4. Is your municipality maintaining the labels (i.e. replacing and/or repainting)?	Yes

Community Wide Ordinances

Have you adopted and are you enforcing a regulatory mechanism for:

1. Pet Waste Ordinance:	Yes
2. Date adopted:	04/02/2007
3. Litter Ordinance/State Litter Statute:	Litter Ordinance
4. Date adopted:	04/02/2007
5. Improper Disposal of Waste Ordinance:	Yes
6. Date adopted:	04/02/2007
7. Wildlife Feeding Ordinance:	Yes
8. Date adopted:	04/02/2007
9. Containerized Yard Waste Ordinance / Yard Waste Collection Program Ordinance:	Adopted Both
10. Date adopted:	04/02/2007
11. Illicit Connection Ordinance:	Yes
12. Date adopted:	04/02/2007
13. Refuse Container/Dumpster Ordinance:	Yes
14. Date adopted:	04/02/2007
15. Private Storm Drain Inlet Retrofitting Ordinance:	Yes
16. Date adopted:	03/01/2001
17. Status of these ordinances (if not adopted):	
18. Method(s) of enforcement (e.g., summons, warnings, additional signs, etc.):	The department of code enforcement
19. Are you distributing the Pet Waste Information Sheets with pet licenses?	Yes

Report Details - Part D

MS4 Outfall Pipe Mapping

1. Has the municipality completed the mapping of the MS4 outfall pipes?	Yes
2. Date completed:	04/01/2007
3. Number of outfall pipes that you operate in the municipality:	250
4. How many MS4 outfall pipes are mapped?	250

Illicit Connection Elimination Program

1. Does the municipality have an ongoing program to detect and eliminate illicit connections to municipally owned or operated outfall pipes?	Yes
2. How many outfall pipes were inspected during the past calendar year?	196
3. Number of illicit connections detected during the past calendar year:	0
4. Number of illicit connections eliminated during the past calendar year:	0

Street Sweeping Program

1. In the past calendar year, were all required streets swept?	Yes
2. What was the total number of miles swept?	411

List the amount of materials collected for each month in 2022.

3. Units:	Tons
4. January:	5.85
5. February:	9.9
6. March:	16.46
7. April:	16.19
8. May:	0
9. June:	13.89
10. July:	0
11. August:	39.45
12. September:	5.68
13. October:	21.57
14. November:	0
15. December:	0
16. Total (Note: 1.053 cubic yards = 1 ton):	128.99
17. Explain the reason if reporting zero (0) for a month above:	Operator vacation, maintenance of sweeper, and season change

Storm Drain Inlet Retrofitting

1. Has the municipality completed repaving, repairing, reconstruction, or alterations on any road surfaces in direct contact with municipally owned or operated storm drain inlets?	Yes
2. Approximately what percentage of storm drains within the municipality currently meet the standard?	95

Stormwater Facility Maintenance

Stormwater facilities include, but are not limited to, catch basins, extended detention basins, low flow bypasses, underground detention, dry wells, manufactured treatment devices, pervious paving buffers, infiltration basins/trenches, sand filters, constructed wetlands, wet ponds, bioretention, rooftop vegetated cover, vegetative filters, and stormwater conveyance systems. Stormwater facility inventories that indicate the type, function, and location of the facility must be kept onsite and available for inspection or upon request in a format provided by the Department. The format is available as SPPP Form 13 at: http://www.nj.gov/dep/dwq/pdf/Tier_A/A%20-%20pdf%206.pdf**.**

1. Have you developed a Stormwater Facility Maintenance Program?	Yes

Other Stormwater Facilities

1. Were all stormwater facilities that you operate inspected?	Yes
2. Were any found to be in need of cleaning or repair in order to function properly?	Yes
3. During the past calendar year, were any stormwater facilities (excluding catch basins) cleaned?	Yes
4. Were repairs made?	Yes
5. Describe repair(s) or if repairs have not yet been made, provide a schedule for the repair(s):	Replaced pipe, installed pipe, unclogged pipe, repaired head wall, uncovered pipe

Catch Basins

1. Total number of catch basins that the municipality operates:	1432
2. Total number of catch basins inspected:	1118
3. Total number of catch basins cleaned:	109
4. Amount of materials removed from catch basins, in tons, during the past calendar year:	5.4
5. Units:	Tons

Report Details - Part E

Outfall Pipe Stream Scouring Remediation

For all outfall pipes undergoing remediation through a scour remediation program, attach additional page(s) as necessary indicating the location of the outfall pipe (including the alphanumeric identifier), the repair start date, and the repair completion date.

1. Has the municipality developed a prioritized list of outfall pipes requiring outfall pipe stream scouring remediation?	Yes

De-icing Material and Sand Storage

1. Does the municipality have a permanent structure for all de-icing material storage?	Yes
2. If sand is being stored outside, is it set back 50 feet from storm sewer inlets, ditches or other stormwater conveyance channels, and surface water bodies?	N/A - no sand stored outdoors

Fueling Operations

1. Is the municipality implementing Best Management Practices for vehicle fueling and receiving of bulk fuel deliveries at maintenance yard operations in accordance with Attachment E of the permit?	Yes

Vehicle Maintenance

1. Is the municipality implementing Best Management Practices for vehicle maintenance and repair activities at maintenance yard operations in accordance with Attachment E of the permit?	Yes

Good Housekeeping Practices

1. Is the municipality implementing Good Housekeeping Practices for all materials or machinery listed in the Inventory Requirements for Municipal Maintenance Yard Operations (including maintenance activities and ancillary operations) in accordance with Attachment E of the permit?	Yes

Equipment and Vehicle Washing

1. Has the municipality implemented measures to properly handle the discharge of equipment and vehicle wash wastewater from municipal maintenance yard operations?	Yes
2. Please indicate which option you implemented to eliminate the unpermitted discharge:	Ceased the discharge (no longer wash onsite)
3. Date the management measure was implemented:	04/01/2009
4. What is the NJPDES permit number that authorizes the discharge of vehicle and equipment wash wastewater?	
5. Is the municipality maintaining records of vehicle and equipment washing?	N/A - we do not wash our vehicles

Annual Employee Training

1. Did the municipality conduct training for employees on stormwater related topics as required under the MS4 permit (e.g., police officers trained on ordinances)?	Yes
2. List date(s) of employee training:	7/21/22, 8/4/22,

Report Details - Part F

Sharing of Responsibilities

Does the municipality share services with another entity to satisfy a permit requirement?	Yes

Incidents of Non-compliance

Based on the answers you provided above, the Department has identified the following possible permit compliance issues. Please complete the Incidents of Non-compliance section and identify steps being taken to correct these deficiencies.

- Your municipality has not revised your Stormwater Pollution Prevention Plan to incorporate changes required by the renewal permit.

1. Did your municipality have any incidents of non-compliance?	Yes
2. Identify the steps being taken to remedy the noncompliance and to prevent such incidents from recurring. **(If the text box is not large enough to complete this section, please provide your report as an attachment and upload it on the next screen. Please reference the attachment in the textbox.)**	Our Township Engineers are in the process of updating a new plan to make it more efficient and effective.

Certification

Certifier: Rob Ritterson
Certifier ID: RITTERSON
Challenge/Response Question: What is your favorite pet?
Challenge/Response Answer: ******
Certification PIN: ******
Date/Time of Certification: 05/05/2023 07:22

"I certify under penalty of law that this Annual Report and Certification and all attached documents were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate this information. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering this information, the information in this Annual Report and Certification and all attached documents is, to the best of my knowledge and belief, true, accurate and complete.

"I certify that the municipality is in compliance with its stormwater program, Stormwater Pollution Prevention Plan (SPPP) and the NJPDES Tier A Municipal Stormwater General Permit No. NJG0152153 except for any incidents of non-compliance which are identified herein. For any incidents of non-compliance, the Annual Report identifies the steps being taken to remedy the non-compliance and to prevent such incidents from recurring.

"I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for purposely, knowingly, recklessly, or negligently submitting false information."

Please note, no changes will be allowed to be made to this report upon its certification. If you need to correct or modify the report after certification, please contact your case manager at (609) 633-7021 so they may enable that function.

Rob Ritterson — 05/05/2023
General — **Date**

Instructions for Saving and Submitting the

2022 MS4 Tier A Permit Annual Report - Supplemental Questionnaire

1. Once opened, please save the Questionnaire to your computer, using the "Save As" function. This can be done by going to FILE > then Save As… or Shift + Ctrl + S. Name the document Supplemental_Questionnaire_*TOWN NAME*
2. Complete the Questionnaire.
3. Once you have completed the Questionnaire, use the "Save" function to save your answers to the Questionnaire to your computer . This can be done by going to FILE > then Save or Ctrl + S.
4. The completed and saved Questionnaire must then be uploaded as an attachment, in Part 7, to your Annual Report before the Annual Report is submitted to the Department.
5. To access the Annual Report, open the link to "NJDEP Online Portal" at http://www.nj.gov/dep/dwq/tier_a.htm. In Part 7, you will be asked to complete information regarding the file(s) to be uploaded. Navigate to your saved Questionnaire and then hit the "Upload" button in the lower right section of Part 7. The Annual Report will indicate if the Questionnaire was successfully uploaded. Then click on the "Continue" button and proceed with finalizing your Annual Report.

Your Annual Report will be considered incomplete if the Supplemental Questionnaire is not attached. If you experience any difficulty in this process, please contact your municipal case manager at 609-633-7021.

Please note that use of Adobe Acrobat Reader DC is recommended. This free software is available for download at http://get.adobe.com/reader/ . If you have an earlier version of Adobe Reader, please go to the Adobe website at http://tv.adobe.com/watch/acrobat-x-tips-tricks/quick-tip-how-to-save-form-data-in-adobe-reader/ for detailed instructions on how to save your completed Questionnaire.

2022 MS4 Tier A Permit Annual Report - Supplemental Questionnaire

General Information

A. Municipal Information

Municipality: Deptford	County: Gloucester
Stormwater Coordinator: Rob Ritterson	
Phone: 856-628-0274	Email: rritterson@deptford-nj.org

Public Involvement and Participation

Provide a web address for each of the following:

Current Stormwater Pollution Prevention Plan (SPPP): www.deptford-nj.org

Municipal Stormwater Management Plan:

Local Public Education and Outreach

Report the number of points obtained in each public education and outreach category:

General Public Outreach: 3

Watershed/Regional Collaboration: 0

Targeted Audiences Outreach: 0

Community Involvement Activities: 1

School/Youth Education and Activities: 2

Has the municipality advertised public education and outreach activities on the municipalities website?: ◯ Yes ◯ No

Post Construction Stormwater Management

Note: This portion of the annual report should be completed by a person knowledgeable in post-construction stormwater management project review and approvals.

Name of person completing this section: Rob Ritterson

Affiliation of person completing this section: Superintendent

Please fill out the attached major development project list for all major developments approved in the last calendar year.

Community Wide Ordinances

Does the municipality maintain a database to track all instances of community wide ordinance violations?:

◯ Yes ◯ No

Provide the web address for each ordinance and report the entity responsible for the enforcement of each ordinance as well as the number of warnings and violations issued for each in the past calendar year:

Pet Waste Ordinance

Entity:

Warnings/Violations: N/A

Wildlife Feeding Ordinance

Entity:

Warnings/Violations: N/A

Litter Control Ordinance

Entity:

Warnings/Violations: N/A

Improper Disposal of Waste Ordinance

Entity:

Warnings/Violations: N/A

Containerized Yard Waste/Yard Waste Collection Program Ordinance
Entity: Warnings/Violations: N/A

Private Storm Drain Inlet Retrofitting Ordinance
Entity: Warnings/Violations: N/A

Illicit Connection Ordinance
Entity: Warnings/Violations: N/A

Stormwater Control Ordinance
Entity: Warnings/Violations: N/A

Municipal Maintenance Yard and Other Ancillary Operations

Does the municipality maintain a list of all materials and machinery located at each municipal maintenance yard and ancillary operation which could be a source of pollutants in a stormwater discharge?: ○ Yes ○ No

Has the municipality implemented Best Management Practices as described in Attachment E for all applicable activities at each municipal maintenance yard and ancillary operation owned or operated by the municipality?: ◉ Yes ○ No

Does the municipality maintain an inspection log detailing conditions requiring attention and remedial actions taken at municipal maintenance yards and other ancillary operations?: ○ Yes ○ No

Does the municipality have an underground vehicle wash water storage tank? ○ Yes ○ No

Employee Training

Does the municipality maintain records of employee training including sign in sheets, dates of training, and training agendas?: ○ Yes ○ No

Does the municipality maintain a list of the names and dates of the municipal board and governing body members that review and approve applications for development and redevelopment projects who have completed the "Asking the Right Questions in Stormwater Review" training tool?: ○ Yes ○ No

Does the municipality maintain a list of the names and dates of individuals that review development and redevelopment projects for compliance with NJAC 7:8 on behalf of the municipality who have completed the Department approved stormwater management training once every 5 years?: ○ Yes ○ No

Outfall Pipe Mapping

Check the box(es) for the components included on the municipality's outfall pipe map in addition to MS4 outfalls and surface water bodies:

- ☑ Conveyances (Pipes,Swales, Ditches)
- ☑ Culverts
- ☑ Block and Lots
- ☐ Green Infrastructure
- ☐ Manufactured Treatment Devices
- ☑ Stormwater Management Basins
- ☑ Storm Drain Inlets
- ☑ Streets/Roadways
- ☑ Subsurface Infiltration/Detention Basins

Has the municipality included the outfall pipe map in the SPPP?: ○ Yes ○ No

Does the municipality update the outfall pipe map annually?: ○ Yes ○ No

Does the municipality's map identify outfalls that do not discharge to surface waters?: ○ Yes ○ No

Stream Scouring

How many outfalls did the municipality inspect for stream scouring in the past calendar year?: 30

How many instances of stream scouring were found during those inspections?: 6

How many instances of stream scouring were remediated in the past calendar year?: 6

Stormwater Facilities Maintenance

Does the municipality keep up to date stormwater facility maintenance logs and inspection records for stormwater facilities owned or operated by the municipality?: ◯ Yes ◯ No

How does the municipality ensure adequate long-term cleaning, operation, and maintenance of stormwater facilities not owned or operated by the municipality?:

Code Enforcement

Does the municipality keep up to date stormwater facility maintenance logs and inspection records for stormwater facilities not owned or operated by the municipality?: ◯ Yes ◯ No

Total Maximum Daily Load (TMDL)

Has the municipality reviewed TMDL reports to identify those which are relevant to the municipality's water bodies?: ◯ Yes ◯ No

How many TMDLs were found to be applicable to the municipality?:

How has the municipality used TMDL information to assist in the prioritization of stormwater facility maintenance?:

N/A

Has the municipality updated its SPPP to include TMDL information?: ◯ Yes ◯ No

Has the municipality incorporated any additional or optional measures? If so, please elaborate:

N/A

Major Development Project List

Provide the following information for each approved development or redevelopment project that is regulated by the Tier A MS4 NJPDES Permit, and not exempted under N.J.A.C. 7:8-1.6(b).

Tier A Municipality: Deptford		NJPDES#: NJG_____			PI ID#: _____		Calendar Year: 2022 ~~2022~~
Project Name / Date Complete Application Received	Block(s) / Lot(s)	5G3 Construction Stormwater Permit Auth.#	NJDEP Land Use Permit Required? (Y/N)	Total Area of Disturbance (acres)	Increase of Impervious > ¼ acre? (Y/N)	Variance or Exemption Granted As Per Part IV.B.4.h of the Tier A MS4 Permit	Design Reviewer(s)
Raising canes	Blk 200.01 Lot 25.01	Yes	Y☐ N☑	1.5	Y☑ N☐	Y☐ N☑	CME Associates, Micheal Roberts PE
A3 Industrial	Blk 417.01 Lot 10	Yes	Y☐ N☑	8.79	Y☑ N☐	Y☐ N☑	CME Associates, Micheal Roberts PE
Chick fil A	Blk 5.01 Lot 13.01	Yes	Y☐ N☑	1.36	Y☑ N☐	Y☐ N☑	CME Associates, Micheal Roberts PE
HHJ Petro	Blk 387.01 Lot 59 60 61	Yes	Y☐ N☑	6.8	Y☑ N☐	Y☐ N☑	CME Associates, Micheal Roberts PE
			Y☐ N☐		Y☐ N☐	Y☐ N☐	
			Y☐ N☐		Y☐ N☐	Y☐ N☐	

Major Development Project List

Provide the following information for each approved development or redevelopment project that is regulated by the Tier A MS4 NJPDES Permit, and not exempted under N.J.A.C. 7:8-1.6(b).

Tier A Municipality: Deptford		NJPDES#: NJG_____			PI ID#: _____		Calendar Year: _____
Project Name / Date Complete Application Received	Block(s) / Lot(s)	5G3 Construction Stormwater Permit Auth.#	NJDEP Land Use Permit Required? (Y/N)	Total Area of Disturbance (acres)	Increase of Impervious > ¼ acre? (Y/N)	Variance or Exemption Granted As Per Part IV.B.4.h of the Tier A MS4 Permit	Design Reviewer(s)
			Y☐ N☐		Y☐ N☐	Y☐ N☐	
			Y☐ N☐		Y☐ N☐	Y☐ N☐	
			Y☐ N☐		Y☐ N☐	Y☐ N☐	
			Y☐ N☐		Y☐ N☐	Y☐ N☐	
			Y☐ N☐		Y☐ N☐	Y☐ N☐	
			Y☐ N☐		Y☐ N☐	Y☐ N	

This Supplemental Questionnaire must be attached to your Annual Report to be considered complete. If you experience any difficulty in this process, please contact your municipal case manager at 609-633-7021.

1. Once you have completed the Questionnaire, use the "Save" function to save your answers to the Questionnaire to your computer. This can be done by going to FILE > then Save or Ctrl + S.
2. The completed and saved Questionnaire must then be uploaded as an attachment, in Part 7, to your Annual Report before the Annual Report is submitted to the Department.
3. To access the Annual Report, open the link to "NJDEP Online Portal" at http://www.nj.gov/dep/dwq/tier_a.htm. In Part 7, you will be asked to complete information regarding the file(s) to be uploaded. Navigate to your saved Questionnaire and then hit the "Upload" button in the lower right section of Part 7. The Annual Report will indicate if the Questionnaire was successfully uploaded. Then click on the "Continue" button and proceed with finalizing your Annual Report.

Exhibit 5 - Township of Deptford Stormwater Control Ordinance

ORDINANCE OF THE TOWNSHIP OF DEPTFORD REPEALING AND REPLACING SECTION 35 OF THE UNIFIED DEVELOPMENT ORDINANCE OF THE TOWNSHIP OF DEPTFORD TO CONTROL STORMWATER

WHEREAS, the New Jersey Department of Environmental Protection ("NJDEP") has amended Stormwater Management Rules, N.J.A.C. 7:8-1 *et seq.*; and

WHEREAS, there is a need to amend Section 35 of the Unified Development Ordinance of the Township of Deptford to reflect the updated Stormwater Management Rules.

NOW, THEREFORE, BE IT ORDAINED by the Mayor and Township Council of the Township of Deptford, in the County of Gloucester and State of New Jersey, that Section 35 of the Unified Development Ordinance, be repealed and replaced to reflect the New Jersey Department of Environmental Protection amended Stormwater Management Rules to be in accordance with N.J.A.C. 7:8-1 *et seq.* and be amended read to as set forth in "**ATTACHMENT A.**"

BE IT FURTHER ORDAINED that all ordinances or parts of ordinances inconsistent or in conflict with this section are hereby repealed as to said inconsistencies and conflict.

If any section, part of any section, or clause or phrase of this Ordinance is for any reason held to be invalid or unconstitutional, such decision shall not affect the remaining provisions of this section. The governing body of the Township of Deptford declares that it would have passed the ordinance and each section and subsection thereof, irrespective of the fact that any one or more of the subsections, sentences, clauses or phrases may be declared unconstitutional or invalid.

The ordinance shall take effect immediately upon passage and publication according to law.

Township of Deptford

ATTEST:

Dina L. Zawadski, Township Clerk, RMC, CMC

Paul Medany, Mayor

CERTIFICATION

The foregoing Ordinance was introduced at a Regular Meeting of Township Council of the Township of Deptford held on the 1st day of March, 2021 and will be considered for final passage and adoption at a Work Session Meeting at which time any person interested therein will be given an opportunity to be heard. Said meeting to be held on the 19th day of April, 2021 at the Municipal Building, 1011 Cooper Street, Deptford, New Jersey.

Dina L. Zawadski, Township Clerk, RMC, CMC

RECORD OF VOTE – Introduction O.6.21				
Council Member	Yes	No	Abstain	Absent
Medany	✓			
Hufnell	✓			
Barnshaw	✓			
Belling	✓			
Lamb	✓			
Love	✓			
Schocklin	✓			

RECORD OF VOTE – Adoption O.6.21				
Council Member	Yes	No	Abstain	Absent
Medany	✓			
Hufnell	✓			
Barnshaw	✓			
Belling	✓			
Lamb	✓			
Love	✓			
Schocklin	✓			

ATTACHMENT A

§35-1. **Scope and purpose.**

A. Policy Statement.

1. Flood control, groundwater recharge, and pollutant reduction shall be achieved through the use of stormwater management measures, including Green Infrastructure Best Management Practices (GI BMPs) and nonstructural stormwater management strategies. GI BMPs and Low Impact Development (LID) should be utilized to meet the goal of maintaining natural hydrology to reduce stormwater runoff volume, reduce erosion, encourage infiltration and groundwater recharge, and reduce pollution. GI BMPs and LID 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.

1. The purpose of this section is to establish minimum stormwater management requirements and controls for "major development," as defined below in §35-2.

C. Applicability.

1. This section shall be applicable to the following major developments:

   a. Non-residential major site plan and subdivision developments; and

   b. Aspects of residential major site plan and subdivision developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C. 5:21.

2. This section shall also be applicable to all major developments undertaken by the Township of Deptford.

D. Compatibility with other permit and ordinance requirements.

1. Development approvals issued pursuant to this section are to be considered an integral part of development approvals 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 section shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare.

2. This section is not intended to interfere with, abrogate, or annul any other ordinances, rule or regulation, statute, or other provision of law except that, where any provision of this

section 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.

§35-2. **Definitions**. See §6. [Such definitions shall be codified into §6 of the UDO and referred to at this subsection and are included here for ease of reference]

"Community basin" means an infiltration system, sand filter designed to infiltrate, standard constructed wetland, or wet pond, established in accordance with N.J.A.C. 7:8-4.2(c)14, that is designed and constructed in accordance with the New Jersey Stormwater Best Management Practices Manual, or an alternate design, approved in accordance with N.J.A.C. 7:8-5.2(g), for an infiltration system, sand filter designed to infiltrate, standard constructed wetland, or wet pond and that complies with the requirements of this chapter.

"Compaction" means the increase in soil bulk density.

"Contributory drainage area" means the area from which stormwater runoff drains to a stormwater management measure, not including the area of the stormwater management measure itself.

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

"County review agency" means an agency designated by the County Commissioners to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be (1) a county planning agency or (2) 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" means the NJ Department of Environmental Protection.

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

"Design engineer" means 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" means the division of a parcel of land into two or more parcels, the construction, reconstruction, conversion, structural alteration, relocation or enlarge-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, 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 land, 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.

"Disturbance" means the placement or reconstruction of impervious surface or motor vehicle surface, or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation. Milling and repaving is not considered disturbance for the purposes of this definition.

"Drainage area" means a geographic area within which stormwater, sediments, or dissolved materials drain to a particular receiving waterbody or to a particular point along a receiving waterbody.

"Environmentally constrained area" means the following areas where the physical alteration of the land is in some way restricted, either through regulation, easement, deed restriction or ownership such as: wetlands, floodplains, threatened and endangered species sites or designated habitats, and parks and preserves. 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.

"Environmentally critical area" means an area or feature which is of significant environmental value, including but not limited to: stream corridors, natural heritage priority sites, habitats of endangered or threatened species, large areas of contiguous open space or upland forest, steep slopes, and well head 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.

"Empowerment Neighborhoods" means neighborhoods 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.

"Erosion" means the detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

"Green infrastructure" means a stormwater management measure that manages stormwater close to its source by (1) treating stormwater runoff through infiltration into subsoil; (2) treating stormwater runoff through filtration by vegetation or soil; or (3) storing stormwater runoff for reuse.

"HUC 14" or "hydrologic unit code 14" means an area within which water drains to a particular receiving surface water body, also known as a subwatershed, which is identified by a 14-digit hydrologic unit boundary designation, delineated within New Jersey by the United States Geological Survey.

"Infiltration" is the process by which water seeps into the soil from precipitation.

"Lead planning agency" means one or more public entities having stormwater management planning authority designated by the regional stormwater management planning committee pursuant to N.J.A.C. 7:8-3.2, that serves as the primary representative of the committee.

"Major development" means an individual "development," as well as multiple developments that individually or collectively result in the disturbance of one or more acres of land since February 2, 2004. Major development includes all developments that are part of a common plan of development or sale (for example, phased residential development) that collectively or individually result in the disturbance of one or more acres of land since February 2, 2004. Projects undertaken by any government agency that otherwise meet the definition of "major development" but which do not require approval under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq., are also considered "major development."

"Motor vehicle" means land vehicles propelled other than by muscular power, such as automobiles, motorcycles, autocycles, and low speed vehicles. For the purposes of this definition, motor vehicle does not include farm equipment, snowmobiles, all-terrain vehicles, motorized wheelchairs, go-carts, gas buggies, golf carts, ski-slope grooming machines, or vehicles that run only on rails or tracks.

"Motor vehicle surface" means any pervious or impervious surface that is intended to be used by "motor vehicles" and/or aircraft, and is directly exposed to precipitation including, but not limited to, driveways, parking areas, parking garages, roads, racetracks, and runways.

"Municipality" means the Township of Deptford.

"New Jersey Stormwater Best Management Practices (BMP) Manual" or "BMP Manual" means the manual maintained by the Department providing, in part, design specifications, removal rates, calculation methods, and soil testing procedures approved by the Department as being capable of contributing to the achievement of the stormwater management standards specified in this chapter. The BMP Manual is periodically amended by the Department as necessary to provide design specifications on additional best management practices and new information on already included practices reflecting the best available current information regarding the particular practice and the Department's determination as to the ability of that best management practice to contribute to compliance with the standards contained in this chapter. Alternative stormwater management measures, removal rates, or calculation methods may be utilized, subject to any limitations specified in this chapter, provided the design engineer demonstrates to the municipality, in accordance with Section IV.F. of this section and N.J.A.C. 7:8-5.2(g), that the proposed measure and its design will contribute to achievement of the design and performance standards established by this chapter.

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

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

"Pollutant" means 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, ground waters or surface waters of the State, or to a domestic treatment works. "Pollutant" includes both hazardous and nonhazardous pollutants.

"Recharge" means the amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

"Impervious surface, regulated" means any of the following, alone or in combination: (1) a net increase of impervious surface; (2) the total area of impervious surface collected by a new stormwater conveyance system (for the purpose of this definition, a "new stormwater conveyance system" is a stormwater conveyance system that is constructed where one did not exist immediately prior to its construction or an existing system for which a new discharge location is created); (3) the total area of impervious surface proposed to be newly collected by an existing stormwater conveyance system; and/or (4) the total area of impervious surface collected by an existing stormwater conveyance system where the capacity of that conveyance system is increased.

"Motor vehicle surface, regulated" means any of the following, alone or in combination: (1) the total area of motor vehicle surface that is currently receiving water; (2) a net increase in motor vehicle surface; and/or (3) quality treatment either by vegetation or soil, by an existing stormwater management measure, or by treatment at a wastewater treatment plant, where the water quality treatment will be modified or removed.

"Sediment" means 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.

"Soil" means all unconsolidated mineral and organic material of any origin.

"State Development and Redevelopment Plan Metropolitan Planning Area (PA1)" means 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" is defined as 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" means 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 BMP" means an excavation or embankment and related areas designed to retain stormwater runoff. A stormwater management BMP may either be normally dry (that is, a detention basin or infiltration system), retain water in a permanent pool (a retention basin), or be planted mainly with wetland vegetation (most constructed stormwater wetlands).

"Stormwater management measure" means any 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 non-stormwater discharges into stormwater conveyances.

"Stormwater runoff" means water flow on the surface of the ground or in storm sewers, resulting from precipitation.

"Stormwater management planning agency" means a public body authorized by legislation to prepare stormwater management plans.

"Stormwater management planning area" means the geographic area for which a stormwater management planning agency is authorized to prepare stormwater management plans, or a specific portion of that area identified in a stormwater management plan prepared by that agency.

"Tidal Flood Hazard Area" means a flood hazard area in which the flood elevation resulting from the two-, 10-, or 100-year storm, as applicable, is governed by tidal flooding from the Atlantic Ocean. Flooding in a tidal flood hazard area may be contributed to, or influenced by, stormwater runoff from inland areas, but the depth of flooding generated by the tidal rise and fall of the Atlantic Ocean is greater than flooding from any fluvial sources. In some situations, depending upon the extent of the storm surge from a particular storm event, a flood hazard area may be tidal in the 100-year storm, but fluvial in more frequent storm events.

"Urban Coordinating Council Empowerment Neighborhood" means a neighborhood given priority access to State resources through the New Jersey Redevelopment Authority.

"Urban Enterprise Zones" means 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" is defined as previously developed portions of areas: (1) delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes; (2) designated as CAFRA Centers, Cores or Nodes; (3) designated as Urban Enterprise Zones; and (4) designated as Urban Coordinating Council Empowerment Neighborhoods.

"Water control structure" means a structure within, or adjacent to, a water, which intentionally or coincidentally alters the hydraulic capacity, the flood elevation resulting from the two-, 10-, or 100-year storm, flood hazard area limit, and/or floodway limit of the water. Examples of a

water control structure may include a bridge, culvert, dam, embankment, ford (if above grade), retaining wall, and weir.

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

§35-3. **Design and performance standards for stormwater management measures.**

A. Stormwater management measures for major development shall be designed to provide erosion control, groundwater recharge, stormwater runoff quantity control, and stormwater runoff quality treatment as follows:

1. The minimum standards for erosion control are those established under the Soil and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules at N.J.A.C. 2:90.

2. The minimum standards for groundwater recharge, stormwater quality, and stormwater runoff quantity shall be met by incorporating green infrastructure.

B. The standards in this section 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.

§35-4. **Stormwater Management Requirements for Major Development.**

A. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with §35-5.

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 15.150, particularly Helonias bullata (Swamp Pink) and/or Clemmys muhlenbergi (Bog Turtle).

C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity requirements of §35-4.P, §35-4.Q and §35-4.R:

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 from the green infrastructure, groundwater recharge, stormwater runoff quality, and stormwater runoff quantity requirements of §35-4.P, §35-4.Q and §35-4.R 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 stormwater management measures, the option selected complies with the requirements of §35-4.P, §35-4.Q and §35-4.R to the maximum extent practicable;

3. The applicant demonstrates that, in order to meet the requirements of §35-4.P, §35-4.Q and §35-4.R, 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 §35-4.D.3 above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of §35-4.P, §35-4.Q and §35-4.R that were not achievable onsite.

E. Tables 35.1 through 35.3 below summarize the ability of stormwater best management practices identified and described in the New Jersey Stormwater Best Management Practices Manual to satisfy the green infrastructure, groundwater recharge, stormwater runoff quality and stormwater runoff quantity standards specified in §35-4.P, §35-4.Q and §35-4.R. When designed in accordance with the most current version of the New Jersey Stormwater Best Management Practices Manual, the stormwater management measures found at N.J.A.C. 7:8-5.2(f) Tables 5-1, 5-2 and 5-3 and listed below in Tables 35.1, 35.2 and 35.3 are presumed to be capable of providing stormwater controls for the design and performance standards as outlined in the tables below. Upon amendments of the New Jersey Stormwater Best Management Practices to reflect additions or deletions of BMPs meeting these standards, or changes in the presumed performance of BMPs designed in accordance with the New Jersey Stormwater BMP Manual, the Department shall publish in the New Jersey Registers a notice of administrative change revising the applicable table. The most current version of the BMP Manual can be found on the Department's website at: https://njstormwater.org/bmp_manual2.htm.

F. Where the BMP tables in the NJ Stormwater Management Rule are different due to updates or amendments with the tables in this section the BMP Tables in the Stormwater Management rule at N.J.A.C. 7:8-5.2(f) shall take precedence.

Table 35.1 - Green Infrastructure BMPs for Groundwater Recharge, Stormwater Runoff Quality, and/or Stormwater Runoff Quantity

Best Management Practice (BMP)	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quality	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
Cistern	0	Yes	No	--
Dry Well[a]	0	No	Yes	2
Grass Swale	50 or less	No	No	2[e]
				1[f]
Green Roof	0	Yes	No	--
Manufactured Treatment Device[a] [g]	50 or 80	No	No	Dependent upon the device
Pervious Paving System[a]	80	Yes	Yes[b]	2[b]
			No[c]	1[c]
Small-Scale Bioretention Basin[a]	80 or 90	Yes	Yes[b]	2[b]
			No[c]	1[c]
Small-Scale Infiltration Basin[a]	80	Yes	Yes	2
Small-Scale Sand Filter	80	Yes	Yes	2
Vegetative Filter Strip	60-80	No	No	--

[a] subject to the applicable contributory drainage area limitation specified at Section IV.O.2;

[b] designed to infiltrate into the subsoil;

[c] designed with underdrains;

[d] designed to maintain at least a 10-foot wide area of native vegetation along at least 50 percent of the shoreline and to include a stormwater runoff retention component designed to capture stormwater runoff for beneficial reuse, such as irrigation;

[e] designed with a slope of less than two percent;

[f] designed with a slope of equal to or greater than two percent;

[g] manufactured treatment devices that meet the definition of green infrastructure at Section II;

[h] manufactured treatment devices that do not meet the definition of green infrastructure at Section II.

Table 35. 2 - Green Infrastructure BMPs for Stormwater Runoff Quantity (or for Groundwater Recharge and/or Stormwater Runoff Quality with a Waiver or Variance from N.J.A.C. 7:8-5.3)

Best Management Practice (BMP)	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quality	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
Bioretention System	80 or 90	Yes	Yes[b]	2[b]

Best Management Practice (BMP)	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quality	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
			No[c]	1[c]
Infiltration Basin	80	Yes	Yes	2
Sand Filter[b]	80	Yes	Yes	2
Standard Constructed Wetland	90	Yes	No	N/A
Wet Pond[d]	50-90	Yes	No	N/A

[a] subject to the applicable contributory drainage area limitation specified at Section IV.O.2;
[b] designed to infiltrate into the subsoil;
[c] designed with underdrains;
[d] designed to maintain at least a 10-foot wide area of native vegetation along at least 50 percent of the shoreline and to include a stormwater runoff retention component designed to capture stormwater runoff for beneficial reuse, such as irrigation;
[e] designed with a slope of less than two percent;
[f] designed with a slope of equal to or greater than two percent;
[g] manufactured treatment devices that meet the definition of green infrastructure at Section II;
[h] manufactured treatment devices that do not meet the definition of green infrastructure at Section II.

Table 35.3 - BMPs for Groundwater Recharge, Stormwater Runoff Quality, and/or Stormwater Runoff Quantity only with a Waiver or Variance from N.J.A.C. 7:8-5.3

Best Management Practice (BMP)	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quality	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
Blue Roof	0	Yes	No	N/A
Extended Detention Basin	40-60	Yes	No	1
Manufactured Treatment Device[h]	50 or 80	No	No	Dependent upon the device
Sand Filter[c]	80	Yes	No	1
Subsurface Gravel Wetland	90	No	No	1
Wet Pond	50-90	Yes	No	N/A

[a] subject to the applicable contributory drainage area limitation specified at Section IV.O.2;
[b] designed to infiltrate into the subsoil;
[c] designed with underdrains;
[d] designed to maintain at least a 10-foot wide area of native vegetation along at least 50 percent of the shoreline and to include a stormwater runoff retention component designed to capture stormwater runoff for beneficial reuse, such as irrigation;

(e) *designed with a slope of less than two percent;*
(f) *designed with a slope of equal to or greater than two percent;*
(g) *manufactured treatment devices that meet the definition of green infrastructure at Section II;*
(h) *manufactured treatment devices that do not meet the definition of green infrastructure at Section II.*

G. An alternative stormwater management measure, alternative removal rate, and/or alternative method to calculate the removal rate may be used if the design engineer demonstrates the capability of the proposed alternative stormwater management measure and/or the validity of the alternative rate or method to the municipality. A copy of any approved alternative stormwater management measure, alternative removal rate, and/or alternative method to calculate the removal rate shall be provided to the Department in accordance with §35-4.B. Alternative stormwater management measures may be used to satisfy the requirements at §35-4.O only if the measures meet the definition of green infrastructure at Section II. Alternative stormwater management measures that function in a similar manner to a BMP listed at §35-4.O.2 are subject to the contributory drainage area limitation specified at §35-4.O.2 for that similarly functioning BMP. Alternative stormwater management measures approved in accordance with this subsection that do not function in a similar manner to any BMP listed at §35-4.O.2 shall have a contributory drainage area less than or equal to 2.5 acres, except for alternative stormwater management measures that function similarly to cisterns, grass swales, green roofs, standard constructed wetlands, vegetative filter strips, and wet ponds, which are not subject to a contributory drainage area limitation. Alternative measures that function similarly to standard constructed wetlands or wet ponds shall not be used for compliance with the stormwater runoff quality standard unless a variance in accordance with N.J.A.C. 7:8-4.6 or a waiver from strict compliance in accordance with §35-4.D is granted from §35-4.O.

H. Whenever the stormwater management design includes one or more BMPs that will infiltrate stormwater into subsoil, 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 or other subsurface structures within the zone of influence of the groundwater mound, or interference with the proper functioning of the stormwater management measure itself.

I. Design standards for stormwater management measures are as follows:

1. Stormwater management measures shall be designed to take into account the existing site conditions, including, but not limited to, 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. 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 one-third the width of the diameter of the orifice or one-third 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 §35-8.C;

3. 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, 7.4, and 7.5 shall be deemed to meet this requirement;

4. Stormwater management BMPs shall be designed to meet the minimum safety standards for stormwater management BMPs at §35-8; and

5. The size of the orifice at the intake to the outlet from the stormwater management BMP shall be a minimum of two and one-half inches in diameter.

J. Manufactured treatment devices may be used to meet the requirements of this subchapter, provided the pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the Department. Manufactured treatment devices that do not meet the definition of green infrastructure at Section II may be used only under the circumstances described at §35-4.O.4.

K. Any application for a new agricultural development that meets the definition of major development at Section II shall be submitted to the Soil Conservation District for review and approval in accordance with the requirements at §35-4.P, §35-4.Q and §35-4.R and any applicable Soil Conservation District guidelines for stormwater runoff quantity and erosion control. For purposes of this subsection, "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 manufacture of agriculturally related products.

L. If there is more than one drainage area, the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards at §35-4.P, §35-4.Q and §35-4.R shall be met in each drainage area, unless the runoff from the drainage areas converge onsite and no adverse environmental impact would occur as a result of compliance with any one or more of the individual standards being determined utilizing a weighted average of the results achieved for that individual standard across the affected drainage areas.

M. Any stormwater management measure authorized under the municipal stormwater management plan or ordinance shall be reflected in a deed notice recorded in the Office of the Gloucester County Clerk. A form of deed notice shall be submitted to the Township of Deptford for approval prior to filing. The deed notice shall contain a description of the stormwater management measure(s) used to meet the green infrastructure, groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards at §35-4.P, §35-

4.Q and §35-4.R and shall identify the location of the stormwater management measure(s) in NAD 1983 State Plane New Jersey FIPS 2900 US Feet or Latitude and Longitude in decimal degrees. The deed notice shall also reference the maintenance plan required to be recorded upon the deed pursuant to Section 35-10.B.5. Prior to the commencement of construction, proof that the above required deed notice has been filed shall be submitted to the Township of Deptford. Proof that the required information has been recorded on the deed shall be in the form of either a copy of the complete recorded document or a receipt from the Office of the Gloucester County Clerk or other proof of recordation provided by the recording office. However, if the initial proof provided to Deptford Township is not a copy of the complete recorded document, a copy of the complete recorded document shall be provided to the municipality within 180 calendar days of the authorization granted by the Township.

N. A stormwater management measure approved under the municipal stormwater management plan or ordinance may be altered or replaced with the approval of the Township, if the Township determines that the proposed alteration or replacement meets the design and performance standards pursuant to §35-4 of this section and provides the same level of stormwater management as the previously approved stormwater management measure that is being altered or replaced. If an alteration or replacement is approved, a revised deed notice shall be submitted to the Township for approval and subsequently recorded with the Office of the Gloucester County Clerk and shall contain a description and location of the stormwater management measure, as well as reference to the maintenance plan, in accordance with §35-4.M above. Prior to the commencement of construction, proof that the above required deed notice has been filed shall be submitted to the Township in accordance with §35-4.M above.

O. Green Infrastructure Standards.

1. This subsection specifies the types of green infrastructure BMPs that may be used to satisfy the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards.

2. To satisfy the groundwater recharge and stormwater runoff quality standards at §35-4.P and §35-4.Q, the design engineer shall utilize green infrastructure BMPs identified in Table 35.1 at §35-4.F. and/or an alternative stormwater management measure approved in accordance with §35-4.G. The following green infrastructure BMPs are subject to the following maximum contributory drainage area limitations:

Best Management Practice	**Maximum Contributory Drainage Area**
Dry Well	1 acre
Manufactured Treatment	2.5 acres
Pervious Pavement Systems	Area of additional inflow cannot exceed three times the area occupied by the BMP
Small-scale Bioretention	2.5 acres
Small-scale Infiltration	2.5 acres
Small-scale Sand Filter	2.5 acres

3. To satisfy the stormwater runoff quantity standards at §35-4.R, the design engineer shall utilize BMPs from Table 35.1 or from Table 35.2 and/or an alternative stormwater management measure approved in accordance with §35-4.G.

4. If a variance in accordance with N.J.A.C. 7:8-4.6 or a waiver from strict compliance in accordance with §35-4.D is granted from the requirements of this subsection, then BMPs from Table 35.1, 35.2, or 35.3, and/or an alternative stormwater management measure approved in accordance with Section IV.G may be used to meet the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity standards at §35-4.P, §35-4.Q and §35-4.R.

5. For separate or combined storm sewer improvement projects, such as sewer separation, undertaken by a government agency or public utility (for example, a sewerage company), the requirements of this subsection shall only apply to areas owned in fee simple by the government agency or utility, and areas within a right-of-way or easement held or controlled by the government agency or utility; the entity shall not be required to obtain additional property or property rights to fully satisfy the requirements of this subsection. Regardless of the amount of area of a separate or combined storm sewer improvement project subject to the green infrastructure requirements of this subsection, each project shall fully comply with the applicable groundwater recharge, stormwater runoff quality control, and stormwater runoff quantity standards at §35-4.P, §35-4.Q and §35-4.R, unless the project is granted a waiver from strict compliance in accordance with §35-4.D.

P. Groundwater Recharge Standards.

1. This subsection contains the minimum design and performance standards for groundwater recharge as follows:

2. The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at §35-5, either:

   a. Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100 percent 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 2-year storm is infiltrated.

3. This groundwater recharge requirement does not apply to projects within the "urban redevelopment area," or to projects subject to 4 below.

4. 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 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.

Q. Stormwater Runoff Quality Standards.

1. This subsection contains the minimum design and performance standards to control stormwater runoff quality impacts of major development. Stormwater runoff quality standards are applicable when the major development results in an increase of one-quarter acre or more of regulated motor vehicle surface.

2. Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm as follows:

   a. Eighty percent TSS removal of the anticipated load, expressed as an annual average shall be achieved for the stormwater runoff from the net increase of motor vehicle surface.

   b. If the surface is considered regulated motor vehicle surface because the water quality treatment for an area of motor vehicle surface that is currently receiving water quality treatment either by vegetation or soil, by an existing stormwater management measure, or by treatment at a wastewater treatment plant is to be modified or removed, the project shall maintain or increase the existing TSS removal of the anticipated load expressed as an annual average.

3. 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. Every major development, including any that discharge into a combined sewer system, shall comply

with 2 above, unless the major development is itself subject to a NJPDES permit with a numeric effluent limitation for TSS or the NJPDES permit to which the major development is subject exempts the development from a numeric effluent limitation for TSS.

4. 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 35.4, below. The calculation of the volume of runoff may take into account the implementation of stormwater management measures.

Table 35.4 - Water Quality Design Storm Distribution

Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)
1	0.00166	41	0.1728	81	1.0906
2	0.00332	42	0.1796	82	1.0972
3	0.00498	43	0.1864	83	1.1038
4	0.00664	44	0.1932	84	1.1104
5	0.00830	45	0.2000	85	1.1170
6	0.00996	46	0.2117	86	1.1236
7	0.01162	47	0.2233	87	1.1302
8	0.01328	48	0.2349	88	1.1368
9	0.01494	49	0.2466	89	1.1434
10	0.01660	50	0.2583	90	1.1500
11	0.01828	51	0.2783	91	1.1550
12	0.01996	52	0.2983	92	1.1600
13	0.02164	53	0.3183	93	1.1650
14	0.02332	54	0.3383	94	1.1700
15	0.02500	55	0.2683	95	1.1750
16	0.03000	56	0.4116	96	1.1800
17	0.03500	57	0.4650	97	1.1850
18	0.04000	58	0.5183	98	1.1900
19	0.04500	59	0.5717	99	1.1950
20	0.05000	60	0.6250	100	1.2000
21	0.05500	61	0.6783	101	1.2050
22	0.06000	62	0.7317	102	1.2100
23	0.06500	63	0.7850	103	1.2150
24	0.07000	64	0.8384	104	1.2200
25	0.07500	65	0.8917	105	1.2250
26	0.08000	66	0.9117	106	1.2267
27	0.08500	67	0.9317	107	1.2284
28	0.09000	68	0.9517	108	1.2300
29	0.09500	69	0.9717	109	1.2317

Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)
30	0.10000	70	0.9917	110	1.2334
31	0.10660	71	1.0034	111	1.2351
32	0.11320	72	1.0150	112	1.2367
33	0.11980	73	1.0267	113	1.2384
34	0.12640	74	1.0386	114	1.2400
35	0.13300	75	1.0500	115	1.2417
36	0.13960	76	1.0568	116	1.2434
37	0.14620	77	1.0636	117	1.2450
38	0.15280	78	1.0704	118	1.2467
39	0.15940	79	1.0772	119	1.2483
40	0.16600	80	1.0840	120	1.2500

5. If more than one BMP in series is necessary to achieve the required 80 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, and
A = the TSS Percent Removal Rate applicable to the first BMP
B = the TSS Percent Removal Rate applicable to the second BMP.

6. 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 green infrastructure BMPs that optimize nutrient removal while still achieving the performance standards in §35-4.P, §35-4.Q and §35-4.R.

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. The Flood Hazard Area Control Act Rules at N.J.A.C. 7:13-4.1(c)1 establish 300-foot riparian zones along Category One waters, as designated in the Surface Water Quality Standards at N.J.A.C. 7:9B, and certain upstream tributaries to Category One waters. A person shall not undertake a major development that is located within or discharges into a 300-foot riparian zone without prior authorization from the Department under N.J.A.C. 7:13.

9. Pursuant to the Flood Hazard Area Control Act Rules at N.J.A.C. 7:13-11.2(j)3.i, runoff from the water quality design storm that is discharged within a 300-foot riparian zone shall be treated in accordance with this subsection to reduce the post-construction load of total suspended solids by 95 percent of the anticipated load from the developed site, expressed as an annual average.

10. This stormwater runoff quality standards do not apply to the construction of one individual single-family dwelling, provided that it is not part of a larger development or subdivision that has received preliminary or final site plan approval prior to December 3, 2018, and that the motor vehicle surfaces are made of permeable material(s) such as gravel, dirt, and/or shells.

R. Stormwater Runoff Quantity Standards.

1. This subsection contains the minimum design and performance standards to control stormwater runoff quantity impacts of major development.

2. In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at Section V, complete one of the following:

   a. Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the 2-, 10-, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;

   b. 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 2-, 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. 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;

   c. Design stormwater management measures so that the post-construction peak runoff rates for the 2-, 10- and 100-year storm events are 50, 75 and 80 percent, 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; or

   d. In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with §35-4.R.2(a), (b) and (c) above is required unless the design engineer demonstrates through hydrologic and hydraulic analysis that the increased volume, change in timing, or increased rate of the stormwater runoff, or any combination of the three will not result in additional flood damage below the point of discharge of the major development. No analysis is required if the stormwater is discharged directly into any ocean, bay, inlet,

or the reach of any watercourse between its confluence with an ocean, bay, or inlet and downstream of the first water control structure.

3. The stormwater runoff quantity standards shall be applied at the site's boundary to each abutting lot, roadway, watercourse, or receiving storm sewer system.

§35-5. **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 Chapters 7, 9, 10, 15 and 16 Part 630, Hydrology National Engineering Handbook, incorporated herein by reference as amended and supplemented. This methodology is additionally described in Technical Release 55 - Urban Hydrology for Small Watersheds (TR-55), dated June 1986, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the Natural Resources Conservation Service website at: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044171.pdf or at United States Department of Agriculture Natural Resources Conservation Service, 220 Davison Avenue, Somerset, New Jersey 08873; or

   b. The Rational Method for peak flow and the Modified Rational Method for hydrograph computations. The rational and modified rational methods are described in "Appendix A-9 Modified Rational Method" in the Standards for Soil Erosion and Sediment Control in New Jersey, January 2014. This document is available from the State Soil Conservation Committee or any of the Soil Conservation Districts listed at N.J.A.C. 2:90-1.3(a)3. The location, address, and telephone number for each Soil Conservation District is available from the State Soil Conservation Committee, PO Box 330, Trenton, New Jersey 08625. The document is also available at: http://www.nj.gov/agriculture/divisions/anr/pdf/2014NJSoilErosionControlStandardsComplete.pdf.

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 above at §35-5.A.1(a) and the Rational and Modified Rational Methods at §35-5.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 have 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* or 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:

1. The New Jersey Geological Survey Report GSR-32, A Method for Evaluating Groundwater-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 the New Jersey Geological Survey website at: https://www.nj.gov/dep/njgs/pricelst/gsreport/gsr32.pdf or at New Jersey Geological and Water Survey, 29 Arctic Parkway, PO Box 420 Mail Code 29-01, Trenton, New Jersey 08625-0420.

§35-6. **Sources for Technical Guidance.**

A. Technical guidance for stormwater management measures can be found in the documents listed below, which are available to download from the Department's website at: http://www.nj.gov/dep/stormwater/bmp_manual2.htm.

1. Guidelines for stormwater management measures are contained in the New Jersey Stormwater Best Management Practices Manual, as amended and supplemented. Information is provided on stormwater management measures such as, but not limited to, those listed in Tables 35.1, 35.2, and 35.3.

2. Additional maintenance guidance is available on the Department's website at: https://www.njstormwater.org/maintenance_guidance.htm.

B. Submissions required for review by the Department should be mailed to:

1. The Division of Water Quality, New Jersey Department of Environmental Protection, Mail Code 401-02B, PO Box 420, Trenton, New Jersey 08625-0420.

§35-7. **Solids and Floatable Materials Control Standards.**

A. Site design features identified under §35-4.F above, or alternative designs in accordance with Section IV.G above, to prevent discharge of trash and debris from drainage systems shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this paragraph, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids. For exemptions to this standard see §35-7.A.2 below.

1. Design engineers shall use one 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; or

   b. A different grate, if each individual clear space in that grate has an area of no more than seven (7.0) square inches, or is no greater than 0.5 inches across the smallest dimension.

      i. 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 system floors used to collect stormwater from the surface into a storm drain or surface water body.

   c. For curb-opening inlets, including curb-opening inlets in combination inlets, 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 (7.0) square inches, or be no greater than two (2.0) inches across the smallest dimension.

2. The standard in §35-7.A.1 above does not apply:

   a. Where each individual clear space in the curb opening in existing curb-opening inlet does not have an area of more than nine (9.0) square inches;

   b. Where the municipality agrees that the standards would cause inadequate hydraulic performance that could not practicably be overcome by using additional or larger storm drain inlets;

c. Where flows from the water quality design storm as specified in N.J.A.C. 7:8 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:

   i. A rectangular space four and five-eighths (4.625) inches long and one and one-half (1.5) inches wide (this option does not apply for outfall netting facilities); or

   ii. A bar screen having a bar spacing of 0.5 inches.

   Note: that these exemptions do not authorize any infringement of requirements in the Residential Site Improvement Standards for bicycle safe grates in new residential development (N.J.A.C. 5:21-4.18(b)2 and -7.4(b)1).

d. Where flows are conveyed through a trash rack that has parallel bars with one-inch (1 inch) spacing between the bars, to the elevation of the Water Quality Design Storm as specified in N.J.A.C. 7:8; or

e. 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.

§35-8. **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 BMPs. This section applies to any new stormwater management BMP.

B. The provisions of this section are not intended to preempt more stringent municipal or county safety requirements for new or existing stormwater management BMPs. Municipal and county stormwater management plans and ordinances may, pursuant to their authority, require existing stormwater management BMPs to be retrofitted to meet one or more of the safety standards in §35-8.C.1, §35-8.C.2, and §35-8.C.3 for trash racks, overflow grates, and escape provisions at outlet structures.

C. 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 BMP to ensure proper functioning of the BMP 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; and

d. The trash rack shall be constructed of rigid, durable, and corrosion resistant material and 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 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. Stormwater management BMPs shall include escape provisions as follows:

   a. If a stormwater management BMP has an outlet structure, escape provisions shall be incorporated in or on the structure. Escape provisions include the installation of permanent ladders, steps, rungs, or other features that provide easily accessible means of egress from stormwater management BMPs. With the prior approval of the municipality pursuant to VIII.C, a free-standing outlet structure may be exempted from this requirement;

   b. Safety ledges shall be constructed on the slopes of all new stormwater management BMPs having a permanent pool of water deeper than two and one-half feet. Safety ledges shall be comprised of two steps. Each step shall be four to six feet in width. One step shall be located approximately two and one-half feet below the permanent water surface, and the second step shall be located one to one and one-half feet above the permanent water surface. See §35-8.E for an illustration of safety ledges in a stormwater management BMP; and

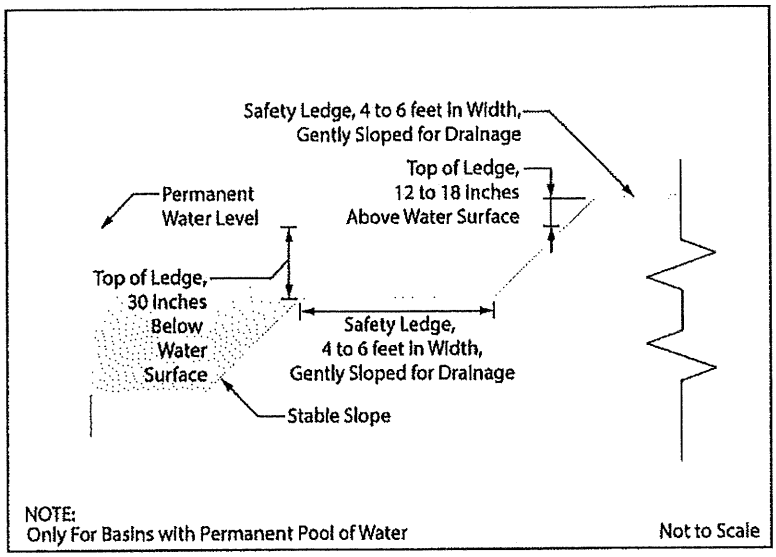
   c. In new stormwater management BMPs, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than three horizontal to one vertical.

D. Variance or Exemption from Safety Standard.

1. A variance or exemption from the safety standards for stormwater management BMPs may be granted only upon a written finding by the municipality that the variance or exemption will not constitute a threat to public safety.

E. Safety Ledge Illustration.

1. Elevation View – Basin Safety Ledge Configuration.



§35-9. **Requirements for a Site Development Stormwater Plan.**

A. Submission of Site Development Stormwater Plan.

1. Whenever an applicant seeks municipal approval of a development subject to this section, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at §35-9.C below as part of the submission of the application for approval.

2. The applicant shall demonstrate that the project meets the standards set forth in this section.

3. The applicant shall submit three (3) copies of the materials listed in the checklist for site development stormwater plans in accordance with §35-9.C of this section, in addition to submitting one (1) electronic copy of all reports and associated plans.

B. Site Development Stormwater Plan Approval.

1. The applicant's Site Development project shall be reviewed as a part of the review process by the municipal board or official from which municipal approval is sought. That municipal board or official shall consult the municipality's review engineer to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this section.

C. Submission of Site Development Stormwater Plan.

1. The following information shall be required:

a. Topographic Base Map. The reviewing engineer may require upstream tributary drainage system information as necessary. It is recommended that the 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 1"=200' or greater, showing 2-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 flood plains 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 manmade features not otherwise shown.

b. Environmental Site Analysis. A written and graphic description of the natural and man-made features of the site and its surroundings should be submitted. 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.

c. Project Description and Site Plans. 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 will 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 for proposed changes in natural conditions shall also be provided.

d. Land Use Planning and Source Control Plan. This plan shall provide a demonstration of how the goals and standards of §35-3 through §35-5 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.

e. Stormwater Management Facilities Map. The following information, illustrated on a map of the same scale as the topographic base map, shall be included:

i. Total area to be disturbed, 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.

ii. 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.

f. Calculations.

i. Comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in §35-4 of this section.

ii. When the proposed stormwater management control measures depend on the hydrologic properties of soils or require certain separation from the seasonal high water table, then a soils report shall be submitted. The soils report shall be based on onsite 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.

g. Maintenance and Repair Plan. The design and planning of the stormwater management facility shall meet the maintenance requirements of §35-5.

h. Waiver from Submission Requirements. The municipal official or board reviewing an application under this section may, in consultation with the municipality's review engineer, waive submission of any of the requirements in §35-9.C.1(a) through §35-9.C.1(g) 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.

§35-10. **Maintenance and Repair.**

A. Applicability. Projects subject to review as in §35-1.C of this section shall comply with the requirements of §35-10.B and §35-10.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). The plan shall contain information on BMP location, design, ownership, maintenance tasks and frequencies, and other details as specified in Chapter 8 of the NJ BMP Manual, as well as the tasks specific to the type of BMP, as described in the applicable chapter containing design specifics.

3. If the maintenance plan identifies a person other than the property owner (for example, a developer, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation of such person's or entity's agreement to assume this responsibility, or of the owner's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.

4. 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. The individual property owner may be assigned incidental tasks, such as weeding of a green infrastructure BMP, provided the individual agrees to assume these tasks; however, the individual cannot be legally responsible for all of the maintenance required.

5. If the party responsible for maintenance identified under §35-10.B.3 above is not a public agency, the maintenance plan and any future revisions based on §35-10.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.

6. Preventative and corrective maintenance shall be performed to maintain the functional parameters (storage volume, infiltration rates, inflow/outflow capacity, etc.) of the stormwater management measure, including, but not limited to, 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 non-vegetated linings.

7. The party responsible for maintenance identified under §35-10.B.3 above shall perform all of the following requirements:

    a. 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;

    b. Evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed; and

    c. 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 §35-10.B.6 and §35-10.B.7 above.

8. The requirements of §35-10.B.3 and §35-10.B.4 do not apply to stormwater management facilities that are dedicated to and accepted by the municipality or another governmental agency, subject to all applicable municipal stormwater general permit conditions, as issued by the Department.

9. 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 fourteen (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 Township or County may immediately proceed to do so and shall bill the cost thereof to the responsible person. Nonpayment of such bill may result in a lien on the property.

C. Nothing in this subsection 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.

§35-11. **Penalties.**

A. Any person(s) who erects, constructs, alters, repairs, converts, maintains, or uses any building, structure or land in violation of this section shall be subject to the following penalties:

1. For each violation of any provision of the within ordinance, a fine of up to $1,200.00 for each day the violation continues, where each day shall constitute a separate violation.

2. A term of imprisonment in the county jail or in any place provided by the municipality for the detention of prisoners, for any term not exceeding 90 days.

3. For any violation of any provision of the within chapter, the Code Enforcement Official of the Township may issue a stop work order.

4. Failure to comply with any such stop work order shall be an additional violation of this chapter and shall subject any violator to an additional fine of up to $1,200.00 for each day the violation continues, where each day shall constitute a separate violation.

5. These fines and penalties are in addition to any fines and/or penalties assessed by any other State, County or Federal agency or authority.

Exhibit 6 - Letter and Violation to Property Owners

JOHN H. ALLGAIR, PE, PP, LS (1983-2001)
DAVID J. SAMUEL, PE, PP, CME
JOHN J. STEFANI, PE, LS, PP, CME
JAY B. CORNELL, PE, PP, CME
MICHAEL J. McCLELLAND, PE, PP, CME
GREGORY R. VALESI, PE, PP, CME

TIMOTHY W. GILLEN, PE, PP, CME
BRUCE M. KOCH, PE, PP, CME
LOUIS J. PLOSKONKA, PE, CME
TREVOR J. TAYLOR, PE, PP, CME
BEHRAM TURAN, PE, LSRP
LAURA J. NEUMANN, PE, PP
DOUGLAS ROHMEYER, PE, CFM, CME
ROBERT J. RUSSO, PE, PP, CME

CME ASSOCIATES

June 30, 2022

Christian Romano
Director of Community Development
1011 Cooper Street
Deptford, NJ 08096

Attn: Gayle Kusmanick
Planning Board Secretary

Re: Stormwater Management Maintenance Inspection
Wal-Mart Store #5476-00
1350 Delsea Drive
Block 456, Lot 2 & 14
Deptford Township, Gloucester County, NJ
Our File: CDF00100.03

Dear Mr. Romano:

In accordance with your authorization, our office completed a field observation at the above referenced a site and reviewed pertinent township documents including:

- Approved Site Plan for Wal-Mart Store #5476-00; prepared by Bergmann Associates, P.C. consisting of 32 sheets, dated November 11, 2007 (signed by the planning board engineer).

- Stormwater Pollution Prevention Plan, prepared by Bergman Associates, dated September 10, 2004.

The purpose of our field observation and review of the design documents was to determine if the stormwater management improvements that support the existing development are being adequately maintained in accordance with the site plan approvals for the property. As you may be aware, in accordance with the Township's Tier A Municipal Stormwater General Permit, the Township has a perpetual responsibility to ensure privately owned stormwater management facilities are being adequately maintened.

Our observations revealed that the detention basin serving the facility contains a large permanent pool of water. The approved basin design was such that all stormwater was to be evacuated after each rain event either by discharge through the outlet control structure or infiltration into the ground.

The stormwater report for the project, specifically states, "Based on the design and soil conditions of this site, there will not be a permanent pool in the basin. All storm water that does not discharge from this basin will be captured in the forebay and will infiltrate into the soil."

CONSULTING AND MUNICIPAL ENGINEERS
ONE MARKET STREET, SUITE 1F • CAMDEN, NEW JERSEY 08102 • (732) 410-2651

See attached aerial depict the limits of permanent water. The basin was not designed as a "wet pond" and therefore a cause of concern related to public health, safety and general welfare. The permanent pool of water uses up storage volume that should otherwise be available significant rain events. The storage capacity of the detention basin is effectively being reduced, thereby reducing the total volume of runoff the basin can detain for major events. Additionally, wet ponds are to be designed to meet certain criteria as described by the NJ Stormwater Best Management Practices Manual in order to maintain water quality. Improperly designed wet ponds can lead to poor water quality, excessive algae or vegetation growth, mosquito breeding, odors and other issues. Finally, wet ponds shall be designed with certain safety measures, such as safety ledges, for which this basin does not have.

It is recommended that the property owner be contacted immediately and a plan of corrective action be required to be submitted. It is likely the owner will need to engage with certain professionals to assist in investigating, diagnosing and preparing a proper plan of corrective action. It is recommended that any plan of corrective action be certified by a licensed professional engineer.

Additionally, the property owner should produce stormwater management maintenance records for the property including, but not limited to, maintenance plans, maintenance logs, maintenance schedules, etc. We note approved stormwater management plan includes the use of a manufactured treatment device (MTD); which is a type of filtering system that relies filter cartridges that must be replaced or cleaned periodically. Maintenance records for the MTD should also be supplied.

Should you have any questions or require any additional information with regard to the above matter, please do not hesitate to contact this office.

Very truly yours,
CME Associates

James Winckowski, PE, CME
Consulting Engineer

Enclosure
cc: Tom Newman, Township Manager

Deptford Township
Code Enforcement
1011 Cooper St
Deptford Township, NJ 08096
(856) 845-5300

FILE COPY

8/19/2022

Inspected: ☐ Tenant ☑ Owner

9489 0090 0027 6080 1413 56

Land Approvals Group LLC
PO Box 130
West Berlin, NJ 08091

VIOLATION NOTICE

Block 385 Lot 9.01 Qualifier _____ BEECHWOOD DR

Inspector Jessie Osuna

Inspection Notes

WATER NOT DRAINING FROM BASIN AS DESIGNED. TRASH AND DEBRIS AROUND THE INSIDE OF THE BASIN NEEDS TO BE REMOVED. TREES ALONG CURBLINE NEED TO BE REPLACED AS PER THE DEPTFORD TOWNSHIP CODES. THE DEAD TREES AROUND THE BASIN NEED TO BE REMOVED. REGRADING OF THE BASIN IS NEEDED DUE TO EROSION. FENCE NEEDS TO CONTINUE TO BE REPLACED.

You are hereby notified that a code official inspected the above referenced premises and determined that there is a violation of the municipal code. The violation listed below must be completed on or before the violation abatement date indicated. Failure to obey this order of the code official shall result in the issuance of a summons resulting in a mandatory court appearance and possible penalty assessment in compliance with this code.

Tracking # — Violations Resulting From This Inspection

CVIO-22-00857 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN
Location
Statute 301.2 : Responsibility.
Summary

CVIO-22-00858 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN
Location
Statute 301.3 : Vacant structures and land.
Summary

CVIO-22-00859 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN
Location
Statute 302.1 : Sanitation.
Summary

CVIO-22-00860 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN
Location
Statute 302.2 : Grading and drainage.
Summary

CVIO-22-00861 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN
Location
Statute 308.1 : Accumulation of rubbish or garbage.
Summary

CVIO-22-00862 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN

Location
Statute UDO 31A : Landscape, Buffer and Tree Protection Standards
Summary

CVIO-22-00863 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN

Location
Statute UDO 31B : Design Guidelines
Summary

CVIO-22-00864 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN

Location
Statute UDO 31C : Tree and Shrub Requirements
Summary

CVIO-22-00865 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN

Location
Statute UDO 31D : Buffers and Berms
Summary

CVIO-22-00866 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN

Location
Statute UDO 31F : Stormwater Facilities
Summary

CVIO-22-00867 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN

Location
Statute UDO 31G : Open Space Landscaping
Summary

CVIO-22-00868 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN

Location
Statute UDO 31I : Site Protection and General Planting Requirements
Summary

CVIO-22-00869 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN

Location
Statute UDO 31K : Tree Management Plan and Tree Replacement
Summary

CVIO-22-00870 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN

Location
Statute 1-5.1 : Maximum Penalty
Summary

CVIO-22-00871 Date 8/19/2022 Compliance Date **8/26/2022** Status OPEN

Location
Statute 1-5.5 : Separate Violations
Summary

If you have questions regarding the status or nature of a violation please contact the department at (856) 845-5300

Jessie Osuna

Deptford Township
Code Enforcement
1011 Cooper St
Deptford Township, NJ 08096

Code Reference

Location BEECHWOOD DR

Inspection Date: 8/19/2022

Inspection Notes:
WATER NOT DRAINING FROM BASIN AS DESIGNED. TRASH AND DEBRIS AROUND THE INSIDE OF THE BASIN NEEDS TO BE REMOVED. TREES ALONG CURBLINE NEED TO BE REPLACED AS PER THE DEPTFORD TOWNSHIP CODES. THE DEAD TREES AROUND THE BASIN NEED TO BE REMOVED. REGRADING OF THE BASIN IS NEEDED DUE TO EROSION. FENCE NEEDS TO

Statute Rule	Statute Text
301.2	The owner of the premises shall maintain the structures and exterior property in compliance with these requirements, except as otherwise provided for in this code. A person shall not occupy as owner-occupant or permit another person to occupy premises that are not in a sanitary and safe condition and that do not comply with the requirements of this chapter. Occupants of a dwelling unit, rooming unit or housekeeping unit are responsible for keeping in a clean, sanitary and safe condition that part of the dwelling unit, rooming unit, housekeeping unit or premises which they occupy and control.
301.3	Vacant structures and premises thereof or vacant land shall be maintained in a clean, safe, secure and sanitary condition as provided herein so as not to cause a blighting problem or adversely affect the public health or safety.
302.1	Exterior property and premises shall be maintained in a clean, safe and sanitary condition. The occupant shall keep that part of the exterior property that such occupant occupies or controls in a clean and sanitary condition.
302.2	Premises shall be graded and maintained to prevent the erosion of soil and to prevent the accumulation of stagnant water thereon, or within any structure located thereon. Exception: Approved retention areas and reservoirs.
308.1	Exterior property and premises, and the interior of every structure, shall be free from any accumulation of rubbish or garbage.

Deptford Township
Code Enforcement
1011 Cooper St
Deptford Township, NJ 08096

Code Reference

UDO 31A

A. General Requirements for Landscaping. The following general requirements shall apply to the installation and design of landscapes and shall be the minimum necessary to promote aesthetic and pleasing views and the general welfare:

1. All land areas not covered with buildings, parking, or other impervious surfaces shall be landscaped with suitable materials. Landscaping shall consist of trees, shrubs, ground cover, perennials, and annuals singly or in combination and may include inanimate materials such as rocks, water, sculpture, art, walls, fences, and paving materials.

2. A landscape design shall be provided as part of site plan and subdivision submissions in accordance with the provisions of this ordinance. Every applicant for subdivision or site plan approval shall comply with the minimum standards as set forth in this section.

3. The Board of Jurisdiction may require additional landscaping beyond the requirements herein in order to create a desirable visual environment and an appropriate landscaping scheme for the site given the existing conditions and the proposed development.

4. Where an application for development is for a residential subdivision only, the minimum standards shall apply only to street trees and to common open space, storm water management facilities and areas proposed to be dedicated to the public; however, additional plantings or landscaping elements shall be required in the subdivision where necessary for climate control, reduce energy consumption, to create privacy, and to screen ground-mounted utilities.

5. All landscape plants shall be typical in size and weight for their species and shall conform to the standards of the American Association of Nurserymen for quality and installation.

6. All plants shall be tolerant of specific site conditions. The use of indigenous species is strongly encouraged. No plant may be installed that is listed as an invasive alien species in NJDEP's Overview of Nonindigenous Plant Species in New Jersey (February 2004), as it may be amended or superseded.

7. Landscape screening is required to visually buffer all trash enclosures, above ground propane tanks, utility boxes, ground-mounted HVAC equipment and other similar structures.

8. Plants with pervasive root systems shall not be located where they may cause damage to drainage pipes or other underground utilities and storm water management facilities and should generally be planted no closer than ten (10) feet measured horizontally from such underground utility.

Deptford Township
Code Enforcement
1011 Cooper St
Deptford Township, NJ 08096

Code Reference

UDO 31B

B. Design Guidelines. The following guidelines shall be followed in the design of landscaping and streetscape plans.

1. In the design of a landscape plan, plantings shall be provided in the varieties, quantities and site locations necessary to:

2. Reduce glare and reflection;

3. Buffer noise and objectionable views;

4. Complement or improve upon existing landscaping on adjoining properties;

5. Provide moisture retention, soil stabilization, wind breaks and air purification;

6. Moderate ground surface, building and stream water temperatures; and

7. Provide seasonal color variety.

8. In the landscape design of sites, areas shall be designated for retaining existing trees and the replacement of trees cleared from the site in accordance with §31.L.

9. Landscaping shall be located to provide effective climatic control. The east and west walls of a building should be the most heavily vegetated to shade for summer sun and the north to northwest area for winter prevailing winds. The southerly facing side of a building should be shaded from summer sun but open for solar gain during the winter.

10. Plant's susceptibility to disease, their colors, textures, shapes, blossoms, and foliage characteristics shall be considered in the overall design of a landscape plan.

11. Local soil conditions and water availability shall be considered in the choice of landscaping.

12. In the design process, the eventual maturity of the plant shall be considered for its effect on circulation patterns, solar access, site lighting, drainage, mergency access and relationship to buildings and the streetscape.

Deptford Township
Code Enforcement
1011 Cooper St
Deptford Township, NJ 08096

Code Reference

UDO 31C

1. Street Trees. When new streets are proposed, street trees shall be installed on both sides of all streets in accordance with an approved landscape plan. Street trees shall be provided along all street frontages lacking existing trees that meet the standards herein whenever an application for development is submitted and approved. However, street trees shall not be required along the frontage of a limited access highway (see Tables 3.17 and 3.18 for buffering requirements adjacent to limited access highways). Trees shall be spaced evenly along the street between the curb and sidewalk. Where the distance between the curb and sidewalk is less than five (5) feet, sidewalks should be placed in a public access easement outside of the right-of-way to create a planting strip at least five (5) feet wide to facilitate street tree growth in accordance with §26.H. In commercial areas with wider sidewalks that extend to the curb, trees shall be placed in tree wells with root guard systems. Such tree wells shall have sufficient soil volume to support tree growth as follows:

Tree Size at Maturity (Height in feet)	Soil Volume (in cubic feet)
Large trees (45'+)	200
Medium-sized trees (30'-45')	150
Small trees (to 30')	100

Areas under sidewalks may be used to meet the soil volume requirement provided no more than 50% of the volume is located under such hard paving.

2. Spacing. When trees are planted at predetermined intervals along streets, spacing shall depend on tree size.

Tree Size at Maturity (Height in feet) (in feet)	Planting Interval
Large trees (45'+)	40
Medium-sized trees (30'-45')	30
Small trees (to 30')	20

Trees may be planted closer together in order to avoid interference with utilities, roadways, sidewalks, sight easements, street lights and street furniture.

3. Street tree type. Tree type may vary depending on overall effect desired but as a general rule, all trees shall be large deciduous trees except as needed to chieve special effects. Tree selection shall be approved by the Board of Jurisdiction in accordance with Tables 31.1, 31.2 and 31.3. Alternate selections may be pproved at the discretion of the Board of Jurisdiction. Within any landscape design, oaks shall be limited to no more than fifteen percent (15%) of the total number of trees to limit the incidence of bacterial leaf scorch disease.

(See Tables in UDO Document)

Deptford Township
Code Enforcement
1011 Cooper St
Deptford Township, NJ 08096

Code Reference

UDO 31D

Buffers and Berms. Landscaping buffers are required to minimize and visually screen any adverse impacts or nuisances on a site or from any adjacent area. Berms may be used to achieve buffering effects in accordance with the regulations herein.

1. General requirements. Landscape buffers shall consist of a combination of deciduous trees, conifers, shrubs, berms, and if appropriate, fences or walls in sufficient quantities and sizes to perform their necessary screening function.

2. Buffers may be installed in required yard areas except for reverse frontage buffers where they shall be in addition to the required rear yard depth. Reverse frontage screening shall be required where the rear or side yards of residential dwellings or lots abut any arterial or major collector street. The minimum width of a landscape buffer for a reverse frontage residential lot shall be 15 feet. Fencing and walls shall not be permitted in a reverse frontage landscape buffer. See §40, Reverse Frontage Lots, for additional requirements.

3. Buffers shall be continuous except for access drives as approved by the Board of Jurisdiction. Storm water management facilities, parking, dumpster enclosures, accessory buildings or above ground structures, and similar encroachments shall not be permitted in the required buffer area.

4. The minimum width of a landscape buffer shall be determined by the proposed use of a property and the land uses and zoning district adjacent to it in accordance with Table 31.7, unless a specific standard is established within a particular zoning district.

(See Tables and Specifications in UDO Document)

UDO 31F

Stormwater Facilities. Stormwater management areas including retention and detention basins, drainage ditches and swales, and wetland areas shall be landscaped in accordance with the standards in this subsection.

1. The screening of outfall structures and emergency spillways from public view is of particular importance in the landscape design. This may involve integration of these areas as aesthetic landscape features, naturalized wetland areas, or active and passive recreation areas, in addition to their stormwater management function.

2. Detention and retention facilities should be located in cleared areas where reasonably feasible.

3. Basins designed as naturalized wetland areas shall be planted with a fringe of wetlands plants such as sedges, rushes and forbs. The ground should be seeded with a wildflower or wet meadow grass mix but in certain circumstances may require sod or hydroseeding to stabilize the basin slopes. All plants shall be tolerant of typical flood plain and wetland conditions. See Table 31.6 for recommended wet conditions plants.

4. Planting other than wildflowers and grasses shall not be located within ten (10) feet of low flow channels to facilitate drainage.

5. Provisions for emergency access as well as general maintenance of the basins shall be reviewed by the Board of Jurisdiction. Plantings shall be designed to disguise yet not hinder vehicular access.

6. Trees shall not be permitted upon any berm or dam associated with a stormwater management basin unless approved by the Board Engineer.

7. All basin structures shall be designed to blend into the landscape in terms of construction materials, color, grading and planting.

Deptford Township
Code Enforcement
1011 Cooper St
Deptford Township, NJ 08096

Code Reference

UDO 31G

Open Space Landscaping. Common or public open space provided as a part of any cluster development shall be landscaped in one of the following ways, depending upon the intent of the use for the open space.

1. Conservation use. Conservation areas are appropriate in areas adjacent to and inclusive of natural features to be preserved, including wooded areas, water bodies, streams wetlands, and steep slopes. The following conservation use design guidelines shall apply:

a. Natural features shall be encompassed in open space areas rather than moved or eliminated in the development process.

b. Cleared areas shall be re-vegetated to a naturalistic appearance where appropriate.

c. Re-vegetated areas may be seeded with a wildflower and/or meadow grass mix.

2. Recreational Open Space. The following landscape standards shall apply for recreational uses:

a. Grading and plantings of the recreation area shall remain consistent with the overall landscape design. The landscape design shall consist of massed deciduous and evergreen trees and berms to create spaces and v iews and ornamental trees and shrub masses for visual variety, interest and detail.

b. In general, plants shall be provided at the following rates:
1) Shade trees - 15 per acre
2) Evergreen Trees - 5 per acre
3) Flowering Shrubs - 10 per acre
4) Shrubs - 20 per acre

These quantities are exclusive of plants that may be required for landscape buffers pursuant to §31.D.

c. Adjacent dwelling units shall be buffered from active play areas with a minimum buffer width of twenty-five (25) feet.

d. In the area where a recreation facility fronts onto a public or private street, fencing may be required to provide controlled access. The adjacent street tree planting shall be continued along this area, and any reverse frontage buffer planting shall be integrated with open space plantings.

Deptford Township
Code Enforcement
1011 Cooper St
Deptford Township, NJ 08096

Code Reference

UDO 31I

1. Topsoil preservation. Topsoil moved during the course of construction shall be redistributed on all re-graded surfaces so as to provide at least four (4) inches of even cover to all disturbed areas of the development and shall be stabilized by seeding or planting.

2. Removal of debris. All stumps and other tree parts, litter, brush, weeds, excess or scrap building materials, or other debris shall be removed from the site and disposed of in accordance with New Jersey Department of Environmental Protection regulations. No tree stumps, portions of tree trunks or limbs shall be buried anywhere in the development. All dead or dying trees, standing or fallen, shall be removed from the site. If trees and limbs are reduced to chips, they may, subject to approval of the Township Engineer, be used as mulch in landscaped areas, provided they have been properly composted.

3. Protection of existing plantings. Maximum effort should be made to save specimen plants. No material or temporary soil deposits shall be placed within four (4) feet of shrubs or ten (10) feet of trees designated to be retained on the preliminary and/or final plat.

4. Slope plantings. Landscaping of the area of all cuts and fills and/or terraces shall be sufficient to prevent erosion, and all roadway slopes steeper than 3:1 shall be planted with ground covers appropriate for the purpose and soil conditions, water availability, and environment.

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Code Enforcement
1011 Cooper St
Deptford Township, NJ 08096

Code Reference

UDO 31K

Tree Management Plan and Tree Replacement. The purpose of this section is to establish protective regulations for trees within the Township of Deptford in order to control problems of flooding, soil erosion, air and noise pollution; to protect the public health, safety and welfare of the citizenry of the Township; and to promote quality development in the Township. The intent of this section is to encourage the protection of the greatest number of trees within the tree protection zone and of large specimen trees throughout the Township, regardless of location.

1. Disturbance zone defined. That portion of a lot covered by existing or proposed buildings, structures or improvements and within a certain distance around same as noted below:

a. House or building - Twelve (12) feet from foundation wall.

b. Garage - Eight (8) feet from foundation wall.

c. Pool/ Cabana - Twelve (12) feet from foundation wall.

d. Driveway/ sidewalk - Five (5) feet

e. Septic fields - Ten (10) feet

f. Underground utility - Five (5) feet

g. Paved parking/drive aisle - Five (5) feet

h. Shed - Five (5) feet

i. Improvement (other) - Five (5) feet

2. Applicability. With the exceptions as set forth in this Section, no person shall cut or remove, or cause to be cut or removed, any tree with a diameter of eight (8) inches or greater upon any lands in the Township unless the cutting or removal is accomplished in accordance with the provisions of this Section. At the time of a minor subdivision, preliminary major subdivision or site plan application submitted pursuant to this chapter, a Tree Protection Management Plan shall be submitted if there are ten (10) or more total non-specimen trees, or one (1) or more total specimen trees, cut or removed or proposed to be cut or removed during development. The provisions of this Section shall be applicable to all property owners in the Township, or their designees, with the following exceptions:

a. When the property in which the tree(s) are located is in excess of one (1) acre and the owner or his designee has submitted an application to the Deptford Township Planning Board or Zoning Board, as the case may be, for subdivision or site plan approval. For the purposes of calculating one (1) acre in a subdivision application, the total area of all lots shall be considered.

b. Any cultivated tree growing on property actually being used as a nursery, orchard or Christmas tree farm.

c. Any tree cut or removed for agricultural use of lands when operated in accordance with a farm conservation plan approved by the local Soil Conservation Service District or tree management plan prepared by a NJDEP approved forester (see sub-paragraph -3, herein), provided that a copy of such plan is filed with the Environmental Commission of Deptford.

d. Any tree, which in the opinion of the Township constitutes an immediate threat to the health or safety of the general public.

e. Any tree that is dead or diseased.

f. Pruning and removal of trees by utility companies to provide for line clearance of underground and overhead utilities.

g. The standards contained herein shall be considered the minimum standards to be met and maintained. Standards established by other Township ordinances, or by state and federal rules and regulations shall apply where those standards are more restrictive than the standards set forth herein.

3. Woodland management plan. Plans for the harvesting of timber shall be in accordance with the standards and recommendations of the New Jersey Forest Service. A copy of such plan shall be filed with the Environmental Commission of Deptford at least fifteen (15) days prior to the harvesting of timber.

4. Requirements of a Tree Protection Management Plan. A Tree Protection Management Plan shall include the following information:

a. Applicant's name, street address, telephone number;

b. Lot owner's name, street address, telephone number;

c. Lot owner's consent to the application;

d. Block and Lot number;

e. Location of all existing or proposed buildings, driveways, septic fields, easements, underground utility lines, and other improvements;

f. Existing or proposed rights of way;

g. Location of all proposed trees having a diameter of eight (8") inches or greater to be cut, removed, or damaged in such a way as to cause a need for their removal, noting each tree by its species, size and general health condition. If the area involved is greater than one (1) acre, a representative section of the woodland one hundred (100) feet by one hundred (100) feet shall be surveyed and the results extrapolated to the woodland area. This shall not preclude surveying the entire property for specimen trees.

h. Reasons for tree removal, including a description of the type of tree removal: thinning, selective cutting, clear cutting, aesthetic improvement cut.

i. Specifications for the removal of existing trees and for the protection of existing trees to be preserved;

j. Specific proposals for planting replacement trees, if applicable.

k. Existing topography within twenty (20) feet of the proposed disturbed area and proposed grading, if any;

l. Location of existing water courses, wetlands, and floodplains

5. Review of applications for a Tree Protection Management Plan.

a. All applications for a Tree Protection Management Plan shall be immediately referred by the Administrative Officer to the Environmental Commission and Planning Board or Zoning Board of Adjustment, as the case may be.

b. The Environmental Commission may provide a recommendation of approval or denial of the Tree Protection Management Plan application to the Board of Jurisdiction. Failure on the part of the Environmental

Commission to provide a recommendation within twenty (20) days, provided that the Environmental Commission receives the application at least ten (10) days in advance of its regularly scheduled meeting, shall be deemed a recommendation for approval. In the event that the Environmental Commission recommends denial of an application, they shall specify, in writing, the reason(s) for their action. The Board of Jurisdiction shall review and consider the recommendations of the Environmental Commission and the recommendations shall be made a part of the record before either Board. The Board of Jurisdiction shall have the authority to approve or to deny the Tree Protection Management Plan as part of the subdivision and/or site plan review process.

c. The Planning Board or Zoning Board shall review the application for a Tree Protection Management Plan and, if necessary, request professional review of the application and inspect the site.

d. In the review of the application, the following factors shall be considered in deciding whether to recommend approval, approval with conditions or denial, of the Tree Protection Management Plan:

1) Impact on the growth of remaining trees;

2) Impact on existing drainage patterns;

3) Impact on soil erosion or increased dust;

4) Impact on the vegetative screening between adjacent land uses; and
5) Impact on woodland corridors, stream corridors, greenways, and wildlife habitat.

e. There is hereby established a presumption that each and every tree of eight (8) inches of diameter or greater located within the tree protection zone or any specimen tree located anywhere on the lot shall be preserved at its location on the site. Each such tree located within the tree protection zone or each specimen tree may be removed only if the Board of Jurisdiction finds that the applicant has set forth:

1) That it is necessary to remove trees which pose a safety hazard to pedestrian or vehicular traffic, or threatens to cause disruption of public services.

2) That it necessary to remove trees which pose a safety hazard to a building.

3) That it is necessary to remove diseased trees, trees infested with destructive insects liable to infect healthy trees on the subject or adjacent property, or trees weakened by age, fire or other injury.

4) That it is necessary to observe good forestry practices, i.e., the number of healthy trees that a given parcel of land will support when documented by a report prepared on behalf of the applicant by a professional forester or a certified landscape architect.

5) That it is necessary for the reasonable development of the site pursuant to other provisions of this ordinance.

6) Other conditions which, in the judgment of the Planning Board/Zoning Board, warrant the removal of a tree.

f. No building permit shall be issued until the applicant has obtained approval and fulfilled any conditions attached thereto of its Tree Protection Management Plan application. Such approval or approval with

conditions may be included in the actions of the Board of Jurisdiction in approving a site plan or subdivision application.

6. Planting of new trees and replacement of trees.

a. Where the Planning Board or Zoning Board, whichever has jurisdiction, determines that it is impossible to retain trees in the tree protection zone, or any specimen tree as defined by this Section, due to cutting, filling, or other construction activity, the applicant shall replant one (1") inch of new tree diameter for every four (4") inches of existing tree diameter removed. Replacement trees should be shown on the Tree Protection Management Plan for review. New replacement trees should have a minimum diameter of two and one-half (2.5) inches measured six (6) inches above the ground. Replanting should be done according to the standards specified by the American Nurserymen's Association.

b. Criteria for the selection of new trees. When an applicant is required to replace trees as described above, the applicant should replace the trees with the same species that were removed or, with the approval of the Planning Board/ Zoning Board, choose other tree species, preferably native to Deptford Township. Wherever possible trees that serve as important food sources for wildlife such as oak, walnut, cherry, and holly should be selected except in those areas where specific problems caused by falling nuts and fruits would occur. In selecting replacement trees, the following positive criteria should be used. These guidelines should also be followed in choosing trees proposed to be retained or cleared.

1) Species longevity;

2) Native to the area;

3) Hardiness (wind firmness, climate requirements, characteristics of soil to hold tree);

4) Resistance to insect and disease attack and to pollution;

5) Aesthetic values (autumn, coloration, type of flowers or fruit, form characteristics);

6) Low maintenance and care (pruning, etc.);

7) High wildlife values;

8) Climate protection of pedestrians, vehicles, and buildings;

9) Size at maturity;

10) Effect of soil retention and erosion control; and

11) Value as a noise buffer

1-5.1 For violation of any provision of this Code or other ordinance of the Township of Deptford unless a specific penalty is otherwise provided in connection with the provision violated, the maximum penalty upon conviction of the violation shall be by one or more of the following: imprisonment in the County Jail or in any place provided by the municipality for the detention of prisoners, for any term not exceeding 90 days; or by a fine not exceeding $1,250; or by a period of community service not exceeding 90 days.

Deptford Township
Code Enforcement
1011 Cooper St
Deptford Township, NJ 08096

Code Reference

1-5.5

Except as otherwise provided, each and every day in which a violation of any provision of this Code or any other Township ordinance exists shall constitute a separate violation.

Exhibit 7 - Township of Deptford 2021 Annual Report

Tier A MSRP Annual Report Summary

Service ID: 1373508
Facility Name: DEPTFORD TWP
Reporting Period: January 1, 2021 through December 31, 2021
NJPDES Permit #: NJG0152153
Activity ID: DST170001

Contacts

Name: Rob Ritterson
Title: Superintendent of Public Works
Contact Type: Stormwater Coordinator
Organization Name: DEPTFORD TWP
Organization Type: Municipal
E-Mail: rritterson@deptford-nj.org
Phone: (856) 228-4719 (Work Phone Number)
(856) 628-0274 (Cell Phone Number)
(856) 228-3654 (Fax Number)
Contact Address: 1011 COOPER ST
Deptford Twp, New Jersey 08096

Uploaded Attachments

Attachment Name	Attachment Description	File Name
Supplemental Questionnaire		Tier_A_MS4_Annual_Supplemental_Questionnaire_2021.pdf

Annual Report Details - Part A

Municipality Information

Team member responsible for completing the report:	Rob Ritterson
Team member email address:	Rritterson@deptford-nj.org

Stormwater Pollution Prevention Plan

1. Has the municipality revised its Stormwater Pollution Prevention Plan during the last calendar year?	No
2. Date of the last revised SPPP:	

Public Notice

1. Is the municipality complying with applicable State and local public notice requirements when providing for public participation in the ongoing development and implementation of the stormwater program?	Yes

Report Details - Part B

Post-Construction Stormwater Management in New Development and Redevelopment

1. Is the municipality reviewing and approving major development residential projects in accordance with the Residential Site Improvement Standards (RSIS)?	Yes
2. Did the municipality adopt a municipal stormwater management plan?	Yes
3. Most recent date of adopted municipal stormwater management plan:	09/11/2006
4. Status of this plan (if not adopted):	
5. Did the municipality adopt the municipal stormwater control ordinance provided by NJDEP without change?	Yes
6. Most recent date the municipality adopted a municipal stormwater control ordinance:	09/11/2006
7. What is the current status of the ordinance?	
8. Did the municipality submit the adopted municipal stormwater management plan to the appropriate county review agency for approval?	Yes
9. Most recent date the adopted Municipal Stormwater Management Plan was submitted to the appropriate county review agency for approval:	09/11/2006
10. If yes, did the municipality send the adopted municipal stormwater control ordinance to the appropriate county review agency for approval?	Yes
11. Most recent date the adopted Municipal Stormwater Control Ordinance was submitted to the appropriate county review agency for approval:	09/11/2006
12. Status of county review:	Approved

13. Did the municipality adopt the review agency's required amendments and resubmit to the county review agency?	
14. Is the Stormwater Control Ordinance in effect?	Yes
15. Most recent effective date of Stormwater Control Ordinance:	09/11/2006
16. Ordinance Number(s):	0.09.06
17. What is the current status of the adopted plan and ordinance?	
18. Are you reviewing projects as part of your site plan and sub-division approval process to ensure that they comply with your municipality's effective municipal stormwater control ordinance(s)?	Yes
19. How many projects that were subject to either the municipal stormwater control ordinance or the stormwater provisions of RSIS did the municipality approve?	0
20. Does the municipal stormwater management plan contain a mitigation plan?	Yes
21. Has the municipality granted any variances or exemptions from the design and performance standards for stormwater management measures set forth in the approved municipal stormwater management plan and stormwater control ordinance(s)?	No
22. If yes, how many variances or exemptions from the design and performance standards has the municipality granted?	

23. If granted any variances or exemptions, did you submit a written report to the county review agency describing the variance or exemption and the required mitigation?	
24. Does the municipality's plan review evaluate storm drain inlet protection for solids and floatables in accordance with Attachment C of the permit?	Yes
25. Does the municipality require plans for long-term operation and maintenance for stormwater BMPs?	Yes
26. Are you ensuring that adequate long-term operation and maintenance of stormwater BMPs is being performed on property that you do not own or operate? **Please keep an inventory of stormwater BMPs indicating type, function and location in a format provided by the Department onsite and available for inspection or upon request.**	Yes
27. Briefly indicate how this is being accomplished (e.g., ordinance requiring operation and maintenance by private entity; operation and maintenance by you or other governmental entity):	Inspections by Township Engineer
28. Is the municipality's stormwater management plan re-examined at each re-examination of the master plan in accordance with N.J.A.C. 7:8-4?	N/A - we did not re-examine our master plan this year
29. Date re-examination report was last adopted:	

Report Details - Part C

Local Public Education Program and Outreach

1. Has the municipality developed a Local Public Education Program?	Yes
2. Has the municipality conducted educational activities that total the minimum number of points required by the permit?	Yes

Storm Drain Inlet Labeling

1. Has the municipality established a storm drain inlet labeling program?	Yes
2. Indicate the percentage labeled to date:	100%
3. Other Amount:	
4. Is your municipality maintaining the labels (i.e. replacing and/or repainting)?	Yes

Community Wide Ordinances

Have you adopted and are you enforcing a regulatory mechanism for:

1. Pet Waste Ordinance:	Yes
2. Date adopted:	04/02/2007
3. Litter Ordinance/State Litter Statute:	Litter Ordinance
4. Date adopted:	04/02/2007
5. Improper Disposal of Waste Ordinance:	Yes
6. Date adopted:	04/02/2007
7. Wildlife Feeding Ordinance:	Yes
8. Date adopted:	04/02/2007
9. Containerized Yard Waste Ordinance / Yard Waste Collection Program Ordinance:	Adopted Both
10. Date adopted:	04/02/2007
11. Illicit Connection Ordinance:	Yes
12. Date adopted:	04/02/2007
13. Refuse Container/Dumpster Ordinance:	Yes
14. Date adopted:	04/02/2007
15. Private Storm Drain Inlet Retrofitting Ordinance:	Yes
16. Date adopted:	03/01/2001
17. Status of these ordinances (if not adopted):	
18. Method(s) of enforcement (e.g., summons, warnings, additional signs, etc.):	The Department of Code Enforcement
19. Are you distributing the Pet Waste Information Sheets with pet licenses?	Yes

Report Details - Part D

MS4 Outfall Pipe Mapping

1. Has the municipality completed the mapping of the MS4 outfall pipes?	Yes
2. Date completed:	04/01/2007
3. Number of outfall pipes that you operate in the municipality:	230
4. How many MS4 outfall pipes are mapped?	230

Illicit Connection Elimination Program

1. Does the municipality have an ongoing program to detect and eliminate illicit connections to municipally owned or operated outfall pipes?	Yes
2. How many outfall pipes were inspected during the past calendar year?	184
3. Number of illicit connections detected during the past calendar year:	0
4. Number of illicit connections eliminated during the past calendar year:	0

Street Sweeping Program

1. In the past calendar year, were all required streets swept?	Yes
2. What was the total number of miles swept?	305

List the amount of materials collected for each month in 2021.

3. Units:	Tons
4. January:	0
5. February:	0
6. March:	10.39
7. April:	0
8. May:	0
9. June:	56.1
10. July:	22.36
11. August:	27.4
12. September:	8.97
13. October:	24.44
14. November:	3.06
15. December:	0
16. Total (Note: 1.053 cubic yards = 1 ton):	152.72
17. Explain the reason if reporting zero (0) for a month above:	Street sweeper does not operate in the winter months. We had manpower issues in April and May.

Storm Drain Inlet Retrofitting

1. Has the municipality completed repaving, repairing, reconstruction, or alterations on any road surfaces in direct contact with municipally owned or operated storm drain inlets?	Yes
2. Approximately what percentage of storm drains within the municipality currently meet the standard?	95

Stormwater Facility Maintenance

Stormwater facilities include, but are not limited to, catch basins, extended detention basins, low flow bypasses, underground detention, dry wells, manufactured treatment devices, pervious paving buffers, infiltration basins/trenches, sand filters, constructed wetlands, wet ponds, bioretention, rooftop vegetated cover, vegetative filters, and stormwater conveyance systems. Stormwater facility inventories that indicate the type, function, and location of the facility must be kept onsite and available for inspection or upon request in a format provided by the Department. The format is available as SPPP Form 13 at: http://www.nj.gov/dep/dwq/pdf/Tier_A/A%20-%20pdf%206.pdf**.**

1. Have you developed a Stormwater Facility Maintenance Program?	Yes

Other Stormwater Facilities

1. Were all stormwater facilities that you operate inspected?	Yes
2. Were any found to be in need of cleaning or repair in order to function properly?	Yes
3. During the past calendar year, were any stormwater facilities (excluding catch basins) cleaned?	Yes
4. Were repairs made?	Yes
5. Describe repair(s) or if repairs have not yet been made, provide a schedule for the repair(s):	Replaced pipe, installed rip wrap, unclogged pipe, repaired head wall, uncovered pipe

Catch Basins

1. Total number of catch basins that the municipality operates:	1405
2. Total number of catch basins inspected:	1099
3. Total number of catch basins cleaned:	94
4. Amount of materials removed from catch basins, in tons, during the past calendar year:	3.8
5. Units:	Tons

Report Details - Part E

Outfall Pipe Stream Scouring Remediation

For all outfall pipes undergoing remediation through a scour remediation program, attach additional page(s) as necessary indicating the location of the outfall pipe (including the alphanumeric identifier), the repair start date, and the repair completion date.

1. Has the municipality developed a prioritized list of outfall pipes requiring outfall pipe stream scouring remediation?	Yes

De-icing Material and Sand Storage

1. Does the municipality have a permanent structure for all de-icing material storage?	Yes
2. If sand is being stored outside, is it set back 50 feet from storm sewer inlets, ditches or other stormwater conveyance channels, and surface water bodies?	N/A - no sand stored outdoors

Fueling Operations

1. Is the municipality implementing Best Management Practices for vehicle fueling and receiving of bulk fuel deliveries at maintenance yard operations in accordance with Attachment E of the permit?	Yes

Vehicle Maintenance

1. Is the municipality implementing Best Management Practices for vehicle maintenance and repair activities at maintenance yard operations in accordance with Attachment E of the permit?	Yes

Good Housekeeping Practices

1. Is the municipality implementing Good Housekeeping Practices for all materials or machinery listed in the Inventory Requirements for Municipal Maintenance Yard Operations (including maintenance activities and ancillary operations) in accordance with Attachment E of the permit?	Yes

Equipment and Vehicle Washing

1. Has the municipality implemented measures to properly handle the discharge of equipment and vehicle wash wastewater from municipal maintenance yard operations?	Yes
2. Please indicate which option you implemented to eliminate the unpermitted discharge:	Ceased the discharge (no longer wash onsite)
3. Date the management measure was implemented:	04/01/2009
4. What is the NJPDES permit number that authorizes the discharge of vehicle and equipment wash wastewater?	
5. Is the municipality maintaining records of vehicle and equipment washing?	N/A - we do not wash our vehicles

Annual Employee Training

1. Did the municipality conduct training for employees on stormwater related topics as required under the MS4 permit (e.g., police officers trained on ordinances)?	Yes
2. List date(s) of employee training:	2/26/21, 7/1/21

Report Details - Part F

Sharing of Responsibilities

Does the municipality share services with another entity to satisfy a permit requirement?	Yes

Incidents of Non-compliance

Based on the answers you provided above, the Department has identified the following possible permit compliance issues. Please complete the Incidents of Non-compliance section and identify steps being taken to correct these deficiencies.

- Your municipality has not revised your Stormwater Pollution Prevention Plan to incorporate changes required by the renewal permit.

1. Did your municipality have any incidents of non-compliance?	Yes
2. Identify the steps being taken to remedy the noncompliance and to prevent such incidents from recurring. **(If the text box is not large enough to complete this section, please provide your report as an attachment and upload it on the next screen. Please reference the attachment in the textbox.)**	Our Township Engineers are in the process of reviewing and updating a plan.

Certification

Certifier: Rob Ritterson
Certifier ID: RITTERSON
Challenge/Response Question: What is your favorite sport?
Challenge/Response Answer: ******
Certification PIN: ******
Date/Time of Certification: 05/09/2022 11:23

"I certify under penalty of law that this Annual Report and Certification and all attached documents were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate this information. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering this information, the information in this Annual Report and Certification and all attached documents is, to the best of my knowledge and belief, true, accurate and complete.

"I certify that the municipality is in compliance with its stormwater program, Stormwater Pollution Prevention Plan (SPPP) and the NJPDES Tier A Municipal Stormwater General Permit No. NJG0152153 except for any incidents of non-compliance which are identified herein. For any incidents of non-compliance, the Annual Report identifies the steps being taken to remedy the non-compliance and to prevent such incidents from recurring.

"I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for purposely, knowingly, recklessly, or negligently submitting false information."

Please note, no changes will be allowed to be made to this report upon its certification. If you need to correct or modify the report after certification, please contact your case manager at (609) 633-7021 so they may enable that function.

Rob Ritterson — 05/09/2022
General — **Date**

Instructions for Saving and Submitting the

2021 MS4 Tier A Permit Annual Report - Supplemental Questionnaire

1. Once opened, please save the Questionnaire to your computer, using the "Save As" function. This can be done by going to FILE > then Save As… or Shift + Ctrl + S. Name the document Supplemental_Questionnaire_*TOWN NAME*
2. Complete the Questionnaire.
3. Once you have completed the Questionnaire, use the "Save" function to save your answers to the Questionnaire to your computer . This can be done by going to FILE > then Save or Ctrl + S.
4. The completed and saved Questionnaire must then be uploaded as an attachment, in Part 7, to your Annual Report before the Annual Report is submitted to the Department.
5. To access the Annual Report, open the link to "NJDEP Online Portal" at http://www.nj.gov/dep/dwq/tier_a.htm. In Part 7, you will be asked to complete information regarding the file(s) to be uploaded. Navigate to your saved Questionnaire and then hit the "Upload" button in the lower right section of Part 7. The Annual Report will indicate if the Questionnaire was successfully uploaded. Then click on the "Continue" button and proceed with finalizing your Annual Report.

Your Annual Report will be considered incomplete if the Supplemental Questionnaire is not attached. If you experience any difficulty in this process, please contact your municipal case manager at 609-633-7021.

Please note that use of Adobe Acrobat Reader DC is recommended. This free software is available for download at http://get.adobe.com/reader/ . If you have an earlier version of Adobe Reader, please go to the Adobe website at http://tv.adobe.com/watch/acrobat-x-tips-tricks/quick-tip-how-to-save-form-data-in-adobe-reader/ for detailed instructions on how to save your completed Questionnaire.

2021 MS4 Tier A Permit Annual Report - Supplemental Questionnaire

General Information

A. Municipal Information

Municipality: Deptford	County: Gloucester
Stormwater Coordinator: Rob Ritterson	
Phone: 856-628-0274	Email: rritterson@deptford-nj.org

Public Involvement and Participation

Provide a web address for each of the following:

Current Stormwater Pollution Prevention Plan (SPPP): www.deptford-nj.org

Municipal Stormwater Management Plan:

Local Public Education and Outreach

Report the number of points obtained in each public education and outreach category:

General Public Outreach: 3

Watershed/Regional Collaboration: 0

Targeted Audiences Outreach: 0

Community Involvement Activities: 1

School/Youth Education and Activities: 2

Has the municipality advertised public education and outreach activities on the municipalities website?: ◯ Yes ◯ No

Post Construction Stormwater Management

Note: This portion of the annual report should be completed by a person knowledgeable in post-construction stormwater management project review and approvals.

Name of person completing this section: Rob Ritterson

Affiliation of person completing this section: Superintendent

Please fill out the attached major development project list for all major developments approved in the last calendar year.

Community Wide Ordinances

Does the municipality maintain a database to track all instances of community wide ordinance violations?:

◯ Yes ◯ No

Provide the web address for each ordinance and report the entity responsible for the enforcement of each ordinance as well as the number of warnings and violations issued for each in the past calendar year:

Pet Waste Ordinance

Entity:

Warnings/Violations: N/A

Wildlife Feeding Ordinance

Entity:

Warnings/Violations: N/A

Litter Control Ordinance

Entity:

Warnings/Violations: N/A

Improper Disposal of Waste Ordinance

Entity:

Warnings/Violations: N/A

Containerized Yard Waste/Yard Waste Collection Program Ordinance
Entity: Warnings/Violations: N/A

Private Storm Drain Inlet Retrofitting Ordinance
Entity: Warnings/Violations: N/A

Illicit Connection Ordinance
Entity: Warnings/Violations: N/A

Stormwater Control Ordinance
Entity: Warnings/Violations: N/A

Municipal Maintenance Yard and Other Ancillary Operations

Does the municipality maintain a list of all materials and machinery located at each municipal maintenance yard and ancillary operation which could be a source of pollutants in a stormwater discharge?: ◯ Yes ◯ No

Has the municipality implemented Best Management Practices as described in Attachment E for all applicable activities at each municipal maintenance yard and ancillary operation owned or operated by the municipality?: ◯ Yes ◯ No

Does the municipality maintain an inspection log detailing conditions requiring attention and remedial actions taken at municipal maintenance yards and other ancillary operations?: ◯ Yes ◯ No

Does the municipality have an underground vehicle wash water storage tank? ◯ Yes ◯ No

Employee Training

Does the municipality maintain records of employee training including sign in sheets, dates of training, and training agendas?: ◯ Yes ◯ No

Does the municipality maintain a list of the names and dates of the municipal board and governing body members that review and approve applications for development and redevelopment projects who have completed the "Asking the Right Questions in Stormwater Review" training tool?: ◯ Yes ◯ No

Does the municipality maintain a list of the names and dates of individuals that review development and redevelopment projects for compliance with NJAC 7:8 on behalf of the municipality who have completed the Department approved stormwater management training once every 5 years?: ◯ Yes ◯ No

Outfall Pipe Mapping

Check the box(es) for the components included on the municipality's outfall pipe map in addition to MS4 outfalls and surface water bodies:

- ☑ Conveyances (Pipes,Swales, Ditches)
- ☑ Culverts
- ☑ Block and Lots
- ☐ Green Infrastructure
- ☐ Manufactured Treatment Devices
- ☑ Stormwater Management Basins
- ☑ Storm Drain Inlets
- ☑ Streets/Roadways
- ☑ Subsurface Infiltration/Detention Basins

Has the municipality included the outfall pipe map in the SPPP?: ◯ Yes ◯ No

Does the municipality update the outfall pipe map annually?: ◯ Yes ◯ No

Does the municipality's map identify outfalls that do not discharge to surface waters?: ◯ Yes ◯ No

Stream Scouring

How many outfalls did the municipality inspect for stream scouring in the past calendar year?: 30

How many instances of stream scouring were found during those inspections?: 6

How many instances of stream scouring were remediated in the past calendar year?: 6

Stormwater Facilities Maintenance

Does the municipality keep up to date stormwater facility maintenance logs and inspection records for stormwater facilities owned or operated by the municipality?: ◯ Yes ◯ No

How does the municipality ensure adequate long-term cleaning, operation, and maintenance of stormwater facilities not owned or operated by the municipality?:

Code Enforcement

Does the municipality keep up to date stormwater facility maintenance logs and inspection records for stormwater facilities not owned or operated by the municipality?: ◯ Yes ◯ No

Total Maximum Daily Load (TMDL)

Has the municipality reviewed TMDL reports to identify those which are relevant to the municipality's water bodies?: ◯ Yes ◯ No

How many TMDLs were found to be applicable to the municipality?:

How has the municipality used TMDL information to assist in the prioritization of stormwater facility maintenance?:

N/A

Has the municipality updated its SPPP to include TMDL information?: ◯ Yes ◯ No

Has the municipality incorporated any additional or optional measures? If so, please elaborate:

N/A

Major Development Project List

Provide the following information for each approved development or redevelopment project that is regulated by the Tier A MS4 NJPDES Permit, and not exempted under N.J.A.C. 7:8-1.6(b).

Tier A Municipality: Deptford		NJPDES#: NJG_____			PI ID#: _____		Calendar Year: 2022
Project Name / Date Complete Application Received	Block(s) / Lot(s)	5G3 Construction Stormwater Permit Auth.#	NJDEP Land Use Permit Required? (Y/N)	Total Area of Disturbance (acres)	Increase of Impervious > ¼ acre? (Y/N)	Variance or Exemption Granted As Per Part IV.B.4.h of the Tier A MS4 Permit	Design Reviewer(s)
Raising canes	Blk 200.01 Lot 25.01	Yes	Y☐ N☑	1.5	Y☑ N☐	Y☐ N☑	CME Associates, Micheal Roberts PE
A3 Industrial	Blk 417.01 Lot 10	Yes	Y☐ N☑	8.79	Y☑ N☐	Y☐ N☑	CME Associates, Micheal Roberts PE
Chick fil A	Blk 5.01 Lot 13.01	Yes	Y☐ N☑	1.36	Y☑ N☐	Y☐ N☑	CME Associates, Micheal Roberts PE
HHJ Petro	Blk 387.01 Lot 59 60 61	Yes	Y☐ N☑	6.8	Y☑ N☐	Y☐ N☑	CME Associates, Micheal Roberts PE
			Y☐ N☐		Y☐ N☐	Y☐ N☐	
			Y☐ N☐		Y☐ N☐	Y☐ N☐	

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Tier A Municipality: Deptford		NJPDES#: NJG_____			PI ID#: _____		Calendar Year: _____
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			Y☐ N☐		Y☐ N☐	Y☐ N☐	
			Y☐ N☐		Y☐ N☐	Y☐ N☐	
			Y☐ N☐		Y☐ N☐	Y☐ N☐	
			Y☐ N☐		Y☐ N☐	Y☐ N☐	
			Y☐ N☐		Y☐ N☐	Y☐ N☐	
			Y☐ N☐		Y☐ N☐	Y☐ N	

This Supplemental Questionnaire must be attached to your Annual Report to be considered complete. If you experience any difficulty in this process, please contact your municipal case manager at 609-633-7021.

1. Once you have completed the Questionnaire, use the "Save" function to save your answers to the Questionnaire to your computer. This can be done by going to FILE > then Save or Ctrl + S.
2. The completed and saved Questionnaire must then be uploaded as an attachment, in Part 7, to your Annual Report before the Annual Report is submitted to the Department.
3. To access the Annual Report, open the link to "NJDEP Online Portal" at http://www.nj.gov/dep/dwq/tier_a.htm. In Part 7, you will be asked to complete information regarding the file(s) to be uploaded. Navigate to your saved Questionnaire and then hit the "Upload" button in the lower right section of Part 7. The Annual Report will indicate if the Questionnaire was successfully uploaded. Then click on the "Continue" button and proceed with finalizing your Annual Report.