PREPARED FOR:

Borough of Keansburg
29 Church Street
Keansburg, New Jersey 07734

PREPARED BY:

T&M Associates
11 Tindall Road
Middletown, NJ 07748

TIER A MUNICIPAL
STORMWATER GENERAL PERMIT

STORMWATER POLUTION PREVENTION PLAN (SPPP) 2020 UPDATE

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

T&M PROJECT NO. KNBG-G2109
April 2021

Table of Contents

SPPP Signature Page

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: Raymond O'Hare, Borough Manager

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/06/2005 Date of most recent update: 04/30/2021

"I certify that this SPPP includes all of the information and items identified in Attachment A of the Tier A Municipal Stormwater General Permit. All attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. 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."

(Signature)

04/30/2021

(Date)

Robert F. Yuro, P.E., C.M.E.

(Print Name)

Borough Client Manager

(Title)

(NOTE: A new SPPP signature page should be attached each time the SPPP is updated or modified, excluding data entries. Previous SPPP signature pages shall be retained as part of the SPPP.)

Tier A Municipal Stormwater Regulation Program

Stormwater Pollution Prevention Team Members

Number of team members may vary.

Completed by: *Francis Mullan, P.E., C.M.E.*
Title: *Borough Engineer*
Date: *April 30, 2021*
Municipality: *Borough of Keansburg*
County: *Monmouth*
NJPDES #: *NJG0149101*
PI ID #: *203010*

Stormwater Program Coordinator: *Edward Striedl*
Title: *Zoning Officer/CFM*
Office Phone #: *732-787-0215*
Emergency Phone #: *Same as above*

Public Notice Coordinator: *Thomas P. Cusick*
Title: *Borough Clerk*
Office Phone #: *(732)787-0215*
Emergency Phone #: *Same as above*

Post-Construction Stormwater Management Coordinator: *Francis W. Mullan, P.E., C.M.E*
Title: *Borough Engineer*
Office Phone #: *(732) 671-6400*
Emergency Phone #: *Same as above*

Local Public Education Coordinator: *Thomas P. Cusick*
Title: *Borough Clerk*
Office Phone #: *(732)787-0215*
Emergency Phone #: *Same as above*

Ordinance Coordinator: *Hon. John O. Bennett III, Esq.,*
Title: *Borough Attorney*
Office Phone #: *(732) 530-8822*
Emergency Phone #: *Same as above*

Public Works Coordinator: *James Della Pietro*
Title: *Director of Public Works*
Office Phone #: *(732) 787-0215 x500*
Emergency Phone #: *Same as above*

Employee Training Coordinator: *James Della Pietro*
Title: *Director of Public Works*
Office Phone #: *(732) 787-0215 x500*
Emergency Phone #: *Same as above*

Other: Pollution Control- James Della Pietro
Title: Director of Public Works
Office Phone #: *(732) 787-0215 x500*
Emergency Phone #: *Same as above*

SPPP Form 2 - Public Notice

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: Thomas P. Cusick, Borough Clerk

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Briefly outline the principal ways in which you comply with applicable State and local public notice requirements when providing for public participation in the development and implementation of your stormwater program.

The Borough of Keansburg provides public notice of meetings as required by the Open Public Meetings Act ("Sunshine Law," N.J.S.A. 10:4-6 et seq.) and as required by N.J.S.A. 40:49-1 et. seq. for the passage of ordinances. The Borough will also provide public notice for municipal actions where necessary, for example in the adoption of applicable stormwater related ordinances or in the re-adoption of the stormwater management plan in subsequent re-examinations. All public notices will be in accordance with Municipal Land Use Law (N.J.S.A. 40:55D-1 et. seq.).

Copies of the Stormwater Pollution Prevention Plan (SPPP), the adopted Municipal Stormwater Management Plan and Stormwater Control Ordinance, and the community wide ordinances (pet waste, wildlife feeding, litter control, improper disposal of waste, yard waste program, illicit connections, and private storm drain inlet retrofitting) have also been posted on the Borough's website for review by the public.

Starting January 1, 2019, the Borough will also provide public notice to all public involvement projects pertaining to stormwater education and outreach activities either on the municipality's website, through a mass mailing, through an advertisement in the Borough newspaper of record or through other similar means.

SPPP Form 3 - New Development and Redevelopment Program

Municipality Information	
	Municipality: Borough of Keansburg County: Monmouth
	NJPDES #: NJG 0149101 PI ID #: 203010
	Team Member/Title: Francis W. Mullan, P.E., C.M.E., Borough Engineer
	Effective Date of Permit Authorization (EDPA): 04/01/2004
	Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Describe in general terms your post-construction stormwater management in new development and redevelopment program (post-construction program), and how it complies with the Tier A Permit minimum standard. This description must address compliance with the Residential Site Improvement Standards for stormwater management; ensuring adequate long-term operation and maintenance of BMPs (including BMPs on property that you own or operate); design of storm drain inlets (including inlets that you install); and preparation, adoption, approval, and implementation of a municipal stormwater management plan and municipal stormwater control ordinance(s). Attach additional pages as necessary. Some additional specific information (mainly about that plan and ordinance(s)) will be provided in your annual reports.

The Borough's post-construction stormwater management program for new development and redevelopment projects is as follows:

1. The Borough's Planning Board will continue to ensure that plans for all new residential development and redevelopment projects, subject to the Residential Site Improvement Standards (RSIS), are in compliance with the Stormwater Management Regulations (including NJAC 7:8) prior to issuance of final subdivision or site plan approvals under Municipal Land Use Law.

2. Borough representatives will ensure continued compliance of all private developments with the approved subdivision plans, and applicable ordinances, as well as, long term operation and maintenance plans of approved BMP's on private property. The Director of Public Works will be responsible for appropriate long-term operation and maintenance of BMP's on Borough property and will monitor private BMP's as needed to ensure proper operation and maintenance is being conducted in accordance with approved operation and maintenance plans.

SPPP Form 3 - New Development and Redevelopment Program (Continued)

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: Francis W. Mullan, P.E., C.M.E., Borough Engineer

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Describe in general terms your post-construction stormwater management in new development and redevelopment program (post-construction program), and how it complies with the Tier A Permit minimum standard. This description must address compliance with the Residential Site Improvement Standards for stormwater management; ensuring adequate long-term operation and maintenance of BMPs (including BMPs on property that you own or operate); design of storm drain inlets (including inlets that you install); and preparation, adoption, approval, and implementation of a municipal stormwater management plan and municipal stormwater control ordinance(s). Attach additional pages as necessary. Some additional specific information (mainly about that plan and ordinance(s)) will be provided in your annual reports.

3. The Borough's Planning Board will continue to ensure all plans for new development and redevelopment projects incorporate the new design of storm drain inlets. The Borough Engineer will ensure proper installation of said inlets and the Director of Public Works will be responsible for proper maintenance and/or retrofit of existing and new inlets. The Borough Engineer and Construction Official will ensure that any existing storm drain on private property in direct contact with a repaving, resurfacing, reconstruction or alteration will be retrofit to prevent discharge of solids and float-able to the Borough's Storm System. The Borough Code Enforcement Officer will ensure that all dumpsters are covered.

4. The Borough's Municipal Stormwater Management Plan (adopted April 10, 2006) and Stormwater Control Ordinance (adopted February 17, 2021) have been completed and adopted in accordance with NJDEP's requirements and final copies have been reviewed and approved by the Monmouth County Planning Board. Copies of both the plan and ordinance are included in Appendix 2 of this report and are also available for review and download on the Borough's website. The Municipal Stormwater Management Plan will be updated as needed as part of the re-examination of the Borough's master plan.

5. All new plans for new development and redevelopment projects are reviewed by the appropriate personnel for compliance with the design and maintenance measures adopted. Additionally, starting January 1, 2019, the Borough and/or their representatives will complete, update, finalize and maintain a "Major Development Stormwater Summary" for applicable structural and non-structural stormwater measures proposed. A copy of the summary report is included in Appendix 3 of this report.

SPPP Form 4 - Local Public Education Program

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: Thomas P. Cusick, Borough Clerk

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Local Public Education Program

Describe your Local Public Education Program. Be specific on how you will distribute your educational information, and how you will conduct your annual event. Attach additional pages with the date(s) of your annual mailing and the date and location of your annual event.

In accordance with the MS4 Permit requirements, the Borough 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). A complete list of activities and their corresponding points is provided in Appendix 4 of this report. The Borough is required to select activities from at least three of the five categories provided.

Due to COVD-19 restrictions, the Borough was unable to schedule all education activities. These activities will resume in 2021.

Based on a review of activities provided, the Borough will conduct the following:

- **WEBSITE** – The Borough 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. (1 POINT)
- **NEWSPAPER AD** – Use Department created and approved stormwater education materials available on www.cleanwaternj.org to publish an ad in a newspaper or newsletter that serves the municipality. (1 POINT)
- **RADIO/TELEVSION** – Broadcast a radio or television public service announcement from www.cleanwaternj.org on a local radio or municipal public service channel. (1 POINT)
- **STORMWATER DISPLAY** – The Borough will present a stormwater related display at the municipal building or other similar public venue. (1 POINT)
- **MAILING or E-Mailing CAMPAIGN** – The Borough will distribute any of the NJDEP 's educational brochures, tip cards or municipaly produced equivalent (e.g. Calendar, Recycling Schedule) to all residents and businesses along with one of its municipal mailings. (2 POINTS)
- **ORDINANCE EDUCATION** – The Borough will distribute a letter to all residents and business highlighting the requirements and benefits of the stormwater related ordinances adopted. (3 POINTS)
- **CLEAN UP** – The Borough will sponsor or organize a litter clean up for a scout troop, local school district, faith-based group or other community youth group along a local waterway, public park, stormwater facility, or in an area with storm drains that discharge to a local lake or waterway. (3 POINTS)

Additional activities will be evaluated and coordinated as needed throughout the year. See Appendix 4 of this report.

SPPP Form 5 - Storm Drain Inlet Labeling

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: Francis W. Mullan, P.E., C.M.E., Borough Engineer

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Storm Drain Inlet Labeling

Describe your storm drain inlet labeling program, including your labeling schedule, the details of your long-term maintenance plan, and plans on coordinating with watershed groups or other volunteer organizations.

Labeling of all existing Borough owned storm drain inlets and catch basins has been completed. This includes all inlets along sidewalks that are adjacent to Borough streets and inlets within plazas, parking areas or maintenance yards operated by the Borough. Labels used include the metal round markers entitled “NO DUMPING - DRAINS TO WATERWAYS”.

Periodic inspection and maintenance is conducted by Borough public work employees throughout the year during their maintenance and annual storm drain inlet cleaning program. Markers are checked to ensure they are visible and firmly attached to the inlet/catch basin head or casting. If necessary, Borough personnel will report any replacement needed and work orders will be generated to replace the missing or damaged markers. New inlets and catch basins are replaced with castings already marked in accordance with NJDEP requirements.

Records of the date and location of repair made is maintained separately by the Borough’s Public Work Department.

SPPP Form 6 - MS4 Outfall Pipe Mapping

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: Francis W. Mullan, P.E., C.M.E., Borough Engineer

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Explain how you will prepare your map (include its type and scale, and the schedule for the mapping process). Who will prepare your map (e.g., municipal employees, a consultant, etc.)?

All stormwater outfalls have been mapped as of August 1, 2005 and have been updated in October 2015.

The Borough has updated their existing mapping and collected digital data for their outfalls in accordance with the permit renewal requireemtns. Data collected has been uploaded to the NJDEP and accepted as of May 26, 2021.

Outfalls identified are provided with numeric identifiers. Mapping is updated as necessary as new drainage construction projects are completed.

SPPP Form 7 - Illicit Connection Elimination Program

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: James Della Pietro, Director of Public Works

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Describe your Illicit Connection Elimination Program and explain how you plan on responding to complaints and/or reports of illicit connections (e.g., hotlines, etc.). Attach additional pages as necessary.

The Borough will continue to inspect its outfalls for signs of dry weather flow. All outfalls will be inspected a minimum of once every 5 years using the NJDEP's Illicit Connection Inspection Report Forms. Outfalls that are found to have a dry weather flow or evidence of an intermittent non-stormwater flow will be re-inspected.

If an illicit connection is identified and located, the responsible party will be cited for being in violation of the Borough's Illicit Connection Ordinance and the connection will be eliminated. If, after three investigation attempts, the illicit connection is not found, a Closeout Investigation Form will be prepared and submitted along with the Borough's Annual Inspection and Recertification Report. Illicit connections found to originate from another public entity will be reported by the Borough to the affected entity and the NJDEP.

The appropriate paperwork is being maintained by the Borough's Public Work Department as needed.

Presently, residents may contact either the Borough Manager or Borough Clerk to report any spills, leaks of hazardous materials, or possible illicit connections.

Illicit Connection Inspection Report Form

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: James Della Pietro, Director of Public Works

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Outfall #:_____ Location:_____

Receiving Waterbody: _____

1. Is there a dry weather flow? Y ( ) N ( )
2. If "YES", what is the outfall flow estimate?_____gpm
   (flow sample should be kept for further testing, and this form will need to be submitted with the Annual Report and Certification)
3. Are there any indications of an intermittent flow? Y ( ) N ( )
4. If you answered "**NO**" to BOTH questions #1 and #3, there is probably not an illicit connection and you can skip to question #7.
   (NOTE: This form **does not** need to be submitted to the Department but should be kept with your SPPP.)

   If you answered "**YES**" to either question, please continue on to question #5.
   (NOTE: This form will need to be submitted to the Department with the Annual Report and Certification.)

5. **PHYSICAL OBSERVATIONS**:

(a) ODOR:

(b) **COLOR**:

(c) **TURBIDITY**:

FLOATABLES:

(e) **DEPOSITS/STAINS**:

VEGETATION CONDITIONS:

(g) **DAMAGE TO OUTFALL STRUCTURES**:

IDENTIFY STRUCTURE:

DAMAGE:

6. **ANALYSES OF OUTFALL FLOW SAMPLE:**

* field calibrate instruments in accordance with manufacturer's instructions prior to testing.

(a) **DETERGENTS**:_____mg/L

(if sample is greater than 0.06 mg/L, the sample is contaminated with detergents [which may be from sanitary wastewater or other sources]. Further testing is required, and this outfall should be given the highest priority.)

(if the sample is not greater than 0.06 mg/L and it does not show physical characteristics of sanitary wastewater [e.g., odor, floatables, and/or color] it is unlikely that it is from sanitary wastewater sources, yet there may still be an illicit connection of industrial wastewater, rinse water, backwash or cooling water. Skip to question #6c.)

(b) AMMONIA (as N) TO POTASSIUM RATIO:_____

(if the Ammonia to Potassium Ratio is greater than 0.6:1, then it is likely that the pollutant is sanitary sewage)

(if the Ammonia to Potassium Ratio is less than or equal to 0.6:1, then the pollutant is from another washwater source.)

(c) FLUORIDE:_____mg/L

(if the fluoride levels are between 1.0 and 2.5 mg/L, then the flow is most likely from fluoride treated potable water.)

(if the sample tests below a detection limit of 0.1 mg/L for fluoride, it is likely to be from groundwater infiltration, springs or streams. In some cases, however, it is possible that the discharge could originate from an onsite well used for industrial cooling water, which will test non-detect for both detergents and fluoride. To differentiate between these cooling water discharges and groundwater infiltration, you will have to rely on temperature.)

(d) TEMPERATURE:_____°F

(if the temperature of the sample is over 70°F, it is most likely cooling water)

(if the temperature of the sample is under 70°F, it is most likely from ground water infiltration)

7. Is there a suspected illicit connection? Y ( ) N ( )

   If "**YES**", what is the suspected source? _____

   If "**NO**", skip to signature block on the bottom of this form.

8. Has the investigation of the suspected illicit connection been completed? Y ( ) N ( )

   If "**YES**", proceed to question #9.
   If "**NO**", skip to signature block on the bottom of this form.

9. Was the source of the illicit connection found? Y ( ) N ( )

   If "**YES**", identify the source. _____

   What plan of action will follow to eliminate the illicit connection? Resolution:

   If "**NO**", complete the Closeout Investigation Form and attach it to this Illicit here is a dry weather flow or evidence of an intermittent flow, be sure to include this form with your Annual Report and Certification.

Inspector's Name: _____

Title: _____

Signature:_____ Date: _____

If there is a dry weather flow or evidence of an intermittent flow, be sure to include this form with your Annual Report and Certification.

If there is not a dry weather flow or evidence of an intermittent flow, this form should be retained with your SPPP.

Closeout Investigation Form

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: James Della Pietro, Director of Public Works

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Outfall #:_____ Location:_____

Receiving Waterbody: _____

Basis for Submittal:

( ) A non-stormwater discharge was found, but no source was located within six months.

( ) An intermittent non-stormwater discharge was observed, and three unsuccessful investigations were conducted to investigate the discharge while it was flowing.

Describe each phase of your investigation, including dates. Attach additional pages as necessary:

Inspector's Name: _____

Title: _____

Signature:_____ Date:_____

Complete and attach this form to the appropriate Illicit Connection Inspection Report Form and submit with the Annual Report and Certification.

SPPP Form 8 - Illicit Connection Records

Municipality Information	
	Municipality: Borough of Keansburg County: Monmouth
	NJPDES #: NJG 0149101 PI ID #: 203010
	Team Member/Title: James Della Pietro, Director of Public Works
	Effective Date of Permit Authorization (EDPA): 04/01/2004
	Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

January 1, 2017 – December 31, 2017 ***Note:*** *Attach a copy of each illicit connection report form for outfalls found to have a dry weather flow.*
Total number of inspections performed this year? N/A
Number of outfalls found to have a dry weather flow? N/A
Number of outfalls found to have an illicit connection? N/A
How many illicit connections were eliminated? N/A
Of the illicit connections found, how many remain? N/A

January 1, 2018 – December 31, 2018 ***Note:*** *Attach a copy of each illicit connection report form for outfalls found to have a dry weather flow.*
Total number of inspections performed this year? N/A
Number of outfalls found to have a dry weather flow? N/A
Number of outfalls found to have an illicit connection? N/A
How many illicit connections were eliminated? N/A
Of the illicit connections found, how many remain? N/A

January 1, 2019 – December 31, 2019 ***Note:*** *Attach a copy of each illicit connection report form for outfalls found to have a dry weather flow.*
Total number of inspections performed this year? N/A
Number of outfalls found to have a dry weather flow? N/A
Number of outfalls found to have an illicit connection? N/A
How many illicit connections were eliminated? N/A
Of the illicit connections found, how many remain? N/A

January 1, 2020 – December 31, 2020 ***Note:*** *Attach a copy of each illicit connection report form for outfalls found to have a dry weather flow.*
Total number of inspections performed this year? N/A
Number of outfalls found to have a dry weather flow? N/A
Number of outfalls found to have an illicit connection? N/A
How many illicit connections were eliminated? N/A
Of the illicit connections found, how many remain? N/A

SPPP Form 9 - Yard Waste Collection/Ordinance Program

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: James Della Pietro, Director of Public Works

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Please describe your yard waste collection program. Be sure to include the collection schedule and how you will notify the residents and businesses of this schedule. Attach additional pages as necessary.

The Borough currently posts on their website and distributes an annual newsletter to all residents and businesses a newsletter/annual calendar that outlines the Borough's recycling and yard waste collection system and clean-up procedures. A collection schedule is also included.

The Yard Waste Collection Ordinance was adopted on October 26, 2005. Yard waste is collected twice per year.

SPPP Form 10 - Ordinances

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: Hon. John O. Bennett III, Esq., Borough Attorney

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

For each ordinance, give the date of adoption. If not yet adopted, explain the development status:

Pet Waste Adopted on 10/26/2005

Are information sheets regarding pet waste distributed with pet licenses? Y (X) N ( )

Litter Adopted on 10/26/2005

Improper Waste Disposal Adopted on 10/26/2005

Wildlife Feeding Adopted on 10/26/2005

Yard Waste Adopted on 10/26/2005

Illicit Connections Adopted on 10/26/2005

Private Storm Drain Retrofitting Ordinance #1499

Refuse Containers and Dumpsters Ordinance #1500

How will these ordinances be enforced?

Local code enforcement/zoning officers will enforce these ordinances. If someone violates one of these ordinances, they will be given a warning before a summons is issued for the violation.

Records of violations issued are maintained by the Borough and reported as needed to the NJDEP in the Borough's Annual Inspection and Recertification Report.

SPPP Form 11 – Storm Drain Inlet Retrofitting

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: Francis W. Mullan, P.E., C.M.E., Borough Engineer

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

What type of storm drain inlet design will generally be used for retrofitting?

The Borough utilizes NJDOT bicycle safe grates and Campbell Foundry Model Type B inlet with a 6" Type N-ECO curb piece or equal.

Repaving, repairing, reconstruction or alteration project name	Projected start date	Start date	Date of completion	# of storm drain inlets	# of storm drains w/ hydraulic exemptions
Raritan Avenue Drainage Improvements		3/2014	5/2016	45	0
Outfall Extensions (#11 / #14)		3/2014	12/2016	4	0
Shore Boulevard Reconstruction		5/2016	6/2017	18	0
Leola Avenue Drainage Improvements		10/2017	6/2018	11	0

Are you claiming any alternative device exemptions or historic place exemptions for any of the above projects? Please explain:

The Borough's Engineer will maintain a list of Capital Improvements Projects and the number of inlets and/or catch basins being replaced. Quantities will be reported annually in the Borough's Annual Inspection and Recertification Report. No exemptions have been requested to date. In the event one is needed documentation will be provided in accordance with NJDEP requirements.

SPPP Form 12 – Street Sweeping and Road Erosion Control Maintenance

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: James Della Pietro, Director of Public Works

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Street Sweeping

Please describe the street sweeping schedule that you will maintain.
(NOTE: Attach a street sweeping log containing the following information: date and area swept, # of miles swept and the total amount of materials collected.)

The Borough of Keansburg has evaluated all of its streets to determine which areas will need to be swept monthly. We have determined that we are already sweeping all municipally owned or operated curbed streets (including roads or highways) with stormdrains that have a posted speed limit of 35mph or less (excluding all entrance and exist ramps) in predominately commercial areas at lease once per month, weather and street surface conditions permitting.

The Borough intends to maintian its existing street sweeping scheudle for all other streets (that are not requried by the permit), which includes sweeping all main roads (including those I predominantly commercial areas) on a daily basis from Easter through Labor Day, and sweeping all main roads at least once per week the remainder of the year, weather and street surface conditions permitting.

See Appendix 7 for detailed description of the Borough's street sweeping program. Records of the sweepings collected and the dates are maintained by the Public Works Department.

Road Erosion Control Maintenance

Describe your Road Erosion Control Maintenance Program, including inspection schedules. A list of all sites of roadside erosion and the repair technique(s) you will be using for each site should be attached to this form.
(NOTE: Attach a road erosion control maintenance log containing the following information: location, repairs, date)

The Borough of Keansburg will use the Public Works Department to monitor all their roads and streets for erosion problems during normal patrols. All identified road erosion problems will be reported to Director of Public Works (or designee). Identified areas of erosion will be discussed and repairs prioritized. Maintenance personnel will then be assigned to the areas of concern, and the areas identified to have road erosion problems will be repaired in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey. The Public Works Department will document these actives on the "Daily route Sheet" (sample in Appendix 6) kept in the Department of Public Works office. The status of the Road Erosion Control Maintenance Program will be included in the Annual Report and Recertification. The Borough performs its Road Erosion Control Maintenance Program by inspecting all roadways on a weekly basis.

If erosion is encountered, stabilization in the form of grading, seeding and straw is applied. The Borough will maintain records of street inspections conducted, as well as, a list of repairs and the dates they were completed.

SPPP Form 13 – Stormwater Facility Maintenance

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: James Della Pietro, Director of Public Works

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Please describe your annual catch basin cleaning program and schedule. Attach a map/diagram or additional pages as necessary.

The Borough will continue to conduct their existing inspection and cleaning activities of their catch basins which is conducted on pace to inspect all catch basins at a minimum of once every 5 years. If at the time of inspection, If at the time of inspection, no sediment, trash or debris is observed in the catch basin, then that catch basin will not be cleaned. All catch basins will be inspected yearly, even if they were found to be "clean" the previous year. At the time of cleaning, the catch basin will also be inspected for proper function. Maintenance will be scheduled for those catch basins that are in disrepair. Catch basin cleanign and maintenance will be documented.

See Appendix 7 for additional information.

Please describe your stormwater facility maintenance program for cleaning and maintenance of all stormwater facilities operated by the municipality. Attach additional pages as necessary.

(NOTE: Attach a maintenance log containing information on any repairs/maintenance performed on stormwater facilities to ensure their proper function and operation.)

The Borough of Keansburg has implemented a stormwater facility maintenance program to ensure that all stormwater facilities operated by the Borough function properly. The Borough operates the following:

-Catch Basin (The catch basin inspection and maintenance program is described above)

-Grease Traps (Seven grease traps are inspected monthly and cleaned as necessary)

These stormwater facilities will be inspected at least annually to insure that they are functioning properly. Preventative or corrective maintenance will be performed as necessary on all stormwater facilities to ensure continued proper functioning. The inspection and maintenance of catch basins is documeted on the"DEP Storm Basin Inspection Log," a DPW computer database. The inspection and maintenance of grease traps is documented on the "Grease Trap Master List," a DPW computer database.

The Borough will continue to maintain its existing stormwater system maintenance program to ensure systems are functioning properly. All stormwater facilities are maintained, inspected and cleaned on a monthly basis.

See Appendix 7 for a detailed description of the Borough's stormwater facility maintenance program. Records of inspection and routine maintenance and/or repairs are kept by the Borough's DPW Department.

SPPP Form 14 - Outfall Pipe Stream Scouring Remediation

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: James Della Pietro, Director of Public Works

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Describe your stormwater outfall pipe scouring detection, remediation and maintenance program to detect and control active localized stream and stream bank scouring. Attach additional pages as necessary.

(NOTE: Attach a prioritized list of sites observed to have outfall pipe stream and stream bank scouring, date of anticipated repair, method of repair and date of completion.)

The Borough of Keansburg implemented its Outfall Pipe Stream Scouring Remediation within 18 months of the EDPA (i.e. prior to October 1, 2015).

The Borough will continue to conduct outfalls inspections a minimum of once every 5 years as required by the permit renewal requirements, along with its dry weather flow inspections. Outfall pipes showing signs of scouring will be reported to the Director of Public Works and the Borough Engineer.

These outfalls will be evaluated to determine if additional rehabiliation, repair or replacement is necessary. Based on the condition of the outfall, they will be prioritized for rehabilitation and/or repair in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey. Repairs and/or rehabilitation work that does not require NJDEP permits will be prioritized first.

All repairs will be followed with an annual inspection to ensure that the scouring has not resumed.

Records of all inspection, maintenance and/or rehabilitation/repairs conducted will be kept by the Borough's DPW Department.

SPPP Form 15 - De-icing Material Storage

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: James Della Pietro, Director of Public Works

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

De-icing Material Storage

Describe how you currently store your municipality's de-icing materials and describe your inspection schedule for the storage area. If your current storage practices do not meet the de-icing material storage SBR describe your construction schedule and your seasonal tarping interim measures. If you plan on sharing a storage structure, please include its location, as well as a complete list of all concerned public entities. If you store sand outdoors, describe how it meets the minimum standard.

The Borough of Keansburg currently stores its de-icing salt in a permanent structure at the Public Works Yard, located at 40 Frazee Place in accordance with the Statewide Basic Requirements. De-Icing material handling will be conducted in accordance with section 3.2 of the Standard Operating Procedure for Good Housekeeping.

The Borough of Keansburg does not store sand.

SPPP Form 16 – Standard Operating Procedures

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: James Della Pietro, Director of Public Works

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

BMP	Date SOP went into effect	Describe your inspection schedule
Fueling Operations (including the required practices listed in Attachment D of the permit)	April 1, 2015	Our only fueling facility, located in the Public Works Yard at 40 Frazee Place, will be inspected at least once per month.
Vehicle Maintenance (including the required practices listed in Attachment D of the permit)	April 1, 2005	We will perform monthly inspections of vehicle maintenance operations in order to ensure that the Standard Operating Procedure is followed.
Vehicle Washing	NOT APPLICABLE	*NO VEHICLE WASHING IS CONDUCTED ONSITE; THE BOROUGH UTILIZES OFFSITE FACILITIES FOR ANY VEHICLE WASHING NEEDED. RECORDS ARE MAINTAINED WHERE APPLICABLE.
Good Housekeeping Practices (including the required practices listed in Attachment D of the permit) **Attach inventory list required by Attachment D of the permit**.	April 1, 2005	Monthly inspections of the Public Work Yard at 40 Frazee Place will be performed.

SPPP Form 17 - Employee Training

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: James Della Pietro, Director of Public Works

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Describe your employee training program. For each required topic, list the employees that will receive training on that topic, and the date the training will be held. Attach additional pages as necessary.

The Borough's Employee Training Program will be broken down into four (4) phases. Phase 1 will include training to be undertaken by the Borough's Board Members and Governing Bodies. Phase 2 will include training requirements for Borough representatives responsible for overseeing the reviews of development and redevelopment applications. Phase 3 will include topics that will be covered on an annual basis with applicable employees. Phase 4 will include those topics that will be covered every two (2) years with applicable employees. Records of all training sessions scheduled for Phase 2 and Phase 3 will be maintained by the Borough's DPW Department. Training will be conducted either through webinars, video training and/or field training where necessary.

Attendance for Phase 3 and 4 of the employee training program will be recorded and maintained by the Borough's DPW Department for future reporting in the Borough's Annual Inspection and Recertification Report, where applicable.

Phase 1 – Municipal Board and Governing Body Members

Borough Board and Governing Body Members that review and approve applications for development and redevelopment projects complete one of the NJDEP's "Training Tools" under their Post Construction Stormwater Management website. Training can be found at https://www.nj.gov/dep/stormwater/training.htm and should be completed within the first month of a new term. Borough Board and Governing Body members will provide the Borough DPW Director with confirmation that the training has been conducted for input in the Borough's Annual Inspection and Recertification Report where applicable.

Phase 2 – Development/Redevelopment Application Reviewer Training

All Borough employees and/or representatives that review development and redevelopment projects for the Borough must complete an NJDEP approved training either offered by NJDEP or other training agency. The initial training must be completed by January 1, 2019 and then taken once every 5 years thereafter. Borough representatives will provide the Borough DPW Director with confirmation that the training has been conducted for input in the Borough's Annual Inspection and Recertification Report where applicable.

SPPP Form 17 - Employee Training (Continued)

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: James Della Pietro, Director of Public Works

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/6/2005 Date of most recent update: 04/30/2021

Describe your employee training program. For each required topic, list the employees that will receive training on that topic, and the date the training will be held. Attach additional pages as necessary.

Phase 3 – Annual Employee Training Program

Waste Disposal Education	Selected Clerks and possibly Police Dept Personnel
Municipal Ordinance Employees	Selected Code Enforcement, Police Department and Public works
Maintenance Yard Operations	Public Works employees & other users as appropriate
STW Facility Maintenance Program	Public Works employees
General SPPP	Public Works employees

Phase 4 – Bi-Annual Employee Training Program

Improper Waste Disposal Education	Code Enforcement Officer & Public Works Employees
Municipal Ordinances	Code Enforcement Officer, Public Works Employees, Police Dept.
Yard Waste Collection Program	Public Works employees
Street Sweeping Program	Public Works employees
Outfall Pipe Stream Scouring Remediation	Public Works employees
Illicit Connection Elimination and Outfall Pipe Mapping	Public Works employees
Construction Activity/Post Construction Stormwater Management in New Development & Redevelopment	Public Works employees & Code Enforcement Officer

The illicit connection elimination training may include field training on procedures to properly conduct outfall inspections for illicit connections, follow-up investigation and procedures for elimination of the illicit connection for new employees. The maintenance yard operations training may include field training on the standard operating procedures for fueling, vehicle maintenance and good housekeeping practices.

As necessary, the Borough will evaluate alternative training tools to optimize the training program. Alternative training tools may include the use of informational CD's provided by MELJIF or through formal training seminars offered by Rutger's Cooperative Extension. Links to training sources can be found at https://www.njstormwater.org/training.htm.

SPPP Form 18 – TMDL Info

Municipality Information

Municipality: Borough of Keansburg County: Monmouth

NJPDES #: NJG 0149101 PI ID #: 203010

Team Member/Title: Raymond O'Hare, Borough Manager

Effective Date of Permit Authorization (EDPA): 04/01/2004

Date of Completion: 03/06/2005 Date of most recent update: 04/30/2021

Using the Total Maximum Daily Load (TMDL) reports provided on the NJDEP website, list adopted TMDLs for the municipality, parameters addressed, and affected waters bodies impacted. Describe how you will use the TMDL information to prioritize stormwater facilities maintenance projects and to address specific sources of stormwater pollutants.

Applicable Shellfish TMDLs:

- *Five Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 12*
  Total coliform - 2006 : Waackaack Creek-A

Based on a review of the above referenced TMDL reports, TMDL parameters identified within waterbodies impacted by the Broough include Fecal and Total Coliform, along with Pathogens. Implementation recommendations were reviewed and the Borough has already complied with implementation of their Phase II Stormwater Program, including adoption of the necessary pet waste, wildlife feeding and other community wide ordinances.

The Borough also continues to actively inspect and clean their stormwater infrastructure as outlined in the street sweeping, catch basin cleaning and outfall inspection requirements of their MS4 permit and they meet or exceed the minimum annual requirements where necessary.

The Borough's Local Public Education is being evaluted to determine what additional education material can be provided to area residents and businesses with respect to goose management, wildlife feeding impacts, mercury poisoning and other topics relavant to the TMDLs listed at future events.

APPENDIX 1

Borough Wide Stormwater Master Plan

BOROUGH WIDE STORMWATER MASTER PLAN

INTRODUCTION

The Borough of Keansburg is located adjacent to the Sandy Hook Bay and the Raritan Bay, and is bounded on the west by Waackaack Creek, State Highway Route 36 on the south, and Middletown Township to the east. The Borough consists of approximately 1.0 square mile of which 450 acres (0.7 square mile) drain to the Raritan/Sandy Hook Bay via six (6) existing drainage outfall pipes as outlined in red on the attached drainage map. The remaining area (0.3 square mile) drains to Waackaack Creek via various storm inlets and piping to a series of small outlet pipes as outlined in blue on the attached drainage area map.

EXISTING CONDITIONS

Topography throughout the Borough is generally flat with a slight variation in grade. A majority of the roadway grades are flat with poor surface (gutter flow) drainage. The existing drainage systems throughout the Borough are generally undersized and/or deteriorated. Where new drainage systems have been installed they are generally connected to existing deteriorated systems which do not have the capacity to convey required flow. In some instances the new systems were improperly installed which further exacerbates the flooding conditions. All of these conditions contribute to the persistent Borough wide flooding.

The existing flooding conditions are further aggravated by tidal action. During periods of high tide and/or tidal surge due to coastal storms, portions of the existing drainage systems become submerged reducing flow carrying capacity of the drainage system which prevents the conveyance of stormwater from the interior collection systems.

The six (6) drainage outfalls into the Raritan Bay and Sandy Hook Bay were built in the late 1960s as part of Army Corp of Engineers (ACOE), Raritan Bay and Sandy Hook Bay Beach Erosion and Hurricane project. The Borough constructed an additional outfall at Twilight Avenue in 1989. The original outfalls built as part of the Corps project are presently in poor condition and do not function. In many cases, the existing outfall chamber, flap valve and sluice gates are not operable,

which allows tidal waters to back flow into the interior stormwater collection systems and inundate the Borough streets.

The Borough recently completed the installation of two (2) stormwater pump stations. The first pump station is located at the end of Raritan Avenue and has a tributary area of approximately 140 acres. The second pump station is located at the end of Beacon Light Avenue having a tributary area of approximately 135 acres. These pump stations were designed to pump stormwater runoff from the upstream tributary areas during periods of high tide reducing the potential for localized street flooding within their tributary area. In addition to the new pump stations, the New Jersey Department of Environmental Protection (NJDEP) recently awarded a construction contract to replace five (5) of the existing stormwater outfalls and chambers. The project involves the replacement of the outfall chamber, flap valve, sluice gate, and outfall pipe into the Raritan/Sandy Hook Bay. The project does not include replacement and/or installation of drainage pipe landward of the new outfall chamber. In order for the new pump stations and outfall structures to have an impact on flooding within the Borough, the Borough must construct the necessary drainage piping landward of the new outfall chambers to provide a positive connection from the upstream tributary areas to the new outfall pipe.

RECOMMENDATIONS

In order for the new pump stations with the new outfalls to have a significant impact on flooding within the Borough, we recommend the Borough implement a drainage improvement program which will upgrade the existing drainage systems and provide a positive connection to each of the new outfalls. This program can be implemented in various phases over a number of years and can be expanded to include known areas of localized flooding throughout the Borough. We recommend the following improvements for the Borough's consideration:

- Priority No. 1 (Year 2011) – Raritan Avenue Drainage Improvements

  The Borough has authorized the preparation of design plans and specifications for the Raritan Avenue drainage improvements. The purpose of these improvements is to provide positive conveyance of stormwater runoff from the upstream areas tributary to the Raritan Avenue pump station and new outfall pipe. The improvements include the installation of a

new drainage trunk line from Beachway south along Raritan Avenue, up to East Shore Street. New drainage inlets will be installed along the trunk line alignment to capture surface (gutter flow). A new drainage pipe will extend from Raritan Avenue west up East Shore Street and Oak Street to Carr Avenue. The intersection of Carr Avenue with Oak Street and East Shore Street has been a source of persistent flooding. These improvements will reduce the frequency of flooding within the area and, when flooding does occur, will allow the area to drain in a short period time. We estimate the total project costs to be approximately $500,000 to 550,000.

- Priority No. 2 (Year 2012) – Beacon Light Avenue Drainage Improvements

  The improvements include the installation of a 24"drainage trunk line along Beacon Light Avenue from Shore Boulevard to Twilight Avenue. New drainage inlets will be installed along Beacon Light Avenue at the intersecting streets capture surface runoff. The purpose of the improvement is to provide positive connection of the existing upstream interior drainage system to the new stormwater pump station and outfall pipe. The trunk line has been designed for future extension of this system to address localized flooding within the tributary area. We estimate the project costs to be approximately $300,000 to $325,000.

- Priority No. 3 (Year 2013) – Beachway Avenue Drainage Improvements

  The improvements include the installation of drainage improvements at the intersection of Bayview Avenue and Beachway to provide a positive connection of the existing interior drainage collection system to the proposed drainage outfall pipe. The project includes the installation of a drainage pipe landward of the new outlet structure to provide a positive connection from the drainage system in the roadway to the new outfall pipe.

  In order to provide a positive flow from the drainage system in the Borough's roadway to the outfall, the plan proposes to install a new 42 inch RCP from Beachway north to the outlet chamber. A new drainage inlet will be installed on Beachway to accommodate the new 42 inch pipe. Two (2) new drainage inlets will be installed approximately 150 feet east and west of the outfall connection pipe to collect gutter flow along this portion of Beachway

and convey it to the outfall. The new drainage line will extended southerly from the new inlet across Beachway and connect to the existing drainage system on Bayview Avenue. New inlets and piping will be installed at the intersection of Bayview Avenue and Beachway. The existing drainage system north of the Bayview and Beachway intersection will remain as it exists today and will be further analyzed and possibly considered for future phases of drainage system improvements. The intersection will be regraded and paved for approximately 50 feet east and west to provide positive gutter flow to all new drainage inlets. The total project costs are estimated to be $150,000 to $200,000.

- Priority No. 4 (Year 2014) – Twilight Avenue Drainage Improvements

  The improvements include the rehabilitation of the existing 42" Twilight Avenue trunk line that installed in 1989. Over the years the existing trunk line has experienced blockage due to collapsed pipe, roadway sinkholes and poor storm water conveyance. The rehabilitation program includes an internal television inspection of the trunk line to identify defects in the existing system. The rehabilitation of the system will include internal as well as external repairs of existing piping. Since the type and limits of the repair work is unknown and will be determined by the TV inspection of the existing piping system, detailed cost estimates were not yet developed. However, for budgeting purpose we recommend the Borough allocate $250,000.00 for this work.

- Priority No. 5 (Year 2015) – Carr Avenue and Fishing Pier Outfall Drainage Improvements

  The improvements include the installation of a 24"drainage trunk line landward of the outfall structure at the Carr Avenue and fishing pier outfall to Beachway. The purpose of the improvement is to provide positive connection of the existing upstream interior drainage system to the new outfall pipe. Again the system is designed for future extension to address localized flooding within the tributary area. We estimate the project costs to be approximately $300,000.00 to $350,000.00.

The drainage improvement program listed above must be implemented in order for the Borough to realize the benefits of the recently installed pump stations and proposed outfall pipes. As the positive connection is made to each outfall, the drainage system may be extended to area of localized flooding within the watersheds. The proposed trunk lines will be installed as deep as possible to accommodate the extension of the systems to upstream flooding areas.

PLOTTED:

BASE INFO – DCA Rotation: 0 Base Point: 0,0

#11
FISHING PIER OUTFALL
DA = 34 Ac±

#12
CARR AVENUE OUTFALL 1Ac±

#13
RARITAN AVENUE PUMP STATION | OUTFALL
DA = 140 Ac±

#14
BAYVIEW AVENUE OUTFALL
DA= 75 Ac±

#15
TWILIGHT AVENUE OUTFALL
DA=62 Ac±

#16
BEACON LIGHT PUMP STATION | OUTFALL
DA = 185 Ac±

AREA TRIBUTARY TO THE RARITAN BAY

AREA TRIBUTARY TO THE WAACKAACK CREEK

GRAPHIC SCALE
250 0 125 250 500
(IN FEET)
1 inch = 250 ft.

NO.	DATE	REVISIONS	BY	CHECKED

BOROUGH OF KEANSBURG

STORMWATER MASTER PLAN

DRAINAGE AREA MAP

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365
NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS
CERTIFICATE OF AUTHORIZATION 24GA27967500

FRANCIS W. MULLAN, P.E., C.M.E.
KEANSBURG BOROUGH ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY LICENSE No. 24GE03824800

9/28/11
DATE

DESIGNED BY	DRAWN BY	CHECKED BY
DMD	BLH	FWM

PROJECT NO. KNBG-00910 | CADD FILE N:\KNBG\00910\Plans\Drainage Area Map.dwg | FIELD BK. # N/A

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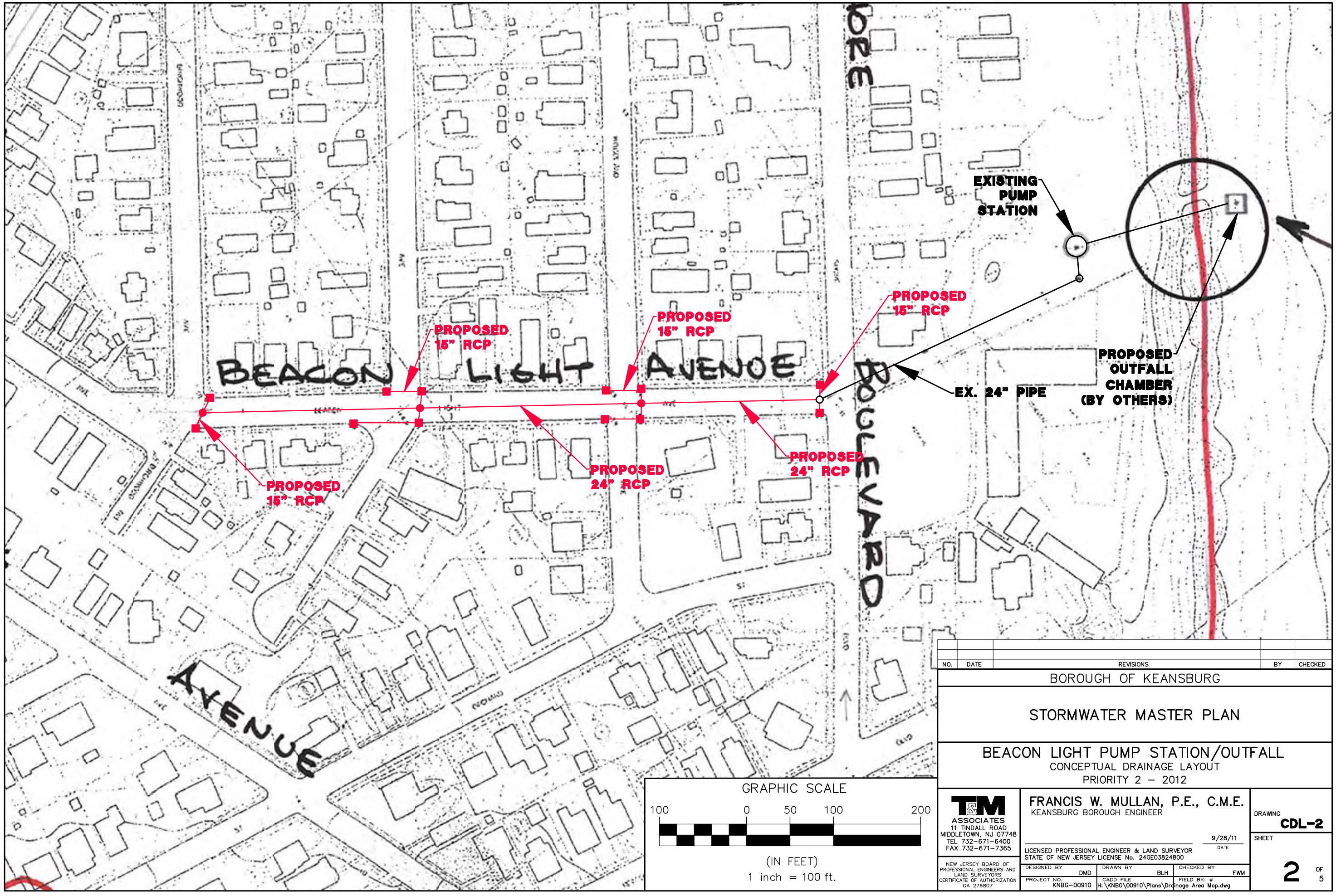

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

1 inch = 100 ft.

NO.	DATE	REVISIONS	BY	CHECKED

BOROUGH OF KEANSBURG

STORMWATER MASTER PLAN

BEACON LIGHT PUMP STATION/OUTFALL

CONCEPTUAL DRAINAGE LAYOUT
PRIORITY 2 – 2012

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365

NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS CERTIFICATE OF AUTHORIZATION GA 276807

FRANCIS W. MULLAN, P.E., C.M.E.
KEANSBURG BOROUGH ENGINEER

LICENSED PROFESSIONAL ENGINEER & LAND SURVEYOR
STATE OF NEW JERSEY LICENSE No. 24GE03824800

9/28/11
DATE

DESIGNED BY	DRAWN BY	CHECKED BY
DMD	BLH	FWM

PROJECT NO.	CADD FILE	FIELD BK. #
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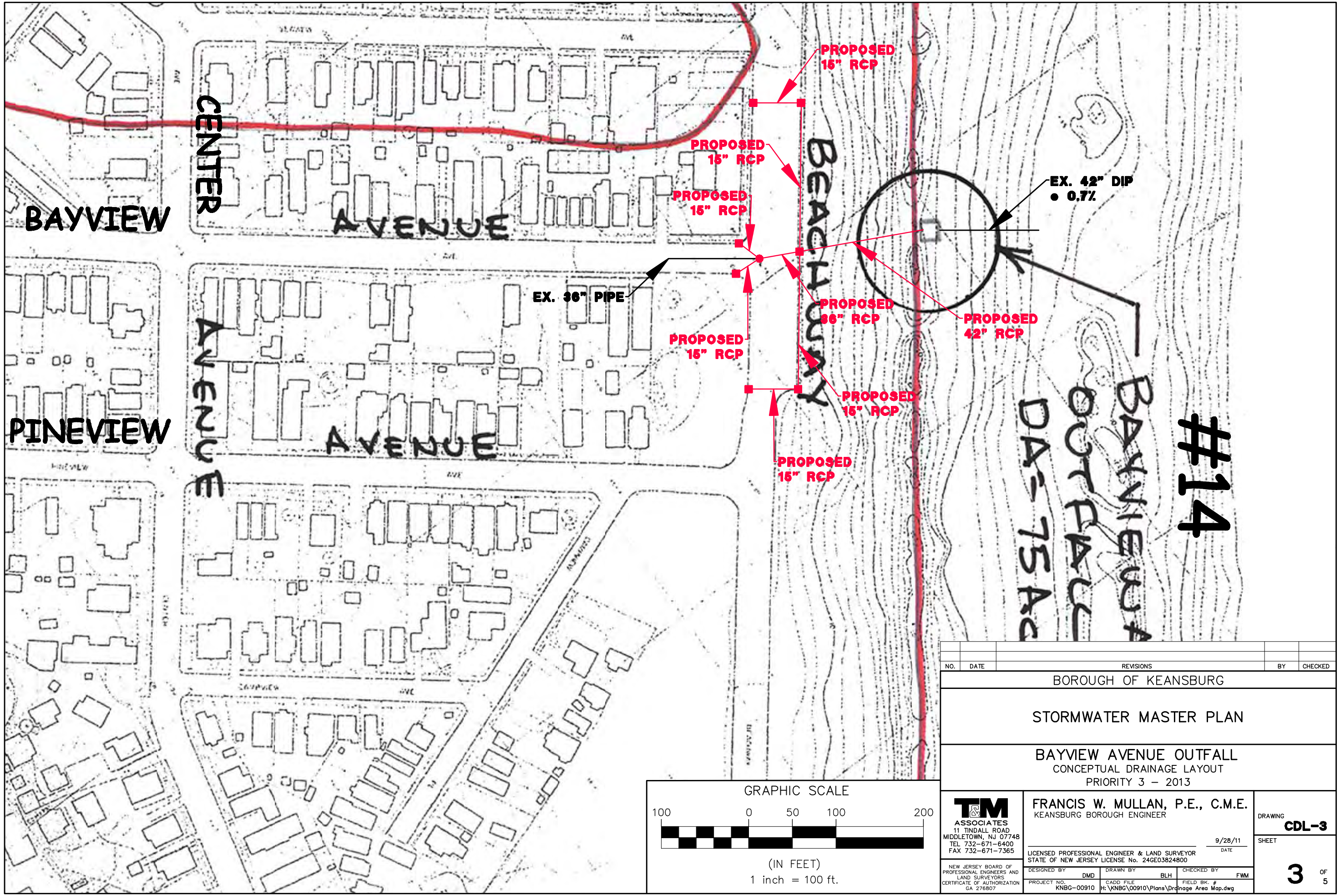

GRAPHIC SCALE

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(IN FEET)

1 inch = 100 ft.

NO.	DATE	REVISIONS	BY	CHECKED

BOROUGH OF KEANSBURG

STORMWATER MASTER PLAN

BAYVIEW AVENUE OUTFALL

CONCEPTUAL DRAINAGE LAYOUT

PRIORITY 3 – 2013

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365

NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS CERTIFICATE OF AUTHORIZATION GA 276807

FRANCIS W. MULLAN, P.E., C.M.E.
KEANSBURG BOROUGH ENGINEER

LICENSED PROFESSIONAL ENGINEER & LAND SURVEYOR
STATE OF NEW JERSEY LICENSE No. 24GE03824800

9/28/11
DATE

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DMD	BLH	FWM

PROJECT NO. KNBG-00910

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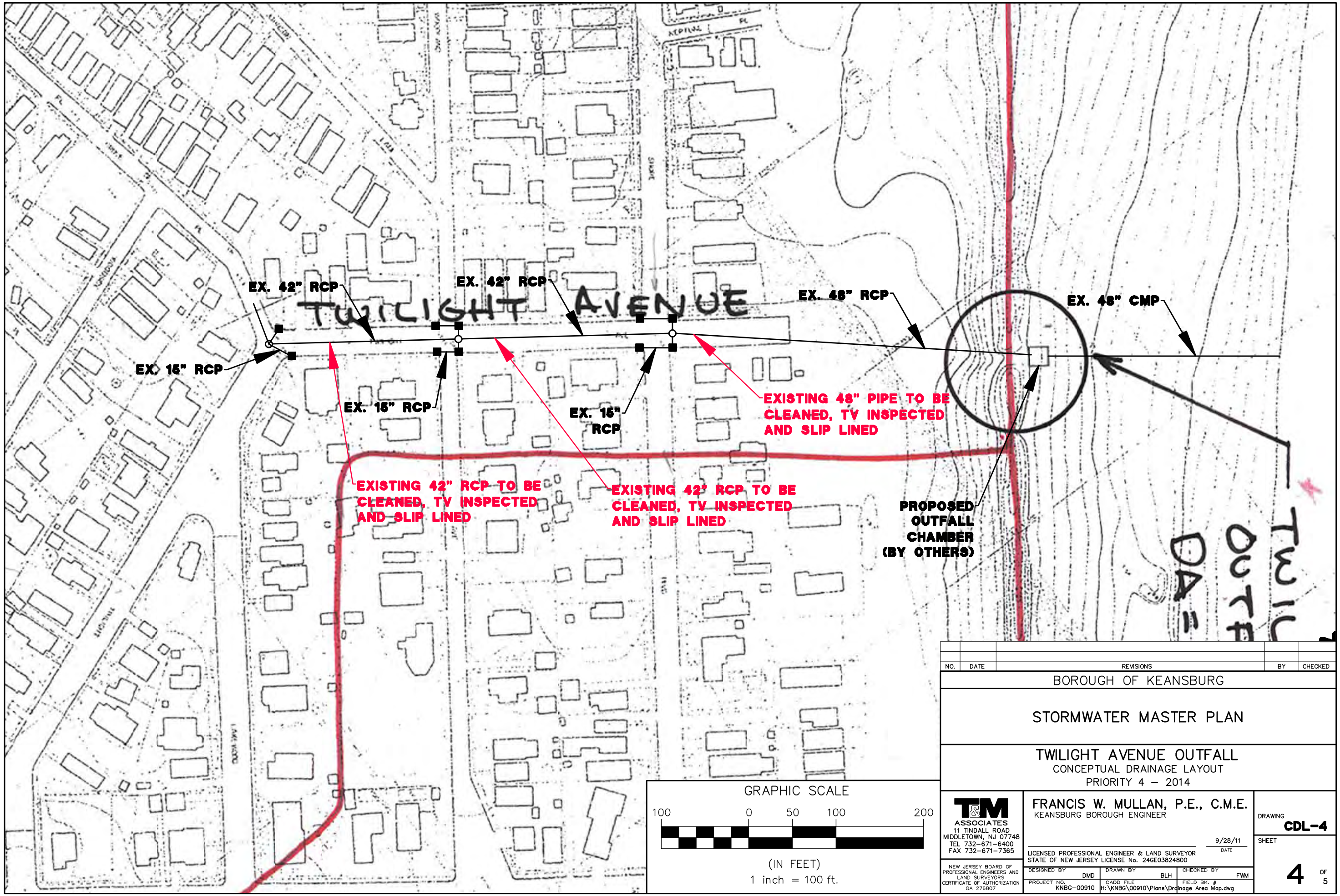

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BOROUGH OF KEANSBURG

STORMWATER MASTER PLAN

TWILIGHT AVENUE OUTFALL
CONCEPTUAL DRAINAGE LAYOUT
PRIORITY 4 – 2014

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365

NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS
CERTIFICATE OF AUTHORIZATION
GA 276807

FRANCIS W. MULLAN, P.E., C.M.E.
KEANSBURG BOROUGH ENGINEER

9/28/11
DATE

LICENSED PROFESSIONAL ENGINEER & LAND SURVEYOR
STATE OF NEW JERSEY LICENSE No. 24GE03824800

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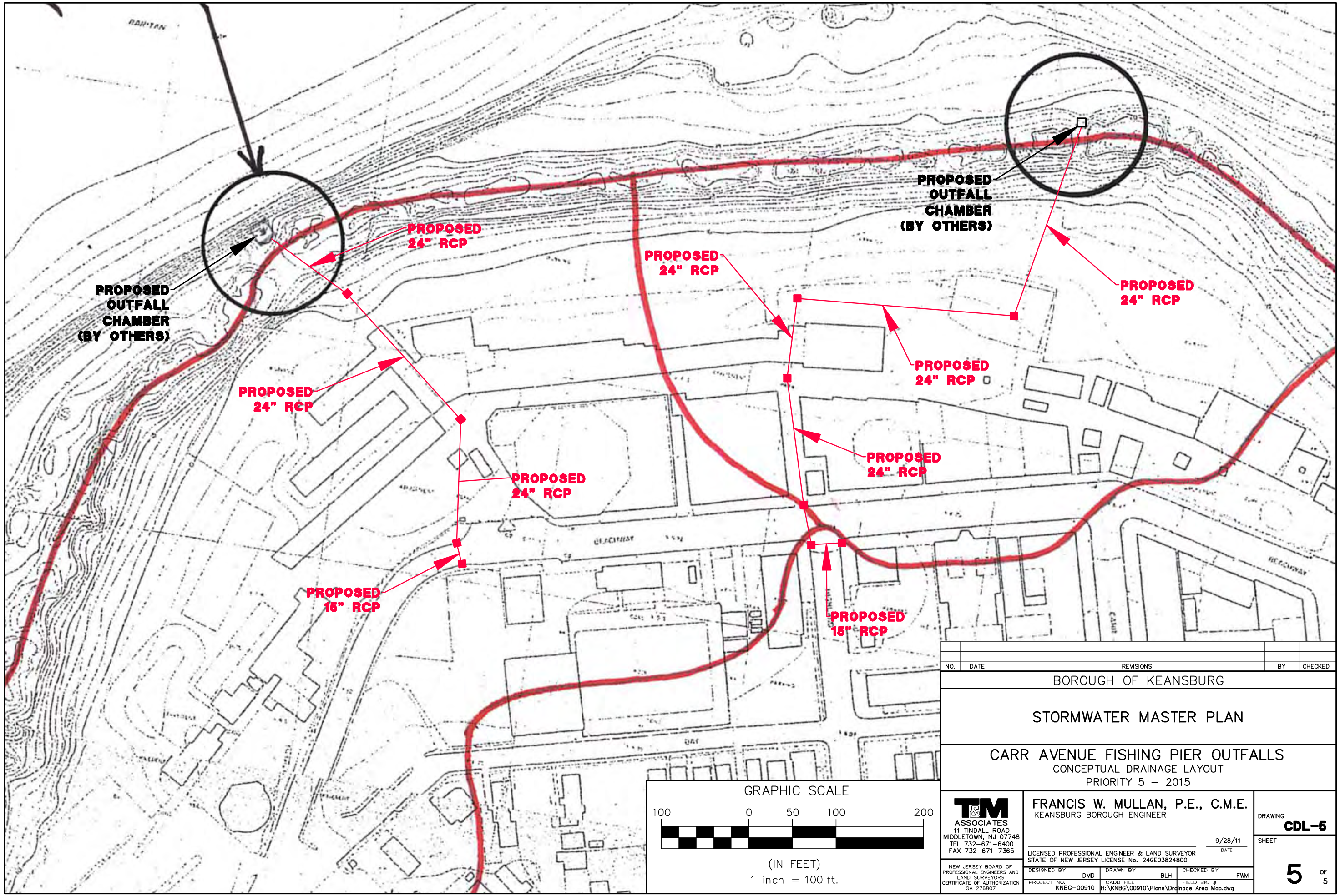

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

1 inch = 100 ft.

NO.	DATE	REVISIONS	BY	CHECKED

BOROUGH OF KEANSBURG

STORMWATER MASTER PLAN

CARR AVENUE FISHING PIER OUTFALLS

CONCEPTUAL DRAINAGE LAYOUT

PRIORITY 5 – 2015

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
TEL 732-671-6400
FAX 732-671-7365

NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS
CERTIFICATE OF AUTHORIZATION GA 276807

FRANCIS W. MULLAN, P.E., C.M.E.
KEANSBURG BOROUGH ENGINEER

9/28/11
DATE

LICENSED PROFESSIONAL ENGINEER & LAND SURVEYOR
STATE OF NEW JERSEY LICENSE No. 24GE03824800

DESIGNED BY	DRAWN BY	CHECKED BY
DMD	BLH	FWM

PROJECT NO.	CADD FILE	FIELD BK. #
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SHEET 5 OF 5

APPENDIX 2

Municipal Stormwater Management Plan

BIRDSALL SERVICES GROUP

BIRDSALL ENGINEERING • DI STASIO & VAN BUREN • LGA ENGINEERING • MORRIS, JOHNSON & ASSOCIATES • PMK GROUP

Job No. 200012440001

MUNICIPAL STORMWATER MANAGEMENT PLAN

KEANSBURG BOROUGH
MONMOUTH COUNTY, NEW JERSEY

KEANSBURG BOROUGH PLANNING BOARD

NOVEMBER 2006

Prepared By:

Jennifer C. Beahm, P.P., AICP
New Jersey License No. 05625

611 Industrial Way West | Eatontown, NJ 07724 | Tel 888.335.BSGi (2744) | Fax 732.380.1701 | www.birdsall.com

STORMWATER MANAGEMENT PLAN
KEANSBURG BOROUGH

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LIST OF APPENDICES

1.0 INTRODUCTION

The Borough of Keansburg has consulted with Birdsall Engineering, Inc. (BEI) to devise a Municipal Stormwater Management Plan (MSWMP) for the Borough. This MSWMP outlines a strategy for Keansburg to alleviate the Borough's stormwater management problems through the incorporation of more stringent stormwater policies within their Land Use Regulations. The creation of this MSWMP is required through the Municipal Stormwater Regulations (N.J.A.C. 7:14A-25), which were proposed in the New Jersey Registrar on January 6, 2003, and were made effective on February 2, 2004.

This plan includes a Model Stormwater Control Ordinance (Appendix A). Following the adoption of this MSWMP, the Borough will adopt a Stormwater Control Ordinance to apply the goals of this plan and the State's newly adopted design standards to "Major Development" applications, which includes development or redevelopment projects that either disturb one or more acres of land, or propose to add ¼ acre or more of impervious surface. Also, this plan will incorporate all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules as well as the nine planning goals that should be addressed when devising municipal level stormwater management plans (N.J.A.C. 7:8-2.2). Further, the plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating the newly adopted stormwater design and performance standards to new development proposals. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides baseflow to receiving water bodies. To reduce the discharge of pollutants to the maximum extent practicable and protect water quality, the plan incorporates the six control measures outlined within the Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program Rules (N.J.A.C. 7:14A).

To accomplish these ends, Birdsall Engineering has completed a review of the Borough's existing ordinances, the Keansburg Master Plan, and other planning documents to ensure that nonstructural stormwater management techniques have been integrated to the maximum extent practicable. Also, a Mitigation Plan (Section 6.4) that allows Keansburg Borough, in limited circumstances, to waive the strict compliance of one or more of the stormwater management design and performance standards where full compliance cannot be reasonably accommodated on site is also been included as Section 6.4 of this plan. However, as the Borough of Keansburg is comprised of less than one square mile of land, a build-out analysis pursuant to N.J.A.C. 7:8 4-2 has not been included in this report.

2.0 GOALS AND OBJECTIVES

To improve water quality, reduce the risk of flooding, and in turn improve the quality of life for residents of Keansburg, the incorporation of more stringent stormwater management techniques have been identified as a priority by both state and local level government agencies. The new stormwater management requirements and best management practices will advance the goals and objectives of both the New Jersey Department of Environmental Protection, and the Borough of Keansburg itself. Within the Borough's most recent Master Plan, which was adopted on November 29, 1988, the first stated objective is to "secure public safety from fire, flood, panic and other natural or man-made disasters...". As the incorporation of more stringent stormwater management regulations would help to advance these objectives, the goals of this MSWMP are consistent with those of the Borough.

Further, the New Jersey Department of Environmental Protection (NJDEP) has established a minimum set of goals and objectives that all municipal stormwater management plans should follow, they include to:

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

This Municipal Stormwater Management Plan will also incorporate the Goals and Objectives that have been established for municipalities within Watershed Management Area 12 (WMA 12) which include:

- Providing healthy and naturally diverse habitats to support plants and wildlife that will enrich the lives of residents;
- Maintaining safe and plentiful drinking water supplies;
- Preserving the integrity of the freshwater and tidal benthic communities that support commercial and recreational water-related uses including boating, bathing, fishing and sightseeing;

- Development and redevelopment in Area 12 will be well-planned and environmentally responsible while maintaining, enhancing and integrating the historic, cultural, scenic, recreational and open space resources that define and strengthen the unique identities of each community.

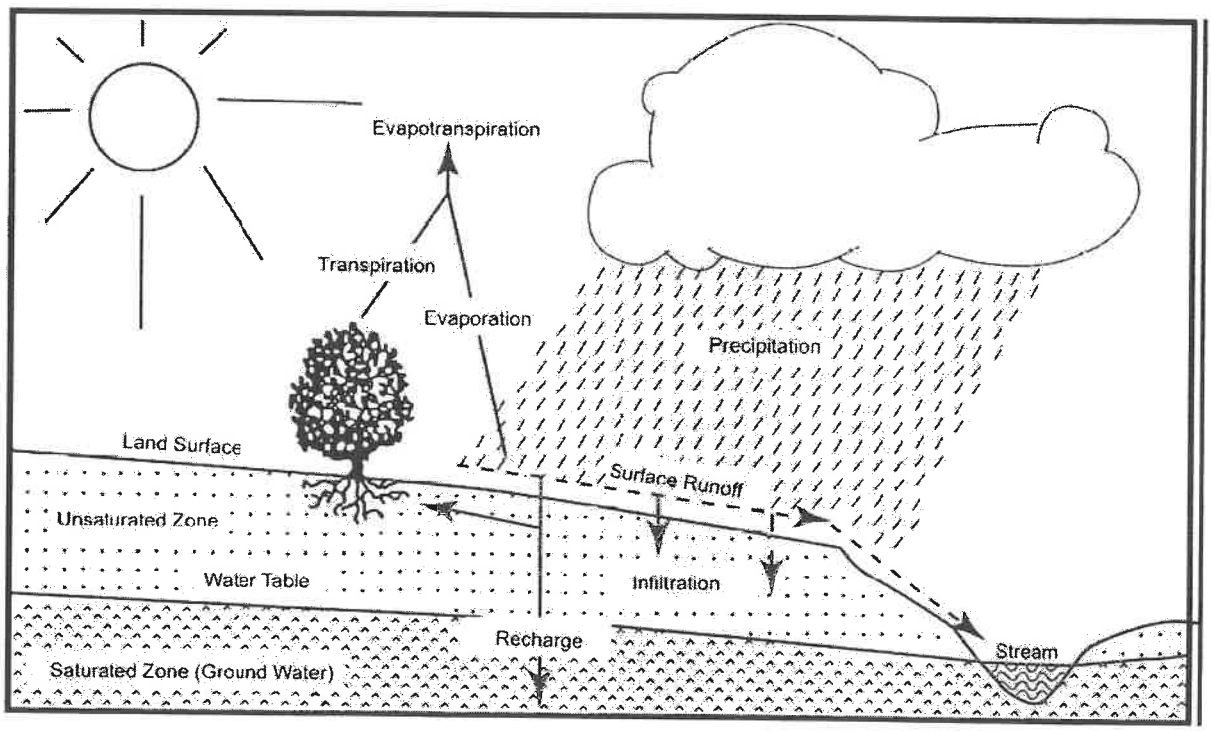
Source: Monmouth Coastal Watershed Partnerships website: http://www.shore.co.monmouth.nj.us/area12/, Accessed March 8, 2005.

To achieve these goals, this plan examines the most pressing stormwater related issues facing Keansburg, and in turn proposes possible amendments to the Borough's design and performance standards to incorporate a more comprehensive code for managing stormwater. By examining the Borough's history, demographics, and current conditions concerning water quality, water quantity, and flooding issues, a clearer picture can be drawn in regards to what the stormwater management issues are at this time, and what type of policy amendments should be taken to improve them. This plan also calls for additional stormwater management regulations to be adopted by the Borough in order to ensure that preventative and corrective maintenance strategies have been formulated to ensure the long-term efficiency of stormwater management facilities.

3.0 EFFECTS OF STORMWATER RUNOFF

The hydrologic cycle is defined as the constant cyclical movement of water from the ground to the atmosphere and back to the ground. As illustrated by the figure below, this process includes evaporation, transpiration, evapotranspiration, condensation, transport, precipitation, infiltration, percolation, surface runoff, interflow, and groundwater flow. Land development has a dramatic effect on the natural function of this process.

GROUNDWATER RECHARGE IN THE HYDROLOGIC CYCLE



Prior to development, native vegetation acts to both intercept falling precipitation, and return water that has infiltrated into the ground through evapotranspiration. By clearing vegetation, compacting soil, and replacing it with impervious cover, lawns, or landscaping, the development process serves to reduce the natural rate of water that may infiltrate into the soil, and in turn evapotranspiration.

In developed areas, following a precipitation event, both the volume and the rate of stormwater runoff will increase in proportion to the amount of additional impervious cover that is generated through a given development. Often gutters, channels and storm sewers, are the tools with which this additional stormwater is carried to local waterways. These man-made stormwater management tools transport water more quickly which causes the stormwater flows in downstream waterways to peak faster and higher than would be produced in a natural state. The increased peak flow during and shortly after a precipitation event produces greater fluctuations between normal and storm flow rates, which can increase channel erosion.

Table 1: The Effect of Impervious Cover on Runoff

Share of Land With Impervious Cover	Share of Rainwater that Becomes Runoff
0% (natural state)	10 %
10-20%	20%
35-50%	30%
75-100%	75-100%

Source: NJDEP *Planning for Clean Water: The Municipal Guide* Trenton, NJ 2000.

Not only does the development process increase the peak rate of stormwater flows, the addition of impervious cover also results in water pollution. Pollutants carried within stormwater runoff can take the form of nutrients such as nitrogen and phosphorous which encourage the growth of algae in downstream water ways, or trash and oils that accumulate on sidewalks and roadways between precipitation events. In locations where stormwater sewers discharge runoff directly into a stream, the aggregate accumulation of sediment and pollutants that are carried within it are dumped directly into local waterways. In addition to the chemical and physical contaminants, runoff from impervious systems also require another form of pollution, heat. When rain falls on pavement that has collected heat through the day, the temperature of runoff can reach as high as 83 degrees Fahrenheit, which is sufficiently warm enough to damage sensitive plant and animal species. Table 2 below, includes a comprehensive list of the possible pollutants contained within untreated stormwater flows.

Table 2: Pollutants Carried in Stormwater
The following pollutants collected and carried in stormwater runoff can seriously degrade water quality in the community:
Nutrients- Include nitrogen and phosphorous, which plants need to grow. However, high levels can cause a health hazard in drinking water and stimulate excessive aquatic plant growth, which can ultimately lower dissolved oxygen levels in the water, causing fish and other aquatic life to smother. Algae blooms are examples of how excess nutrients pollute. Sources of excess nutrients include animal waste, fertilizers, septic systems, road salt applications and auto emissions. About half of the fertilizers applied to lawns in the New Jersey coastal zone enter streams and head to the bay and ocean.
Pathogens- Are disease causing bacteria and viruses associated with the presence of fecal matter. They affect human health directly when people contact contaminated water and consume shellfish. Sources include failing septic systems, animal waste, and boat sanitation facilities.
Sediment- Is fine particles of eroded soil or sand. Common origins are concentrated, excessive stormwater runoff from construction sites. Sediment smothers aquatic habitat, carries pollutants bound to soil particles, makes water cloudy and inhibits the breeding and movement of aquatic species.
Toxic Contaminants- Include pesticides as well as heavy metals such as copper, lead and zinc which are commonly found in old paint, tires, lawn chemicals and preservatives. They attach to sediments, resist breakdown, accumulate in organisms and represent threats to the food chain.
Debris- Consists of various items of trash, such as old tires, shopping carts and plastics. It comes from illegal dumping, street litter, and boating waste. It threatens aquatic life and detracts from recreational and aesthetic values.
Oil- Is one of the worst offenders. One gallon of oil dumped down a storm drain can create a slick up to 8 acres and may pollute up to 1 million gallons of water.
Thermal Stress- From elevated water temperatures reduces survival rates and disease resistance of valued native species and allows the spread of non-native (exotic) species. Water temperature rises because of increased pavement near streams, loss of vegetated stream buffers and stream channelization.
Source: Association of New Jersey Environmental Commissions (1998, Spring). *ANJEC Report*

4.0 CURRENT CONDITONS

4.1 SETTING

The Borough of Keansburg, incorporated in 1917, consists of 0.95 square miles (2.5 km2) and is located on the Raritan Bay in Monmouth County. For reference, the Borough's location is illustrated in this MSWMP through Figure 1-USGS Quad Map. Keansburg was originally developed as a summer resort, complete with steamboat service to and from New York City. The Borough quickly became one of the most popular vacation spots on the New Jersey shoreline as it featured bathing beaches, large rooming houses, fishing, a boardwalk, and amusement parks.

In the beginning of the 20th century, the winter population would be approximately 500 residents, but swell to nearly 10,000 people during the summer months. However, since that time, the Borough has steadily become more of a year round community. The classic bungalow dominates Keansburg's residential architecture as summer homes have been converted to year round residences. However, in the summertime, the Keansburg amusement park and boardwalk still draw additional visitors from across Monmouth County, and beyond. Land Uses in the Borough of Keansburg are illustrated in this MSWMP through Figure 2-Land Use Map.

Within Monmouth County, Keansburg shares common boundaries with two developed suburban municipalities, Hazlet Township, and Middletown Township. To the north Keansburg is bordered by Raritan Bay. To the south, Keansburg shares a common boundary with Hazlet Township formed by State Highway Route 36. The western boundary is defined by Waackaack Creek, which separates Keansburg from a portion of Hazlet Township that is known as West Keansburg. The Borough's eastern boundary with Middletown Township is an irregular line, which extends westerly following lot lines and streets to Highway 36.

4.2 DEMOGRAPHICS

The Borough of Keansburg is located in northwestern Monmouth County. The Borough is small, having a land area of only .95 square miles, and contained 10,732 residents as of the 2000 census.

Since growing rapidly in the post World War II years, Keansburg has maintained a relatively stable population base. In the period of time between 1980 and 1990, Keansburg experienced a 4.3% growth rate, as the population increased from 10,613 residents to 11,069 residents. From 1990 to 2000, the Borough lost 337 residents, and population projections completed by the Monmouth County Planning Board have projected a 0.34% growth in population between 2000 and 2004.

Table 3: Keansburg Population Characteristics		
Year	Population	% Change
1980	10,613	N/A
1990	11,069	4.3%
2000	10,732	-3.1%
2004 (Estimate)	10,769	3.4%
Source: Monmouth County Planning Board: March 22, 2005 http://www.visitmonmouth.com/03230planboard/AtAGlanceFiles/AtAGlance2004.pdf		

4.3 W ATERWAYS

The Borough of Keansburg is bordered by two waterways. The first, Raritan Bay, forms the Borough's north and northeastern borders. Due to their proximity to this waterbody, coastal areas of the Borough are threatened by flooding and the consequent damage that is posed by wave action along the shoreline. A comprehensive illustration of the waterways within and proximate to Keansburg are provided in this MSWMP through Figure 3-Waterways Map.

The second body of water that flows through Keansburg is the Waackaack Creek. The Waackaack flows along the western border of the Borough before meeting with Thorns Creek and emptying directly into the Raritan Bay. The Creek is prone to flooding and due to the low relief of the Creek's floodplain, a large area of the Borough is subject to the 100-year flood of the Waackaack Creek. In 2001, the DEP awarded Keansburg Borough funds to complete a stormwater management project consisting of underground piping, roadway regrading and the installation of new curbing and gutters to reduce the risk of flooding along the Waackaack Creek. This project, which was undertaken jointly by the Borough's professionals and an engineering consultant has since been completed. When coupled with the Borough's Laurel Avenue Flood Mitigation project, which utilized similar means to reduce the threat of flooding along Laurel Avenue, these efforts have served to reduce the flooding risk that the Waackaack poses to the Borough's residents.

4.4 WATER QUALITY

Changes in the Borough's landscape have increased stormwater runoff volumes and pollutant loads to waterways that flow through Keansburg. Environmental concerns have brought about the development of studies, programs and networks intended to monitor the health of waterways and aid in determining methods to mitigate pollution where encountered. Among many programs, the New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the State's waterways. There are now over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as "non-impaired", "moderately impaired", or "severely impaired" based upon a standardized inspection process. The data is used to generate a New Jersey Impairment Score (NJIS).

According to these scores, the waterway is then classified as "non-impaired", "moderately impaired", or "severely impaired". These designations are determined by the following criteria:

Table 4: New Jersey Department of Environmental Protection AMNET Program Waterway Classification Criteria	
Non-Impaired	Benthic community comparable to other undisturbed streams within the region. A community characterized by a maximum taxa richness, balanced taxa groups and good representation of intolerant individuals.
Moderately Impaired	Macroinvertebrate richness is reduced, in particular EPT taxa. Taxa composition changes result in reduced community balance and intolerant taxa become absent.
Severely Impaired	A dramatic change in the benthic community has occurred. Macroinvertebrates are dominated by a few taxa that are very abundant. Tolerant taxa are the only individuals present.
Source: New Jersey Department of Environmental Protection Bureau of Freshwater and Biological Monitoring (NJDEP/BFBM): *http://www.state.nj.us/dep/wmm/bfbm/*. Accessed: March 30, 2005.	

In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state. The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d) (Integrated List) is required by the federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. The integrated list is divided into five different sublists. The following table illustrates how those sublists were determined:

Table 5: New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d) Integrated List) Sublist Criteria	
Sublist 1	Attaining a water quality standard and no use is threatened.
Sublist 2	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	Insufficient or no data and information to determine if any designated use is attained.
Sublist 4	Impaired or threatened for one or more designated uses but does not require the development of a TMDL. (Three Categories). 1.TMDL has been completed. 2.Other enforceable pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future. 3. Impairment is not caused by a pollutant.
Sublist 5	The water quality standard is not attained. The waterbody is impaired or threatened for one or more designated uses by a pollutant(s), and requires a TMDL.
Source: New Jersey Department of Environmental Protection: http://www.state.nj.us/dep/wmm/sgwqt/wat/integratedlist/integratedlist2004.html. Accessed March 30, 2005	

Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDL's are needed. A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and non-point sources, which interfere with stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. Then, an implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems and other BMP's.

The New Jersey 2004 Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(b)) was released by the NJDEP in June of 2004. The data shows Waackaack Creek as attaining water quality criteria for dissolved oxygen; however, the tidal portions of Waackaack Creek were allocated to Sublist 5 for not attaining water quality standards for Fecal Coliform or Total Coliform. The report also indicates that a TDML for fecal coliform will be established at a water quality testing station along Highland Ave in Keansburg. The complete water quality results from the Waackaack Creek testing location are included within this MSWMP within Appendices B and C.

4.5 WATER QUANTITY

The Borough of Keansburg has exhibited water quantity problems including flooding, steam bank erosion, and diminished base flow in streams. The size and design of culverts has been cited as a major contributor to both the frequency and the severity of stormwater flow flooding, which is experienced in several locations in the Borough. Further, the high imperviousness of the Borough has significantly decreased groundwater recharge, and in turn exacerbated the stormwater management issues that exist in Keansburg. The average annual groundwater recharge rates are shown graphically in Figure 4- Ground Water Recharge Areas. The New Jersey Geologic Survey (NJGS) estimates groundwater recharge using methodology from NJGS Report GSR-32 "A Method for Evaluation of Ground-Water-Recharge Areas in New Jersey", which combined the NJDEP's Land-use/land-cover, soil and municipality-based climatic data to produce an estimate of ground-water recharge in inches/year. Recharge was then ranked by volume (billions of gallons/year) using natural breaks in the percentage of total volume. Also, the soils which are contained within the Brough are illustrated through Figure 5-Soils Map.

With regards to potable water supplies, the Borough has begun evaluating several options to alleviate the looming water quantity and quality issues for Keansburg. The Borough is currently examining several items including the possibility of drilling deeper wells, a desalinization plant and an increase in water allocation. The Keansburg Borough Council has recently authorized the purchase of 60 million gallons of water each year from the New Jersey American Water Company. Birdsall Engineering, Inc (BEI) is currently reviewing a previously completed Water System Study for accuracy and completeness with regard to anticipated costs and potential options available to the Borough. As further analysis is conducted a clearer picture of the Borough's problems and alternative solutions pertaining to water quantity and quality may be pursued.

Wellhead protection areas, which are also required to be included in a MSWMP, are illustrated in Figure 6-Wellhead Protection Areas. According to the NJDEP, "A Well Head Protection Area (WHPA) in New Jersey is a map area calculated around a Public Community Water Supply (PCWS) well that delineates the horizontal extent of ground water captured by a well pumping at a specific rate over a two, five, and twelve-year period of time for unconfined wells. ...The confined wells have a fifty foot radius delineated around each well serving as the well head protection area to be controlled by the water purveyor in accordance with Safe Drinking Water Regulations" (see NJAC 7:10-11.7(b) 1). Well Head Protection Area delineations are conducted in response to the

Safe Drinking Water Act Amendments of 1986 and 1996 as part of the Source Water Area Protection Program (SWAP). The delineations are the first step in defining the sources of water to a public supply well. Within these areas, potential contamination will be assessed and appropriate monitoring will be undertaken as subsequent phases of the NJDEP SWAP program are completed.

The NJDEP's 2004 Source Water Assessment Report indicates that the Keansburg Water and Sewer Department supplies all public water to the Borough. The Department operates 3 supply wells that supply water to Borough residents. One well is located near the intersection of Port Monmouth Road and Harding Avenue, and the two other supply wells are both located on Frazee Street. All three of the supply wells have been mapped as Tier 1 protection areas, which means that the two-year time of recharge has been delineated. However, it is important to note that, the NJDEP's Wellhead Protection Mapping effort only includes wellhead protection areas for public supply wells. Individual home or property owner wells are excluded.

4.6 FLOODING & PROPOSED SOLUTIONS

The Borough of Keansburg is relatively level, but slopes gently in a northerly direction towards Raritan Bay. However, localized areas around the western boundary slope in a southwesterly direction toward Waackaack Creek. The creek, which is prone to flooding, is surrounded by a wide floodplain. The intersection of New Jersey State Highway Route 36 and Main Street is located on one of the highest elevations within the Borough as it rests 16 feet above sea level. The areas along Beachway and Shore Boulevard are approximately 10 feet above sea level. The lowest elevations in the municipality are found along the Bayshore.

To inform both public and private land use decision makers of areas that are subject to flooding, the Federal Emergency Management Agency has completed Flood Insurance Rate Maps (FIRM) for the Borough of Keansburg. Due to its low relief and proximity to both the Waackaack Creek and Raritan Bay, a significant portion of the Borough lies within an area that has been designated as an "A Flood Zone" by the FIRM maps. The 100-year flood prone area of the Waackaack Creek extends inland, encompassing lowlands adjacent to the creek east of Wood Avenue, Stella Drive, Central Street and Creek Road. The 100-year flood prone area also includes a large lowland area west of Creek Road, south of Highland Boulevard and encompassing Highland Avenue, Beachway, Camp View Avenue, Gordon Place, and Maple Avenue. The 500-year flood prone area includes lands south of the 100-year floodplain including lands between Terrace Place, Myrtle Avenue, Carr Avenue, Manning Place, Lancaster Avenue, Crescent Street, Beacon Terrace, Orchard Street, Park Avenue, Shore Boulevard, Waterview Place and Maple Avenue. Although the FIRM maps delineate floodplain boundary designations for the entire Borough, specific base flood elevations have only been determined at a few selected points. The specific points, along with the base flood elevation are listed on the next page in Table 5. In addition, Figure 7-FEMA Flood Zone Map illustrates both 100-year and 500-year FEMA flood zone delineations for the entire Borough of Keansburg.

Table 5: Elevation Reference Marks Within Keansburg Borough	
Elevation	**Location**
10.020 ft.	Along Laurel Avenue, at Belvedere Beach at the junction of Laurel Avenue and Creek Road, in the top of the west edge at the north end of the pedestrian walk of a 30 foot concrete bridge over Waackaack Creek, 22 feet west of centerline of Laurel Avenue, about 110 feet south of extended centerline of Creek Road, 2 feet south of north end of walk and about ½ foot above level of bridge floor.
8.419 ft.	Along Laurel Avenue, at Belvedere Beach, 99 feet north of centerline of Charles Avenue, about level with Laurel Avenue and set in the top of a concrete post projecting one inch.
10.659 ft.	At Belvedere Beach, at the junction of Beach Way and Oakwood Place, set in the top of the southeast curb of Beachway, 14 feet southeast of centerline of Beachway, 38 feet southwest of centerline of Oakwood Place, 3 feet west of a fire hydrant, and about level with junction.
5.804 ft.	At the intersection of Center Avenue and Pineview Avenue, 4.7 feet northeast of the northeast curb of Center Avenue, 3.5 feet southwest of a wire fence, about level with Center Avenue and is set in the sidewalk.
Source: FEMA Flood Insurance Rate Map (FIRM) Keansburg Borough, Monmouth County, New Jersey. Effective Date: May 16, 1983.	

Finally, Keansburg actively addresses drainage and flooding issues as they arise and are reported by residents. Each year Keansburg includes drainage improvements as part of their Capital Improvement Program. As such, most of the reported flooding and drainage problems have been corrected. However, Keansburg will continue to utilize this program, along with its Mitigation Plan, which is included within this report as Section 6.4, as tools to remediate the most pressing flooding and stormwater management issues that face the Borough.

5.0 STORMWATER MANAGEMENT

5.1 INFRASTRUCTURE

The Borough of Keansburg receives nearly 46 inches of rain in an average year. To manage the public risk that flooding imposes on residents, a substantial stormwater management system has been developed. As illustrated earlier through Table 2, both the amount and the condition of stormwater that finds its way into local waterways is in large part determined by the amount of impervious cover the land contains. With less absorption of rainwater into the ground, the increased runoff moves faster and collects more pollutants from the surface, which promotes erosion, damages stream banks, and in turn dumps sediment into streambeds.

N.J.A.C. 7:8 spells out guidelines for how to manage stormwater more effectively and also how to incorporate best management practices into the planning stages of project design. These standards now require stormwater detention capacity to hold and slowly release the runoff from storms that have a likelihood of occurring once every two, ten and one hundred years. Some sites may be able to achieve these standards through vegetative swales, buffers, and other landscaping measures to control non-point source pollution. Other sites may require the building of a stormwater basin. In these cases, where the development of structural stormwater facilities is necessary, the New Jersey Department of Environmental Protection's BMP guide should be consulted as it outlines alternatives and strategies to incorporate Best Management Practices into a projects site design. The potential alternatives include structures such as Bioretention Basins, Sand Filters, constructed wetlands and Pervious Paving Systems. Generally, surficial BMP's are preferred by the DEP due to the difficulties associated with maintaining and repairing subsurface structures. However, guidance on which BMP would be most suited for a particular site can be not only be found within the DEP's BMP manual, but also on-line as the DEP has prepared a draft document entitled "Matching the BMP to Site and Watershed Conditions" at:
http://72.14.203.104/search?q=cache:lU5IILBHCZkJ:www.state.nj.us/dep/watershedmgt/DOCS/BMP_DOCS/chapter4.PDF

The incorporation of such designs into the Borough's existing stormwater management infrastructure is strongly encouraged to enhance groundwater recharge and reduce the amount of runoff that originates on site; thus improving both the quality and quantity of stormwater that originates within the Borough.

5.2 STORM DRAINS

Keansburg Borough has an annual Capital Improvement Program through which infrastructure improvements are designed and constructed. The construction or reconstruction of drainage best management practices, and stormwater management improvements are included in this program.

Further, to inform the public of the presence of storm drains, Keansburg has initiated a storm drain-labeling program The Keansburg Public Works Department will be implementing a storm drain inlet-labeling program. The project will label all storm drain inlets that are along municipal streets with sidewalks, and all storm drain inlets within plazas, parking areas, or maintenance yards that are operated by the Borough. Keansburg is currently evaluating various label types and application methods. More than one label type may be utilized to ensure maximum durability in all locations. The labeling program will divide the Borough into two sectors. Sector 1 is the area east of Main Street, and Sector 2 is the area west of Main Street to Creek Road. The labeling of Sector 1 will be completed by April 2007, and Sector 2 will be completed by April 2009. Through the annual catch basin cleaning program, the Borough will be checking to ensure that the labels are still visible. If not, they will be replaced as soon as possible.

Keansburg has also initiated programs to more effectively maintain and manage its existing stormwater infrastructure. In accordance with the Sewage Infrastructure Improvement Act (SIAA) regulations, maps showing the location of the end of all MS4 outfall pipes that are operated by the Borough, and that discharge within the Borough's jurisdiction to a surface water body, have been prepared by T&M Associates, a consultant of the Borough. The maps show the location of each outfall pipe, and have also been given an alphanumeric identifier that is noted on the map. Through the future, as new development and/or redevelopment changes the current storm sewer system through the creation of new outfalls, these maps will be updated accordingly.

Further, the Borough of Keansburg will implement a stormwater facility maintenance program to insure that all stormwater facilities operated by the Borough are functioning properly. The Borough of Keansburg will implement an annual catch basin cleaning program to maintain catch basin function and efficiency. This program will inspect each catch basin on a yearly basis. If, at the time of inspection, no sediment, trash, or debris is observed in the catch basin, then that catch basin will not be cleaned. However, all catch basins within Keansburg will be inspected annually, even if the had been found to be "clean" the previous year. At the time of cleaning, the catch basins will also be inspected for proper function, and maintenance will be performed on those facilities that are not operating to capacity. The catch basin cleaning and maintenance will be recorded through the "Stormwater Facility Inspection and Maintenance Log", which will be submitted to the NJDEP annually.

Keansburg Borough will also investigate storm drains for illicit connections and will check outfall pipes for signs of scouring. The Borough will begin performing the initial inspection of outfall pipes and will have completed a comprehensive inspection of all outfall pipes within 60 months of the EDPA (April 2009). The Borough will use the NJ Department of Environmental Protection (NJDEP) Illicit Connection Inspection Report Form to conduct these inspections, and each of these forms will be kept within the SPPP records. Outfall pipes that are found to have dry weather flow or evidence of an intermittent non-stormwater flow will be investigated to locate the illicit connection. If the Borough is able to locate the illicit connection (and the connection is located within Keansburg), the responsible party will be cited, and the connection will be eliminated

immediately. If an illicit connection is found to originate from another public entity, the Borough of Keansburg will report the illicit connection to the NJDEP. As part of its illicit connection elimination program, the Borough is also checking outfall points for signs of scouring. All sites where scouring is observed is will be placed on a prioritized list and repairs will be made in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey. Those repairs that do not need NJDEP permits for implementation may be done first. Each repair will be followed up to ensure that scouring has not resumed. This program will be implemented in conjunction with the illicit connection elimination program by October 1, 2005 (within 18 months of the EDPA).

5.3 STORMWATER BASINS

As development has expanded across the Borough, so too have the number of storm basins. However, there are two types of stormwater basins and both are present in Keansburg. First, "detention basins", which are designed to stay dry between storm events, detain stormwater for a period of time, while releasing water at a slow and controlled rate. A second type of basin that is designed to manage stormwater flows is a "retention basin". These basins are designed to stay wet by retaining a permanent pool so as to mimic a natural pond or lake. Although both types of stormwater basins are contained in the Borough, Keansburg is only responsible for maintaining the dry stormwater basins as the single stormwater retention basin in the Borough is owned and maintained by the Keansburg Board of Education. This retention basin is responsible for collecting runoff produced on the grounds of Keansburg High School and has been successful at managing stormwater in all the storm events that the Borough has experienced through the years. Further, drainage issues at eh Bolger Middle School are handle through a system of runoff ditches that continue south into Middletown Township.

A number of the existing stormwater basins in Keansburg are suited to be retrofitted to accommodate more volume, or to improve the quality of stormwater that is dispended into the basin. As flooding and/or drainage issues arise in the Borough, due to their ability to improve water quality, maintain water quantity, and provide groundwater recharge, the retrofitting of stormwater basins may be initiated by the Borough itself. Or, these initiatives may be included in Mitigation Plan, which would allow applicants who are not able to meet the stormwater design standards on site to provide mitigation by means of retrofitting a proximate stormwater basin. Through mapping, maintenance, and retrofitting, these coordinated stormwater management programs will enable the Borough to improve the way stormwater is managed in Keansburg.

5.4 WATERSHED

The Borough of Keansburg is located within the Raritan Bay watershed. Also, the Borough lies within the Bayshore Watershed Area, which includes approximately fifteen separate creeks between Atlantic Highlands and South Amboy. However, the United States Geological Service (USGS) has developed a method for identifying and inventorying subwatersheds within this larger watershed network called the hydrologic unit code system. Through this system all U.S. watersheds have a name and a

corresponding number, this number is called the hydrologic unit code (HUC) or watershed address.

The term "HUC-14" is from the hydrologic unit code system for delineating and identifying drainage areas. The system starts with the largest possible drainage area (basin) and progressively breaks it down into smaller subdivisions (subbasins, watersheds and subwatersheds respectively). These subdivisions are delineated and numbered in a nested fashion. A drainage area with a 14 numbered address, or HUC-14, is a subwatershed of a larger watershed with 11 numbers, or a HUC-11. There are 921 HUC-14 subwatersheds in New Jersey that average 8.5 square miles. There are 150 HUC-11 watersheds in New Jersey with an average size of 51.9 square miles. A statewide graphic depiction of the breakdown of these watershed areas is available at: http://www.nj.gov/dep/watershedmgt/hucmap.htm (Source: NJDEP – Division of Watershed Management). Keansburg Borough is located entirely within one subwaterwershed of the Waackaack Creek. The subwatershed has been given HUC-14 unit code 02030104060050 (Waackaack Creek), and its area is illustrated on Figure 3-Weaterways Map.

6.0 DESIGN AND PERFORMANCE STANDARDS

To minimize the adverse impact of stormwater runoff on water quality, water quantity and the loss of groundwater recharge in receiving water bodies, the Borough will adopt design and performance standards that comply with the stormwater management measures as presented in N.J.A.C. 7:8. The design and performance standards include amended language for the inclusion of maintenance requirements, and safety standards consistent with N.J.A.C. 7:8-6. The ordinances will be submitted to the County for review and approval within 24 months of the effective date of permit authorization (EDPA).

Further, it is the intention of the Borough of Keansburg to incorporate both structural and nonstructural stormwater management strategies as presented in N.J.A.C. 7:8-5 to the maximum extent practicable. Major developments must meet one of two standards for groundwater recharge (N.J.A.C. 7:8-5.4(a)2.): (1) maintain 100 percent of the average annual pre-construction groundwater recharge volume for the site or (2) infiltrate the increase in the stormwater runoff volume from pre-construction to post-construction for the two-year storm. For water quality (N.J.A.C. 7:8-5.5), stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in the stormwater runoff generated by the water quality design storm by 80 percent of the anticipated load from the major development.

To control stormwater runoff quantity impacts (N.J.A.C. 7:8-5.4 (3)), a major development must also meet one of three design standards: (1) demonstrate at no point in time that the post-construction runoff hydrograph exceed the pre-construction runoff hydrograph, (2) demonstrate 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, 100-year storm event and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site, and (3) demonstrate the postconstruction peak runoff rates for the 2, 10 and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction runoff rates. However, for stormwater water runoff quantity requirement (3), stream encroachment standards (N.J.A.C. 7:13-2.8) will require for the 100-year storm event 75 percent of the pre-construction peak runoff rates.

A second set of provisions that have been adopted by the State which affect stormwater management is the Phase II New Jersey Pollutant Discharge Elimination System Stormwater Regulation Program Rules (N.J.A.C. 7:14A). These Rules are intended to address and reduce pollutants associated with existing stormwater runoff. The Rules establish a regulatory program for existing stormwater discharges as required under the Federal Clean Water Act. These rules govern the issuance of permits to entities that own or operate "small" (those that serve a population of under 100,000) municipal separate storm sewer systems, known as MS4s. Under this program permits must be secured by municipalities, certain public complexes such as universities and hospitals, and State, interstate and Federal agencies that operate or maintain highways. The permit program establishes the Statewide Basic Requirements that must be implemented to reduce

nonpoint source pollutant loads from these sources. The Statewide Basic Requirements include measures such as: the adoption of ordinances (litter control, pet waste, wildlife feeding, proper waste disposal, etc.); the development of a municipal stormwater management plan and implementing ordinance(s); requiring certain maintenance activities (such as street sweeping and catch basin cleaning); locating discharge points and stenciling catch basins; and a public education component.

Owners or operators of small MS4s are required to develop and implement a storm water management program designed to reduce the discharge of pollutants to the maximum extent practicable and protect water quality. Control measures are expected to include, at a minimum, the following components:

- Public education and outreach
- Public involvement and participation
- Illicit discharge detection and elimination
- Construction site storm water runoff control
- Post-construction storm water management in new development and redevelopment
- Pollution prevention/good housekeeping for municipal operations.

6.1 IMPLEMENTING NON-STRUCTURAL STORMWATER MANAGEMENT STRATEGIES

The implementation of non-structural Best Management Practices are strongly encouraged to be added to the Borough's existing development regulations and applied to all new site design proposals. Whenever possible, the following nine strategies should be incorporated into site design:

- Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;
- Minimize impervious surfaces and break up or disconnect the flow of runoff over
- impervious surfaces;
- Maximize the protection of natural drainage features and vegetation;
- Minimize the decrease in the "time of concentration" from pre-construction to post construction. "Time of Concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the drainage area to the point of interest within a watershed;
- Minimize land disturbance including clearing and grading;
- Minimize soil compaction;
- Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;
- Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas; and

- Provide other source controls to prevent or minimize the use or exposure of pollutants at the site in order to prevent or minimize the release of those pollutants into stormwater runoff. These source controls include, but are not limited to:

    i. Site design features that help to prevent accumulation of trash and debris in drainage systems;

    ii. Site design features that help to prevent discharge of trash and debris from drainage systems;

    iii. Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and

    iv. When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act N.J.S.A. 4:24-39 et seq., and implementing rules.

Also, Chapter 22 "Development Regulations" of the Borough's Code was reviewed to evaluate the extent to which non-structural stormwater management techniques have been implemented into the site deign of a proposed development. This review included, but was not limited to existing provisions for Curbs and Gutters, Driveways and Accessways, Off-Street Parking and Loading, Streets, and Sidewalks. A summary of the of the pertinent provisions is presented below:

Chapter 22, Section 9.2 (Streets) This section outlines regulations concerning street width. Collector streets require a 60-foot right-of-way and 40-foot cartway, while local street require a 50-foot right of way and 36 foot cartway. Street curbing standards include road shoulders. Shoulders and/or drainage swales shall be required instead of curbs when: (1) shoulders are required by CAFRA, (2) soil and/or topography make use of shoulders and/or drainage swales, and/or (3) it is in the best interest of the community to preserve its character by using shoulders and/or drainage swales instead of curbs. Also, these shoulder areas may consist of a reduced pavement section or other special construction approved by the Municipal Engineer.

Sidewalks- To reduce the amount of impervious cover on a proposed site, when practicable, alternative pedestrian and biking paths are encouraged to be used than sidewalking. Incentives exist for constructing alternative pedestrian and bike paths in a site design include density bonuses for projects being proposed in a mixed-use development zoning district.

Chapter 22 Section 9.7 (Stormwater Management) Keansburg has a specific Stormwater Management Ordinance that outlines provisions for new development. Language in this section specifically encourages the utilization of nonstructural BMP's as stormwater management methods shall "use the best available technology to minimize off-site

stormwater runoff, increase on-site infiltration, simulate natural drainage systems, and minimize the off-site discharge of pollutants to ground and surface water and encourage natural filtration functions. Best available technology may include measures such as retention basins, recharge trenches, porous paving and piping, contour terraces and swales. Additional design standards that have been adopted by the Borough relating to stormwater management are listed in the Construction Specifications Section. Also this section requires detention to be provided for all major subdivisions and all major site plans resulting in more than ten thousand (10,000) square feet of impervious surface. In such developments, the after development peak rate of flow from the site will not exceed the corresponding flow which would have been created by similar storms prior to development.

When required, detention will be provided for all major subdivisions and all major site plans resulting in more than ten thousand (10,000) square feet of impervious surface. In such developments, the after development peak rate of flow from the site will not exceed the corresponding flow which would have been created by similar storms prior to development.

Chapter 22 Section 9.8 (Construction Specifications) This section outlines numerous stormwater management provisions, both structural and nonstructural, relating to: System Design (Inlets, Catch Basins, and Manholes) and System Demand (Runoff Volume, Peak Rate of Discharge and Stormwater Facility Maintenance, Repair and Emergency Spillway Design). The following sections summarize different aspects of these design standards.

Runoff Calculation-The peak rate of runoff for areas greater than one-half (1/2) square mile shall be calculated by the hydrograph analysis method as outlined in TR No. 55 (S.C.S. method). The peak rate of runoff for areas of up to one-half (1/2) of a square mile shall be calculated by the Rational Method or derivatives. Runoff volume for watersheds with drainage areas of less than five (5) square miles shall be calculated by the hydrograph analysis method as outlined in TR No. 55 (S.C.S. method).

Stormwater System Design Strategy-The Borough encourages a natural as opposed to an engineered drainage strategy. The section also states that storm water management facilities shall conform to the standards under the New Jersey Storm Management Act, N.J.S.A. 40:55D-1 et se. Language may be added to the current ordinance to incorporate the design standards of N.J.A.C. 7:8, and also refer developers to the NJDEP BMP Manual for additional support and/or information. The ordinance also stipulates that "Responsibility for operation and maintenance of detention facilities, including periodic removal and disposal of accumulated particulate material and debris, shall remain with the owner or owners of the property with permanent arrangements that it shall pass to any successive owner, unless assumed by a governmental agency."

Detention Facilities in Flood Hazard Areas- Whenever practicable, developments and their stormwater detention facilities should be beyond the extent of the flood hazard area of a stream. When that is not feasible and detention facilities are proposed to be located

partially or wholly within the flood hazard area (as defined by the New Jersey Division of Water Resources), or other areas which are frequently flooded, some storm conditions will make the facility ineffective at providing retention of site runoff. Where detention basins are proposed to be located in areas, which are frequently flooded but have not been mapped as flood hazard areas, the provisions will be applied substituting the elevation of a computed one hundred (100) year flood for the elevation of the flood hazard area.

Water Quality- The water quality design storm shall be controlled by best management practices. Infiltration practices such as dry wells, infiltration basins, infiltration trenches, buffer strips, etc., may be used to satisfy this requirement provided they produce zero runoff from the water quality design storm and allow for complete infiltration within seventy-two (72) hours. This section also specifies quality control provisions for Principal Outlet stormwater management structures.

Chapter 22, Section 8.4A (Building Design Standards) The Borough's General Design Standards state that "All buildings shall be located with proper consideration of their orientation and relationship to other buildings, both existing and proposed in terms of light, air and usable open space, access to public right-of-way and off-street parking; height and bulk; drainage and existing topography; trees and vegetation; and other natural features and land forms." By adhering to these provisions developers are indirectly incorporating nonstructural stormwater management into the site design of a proposed development.

Chapter 22, Section 8.7 (Design Standards-Open Space and Recreation) Planned developments, multi-family developments, and mixed use and commercial residential developments shall be required to provide open space. At least twenty (20%) percent of the developable acreage of a tract proposed for development shall be set aside for developed and undeveloped open space. In the event that a non-municipal organization with the responsibility for maintaining the open space fails to maintain it in reasonable order and condition, the Borough Council may serve written notice upon such organization or upon the owners of the development setting forth the manner in which the organization has failed to maintain the open space in reasonable condition, and said notice shall include a demand that such deficiencies of maintenance be remedied within thirty-five (35) days thereof and shall state the date and place of a hearing thereon which shall be held within fifteen (15) days of the notice.

Chapter 22 Section 8.2 (Design Guidelines for Subdivisions and Site Plans) Within Keansburg, subdivisions and site plan proposals shall locate development to preserve the natural features of a site to the maximum extent practical to preserve areas of environmental sensitivity, and to minimize negative impacts and alteration of natural features and to create an appropriate design relationship to surrounding uses.

Chapter 22 Section 9.3 (Off-Street Parking) This section outlines off-street parking provisions. Each off-street parking space shall measure nine (9') feet in width by eighteen (18') feet in length, which meets LID standards. Shared driveways are permitted in residential developments as means to reduce some to the impervious cover imposed by

development. Further, parking areas shall be suitably landscaped to minimize noise, glare and other nuisance characteristics as well as to enhance the environment and ecology of the site and surrounding area. Parking lots containing more than one hundred (100) spaces shall be broken down into sections of smaller lots of fifty (50) spaces separated from other sections by landscaped dividing strips, berms, and similar elements, which serves to disconnect large areas of impervious surface.

Chapter 22 Section 8.5C (Design Standards- Site Protection and General Planting Requirements) The extent of site disturbance is addressed in this section. Provisions to preserve topsoil to protect existing plantings, replanting requirements the disturbed area, and slope areas are all provided in this section. Landscaping may include plant materials such as trees, shrubs, ground cover, perennial, and annuals and other materials such as rocks, water, sculpture, art, walls, fences, and building and paving materials. At a minimum, the equivalent of at least two (2) shrubs and one shade or ornamental tree of two and one half (2 1/2") inch caliper or greater shall be provided for each fifteen hundred (1,500) square feet of area of a residential development not covered by buildings or improvements and for each one thousand (1,000) square feet of nonresidential development. Existing healthy specimen trees may be included in satisfying these requirements. These plantings shall be in addition to any other landscaping requirements including landscaping of off-street parking areas and buffer areas. Deciduous trees shall have at least a two (2") inch caliper at planting and the plant species selected should be hardy for the particular climatic zone in which the development is located and appropriate in terms of function and size.

Section 8.6 (Street Trees) specifies that street trees shall be installed on both sides of all streets in accordance with an approved landscape plan. Trees shall either be massed at critical points, spaced evenly along the street, or both. Street trees planting shall adhere to the following specifications:

Keansburg Borough Street Tree Specifications	
Tree Size (In Feet)	**Tree Intervals (In Feet)**
Large Trees (40+)	50
Medium Size Trees (30-40)	40
Small Trees (to 30)	30
Source: Keansburg Development Regulation Chapter 22 Section 8.5D	

As illustrated above, Keansburg has adopted a number of provisions to incorporate nonstructural stormwater management practices into their Land Development Regulations. However, several sections of the existing ordinance may be examined to determine if additional nonstructural language is practicable. For example, the Borough's landscaping requirements may be revised to require the use of native vegetation (which requires less fertilization and watering than non-native species). Secondly, design standards may be amended so as to incorporate pervious paving materials along sidewalks, driveways, and parking areas. Although amendments may be made, the

Borough's existing provisions have been found to be compatible with N.JA.C. 7:8-5.3 (Nonstructural Stormwater Management Strategies).

In addition, Appendix A provides a model ordinance that has been provided by the NJDEP to assist municipalities in drafting stormwater control ordinances that comply with the State's newly adopted stormwater management design and performance standards. Following the adoption of this plan a new Stormwater Management Control Ordinance per the NJDEP's new Stormwater Management Rules will be prepared and adopted by the Borough. A number of additional provisions relating to stormwater basin fees and maintenance, design standards, pertaining to both structural and nonstructural methods that must be incorporated into a projects design, safety standards for stormwater basins, and maintenance and repair fees and responsibility will all be included within the amended ordinance.

6.2 IMPLEMENTING STRUCTURAL STORMWATER MANAGEMENT STRATEGIES

As mentioned earlier, the NJDEP has implemented more rigid regulations regarding the volume, rate, and quality of stormwater originating on a new development site. Some sites may be able to achieve these standards through vegetative swales, and buffers, and landscaping to control non-point source pollution. Other sites may require the building of a stormwater basin. In these cases, where the development of structural stormwater facilities is necessary, the New Jersey Department of Environmental Protection's BMP guide should be consulted. The structural BMP's utilized in low impact development concentrate on the following practices to be utilized in site development in conjunction with the non-structural methods described above:

- Bio-retention Systems – A bioretention system consists of a soil bed planted with native vegetation located above and underdrained sand layer. It can be configured either as a basin or a swale.
- Constructed Stormwater Wetlands – Constructed wetlands are wetlands systems designed to maximize the removal of pollutants from stormwater runoff through settling and both uptake and filtering by the vegetation.
- Dry Wells - A dry well is a subsurface storage facility that receives and temporarily stores stormwater runoff from roofs and structures. Discharge of the accumulated stormwater from a dry well occurs through infiltration into the surrounding soils.
- Extended Detention Basins - An extended detention basin is a facility constructed through excavation or embankments that provides temporary storage of stormwater runoff. It has an outlet structure that detains runoff inflow and allows for controlled outflow to aid in mitigating stormwater flows from development. Usually this type of structure is utilized to provide both water quantity and water quality mitigation.
- Infiltrative Basins – Infiltration Basins are similar to detention basins in that they both temporarily store stormwater runoff generated from development project. The principal outlet to this type of basin is not a constructed outlet structure, but

rather the highly permeable soils allowing for infiltration into the surrounding subsoils.

- Manufactured Treatment Devices – A manufactured treatment device is a pre-fabricated stormwater treatment structure utilizing settling, filtration, absorptive materials, vortex separation, vegetative components, and/or other appropriate technology to remove pollutants from stormwater runoff.
- Pervious Paving Systems – Pervious pavement utilizes paving material which allows for stormwater to infiltrate through the pavement rather than accumulate as is the case with standard paving material. Pervious pavement utilizes void areas within the paving material to provide for this permeable feature.
- Sand Filters – A sand filter consists of a forebay and an underdrained sand bed. Runoff entering the sand filter is conveyed first through the forebay, which removes trash, debris and coarse sediments, and then infiltrates through the sand bed to an outlet pipe at the bottom of said filter.
- Vegetative Filters – A vegetative filter is an area designed to remove suspended solids and other pollutants from stormwater runoff flowing through a length of vegetation, called a vegetative filter strip. The vegetation in a filter strip can range from turf grass to woody vegetation.
- Wet Ponds - A wet pond is a facility constructed through excavation or embankments that provides both permanent and temporary storage of stormwater runoff. It has an outlet structure that creates a permanent pool and detains and attenuates runoff inflows promoting the settlement of pollutants.

Further, all structural stormwater management measures (structural BMP's) shall be designed according to the following conditions:

- They should to take into account the existing site conditions, including, for example, environmentally critical areas, wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability and texture; drainage area and drainage patterns; and the presence of solution-prone carbonate rocks (limestone).
- They should 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 be parallel bars with one-inch (1") 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 (1/3) the width of the diameter of the orifice or one-third (1/3) the width of the weir, with a minimum spacing between bars of one-inch and a maximum spacing between bars of six inches. In addition, the design of trash racks must comply with the requirements of N.J.A.C. 7:8-7.D.
- They should be designed, constructed, and installed to be strong, durable, and corrosion resistant. Measures that are consistent with the relevant portions of the Residential Site Improvements Standards at N.J.A.C. 5:21-7.3, 7.4, and 7.5 shall be deemed to meet this requirement.

- At the intake to the outlet from the stormwater management basin, the orifice size shall be a minimum of two and one-half inches in diameter.
- Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at Section N.J.A.C. 7:8-7.
- Stormwater management measure guidelines are available in the New Jersey Stormwater Best Management Practices Manual. Other stormwater management measures may be utilized provided the design engineer demonstrates that the proposed measure and its design will accomplish the required water quantity, groundwater recharge and water quality design and performance standards established by this subchapter.
- 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.
- In order to ensure adequate long term operation as well as preventative and corrective maintenance of stormwater management measures and structural BMP's, the designers of such facilities should submit to the municipality a *Maintenance Plan* indicating specific maintenance tasks and schedules as indicated in N.J.A.C. 7:8-5.8 "Maintenance Requirements". This maintenance plan will require the ultimate user of said structural BMP's to provide an annual certification that the stormwater management measures approved are functioning as designed and that the proper maintenance and inspection of said measures have been performed. Random spot inspections by the municipality will be conducted to ensure compliance along with appropriate enforcement actions such as fines to be levied should non-compliance result.

By adhering to the State's newly adopted design standards, the BMP's engineered for each proposed development project will serve to improve stormwater quality, enhance groundwater recharge, and reduce stormwater runoff. Combined, these methods will serve to improve the environment and protect the public interest by minimizing the risk of flooding and maintain the Borough's water supply through the future.

6.3 PLAN CONSISTENCY

Currently, no land within Keansburg is contained within the bounds of an adopted Regional Stormwater Management Plan (RSWMP) and no Total Daily Maximum Loads (TMDL's) have been developed for waters within the Borough. Therefore, at this time, it is not necessary for the amendments proposed in this plan to adhere to standards developed through the adoption of a Regional Stormwater Management Plan. However, if a RSWMP that included Keansburg Borough were to be developed, the Borough would support of such an effort. In addition, if more stringent design standards were to become effective for the Borough either through the adoption of a RSWMP, or if a TMDL becomes effective upstream or within the Borough, then this plan and the Borough's Stormwater Control Ordinance will be reviewed and revised accordingly.

Also, the Borough's current ordinance reinforces the principles and design standards that have already been adopted in the State of New Jersey's Residential Site Improvement

Standards (RSIS). As the State of New Jersey's Stormwater Management Rules have already been adopted into the RSIS, this municipal stormwater management plan is consistent with the RSIS (N.J.A.C. 5:21), and the Borough will utilize the most current update of the RSIS in the stormwater management review of residential areas. Further, major development must meet the established design and performance standards set forth in the Soil Erosions and Sediment Control Act as all new development and redevelopment plans must comply with New Jersey's Soil Erosion and Sediment Control standards. Also, during construction activities, municipal inspectors will observe land disturbance as well as on-site soil erosion and sediment control measures and will report any inconsistency to the Freehold Soil Conservation District.

With regard to land use, the ecologically sensitive measures that are being pursued through this plan and other Borough initiatives are consistent with the State Plan. As the entire Borough of Brielle has been designated as a either a (PA1) Metropolitan Planning Area, the goals and objectives outlined within this plan will serve to encourage compact redevelopment of an appropriate scale where land is suited for development, which in turn, will protect environmentally sensitive lands from development.

Further, the stormwater management methods that are discussed within this Municipal Stormwater Management Plan are consistent with and incorporate the objectives and polices of the Monmouth County Growth Management Guide, which was adopted by the Monmouth County Planning Board in December 1995.

6.4 MITIGATION PLAN

OVERVIEW

A mitigation plan is an element of the Municipal Stormwater Management Plan that allows municipalities to grant a waiver from the design and performance standards for stormwater runoff quality, stormwater runoff quantity, and groundwater recharge established in N.J.A.C. 7:8-5, and adopted into the municipal stormwater control ordinance. The existence of a mitigation plan does not preclude the requirement that an applicant meet the design and performance standards for any one of the three key stormwater requirements, namely maintaining pre-development recharge, stormwater runoff quantity reduction and stormwater runoff quality. Instead, this mitigation plan will serve to enable the Borough of Keansburg, in limited circumstances to waive the strict compliance with one or more of the performance standards where full compliance cannot be reasonably accommodated on site. In addition, approval of a waiver or exemption from one of the three criteria outlined above provides no guarantee that, if requested, an exemption or waiver will be granted for either or both of the remaining criteria. However, under no circumstances shall Keansburg waive the Special Resources Protection Area (SRPA) established under the Stormwater Management Rules at N.J.A.C. 7:8-5.5 (h).

Supporting evidence for an exemption or waiver shall be prepared in the form of a "stormwater management report" which will be signed and sealed by a New Jersey licensed professional engineer. The report shall include at a minimum:

- Detailed hydrologic and hydraulic calculations identifying the sizing criteria for each BMP and the stormwater collection system based upon the anticipated peak flow and/or volume.

- A map of the planned project showing existing conditions with drainage boundaries and land features, including delineated wetlands, proposed improvements, including all BMPs, grading, utilities, impervious features, and landscaping.

- Construction details for each BMP with appropriate contact information.

When applying for a waiver, the applicants professional engineer must first demonstrate that on-site compliance is either a) not possible, or b) possible but would result in tangible negative environmental or structural impacts. Such impacts may include:

- If the strict application of the regulations would result in a reduction of open space and/or undisturbed buffer areas. It is important to note that in this situation, the applicant must demonstrate that such reductions are caused by compliance with State and local regulations and not an attempt to maximize buildable area.

- The degradation of groundwater quality due to the infiltration of poor quality runoff. For example, if runoff from a shopping plaza with heavy traffic volume will be directed to a protected water supply aquifer to achieve compliance, alternative recharge locations may be more practical and environmentally sound.

- The modification to the elevation of the groundwater table due to rapid infiltration of stormwater will have demonstrable negative impacts on local structures and/or local groundwater quality. For example, rapid infiltration in a highly pervious soil near a basement may cause flooding and settlement; and also

- Flooding due to changes in the time of peak for a storm attenuated in compliance with *N.J.A.C. 7:8* and the *New Jersey Stormwater Best Management Practices Manual.* Despite the requirement for peak reductions to be applied to the 2-year, 10-year and 100-year events, peak runoff from a sub-basin of a HUC-14 may actually experience increases due to changes to peak timing.

An applicant may also propose a mitigation project on a site that has not been identified in this mitigation plan. However, in each circumstance the selection of a mitigation project must incorporate the following requirements:

- The project must be within the same area that would contribute to the receptor impacted by that project. If there is no specific sensitive receptor impacted, then the location of the mitigation project may be located anywhere within the municipality, preferably at a location that would provide the greatest benefit.

- Legal authorization must be obtained to construct the project at the location selected. This includes the maintenance and any access needs for the project throughout its operation.

- The mitigation project should be located close to the original development project. If possible, the mitigation project should be located at a similar distance from the identified sensitive receptor. This distance should not be based on actual location, but on a similar hydraulic distance to the sensitive receptor. For example, if a project for which a waiver is obtained discharges to a tributary, but the closest location discharges to the main branch of a waterway, it may be more beneficial to identify a location discharging to the same tributary.

- It is preferable to have one location that addresses any and all of the performance standards waived, rather than one location for each performance standard.

- The project location must demonstrate no adverse impacts to other properties.

- For projects addressing the groundwater recharge performance standard, a mitigation project site upstream of the location of the actual project site is preferable to a downstream location.

- Mitigation projects that address stormwater runoff quantity can choose to provide storage for proposed increases in runoff volume, as opposed to a direct peak flow reduction.

- Mitigation projects that address stormwater runoff quality can choose to address another pollutant other than TSS, which has been demonstrated to be of particular concern, such as streams that have been listed as an impaired waterbody for other pollutants. However, care must be taken to ensure that waivers that are granted for the TSS requirements do not result in the impairment of an existing unimpaired area.

All mitigation plans and reviews should consider the location of the mitigation project in relation to the property where the projected damage will occur. For example, if a project were unable to achieve the stormwater quantity performance standards upstream of an inadequate culvert, a mitigation project downstream of that culvert would not offer similar protection. Or, if the groundwater recharge is the major contributor to a wetlands area, the new project should continue to provide recharge to the wetlands area.

Also, in environmentally critical areas, the quality of stormwater that is being directed to infiltration facilities should be assessed. If the quality of stormwater that would be infiltrated following development poses a threat to groundwater supplies, off-site mitigation should be considered. Off-site mitigation should also be undertaken when on-site recharge is precluded by site conditions, or when stormwater quality assessments indicate that on-site stormwater infiltration will degrade ambient groundwater quality in environmentally sensitive areas. Environmentally critical areas include locations where

groundwater is classified by the State as holding either special ecological significance, wellhead protection areas, areas of known groundwater contamination, or areas of on-going groundwater remediation. Groundwater recharge is of particular concern in areas discharging to Category 1 (C1) groundwater or in wellhead protection areas. Options for off-site groundwater recharge include:

- Retrofitting an existing stormwater basin
- Reducing the amount of impervious cover on site by adding vegetation or incorporating pervious paving materials
- Splitting flows to isolate high quality runoff and constructing infiltration basins to receive only the high quality runoff
- Acquiring upland recharge areas

SENSITIVE RECEPTORS

Within Figure 8, entitled Sensitive Receptor Areas Map, Keansburg has indicated the sensitive receptor areas within the Borough that are especially susceptible to stormwater changes. As many of the mitigation measures that will be employed to these sensitive receptor areas are in the planning stage, when appropriate, Keansburg will allow developers to fund studies to plan and engineer the most suitable mitigation measure for each project site, and each performance standard. An applicant may also provide compensatory mitigation through the contribution of funds when, due to the small amount of the waiver given for the performance standard, it is not practical to provide a full mitigation project. In these circumstances, the receipt of financial contributions shall be considered the completion of mandatory mitigation for that project. However, in these instances, the Borough of Keansburg itself would be responsible to ensure that mitigation occurs based on the collection of these funds. If such a situation were to arise, a detailed description of the circumstances, funding amount and performance standard that was mitigated will be provided in Keansburg's annual NJPDES report.

MITIGATION CRITERIA

The mitigation requirements listed below offer a hierarchy of options that are intended to offset the effect on groundwater recharge, stormwater quantity control, and/or stormwater quality control to an equal or greater extent than was created by the granting of a waiver or exemption from the stormwater management requirements.

The mitigation criteria are listed below in order of preference:

1) **Identify, design, and implement a compensating measure to mitigate impacts**- The preferred option is to identify and develop a compensating mitigation project in the same drainage area as the proposed development. In these cases, the applicant will address the same issue within the design and performance standards for which the variance or exemption is being sought, and

demonstrate that the proposed mitigating measures provide equal or greater compensation to offset the non-complying aspect of the stormwater management system on site. The developer must also ensure the long-term maintenance of the project as outlined in Chapters 8 and 9 of the NJDEP Stormwater BMP Manual. If the Borough agrees to control a new stormwater management facility, arrangement in the form of an escrow account will be made to stipulate the payment amount, schedule, and long term responsibilities of the facility to ensure that it functions to capacity.

2) **Complete a project identified by the municipality as equivalent to the environmental impact created by the exemption or variance-** If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in option 1, the mitigation project may provide measures that are not directly equivalent to the impacts for which the variance or exemption is being sought, but that addresses the same issue to an equal or greater extent. For example if a variance is given because the 80% TSS requirement has not been met, the selected project may address water quality impacts that increase the siltation of a waterbody within the applicable HUC 14 subwatershed.

   It shall be the responsibility of the applicant that is requesting hardship to identify, quantity, and complete a compensatory mitigation alternative that will compensate for the relief that is being sought form the stormwater design and performance standards to an equal or greater extent.

   First and foremost, the applicant is encouraged to identify and propose a compensatory mitigation project within the confines of the drainage area within which the proposed project is located. However, an appropriate mitigation measure may take place within the larger confines of a proposed projects HUC-14 subwatershed area, or another portion of the Borough, rather than the contributing area if the Keansburg Planning Board or Zoning Board of Adjustment finds that the mitigation will equally protect public health, safety and welfare, the environment, and public and private property.

3) **Provide funding for municipal projects that would address existing stormwater impacts-** The third and least preferable stormwater mitigation option is for the applicant to provide funding or partial funding for an environmental enhancement project that has been identified in the Municipal Stormwater Management Plan, or towards the development of a Regional Stormwater Management Plan. The contributed funds must be equal or greater than the cost to implement the required on-site stormwater measure for which relief is requested including the cost of land, easements, engineering design, and long-term maintenance. However, with this option, the Borough, and not the applicant is ultimately responsible for the design, property acquisition, construction, construction management, maintenance (short-term and long-term) and follow-up

study, unless that project and its prospective costs have been outlined within this Mitigation Plan.

REQUIREMENTS FOR MITIGATION PROJECTS

Whether the applicant is proposing the mitigation project, or Keansburg has identified the project within this Mitigation Plan, the following requirements for mitigation must be included in the project submission.

- **Impact from noncompliance-** The applicant must provide a table to show the required values, and the values provided in the project, and include an alternatives analysis that demonstrates that on-site compliance was maximized to the greatest extent practicable.

- **Narrative and Supporting Information Regarding the Need for the Waiver-** The waiver cannot be granted for a condition that was created by the applicant. If the applicant can provide compliance with the stormwater rules through a reduction in the scope of the project, the applicant has created the condition and a waiver cannot be issued. The applicant must provide a discussion and supporting information of the site conditions that would not allow the construction of a stormwater management facility to provide compliance with these requirements, and/or if the denial of the application would impose an extraordinary hardship on the applicant brought about by circumstances peculiar to the subject property. The site conditions to be considered are soil type, the presence of limestone, acidic soils, a high groundwater table, any other unique conditions that would create an unsafe design, as well as conditions that may provide a detrimental impact to public health, welfare, and safety.

- **Sensitive Receptor**- Identify the sensitive receptor related to the performance standard for which a waiver is sought. Demonstrate that the mitigation site contributes to the same sensitive receptor.

- **Design of the Mitigation Project**- Provide the design details of the mitigation project. This includes, but is not limited to, drawings, calculations, and other information needed to evaluate the mitigation project.

- **Responsible Party**- The mitigation project submission must list the party or parties responsible for the construction or maintenance of the mitigation project. Documentation must be provided to demonstrate that the responsible party is aware of, has authority to perform, and accepts the responsibility for the construction and the maintenance of the mitigation project. Under no circumstances shall the responsible party be an individual single-family homeowner.

- **Maintenance**- The applicant must include a maintenance plan that addresses the maintenance criteria at N.J.A.C. 7:8-5 as part of a mitigation plan. In addition, if

the maintenance responsibility is being transferred to Keansburg, or another entity, the entity responsible for the cost of the maintenance must be identified. Keansburg provides applicants with the option of conveying the mitigation project to the Borough, provided that the applicant funds the cost of long-term maintenance of the facility in perpetuity.

- **Permits**- The applicant is solely responsible to obtain any and all necessary local, State, or other applicable permits for the identified mitigation project or measure. The applicable permits must be obtained prior to the municipal approval of the project for which the mitigation is being sought.

- **Construction**- The applicant must demonstrate that the construction of the mitigation project coincides with the construction of the proposed project. A certificate of occupancy or final approval by the municipality for the application permit cannot be issued until the mitigation project or measure receives final approval. Any mitigation projects proposed by the municipality to offset the stormwater impacts of the Borough's own projects must be completed within six months of the completion of the municipal project, in order to remain in compliance with Keansburg's NJPDES General Permit.

APPENDIX A

STORMWATER CONTROL ORDINANCE

NOW THEREFORE, BE IT ORDAINED by the Mayor and Council of the Borough of Keansburg (the "Borough") that:

Section 1: Scope and Purpose

A. Policy Statement

Flood control, groundwater recharge, and pollutant reduction through nonstructural or low impact techniques shall be explored before relying on structural BMPs. Structural BMPs should be integrated with nonstructural stormwater management strategies and proper maintenance plans. Nonstructural strategies include both environmentally sensitive site design and source controls that prevent pollutants from being placed on the site or from being exposed to stormwater. Source control plans should be developed based upon physical site conditions and the origin, nature, and the anticipated quantity or amount of potential pollutants. Multiple stormwater management BMPs may be necessary to achieve the established performance standards for water quality, quantity, and groundwater recharge.

B. Purpose

It is the purpose of this ordinance to establish minimum stormwater management requirements and controls for "major development," as defined in Section 2.

C. Applicability

1. This ordinance shall be applicable to all site plans and subdivisions for the following major developments that require preliminary or final site plan or subdivision review:

   a. Non-residential major developments; and

   b. Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C. 5:21.

2. This ordinance shall also be applicable to all major developments undertaken by the Borough of Keansburg

D. Compatibility with Other Permit and Ordinance Requirements

Development approvals issued for subdivisions and site plans pursuant to this ordinance are to be considered an integral part of development approvals under the subdivision and site plan review process and do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance. In their interpretation and application, the provisions of this ordinance shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This ordinance 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 ordinance 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.

Section 2: Definitions

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

"CAFRA Planning Map" means the geographic depiction of the boundaries for Coastal Planning Areas, CAFRA Centers, CAFRA Cores and CAFRA Nodes pursuant to N.J.A.C. 7:7E-5B.3.

"CAFRA Centers, Cores or Nodes" means those areas within boundaries accepted by the Department pursuant to N.J.A.C. 7:8E-5B.

"Compaction" means the increase in soil bulk density.

"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 Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be:

A county planning agency; or

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

"Drainage area" 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 critical areas" means an area or feature which is of significant environmental value, including but not limited to: stream corridors; natural heritage priority sites; habitat of endangered or threatened species; large areas of contiguous open space or upland forest; steep slopes; and 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 Neighborhood" means a neighborhood designated by the Urban Coordinating Council "in consultation and conjunction with" the New Jersey Redevelopment Authority pursuant to N.J.S.A 55:19-69.

"Erosion" means the detachment and movement of soil or rock fragments by water, wind, ice or gravity.

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

"Infiltration" is the process by which water seeps into the soil from precipitation.

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

"Municipality" means Keansburg Borough.

"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.

"Person" means any individual, corporation, company, partnership, firm, association, Borough of Keansburg, or political subdivision of this State subject to municipal jurisdiction pursuant to the Municipal Land Use Law , N.J.S.A. 40:55D-1 et seq.

"Pollutant" 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.

"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.

"Site" means the lot or lots upon which a major development is to occur or has occurred.

"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 runoff" means water flow on the surface of the ground or in storm sewers, resulting from precipitation.

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

"Stormwater management measure" means any structural or nonstructural strategy, practice, technology, process, program, or other method intended to control or reduce stormwater runoff and associated pollutants, or to induce or control the infiltration or groundwater recharge of stormwater or to eliminate illicit or illegal non-stormwater discharges into stormwater conveyances.

"Tidal Flood Hazard Area" means a flood hazard area, which may be influenced by stormwater runoff from inland areas, but which is primarily caused by the Atlantic Ocean.

"Urban Coordinating Council Empowerment Neighborhood" 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.

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

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

Section 3: General Standards

A. Design and Performance Standards for Stormwater Management Measures

1. Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards in Section 4. To the maximum extent practicable, these

standards shall be met by incorporating nonstructural stormwater management strategies into the design. If these strategies alone are not sufficient to meet these standards, structural stormwater management measures necessary to meet these standards shall be incorporated into the design.

2. The standards in this ordinance 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.

Section 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 Section 10.

B. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department' 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 muhlnebergi* (bog turtle).

C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Sections 4.F and 4.G:

1. The construction of an underground utility line provided that the disturbed areas are revegetated upon completion;

2. The construction of an aboveground utility line provided that the existing conditions are maintained to the maximum extent practicable; and

3. The construction of a public pedestrian access, such as a sidewalk or trail with a maximum width of 14 feet, provided that the access is made of permeable material.

D. A waiver from strict compliance from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Sections 4.F and 4.G may be obtained for the enlargement of an existing public roadway or railroad; or the construction or enlargement of a public pedestrian access, provided that the following conditions are met:

1. The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;

2. The applicant demonstrates through an alternatives analysis, that through the use of nonstructural and structural stormwater management strategies and measures, the option selected complies with the requirements of Sections 4.F and 4.G to the maximum extent practicable;

3. The applicant demonstrates that, in order to meet the requirements of Sections 4.F and 4.G, existing structures currently in use, such as homes and buildings, would need to be condemned; and

4. The applicant demonstrates that it does not own or have other rights to areas, including the potential to obtain through condemnation lands not falling under D.3 above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of Sections 4.F and 4.G that were not achievable on-site.

E. Nonstructural Stormwater Management Strategies

1. To the maximum extent practicable, the standards in Sections 4.F and 4.G shall be met by incorporating nonstructural stormwater management strategies set forth at Section 4.E into the design. The applicant shall identify the nonstructural measures incorporated into the design of the project. If the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management measures identified in Paragraph 2 below into the design of a particular project, the applicant shall identify the strategy considered and provide a basis for the contention.

2. Nonstructural stormwater management strategies incorporated into site design shall:

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

   b. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;

   c. Maximize the protection of natural drainage features and vegetation;

   d. Minimize the decrease in the "time of concentration" from pre-construction to post construction. "Time of concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the watershed to the point of interest within a watershed;

   e. Minimize land disturbance including clearing and grading;

   f. Minimize soil compaction;

   g. Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;

   h. Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas;

   i. Provide other source controls to prevent or minimize the use or exposure of pollutants at the site, in order to prevent or minimize the release of those pollutants into stormwater runoff. Such source controls include, but are not limited to:

      (1) Site design features that help to prevent accumulation of trash and debris in drainage systems, including features that satisfy Section 4.E.3. below;

(2) Site design features that help to prevent discharge of trash and debris from drainage systems;

(3) Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and

(4) When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules.

3. Site design features identified under Section 4.E.2.i.(2) above shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this paragraph, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids. For exemptions to this standard see Section 4.E.3.c below.

a. Design engineers shall use either of the following grates whenever they use a grate in pavement or another ground surface to collect stormwater from that surface into a storm drain or surface water body under that grate:

(1) The New Jersey Department of Transportation (NJDOT) bicycle safe grate, which is described in Chapter 2.4 of the NJDOT Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines (April 1996); or

(2) 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.

Examples of grates subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridges), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater basin floors.

b. Whenever design engineers use a curb-opening inlet, the clear space in that curb opening (or each individual clear space, if the curb opening has two or more clear spaces) shall have an area of no more than seven (7.0) square inches, or be no greater than two (2.0) inches across the smallest dimension.

c. This standard does not apply:

(1) Where the review agency determines that this standard would cause inadequate hydraulic performance that could not practicably be overcome by using additional or larger storm drain inlets that meet these standards;

(2) Where flows from the water quality design storm as specified in Section 4.G.1 are conveyed through any device (e.g., end of pipe netting facility, manufactured treatment device, or a catch basin hood) that is designed, at a minimum, to prevent delivery of all solid and floatable materials that could not pass through one of the following:

(a) A rectangular space four and five-eighths inches long and one and one-half inches wide (this option does not apply for outfall netting facilities); or

(b) A bar screen having a bar spacing of 0.5 inches.

(3) Where flows are conveyed through a trash rack that has parallel bars with one-inch (1") spacing between the bars, to the elevation of the water quality design storm as specified in Section 4.G.1; or

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

4. Any land area used as a nonstructural stormwater management measure to meet the performance standards in Sections 4.F and 4.G shall be dedicated to a government agency, subjected to a conservation restriction filed with the appropriate County Clerk's office, or subject to an approved equivalent restriction that ensures that measure or an equivalent stormwater management measure approved by the reviewing agency is maintained in perpetuity.

5. Guidance for nonstructural stormwater management strategies is available in the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in Section 7, or found on the Department's website at www.njstormwater.org.

F. Erosion Control, Groundwater Recharge and Runoff Quantity Standards

1. This subsection contains minimum design and performance standards to control erosion, encourage and control infiltration and groundwater recharge, and control stormwater runoff quantity impacts of major development.

a. The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq. and implementing rules.

b. The minimum design and performance standards for groundwater recharge are as follows:

(1) The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at Section 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.

(2) This groundwater recharge requirement does not apply to projects within the "urban redevelopment area," or to projects subject to (3) below.

(3) The following types of stormwater shall not be recharged:

(a) Stormwater from areas of high pollutant loading. High pollutant loading areas are areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied, areas where pesticides are loaded/unloaded or stored; areas where hazardous materials are expected to be present in greater than "reportable quantities" as defined by the United States Environmental Protection Agency (EPA) at 40 CFR 302.4; areas where recharge would be inconsistent with Department approved remedial action work plan or landfill closure plan and areas with high risks for spills of toxic materials, such as gas stations and vehicle maintenance facilities; and

(b) Industrial stormwater exposed to "source material." "Source material" means any material(s) or machinery, located at an industrial facility, that is directly or indirectly related to process, manufacturing or other industrial activities, which could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to, raw materials; intermediate products; final products; waste materials; by-products; industrial machinery and fuels, and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.

(4) The design engineer shall assess the hydraulic impact on the groundwater table and design the site so as to avoid adverse hydraulic impacts. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonally high water table so as to cause surficial ponding, flooding of basements, or interference with the proper operation of subsurface sewage disposal systems and other subsurface structures in the vicinity or downgradient of the groundwater recharge area.

c. In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at Section 5, complete one of the following:

(1) Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the two, 10, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;

(2) Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two, 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;

(3) 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. The percentages shall not be applied to post-construction stormwater runoff into tidal flood hazard areas if the increased volume of stormwater runoff will not increase flood damages below the point of discharge; or

(4) In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with (1), (2) and (3) above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.

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

G. Stormwater Runoff Quality Standards

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

Table 1: Water Quality Design Storm Distribution			
Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)
0	0.0000	65	0.8917
5	0.0083	70	0.9917
10	0.0166	75	1.0500
15	0.0250	80	1.0840
20	0.0500	85	1.1170
25	0.0750	90	1.1500
30	0.1000	95	1.1750
35	0.1330	100	1.2000
40	0.1660	105	1.2250
45	0.2000	110	1.2334
50	0.2583	115	1.2417
55	0.3583	120	1.2500
60	0.6250		

2. For purposes of TSS reduction calculations, Table 2 below presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in Section 7, or found on the Department's website at www.njstormwater.org. The BMP Manual and other sources of technical guidance are listed in Section 7. TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2 below. Alternative removal rates and methods of calculating removal rates may be used if the design engineer provides documentation demonstrating the capability of these alternative rates and methods to the review agency. A copy of any approved alternative rate or method of calculating the removal rate shall be provided to the Department at the following address: Division of Watershed Management, New Jersey Department of Environmental Protection, PO Box 418 Trenton, New Jersey, 08625-0418.

3. 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:

   $R = A + B - (AXB)/100$

   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

Table 2: TSS Removal Rates for BMPs

Best Management Practice	TSS Percent Removal Rate
Bioretention Systems	90
Constructed Stormwater Wetland	90
Extended Detention Basin	40-60
Infiltration Structure	80
Manufactured Treatment Device	See Section 6.C
Sand Filter	80
Vegetative Filter Strip	60-80
Wet Pond	50-90

4. If there is more than one onsite drainage area, the 80 percent TSS removal rate shall apply to each drainage area, unless the runoff from the subareas converge on site in which case the removal rate can be demonstrated through a calculation using a weighted average.

5. Stormwater management measures shall also be designed to reduce, to the maximum extent feasible, the post-construction nutrient load of the anticipated load from the developed site in stormwater runoff generated from the water quality design storm. In achieving reduction of nutrients to the maximum extent feasible, the design of the site shall include nonstructural strategies and structural measures that optimize nutrient removal while still achieving the performance standards in Sections 4.F and 4.G.

6. Additional information and examples are contained in the New Jersey Stormwater Best Management Practices Manual, which may be obtained from the address identified in Section 7.

7. In accordance with the definition of FW1 at N.J.A.C. 7:9B-1.4, stormwater management measures shall be designed to prevent any increase in stormwater runoff to waters classified as FW1.

8. Special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B, and perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC14 drainage area. These areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, and exceptional fisheries significance of those established Category One waters. These areas shall be designated and protected as follows:

   a. The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:

      (1) A 300-foot special water resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of the bank outwards or from the centerline of the waterway where the bank is not defined, consisting of existing vegetation or vegetation allowed to follow natural succession is provided. (2) Encroachment within the designated special water resource protection area under Subsection (1) above shall only be allowed where previous development or disturbance has occurred (for example, active agricultural use, parking area or maintained lawn area). The encroachment shall only be allowed where applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top of bank of the waterway or centerline of the waterway where the bank is undefined. All encroachments proposed under this subparagraph shall be subject to review and approval by the Department.

   b. All stormwater shall be discharged outside of and flow through the special water resource protection area and shall comply with the Standard for Off-Site Stability in the "Standards For Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act , N.J.S.A. 4:24-39 et seq.

   c. If stormwater discharged outside of and flowing through the special water resource protection area cannot comply with the Standard For Off-Site Stability in the "Standards for Soil Erosion and Sediment Control in New Jersey," established under the Soil Erosion and Sediment Control Act , N.J.S.A. 4:24-39 et seq., then the stabilization measures in accordance with the requirements of the above standards may be placed within the special water resource protection area, provided that:

      (1) Stabilization measures shall not be placed within 150 feet of the Category One waterway;

      (2) Stormwater associated with discharges allowed by this section shall achieve a 95 percent TSS post-construction removal rate;

      (3) Temperature shall be addressed to ensure no impact on the receiving waterway;

      (4) The encroachment shall only be allowed where the applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable;

(5) A conceptual project design meeting shall be held with the appropriate Department staff and Soil Conservation District staff to identify necessary stabilization measures; and

(6) All encroachments proposed under this section shall be subject to review and approval by the Department.

d. A stream corridor protection plan may be developed by a regional stormwater management planning committee as an element of a regional stormwater management plan, or by a municipality through an adopted municipal stormwater management plan. If a stream corridor protection plan for a waterway subject to Section 4.G(8) has been approved by the Department of Environmental Protection, then the provisions of the plan shall be the applicable special water resource protection area requirements for that waterway. A stream corridor protection plan for a waterway subject to G.8 shall maintain or enhance the current functional value and overall condition of the special water resource protection area as defined in G.8.a.(1) above. In no case shall a stream corridor protection plan allow the reduction of the Special Water Resource Protection Area to less than 150 feet as measured perpendicular to the waterway subject to this subsection.

e. Paragraph G.8 does not apply to the construction of one individual single family dwelling that is not part of a larger development on a lot receiving preliminary or final subdivision approval on or before February 2, 2004 , provided that the construction begins on or before February 2, 2009.

Section 5: Calculation of Stormwater Runoff and Groundwater Recharge

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

1. The design engineer shall calculate runoff using one of the following methods:

   a. The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Section 4 – Hydrology and Technical Release 55 – Urban Hydrology for Small Watersheds; or

   b. The Rational Method for peak flow and the Modified Rational Method for hydrograph computations.

2. For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the pre-construction condition of a site or portion thereof is a wooded land use with good hydrologic condition. The term "runoff coefficient" applies to both the NRCS methodology at Section 5.A.1.a and the Rational and Modified Rational Methods at Section 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 and other methods may be employed.

5. If the invert of the outlet structure of a stormwater management measure is below the flood hazard design flood elevation as defined at N.J.A.C. 7:13, the design engineer shall take into account the effects of tailwater in the design of structural stormwater management measures.

B. Groundwater recharge may be calculated in accordance with the following:

1. The New Jersey Geological Survey Report GSR-32 A Method for Evaluating Ground-Water Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the New Jersey Stormwater Best Management Practices Manual; at http://www.state.nj.us/dep/njgs/; or at New Jersey Geological Survey, 29 Arctic Parkway, P.O. Box 427 Trenton, New Jersey 08625-0427; (609) 984-6587.

Section 6: Standards for Structural Stormwater Management Measures

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

1. Structural stormwater management measures shall be designed to take into account the existing site conditions, including, for example, environmentally critical areas, wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability and texture; drainage area and drainage patterns; and the presence of solution-prone carbonate rocks (limestone).

2. Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning. Trash racks shall be installed at the intake to the outlet structure as appropriate, and shall have parallel bars with one-inch (1") 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 (1/3) the width of the diameter of the orifice or one-third (1/3) the width of the weir, with a minimum spacing between bars of one-inch and a maximum spacing between bars of six inches. In addition, the design of trash racks must comply with the requirements of Section 8.D.

3. Structural stormwater management measures shall be designed, constructed, and installed to be strong, durable, and corrosion resistant. Measures that are consistent with the relevant portions of the Residential Site Improvement Standards at N.J.A.C. 5:21-7.3, 7.4, and 7.5 shall be deemed to meet this requirement.

4. At the intake to the outlet from the stormwater management basin, the orifice size shall be a minimum of two and one-half inches in diameter.

5. Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at Section 8.

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

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

Section 7: Sources for Technical Guidance

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

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

2. The New Jersey Department of Environmental Protection Stormwater Management Facilities Maintenance Manual, as amended.

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

1. The "Standards for Soil Erosion and Sediment Control in New Jersey" promulgated by the State Soil Conservation Committee and incorporated into N.J.A.C. 2:90. Copies of these standards may be obtained by contacting the State Soil Conservation Committee or the Freehold Soil Conservation District located at 4000 Kozloski Road -- PO Box 5033 Freehold, NJ 07728, Phone: 732-683-8500, Fax: 732-683-9140 Email: info@freeholdscd.org. The telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey 08625; (609) 292-5540;

2. The Rutgers Cooperative Extension Service, 732-932-9306; and

Section 8: Safety Standards for Stormwater Management Basins

A. This section sets forth requirements to protect public safety through the proper design and operation of stormwater management basins. This section applies to any new stormwater management basin.

B. Requirements for Trash Racks, Overflow Grates and Escape Provisions

1. A trash rack is a device designed to catch trash and debris and prevent the clogging of outlet structures. Trash racks shall be installed at the intake to the outlet from the stormwater management basin to ensure proper functioning of the basin outlets in accordance with the following:

   a. The trash rack shall have parallel bars, with no greater than six inch spacing between the bars.

   b. The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure.

   c. The average velocity of flow through a clean trash rack is not to exceed 2.5 feet per second under the full range of stage and discharge. Velocity is to be computed on the basis of the net area of opening through the rack.

   d. The trash rack shall be constructed and installed to be rigid, durable, and corrosion resistant, and shall be designed to withstand a perpendicular live loading of 300 lbs/ft sq.

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 lbs./ft sq.

3. For purposes of this paragraph 3, escape provisions means the permanent installation of ladders, steps, rungs, or other features that provide easily accessible means of egress from stormwater management basins. Stormwater management basins shall include escape provisions as follows:

   a. If a stormwater management basin has an outlet structure, escape provisions shall be incorporated in or on the structure. With the prior approval of the reviewing agency identified in Section 8.C a free-standing outlet structure may be exempted from this requirement.

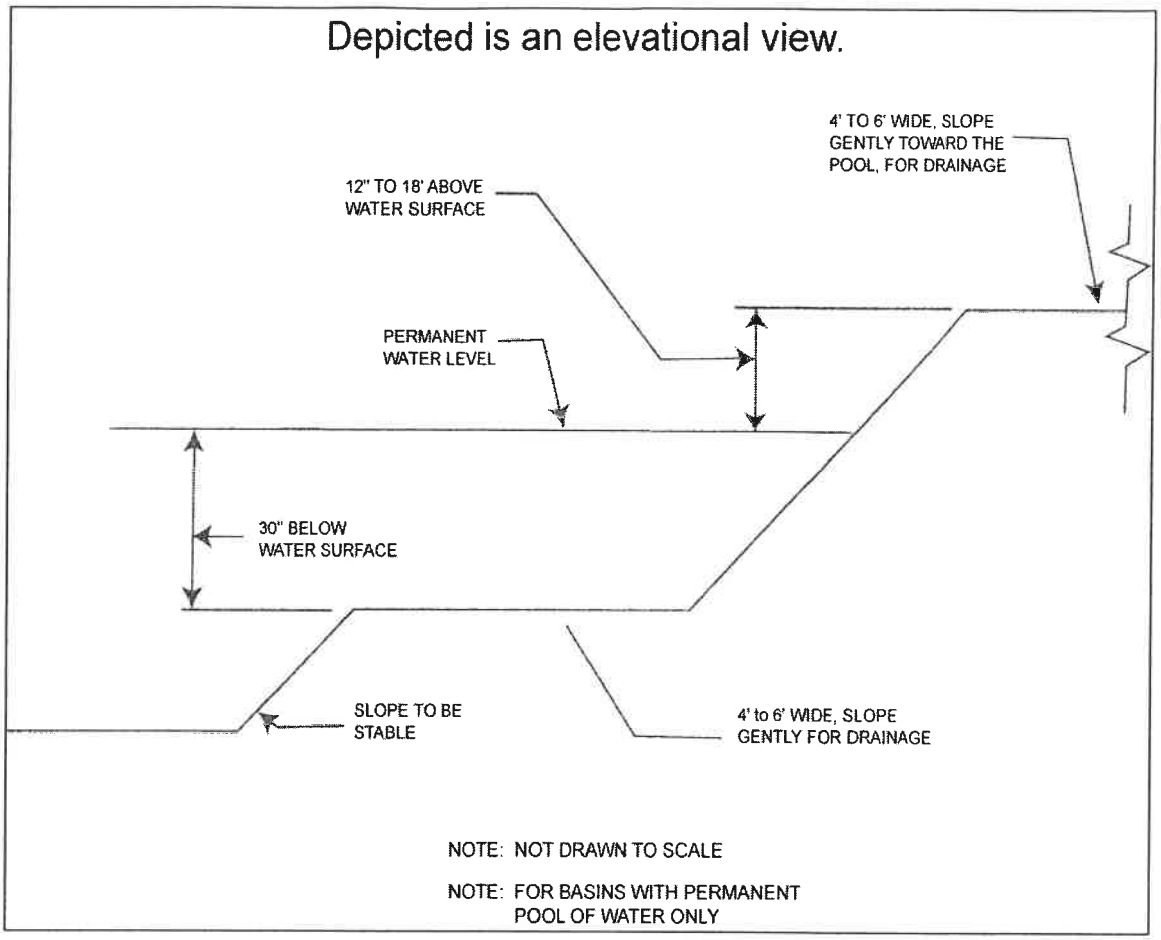
   b. Safety ledges shall be constructed on the slopes of all new stormwater management basins having a permanent pool of water deeper than two and one-half feet. Such safety ledges shall be comprised of two steps. Each step shall be four to six feet in width. One step shall be located approximately two 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 Section 8.D for an illustration of safety ledges in a stormwater management basin.

   c. In new stormwater management basins, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than 3 horizontal to 1 vertical.

C. Variance or Exemption from Safety Standards

1. A variance or exemption from the safety standards for stormwater management basins may be granted only upon a written finding by the appropriate reviewing agency (municipality, county or Department) that the variance or exemption will not constitute a threat to public safety.

D. Illustration of Safety Ledges in a New Stormwater Management Basin



Section 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 ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section 9.C below as part of the submission of the applicant's application for subdivision or site plan approval.
2. The applicant shall demonstrate that the project meets the standards set forth in this ordinance.
3. The applicant shall submit 15 copies of the materials listed in the checklist for site development stormwater plans in accordance with Section 9.C of this ordinance.

B. Site Development Stormwater Plan Approval

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

C. Checklist Requirements

The following information shall be required:

1. Topographic Base Map

The reviewing engineer may require upstream tributary drainage system information as necessary. It is recommended that 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.

2. Environmental Site Analysis

A written and graphic description of the natural and man-made features of the site and its environs. This description should include a discussion of soil conditions, slopes, wetlands, waterways and vegetation on the site. Particular attention should be given to unique, unusual, or environmentally sensitive features and to those that provide particular opportunities or constraints for development.

3. Project Description and Site Plan(s)

A map (or maps) at the scale of the topographical base map indicating the location of existing and proposed buildings, roads, parking areas, utilities, structural facilities for stormwater management and sediment control, and other permanent structures. The map(s) shall also clearly show areas where alterations occur in the natural terrain and cover, including lawns and other landscaping, and seasonal high ground water elevations. A written description of the site plan and justification of proposed changes in natural conditions may also be provided.

4. Land Use Planning and Source Control Plan

This plan shall provide a demonstration of how the goals and standards of Sections 3 through 6 are being met. The focus of this plan shall be to describe how the site is being developed to meet the objective of controlling groundwater recharge, stormwater quality and stormwater quantity problems at the source by land management and source controls whenever possible.

5. Stormwater Management Facilities Map

The following information, illustrated on a map of the same scale as the topographic base map, shall be included:

a. Total area to be paved or built upon, proposed surface contours, land area to be occupied by the stormwater management facilities and the type of vegetation thereon, and details of the proposed plan to control and dispose of stormwater.

b. Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention and emergency spillway provisions with maximum discharge capacity of each spillway.

6. Calculations

a. Comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in Section 4 of this ordinance.

b. When the proposed stormwater management control measures (e.g., infiltration basins) depends on the hydrologic properties of soils, 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.

7. Maintenance and Repair Plan

The design and planning of the stormwater management facility shall meet the maintenance requirements of Section 10.

8. Waiver from Submission Requirements

The municipal official or board reviewing an application under this ordinance may, in consultation with the municipal engineer, waive submission of any of the requirements in Sections 9.C.1 through 9.C.6 of this ordinance 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.

Section 10: Maintenance and Repair

A. Applicability

1. Projects subject to review as in Section 1.C of this ordinance shall comply with the requirements of Sections 10.B and 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). Maintenance guidelines for stormwater management measures are available in the New Jersey Stormwater Best Management Practices Manual. If the maintenance plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation of such person's agreement to assume this responsibility, or of the

developer's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.

3. Responsibility for maintenance shall not be assigned or transferred to the owner or tenant of an individual property in a residential development or project, unless such owner or tenant owns or leases the entire residential development or project.

4. If the person responsible for maintenance identified under Section 10.B.2 above is not a public agency, the maintenance plan and any future revisions based on Section 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.

5. Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure, including repairs or replacement to the structure; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of nonvegetated linings.

6. The person responsible for maintenance identified under Section 10.B.2 above shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders.

7. The person responsible for maintenance identified under Section 10.B.2 above shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed.

8. The person responsible for maintenance identified under Section 10.B.2 above shall retain and make available, upon request by any public entity with administrative, health, environmental, or safety authority over the site, the maintenance plan and the documentation required by Sections 10.B.6 and 10.B.7 above.

9. The requirements of Sections 10.B.3 and 10.B.4 do not apply to stormwater management facilities that are dedicated to and accepted by Keansburg or another governmental agency.

10. In the event that the stormwater management facility becomes a danger to public safety or public health, or if it is in need of maintenance or repair, Keansburg 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. Keansburg, 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, Keansburg or County may immediately proceed to do so and shall bill the cost thereof to the responsible person.

B. Nothing in this section shall preclude Keansburg 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.

Section 11: Penalties

Failure to comply with any provisions of this Section shall be considered a violation of the Coded Ordinances of Keansburg Borough. Any person, firm or corporation found to be in violation of the provisions of this chapter shall be punishable as provided in Chapter 22-3.9 (Violations and Penalties), of the Borough's adopted Code.

Section 12: Effective Date

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

Section 13: Severability

If the provisions of any section, subsection, paragraph, subdivision, or clause of this ordinance shall be judged invalid by a court of competent jurisdiction, such order of judgment shall not affect or invalidate the remainder of any section, subsection, paragraph, subdivision, or clause of this ordinance.

Introduction **October 25, 2006**

Adopted **December 13, 2006**

APPENDIX B

2004 NEW JERSEY INTEGRATED WATERS

Water Quality Testing Sites Along the Waackaack Creek Included in the New Jersey 2004 Integrated List of Waterbodies

Sublist	Watershed Region	WMA	Station Name/Waterbody	Site ID	Parameters	Data Source
1	Atlantic Coast	12	Waackaack Creek-Tidal	35, R65, SRB4	Dissolved Oxygen	Monmouth Co HD, NJDEP Coastal Monitoring, NJDEP Shellfish Monitoring
5	Atlantic Coast	12	Waackaack Creek-Tidal	35, R65, SRB4	Fecal Coliform, Total Coliform	Monmouth Co HD, NJDEP Coastal Monitoring, NJDEP Shellfish Monitoring

APPENDIX C

MCHD WATER QUALITY TESTING RESULTS

The Monmouth County Department of Health (MCHD) monitors 62 representative stations throughout Monmouth County. Stations are sampled quarterly for fecal coliform and twice annually for ammonia and total phosphorus. Standards are: Fecal Coliform - 200 fecal colonies/100 ml, Ammonia - 0.05 mg/L, Phosphorus - 0.1 mg/l.

WAACKCAACK CREEK, HIGLAND AVE, KEANSBURG

Collection Date	Fecal	Ammonia	Phosphorus	Ph	TSS	Turbidity
11/16/2004	10		0.15	7.56	19.6	3.31
8/12/2004	1200			6.63	30.8	45.6
5/25/2004	490	0.19	0.15	7.28	19.2	10.2
3/22/2004	10			6.98	2.8	12.7
9/16/2003	1200	0.32	0.19	7.3	20	12.6
6/17/2003	50			7.3	20	7.19
3/25/2003	10	0.1	0.09	7.07	16	9.6
12/3/2002	60			6.76	18.4	16.5
10/22/2002	10	0.25	0.22	6.77	8.8	5.2
6/25/2002	650			7.8	19.2	16.5
3/12/2002	30	0.14	0.11	8	19	
12/11/2001	630				16	
10/9/2001	70	0.6	0.2	7.15	61	
6/12/2001	190			7.85	54	
3/13/2001	20	0.19	0.11	8.05	20	
12/12/2000	36					
10/17/2000	60	0.13	0.15			
6/13/2000	1200					
3/14/2000	60	0.1	0.13			
12/14/1999	10					
10/13/1999	60	0.64	0.193			
6/8/1999	1070					
3/10/1999	30	< 0.03	0.1			

FIGURES

Figure 1: USGS Topographic Map

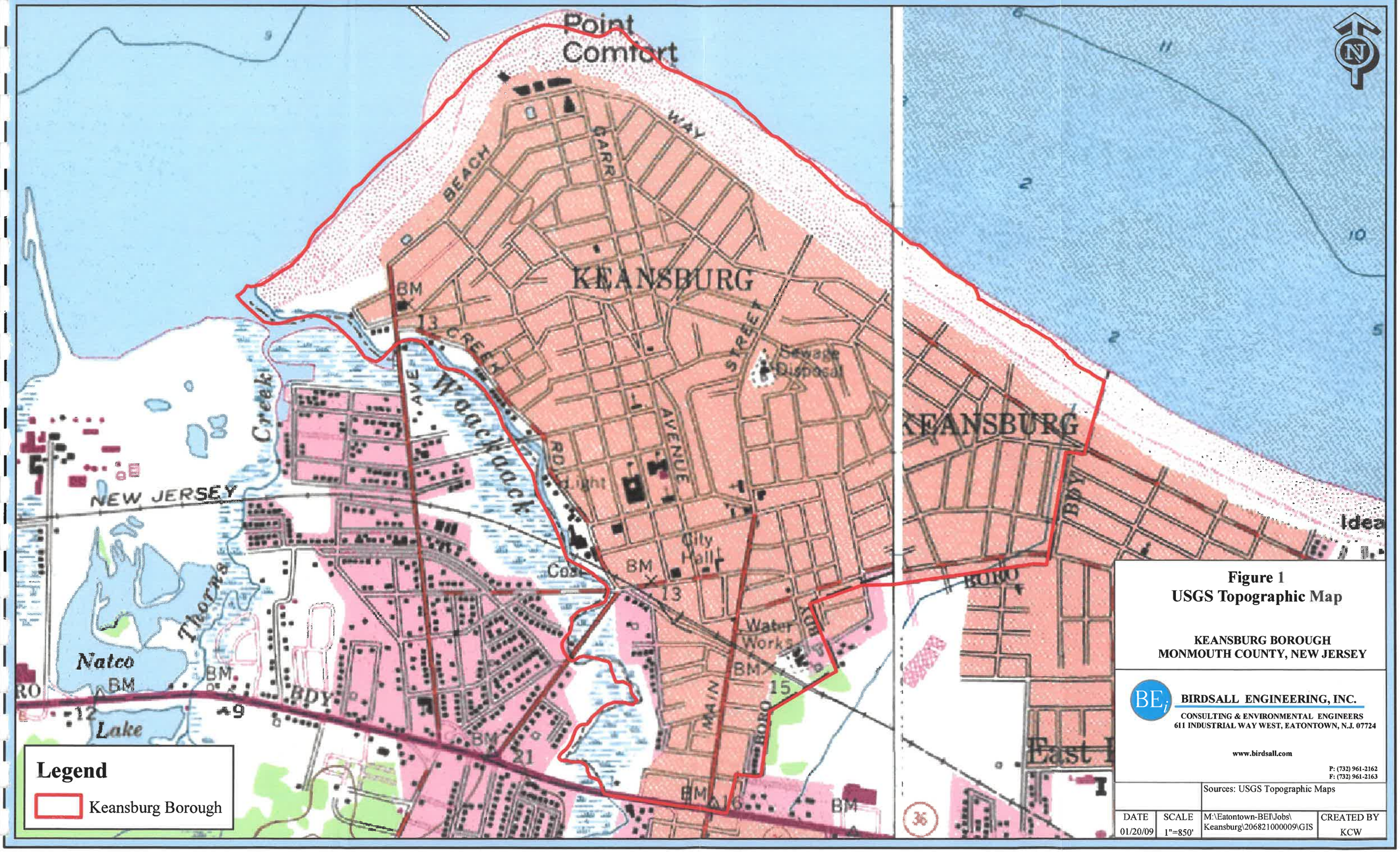


Figure 1
USGS Topographic Map

KEANSBURG BOROUGH
MONMOUTH COUNTY, NEW JERSEY

BIRDSALL ENGINEERING, INC.
CONSULTING & ENVIRONMENTAL ENGINEERS
611 INDUSTRIAL WAY WEST, EATONTOWN, N.J. 07724

www.birdsall.com

P: (732) 961-2162
F: (732) 961-2163

Sources: USGS Topographic Maps

DATE	SCALE		CREATED BY
01/20/09	1"=850'	M:\Eatontown-BEI\Jobs\ Keansburg\206821000009\GIS	KCW

Keansburg Borough

Figure 2: 2002 Land Use/Land Cover

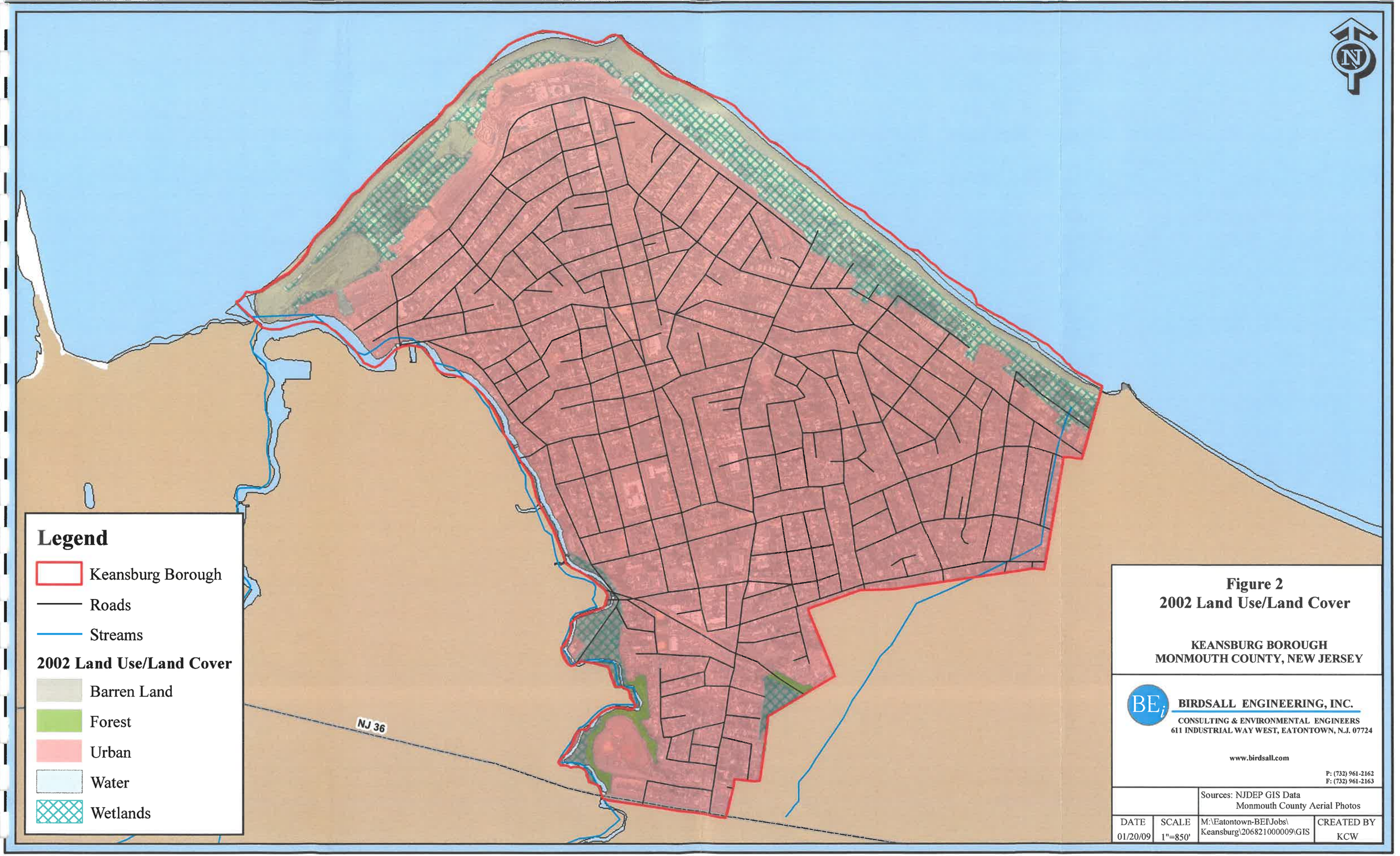


Figure 2
2002 Land Use/Land Cover

KEANSBURG BOROUGH
MONMOUTH COUNTY, NEW JERSEY

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F: (732) 961-2163

		Sources: NJDEP GIS Data Monmouth County Aerial Photos	
DATE 01/20/09	SCALE 1"=850'	M:\Eatontown-BEI\Jobs\ Keansburg\206821000009\GIS	CREATED BY KCW

Keansburg Borough

Figure 3: Waterways Map

Figure 3
Waterways Map

KEANSBURG BOROUGH
MONMOUTH COUNTY, NEW JERSEY

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		Sources: NJDEP GIS Data Monmouth County Aerial Photos	
DATE 01/20/09	SCALE 1"=850'	M:\Eatontown-BE\Jobs\ Keansburg\206821000009\GIS	CREATED BY KCW

Keansburg Borough

Figure 4: Groundwater Recharge (Inches/Year)

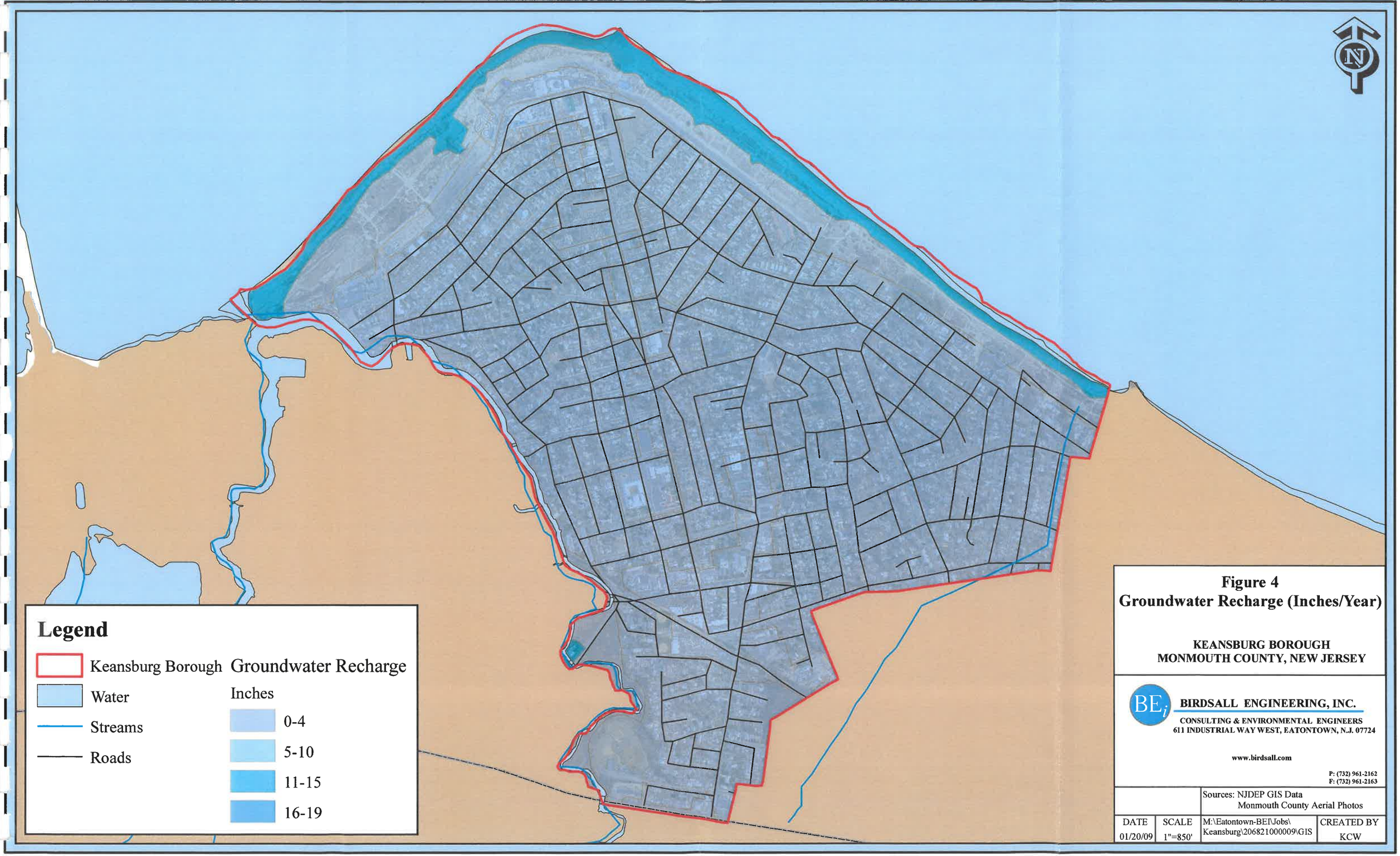

Figure 4
Groundwater Recharge (Inches/Year)

KEANSBURG BOROUGH
MONMOUTH COUNTY, NEW JERSEY

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CONSULTING & ENVIRONMENTAL ENGINEERS
611 INDUSTRIAL WAY WEST, EATONTOWN, N.J. 07724

www.birdsall.com

P: (732) 961-2162
F: (732) 961-2163

Sources: NJDEP GIS Data
Monmouth County Aerial Photos

DATE	SCALE		CREATED BY
01/20/09	1"=850'	M:\Eatontown-BE\Jobs\Keansburg\206821000009\GIS	KCW

Keansburg Borough

Figure 5: Soils Map(2005)

Figure 5
Soils (2005)

KEANSBURG BOROUGH
MONMOUTH COUNTY, NEW JERSEY

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P: (732) 961-2162
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		Sources: NJDEP GIS Data Monmouth County Aerial Photos	
DATE 01/20/09	SCALE 1"=850'	M:\Eatontown-BEI\Jobs\ Keansburg\206821000009\GIS	CREATED BY KCW

Keansburg Borough

Figure 6: Wellhead Protection Areas

Figure 6
Wellhead Protection Areas

KEANSBURG BOROUGH
MONMOUTH COUNTY, NEW JERSEY

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Sources: NJDEP GIS Data
Monmouth County Aerial Photos

DATE	SCALE		CREATED BY
01/20/09	1"=850'	M:\Eatontown-BEI\Jobs\Keansburg\206821000009\GIS	KCW

Keansburg Borough

Figure 7: FEMA

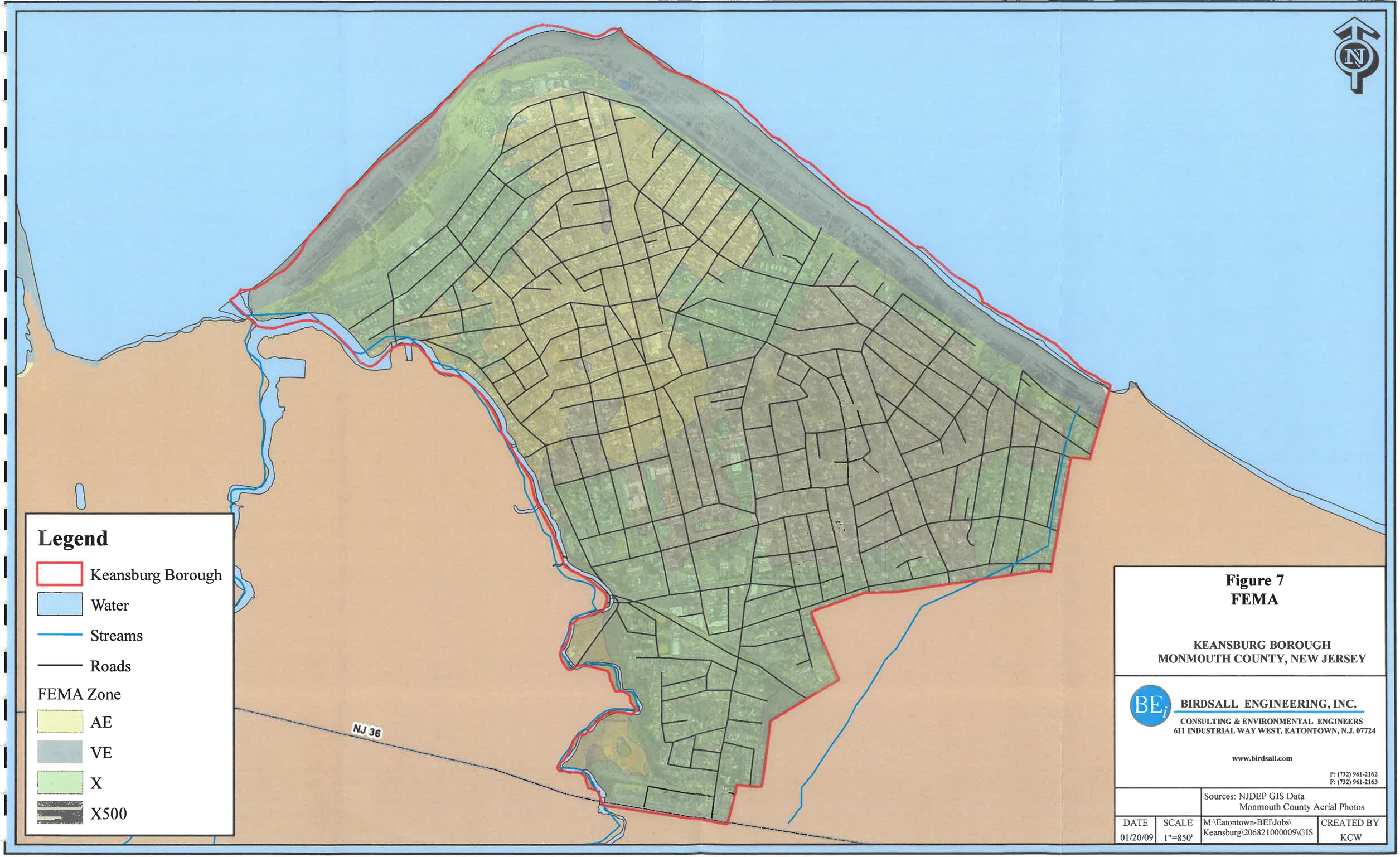

Figure 7
FEMA

KEANSBURG BOROUGH
MONMOUTH COUNTY, NEW JERSEY

BIRDSALL ENGINEERING, INC.
CONSULTING & ENVIRONMENTAL ENGINEERS
611 INDUSTRIAL WAY WEST, EATONTOWN, N.J. 07724

www.birdsall.com

P: (732) 961-2162
F: (732) 961-2163

		Sources: NJDEP GIS Data Monmouth County Aerial Photos	
DATE 01/20/09	SCALE 1"=850'	M:\Eatontown-BEI\Jobs\ Keansburg\206821000009\GIS	CREATED BY KCW

Keansburg Borough

Figure 8: Sensitive Receptor Map

Note: Keansburg has not yet identified any sensitive receptors. As sensitive receptors are identified, mapping will be updated accordingly.

Figure 8
Sensitive Receptors Map

KEANSBURG BOROUGH
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Ordinance #[*Chapter 27-1 to 27-13*] – Stormwater Control *(continued)*

Section XI. Penalties:

Any person(s) who erects, constructs, alters, repairs, converts, maintains, or uses any building, structure or land in violation of this ordinance shall be subject to the following penalties:

A. Fine not to exceed two thousand ($2,000.00) dollars.

Section XII. Severability:

Each section, subsection, sentence, clause and phrase of this Ordinance is declared to be an independent section, subsection, sentence, clause and phrase, and the finding or holding of any such portion of this Ordinance to be unconstitutional, void, or ineffective for any cause, or reason, shall not affect any other portion of this Ordinance.

Section XIII. Effective Date:

This Ordinance shall be in full force and effect from and after its adoption and any publication as required by law.

Mr. Cusick asked for a roll call vote to ADOPT Ordinance #1666:

Roll Call

	Moved	Seconded	Ayes	Nays	Absent	Abstain
Mr. Donaldson			✓			
Mr. Tonne	✓		✓			
Mr. Cocuzza		✓	✓			
Mr. Foley						✓
Mr. Hoff			✓			

INTRODUCTION: January 27, 2021
ADOPTION: February 17, 2021

CERTIFICATION

I, Jo-Ann O'Brien, Clerk of the Borough of Keansburg, in the County of Monmouth, New Jersey, do hereby certify that the foregoing is a true copy of an ordinance duly adopted by the Borough Council at its regularly scheduled public meeting on February 17, 2021

Jo-Ann O'Brien
Deputy Municipal Clerk

ORDINANCE #1666

AN ORDINANCE AMENDING AND SUPPLEMENTING THE REVISED GENERAL ORDINANCES OF THE BOROUGH OF KEANSBURG, CHAPTER XXVII STORMWATER CONTROL.

NOW, THEREFORE BE IT ORDAINED BY THE MAYOR AND COUNCIL.. OF THE BOROUGH OF KEANSBURG that CHAPTER XXVII STORMWATER CONTROL OF THE REVISED GENERAL ORDINANCES, Is hereby amended and supplemented as follows:

Municipal Stormwater Control Ordinance

Ordinance #[*Chapter 27-1 to 27-13*] – Stormwater Control

Section I. Scope and Purpose:

A. Policy Statement

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

The purpose of this ordinance is to establish minimum stormwater management requirements and controls for "major development," as defined below in Section II.

C. Applicability

1. This ordinance shall be applicable to the following major developments:

    a. Non-residential major developments; and
    b. Aspects of residential major developments that are not pre-empted by the Residential Site Improvement Standards at N.J.A.C. 5:21.

2. This ordinance shall also be applicable to all major developments undertaken by the Borough of Keansburg.

D. Compatibility with Other Permit and Ordinance Requirements

Development approvals issued pursuant to this ordinance 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 ordinance shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare.

This ordinance 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 ordinance imposes restrictions different from those imposed by any

(continued on the next page)

other ordinance, rule or regulation, or other provision of law, the more restrictive provisions or higher standards shall control.

Section II. Definitions:

For the purpose of this ordinance, the following terms, phrases, words and their derivations shall have the meanings stated herein unless their use in the text of this Chapter clearly demonstrates a different meaning. When not inconsistent with the context, words used in the present tense include the future, words used in the plural number include the singular number, and words used in the singular number include the plural number. The word "shall" is always mandatory and not merely directory. The definitions below are the same as or based on the corresponding definitions in the Stormwater Management Rules at N.J.A.C. 7:8-1.2.

"CAFRA Centers, Cores or Nodes" means those areas with boundaries incorporated by reference or revised by the Department in accordance with N.J.A.C. 7:7-13.16.

"CAFRA Planning Map" means the map used by the Department to identify the location of Coastal Planning Areas, CAFRA centers, CAFRA cores, and CAFRA nodes. The CAFRA Planning Map is available on the Department's Geographic Information System (GIS).

"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 Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinance(s). The county review agency may either be:

1. A county planning agency or

(continued on the next page)

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 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.

(continued on the next page)

Ordinance #[*Chapter 27-1 to 27-13*] – Stormwater Control *(continued)*

"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.

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

"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:

1. The disturbance of one or more acres of land since February 2, 2004;
2. The creation of one-quarter acre or more of "regulated impervious surface" since February 2, 2004;
3. The creation of one-quarter acre or more of "regulated motor vehicle surface" since March 2, 2021; or

(continued on the next page)

4. A combination of 2 and 3 above that totals an area of one-quarter acre or more. The same surface shall not be counted twice when determining if the combination area equals one-quarter acre or more.

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 meet any one or more of paragraphs 1, 2, 3, or 4 above. 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 any city, borough, town, township, or village.

"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 ordinance 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.

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"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.

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"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.

"Person" means any individual, corporation, company, partnership, firm, association, political subdivision of this State and any state, interstate or Federal agency.

"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.

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"Regulated impervious surface" 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.

"Regulated motor vehicle surface" 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
   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.

"Site" means the lot or lots upon which a major development is to occur or has occurred.

"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.

(continued on the next page)

"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;

(continued on the next page)

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.

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

Section III. 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 ordinance 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.

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Ordinance #[*Chapter 27-1 to 27-13*] – Stormwater Control *(continued)*

Section IV. 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 Section X.

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 muhlnebergi* (bog turtle).

C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quality, and stormwater runoff quantity requirements of Section IV.P, Q and 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 Section IV.O, P, Q and 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 Section IV.O, P, Q and R to the maximum extent practicable;
3. The applicant demonstrates that, in order to meet the requirements of Section IV.O, P, Q and 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 IV.D.3 above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of Section IV.O, P, Q and R that were not achievable onsite.

E. Tables 1 through 3 below summarize the ability of stormwater best management practices identified and described in the New Jersey Stormwater Best Management

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Practices Manual to satisfy the green infrastructure, groundwater recharge, stormwater runoff quality and stormwater runoff quantity standards specified in Section IV.O, P, Q and 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 1, 2 and 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 ordinance the BMP Tables in the Stormwater Management rule at N.J.A.C. 7:8-5.2(f) shall take precedence.

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Table 1
Green Infrastructure BMPs for Groundwater Recharge, Stormwater Runoff Quality, and/or Stormwater Runoff Quantity

Best Management Practice	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quantity	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)] No[(c)]	2[(b)] 1[(c)]
Small-Scale Bioretention Basin[(a)]	80 or 90	Yes	Yes[(b)] No[(c)]	2[(b)] 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	--

(Notes corresponding to annotations [(a)] through [(g)] are found on Page D-14)

(continued on the next page)

Table 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	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quantity	Groundwater Recharge	Minimum Separation from Seasonal High Water Table (feet)
Bioretention System	80 or 90	Yes	Yes[(b)] No[(c)]	2[(b)] 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

(Notes corresponding to annotations [(b)] through [(d)] are found on Page D-14)

(continued on the next page)

Table 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	Stormwater Runoff Quality TSS Removal Rate (percent)	Stormwater Runoff Quantity	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

Notes to Tables 1, 2, and 3:

(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.

(continued on the next page)

Ordinance #[*Chapter 27-1 to 27-13*] – Stormwater Control *(continued)*

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 Section VI.B. Alternative stormwater management measures may be used to satisfy the requirements at Section IV.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 Section O.2 are subject to the contributory drainage area limitation specified at Section 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 Section 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 Section IV.D is granted from Section IV.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

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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 Section VIII.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 Section VIII; 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 Section IV.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 Sections IV.O, P, Q and 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 Section IV.P, Q and 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 Monmouth County Office of the County Clerk or the Monmouth County registrar of deeds and mortgages.

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A form of deed notice shall be submitted to the municipality 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 Section IV.O, P, Q and 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 X.B.5. Prior to the commencement of construction, proof that the above required deed notice has been filed shall be submitted to the municipality. 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 clerk or other proof of recordation provided by the recording office. However, if the initial proof provided to the municipality 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 municipality.

N. A stormwater management measure approved under the municipal stormwater management plan or ordinance may be altered or replaced with the approval of the municipality, if the municipality determines that the proposed alteration or replacement meets the design and performance standards pursuant to Section IV of this ordinance 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 municipality for approval and subsequently recorded with the Monmouth County Office of the County Clerk or the Monmouth County registrar of deeds and mortgages and shall contain a description and location of the stormwater management measure, as well as reference to the maintenance plan, in accordance with M above. Prior to the commencement of construction, proof that the above required deed notice has been filed shall be submitted to the municipality in accordance with 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 Section IV.P and Q, the design engineer shall utilize green infrastructure BMPs identified in Table 1 at Section IV.F. and/or an alternative stormwater management measure approved in accordance with Section IV.G. The following green infrastructure BMPs are subject to the following maximum contributory drainage area limitations:

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Ordinance #[*Chapter 27-1 to 27-13*] – Stormwater Control *(continued)*

Best Management Practice	Maximum Contributory Drainage Area
Dry Well	1 acre
Manufactured Treatment Device	2.5 acres
Pervious Pavement Systems	Area of additional inflow cannot exceed three times the area occupied by the BMP
Small-scale Bioretention Systems	2.5 acres
Small-scale Infiltration Basin	2.5 acres
Small-scale Sand Filter	2.5 acres

3. To satisfy the stormwater runoff quantity standards at Section IV.R, the design engineer shall utilize BMPs from Table 1 or from Table 2 and/or an alternative stormwater management measure approved in accordance with Section IV.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 Section IV.D is granted from the requirements of this subsection, then BMPs from Table 1, 2, or 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 Section IV.P, Q and 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 Section IV.P, Q and R, unless the project is granted a waiver from strict compliance in accordance with Section IV.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 Section V, either:

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Ordinance #[*Chapter 27-1 to 27-13*] – Stormwater Control *(continued)*

i. 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
ii. 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:

i. 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
ii. 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:

i. 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.

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ii. 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 4, below. The calculation of the volume of runoff may take into account the implementation of stormwater management measures.

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Table 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	0.2350	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	0.3583	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
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	1.0383	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

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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 Section IV.P, Q and 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:

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i. 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;

ii. 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;

iii. 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

iv. In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with 2.i, ii and iii 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.

Section V. 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:

i. 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,

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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

ii. 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 Section V.A.1.i and the Rational and Modified Rational Methods at Section V.A.1.ii. 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

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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:

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.

Section VI. 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 1, 2, and 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:

The Division of Water Quality, New Jersey Department of Environmental Protection, Mail Code 401-02B, PO Box 420, Trenton, New Jersey 08625-0420.

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Ordinance #[*Chapter 27-1 to 27-13*] – Stormwater Control *(continued)*

Section VII. Solids and Floatable Materials Control Standards:

A. Site design features identified under Section IV.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 Section VII.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:

   i. 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
   ii. 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.

      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.

   iii. 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 A.1. above does not apply:

   i. 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;
   ii. 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;
   iii. 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

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prevent delivery of all solid and floatable materials that could not pass through one of the following:

a. 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
b. 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).

iv. 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

v. 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.

Section VIII. 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 Section VIII.C.1, VIII.C.2, and VIII.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:

i. The trash rack shall have parallel bars, with no greater than six-inch spacing between the bars;
ii. The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure;

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iii. 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

iv. 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:

i. The overflow grate shall be secured to the outlet structure but removable for emergencies and maintenance.

ii. The overflow grate spacing shall be no less than two inches across the smallest dimension

iii. 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:

i. 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;

ii. 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 VIII.E for an illustration of safety ledges in a stormwater management BMP; and

iii. 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

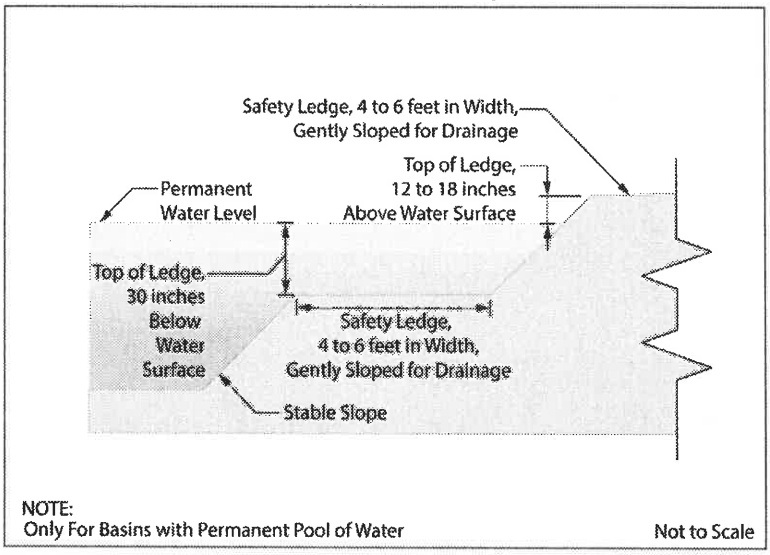
A variance or exemption from the safety standards for stormwater management BMPs may be granted only upon a written finding by the municipality that the variance or exemption will not constitute a threat to public safety.

(continued on the next page)

Ordinance #[*Chapter 27-1 to 27-13*] – Stormwater Control *(continued)*

E. Safety Ledge Illustration

Elevation View –Basin Safety Ledge Configuration



Section IX. 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 ordinance, the applicant shall submit all of the required components of the Checklist for the Site Development Stormwater Plan at Section IX.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 ordinance.

3. The applicant shall submit seventeen (17) hard copies and one (1) electronic copy of the materials listed in the checklist for site development stormwater plans in accordance with Section IX.C of this ordinance.

B. Site Development Stormwater Plan Approval

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 ordinance.

(continued on the next page)

Ordinance #[*Chapter 27-1 to 27-13*] – Stormwater Control *(continued)*

C. Submission of Site Development Stormwater Plan

The following information shall be required:

1. Topographic Base Map

   The reviewing engineer may require upstream tributary drainage system information as necessary. It is recommended that 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.

2. 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.

3. 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.

4. Land Use Planning and Source Control Plan

   This plan shall provide a demonstration of how the goals and standards of Sections III through V 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.

(continued on the next page)

Ordinance #[*Chapter 27-1 to 27-13*] – Stormwater Control *(continued)*

5. 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.

6. Calculations

   i. Comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in Section IV of this ordinance.
   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.

7. Maintenance and Repair Plan

   The design and planning of the stormwater management facility shall meet the maintenance requirements of Section X.

8. Waiver from Submission Requirements

   The municipal official or board reviewing an application under this ordinance may, in consultation with the municipality's review engineer, waive submission of any of the requirements in Section IX.C.1 through IX.C.6 of this ordinance 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.

(continued on the next page)

Ordinance #[*Chapter 27-1 to 27-13*] – Stormwater Control *(continued)*

Section X. Maintenance and Repair:

A. Applicability

Projects subject to review as in Section I.C of this ordinance shall comply with the requirements of Section X.B and X.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 Section X.B.3 above is not a public agency, the maintenance plan and any future revisions based on Section X.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

(continued on the next page)

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 Section X.B.3 above shall perform all of the following requirements:

   i. 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;
   ii. evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed; and
   iii. 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 Section X.B.6 and B.7 above.

8. The requirements of Section X.B.3 and 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.

   https://www.njstormwater.org/maintenance_guidance.htm.

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 municipality 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.

(continued on the next page)

APPENDIX 3

Major Development Stormwater Summary Report

No Major Development at this time.

Attachment D – Major Development Stormwater Summary

General Information

1. Project Name:
2. Municipality: County: Block(s): Lot(s):
3. Site Location (State Plane Coordinates – NAD83): E: N:
4. Date of Final Approval for Construction by Municipality:
   Date of Certificate of Occupancy:
5. Project Type (check all that apply):
   Residential ☐ Commercial ☐ Industrial ☐ Other (please specify) _____
6. Soil Conservation District Project Number:
7. Did project require an NJDEP Land Use Permit? Yes ◯ No ◯ Land Use Permit #:
8. Did project require the use of any mitigation measures? Yes ◯ No ◯
   If yes, which standard was mitigated? _____

Site Design Specifications

1. Area of Disturbance (acres): Area of Proposed Impervious (acres):
2. List all Hydrologic Soil Groups:
3. Please Identify the Amount of Each Best Management Practices (BMPs) Utilized in Design Below:
   Bioretention Systems ___ Constructed Wetlands ___ Dry Wells ___ Extended Detention Basins ___
   Infiltration Basins ___ Combination Infiltration/Detention Basins ___ Manufactured Treatment Devices___
   Pervious Paving Systems ___ Sand Filters ___ Vegetative Filter Strips ___ Wet Ponds ___
   Grass Swales ___ Subsurface Gravel Wetlands ___ Other _____

Storm Event Information

Storm Event - Rainfall (inches and duration): 2 yr.: _____ 10 yr.: _____

100 yr.: _____ WQDS: _____

Runoff Computation Method:
NRCS: Dimensionless Unit Hydrograph ☐ NRCS: Delmarva Unit Hydrograph ☐ Rational ☐ Modified Rational ☐
Other: _____

Basin Specifications (answer all that apply)

If more than one basin, attach multiple sheets

1. Type of Basin: Surface/Subsurface (select one): Surface ◯ Subsurface ◯
2. Owner (select one):
   ◯ Public ◯ Private: If so, Name: Phone number:
3. Basin Construction Completion Date:
4. Drain Down Time (hr.):
5. Design Soil Permeability (in./hr.):
6. Seasonal High Water Table Depth from Bottom of Basin (ft.): Date Obtained:
7. Groundwater Recharge Methodology (select one): 2 Year Difference ◯ NJGRS ◯ Other ◯ NA ◯
8. Groundwater Mounding Analysis (select one): Yes ◯ No ◯ If, Yes Methodology Used:
9. Maintenance Plan Submitted: Yes ◯ No ◯ Is the Basin Deed Restricted: Yes ◯ No ◯

Comments:

Name of Person Filling Out This Form: _____ Signature: _____

Title: _____ Date: _____ 2/2/2018

Basin Specifications (answer all that apply) *If more than one basin, attach multiple sheets*
1. Type of Basin: Surface/Subsurface (select one): Surface ○ Subsurface ○
2. Owner (select one): ○ Public ○ Private: If so, Name: Phone number:
3. Basin Construction Completion Date:
4. Drain Down Time (hr.):
5. Design Soil Permeability (in./hr.):
6. Seasonal High Water Table Depth from Bottom of Basin (ft.): Date Obtained:
7. Groundwater Recharge Methodology (select one): 2 Year Difference ○ NJGRS ○ Other ○ NA ○
8. Groundwater Mounding Analysis (select one): Yes ○ No ○ If, Yes Methodology Used:
9. Maintenance Plan Submitted: Yes ○ No ○ Is the Basin Deed Restricted: Yes ○ No ○

Basin Specifications (answer all that apply) *If more than one basin, attach multiple sheets*
1. Type of Basin: Surface/Subsurface (select one): Surface ○ Subsurface ○
2. Owner (select one): ○ Public ○ Private: If so, Name: Phone number:
3. Basin Construction Completion Date:
4. Drain Down Time (hr.):
5. Design Soil Permeability (in./hr.):
6. Seasonal High Water Table Depth from Bottom of Basin (ft.): Date Obtained:
7. Groundwater Recharge Methodology (select one): 2 Year Difference ○ NJGRS ○ Other ○ NA ○
8. Groundwater Mounding Analysis (select one): Yes ○ No ○ If, Yes Methodology Used:
9. Maintenance Plan Submitted: Yes ○ No ○ Is the Basin Deed Restricted: Yes ○ No ○

Basin Specifications (answer all that apply) *If more than one basin, attach multiple sheets*
1. Type of Basin: Surface/Subsurface (select one): Surface ○ Subsurface ○
2. Owner (select one): ○ Public ○ Private: If so, Name: Phone number:
3. Basin Construction Completion Date:
4. Drain Down Time (hr.):
5. Design Soil Permeability (in./hr.):
6. Seasonal High Water Table Depth from Bottom of Basin (ft.): Date Obtained:
7. Groundwater Recharge Methodology (select one): 2 Year Difference ○ NJGRS ○ Other ○ NA ○
8. Groundwater Mounding Analysis (select one): Yes ○ No ○ If, Yes Methodology Used:
9. Maintenance Plan Submitted: Yes ○ No ○ Is the Basin Deed Restricted: Yes ○ No ○

Name of Person Filling Out This Form: ________________________ Signature: ________________________

Title: ____ Date: ____________________________

APPENDIX 4

Local Public Education Program

BOROUGH OF KEANSBURG

APPENDIX 4 – LOCAL PUBLIC EDUCATION PROGRAM

Statewide Basic Requirement:

Local Public Education Program - Tier A Municipalities 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 groundwater and to involve the public in reducing pollutants in stormwater and mitigating flow.

The Tier A Municipality shall annually conduct activities that total at least 12 points and include activities from at least three of the five categories as set forth in the Table (Points System for Public Education and Outreach Activities) below. 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. Records shall be kept necessary to demonstrate compliance with this requirement, including date of activities and any other relevant documentation.

Category 1: General Public Outreach		
Activity	**Description**	**Points**
Website & Social Media	Maintain a stormwater related page on the municipal website or on a municipal social media site. The web page may include links to other stormwater related resources, including the NJDEP stormwater website (www.njstormwater.org).	1
Newspaper Ad	Use Department created and approved stormwater education materials available on www.cleanwaternj.org to publish an ad in a newspaper or newsletter that serves the municipality.	1
Radio/ Television	Broadcast a radio or television public service announcement from www.cleanwaternj.org on a local radio or municipal public service channel.	1
Green Infra-structure Signage	Post signs at municipally-owned green infrastructure sites that describe the function and importance of the infrastructure, contact phone number, municipal identification number, and/or website for more information. *New signs receive 0.5 credits per sign. Existing signs that are maintained or upgraded receive 0.25 credits per sign. A maximum of 5 credits are allowed.	5*
Billboard/ Sign	Produce and maintain (for credit in subsequent years) a billboard or sign which can be displayed on a bus, bus stop shelter, recreation field (outfield sign), or other similar public venue.	2
Mural	Produce and maintain (for credit in subsequent years) the planning and painting of a stormwater pollution themed mural, storm drain art or other artwork at a local downtown/commercial area or other similar public venue.	2
Stormwater Facility Signage	Post signs at municipally-owned stormwater management basins or other structural stormwater related facilities that describe the function and importance of the facility, contact phone number, municipal identification number, and/or website for more information. *New signs receive 0.5 credits per sign. Existing signs that are maintained or upgraded receive 0.25 credits per sign. A maximum of 5 credits are allowed.	5*

Category 2: Targeted Audiences Outreach		
Activity	**Description**	**Points**
Stormwater Display	Present a stormwater related display or materials at any municipal event (e.g., Earth Day, town picnic), at the municipal building or other similar public venue.	1
Promotional Item	Distribute an item or items with a stormwater related message (e.g., refrigerator magnets, temporary tattoos, key chains, bookmarks, pet waste bag dispensers, coloring books, and pens or pencils). Municipality must initially have available a minimum number of the items equal to 10% of the municipal population.	2
Mailing or e-Mailing Campaign	Provide information to all known owners of stormwater facilities not owned or operated by the municipality (i.e., privately owned) highlighting the importance of proper maintenance of stormwater measures. For assistance, see information at www.nj.gov/dep/stormwater/maintenance_guidance.htm.	3
Mailing or e-Mailing Campaign	Distribute any of the Department's educational brochures, tip cards, or a municipally produced equivalent (e.g., community calendar, newsletter, or recycling schedule) via a mailing to every resident and business in the municipality.	2
Ordinance Education	Distribute a letter or e-mail from the mayor or municipal official to every resident and business in the municipality highlighting the requirements and environmental benefits of the Pet Waste, Wildlife Feeding, Litter Control, Improper Disposal of Waste, Containerized Waste/Yard Waste Collection, Private Storm Drain Inlet Retrofitting and Illicit Connection ordinances. Provide a link to the municipal website where subject ordinances are posted.	3
Category 3: School / Youth Education and Activities		
Activity	**Description**	**Points**
School Presen-tations	Provide water-related educational presentation(s) and/or activities to local preschool, elementary, middle, and/or high school classes using municipal staff or local partner organizations. Topics could include stormwater, nonpoint source pollution, watersheds, water conservation and water quality. For ideas, see information at www.nj.gov/dep/seeds. *Presentations receive 1 credit/presentation, with a maximum of 5 credits allowed.	5*
Water Education Workshops	Provide water-related professional development workshops for local teachers from a registered NJ Department of Education Professional Development Provider.	2
Storm Drain Labeling	Organize a project to label and/or maintain storm drain labels (that are not already precast with a message) with a scout troop, local school district, or faith-based group, or other community youth group for a minimum of 40 labels. This project could also include stenciling over precast labels to improve legibility.	3
Educational Contest for Schools	Organize an educational contest with a local school district or a local community organization serving youth to design a poster, magnet, rain stick, rain barrel or other craft/art object. Contest themes shall have an appropriate stormwater message. Winning entries are to be displayed at publicly accessible locations within the municipality such as at the town hall, library, post office, or school. The winning design should be shown on the municipality's website or social media site, if practical.	3
AmeriCorps Event	Coordinate an event (e.g. volunteer stream monitoring, educational presentations, or stormwater awareness project) through AmeriCorps NJ Watershed Ambassador Program.	4
Clean-up	Sponsor or organize a litter clean up for a scout troop, local school district, faith-based group or other community youth group along a local waterway, public park, stormwater facility, or in an area with storm drains that discharge to a local lake or waterway.	3

Category 4: Watershed/Regional Collaboration		
Activity	**Description**	**Points**
Regional Stormwater Collaboration	Participate in a regional stormwater, community collaborative or other watershed-based group on a regular basis to discuss impaired waterbodies, TMDLs, regional stormwater related issues, or watershed restoration plans that address those waterbodies. Evaluate, develop and implement remedies that resolve stormwater-related issues within the affected waterbody or watershed.	3
Green Infrastructure Workshop	Organize or participate in a rain barrel, rain garden or other green infrastructure workshop on a regional or watershed basis. This could be a partnership exercise with a local watershed organization, utility, university, school, youth/faith-based group, and/or other organization.	3
Community Activity	Organize or participate in the organization of a regional or watershed-based event to carry out stormwater activities such as stormwater facility maintenance or litter clean-up. The municipality may identify and enter into a partnership agreement with a local group such as a watershed organization, utility, university, school, youth/faith-based group, and/or other organization to carry out these activities	3
Category 5: Community Involvement Activities		
Activity	**Description**	**Points**
Volunteer Stormwater Assessment or Stream Monitoring	Establish a volunteer stormwater facility assessment (inspection, inventory and/or mapping) or stream monitoring program for a waterbody within the municipality in order to gauge the health of the waterway through chemical, biological or visual monitoring protocols. Contact NJDEP's AmeriCorps NJ Watershed Ambassador Program or review USEPA National Directory of Volunteer Monitoring Programs.	3
Rain Barrel Workshop	Organize or participate in a rain barrel workshop. This could be a partnership exercise with a local watershed organization, university, school, youth/faith-based group, and/or other nonprofit.	3
Rain Garden Workshop	Organize or participate in a rain garden training or installation workshop. This could be a partnership exercise with a local watershed organization, university, school, youth/faith-based group, and/or other nonprofit.	3
Community Event	Organize or participate in the organization of a community event to carry out stormwater activities such as stormwater measure maintenance or a stream buffer restoration. The municipality may identify and enter into a partnership agreement with a local group such as a watershed organization, university, utility, school, youth/faith-based group, and/or other nonprofit to carry out these activities.	3
Community Involvement	Organize a project with a local organization to create and post signs at either green and/or gray stormwater infrastructure sites or facilities that describe the function and importance of the facility, contact phone number, municipal identification number, and/or website for more information. *Signs receive 0.5 credits per sign. A maximum of 5 credits are allowed.	5*

To comply with the Local Public Education requirement outlined above, the Borough will conduct the following activities:

- **WEBSITE** – The Borough 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. (1 POINT)
- **STORMWATER DISPLAY** – The Borough will present a stormwater related display at the municipal building or other similar public venue. (1 POINT)
- **MAILING CAMPAIGN** – The Borough will distribute andy of the NJDEP 's educational brochures, tip cards or municipaly produced equivalent (e.g. Calendar, Recycling Schedule) to all residents and businesses along with one of its municipal mailings. (2 POINTS)
- **ORDINANCE EDUCATION** – The Borough will distribute a letter to all residents and business highlighting the requirements and benefits of the stormwater related ordinances adopted. (3 POINTS)
- **CLEAN UP** – The Borough will sponsor or organize a litter clean up for a scout troop, local school district, faith-based group or other community youth group along a local waterway, public park, stormwater facility, or in an area with storm drains that discharge to a local lake or waterway. (3 POINTS)
- **REGIONAL STORMWATER COLLABORATION** – The Borough will participate in a regional stormwater, community collaborative or other watershed-based group on a regular basis to discuss impaired waterbodies, TMDLs, regional stormwater related issues, or watershed restoration plans that address those waterbodies. Evaluate, develop and implement remedies that resolve stormwater-related issues within the affected waterbody or watershed. (3 POINTS)

<u>Additional Measures:</u>

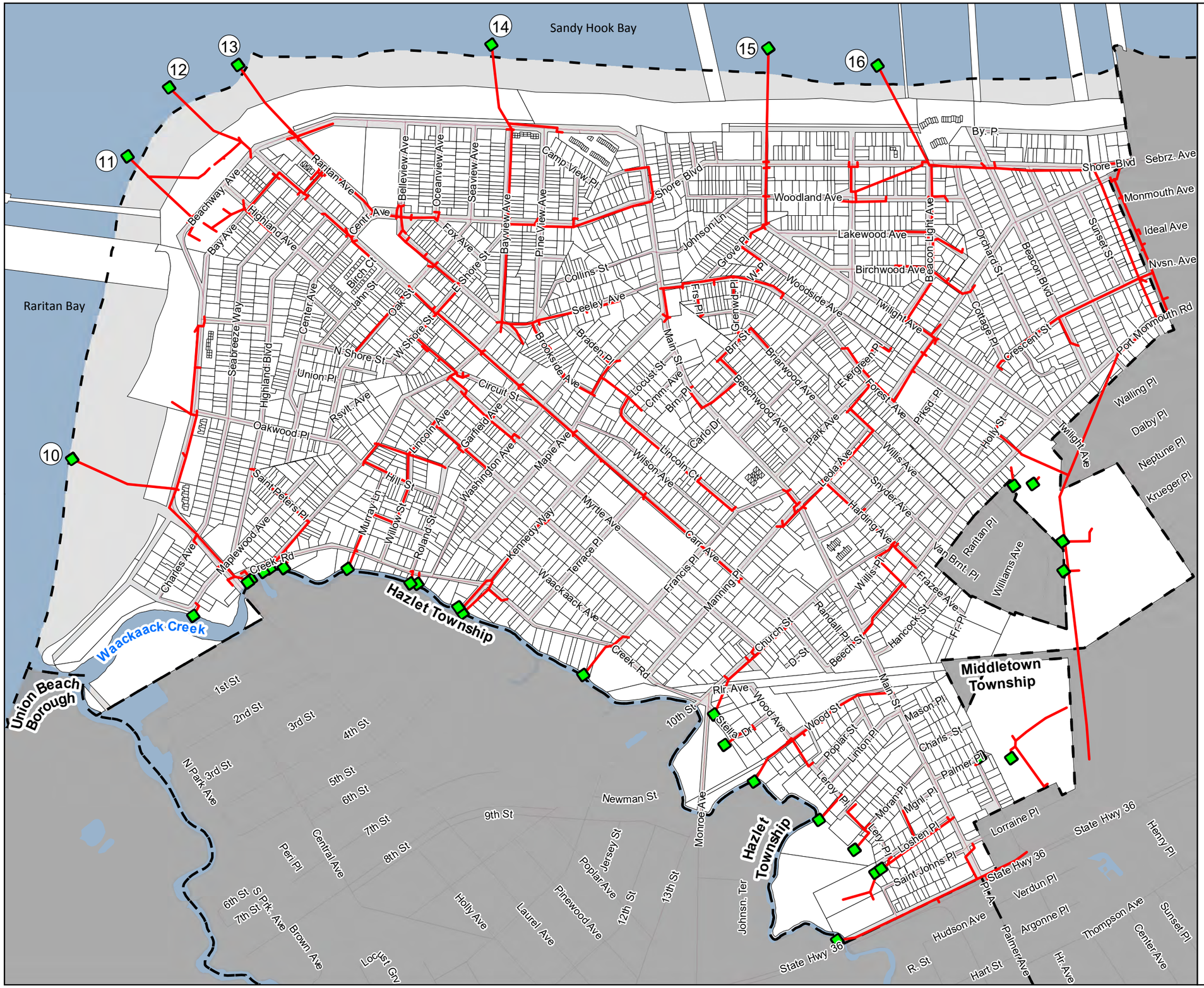
Additional activities will be evaluated and coordinated as needed throughout the reaminder of the permit year in order to complete accumulating the minimum 12 points required.

Other activites that are under consideration may include coordinating with the NJ Watershed Ambassadors Program to conduct free classroom workshops, and/or presentations at the local public schools, providing magnets, buttons, bookmarks, or pencils that portray the message of stormwater prevention at future annual educational events or coordinating stream/water body cleanups with local organizations. Final determination of additional activities to be conducted is to be determined at a later date and will be documented appropriately to record the date and event held for future reporting purposes in the Borough's Annual Inspection and Recertification Report.

APPENDIX 5

Outfall Pipe Map

Stormwater Mains and Outfalls
Borough of Keansburg
Monmouth County, New Jersey



Storm Outfalls

Storm Pipe

Municipal Boundary

Parcel Boundary

Open Water

N

0 250 500 1,000 1,500 2,000 Feet

T&M Associates
11 Tindall Road
Middletown, NJ 07748
Phone: 732-671-6400

Prepared by: JAC, 1/10/2019
Source: NJDOT; Monmouth County; Borough of Keansburg
G:\Projects\KNBG\G1901\GIS\Projects\
Stormwater Mains and Outfalls.mxd

APPENDIX 6

Recycling Program and Schedule

Borough of Keansburg – Outfall Inventory

Bay Outfalls – East to West		Map #	Pump Recommendation	OF Replace
1. Carr Place Pump Station	58" RCP	17	N/A	Mddletwn.
2. Beaconlight Ave. OF -	24" CMP	16	Yes # 1	Yes
3. Twilight Ave. OF -	24" CMP	15	Yes # 4	No-New 96'
4. Bayview Ave. OF -	36" CMP	14	Yes # 3	Yes
5. Raritan Ave. OF -	36" CMP	13	Yes # 2	Yes
6. Carr Ave. Boardwalk OF -	24 " CMP	12	No	Yes
7. Highland Ave. (pier) -	24 " CMP	11	No	Yes
8. Laurel Ave. OF -	12" CMP	10	No	Abandoned
9. Laurel Ave. @ Harbor Lights -	12" CMP	9	No	Yes

Amt. 6

Creek Outfalls – Bay to St. Johns Park

1. Flood Gate – Closes High Tide – control 12" top of B-Head	Major - Pump(s) – 3
2. Charles St. – empties to the Marina	8" ABS - 1997
3. Maplewood Ave. "	12 " ABS – 97 – Duck Bill (Red Max)
4. Seeley Ave. @ Creek Rd.	24" RCP – Thru Bulkhead - 1999
5. Murray Lane	18" CMP - Thru Bulkhead - 1997
6. Roland St.	15" PVC – Thru Bulkhead - 1999
7. Kennedy Way	24" RCP – 4th St./Creek - 1999
8. Frances Pl.	15" RCP – Caruso School Pickup
9. Manning Pl. (8" VCP dead head)	Aux. percolation system 2005
10. Creek Rd. off Church St.	8" ABS – Reinstalled 1997
11. Church St. – County System	42" RCP – Pt. Mon Rd./Main St. 2006
12. Wood St.	8" ABS – Partial Rebuild 1997
13. Thorne Place Culvert	Percolation System 1997
14. Leroy Pl. – between Linton & Fredrick	8" VCP-abandon w/CDBG
15. Moran Pl. – Two invert lines	12" ABS top 2008/15" RCP Bottom 1988
16. Lohsen Ave.	21" RCP shoe – Repalced 1988
17. St. Johns Fields	2 inlets entrance to drive - 1998

Total OF – Bay 8 / Creek 17 = 25 dok 3/07

Note: The Beaconlight Bay OF lead line was installed in 2/07 and has been designed by BEI to accept a mini pump station. The pump stations are listed in order of priority. Each Bay OF (3, 4 & 5) has sink hole problems street side that MUST BE ADDRESSED before p-stations are installed. The first station installed should be at the Beaconlight OF location, followed by Raritan & Bayview This installation will give the Borough an evaluation process, and allow for an easier transition with the remaining pump installations. The lead lines for these locations must be addressed as above.
Update 4/05/07 – All OF inspected for illicit connections – none found.
Update 10/04/07 – See memo to T. Cusick Re: Bayview sinkhole repair this date (Completed)
11/28/07 – Attached two reports #1 OF inventory - #2 Storm report listing avg. scenarios

Borough of Keansburg - Department of Public Works - SW Outfall Listings

#	Location	Creek Outfalls		inspection 2/21/2018	inspection 7/19/2018	inspection 1/8/2019	inspection 7/5/2019	inspection 1/7/2020	inspection 7/14/2020	inspection 1/15/2021	inspect
1	Charles Street - 8" ABS - Thru bulkhead in Marina			ok	ok	ok	ok	ok	ok	ok	
2	Maplewood Ave. - 12" ABS - Thru bulkhead in Marina			ok	ok	ok	ok	ok	ok	ok	
3	Seeley Ave/Creek Rd. - 24" RCP - Thru bulkhead			ok	ok	ok	ok	ok	ok	ok	
4	Murray Lane - 18" CMP - Thru bulkhead			ok	ok	ok	ok	ok	ok	ok	
5	Roland St/Creek Rd. - 15" Trans. - Thru bulkhead			ok	ok	ok	ok	ok	ok	ok	
6	Kennedy Way @ Bridge N. side - 18" RCP - direct			ok	ok	ok	ok	ok	ok	ok	
7	Kennedy Way @ Bridge S. side - 18" RCP - direct			ok	ok	ok	ok	ok	ok	ok	
8	Frances Pl. - 15" RCP - Thru housing Pking. Lot			ok	ok	ok	ok	ok	ok	ok	
9	Manning Pl. - 8" VCP - Backup w/Perc system 2005			ok	ok	ok	ok	ok	ok	ok	
10	Creek Rd. off Church St. - 8" ABS - 1 inlet			ok	ok	ok	ok	ok	ok	ok	
11	Church St/Monroe Ave. @ Bridge S. side - 42" RCP			ok	ok	ok	ok	ok	ok	ok	
12	Wood St. - 8" ABS - direct drop - High in weed area		Recon. 2013	county,no	county	county	county	county,ok,no	ok/no county	ok/county	
13	Thorne Pl. - Culvert - perc system - fenced in		cut april ann.	ok	ok	ok	ok	ok	ok	ok	
14	Leroy Pl./between Linton & Frederick Pl. - 8" VCP			ok	ok	ok	ok	ok	ok	ok	
15	Moran Pl. - 15" RCP - direct drop - High in weed area			ok	ok	ok	ok	ok	ok	ok	
16	Lohsen Ave. - 18" RCP - shoe lead w/ gravel			ok	ok	ok	ok	ok	ok	ok	
17	St Johns Park - 21" RCP - shoe lead w/lg. blue rock			ok	ok	ok	ok	ok	ok	ok	
				ok	ok	ok	ok	ok	ok	ok	
#	Location	Bay Outfalls									
1-Jan	Carr Place Pump Station - East Beacon Beach		Mddletwn	Mddletwn	Mddletwn	Mddletwn	Mddletwn	Mddletwn	Mddletwn	Mddletwn	
2	Beaconlight Outfall - 24" CMP	#16	ann.pumps pulled	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok	
3	Twilight Avenue - 24" CMP	#15		ok	0k	ok	ok	ok	ok	ok	
4	Bayview Avenue - 36" CMP	#14		new const.	ok	ok	ok	ok	ok	ok	
5	Raritan Avenue - 24" CMP	#13	ann. Pumps pulled	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok	
6	Boardwalk/Midway Outfall - 24" -	#12		slow	slow	slow	slow	slow	slow	slow	
7	Pier Outfall - 24" CMP	#11		ok	ok	ok	ok	ok	ok	ok	
8	Beachway - Collichio - 18" CMP			min. flow	min. flow	min. flow	min. flow	min. flow	min flow	min flow	

Borough of Keansburg - Department of Public Works - SW Outfall Listings

#	Location	Creek Outfalls		inspection 2/21/2018	inspection 7/19/2018	inspection 1/8/2019	inspection 7/5/2019	inspection 1/7/2020	inspection 7/14/2020
1	Charles Street - 8" ABS - Thru bulkhead in Marina			ok	ok	ok	ok	ok	ok
2	Maplewood Ave. - 12" ABS - Thru bulkhead in Marina			ok	ok	ok	ok	ok	ok
3	Seeley Ave/Creek Rd. - 24" RCP - Thru bulkhead			ok	ok	ok	ok	ok	ok
4	Murray Lane - 18" CMP - Thru bulkhead			ok	ok	ok	ok	ok	ok
5	Roland St/Creek Rd. - 15" Trans. - Thru bulkhead			ok	ok	ok	ok	ok	ok
6	Kennedy Way @ Bridge N. side - 18" RCP - direct			ok	ok	ok	ok	ok	ok
7	Kennedy Way @ Bridge S. side - 18" RCP - direct			ok	ok	ok	ok	ok	ok
8	Frances Pl. - 15" RCP - Thru housing Pking. Lot			ok	ok	ok	ok	ok	ok
9	Manning Pl. - 8" VCP - Backup w/Perc system 2005			ok	ok	ok	ok	ok	ok
10	Creek Rd. off Church St. - 8" ABS - 1 inlet			ok	ok	ok	ok	ok	ok
11	Church St/Monroe Ave. @ Bridge S. side - 42" RCP			ok	ok	ok	ok	ok	ok
12	Wood St. - 8" ABS - direct drop - High in weed area		Recon. 2013	county,no	county	county	county	county,ok,no	ok/no county
13	Thorne Pl. - Culvert - perc system - fenced in		cut april ann.	ok	ok	ok	ok	ok	ok
14	Leroy Pl./between Linton & Frederick Pl. - 8" VCP			ok	ok	ok	ok	ok	ok
15	Moran Pl. - 15" RCP - direct drop - High in weed area			ok	ok	ok	ok	ok	ok
16	Lohsen Ave. - 18" RCP - shoe lead w/ gravel			ok	ok	ok	ok	ok	ok
17	St Johns Park - 21" RCP - shoe lead w/lg. blue rock			ok	ok	ok	ok	ok	ok
				ok	ok	ok	ok	ok	ok
#	Location	Bay Outfalls							
1-Jan	Carr Place Pump Station - East Beacon Beach		Mddletwn.	Mddletwn	Mddletwn	Mddletwn	Mddletwn	Mddletwn	Mddletwn
2	Beaconlight Outfall - 24" CMP	#16	ann.pumps pulled	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok
3	Twilight Avenue - 24" CMP	#15		ok	0k	ok	ok	ok	ok
4	Bayview Avenue - 36" CMP	#14		new const.	ok	ok	ok	ok	ok
5	Raritan Avenue - 24" CMP	#13	ann. Pumps pulled	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok	ok,pump ok
6	Boardwalk/Midway Outfall - 24" -	#12		slow	slow	slow	slow	slow	slow
7	Pier Outfall - 24" CMP	#11		ok	ok	ok	ok	ok	ok
8	Beachway - Collichio - 18" CMP			min. flow	min. flow	min. flow	min. flow	min. flow	min flow

inspection	inspected
1/15/2021	
ok	
ok	
ok	
ok	
ok	
ok	
ok	
ok	
ok	
ok	
ok	
ok/county	
ok	
ok	
ok	
ok	
ok	
ok	
Mddletwn	
ok,pump ok	
ok	
ok	
ok,pump ok	
slow	
ok	
min flow	

BOROUGH OF KEANSBUG

APPENDIX 6 – RECYCLING PROGRAM AND SCHEDULE

The Borough of Keansburg maintains a Solid Waste, Bulk Refuse, and Recyclable Materials Collection and Disposal Services contract. The Scope and Conditions of the current contract are outlined below:

RECYCLABLE COLLECIOTN AND DISPOSAL
(DUE STREAM, CONTRACTOR OWNED AND DESIGNATED)

Specified recyclables shall be collected Borough-wide every Wednesday. In the event that collection cannot occur on a given Wednesday due to a snow emergency or designated holiday, then recyclables collection will occur on that Saturday following the missed Wednesday.

Borough residents will place recyclables out for Wednesday collection. Glass bottles, aluminum cans, bi-metal cans, steel, and light cardboard packaging materials will be comingled in a combined container to be provided by the resident.

Newspapers, mixed paper, and junk mail will be bundled together and placed at the curb separately.

Corrugated cardboard will be flattened and also placed at the curb separately.

Multi-Unit Developments

Recyclable collection service includes collection of multi-family, apartment, and condominium units in the Borough (in thirteen discrete complexes, see Attachment #3). These complexes utilize dumpsters. The Owners of said entities shall be responsible to provide their own dumpsters which are compatible with the Contractor's collection vehicles. These dumpsters shall be privately owned or leased from the Contractor under a separate agreement. No payments shall be made under this contract for the provision of said dumpsters to these private entities.

Disposal of Recyclables

The Contractor shall take ownership of all recyclables upon collection. The Contractor shall be required to dispose of all recyclables following all Federal, State, and Local requirements. The Borough will not be responsible for any disposal charges, nor will the Borough seek any reimbursement for any recycling rebates. Once collected, all recyclables become the sole property and responsibility of the Contractor. The contractor must file an annual report with the Borough Recycling Coordinator.

CONTAINERS REQUIRED TO BE PROVIDED

The Contractor will not be required to provide any containers under this contract. All containers shall be provided by the Owners.

COLLECTION SCHEDULE

A. All collection services, as described in these specifications, shall be performed on all designated days between 5:00 AM and 5:00 PM.

B. The following legal holidays are exempt from the waste collection schedule: Sundays, Thanksgiving Day, Christmas Day, New Years Day.

APPENDIX 7

Maintenance Operations Program

BOROUGH OF KEANSBUG

APPENDIX 7 – MAINTENANCE OPERATIONS

1. STREET SWEEPING

Statewide Basic Requirement:

Street Sweeping: Tier A Municipalities shall sweep, at a minimum of once per month (weather and street surface conditions permitting), all streets (including roads or highways) that meet all of the following criteria: (1) the street is owned or operated by the municipality; (2) the street is curbed and has storm drains; (3) the street has a posted speed limit of 35 miles per hour or less; (4) the street is not an entrance or exit ramp; an d (5) the street is in a predominantly commercial area.

Existing Street Sweeping Program:

- In order to complay wih the Street Sweeping requiements stated above, the Borough has been divided into multiple areas and two (2) street sweapers operate daily. Please see attachd smaple DPW reporting sheet, as well the Sweeper/Storm Basin Route Areas, and scheudling.

2. CATCH BASINS AND STORM DRAIN INLETS

Statewide Basic Requirement:

Catch Basin and Storm Drain Inlet Inspection and Cleaning: The Tier A Municipality shall inspect storm drain inlets and any associated catch basins that it owns or operates and remove sediment, trash, or debris when present. Each catch basin and inlet shall be inspected at least once every five years. The Tier A Municipality shall clean any municipally owned or operated storm drain inlet or catch basin as frequently as necessary to eliminate recurring problems and restore proper function.

Existing Catch Basin and Storm Drain Inlet Program:

- The Borough conducts a annual inspection of all its inlets and catch basins.
- Cleaning of inlets and catch basins are done as needed based on the results of the field inspection.
- Spoils collected from the inlets/catch basins are dumped into the Borough's street sweeping container maintained at Public Works.

- Inspection records for each inlet/catch basin is maintained by the Borough's Public Works.

- Repairs needed are noted and work orders are generated where necessary.

3. STORMWATER FACILITIES

Statewide Basic Requirement:

Stormwater Facility Maintenance - The Tier A Municipality shall develop, update and implement a program to ensure adequate long-term cleaning, operation and maintenance of all municipally owned or operated stormwater facilities

Existing Stormwater Facilities:

The Borough currently maintains 25 outfalls, 646 storm basins and storm sewer pipe ranging in size from 8 inches to 58 inches.

Inspection Program:

As part of the Borough's regular maintenance program the Department of Public Works shall inspect the Borough's stormwater facilities as follows:

- Pump stations shall be inspected on an annual basis and after a major storm event to ensure the screens are clear of major debris and all mechanical elements are functioning as they were designed.

- Inlets shall be inspected and cleaned on an annual basis. DPW personnel will also conduct a visual inspection of the inlets to ensure they are functioning properly. Inlets found to be in disrepair shall be reported to the Director of Public Works for scheduling of maintenance. Records of maintenance conducted on inlets will be recorded.

- Storm sewer pipes identified as problem areas shall be inspected after major storm events and on an as needed basis. Broken or collapsed storm sewer pipes shall be reported to the Director of Public Works and the Borough Engineer for further evaluation and/or maintenance.

- Outfalls shall be inspected once every 5 years for evidence of dry weather flow, scouring or erosion. Observations will be reported to the Director of Public Works and the Borough Engineer and necessary action will be taken if applicable.

Maintenance Program:

Based on field observations, the following routine maintenance will be performed as required:

- Removal of trash or litter on the pump station screens.
- Inlets with evidence of debris will be cleaned as needed by the Public Works Department or utilizing on-call contractors, where necessary.
- Inlet markers will be replaced as needed.
- Blocked storm sewer pipes shall either be hand snaked or jetted to remove the blockage.

The DPW will note all inspections and maintenance/repair calls for the stormwater facilities in their internal maintenance log.

SAMPLE

Keansburg Public Works – Daily Route Sheet – Date -

Employee's Name (print) **int.**

Employee's Name (print) **int.**

Driver's Name (print) **int.**

Work Assignment Section 1 - 2 - 3

Supervisor's Int. **M T W T F S S**

Total Time

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.

Driver's Notes:

Supervisor's Notes:

Loads Dumped- Type **Type** **Type**

Note: next to type write in Branches-Leaves-Metal etc. On the next line place a check for each load

Keansburg Public Works – Daily Route Sheet – Date - _____

Employee's Name (print) _____ **int.** _____

Employee's Name (print) _____ **int.** _____

Driver's Name (print) _____ **int.** _____

Work Assignment Section 1 - 2 - 3 _____

Supervisor's Int. _____ **M T W T F S S** _____

Total Time

*A. Daily inspection of Road shoulders for stability and correct grade are to be listed below – 2/7/06

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

Driver's Notes: _____

_____

_____

Supervisor's Notes: _____

_____

_____

Loads Dumped- Type _____ **Type** _____ **Type** _____

_____

Mileage - Start: _____ **Finish:** _____

Sweeper Mileage Monthly – GeoVac: _____ **Pelican:** _____

Note: next to type write in Branches/Leaves- Sweepings. On the next line place a check for each load

[ ] All lines have been filled in correctly and checked by this Supervisor: _____

SWEEPER MILEAGE ADDED 4-08

SWEEPER/STORM BASIN ROUTE

AREA # 1

BETWEEN HWY 36 & CHURCH ST. MONROE & MAIN ST.

		Basins	Revision
1.	STELLA DRIVE	2	
2.	RAILROAD AVE	0	
3.	WOOD AVE	0	
4.	WOOD ST	8	
5.	HORNER PLACE	0	
6.	POPLAR ST	2	
7.	LINTON PLACE	0	
8.	FREDERICK PLACE	1	
9.	MORAN PLACE	2	
10.	VOGEL STREET	3	
11.	MAGNOLIA PLACE	0	
12.	LOHSEN PLACE	8	
13.	LEROY PLACE	7	
14.	SAINT JOHNS PLACE	0	
15.	MASON PALCE	0	
16.	CHARLES PLACE	0	
17.	PALMER PLACE	3	
18.	EUCLID PLACE	0	
19.	DEPOT PLACE	0	
20.	BEACH STREET	2	
21.	RANDALL STREET	0	
22.	HANCOCK STREET	0	
23.	FRAZEE AVE	0	
24.	FRAZEE PLACE	0	
25.	DPW YARD	3	
26.	Thorn Place	1 Culvert	
27.	Lorraine Pl.	1	

Area #1 – Amt. of Basins - 43

Circle # upon completion, place notes next to street name & on rear

OPERATOR: **Date:**

SWEEPER/STORM BASIN ROUTE

AREA # 2

BETWEEN CREEK RD. & CARR AVE. SEELEY & CHURCH

		Basins	Revision
1.	MYRTLE AVE	20	
2.	RAMSEY AVE	7	
3.	WAACKAACK AVE	0	
4.	CREEK ROAD	26	
5.	MANNING PLACE	5	
6.	FRANCES PLACE	3	
7.	TERRACE PLACE	0	
8.	KENNEDY WAY	14	
9.	MAPLE AVE	8	
10.	WASHINGTON AVE	9	
11.	GARFIELD AVE	6	
12.	LINCOLN AVE	9	
13.	WILLOW STREET	6	
14.	ROLAND STREET	7	
15.	HOWARD STREET	3	
16.	HILL STREET	5	
17.	MURRAY LANE	3	
18.	SEELEY AVENUE	24	
19.	CHURCH STREET	6	County
20.	CARR AVENUE	31	County

Area #2 – Amt. of Basins - 192

Circle # upon completion, place notes next to street name & on rear

OPERATOR: _____ **Date:** _____

SWEEPER/STORM BASIN ROUTE

AREA # 3

BETWEEN BEACHWAY & SEELEY, LAUREL & CARR

		Basins	Revision
1.	BEACHWAY	24	
2.	CHARLES AVE	5	
3.	SEABREEZE WAY	4	
4.	HIGHLAND BLVD	3	
5.	MAPLEWOOD AVE	7	
6.	SAINT PETERS	1	
7.	OAKWOOD PLACE	11	
8.	SAINT MARKS PLACE	0	
9.	ROOSEVELT AVE	0	
10.	SAINT JAMES AVE	0	
11.	CENTER AVE	12	
12.	HIGHLAND AVE	10	
13.	BAY AVENUE	3	
14.	PINEWOOD AVE	1	
15.	UNION PLACE	0	
16.	SMITH PLACE	0	
17.	NORTH SHORE ST	2	
18.	SOUTH STREET	0	
19.	GILLETTE ST	5	
20.	WEST SHORE ST	1	
21.	OAK STREET	5	
22.	WALTERS STREET	0	
23.	JAHN STREET	0	
24.	LAUREL AVENUE	4	

Area #3 – Amt. of Basins - 98

Circle # upon completion, place notes next to street name & on rear.

OPERATOR: **Date:**

SWEEPER/STORM BASIN ROUTE

AREA # 4

BETWEEN CARR, MAIN, SEELEY AND CHURCH

		Basins	Revision
1.	MANNING PLACE	5	
2.	FRANCES PLACE	3	
3.	WILSON AVENUE	0	
4.	MAPLE AVENUE	8	
5.	BROOKSIDE AVE	4	
6.	BRADEN PLACE	2	
7.	LOCUST PLACE	2	
8.	LINCOLN COURT	6	
9.	COMMODORE AVE	1	
10.	BROANDER PLACE	0	
11.	CARLO DRIVE	1	
12.	MAIN STREET	16	

Area #4 – Amt. of Basins - 48

Circle # upon completion, place notes next to street name & on rear

OPERATOR: _____ **Date:** _____

SWEEPER/STORM BASIN ROUTE

AREA # 5

BETWEEN CARR, MAIN, SEELEY AND BEACHWAY

		Basins	Revision
1.	CAMPVIEW PLACE	3	
2.	CAMPVIEW AVENUE	2	
3.	PINEVIEW AVENUE	2	
4.	SHADYNOOK	0	
5.	COLLINS STREET	0	
6.	BAYVIEW AVENUE	7	
7.	EAST SHORE STREET	0	
8.	OAK STREET	5	
9.	FOX AVENUE	1	
10.	RARITAN AVENUE	20	
11.	BELLEVIEW AVENUE	2	
12.	OCEANVIEW AVENUE	2	
13.	SEAVIEW AVENUE	1	
14.	CENTER AVENUE	Basins (12) in Area #3	

Area #5 – Amt. of Basins - 44

Circle # upon completion, place notes next to street name & on rear.

OPERATOR: _____ **Date:** _____

SWEEPER/STORM BASIN ROUTE

AREA # 6

BETWEEN MAIN ST, FOREST AVE, & PORT MONMOUTH RD

		Basins	Revision
1.	WILLIS PLACE	0	
2.	E. CHURCH STREET	6	
3.	LANCASTER AVE	1	
4.	LEOLA AVE	8	
5.	HARDING AVENUE	11	
6.	SNYDER AVE	0	
7.	WILLIS AVE	1	
8.	PARK AVE	14	
9.	RANDOLPH PLACE	3	
10.	BERRY STREET	3	
11.	BRIARWOOD AVE	3	
12.	BEECHWOOD AVE	3	
13.	LAWRENCE AVE	3	
14.	CHESTNUT ST (Paper Rd)	0	
15.	FOREST PLACE	1	
16.	SEAWOOD AVE	5	
17.	GREENWOOD PLACE	1	
18.	FOREST AVENUE	22	

Area #6 – Amt. of Basins - 85

Circle # upon completion, place notes next to street name & on rear.

OPERATOR: _____ **Date:** _____

SWEEPER/STORM BASIN ROUTE

AREA # 7

BETWEEN FOREST AVE, SHORE BLVD, PARK AVE & MAIN ST

		Basins	Revision
1.	PARK AVENUE	14	
2.	BEACON BLVD	3	
3.	ORCHARD STREET	0	
4.	BEACONLIGHT AVE	10	
5.	LAWRENCE AVE	3	
6.	EVERGREEN PLACE	2	
7.	WOODSIDE PLACE	1	
8.	GROVE PLACE	6	
9.	TWILIGHT AVENUE	14	
10.	BIRCHWOOD AVENUE	6	
11.	LAKEWOOD AVENUE	5	
12.	WOODLAND AVENUE	8	
13.	JOHNSON LANE	0	
14.	SEASIDE PLACE	0	
15.	WATERVIEW PLACE	0	
16.	NEPTUNE PLACE	0	
17.	SHORE BLVD.	20	
18.	WOODSIDE AVE.	3	

Area #7 – Amt. of Basins - 95

Circle # upon completion, place notes next to street name & on rear.

OPERATOR: _____ **Date:** _____

SWEEPER/STORM BASIN ROUTE

AREA #8

BETWEEN PARK AVE, PORT MONMOUTH RD, FOREST AVE & ATLANTIC AVENUE – (BEACON BEACH SECTION)

		Basins	Revision
1.	HOLLY STREET	4	
2.	GARDEN STREET	2	
3.	BEACON TERRACE	0	
4.	CRESCENT STREET	16	
5.	ATLANTIC STREET	3	
6.	SUNSET STREET	0	
7.	MORNINGSIDE AVE	0	
8.	BEACON BLVD	3	
9.	ORCHARD STREET	0	
10.	COTTAGE PLACE	0	
11.	TWILIGHT AVENUE	Basins (14) in Area #7	
12.	SHADYSIDE AVENUE	0	
13.	PARKSIDE PLACE	0	
14.	PORT MONMOUTH ROAD	13 County	

Area #8 – Amt. of Basins - 41

Circle # upon completion, place notes next to street name & on rear.

OPERATOR: _____ **Date:** _____

KEANSBURG -- DPW

CATCH BASIN & CURB LINE

Total Amount of Basins - 646
Total owned by County - 50
Total owned by Boro - 596

MAINTENANCE FORMAT

ADOPTED BY DPW 1/15/97
FORMATTED ------ 1/19/02
REVISED ------ 6/09/03

Collection System Maintenance to be scheduled Spring through Summer- Second cleaning is mandatory after leaf pick-up. This schedule will be adopted upon arrival of Sweeper Vacuum in the summer of 2002. N Waackaack Grease traps to be inspected monthly, and cleaned if necessary. Master list maintained for all basins that have been cleaned. Final adoption of State regulations complying with the federal Clean Air Act are scheduled for September 03. The main key is to continuously sweep the roadways thereby keeping storm basin litter to a minimum.

NOTE: SUPERVISORS TO MAINTAIN A MASTER COPY, COPIES ARE TO BE USED AS FIELD WORK SHEETS. WORK SHEETS TO BE FORWARDED TO THE SUPERINTENDENT TO CREATE A MASTER DEP LIST. FILE WORKSHEETS WITH SUPERVISOR.

SWEEPER/STORM BASIN ROUTE

AREA - A

MAIN ROADS – ALL OF CHURCH ST. – ALL OF CARR AVE. – & BEACHWAY FROM RARITAN AVENUE TO LAUREL AVENUE.

AREA - B

MAIN ROADS – ALL OF MAIN STREET & BEACHWAY FROM MAIN STREET TO LAUREL AVENUE.

OPERATOR: E. DONLON - 2002 ELGIN GEO-VAC/SWEEPER
AREAS – A – 1 – 6 – 7 – 8

OPERATOR: J. STEIMEL – 1994 ELGIN PELICAN SWEEPER
AREAS – B – 2 – 3 – 4 – 5

THE FOLLOWING SWEEPER SCHEDULE WILL BE ADHERED TO, PROVIDING MECHANICAL BREAKDOWNS, INCLEMENT WEATHER, AND EMPLOYEE ABSENCES DO NOT INTERFERE.

SUMMER SCHEDULE: ALL MAIN ROADS WILL BE SWEPT DAILY – IE: AREAS – A & B. ALL SECTIONS WILL BE SWEPT EVERY 2 WEEKS. AGAIN THIS SCHEDULE IS CONTINGENT UPON THE ABOVE FACTORS. PLACING TWO SWEEPERS IN OPERATION REMOVES A MAN FROM THE ROAD CREW, AND INCREASES SWEEPINGS BY 50%.

(13 employees)

Breakdown – Superintendent – Road Supervisor – Asst. Supervisor
Mechanic - Mechanic
Motor Broom Operator – Motor Broom Operator
Public Works Repairer (Beach Sanitizer)
Public Works Repairer (Transport Recycling & Debris)
3 Public Works Repairers – Road Debris & Repairs
1 Yardman – Works with Transporter – covers Saturday

SWEEPER OBSTACLES & Residents complaints

A. **The main obstacle in sweeping curb to curb on any street is a parked vehicle. The sweeper will veer around any parked vehicle leaving that part of the road untouched. There are certain roads that are impossible to sweep such as: Woodland Avenue, N. side of Hgld. Blvd & Seabreeze Way, Raritan Avenue, and the View Streets.**
B. **Alternate side of the street parking is an alternative on Hgld. Blvd. and Seabreeze, only if the residents will accept it via ordinance. A trial period can be implemented, and if it does not conform to the residents wishes in that area it should be rescinded.**
C. **Dead end streets must be handled in a safe manner. If the sweeper operator can not turn around at the dead end, he will not back up the entire street due to safety considerations.**
D. **County Roads – will also be swept by the Borough operators.**

Stormwater Management – Tier A – Solids & Floatable Controls

a. Monthly Sweeping of Certain Streets in Predominantly Commercial areas.

1. Minimum standard- Tier A Municipalities shall sweep, at a minimum of once per month (weather & St. surface conditions permitting) all Sts. That meet all of the following criteria:

- **The street is owned by the Municipality.**
- **The street is curbed and has storm drains.**
- **The street has a posted speed limit of 35 mph or less.**
- **The street is not an entrance or exit ramp.**
- **The street is in a predominantly commercial area.**

2. Measurable Goal- Tier A Municipalities shall certify annually that they have met the Street Sweeping minimum standard. Tier A Municipalities must maintain records including the date and areas swept, number of miles of streets swept and the total number of materials collected. Information shall be reported to the NJ-DEP in the annual report and certification.

The Solids and Floatable controls which are maintained by implementing a strict Municipal Street Sweeping Program are further backed up by implementing additional programs mandated under the Tier A General Permit process. These programs are listed in the Borough of Keansburg SW Pollution Plan and include: Storm Drain Inlet Retrofitting * Stormwater Facility Maintenance (Basin Cleaning – And Repair) * Road Erosion Control Maintenance * Outfall Pipe STREAM Scouring Remediation (This does not include Bay OF) * Maintenance Yard Operations – Includes: a. De-Iciing b. Fueling Operations c. Vehicle Maintenance d. Housekeeping e. Vehicle Washing The above a. to e. are also included in the annual employee training program.

2020 Sweeper Report Month	Elgin WW Mileage S-15,042	Elgin WW Cu Yds
Jan	15,382---340mi.	20
Feb	15,444—62mi.	3
Mar	15,525---81mi.	6
Apr	15,570---45mi.	3
May	15690---120mi	5
June	16095---405mi	18
July	16417—322mi.	15
Aug	*16555---138mi.*	*6*
Sept	16842---287mi.	11
Oct	17059—217mi.	20
Nov	17109—50mi.	5
Dec	17119—10mi.	6
Totals	Miles 2077mi	118 Cu Yds

Ending Mileage for Sweeper – 17,119

DEP STORM BASIN INSPECTION LOG – KEANSBURG DPW

Date	Location	Description
Jan./ 2020		cleaned&inspected by sweeper total of basins-83+7 grease traps
Feb./ 2020		cleaned &inspected by sweeper total of basins- 37
March/2020		cleaned&inspected by sweeper total of basins-70
April/2020		cleaned&inspected by sweeper total of basins- 0
May/2020		cleaned& inspected by sweeper total of basins- 0
June/2020		cleaned& inspected by sweeper total of basins- 33+7 grease traps
July/2020		cleaned& inspected by sweeper total of basins-39+7 grease traps
August/2020		cleaned& inspected by sweeper total of basins- 0
Sept./2020		cleaned& inspected by sweeper total of basins-96+7 grease traps
Oct./2020		cleaned &inspected by sweeper total of basins-40
Nov./2020		cleaned& inspected by sweeper total of basins-0
Dec./ 2020		cleaned &inspected by sweeper total of basins-37

463 basins cleaned –inspected-repaired for the year 2020 JD

2020-Basin Cleaning & Inspection Spread Sheet by Sweeper

1/15/20- 6 basins cleaned & inspected on Frazee by sweeper vac s.r m.c
1/15/20- 28 basins cleaned & inspected on Shore blvd by sweeper vac s.r m.c
1/15/20-7 basins cleaned & inspected on Raritan ave by sweeper vac s.r m.c
1/15/20- 2 basins cleand & inspected on Bellview by sweeper vac s.r m.c
1/15/20- 2 basins cleaned & inspected on Oceanview by sweeper vac s.r m.c
1/15/20- 5 basins cleaned & inspected on Bayview ave by sweeper vac s.r m.c
1/15/20- 2 basins cleaned & inspected on Pineview by sweeper vac s.r m.c
1/15/20- 2 basins cleaned & inspected on Campview pl by sweeper vac s.r m.c
1/15/20-6 basins cleaned & inspected on Seeley ave by sweeper vac s.r m.c
1/15/20-6 basins cleaned & inspected on Raritan ave by sweeper vac s.r m.c
1/15/20-4 basins cleaned & inspected on Manning pl by sweeper vac s.r m.c
1/15/20-2 basins cleaned & inspected on Fox st by sweeper vac s.r m.c
1/15/20- 11 basins cleaned & inspected on Center ave by sweeper vac s.r m.c
1/15/20- 7 Grease Traps cleaned & inspected by sweeper vac s.r m.c
2/19/20- 19 basins cleaned & inspected on Cresent st by sweeper vac j.s g.m
2/19/20- 11 basins cleaned & inspected on Park ave by sweeper vac j.s g.m
2/19/20- 7 basins cleaned & inspected on Twilight ave by sweeper vac j.s g.m
3/4/20-31 basins cleaned & inspected on Shore blvd by sweeper vac j.s g.m
3/4/20-18 basins cleaned & inspected on Center ave by sweeper vac j.s g.m
3/4/20-21 basins cleaned & inspected on Raritan ave by sweeper vac j.s g.m
6/3/20- 18 basins cleaned & inspected on Shore blvd by sweeper vac j.s m.c
6/3/20-15 basins cleaned & inspected on Center ave by sweeper vac j.s m.c
6/3/20-7 grease traps cleaned & inspected by sweeper vac j.s m.c
7/8/20- 14 basins cleaned and inspected on Ramsey ave by the sweeper vac j.s t.s
7/8/20- 25 basins cleaned and inspected on Myrtle ave by the sweeper vac j.s t.s
7/29/20- 7 Grease traps cleaned and inspected by sweeper vac j.s m.c
9/22/20-27 basins cleaned and inspected on Shore blvd by sweeper vac J.S G.M
9/22/20-15 basins cleaned and inspected on Center ave by sweeper vac J.S G.M
9/22/20-21basins cleaned and inspected on Forest ave by sweeper vac J.S G.M
9/23/20-11 basins cleaned and inspected on Kennedy way by sweeper vac j.s g.m
9/23/20-15 basins cleaned and inspected on Willow by sweeper vac j.s g.m
9/23/20-7 basins cleaned and inspected on Washington ave by sweeper vac j.s g.m
9/23/20-7 grease traps cleaned and inspected by sweeper vac J.S G.M
10/8/20-4 basins cleaned and inspected on Myrtle&Garfield by sweeper vac js gm
10/8/20-5 basins cleaned and inspected on Myrtle&Washington by sweeper vac jsgm
10/20/20-10 basins cleaned and inspected on Highland ave by sweeper vac js/mc
10/20/20-6 basins cleaned and inspected on Bay ave by sweeper vac js/mc
10/20/20-9 basins cleaned and inspected on Seabreeze way by sweeper vac js/mc
10/20/20-6 basins on Highland blvd cleaned and inspected by sweeper vac js/mc
12/3/20-5 basins on Manning place cleaned and inspected by sweeper vac js/jn
12/3/20-5 basins on Lincoln ct cleaned and inspected by sweeper vac js/jn
12/3/20-3 baisns on Locust cleaned and inspected by sweeper vac js/jn
12/3/20-8 basins on Maple cleaned and inspected by sweeper vac js/jn
12/3/20-6 basins on Brookside cleaned and inspected by sweeper vac js/jn

12/3/20-10 basins on Seeley cleaned and inspected by sweeper vac js/jn

Total of 463 Basins were cleaned & inspected by sweeper crew also basins were checked daily by Public Works Crews, inspecting them and reporting any damage or clogs in the system. Above information spread sheet shows basins cleaned and repaired by Public Works Crews for the year 2020. Jim DellaPietro

APPENDIX 8

Maintenance Yard Operations

BOROUGH OF KEANSBURG

APPENDIX 8 – MAINTENANCE YARD OPERATIONS

Statewide Basic Requirement:

The Tier A Municipality shall implement best management practices for municipal maintenance yards and other ancillary operations owned or operated by the Tier A Municipality. Ancillary operations include but are not limited to impound yards, permanent and mobile fueling locations, and yard trimmings and wood waste management sites. The Inventory of Material and Machinery, and Inspections and Good Housekeeping practices shall be conducted at all municipal maintenance yards and other ancillary operations. Best Management Practices shall be implemented for the following activities, whenever such activities occur:

- Fueling Operations;
- Discharge of Stormwater from Secondary Containment;
- Vehicle Maintenance;
- On-Site Equipment and Vehicle Washing and Wash Wastewater Containment; and
- Salt and De-icing Material Storage and Handling.

Implementation of best management practices for the following activities, if applicable, shall commence on January 1, 2019:

- Aggregate Material and Construction Debris Storage;
- Street Sweepings, Catch Basin Clean Out, and Other Material Storage;
- Yard Trimmings and Wood Waste Management Sites that are owned and operated by the Tier A Municipality; and
- Roadside Vegetation Management

Existing Maintenance Yard Conditions and Activities:

To comply with the permit renewal requirements, a copy of the Borough's Standard Operating Produces for "Good Housekeeping," Vehicle and Equipment Fueling, and Vehicle Maintenance..

Aggregate Material and Construction Debris Storage:

Any sand, gravel, stone, topsoil, road millings, waste concrete, asphalt, brick, block and asphalt-based roofing scrap or processed aggregate shall be stored in such a manner as to minimize stormwater run-on and aggregate run-off. Outdoor storage of aggregate material shall be considered only if a 50-foot setback from surface water bodies, storm drain inlets and/or stormwater ditches can be maintained.

Street Sweepings, Catch Basin Clean Out, and Other Material Storage:

Road cleanup material, which includes but is not limited to street sweepings, storm sewer clean out materials, stormwater basins clean out materials and other similar materials collected during road cleanup operations, that is placed into storage must:

- Stored in leak-proof containers or on an impervious surface that is contained (e.g. bermed) to control leachate and litter; and
- Be removed for disposal within six (6) months of placement into storage.

Borough Owned/Operated Yard Trimmings and Wood Waste Management Sites:

In accordance with permit renewal requirements, yard trimming storage areas will be located and/or constructed to limit discharge to State waterways, prevent stormwater run-on and leachate run-off, and not be located in areas susceptible to seasonal flooding.

APPENDIX 9

2005 SPPP Inventory of Materials/Machinery Which Could Be a Source of Stormwater Pollution

Attachment E – Best Management Practices for Municipal Maintenance Yards and Other Ancillary Operations

The Tier A Municipality shall implement the following practices at municipal maintenance yards and other ancillary operations owned or operated by the municipality. Inventory of Materials and Machinery, and Inspections and Good Housekeeping shall be conducted at all municipal maintenance yards and other ancillary operations. All other Best Management Practices shall be conducted whenever activities described below occur. Ancillary operations include but are not limited to impound yards, permanent and mobile fueling locations, and yard trimmings and wood waste management sites.

Inventory of Materials and Machinery

The SPPP shall include a list of all materials and machinery located at municipal maintenance yards and ancillary operations which could be a source of pollutants in a stormwater discharge. The materials in question include, but are not limited to: raw materials; intermediate products; final products; waste materials; by-products; machinery and fuels; and lubricants, solvents, and detergents that are related to the municipal maintenance yard operations and ancillary operations. Materials or machinery that are not exposed to stormwater at the municipal maintenance yard or related to its operations do not need to be included.

Inspections and Good Housekeeping

1. Inspect the entire site, including the site periphery, monthly (under both dry and wet conditions, when possible). Identify conditions that would contribute to stormwater contamination, illicit discharges or negative impacts to the Tier A Municipality's MS4. Maintain an inspection log detailing conditions requiring attention and remedial actions taken for all activities occurring at Municipal Maintenance Yards and Other Ancillary Operations. This log must contain, at a minimum, a record of inspections of all operations listed in Part IV.B.5.c. of this permit including dates and times of the inspections, and the name of the person conducting the inspection and relevant findings. This log must be kept on-site with the SPPP and made available to the Department upon request. See the Tier A Municipal Guidance document (www.nj.gov/dep/dwq/tier_a_guidance.htm) for additional information.

2. Conduct cleanups of spills of liquids or dry materials immediately after discovery. All spills shall be cleaned using dry cleaning methods only. Clean up spills with a dry, absorbent material (i.e., kitty litter, sawdust, etc.) and sweep the rest of the area. Dispose of collected waste properly. Store clean-up materials, spill kits and drip pans near all liquid transfer areas, protected from rainfall.

3. Properly label all containers. Labels shall be legible, clean and visible. Keep containers in good condition, protected from damage and spillage, and tightly closed when not in use. When practical, store containers indoors. If indoor storage is not practical, containers may be stored outside if covered and placed on spill platforms or clean pallets. An area that is graded and/or bermed to prevent run-through of stormwater may be used in place of spill platforms or clean pallets. Outdoor storage locations shall be regularly maintained.

Fueling Operations

1. Establish, maintain and implement standard operating procedures to address vehicle fueling; receipt of bulk fuel deliveries; and inspection and maintenance of storage tanks, including the associated piping and fuel pumps.

   a. Place drip pans under all hose and pipe connections and other leak-prone areas during bulk transfer of fuels.

   b. Block storm sewer inlets, or contain tank trucks used for bulk transfer, with temporary berms or temporary absorbent booms during the transfer process. If temporary berms or booms are being used instead of blocking the storm sewer inlets, all hose connection points associated with the transfer of fuel shall be within the temporarily bermed or boomed area during the loading/unloading of bulk fuels. A trained employee shall be present to supervise the bulk transfer of fuel.

   c. Clearly post, in a prominent area of the facility, instructions for safe operation of fueling equipment. Include all of the following:
      - "Topping off of vehicles, mobile fuel tanks, and storage tanks is strictly prohibited"
      - "Stay in view of fueling nozzle during dispensing"
      - Contact information for the person(s) responsible for spill response.

   d. Immediately repair or replace any equipment, tanks, pumps, piping and fuel dispensing equipment found to be leaking or in disrepair.

Discharge of Stormwater from Secondary Containment

The discharge pipe/outfall from a secondary containment area (e.g. fuel storage, de-icing solution storage, brine solution) shall have a valve and the valve shall remain closed at all times except as described below. A municipality may discharge stormwater accumulated in a secondary containment area if a visual inspection is performed to ensure that the contents of aboveground storage tank have not come in contact with the stormwater to be discharged. Visual inspections are only effective when dealing with materials that can be observed, like petroleum. If the contents of the tank are not visible in stormwater, the municipality shall rely on previous tank inspections to determine with some degree of certainty that the tank has not leaked. If the municipality cannot make a determination with reasonable certainty that the stormwater in the secondary containment area is uncontaminated by the contents of the tank, then the stormwater shall be hauled for proper disposal.

Vehicle Maintenance

1. Operate and maintain equipment to prevent the exposure of pollutants to stormwater.

2. Whenever possible, conduct vehicle and equipment maintenance activities indoors. For projects that must be conducted outdoors, and that last more than one day, portable tents or covers shall be placed over the equipment being serviced when not being worked on, and drip pans shall be used at all times. Use designated areas away from storm drains or block storm drain inlets when vehicle and equipment maintenance is being conducted outdoors.

On-Site Equipment and Vehicle Washing and Wash Wastewater Containment

1. Manage any equipment and vehicle washing activities so that there are no unpermitted discharges of wash wastewater to storm sewer inlets or to waters of the State.

2. Tier A Municipalities which cannot discharge wash wastewater to a sanitary sewer or which cannot otherwise comply with 1, above, may temporarily contain wash wastewater prior to proper disposal under the following conditions:

   a. Containment structures shall not leak. Any underground tanks and associated piping shall be tested for integrity every 3 years using appropriate methods determined by "*The List of Leak Detection Evaluations for Storage Tank Systems"* created by the National Work Group on Leak Detection Evaluations (NWGLDE) or as determined appropriate and certified by a professional engineer for the site specific containment structure(s)**.**

   b. For any cathodically protected containment system, provide a passing cathodic protection survey every three years.

   c. Operate containment structures to prevent overfilling resulting from normal or abnormal operations, overfilling, malfunctions of equipment, and human error. Overfill prevention shall include manual sticking/gauging of the tank before each use unless system design prevents such measurement. Tank shall no longer accept wash wastewater when determined to be at 95% capacity. Record each measurement to the nearest ½ inch.

   d. Before each use, perform inspections of all visible portions of containment structures to ensure that they are structurally sound, and to detect deterioration of the wash pad, catch basin, sump, tank, piping, risers, walls, floors, joints, seams, pumps and pipe connections or other containment devices. The wash pad, catch basin, sump and associated drains should be kept free of debris before each use. Log dates of inspection; inspector's name, and conditions. This inspection is not required if system design prevents such inspection.

   e. Containment structures shall be emptied and taken out of service immediately upon detection of a leak. Complete all necessary repairs to ensure structural integrity prior to placing the containment structure back into service. Any spills or suspected release of hazardous substances shall be immediately reported to the NJDEP Hotline (1-877-927-6337) followed by a site investigation in accordance with N.J.A.C. 7:26C and N.J.A.C 7:26E if the discharge is confirmed.

   f. All equipment and vehicle wash wastewater placed into storage must be disposed of in a legally permitted manner (e.g. pumped out and delivered to a duly permitted and/or approved wastewater treatment facility).

   g. Maintain a log of equipment and vehicle wash wastewater containment structure clean-outs including date and method of removal, mode of transportation (including name of hauler if applicable) and the location of disposal. See Underground Vehicle Wash Water Storage Tank Use Log at end of this attachment.

   h. Containment structures shall be inspected annually by a NJ licensed professional engineer. The engineer shall certify the condition of all structures including: wash pad, catch basin, sump, tank, piping, risers to detect deterioration in the, walls, floors, joints, seams, pumps and pipe connections or other containment devices using the attached Engineer's Certification of Annual Inspection of Equipment and Vehicle Wash Wastewater Containment Structure. This

certification may be waived for self-contained systems on a case-by-case basis. Any such waiver would be issued in writing by the Department.

3. Maintain all logs, inspection records, and certifications on-site. Such records shall be made available to the Department upon request.

Salt and De-icing Material Storage and Handling

1. Store material in a permanent structure.
2. Perform regular inspections and maintenance of storage structure and surrounding area.
3. Minimize tracking of material from loading and unloading operations.
4. During loading and unloading:
    a. Conduct during dry weather, if possible;
    b. Prevent and/or minimize spillage; and
    c. Minimize loader travel distance between storage area and spreading vehicle.
5. Sweep (or clean using other dry cleaning methods):
    a. Storage areas on a regular basis;
    b. Material tracked away from storage areas;
    c. Immediately after loading and unloading is complete.
6. Reuse or properly discard materials collected during cleanup.
7. Temporary outdoor storage is permitted only under the following conditions:
    a. A permanent structure is under construction, repair or replacement;
    b. Stormwater run-on and de-icing material run-off is minimized;
    c. Materials in temporary storage are tarped when not in use;
    d. The requirements of 2 through 6, above are met; and
    e. Temporary outdoor storage shall not exceed 30 days unless otherwise approved in writing by the Department;
8. Sand must be stored in accordance with Aggregate Material and Construction Debris Storage below.

Aggregate Material and Construction Debris Storage

1. Store materials such as sand, gravel, stone, top soil, road millings, waste concrete, asphalt, brick, block and asphalt based roofing scrap and processed aggregate in such a manner as to minimize stormwater run-on and aggregate run-off via surface grading, dikes and/or berms (which may include sand bags, hay bales and curbing, among others) or three sided storage bays. Where possible the open side of storage bays shall be situated on the upslope. The area in front of storage bays and adjacent to storage areas shall be swept clean after loading/unloading.

2. Sand, top soil, road millings and processed aggregate may only be stored outside and uncovered if in compliance with item 1 above and a 50-foot setback is maintained from surface water bodies, storm sewer inlets, and/or ditches or other stormwater conveyance channels.

3. Road millings must be managed in conformance with the "Recycled Asphalt Pavement and Asphalt Millings (RAP) Reuse Guidance" (see www.nj.gov/dep/dshw/rrtp/asphaltguidance.pdf) or properly disposed of as solid waste pursuant to N.J.A.C. 7:26-1 et seq.

4. The stockpiling of materials and construction of storage bays on certain land (including but not limited to coastal areas, wetlands and floodplains) may be subject to regulation by the Division of Land Use Regulation (see www.nj.gov/dep/landuse/ for more information).

Street Sweepings, Catch Basin Clean Out, and Other Material Storage

1. For the purposes of this permit, this BMP is intended for road cleanup materials as well as other similar materials. Road cleanup materials may include but are not limited to street sweepings, storm sewer clean out materials, stormwater basin clean out materials and other similar materials that may be collected during road cleanup operations. These BMPs do not cover materials such as liquids, wastes which are removed from municipal sanitary sewer systems or material which constitutes hazardous waste in accordance with N.J.A.C. 7:26G-1.1 et seq.

2. Road cleanup materials must be ultimately disposed of in accordance with N.J.A.C. 7:26-1.1 et seq. See the "Guidance Document for the Management of Street Sweepings and Other Road Cleanup Materials" (www.nj.gov/dep/dshw/rrtp/sweeping.htm).

3. Road cleanup materials placed into storage must be, at a minimum:

    a. Stored in leak-proof containers or on an impervious surface that is contained (e.g. bermed) to control leachate and litter; and

    b. Removed for disposal (in accordance with 2, above) within six (6) months of placement into storage.

Yard Trimmings and Wood Waste Management Sites

1. These practices are applicable to any yard trimmings or wood waste management site:

   a. Owned and operated by the Tier A Municipality;
      i. For staging, storing, composting or otherwise managing yard trimmings, or
      ii. For staging, storing or otherwise managing wood waste, and

   b. Operated in compliance with the Recycling Rules found at N.J.A.C. 7:26A.

2. Yard trimmings or wood waste management sites must be operated in a manner that:

   a. Diverts stormwater away from yard trimmings and wood waste management operations; and
   b. Minimizes or eliminates the exposure of yard trimmings, wood waste and related materials to stormwater.

3. Yard trimmings and wood waste management site specific practices:

   a. Construct windrows, staging and storage piles:
      i. In such a manner that materials contained in the windrows, staging and storage piles (processed and unprocessed) do not enter waterways of the State;
      ii. On ground which is not susceptible to seasonal flooding;
      iii. In such a manner that prevents stormwater run-on and leachate run-off (e.g. use of covered areas, diversion swales, ditches or other designs to divert stormwater from contacting yard trimmings and wood waste).

   b. Maintain perimeter controls such as curbs, berms, hay bales, silt fences, jersey barriers or setbacks, to eliminate the discharge of stormwater runoff carrying leachate or litter from the site to storm sewer inlets or to surface waters of the State.

   c. Prevent on-site storm drain inlets from siltation using controls such as hay bales, silt fences, or filter fabric inlet protection.

   d. Dry weather run-off that reaches a municipal stormwater sewer system is an illicit discharge. Possible sources of dry weather run-off include wetting of piles by the site operator; uncontrolled pile leachate or uncontrolled leachate from other materials stored at the site.

   e. Remove trash from yard trimmings and wood waste upon receipt.

   f. Monitor site for trash on a routine basis.

   g. Store trash in leak-proof containers or on an impervious surface that is contained (e.g. bermed) to control leachate and litter;

   h. Dispose of collected trash at a permitted solid waste facility.

   i. Employ preventative tracking measures, such as gravel, quarry blend, or rumble strips at exits.

Roadside Vegetation Management

1. Tier A Municipalities shall restrict the application of herbicides along roadsides in order to prevent it from being washed by stormwater into the waters of the State and to prevent erosion caused by de-vegetation, as follows: Tier A Municipalities shall not apply herbicides on or adjacent to storm drain inlets, on steeply sloping ground, along curb lines, and along unobstructed shoulders. Tier A Municipalities shall only apply herbicides within a 2 foot radius around structures where overgrowth presents a safety hazard and where it is unsafe to mow.

ENGINEERS CERTIFICATION OF ANNUAL INSPECTION OF EQUIPMENT AND VEHICLE WASH WASTEWATER CONTAINMENT STRUCTURE

(Complete a separate form for each vehicle wash wastewater containment structure)

Permittee: _____ NJPDES Permit No: _____

Containment Structure Location: _____

The annual inspection of the above referenced vehicle wash wastewater containment structure was conducted on _____ (date). The containment structure and appurtenances have been inspected for:

1. The integrity of the structure including walls, floors, joints, seams, pumps and pipe connections
2. Leakage from the structure's piping, vacuum hose connections, etc.
2 Bursting potential of tank.
3. Transfer equipment
4. Venting
5. Overflow, spill control and maintenance.
6. Corrosion, splits, and perforations to tank, piping and vacuum hoses

The tank and appurtenances have been inspected for all of the above and have been determined to be:

Acceptable _____

Unacceptable _____

Conditionally Acceptable _____

List necessary repairs and other conditions: _____

_____

_____

_____

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (N.J.A.C. 7:14A-2.4(d)).

Name (print): _____ Seal:

Signature: _____

Date: _____

Underground Vehicle Wash Water Storage Tank Use Log

Name and Address of Facility _____

Facility Permit Number _____

Tank ID Number _____ Tank Location _____

Tank Volume _____ gallons Tank Height _____ inches

95% Volume _____ gallons 95% Volume _____ inches

Date and Time	Inspector	Height of Product Before Introducing Liquid (inches)	Is Tank Less Than 95% Full? (Y/N)	Visual Inspection Pass? (Y/N)	Comments

Notes: The volume of liquid in the tank should be measured **before** each use.

Liquid **should not be introduced** if the tank contains liquid at 95% of the capacity or greater.

A visual inspection of all exposed portions of the collection system should be performed before each use. Use the comments column to document the inspection and any repairs.

Underground Vehicle Wash Water Storage Tank Pump Out Log

Name and Address of Facility _____

Facility Permit Number _____

Tank ID Number _____ Tank Location _____

Tank Volume _____ gallons

Date and Time of Pump Out	Volume of Liquid Removed	Waste Hauler *	Destination of the Liquid Disposal *

*** The Permittee must maintain copies of all hauling and disposal records and make them available for inspection.**

Borough of Keansburg
Stormwater Pollution Prevention Plan

Standard Operating Procedure
For
Vehicle and Equipment Fueling

Revision No. 1 Effective Date – 04/01/05

1.0 PURPOSE

This procedure provides instructions for delivering fuel into vehicles, equipment, mobile fuel tanks, and storage tanks in a manner that ensures the safety of Borough personnel and the public as well as minimizing any impact on surface or groundwater.

2.0 APPLICABILITY/SCOPE

This procedure is applicable to all Borough personnel who participate in delivering fuel into vehicles, equipment, mobile fuel tanks, and storage tanks at the Public Works Yard at 40 Frazee Place as well as those who participate in mobile fueling operations in the Borough of Keansburg.

3.0 PROCEDURE

3.1 Vehicle and Equipment Fueling

- ✓ Mobile fueling shall be minimized. Whenever practical, vehicles and equipment shall be transported to the designated fueling area in the Public Works Yard.
- ✓ Clearly post, in a prominent area of the facility, instructions for safe operation of fueling equipment, and appropriate contact information for the person(s) responsible for spill response.
- ✓ Shut the engine off on the vehicle or equipment to be fueled.
- ✓ Verify that the fuel is the proper type for the vehicle or equipment.
- ✓ Ensure that absorbent spill clean-up materials or spill kits are available in the fueling area and on mobile fueling equipment.
- ✓ Nozzles used in vehicle and equipment fueling shall be equipped with an automatic shut-off to prevent overfill.
- ✓ Fuel tanks shall not be "topped off". Allow sufficient room for expansion and to prevent spillage during vehicle movement.

3.2 Bulk Fueling

- ✓ A trained employee must always be present to supervise during bulk fuel transfers.
- ✓ Drip pans or absorbent pads shall be used under all hose and pipe connections and other leak-prone areas during bulk fueling.
- ✓ Block storm sewer inlets, or contain tank trucks used for bulk fuel transfer, with temporary berms or temporary absorbent booms during the transfer process. If temporary berms are being used instead of blocking the storm sewer inlets, all hose connection points associated with the transfer of fuel must be within the temporary berms during the loading/unloading of fuels.

3.3 Spill Response and Reporting

- ✓ In the event of a spill, call the Borough of Keansburg Emergency Line at 732-787-0600.
- ✓ Conduct cleanups of any fuel spills immediately after discovery.
- ✓ Spills are to be cleaned up using dry cleaning methods only. Spills shall be cleaned up with a dry, absorbent material (e.g., kitty litter, sawdust, etc.) and the absorbent materials shall be swept up as soon as possible after the spilled fuel has been absorbed.
- ✓ Spill cleanup waste material is to be disposed of properly.

3.4 Maintenance and Inspection

- ✓ Fueling areas and storage tanks shall be inspected monthly.
- ✓ Keep an ample supply of spill cleanup material near the site of vehicle and equipment fueling and bulk fuel transfer operations.
- ✓ Any equipment, tanks, pumps, piping and fuel dispensing equipment found to be leaking or in disrepair must be repaired or replaced immediately.
- ✓ The valves on the discharge pipes from any secondary containments for aboveground fuel storage tanks shall remain closed at all times except as described below. Visual inspections shall be performed before discharging stormwater through the valve, to ensure that fuel from the tank has not come into contact with the stormwater to be discharged.

3.5 References

- ✓ Borough of Keansburg Stormwater Pollution Prevention Plan.
- ✓ New Jersey Pollutant Discharge Elimination System, Tier A Municipal Stormwater General Permit No. NJG0149101.

Borough of Keansburg
Stormwater Pollution Prevention Plan

Standard Operating Procedure
For
Vehicle Maintenance

Revision No. 1 Effective Date – 04/01/05

1.0 PURPOSE

This procedure provides instructions for performing vehicle maintenance in a manner that ensures that proper consideration is given to spill prevention, containment and countermeasures, waste management, and pollution control, in order to minimize the impact of maintenance activities on the environment.

2.0 APPLICABILITY/SCOPE

This procedure is applicable to all Borough personnel and contractors who participate in vehicle maintenance activities at the Public Works Yard at 40 Frazee Place or other areas where vehicle maintenance may be performed in the Borough of Keansburg.

3.0 PROCEDURE

3.1 Vehicle Maintenance

- ✓ Vehicle and equipment maintenance shall only be conducted in areas designated by the Director Department of Public Works.
- ✓ Ensure that absorbent spill clean-up materials or spill kits are available in the vehicle maintenance area.
- ✓ Whenever possible, perform all vehicle and equipment maintenance at an indoor location with a paved floor.
- ✓ For projects that must be performed outdoors and that last more than one day, portable tents, tarps, or other covers must be placed over the equipment being serviced when it is not being worked on. If the machinery is not exposed (e.g., hood of vehicle can be closed, tractor engine cover is replaced, etc.), then no cover is required.
- ✓ Drip pans or other containment devices must be used if the equipment that is being serviced could possibly leak fuel, oil, hydraulic fluids or other fluids, and will be left outside for a time period of greater than one day.
- ✓ Maintenance areas shall be protected from stormwater run-on and runoff, and shall be located at least 50 feet downstream from drainage facilities and watercourses.

- ✓ Properly dispose of or recycle batteries, fuels, oils, grease, lubricants, antifreeze and other hazardous materials. **Do not dump any of these materials on the ground or into a storm drain or watercourse.** Collect waste fluids in properly labeled containers and dispose of properly.
- ✓ Properly dispose of or recycle waste tires. **Do not bury tires.**

3.2 Spill Prevention, Response and Reporting

- ✓ Provide spill containment dikes or other secondary containment around stored oils and other fluid storage containers.
- ✓ In the event of a spill, call the Borough of Keansburg Emergency Line at 732-787-0600.
- ✓ Conduct cleanups of any spills of fuels, oils, lubricants, antifreeze and other hazardous materials immediately after discovery.
- ✓ Spills are to be cleaned up using dry cleaning methods only. Spills shall be cleaned up with a dry, absorbent material (e.g., kitty litter, sawdust, etc.) and the absorbent materials shall be swept up as soon as possible after the spilled material has been absorbed.
- ✓ Spill cleanup waste material is to be disposed of properly.

3.3 Maintenance and Inspection

- ✓ Periodically check vehicle/equipment maintenance areas for leaking or damaged equipment or containers and make repairs as necessary.

3.4 References

- ✓ Borough of Keansburg Stormwater Pollution Prevention Plan.
- ✓ New Jersey Pollutant Discharge Elimination System, Tier A Municipal Stormwater General Permit No. NJG0149101.

Borough of Keansburg
Stormwater Pollution Prevention Plan

Standard Operating Procedure
For
Good Housekeeping

Revision No. 1 Effective Date – 04/01/05

1.0 PURPOSE

This procedure provides the basic practices of good housekeeping to be implemented at maintenance yards or other areas where maintenance may be performed in the Borough of Keansburg, in a manner that ensures that proper consideration is given to spill prevention, containment and countermeasures, waste disposal and recycling, and pollution control, in order to minimize the impact of maintenance yard activities on the environment.

2.0 APPLICABILITY/SCOPE

This procedure is applicable to all Borough personnel and contractors who work at the Public Works Yard at 40 Frazee Place or other areas where maintenance may be performed in the Borough of Keansburg.

3.0 PROCEDURE

3.1 General Good Housekeeping

- ✓ All containers should be properly labeled and marked, and the labels must remain clean and visible.
- ✓ All containers must be kept in good condition and tightly closed when not in use.
- ✓ Whenever practical, chemicals, fluids and supplies should be stored indoors.
- ✓ If containers are stored outside, they must be covered and placed on spill platforms.
- ✓ Keep storage areas clean and well organized.
- ✓ Spill kits and drip pans must be kept near any liquid transfer areas, protected from rainfall.
- ✓ Absorbent spill clean-up materials must be available in maintenance areas and shall be disposed of properly after use.
- ✓ Place trash, dirt and other debris in a dumpster or other appropriate waste container.
- ✓ Collect waste fluids in properly labeled containers and dispose of them properly.
- ✓ Establish and maintain a recycling program including the provision of containers for recycling paper, cans, and bottles.

3.2 Sand, Salt and De-icing Material Handling

- ✓ Prevent or minimize spills during loading and unloading of sand, salt and de-icing materials. If salt or de-icing materials are spilled, remove the spilled materials using dry cleaning methods. All collected materials shall either be reused or disposed of properly.
- ✓ Sand, salt and de-icing material storage areas should be swept at least once per week to remove dirt and debris. Sweeping should also be conducted immediately following loading/unloading activities, when practical.
- ✓ If interim seasonal tarping is being implemented pending the construction of permanent indoor storage, salt and de-icing materials may be stored outdoors only during the October 15th through April 30th period.
- ✓ Minimize the tracking of materials from storage and loading/unloading areas.
- ✓ Minimize the distance that sand, salt and de-icing materials are transported during loading/unloading activities.
- ✓ Any salt or de-icing materials that are stored outside must be tarped when not actively being used.
- ✓ Sand may be permanently stored outdoors and uncovered, as long as a 50-foot setback is maintained from any storm sewer inlets, ditches or other stormwater conveyance channels, and surface water bodies. For sand stored in three-sided uncovered bins, the 50-ft setback is measured from the open side of the bin. If the sand is covered, the 50-ft setback is not required.

3.3 Spill Prevention, Response and Reporting

- ✓ Provide spill containment dikes or other secondary containment around stored oils and other fluid storage containers.
- ✓ In the event of a spill, call the Borough of Keansburg Emergency Line at 732-787-0600.
- ✓ Conduct cleanups of any spills of fuels, oils, lubricants, antifreeze and other hazardous materials immediately after discovery.
- ✓ Spills are to be cleaned up using dry cleaning methods only. Spills shall be cleaned up with a dry, absorbent material (e.g., kitty litter, sawdust, etc.) and the absorbent materials shall be swept up as soon as possible after the spilled material has been absorbed.
- ✓ Spill cleanup waste material is to be disposed of properly.

3.4 Maintenance and Inspection

- ✓ Periodically check for leaking or damaged equipment or containers and make repairs as necessary.
- ✓ Perform monthly inspections of all (indoor and outdoor if applicable) storage locations.

3.5 References

- ✓ Borough of Keansburg Stormwater Pollution Prevention Plan.
- ✓ New Jersey Pollutant Discharge Elimination System, Tier A Municipal Stormwater General Permit No. NJG0149101.

THE BOROUGH OF KEANSBURG - STORMWATER POLLUTION PREVENTION PLAN
INVENTORY OF MATERIALS/MACHINERY WHICH COULD BE A SOURCE OF STORMWATER POLLUTION
NJPDES Permit # NJG0149101 PI ID #203010

Municipal Maintenance Yard Location: ***Public Works Yard at 40 Frazee Place***

Date of Inventory: ***March 14, 2005***

POTENTIAL SOURCE OF STORMWATER POLLUTANTS	PRESENT? (Y/N)	COMMENTS
Bulk Storage Tanks & Appurtenances (gasoline, diesel, etc.)		
Aboveground Storage Tanks & Associated Piping, Secondary Containment	Y	One 2,000 gallon gasoline tank and one 500 gallon diesel tank located in the Public Works Yard. Both tanks are double-walled with leak detection. **No exposure to stormwater**. One 240 gallon waste oil tank located inside the Mechanics Garage. **No exposure to stormwater**.
Underground Storage Tanks & Associated Piping	N	
Bulk Loading and Unloading Areas	Y	Bulk-fueling area for aboveground gasoline and diesel tanks in the Public Works Yard. Bulk fueling activities will be conducted in accordance with the Standard Operating Procedure for Vehicle and Equipment Fueling.
Pumping Stations & Associated Piping	Y	Pumping facilities associated with the aboveground gasoline and diesel tanks located in the Public Works Yard. These facilities will be operated and maintained in accordance with the Standard Operating Procedure for Vehicle and Equipment Fueling.
Mobile Tanks and Associated Pumping Equipment	N	
Silos or Rail Cars	N	

THE BOROUGH OF KEANSBURG - STORMWATER POLLUTION PREVENTION PLAN
INVENTORY OF MATERIALS/MACHINERY WHICH COULD BE A SOURCE OF STORMWATER POLLUTION
NJPDES Permit # NJG0149101 PI ID #203010

Municipal Maintenance Yard Location: ***Public Works Yard at 40 Frazee Place***

Date of Inventory: ***March 14, 2005***

POTENTIAL SOURCE OF STORMWATER POLLUTANTS	PRESENT? (Y/N)	COMMENTS
Storage and Staging Areas		
Drum Storage Pads/Areas (fuels, lubricants, antifreeze, solvents, paints & other coatings, detergents/cleaning chemicals, fertilizers, pesticides, etc.)	Y	All drum storage is located inside the Mechanics Garage and other buildings. **No exposure to stormwater.**
Waste & Scrap Material Storage Pads/Areas	Y	Small quantities of scrap metal stored for short periods of time in a three-sided bin with an asphalt floor at the north end of the Public Works Yard.
Recyclable Storage Pads/Areas (oil, batteries, household chemicals, etc.)	N	
Chemical Storage Cabinets/Closets/Lockers (fuels, lubricants, antifreeze, solvents, paints & other coatings, detergents/cleaning chemicals, fertilizers, pesticides, etc.)	Y	All chemical storage is located inside the buildings. **No exposure to stormwater.**
Waste in Dumpsters or other Containers	Y	One covered solid waste dumpster near the northwest corner and two open topped dumpsters for "litter can" waste in plastic bags at the south end of the Public Works Yard. **Little or no exposure to stormwater.**
Recyclables in Dumpsters or other Containers	Y	One open topped dumpster for bottles and cans, one open topped dumpster for cardboard and one covered dumpster for newspaper near the north end of the Public Works Yard.
De-icing Material Storage/Loading Areas	Y	De-icing salt stored in a permanent structure on the east side of the Public Works Yard. **No exposure to stormwater.**
Sand Storage/Loading Areas	N	
Soil/Leaf Storage (top soil, compost, etc.)	Y	Brush and mulch and street sweepings stored in three-sided concrete bins with concrete floors resulting in minimal stormwater run-on/runoff. Leaves stored in a pile near the south end of the Public Works Yard. This portion of the facility is surrounded by soil berms and concrete walls resulting in little or no stormwater run-on/runoff.
Raw Material Storage (sheet metal, treated lumber, other building materials, etc.)	Y	Cold patch and bluestone stored in three-sided concrete bins with concrete floors resulting in little or no stormwater run-on/runoff.
Other	Y	Concrete and asphalt rubble stored in three-sided concrete bins with concrete floors resulting in little or no stormwater run-on/runoff. This portion of the facility is surrounded by soil berms and concrete walls, further preventing stormwater run-on/runoff.

THE BOROUGH OF KEANSBURG - STORMWATER POLLUTION PREVENTION PLAN
INVENTORY OF MATERIALS/MACHINERY WHICH COULD BE A SOURCE OF STORMWATER POLLUTION
NJPDES Permit # NJG0149101 PI ID #203010

Municipal Maintenance Yard Location: ***Public Works Yard at 40 Frazee Place***

Date of Inventory: ***March 14, 2005***

POTENTIAL SOURCE OF STORMWATER POLLUTANTS	PRESENT? (Y/N)	COMMENTS
Drainage Systems/Areas (that may discharge to the Municipal Stormwater System)		
Floor Drains	**Y**	Floor drains in Mechanics Garage and attached buildings drain to a concrete lined vault. **No exposure to stormwater and no discharges to the environment**.
Sumps, Drywells, Pipes or Trenches	**N**	
Process Area Sinks and Associated Piping	**Y**	Self-contained parts cleaning sink located inside the Mechanics Garage. **No exposure to stormwater and no discharges to the environment.**
Septic Systems, Leachfields or Seepage Pits	**N**	
Roof Leaders (when process operations occur on or vent to the roof or when materials are stored on the roof)	**N**	
Drainage Swales & Culverts	**N**	
Other	**N**	

THE BOROUGH OF KEANSBURG - STORMWATER POLLUTION PREVENTION PLAN
INVENTORY OF MATERIALS/MACHINERY WHICH COULD BE A SOURCE OF STORMWATER POLLUTION
NJPDES Permit # NJG0149101 PI ID #203010

Municipal Maintenance Yard Location: ***Public Works Yard at 40 Frazee Place***

Date of Inventory: ***March 14, 2005***

POTENTIAL SOURCE OF STORMWATER POLLUTANTS	PRESENT? (Y/N)	COMMENTS
Other Potential Sources		
Vehicle/Machinery Storage Areas	Y	Approximately 90% of the vehicles and heavy equipment, including all diesel fueled vehicles/equipment, are stored inside the garages. The remaining vehicles are stored outside in the Public Works Yard. All vehicles stored in the yard were in excellent condition and no leaks of oil or other fluids were observed.
Vehicle/Machinery Maintenance Areas	Y	All vehicle maintenance is performed inside the Mechanics Garage. **No exposure to stormwater.**
Air Compressor Vent Discharges	N	Two air compressors, one main and one back-up, are located inside the Mechanics Garage. **No exposure to stormwater.**
Electrical Transformers & Capacitors	N	
Boilers or Incinerators	N	
Other	N	

STORMWATER POLLUTION PREVENTION TECHNIQUES

General Good Housekeeping

All containers should be properly labeled and marked, and the labels must remain clean and visible.

All containers must be kept in good condition and tightly closed when not in use.

When practical, chemicals, fluids and supplies should be kept indoors.

If containers are stored outside, they must be covered and placed on spill platforms or in an area graded and/or bermed to prevent run-through of stormwater.

Keep storage areas clean and well organized.

Spill kits and drip pans must be kept near any liquid transfer areas, protected from rainfall.

Absorbent spill clean-up materials must be available in maintenance areas and shall be disposed of properly after use.

Trash, dirt and other debris should be placed in a dumpster or other suitable container.

Collect waste fluids in properly labeled containers and dispose of them properly.

Salt/Deicing Material & Sand Handling

During loading and unloading of salt and de-icing materials, prevent and/or minimize spills. If salt or de-icing materials are spilled, remove the materials using dry cleaning methods. All collected materials shall be either reused or properly discarded.

Sweeping should be conducted once a week to get rid of dirt and other debris. Sweeping should also be conducted immediately following loading/unloading activities, when practical.

Minimize the tracking of materials from storage and loading/unloading areas.

Minimize the distance that salt and de-icing materials are transported during loading/unloading activities.

Any salt or deicing materials that are stored outside must be tarped when not actively being used.

If interim seasonal tarping is being implemented, de-icing materials may be stored outdoors only between October 15th through April 30th.

Sand may be stored outside & uncovered if a 50-ft setback is maintained from storm sewer inlets, stormwater conveyance channels and surface water bodies. Covered sand does not require the 50-ft setback.

Spill Cleanup

Absorbent spill clean-up materials and/or spill kits should be available in fueling areas and on mobile fueling vehicles.

Spills should be cleaned up immediately after discovery.

Spills should be cleaned up using dry cleaning methods only.

APPENDIX 10

Certifications of Stormwater Review

NEW JERSEY

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certificate of Course Completion

THIS CERTIFIES THAT

Robert F. Yuro

New Jersey Professional Engineer Lic. GE 36701

Has completed 10.96 Professional Development Hours
(PDHs) or 1.096 Continuing Education Units (CEUs) for the

STORMWATER MANAGEMENT DESIGN REVIEW COURSE

JULY 31, 2018 and OCTOBER 25, 2018

Gabriel Mahon

GABRIEL MAHON JANUARY 15, 2019

NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER QUALITY

Certificate of Course Completion

THIS CERTIFIES THAT

Edward P. Striedl, CFM

Has Completed 10 Professional Development Hours (PDHs)
or 1.0 Continuing Education Units (CEUs) for the

STORMWATER MANAGEMENT DESIGN REVIEW COURSE

MAY 2 & 3, 2018

Gabriel Mahon

GABRIEL MAHON — MAY 18, 2018

CERTIFICATION
REGARDING NJ DEP STORMWATER REVIEW TRAINING

I, Judy Ferraro, of full age, do hereby certify that I am a Member of the Borough of Keansburg Planning Board of Adjustment, and that I viewed on 12/10/18, 2018, the interactive training tool video set forth on the Stormwater Training page of the NJ DEP website, and referenced as follows:

> Asking the Right Questions in Stormwater Review Training Tool (2015)
> This interactive training tool is designed for Municipal Board and Governing Body members to provide a general understanding of the post construction section of the permit so that they can "Ask the Right Questions" during their review.

I certify that the foregoing statements made by me are true. I am aware that if any of the foregoing statements made by me are willfully false, I am subject to punishment.

Dated: 12/10/18

Judy Ferraro

CERTIFICATION
REGARDING NJ DEP STORMWATER REVIEW TRAINING

I, Jennifer R. Perkel, of full age, do hereby certify that I am a Member of the Borough of Keansburg Planning Board of Adjustment, and that I viewed on Oct 30, 2015, 2018, the interactive training tool video set forth on the Stormwater Training page of the NJ DEP website, and referenced as follows:

> Asking the Right Questions in Stormwater Review Training Tool (2015)
> This interactive training tool is designed for Municipal Board and Governing Body members to provide a general understanding of the post construction section of the permit so that they can "Ask the Right Questions" during their review.

I certify that the foregoing statements made by me are true. I am aware that if any of the foregoing statements made by me are willfully false, I am subject to punishment.

Dated: November 19, 2018 Jennifer R Perkel

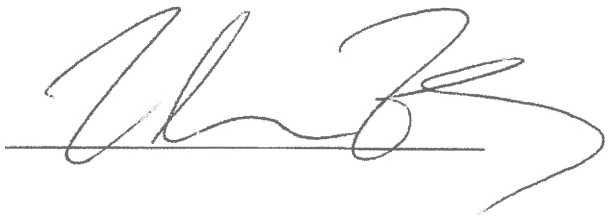
CERTIFICATION
REGARDING NJ DEP STORMWATER REVIEW TRAINING

I, Thomas Foley, of full age, do hereby certify that I am a Member of the Borough of Keansburg Planning Board of Adjustment, and that I viewed on 11/19/18, 2018, the interactive training tool video set forth on the Stormwater Training page of the NJ DEP website, and referenced as follows:

> Asking the Right Questions in Stormwater Review Training Tool (2015)
> This interactive training tool is designed for Municipal Board and Governing Body members to provide a general understanding of the post construction section of the permit so that they can "Ask the Right Questions" during their review.

I certify that the foregoing statements made by me are true. I am aware that if any of the foregoing statements made by me are willfully false, I am subject to punishment.

Dated: 11/19/18



CERTIFICATION
REGARDING NJ DEP STORMWATER REVIEW TRAINING

I, _____, of full age, do hereby certify that I am a Member of the Borough of Keansburg Planning Board of Adjustment, and that I viewed on 11/9/18, 2018, the interactive training tool video set forth on the Stormwater Training page of the NJ DEP website, and referenced as follows:

> Asking the Right Questions in Stormwater Review Training Tool (2015)
> This interactive training tool is designed for Municipal Board and Governing Body members to provide a general understanding of the post construction section of the permit so that they can "Ask the Right Questions" during their review.

I certify that the foregoing statements made by me are true. I am aware that if any of the foregoing statements made by me are willfully false, I am subject to punishment.

Dated:
11/19/18

_____

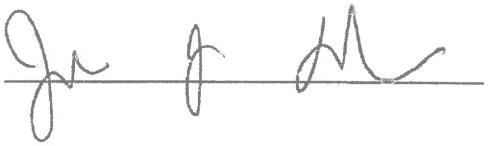
CERTIFICATION
REGARDING NJ DEP STORMWATER REVIEW TRAINING

I, JOHN J DONOHOE JR, of full age, do hereby certify that I am a Member of the Borough of Keansburg Planning Board of Adjustment, and that I viewed on 10-28-18, 2018, the interactive training tool video set forth on the Stormwater Training page of the NJ DEP website, and referenced as follows:

> Asking the Right Questions in Stormwater Review Training Tool (2015)
> This interactive training tool is designed for Municipal Board and Governing Body members to provide a general understanding of the post construction section of the permit so that they can "Ask the Right Questions" during their review.

I certify that the foregoing statements made by me are true. I am aware that if any of the foregoing statements made by me are willfully false, I am subject to punishment.

Dated: 11-19-18,



CERTIFICATION
REGARDING NJ DEP STORMWATER REVIEW TRAINING

I, Owen P. McKenna, of full age, do hereby certify that I am a Member of the Borough of Keansburg Planning Board of Adjustment, and that I viewed on Oct 16, 2018, the interactive training tool video set forth on the Stormwater Training page of the NJ DEP website, and referenced as follows:

> Asking the Right Questions in Stormwater Review Training Tool (2015)
> This interactive training tool is designed for Municipal Board and Governing Body members to provide a general understanding of the post construction section of the permit so that they can "Ask the Right Questions" during their review.

I certify that the foregoing statements made by me are true. I am aware that if any of the foregoing statements made by me are willfully false, I am subject to punishment.

Dated: 10/16/2018

APPENDIX 11

Training Logs

Keansburg Public Works-Water Sewer Depts.

DATE: 1/29/20 **TIME:** 9AM **TO:** 12PM

TRAINING TOPICS COVERED IN LENGTH:

1. [] Stormwater Management training for Public Works/WS
2. Fire Safety / Extinguishers
3. Right to know
4. Blood Borne Path.

Supervisors Checklist:: Manuals [] Video [/] Hands On [] Demo []

CONDUCTED BY: State Wide Ins. Brown & Brown Metro LLC

ATTENDED BY: **Note – Do not sign unless you thoroughly understand the Topics involved.**

1. [signature]
2. [signature]
3. [signature]
4. [signature]
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10. [signature]
11. [signature]
12. [signature]
13. [signature]
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16.

Each employee has received and read any appropriate manuals for the above mentioned topics.

NOTES:

Keansburg Public Works-Water Sewer Depts.

DATE: 2/19/20 **TIME:** 7 AM **TO:** 7:45

TRAINING TOPICS COVERED IN LENGTH:

1. ☑ Stormwater Management training for Public Works/WS
2. BASIN cleaning PREPARING for SNOW
3. SMALL TALK ABOUT CLEANING TRUCKS AND filling of
4. Paperwork etc.

Supervisors Checklist:: Manuals [ ] Video [ ] Hands On [ ] Demo [ ]

CONDUCTED BY: Jim DeLaPiano

ATTENDED BY: *Note – Do not sign unless you thoroughly understand the Topics involved.*

1. [signature]
2. Robert Kolle
3. [signature]
4. [signature]
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Each employee has received and read any appropriate manuals for the above mentioned topics.

NOTES:

Keansburg Public Works-Water Sewer Depts.

DATE: 3/17/20 **TIME:** 7AM **TO:** 7:45 AM

TRAINING TOPICS COVERED IN LENGTH:

1. ✓ Stormwater Management training for Public Works/WS
2. Flu Precautions
3.
4.

Supervisors Checklist:: Manuals [ ] Video [ ] Hands On [ ] Demo [ ]

CONDUCTED BY: Jim Dell Steve Rogan

ATTENDED BY: *Note – Do not sign unless you thoroughly understand the Topics involved.*

1. [signature]
2. [signature]
3. Daniel Johnson
4. John Jelinski
5. Dave Summers
6. Matt Corretti
7. [signature]
8. [signature]
9. [signature]
10. Robert Kalla
11. [signature]
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Each employee has received and read any appropriate manuals for the above mentioned topics.

NOTES:

Keansburg Public Works-Water Sewer Depts.

DATE: 6/2/20 **TIME:** 7AM **TO:** 7:45AM

TRAINING TOPICS COVERED IN LENGTH:

1. ~~H~~ Stormwater Management training for Public Works/WS
2. Keeping Vehicles Clean
3. Staying Safe.
4.

Supervisors Checklist:: Manuals [ ] Video [ ] Hands On [ ] Demo [ ]

CONDUCTED BY: Jim D Steve R

ATTENDED BY: *Note – Do not sign unless you thoroughly understand the Topics involved.*

1. [signature]
2. [signature]
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4. [signature]
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8. [signature]
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14.
15.
16.

Matt Cerrot

Each employee has received and read any appropriate manuals for the above mentioned topics.

NOTES:

Keansburg Public Works-Water Sewer Depts.

DATE: 6/17/20 *TIME:* 7:00 AM *TO:* 8 AM

TRAINING TOPICS COVERED IN LENGTH:

1. Stormwater Management training for Public Works/WS

2. VEHICLE MAINTENANCE

3. WRITE UPS / CARELESSNESS ON JOB.

4.

Supervisors Checklist:: Manuals [ ] Video [ ] Hands On [ ] Demo [ ]

CONDUCTED BY: J. DELL S ROGAN

ATTENDED BY: *Note – Do not sign unless you thoroughly understand the Topics involved.*

1. [signature] 9. [signature]
2. [signature] 10. [signature]
3. Dancie Zitzmor 11. [signature]
4. Matt Carrot 12. John Jelinski
5. Robert Keller 13. [signature]
6. [signature] 14. Dave Simmes
7. [signature] 15.
8. [signature] 16.

Each employee has received and read any appropriate manuals for the above mentioned topics.

NOTES:

Keansburg Public Works + Water Sewer Depts.

DATE: 8/20/20 **TIME:** 7AM **TO:** 7:45

TRAINING TOPICS COVERED IN LENGTH:

1. XX Stormwater Management training for Public Works/WS
2. BASIN CLEANING AFTER STORMS
3. SAFETY TALKS
4.

Supervisors Checklist:: Manuals [ ] Video [ ] Hands On [ ] Demo [ ]

CONDUCTED BY: J. DELL S ROGAN

ATTENDED BY: *Note – Do not sign unless you thoroughly understand the Topics involved.*

1. 9. Dave Simmons
2. 10.
3. 11.
4. 12.
5. 13.
6. 14.
7. 15.
8. 16.

Each employee has received and read any appropriate manuals for the above mentioned topics.

NOTES:

Keansburg Public Works-Water Sewer Depts.

DATE: 9/4/20 **TIME:** 7AM **TO:** 8AM

TRAINING TOPICS COVERED IN LENGTH:

1. N Stormwater Management training for Public Works/WS
2. BASINS After Storm
3. TRUCK Cleaning Sanitizing
4. A/C RADIOS Phones

Supervisors Checklist:: Manuals [ ] Video [ ] Hands On [ ] Demo [ ]

CONDUCTED BY: J. DELL S ROGAN

ATTENDED BY: Note – Do not sign unless you thoroughly understand the Topics involved.

1. [signature]	9. [signature]
2. M Cerrato	10. [signature]
3. Robert Koller	11.
4. John Zelinski	12.
5. [signature]	13.
6. [signature]	14.
7. [signature]	15.
8. [signature]	16.

Each employee has received and read any appropriate manuals for the above mentioned topics.

NOTES:

Keansburg Public Works-Water Sewer Depts.

DATE: 9/18/20 **TIME:** 7AM **TO:** 8AM

TRAINING TOPICS COVERED IN LENGTH:

1. ~~H~~ Stormwater Management training for Public Works/WS BASINS
2. PROPER LIFTING TECHNIQUES HAND OUT INCLUDED
3. ANNUAL TRAINING START UP.
4.

Supervisors Checklist:: Manuals [ ] Video [ ] Hands On [ ] Demo [ ]

CONDUCTED BY: JIM D STEVE R.

ATTENDED BY: *Note – Do not sign unless you thoroughly understand the Topics involved.*

1. [signature] 9. [signature]
2. [signature] 10.
3. [signature] 11.
4. [signature] 12.
5. [signature] 13.
6. [signature] 14.
7. [signature] 15.
8. [signature] 16.

Each employee has received and read any appropriate manuals for the above mentioned topics.

NOTES:

Keansburg Public Works-Water Sewer Depts.

DATE: 10/22/20 **TIME:** 7AM **TO:** 730AM

TRAINING TOPICS COVERED IN LENGTH:

1. [✓] Stormwater Management training for Public Works/WS

2. DRIVER Saftey

3.

4.

Supervisors Checklist:: Manuals [ ] Video [ ] Hands On [ ] Demo [ ]

CONDUCTED BY: J. Dell

ATTENDED BY: *Note – Do not sign unless you thoroughly understand the Topics involved.*

1. [signature]	9. [signature]
2. Robert Kolla	10. Matt Curtis
3. [signature]	11. [signature]
4. [signature]	12.
5. Daniel Zitzman	13.
6. John Jelinski	14.
7. [signature]	15.
8. Dave Simmers	16.

Each employee has received and read any appropriate manuals for the above mentioned topics.

NOTES:

Keansburg Public Works-Water Sewer Depts.

DATE: 12/4/20 **TIME:** 7AM **TO:** 7:45

TRAINING TOPICS COVERED IN LENGTH:

1. IV Stormwater Management training for Public Works/WS
2. BASIN TOPS - LEAVES
3. TRUCK SAFETY LEAF VAC MACHINE
4. HOOKING UP TRAILER SAFETY - HOW TO USE HITCHES

Supervisors Checklist:: Manuals [ ] Video [ ] Hands On [ ] Demo [ ]

CONDUCTED BY:

ATTENDED BY: *Note – Do not sign unless you thoroughly understand the Topics involved.*

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3. [signature]
4. [signature]
5. [signature]
6. John [signature]
7. [signature]
8. [signature]
9. Dave [signature]
10. [signature]
11. [signature]
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16.

Each employee has received and read any appropriate manuals for the above mentioned topics.

NOTES: