

MUNICIPAL STORMWATER MANAGEMENT PLAN

For the

Township of Berkeley

Ocean County, New Jersey

March 23, 2005

Revised October 2006

Updated October 2020

Updated November 2024

Prepared By



**9 Allen Street
Toms River, NJ 08753
(732) 286-9220**

RVE Project No. Job #1506-T-166

Signature

December 2, 2024

Date

**Alan Dittenhofer, PE, PP, CME
License # 37672**

Table of Contents

I. INTRODUCTION	3
II. GOALS.....	3
III. STORMWATER DISCUSSION	4
IV. BACKGROUND	5
V. DESIGN STANDARDS	8
VI. PLAN CONSISTENCY	10
VII. NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES	11
VIII. LAND USE/BUILD-OUT ANALYSIST	13
IX. MITIGATION PLANS.....	13

List of Figures

- Figure C-1: Groundwater Recharge in the Hydrologic Cycle**
- Figure C-2: Aerial Map**
- Figure C-3: Map of Ground Water Recharge Areas**
- Figure C-4: USGS Quadrangles and Municipal Boundaries**
- Figure C-5: Map of Waterways**
- Figure C-6: Map of Well Head Protection Areas**
- Figure C-7: Map of Wetlands and Water Land Uses**
- Figure C-8: Zoning Map**

List of Tables

- Table C-1 Buildout Calculations**

I. INTRODUCTION

The Municipal Stormwater Management Plan (MSWMP) was prepared by Berkeley Township's previous municipal engineers, Schoor DePalma, Inc., dated March 23, 2005.

The Berkeley Township MSWMP was revised October 11, 2006 reviewed by Ocean County Planning and adopted at the Berkeley Township Planning Board Meeting on March 1, 2007.

Berkeley Township had an onsite audit meeting in 2019 with NJDEP. At the request of the Township RVE updated its MSWMP and Stormwater Control Ordinances in 2020 to be consistent with NJAC 7:8 and the NJDEP MS4 requirements.

According to NJDEP the Stormwater Management Rules, NJAC 7:8 was amended and adopted on July 17th, 2023. NJDEP indicated that the Storm Water Management Plan and the Stormwater Control Ordinances were to be adopted by July 17th, 2024. RVE has updated the MSWMP and Stormwater Control Ordinance to be in accordance with the requirements set forth in the NJDEP MS4 Permit Conditions, amendments to the Pinelands Comprehensive Management Plan (CMP) and the amendments to NJAC 7:8 Stormwater Management Rules.

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Township of Berkeley to address stormwater related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acres of land. These standards intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides base flow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

The plan also addresses the review and update of existing ordinances, the Township Master Plan, and other planning documents to allow for project designs that include low impact development techniques.

A "build-out" analysis has been included in this plan based upon existing zoning and land available for development.

The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought.

II. GOALS

The goals of this MSWMP are to:

- Reduce flood damage, include 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.

To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for stormwater infrastructure to be implemented to protect public safety. *All of these goals are ongoing.*

The General Reexamination of the Master Plan occurred on March 20, 2019. The MSWMP was adopted as a stormwater element to the master plan. The following Goals and Objectives were implemented to the Master Plan that referenced Stormwater Management:

1. Preserve the Township natural resources to protect water quality, manage stormwater, reduce the potential of flood damage, protect endangered habitat and provide open space. *Still ongoing goal.*
2. Encourage regional solution to flood and storm related impacts. *Still ongoing goal.*
3. Encourage Green Infrastructure Projects. *During the planning stages of developmental projects, developers are encouraged to include additional landscaping standards regarding low impact design, native vegetation and green storm water facility concepts such as rain gardens. Ordinances have been updated and approved to include these design concepts. See Nonstructural Stormwater Management Strategies section located in this plan for the update on the adoption dates and ordinance numbers.*
4. Develop GIS database regarding Berkeley Township stormwater collection system and outfall mapping. *GIS Outfall Mapping is complete and located on the Berkeley Township website. GIS Stormwater Infrastructure Mapping is being prepared by Remington Vernick Engineers per NJDEP MS4 requirements.*

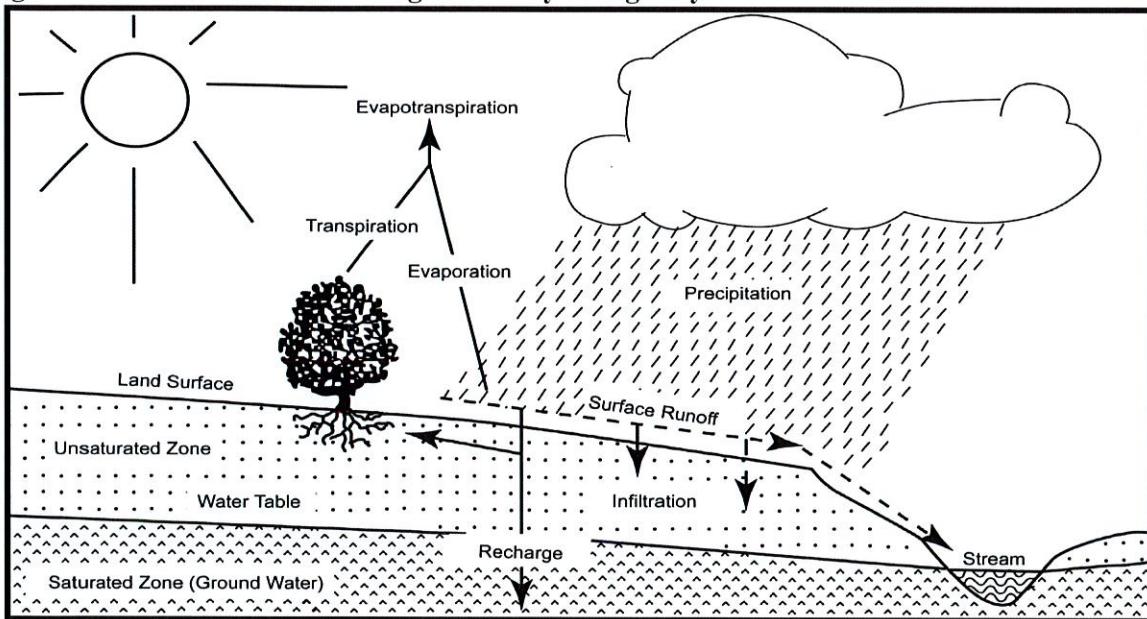
III. STORMWATER DISCUSSION

Land development can dramatically alter the hydrologic cycle (See Figure C-1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion, that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater

recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

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

Figure C-1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey

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

IV. BACKGROUND

Population:

The Township encompasses a 55.8 square mile area in Ocean County, New Jersey. Berkeley Township includes Pelican Island and Island Beach State Park. The population of the Township increased from 39,991 in 2000, to 41,255 in 2010, to 43,754 in 2020. This population increase has resulted in a demand for new development.

Identification of Constraints on Developed and Undeveloped Land Areas:

Berkeley Township has some areas for potential development. However, the low steady population level has not resulted in a considerable demand for new development.

Undeveloped land in Berkeley Township has some land constraints. There are many areas of undeveloped land that consist of wetlands, endangered plants and wildlife and waterways which can be found on Figure C- and C-7.

The Waterway Map Figure C-5 shows that Wrangle Brook, Sunken Branch, Jakes Branch, and Davenport River runs along the western border of Berkeley Township and feeds into the Toms River which borders Berkeley Township on the north. Barnegat Bay borders Berkeley Township on the east and Cedar Creek runs along the southern border of Berkeley Township and feeds into Barnegat Bay which borders Berkeley Township on the east.

Another constraint is indicated on the Zoning Map Figure C-8. According to the Zoning Map, Berkeley Township has two zones dedicated purely for conservation purposes, which are the XXXV, Land Development Ordinance of the Township of Berkeley, Article XI, Zoning District Regulation, Section 35-108 Beach Conservation Zone of the Berkeley Township Code, the only permitted use for the Beach Conservation zone is for erecting temporary structures by a public body for essential government or seasonal uses. According to Section 35-110.7, Forest Area - Conservation Zone of the same chapter and article, the only permitted uses for the Forest Area – Conservation Zone are fish and wildlife management and low intensity recreational uses. Conditional use allows dedicated public right of ways for emergency access. Another relevant zone is the Planned Residential Retirement Community Zone, which appears to coincide with the open space found in Holiday City. According to Section 35-101, Planned Residential Retirement Community (PRRC) of the Berkeley Township Code, Section 35-101.6d requires a minimum of 20% of the acreage to be reserved as green area or open space.

New Development does increase stormwater runoff volumes and pollutant loads to the waterways of the municipality. The Groundwater Recharge Areas Map Figure C-3, Wellhead Protection Areas Figure C-6 and USGS Map Figure C-4 identifies constraints that may create limitations to new stormwater management facilities. Any future major development will comply with the new NJDEP Stormwater design standards (NJAC 7:8) and the new updated Berkeley Township Stormwater Control Ordinances, last revised August 2024 for future developments. As such, future development/redevelopment will be controlled to the maximum extent practicable with respect to Total Suspended Solids (TSS) minimization and stormwater recharge.

Inland flooding in the Township of Berkeley occurs infrequently because of the low runoff generating character of the soil (sandy soils) and the extensive areas of wetlands which absorb the impact of runoff. However, as land is developed, the permeable soils are replaced by impermeable surfaces which increase runoff volumes. All future development in Berkeley Township shall utilize the best available technology to minimize offsite stormwater runoff, increase on-site infiltration, simulate natural drainage systems and minimize off-site discharge of pollutants to ground or surface water and encourage natural filtration functions.

Identification of TMDL:

In accordance with Section 305(b) and 303(d) of the Federal Clean Water Act, the State of New Jersey is required to assess the overall water quality of the State's waters and identify those waterbodies with a

water quality impairment for which Total Maximum Daily Loads (TMDL) may be necessary. NJDEP fulfills its assessment obligation under the Clean Water Act through the Integrated Water Quality Monitoring and Assessment Report (Integrated Report), which includes the Integrated List of Waterbodies, issued biennially. The Integrated Report can be found at:

<https://dep.nj.gov/wms/bears/integrated-wq-assessment-report-2022>

The New Jersey Integrated Water Quality Assessment Report (Integrated Report) is a compilation of information about the quality of New Jersey's surface waters. The New Jersey Department of Environmental Protection (DEP) prepares the Integrated Report as a biennial assessment of statewide water quality that identifies and prioritizes waters for protection, restoration, and additional monitoring or research. The Integrated Report thus serves as an effective tool for enhancing, maintaining, and restoring water quality in all surface waters of the State to support their use for aquatic life, recreation, water supply, fish consumption, and shellfish harvest for consumption.

Under this obligation, NJDEP has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. The AMNET Program is a sampling program that supports the water quality inventory report and list of impaired waters. The AMNET site is found at:

<https://www.nj.gov/dep/wms/bfbm/amnet.html>

There are over 760 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrate by the NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. Based on the Integrated Report, the Department identifies waterbodies for which a Total Maximum Daily Load (TMDL) may be necessary.

A Total Maximum Daily Load (TMDL) is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

Several of the impaired waterbodies transverse Berkeley Township and are monitored through AMNET testing and data. These include Davenport Branch, Cedar Creek, Toms River Lower and Barnegat Bay.

The AMNET data lists these impaired waterbodies with the following TMDL levels:

Applicable Stream TMDL(s)

- Total Maximum Daily Load for Mercury Impairments Based on Concentration in Fish Tissue Caused Mainly by Air Deposition to Address 122 HUC 14s Statewide
 - Mercury - 2010 : Cedar Creek (GS Parkway to 74d16m38s) :
- Total Maximum Daily Load for Mercury Impairments Based on Concentration in Fish Tissue Caused Mainly by Air Deposition to Address 122 HUC 14s Statewide
 - Mercury - 2010 : Davenport Branch (above Pinewald Road) :

- Total Maximum Daily Load for Mercury Impairments Based on Concentration in Fish Tissue Caused Mainly by Air Deposition to Address 122 HUC 14s Statewide
 - Mercury - 2011 : Toms R Lwr (Rt 166 to Oak Ridge Pkwy) :

Applicable Shellfish TMDL(s)

- Fourteen Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 13
 - Total coliform - 2006 : Barnegat Bay-J :
- Fourteen Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 13
 - Total coliform - 2006 : Barnegat Bay-K :
- Fourteen Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 13
 - Total coliform - 2006 : Barnegat Bay-L, Toms River-A :
- Fourteen Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 13
 - Total coliform - 2006 : Barnegat Bay-M :
- Fourteen Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 13
 - Total coliform - 2006 : Cedar Creek-A :

The report established 14 TMDL's for total coliform to address the impaired shellfish water in the WM #13 for Barnegat Bay and Cedar Creek.

Berkeley Township has identified the Total Maximum Daily Load (TMDL) levels and has implemented the following strategies:

1. Annually ensure that any newly developed TMDL will be identified by looking up the NJDEP Look Up Tool annually. The TMDL Look-Up Tool is available at <http://www.nj.gov/dep/dwq/msrp-tmdl-rh.htm>.
2. Implemented MS4 Program requirements.
3. Maintain and repair stormwater infrastructure to address specific pollutant sources.
4. Adding additional education programs.
5. Adopted strict enforced Ordinances.
6. Adopted strict and more conservative post construction stormwater management standards.

Furthermore, all future development in the Township of Berkeley shall utilize the best available technology to minimize off-site stormwater runoff, increase onsite infiltration, simulate natural drainage systems, encourage green infrastructure, minimize off-site discharge of pollutants to ground or surface water and encourage natural filtration functions. Aside from the efforts to reduce the daily pollutant loads, Berkeley will continue to implement the adopted Stormwater Pollution Prevention Plan, Stormwater Control Ordinances and the Stormwater Management Plan.

V. DESIGN STANDARDS

Non-Pinelands Area:

The Township has adopted the NJDEP Model Ordinances, design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8, which went into effect on July 17, 2023. These Ordinances minimize the adverse impact of stormwater runoff on water quality and water

quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards in the language for maintenance of stormwater management measures, consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins.

The new Stormwater Control Ordinance – Non Pinelands Area - Chapter 35-74 has been revised and adopted August 19, 2024, Ordinance #24-37-OAB.

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.

Pinelands Area:

The New Jersey Department of Environmental Protection (DEP) amended the stormwater management regulations contained at N.J.A.C. 7:8, effective July 17, 2023. The stormwater management regulations in the Pinelands CMP incorporate various sections of N.J.A.C. 7:8 by cross-reference, including sections that were impacted as part of this amendment.

The Township has adopted the Pinelands Model Stormwater Control Management Ordinances for design on April 2024. The Ordinances incorporate stormwater management regulations contained in N.J.A.C. 7:8; and the New Jersey Department of Environmental Protection adopted amendments to certain stormwater management regulations.

The new Pinelands CMP Stormwater Control Ordinances has been updated and adopted Chapter 35-153, 155 and 159 on April 15, 2024, Ordinance #24-19-OAB.

During the Review Process at the Planning /Zoning Board, the Applicants Engineer is required to prepare a maintenance plan and/or report for its stormwater management facilities incorporated into the design of the major development. The maintenance plan and/or report shall have specific preventative and corrective maintenance tasks, schedules and cost estimates, as well as the responsible party for corrective and preventative maintenance. Adequate long term operation, as well as preventative and corrective maintenance of the selected stormwater management measures, will be ensured by the Public Works Department through annual inspections. The Maintenance plans and reports will be kept at the Public Works Department.

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

Currently, the Township of Berkeley requires all basins for Major Subdivisions to be owned and maintained by a private Homeowners Association. Basins for non-residential development are to be owned and maintained by the property owner or other official designated at time of application to the applicable Board.

Should basins fall in disrepair or have noticeable failure, Public Works may first issue written directive to correct the problem. If a problem is not corrected, the Township Code Enforcement issues a Notice of Violation to the responsible party. Public Works may do the necessary repairs and charge the responsible entity.

Where the Township assumes maintenance responsibility of a stormwater management facility, preventative maintenance shall be performed on a regular basis by Public Works. These maintenance measures shall be in accordance with N.J.A.C. 7:8-5 and may include: periodic inspections, vegetation management, sediment, debris and trash removal and mosquito control. Corrective maintenance shall be performed on an as needed basis for structure repairs or replacements, removal of outlet and pipe blockages, erosion restoration, snow and ice removal, etc. The Public Works Department shall keep a detailed log of all preventative and corrective maintenance for the structural management measures incorporated into the design of the development, including a record of all inspections and work orders.

VI. PLAN CONSISTENCY

The Municipal Stormwater Management Plan (MSWMP) is consistent with their Stormwater Control Ordinances (SCO) which has been updated per the NJDEP Model Ordinance required by NJDEP and MS4 requirements. The new Stormwater Control Ordinance – Non Pinelands Area - Chapter 35-74 has been revised and adopted August 19, 2024, Ordinance #24-37-OAB. SCO is located online and on the Berkeley Township website.

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

The Township's Stormwater Management Ordinance will require all new development and redevelopment plans to comply with Ocean County New Jersey's Soil Erosion and Sediment Control Standards. During construction, Township inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to Ocean County Soil Conservation District.

Within Berkeley Township, west of the Garden State Parkway, are areas within the New Jersey Pinelands Preservation Area. The Municipal Stormwater Management Plan is consistent with Pinelands Regulations. Major development within portions of Berkeley Township that lie within the Pinelands area. The Municipal Stormwater Management Plan (MSWMP) is consistent with their Stormwater Control Ordinances (SCO) which has been updated per the Pinelands Model Ordinance. The new Pinelands CMP Stormwater Control Ordinances has been updated and adopted Chapter 35-153, 155 and 159 on April 15, 2024, Ordinance #24-19-OAB.

NJDEP CAFRA Regulations have been incorporated by reference the Stormwater Management Regulations; consequently, an Applicant submitting a CAFRA application that has also requested a waiver from the performance standards may be required by the NJDEP to develop a mitigation plan.

VII. NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES

The Township has revised the stormwater ordinances to incorporate guidelines for Major Development in accordance with the New Jersey Department of Environmental Protection Best Management Practices Manual and Model Stormwater Control Ordinance for Municipalities as required by the NJDEP. Nonstructural stormwater management strategies such as Green Infrastructure (GI) BMPs and Low Impact Development (LID) should be developed based upon physical site conditions and the origin, nature and the anticipated quantity, or amount, of potential pollutants. These strategies are outlined in the updated Stormwater Control Ordinances (SCO).

The Township has reviewed the master plan and ordinances and has provided a list of the sections in the Township land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies. The following are these Ordinances:

Chapter 35-48: Buffers, Screening, Landscaping and Shade Trees requires buffer areas along all sides and rear property lines which abut areas zoned residentially or containing existing residential uses and along front property lines on local, local collector, minor collector and major collector streets which abut areas zoned for such residential uses. The preservation of all desirable existing vegetation in a buffer area shall be assured through sensitive grading and development practices. *This section should be amended to allow buffer areas to be utilized for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces*, as deemed appropriate by the municipal engineer. **This was incorporated into the ordinances per section 35-48n and 35-48o on December 2020 per Ordinance #20-46-OAB.**

Chapter 35-50: Bulk Storage describes that in zoning districts where bulk storage is a permitted accessory use, some minimum requirements include that no bulk storage of materials or equipment shall be permitted in any required front yard and all bulk storage areas shall be screened from public view by means of suitable fencing and/or evergreen plantings as required by the Planning Board. *This section should be amended to include language that no bulk storage shall be stored within 50 feet of a stormwater management basin/facility*, as deemed appropriate by the municipal engineer. **This was incorporated in to the Ordinances per section 35-50h on December 2020 per Ordinance #20-46-OAB.**

Chapter 35-51: Clearing and Grading describes that lots shall be graded to secure proper drainage and to prevent ponding of stormwater and that land shall be graded so that stormwater from each lot drains directly to the street. *This section should be amended to include language that stormwater shall be disconnected from impervious surfaces prior to entering stormwater management system*, as deemed appropriate by the municipal engineer.

Chapter 35-52: Common Open Spaces and Public Open Spaces includes provisions for required common and public open spaces, including land areas to be preserved as open space (52.1). *These areas should be amended to add "Areas shown to have significant stormwater quality and quantity management capabilities,"* as deemed appropriate by the municipal engineer. Also, Section 52.2, Site Preparation, allows developer to make certain site preparation improvements within open space areas. *This section should be amended to add planting of native vegetation*, as deemed appropriate by the municipal engineer. **This was incorporated into the ordinances per section 35-52.1.d on December 2020 per Ordinance #20-46-OAB.**

Chapter 35-53: Curbs or Curbs and Gutters describes that concrete curb shall be installed along the edge of all paved surfaces. At locations specified by the approving authority and at all intersections, the curbing shall have a barrier-free design to provide a ramp for bicycles and/or wheelchairs, details for which may be obtained from the Engineer. In certain instances, it may be necessary or desirable to construct alternate curb types. *This section should be amended to allow for curb cuts or flush curbs with curb stops to allow vegetated swales to be used for stormwater conveyance and to allow the disconnection of impervious areas*, as deemed appropriate by the municipal engineer. **This was incorporated into the ordinances per section 35-53.11 on December 2020 per Ordinance #20-46-OAB.**

Chapter 35-54: Driveways describes the procedure for construction of any new driveway or access way to any street. *This section should be amended to allow the use of pervious paving materials to minimize stormwater runoff and promote groundwater recharge*, as deemed appropriate by the municipal engineer. **This was incorporated into the ordinances per section 35-54c on December 2020 per Ordinance #20-46-OAB.**

Chapter 35-55: Easements includes provisions for drainage and conservation easements. *This section should be amended to include the required use of native vegetation in easement areas for any replanting*, as deemed appropriate by the municipal engineer. **This was incorporated into the ordinances per section 35-55.2.c on December 2020 per Ordinance #20-46-OAB.**

Chapter 35-56: Environmental Impact Statement presents the scope of applications that require an Environmental Impact Statement, and the specific concerns that must be covered. *This section should be amended to require an assessment of stormwater impacts, both quantity and quality, within the Environmental Impact Statement and proposed mitigation strategies*, as deemed appropriate by the municipal engineer. **This was incorporated into the ordinances per section 35-56.1.g on December 2020 per Ordinance #20-46-OAB.**

Chapter 35-63: Off Street Parking provides off street parking requirements for industrial, commercial, and any other applicable use. This section requires all parking areas and driveways to be paved and curbed (35-63.1e). *This section should be amended to allow for curb cuts or flush curbs with curb stops to allow for the discharge of impervious areas into landscaped areas for stormwater management. Also language should be added to allow for use of natural vegetated swales for the water quality design storm, with overflow for larger storm events into storm sewers*, as deemed appropriate by the municipal engineer.

Chapter 35-64: Additional Parking and Loading Regulations requires the perimeter of all parking areas and internal islands within all parking areas open to the general public shall have continuous cast-in-place concrete curbing. *This section should be amended to allow for curb cuts or flush curbs with curb stops to allow for the discharge of impervious areas into landscaped areas for stormwater management. Also, language should be added to allow for use of natural vegetated swales for the water quality design storm, with overflow for larger storm events into storm sewers*, as deemed appropriate by the municipal engineer.

Chapter 35-67: Sidewalks and Aprons provides general requirements for sidewalk and apron construction. *Language should be added to this section to use permeable materials, where appropriate, and to require developers to design sidewalks to discharge stormwater to neighboring lawns where feasible to disconnect these impervious surfaces*, as deemed appropriate by the municipal engineer. **This was incorporated into the ordinances per section 35-67.1.c on December 2020 per Ordinance #20-46-OAB.**

Chapter 35-71: Storm Drainage Facilities describes the construction standards for storm piping and inlets. *Language should be added to require bicycle safe grates in all roadways, parking lots, and pedestrian areas, and all curb inlets shall be "N-ECO" Type, limiting curb opening to no bigger than 2"*

high. This section should also be amended to encourage the use of natural vegetated swales, in lieu of pipe and inlets, where feasible, as deemed appropriate by the municipal engineer.

VIII. LAND USE/BUILD-OUT ANALYST

A detailed land use analysis for the Township was conducted utilizing information about the Township based on HUC 14 boundaries. A Hydrologic unit code 14 (HUC 14) is a specific drainage area defined by the US Geological Survey. The total land area of Berkeley Township contained in the HUC 14 boundaries is illustrated on C-9. Figure C-6 & C-7 illustrates the constrained lands within the Township. The build out calculations for impervious coverage, pollutant loading coefficients and pollutant loads can all be found in Table C-1.

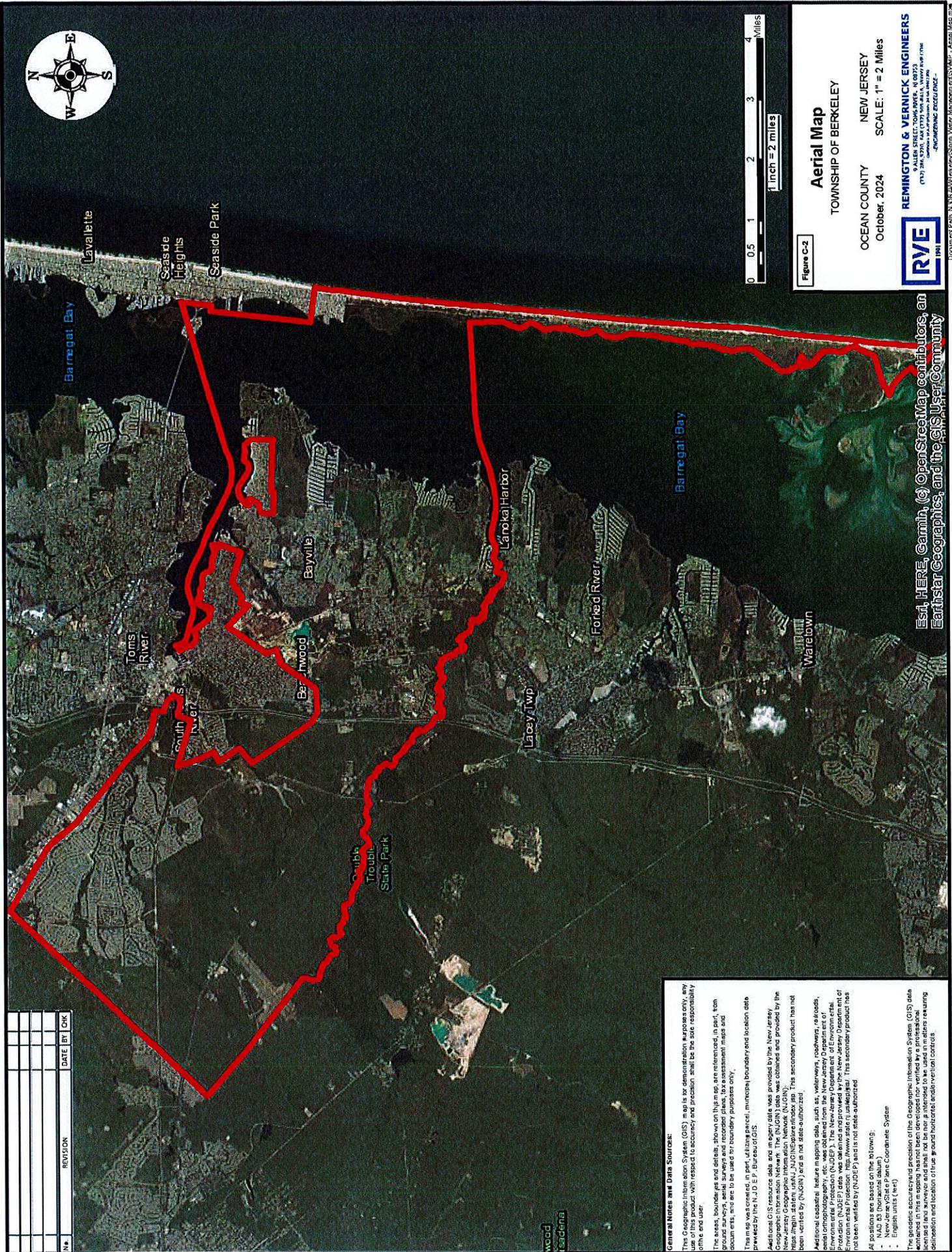
IX. MITIGATION PLANS

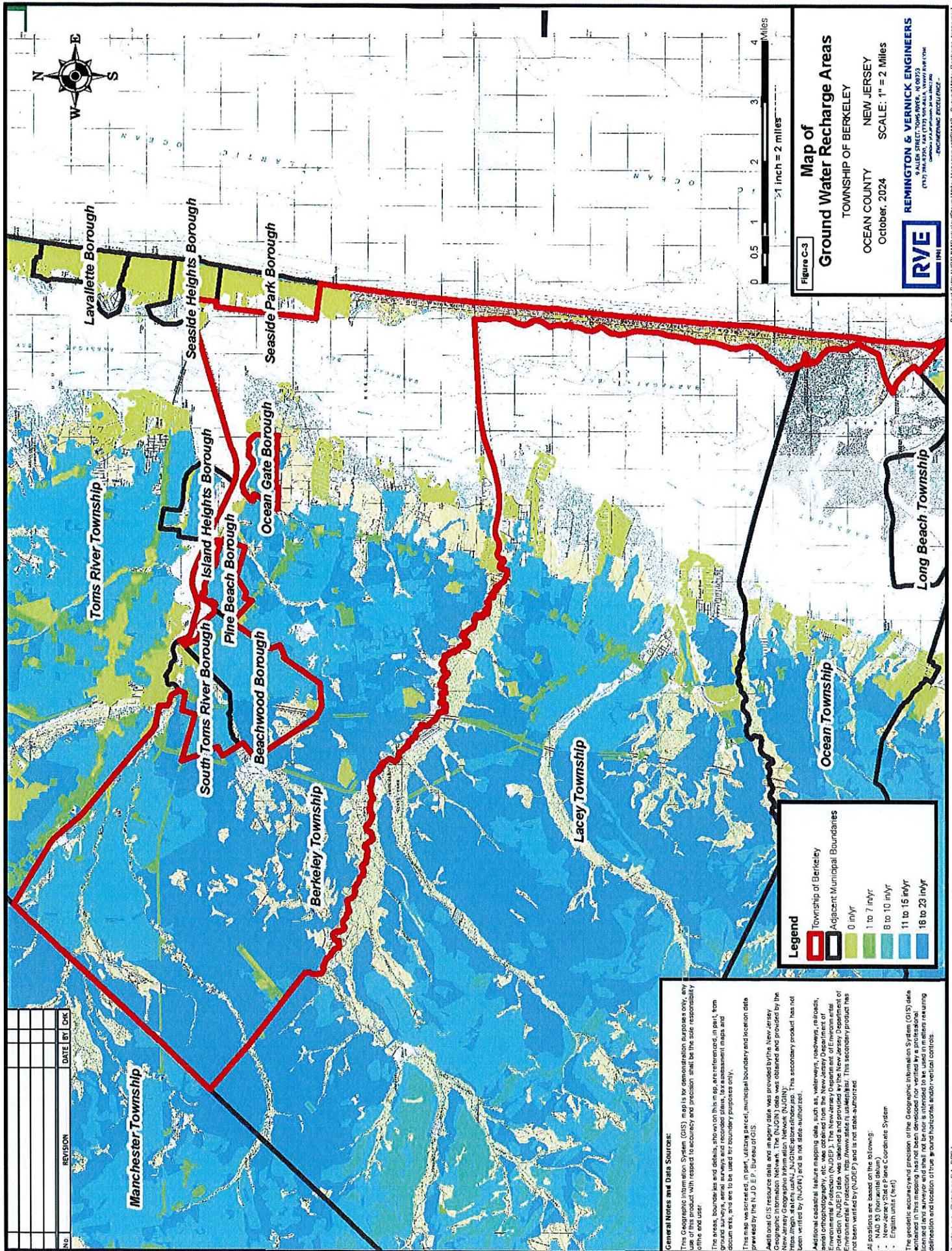
This mitigation plan is provided for, a proposed development that is granted a variance or exemption from the stormwater management design and performance standards.

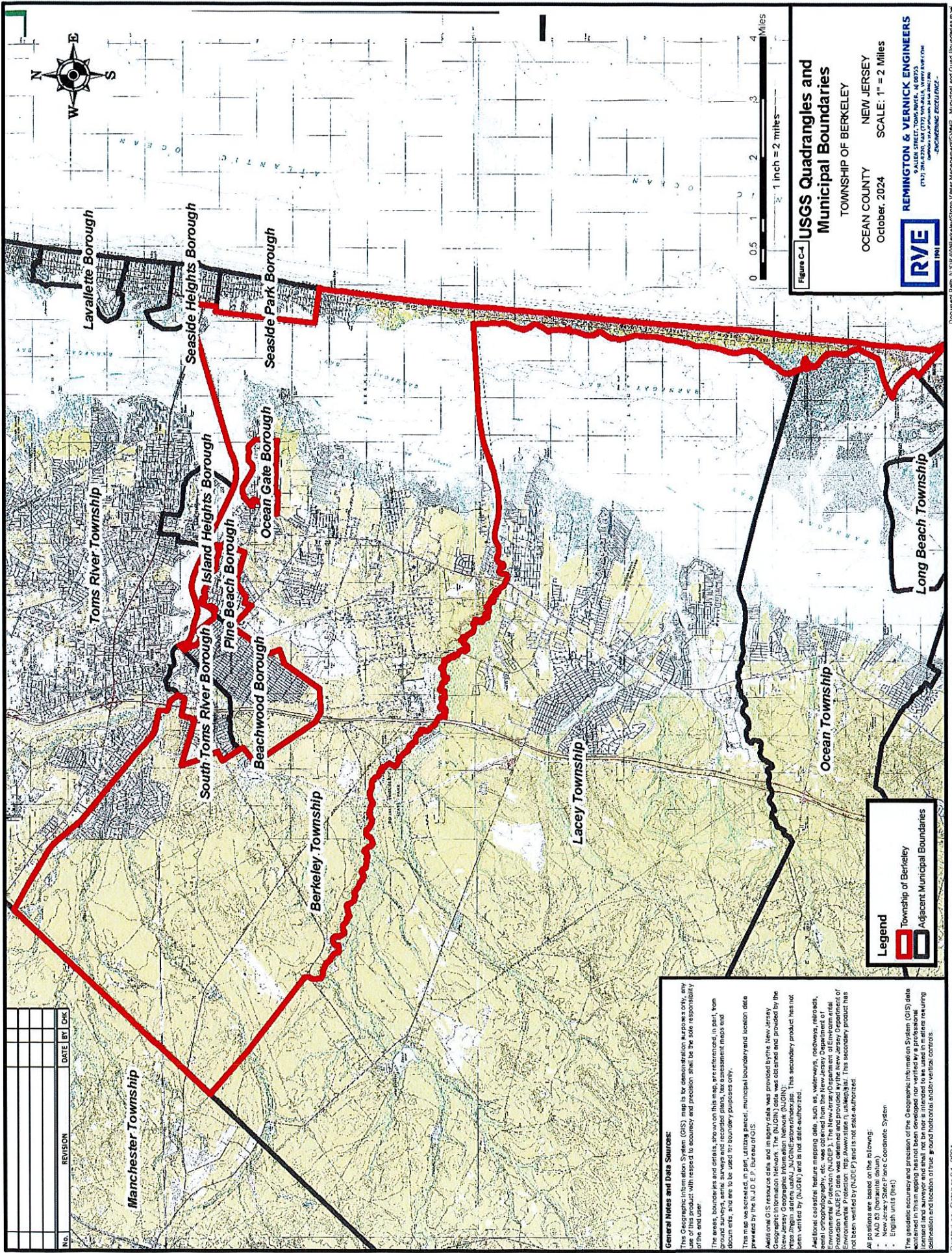
Mitigation Project Criteria

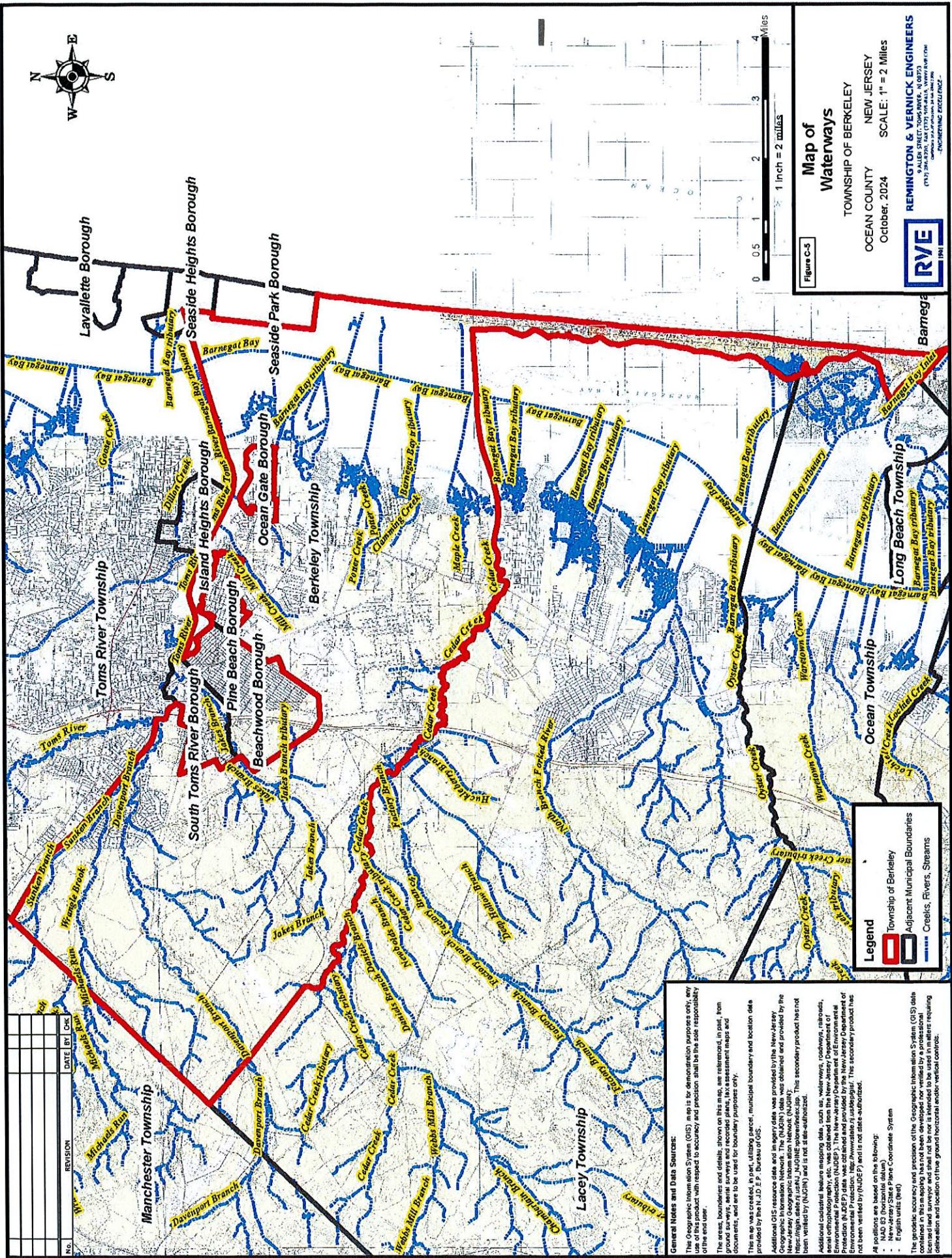
1. The mitigation project must be implemented in the same drainage area as the proposed development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards outlined in the Municipal Stormwater Management Plan. The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual.

All Mitigation Projects will be reviewed on a case by case basis. Review and recommendation will be done by the Township Planner and Township Engineer. The Recommendation will be brought to the Planning Board for review on its consistency with the Master plan.









General Notes and Data Sources:

This Geographic Information System (GIS) map is for demonstration purposes only, and any use of this product, with respect to accuracy and precision, shall be the sole responsibility of the end user.

The areas, boundaries and details, shown on this map, are referenced, in part, from ground surveys, aerial surveys and recorded plans, but are assessment maps and documents, and are to be used for boundary only.

This map was created, in part, utilizing parcel, municipal boundary and location data provided by the J.D. F. Corp. of New Jersey.

Additional GIS resource data and/or legend data was provided by the New Jersey Geographic Information Network. This data was obtained and provided by the New Jersey Geographic Information Network (NJGIN). This secondary product has not been reviewed by the NJGIN. JAGINE is a trademark of NJGIN. This secondary product has not been reviewed by NJGIN and is not yet authorized.

All positions are based on the following:
Additional cadastral feature mapping data such as, watercourse, roads/bridges, railroads, soil/soil morphology, etc., were obtained from the New Jersey Department of Environmental Protection (NJDEP). The New Jersey Department of Environmental Protection (NJDEP) data was obtained and provided by the New Jersey Department of Environmental Protection. <http://www.state.nj.us/dep/> This secondary product has not been verified by (NJDEP) and is not state-authorized.

- NAV 80 (horizontal datum)
- New Jersey State Plane Coordinate System
- English units (feet)

The periodic accuracy and precision of the Geographic Information Systems (GIS) data contained in this map scope has not been developed nor verified by a professional land surveyor and shall not be intended to be used in a manner requiring delineation and location of true ground horizontal and/or vertical control.

Printed on: October 24, 2024

