Colliers Engineering & Design

Municipal Stormwater Management Plan

NJDEP Tier A Municipal Stormwater Permit

Township of Brick

Ocean County, New Jersey

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Prepared by:

Colliers Engineering & Design
2000 Midlantic Drive Suite 100
Mount Laurel New Jersey 08054
Main: 856 797 0412
Colliersengineering.com

Colliers Engineering & Design

Table of Contents

Appendices

List of Tables

INTRODUCTION

This Municipal Stormwater Management Plan (MSWMP) provides strategies for the Township of Brick to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. The contents and format are consistent with the requirements of N.J.A.C. 7:8 Municipal Stormwater Management Rules. The plan provides the options and strategies available to improve the management of stormwater throughout the Township of Brick. 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. The standards and practices provided within are intended to minimize the adverse impact of stormwater runoff on water quality and 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 MSWMP goes hand in hand with the Township's SPPP, or Stormwater Pollution Prevention Plan. An SPPP's purpose is to outline potential sources of pollution and establish ways to minimize and/or eliminate the exposure of these pollutant sources into the stormwater management system(s). The MSWMP and SPPP work together to satisfy their goals in not only minimizing flooding, reducing erosion, and maintaining groundwater recharge while keeping out pollutants, but together are responsible for the wholistic management, review, and maintenance of the overall municipal stormwater system.

A "build-out" analysis has been included in this plan based upon existing zoning and land available for development. This plan also addresses the review and update of the Township of Brick Master Plan, existing ordinances, and other related planning documents to allow for project designs that include low impact development techniques and green infrastructure standards. Finally, a mitigation plan will identify the required strategies to offset the impact created by granting a waiver, variance, or exemption of the design and performance standards as set by this plan. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

GOALS

The goals of this MSWMP are to:

- 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;

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

STORMWATER DISCUSSION

Water moves continuously through the hydrologic or water cycle (see Figure 3). Water evaporates from water bodies and the earth's surface and transpires from vegetation into the atmosphere (these components of the water cycle are jointly referred to as evapotranspiration). Water vapor in the atmosphere condenses to form clouds which produce precipitation that falls to the earth's surface. A small percentage of this precipitation falls over the land and runs off into streams and lakes flowing to the oceans.

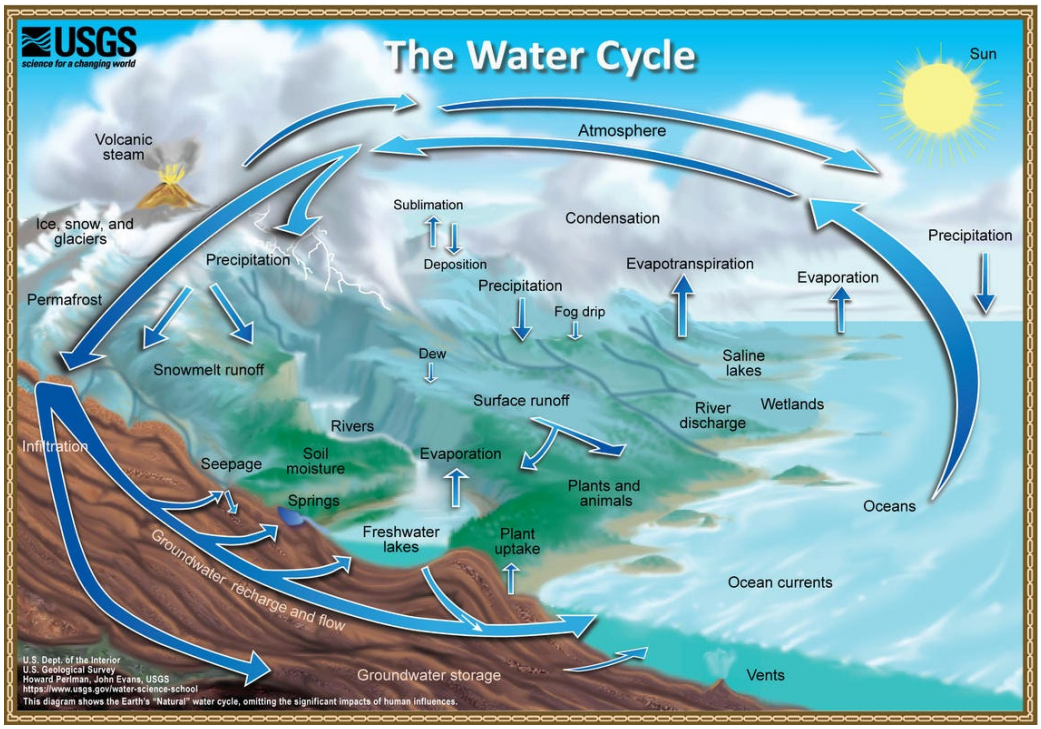


Figure 3: The Hydrologic Cycle
Source: United States Geological Survey

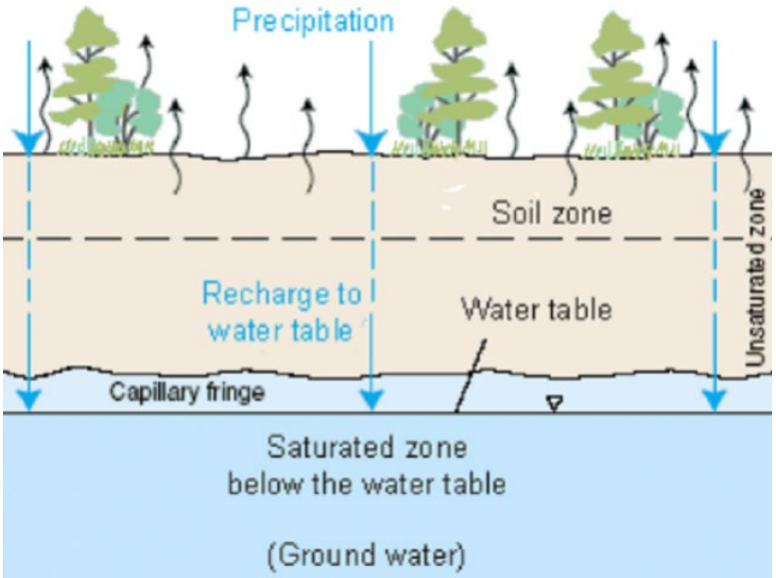


Figure 4: Infiltration & Recharge
Source: Ohio State University – Soil Infiltration

However, most of the precipitation that falls on land surfaces infiltrates into the ground (see Figure 4), where it either recharges shallow groundwater table aquifers and discharges to streams and springs, sustaining their base flow, or seeps into deeper confined aquifers, where it is stored for long periods and discharges regionally (see Figure 5). Human activities and development of the land can interfere with the natural water cycle, and in doing so, impact a watershed in many ways.

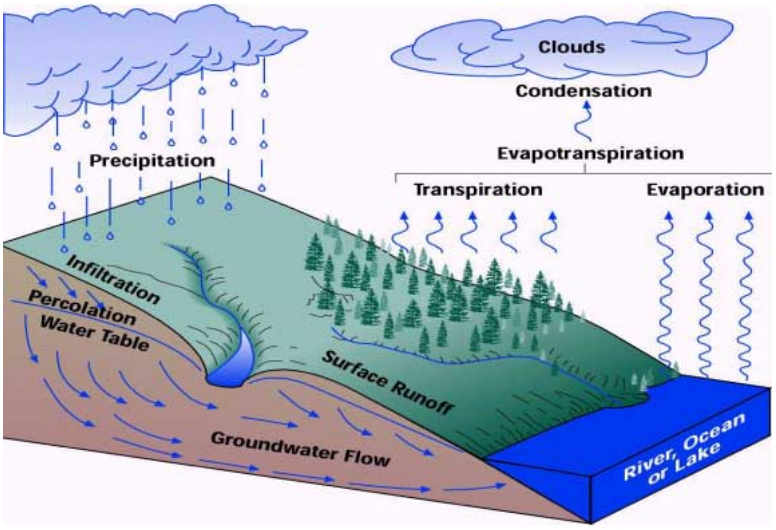


Figure 5: Deep Groundwater Discharge
Source: Spokane Aquifer Joint Board

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

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

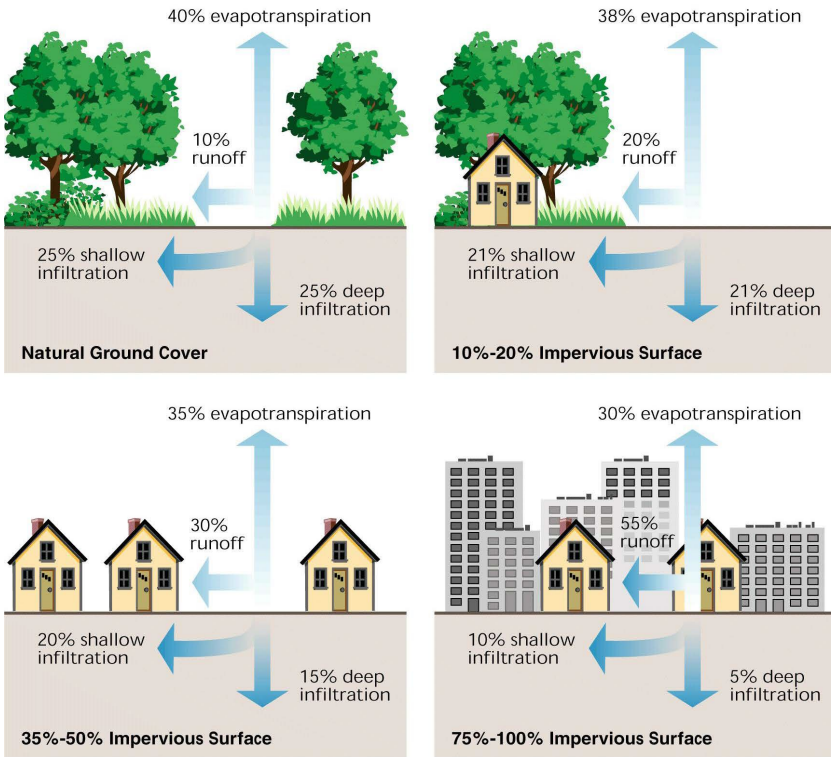


Figure 6: Impervious Surface & Infiltration
Source: NRCS

Increased impervious area from land development can also decrease infiltration (Figure 6), and in turn, reduce stream base flow and groundwater recharge. Reductions in stream base flow can dry up habitat in stream channels and adjacent wetlands, and in so doing, adversely impact the health of important biological communities that reside in or depend upon these stream channels and wetlands. Increased impervious area can also increase peak stream flow, channel erosion, and sedimentation and thus can destroy aquatic habitat.

Land development can result in the addition and accumulation of pollutants on the land surface. Runoff and infiltration can mobilize and transport these pollutants to groundwater and streams. Surfaces and cleared areas within a development can receive a variety of pollutants from the atmosphere and from runoff over land surfaces that mobilizes fertilizers, animal wastes, and leakage and corrosion from vehicles. The pollutants may include suspended and dissolved solids containing metals, nutrients and other inorganic compounds; hydrocarbons, pesticides, herbicides and other

organic compounds; and pathogens--all of which can become mobilized by precipitation falling on the land.

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

BACKGROUND

The Township of Brick encompasses 32.22 square miles in the northeastern part of Ocean County, New Jersey, not including the Metedeconk & Manasquan Rivers or Barnegat Bay. The predominant land use throughout the Township is residential. The existing land use map is depicted in Appendix C-5. The various zoning districts found in the Township and the current zoning map is shown in Appendix C-7.

Appendix C-5 illustrates the land use of the Township of Brick and Appendix C-2 identifies the topography as depicted on the USGS 7.5 Minute Quadrangle Maps.

Population & Housing

According to the 2020 Census, the Township of Brick has 73,620 residents. The population declined by a total of 1,452 residents between 2010 and 2020. The population size in Brick has decreased in recent years. Ocean County has continued to grow over the past 10 years. Current population size as received from the 2020 Census for the county was 637,229.

Based on 2015-2019 American Community Survey data, the Township of Brick is estimated to have 30,122 housing units with 82.7% of the units being owner occupied.

Land Development & Use

In the Township of Brick, we can see by utilizing the NJDEP GeoWeb that the township is primarily dominated by single family and multifamily residential uses.

Along the waterways located within the Township of Brick, areas of wetlands are protected areas. This correlates directly with open space areas within the township.

SURFACE WATER QUALITY

Within the Township of Brick there are a total of six (6) watersheds; the Metedeconk River Watershed, Metedeconk River NB, Metedeconk River SB, Kettle Creek/ Barnegat Bay North Watershed, the Manasquan River Watershed, and the Atlantic Coast (Manasquan to Barnegat).

Table 1.1 – Township of Brick Watersheds (HUC-11)

Watershed ID	Watershed Management Area	Watershed No.	Watershed Name
12EA	12	02030104100	Manasquan River
13CA	13	02040301040	Metedeconk River
13AA	13	02040301020	Metedeconk River NB
13BA	13	02040301030	Metedeconk River SB
13DA	13	02040301050	Kettle Creek / Barnegat Bay North
13MA	13	02040301910	Atlantic Coast (Manasquan to Barnegat)

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

Appendix C-6 shows the HUC14s located partially or entirely within the municipal boundaries of the Township of Brick. The names of the HUC14s are shown in Table 1.2.

New Jersey Surface Water Quality Standards

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

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

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

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

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

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

Table 1.2 – Township of Brick Sub- Watersheds (HUC-14)

Watershed (HUC 11)	**HUC 14 Sub-Watersheds**	
	No.	**Name**
Manasquan River	02030104100090	Manasquan R (Rt 70 br to 74d07m30s)
	02030104100100	Manasquan River (below Rt 70 bridge)
Metedeconk River	02040301040010	Beaverdam Creek
	02040301040030	Metedeconk R (below Beaverdam Creek)
	02040301040020	Metedeconk R (Beaverdam Ck to confl)
Metedeconk River NB	02040301020050	Metedeconk R NB (confluence to Rt 9)
Metedeconk River SB	02040301030050	Metedeconk River SB (confluence to Rt 9)
Kettle Creek/ Barnegat Bay North	02040301050010	Kettle Creek (above Lake Riviera outlet)
	02040301050020	Kettle Creek (below Lake Riviera outlet)
	02040301050030	Metedekunk Neck tribs (below Heron Is)
	02040301050050	Barnegat Bay North (above Rt 37 bridge)
Atlantic Coast (Manasquan to Barnegat)	02040301910020	Atlantic Coast (Herring Is to Rt 37)

Surface Water Classifications

The surface waters in the Manasquan River watershed have multiple surface water classifications including FW2-NT/SE1, SE1, and FW2-TMC1. Within the Metedeconk River watershed classifications include: FW2-NT, FW2-NT/SE1, and SE1C1. The Metedeconk River NB classifications are: FW2-NTC1 and FW2-TMC1, The Metedeconk River SB classifications are: FW2-NTC1. In the Kettle Creek/ Barnegat Bay North watershed surface water classifications consist of FW2-NT/SE1 and SE1C1. The Atlantic Coast does not have any surface water classifications. Below are descriptions of the surface water classifications stated above.

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

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

The designated uses for surface water classification FW2-NT are to meet the statewide surface water criteria as stated in N.J.A.C. 7:9B-1.14. The freshwater portions or where the salinity is below or equal to 3.5 ppt at mean high tide, are classified as FW2-NT and take on the designate uses as described above.

The designated uses for surface water classification SE1 as described by the N.J.A.C. 7:9B-1.12(d) are:

1. Shellfish harvesting in accordance with N.J.A.C. 7:12;
2. Maintenance, migration and propagation of the natural and established biota;
3. Primary contact recreation; and
4. Any other reasonable uses

Surface Water Quality Data

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sites throughout the state of New Jersey, 4 of which are located in the Township of Brick:

- AN0506 – Metedeconk River (North Branch), Rt 88
- AN0512 – Metedeconk River (South Branch), Chambers Bridge Road
- AN0514 – Cedar Bridge Branch, Rt 70
- AN0515A – Kettle Creek, Shorrock Road

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 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.

Conventional Water Quality Data

The NJDEP utilizes conventional surface water quality data from a number of sources to bi-annually evaluate the impairment of surface water bodies. These water quality data include the federal Storage and Retrieval repository (STORET) data and other Existing Sources.

Impaired Waterways

For the purpose of evaluating surface water quality in this watershed, the NJDEP Integrated List (Sublists 1-5) were abridged and sorted to provide the locations of impaired waters within these watersheds and these are listed in Table 1.3(a), 1.3(b), and 1.3(c) below. The impairments include but are not limited to: phosphorus, mercury, PCB's, pH, E. coli, fecal coliform, etc. These impairments are ranked in severity (low, medium, or high) and total maximum daily loads (TMDLs) are formed from the recommendations of this impairment listing.

Below is a list of the impaired waterways as listed within the *2014 New Jersey Integrated Report* for the Metedeconk, Manasquan, and Kettle Creek/ Barnegat Creek Watersheds:

Table 1.3(a) – Manasquan River Watershed Impaired Waterways

No.	Location	Parameter	Priority
1	Manasquan River	Oxygen, dissolved	Medium

Table 1.3(b) – Metedeconk River Watershed Impaired Waterways

No.	Location	Parameter	Priority
1	Metedeconk R (Beaverdam Ck to confl)	Arsenic	Low
2	Metedeconk R (Beaverdam Ck to confl)	Unknown	Low
3	Metedeconk R (Beaverdam Ck to confl)	Lead	Low

Table 1.3(c) – Kettle Creek/ Barnegat Bay North Watershed Impaired Waterways

No.	Location	Parameter	Priority
1	Kettle Creek (above Lake Riviera outlet)	Arsenic	Low
2	Kettle Creek (above Lake Riviera outlet)	Unknown	Low
3	Kettle Creek (below Lake Riviera outlet)	Arsenic	Low

Total Maximum Daily Loads (TMDLs)

The NJDEP Bureau of Stormwater Permitting has provided an online search tool to review the approved TMDLs for a specific municipality. Using this tool, we have listed below the approved TMDLs applicable to the noted HUC 14 watershed areas.

1. Metedeconk River Watershed TMDL's
    a. Total Maximum Daily Loads for Fecal Coliform to Address 31 Streams in the Atlantic Water Region
        i. **Applicable HUC 14: Metedeconk River S Br (2003)**

2. Shellfish TMDL's
    a. Fourteen Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 13
        i. **Applicable HUC 14: Barnegat Bay (2006)**
    b. Fourteen Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 13
        i. **Applicable HUC 14: Barnegat Bay D, Beaverdam Creek A, Metedeconk A (2006)**
    c. Fourteen Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 13
        i. **Applicable HUC 14: Barnegat Bay D, Metedeconk A (2006)**
    d. Fourteen Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 13
        i. **Applicable HUC 14: Barnegat Bay E (2006)**
    e. Fourteen Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 13
        i. **Applicable HUC 14: Barnegat Bay G (2006)**
    f. Five Total Maximum Daily Loads for Total Coliform to Address Shellfish-Impaired Waters in Watershed Management Area 12
        i. **Applicable HUC 14: Manasquan A, Point Pleasant A (2006)**

The TMDLs noted above are often the result of natural causes such as bird droppings and feces from wildlife. The contaminant tends to not be of high concern however the appropriate steps should be taken to continue to monitor the fecal coliform levels for any spikes or increases. Control measures such as geese and other wildlife deterrents can help to keep wildlife in natural settings and prevent non-point source pollution.

Category 1 Waterways

Category 1 is a classification for waterways that have exceptional ecological, water supply, recreation, and/or fisheries values. Any wastewater that discharges to Category 1 waterways is regulated to meet stringent water quality standards. The Township of Brick has multiple Category 1 waterways, listed below:

- Barnegat Bay

- Metedeconk River
- Manasquan River
- Metedeconk River North & South Branches
- Kettle Creek
- Reedy Creek

Hydrogeology

The Township of Brick is contained in its entirety within the Kirkwood Cohansey aquifer system. The geologic formation the Township is found within is the Lower Member Kirkwood Formation (Tkl). The majority of the geological nature in this area is comprised of quartz sands and clay.

The upper strata of the profile typically show fine to medium grain light yellow to white sands stained by iron oxides. Beneath these upper horizons clays and clay silts can be found containing wood fragments, flattened twigs, and other organic debris.

Hydrogeology & stormwater management go hand-in-hand and have a direct relationship with the soils beneath the Township of Brick. The types of existing soils are a huge factor when it comes to the design and functionality of proposed stormwater management systems. The better the soil naturally drains storm runoff, the less extensive a stormwater management system must be, and vice versa. Since the Township of Brick has its mix of sandy (well-draining) and silty (poor-draining) soils, hydrogeologic tests must be done to see how the soil behaves at varying depths below the surface before a satisfactory stormwater management system can be designed.

Soils

Soils within the township are primarily Eversboro and Downer sands with wetland areas showing Atison sands intermixed with peat. Some clay horizons can be found in certain areas of the western portion of the township.

Critical Habitats

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

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

New Jersey is the most densely populated state in the nation. One of the consequences of this distinction is the extreme pressure that is placed on our natural resources. As the population grows,

we continue to lose or impact the remaining natural areas of the state. As more and more habitat is lost, people are beginning to appreciate the benefits and necessity of maintaining land in its natural state.

For example, we know that wetlands are critical for recharging aquifers, lessening the damage from flooding and naturally breaking down contaminants in the environment. Forests and grasslands protect the quality of our drinking water, help purify the air we breathe and provide important areas for outdoor recreation. Collectively, these habitats are of critical importance to the diverse assemblage of wildlife found in New Jersey, including more than 70 species classified as threatened or endangered.

Many imperiled species require large contiguous tracts of habitat for survival. The consequence of the rapid spread of suburban sprawl is the loss and fragmentation of important wildlife habitat and the isolation and degradation of the smaller habitat patches that remain. Small patches of fields, forests and wetlands interspersed with development provide habitat for common species that do well living near humans, but do not provide the necessary habitat for most of our imperiled wildlife. We need to protect large, contiguous blocks of forest, grassland and wetlands to assure the survival of imperiled species over the long-term.

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

Most critical habitats are supported in part or in total by the surrounding surface and ground water resources, and they are consequently impacted by development, non-point source pollution and stormwater runoff. The Critical Habitats within the Township of Brick may include Grassland, Forest, Forested Wetland, Emerging Wetland, Beach, Bald Eagle Foraging, Urban Peregrine Falcon Nesting, and Wood Turtle habitats that should, to the extent practical, be conserved and protected from the adverse impacts caused by uncontrolled development and stormwater runoff. The majority of the critical habitats within the Township of Brick are contained within the noted wetland areas as shown in Appendix C-8.

Groundwater

The Township of Brick receives its drinking water from the Township of Brick Municipal Utility Authority (BTMUA). The BTMUA is a public community water system consisting of 11 wells, 2 wells under the influence of surface water, 1 surface water intake and 3 purchased groundwater sources. The BTMUA holds a current water allocation permit with the NJDEP (PWSID 1506001) allowing the Township of Brick to draw a total of 5864MGY.

The system's source water comes from the Kirkwood-Cohansey and the Potomac-Raritan-Magothy aquifer systems and the Metedeconk River. The Township of Brick Municipal Utility Authority has also recently completed a One Billion Gallon reservoir located on Herbertsville and Sally Ike Roads. The Reservoir was filled utilizing an elaborate piping system from the Metedeconk River. At high flows of

the Metedeconk River, water is withdrawn through an intake located behind the BTMUA property and pumped to the reservoir. The water stored in the reservoir provides for an extra source of potable water during times of low flow or drought.

Although the main supply of water for the BTMUA originates in the upper reaches of the Metedeconk Watershed, the groundwater withdrawals are affected by land use and over-development. During times of drought, stresses placed upon the 11 well systems can be significant as many township residents have wells for out-door watering and landscaping needs. In addition, the built-out nature of the municipality does not provide for enough ground water infiltration to replenish the aquifer systems adequately. In order to give the watershed to recharge in the event of an emergency, nonessential water usage may be limited or even halted. This would the effect the residential recreational use, such as sprinkler systems, filling of swimming pools, car washing, etc. See the Township of Brick Land Use Ordinance, Chapter 486 for more information.

The Township of Brick currently has four (4) tier 1 well head protection areas for community well sources. These four locations are at the headwaters of the Metedeconk River. The Township of Brick also has one (1) non-community well head protection area nearest to the intersection of Brick Boulevard and Beaverson Boulevard. A copy of the wellhead protection map has been provided within Appendix C-4.

Elevating groundwater levels continue to be an issue in the Township of Brick causing surface water flow across lawn areas, infiltration into residential homes and basements, and flow in stormwater systems during dry periods during the year. New development should be more closely reviewed to ensure infrastructure will not be impacted by rising groundwater levels or create impacts that would exacerbate the situation.

Non-Point Sources

The Township of Brick is more than 95% developed. While development rates have slowed, the effects of this development have serious implications for water quality and quantity. Many of the waterways within the Township of Brick have been identified as impaired or moderately impaired. Restrictions within the Barnegat Bay and Metedeconk River have been put in place due to the pollution that has occurred over the years.

In 2013, the Brick Township Municipal Utilities Authority submitted a plan to the NJDEP's Division of Policy Implementation and Watershed Restoration for the protection and restoration of the Metedeconk River Watershed. The plan aims to control non-point sources and stormwater flows to address water quality focused on nutrient, pathogen, and total suspended solids (TSS) reduction within the Metedeconk River.

The plan adequately characterizes the watershed to build a plan for restoration and monitoring. The plan identifies the most critical restoration projects to be undertaken and how implementation of NJDEP BMP strategies will help to alleviate concerns of nutrient loading into the Metedeconk River and subsequently into the Barnegat Bay.

The full plan is available here:
http://brickmua.com/metedeconk/pdf/Metedeconk_River_Watershed_Plan_TEXT.pdf

Point Sources

The NJDEP's NJPDES program has documented a total of five (5) point source discharges within the Township of Brick. All the points listed below have been terminated and are no longer active. The following are the recorded historical point sources:

- Ocean Medical Center – Block 1170, Lot 18.01 – Terminated on December 30th, 2013
- Shell Oil Company – Block 670, Lot 1.01 – Terminated on August 3rd, 1993
- Sunoco Inc. – Block 381, Lot 7 – Terminated on August 6th, 2012
- Sunoco Inc. – Block 642.11, Lot 1 – Terminated on December 30th, 2002
- Al's Auto Care – Block 169, Lot 50 – Terminated on November 29th, 1998

Illicit Discharges & Connections

Illicit discharges and connections into a stormwater system are very hard to detect. If the Township notices multiple releases of oil or a solvent that is apparent and visible with the naked eye, proper procedures will be followed to ensure the discharge is contained and properly remedied. The Township has adopted the Illicit Connection ordinance as stipulated by the NJDEP to attempt to stop illicit connections from happening and illicit discharges from ending up in Township waterways.

BUILD OUT ANALYSIS AND POLLUTANT LOADING PROJECTIONS

As a requirement of the Municipal Stormwater Management Rule, the Township must prepare a build-out analysis based on existing developable land and current zoning unless; the Township has less than one-square mile or 640 developable acres of land. Knowing that the Township is significantly "built-out", the Township conducted a planning exercise to determine the actual acreage of vacant, developable, privately owned lands within the Township.

Table C-1 contains a full build out and pollutant loading analysis by land cover for the Township of Brick.

DESIGN AND PERFORMANCE STANDARDS

The Township has adopted the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality/quantity and loss of groundwater recharge in receiving water bodies. This has been implemented by adoption of the NJDEP Model Stormwater Ordinance, as amended for use and enforcement within the Township of Brick.

The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules in 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).

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

PLAN CONSISTENCY

The Township of Brick is not within a Regional Stormwater Management Planning Area (RSWMPs); therefore, this plan does not need to be consistent with any regional stormwater management plans at this time. At such time a Regional Stormwater Management Plan is developed, the Township will amend its plan to be consistent. The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21, as the township's own ordinance is a duplicate of this rule. The municipality will utilize the most current update of the RSIS in the stormwater management review of residential areas and its own Municipal Stormwater Management Ordinance. This Municipal Stormwater Management Plan will be updated to be consistent with any future updates to the RSIS. The Township's Stormwater Management Ordinance requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Township engineering inspectors will continue to observe on-site soil erosion and sediment control measures and report any inconsistencies to the Ocean County Soil Conservation District.

The Township of Brick is entirely within the regulatory boundaries of the Coastal Areas Facilities Review Act (CAFRA) Zone. CAFRA Rules incorporate the new Stormwater Rules by reference and require compliance with the regulations promulgated by the State of New Jersey for all new developments and redevelopments that trigger a CAFRA permit. If an applicant requests waivers from the performance standards under CAFRA or the Municipal Stormwater Control Ordinance, a mitigation plan could be required by CAFRA reviewers as well as the Townships' reviewing entity.

In addition, the Township is currently under review for Plan Endorsement by the New Jersey Department of Community Development, Office of Smart Growth for consistency with the State Plan and a Town Center designation. Once the review is completed, the Township will be considered "consistent" with all state regulatory and voluntary programs including all programs promulgated under NJDEP.

The Township of Brick participates in the National Flood Insurance Program (NFIP) Community Rating System (CRS) in an effort to provide residents within the township reduced flood insurance premiums, reduce flood damage to insurable property, strengthen the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management.

The NFIP Community Rating System was implemented in 1990 as a voluntary program to recognize and encourage community floodplain management activities. Points are awarded to the township for completing any 19 creditable activities within the following four categories:

- Public Information
- Mapping and Regulations
- Flood Damage Reduction
- Warning and Response

At the time of writing, the annual progress report prepared by Tetra Tech notes the township as having a Class 6 rating which entitles flood insurance policy holders within special flood hazard areas to receive a 20 percent discount on premiums.

The Township of Brick continues to implement measures to further address areas of concern that have been noted within the Floodplain Management Plan. The 2020 review of the plan showed that 58% of the plan is considered to be complete.

The NFIP CRS Manual encourages stormwater management (Activity 450), floodplain management planning (Activity 510), and open space preservation (Activity 420). Each of these activities directly correlate back to stormwater management planning and the purpose of this Municipal Stormwater Management Plan.

The participation within the NFIP CRS program aids in accomplishing the goals of the Municipal Stormwater Management Plan contained herein which focus on the reduction of peak flows, improving groundwater recharge, and promoting water quality.

During construction, Township inspectors will observe on-site soil erosion and sediment control measure and report any inconsistencies to the Ocean County Soil Conservation District.

NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES

The NJDEP's new Stormwater Management Rules include the specific provisions that must be addressed in a municipal stormwater management plan (N.J.A.C. 7:8-4.2(c)). One of these requirements is that the plan include an evaluation of the extent to which the master plan (including the land use element), official map, and development regulations (including zoning ordinances) implement the principles of the Stormwater Management Rules relating to Green Infrastructure (GI) stormwater management strategies (N.J.A.C. 7:8-5.3(b)). The NJDEP recently adopted amendments to the current Stormwater Management Rules (N.J.A.C. 7:8) which included the removal of the non-structural strategies and the replacement with the GI Standards. An updated Stormwater Ordinance was approved on April 13th, 2021 to reflect the amendments to The New Jersey Stormwater Management Rules (N.J.A.C. 7:8) adopted on March 2nd, 2020.

New stormwater management techniques have been developed to mimic natural hydrologic conditions and encourage infiltration and vegetation rather than structural stormwater management methods. These techniques are referred to by the NJDEP as GI Standards. GI Techniques are designed to attenuate runoff from smaller drainage areas throughout the site area in an attempt to infiltrate stormwater to be treated by vegetation or by soils or to be stored for reuse. The link to the NJDEP website to download the BMP Manual is:

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

The NJDEP BMP Manual encourages the use of nonstructural low impact development-BMPs, however, the requirement to utilize these BMP's has been removed from N.J.A.C 7:8-5.2. These BMP's include such practices as minimizing site disturbance, preserving important site features, reducing and disconnecting impervious cover, flattening slopes, utilizing native vegetation, minimizing turf grass lawns and maintaining natural drainage features.

While it may be possible at some sites to satisfy all stormwater management requirements through nonstructural LID-BMPs, these strategies are meant to be used in conjunction with the GI Standards as set forth in N.J.A.C-5.3. In an effort to break up large point discharges, the GI employs small scale

structural BMP's such as dry wells, manufactured treatment devices (MTD's), pervious paving systems, bio-retention, infiltration, and sand filters. These systems are permitted to be used in conjunction with larger scale structural strategies to attenuate larger storm events. The combination of the GI strategies and the structural BMP's are required to satisfy the requirements for stormwater runoff quality, quantity, and groundwater recharge.

Because GI BMP's rely on nonstructural or relatively small structural BMPs distributed throughout a land development site, ownership and maintenance may be similarly distributed to an array of property owners. Each GI BMP requires the use of a deed notice to be recorded in the county clerk's office to prevent any alteration or removal of the BMP.

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

The NJDEP Stormwater Management Rules (N.J.A.C. 7:8) require, in Section 5.2(a) that Major Development (disturbing one acre or more or increasing impervious surface by 1/4 acre) incorporate green infrastructure strategies in accordance with N.J.A.C. 7:8-5.3. Nonstructural development strategies and GI are to be given preference over structural BMPs. Where it is not possible to fully comply with the Stormwater Management Rules through nonstructural LIDs and GI, structural LID-BMPs are to be used in conjunction with standard structural BMPs to meet the Rules' requirements.

N.J.A.C. 7:8-5.2 requires that an Applicant seeking approval for a major development that is unable to meet strict compliance with green infrastructure, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements may obtain a waiver for certain conditions including:

- Enlargement of an existing public roadway
- Construction or enlargement of a public pedestrian access

Additional requirements under N.J.A.C 7:8-5.2(e) are to be met in conjunction with the activities noted above.

Green Infrastructure Standards

The NJDEP has amended the Stormwater Management Rule (N.J.A.C. 7:8) to require the use of Green Infrastructure (GI) BMP's to the greatest extent possible to meet the stormwater quality, stormwater quantity, and groundwater recharge requirements.

Stormwater practices prior to the development of the GI BMP's allowed for the discharge of surface water runoff into a large infiltration basin or detention basin. This created a point discharge area and ultimately led to a large volume of stormwater being discharged into a waterway without proper treatment.

The GI Standards were developed to be paired with the Low Impact Development (LID – Non-Structural Strategies) techniques to reduce the impact of stormwater from site development. The

design techniques to be utilized include:

- Preserving stream buffer areas
- Minimizing the number of trees cut down during construction
- Minimizing the areas on site where heavy equipment is used
- Using the soils and vegetation that are beneficial on site
- Using GI practices that treat stormwater runoff through soil and vegetation

The NJDEP has approved a total of ten (10) GI BMP's to address groundwater recharge, stormwater runoff quantity, and stormwater quality. The following systems have been approved for use to meet the requirements of N.J.A.C. 7:8-5.2:

- Cisterns
- Dry Wells
- Grass Swales
- Green Roof
- Manufactured Treatment Device
- Pervious Paving System
- Small Scale Bioretention Basin
- Small Scale Infiltration Basin
- Small Scale Sand Filter
- Vegetative Filter Strip

To satisfy the requirements of N.J.A.C 7:8 for water quality and groundwater recharge, the GI BMP's must have a contributory drainage area of no greater than 2.5 acres in most cases. In certain cases when compliance with these standards is not possible, a design waiver or variance can be requested.

Nonstructural LID-BMPs

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

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

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

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

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

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

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

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

   A. **Streets –** use minimum acceptable pavement widths and incorporate pervious vegetated medians and islands with curb cuts for runoff access.
   B. **Parking and Driveways –** use pervious pavement wherever practical **and** reduce parking space requirements by sharing requirements in mixed uses and by reducing parking space lengths by allowing for overhang into pervious areas.
   C. **Unconnected Impervious Areas –** Disconnect impervious areas and runoff form the site's drainage system allowing the sheet flow to cross pervious areas through curb cuts or by eliminating curbing and using shoulders and swales.

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

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

Structural LID-BMPs

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

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

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

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

The Township of Brick will review the Master Plan and local land use ordinances and incorporate structural stormwater management strategies (LID and standard structural stormwater BMPs) to the

extent practicable and in accordance with sound planning, science, engineering and construction principles, as they apply to its unique environment.

The Township of Brick Stormwater Control Ordinance contains the following sections to be utilized in conjunction with N.J.A.C 7:8.

- Section 396-6 Design and Performance Standards for Stormwater Management Measures
- Section 396-7 Stormwater Management Requirements for Major Development
- Section 396-8 Methods of Calculation of Stormwater Runoff and Groundwater Recharge
- Section 396-9 Sources for Technical Guidance
- Section 396-10 Solids and floatable materials control standards
- Section 396-11 Safety Standards for Stormwater Management Basins
- Section 396-12 Requirements for Site Development Stormwater Plan
- Section 396-13 Maintenance and Repair

MITIGATION PLANS

A mitigation plan is required to grant a variance or exemption form design and performance standards of the Township of Brick's MSWMP. The mitigation requirements offer a hierarchy of options that clearly offset the effect on the three elements of the MSWMP; groundwater recharge, stormwater quantity control, and/or stormwater quality control that was created by granting the variance or exemption. Below are the three (3) options available to developer's wishing to request a variance or exemption from the design and performance standards of the Township of Brick's Municipal Stormwater Management Plan and Land Use Chapter 396.

1. **Option 1:** Exemptions are to be granted only upon the condition that the applicant provides a mitigation project of equal or additional stormwater design benefit value within the same sub-watershed as delineated by the HUC 14 number. For example, if the applicant cannot reduce the peak rate of runoff from the 2-, 10- and 100-year storm event to meet the 50%, 75% and 80% requirement on the site, the mitigation project might be retrofitting an existing basin within the same watershed with an outlet control device to reduce the peak rates of runoff by the same cfs reductions. The applicant would be required to analyze the existing drainage shed to the basin and determine the outflow device that would meet the peak rate of flow requirements. The developer must ensure long term maintenance of the project, including maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual.

   Under Option 1, the applicant may select a specific mitigation project listed in this plan or work with the Township of Brick Engineering and Planning Department to determine a suitable mitigation project in the same drainage area (HUC 14) from the general types of mitigation projects listed in this plan. The review of stormwater management design for the site and stormwater criteria provided by the mitigation project will be reviewed and approved by the Planning or Zoning Board Engineer, whichever is applicable, under the review process.

2. **Option 2:** If a suitable site cannot be located or determined with the same drainage area (HUC 14) as the proposed development, as set forth in Option 1, the mitigation project may provide mitigation that does not have the equivalent stormwater design benefit value but addresses the same issue (i.e. Water quality, water quantity or recharge). For example, if the applicant cannot meet the 80% reduction of the Total Suspended Solids requirement at the site, the mitigation project might be a site creating a vegetated buffer at a lake edge to reduce fecal impairment, improving water quality.

   In the case of Option 2, the applicant will be required to determine the cost of meeting the design requirement on the development site and provide a stormwater design of equal or greater value at the mitigation site. The cost estimates for the stormwater development and mitigation will be reviewed and approved by the Planning or Zoning Board Engineer, whichever is applicable, under the review process.

3. **Option 3:** The Planning or Zoning Board may allow the developer to provide funding for a specific project that has been identified in the Stormwater Management Plan if the value of meeting the on-site stormwater design is so low that it will not fund an entire project. The funding must be equal to or greater than the cost to implement the mitigation project, including costs associated with purchasing the property or easement for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure. The cost estimates for the stormwater development and mitigation will be reviewed and approved by the Planning or Zoning Board Engineer, whichever is applicable, under the review process. Option 3 should be used only on small redevelopment projects where all other options have been exhausted.

The Township of Brick requires applicants that are seeking a variance or exemption from the design and performance standards of the MSWMP to refer to the current list of mitigation projects that would qualify as candidates to be included in the applicant's proposed mitigation plan.

Annually, the Township Engineer and Township Planner in conjunction with the Township Environmental Commission shall develop and/or amend a list if mitigation projects throughout the Township that may be used by applicants seeking a variance or exemption form the design and performance standards set by the Township MSWMP. The mitigation list is intended to provide the desired hierarchy of projects for the element of the MSWMP that the variance or exemption was granted. The current list of mitigation projects will be kept on file at the Township Municipal Building and will be made available upon request.

Mitigation Project Criteria

The following criteria should be applied for developers who request a waiver under NJAC 7:8 for meeting the stormwater regulations on site:

1. The applicant demonstrates that it is technically impracticable to meet any one or more of the design and performance standards on-site. For the purposes of this analysis, technical impracticability exists only when the design and performance standard cannot be met for engineering, environmental,

or safety reasons. A municipality's approval of a variance shall apply to an individual drainage area and design and performance standard and shall not apply to an entire site or project, unless an applicant provides the required analysis for each drainage area within the site and each design and performance standard;

2. The applicant demonstrates that the proposed design achieves the maximum possible compliance with the design and performance standards on-site; and

3. A mitigation project in accordance with the following is implemented.

i. The mitigation project may be selected from the municipal mitigation plan or may be proposed by the applicant, provided it meets the criteria in the municipal mitigation plan.

ii. The mitigation project shall be approved no later than preliminary or final site plan approval of the major development.

iii. The mitigation project shall be located in the same HUC 14 as the area of the major development subject to the variance.

iv. The mitigation project shall be constructed prior to, or concurrently with, the major development.

v. The mitigation project shall comply with the green infrastructure standards at N.J.A.C. 7:8-5.3.

vi. If the variance that resulted in the mitigation project being required is from the green infrastructure standards at N.J.A.C. 7:8-5.3, then the mitigation project must use green infrastructure BMPs in Table 5-1, and/or an alternative stormwater management measure approved in accordance with N.J.A.C. 7:8-5.2(g) that meets the definition of green infrastructure to manage an equivalent or greater area of impervious surface and an equivalent or greater area of motor vehicle surface as the area of the major development subject to the variance. Grass swales and vegetative filter strips may only be used in the mitigation project if the proposed project additionally includes a green infrastructure BMP other than a grass swale or vegetative filter strip. The green infrastructure used in the mitigation project must be sized to manage the water quality design storm, as defined at N.J.A.C. 7:8-5.5(d), at a minimum, and is subject to the applicable contributory drainage area limitation specified at N.J.A.C. 7:8-5.2(g) or 5.3(b), as applicable.

vii. A variance from the groundwater recharge standards at N.J.A.C. 7:8-5.4 may be granted if one of the following is met:

1) The average annual groundwater recharge provided by the mitigation project must equal or exceed the average annual groundwater recharge deficit resulting from granting the variance for the major development; or

2) Runoff infiltrated during the two-year storm from the mitigation project must equal or exceed the deficit resulting from granting the variance from the required infiltration

of the increase in runoff volume from pre-construction to post-construction from the major development.

viii. A variance from the stormwater runoff quality standards at N.J.A.C. 7:8-5.5 may be granted if the following are met:

1) The total drainage area of motor vehicle surface managed by the mitigation project(s) must equal or exceed the drainage area of the area of the major development subject to the variance and must provide sufficient TSS removal to equal or exceed the deficit resulting from granting the variance for the major development; and

2) The mitigation project must remove nutrients to the maximum extent feasible in accordance with N.J.A.C. 7:8-5.5(f).

ix. A variance from the stormwater runoff quantity standards at N.J.A.C. 7:8-5.6 may be granted if the following are met:

1) The applicant demonstrates, through hydrologic and hydraulic analysis, including the effects of the mitigation project, that the variance will not result in increased flooding damage below each point of discharge of the major development.

2) The mitigation project discharges to the same watercourse and is located upstream of the major development subject to the variance; and

3) The mitigation project provides peak flow rate attenuation in accordance with N.J.A.C. 7:8-5.6(b)3 for an equivalent or greater area than the area of the major development subject to the variance. For the purposes of this demonstration, equivalent includes both size of the area and percentage of impervious surface and/or motor vehicle surface.

x. The applicant or the entity assuming maintenance responsibility for the associated major development shall be responsible for preventive and corrective maintenance (including replacement) of the mitigation project and shall be identified as such in the maintenance plan established in accordance with N.J.A.C. 7:8-5.8. This responsibility is not transferable to any entity other than a public agency, in which case, a written agreement with that public agency must be submitted to the review agency.

More detailed information on the current projects can be obtained from the Township Engineer or Township Planner.

Any approved variance shall be submitted by the municipality to the county review agency and the Department by way of written report describing the variance as well as the mitigation within 30 days of the approval.

Administration of Stormwater Mitigation Plan

The following information is required for each waiver granted from the performance standards contained within Section 396 of the Township of Brick Stormwater Management Code.

1. A statement detailing the impact from non-compliance. A table shall be provided to quantify what would be required for the project to achieve the standards set, the value of achieved based on the standards and the extent of value that will need to be mitigated off site.

2. Narrative and supporting information regarding the need for the waiver including;

    a. The waiver cannot be due to a condition created by the applicant. If the applicant can comply with the Stormwater Management rules through a reduction in the scope of the project, the applicant has created the condition and a waiver cannot be issued. Demonstrate that the need for a waiver is not created by the applicant.

    b. Provide a discussion and supporting documentation of the site conditions peculiar to the subject property that prevent the construction of a stormwater management facility that would achieve full compliance with the design and performance standards. Site conditions may include soil type, the presence of karst geology, acid soils, a high groundwater table, unique conditions that would create an unsafe design, as well as conditions that may provide a detrimental impact to public health, welfare and safety. o Demonstration that the grant of the requested waiver/exemption would not result in an adverse impact that would not be compensated for by offsite mitigation.

3. Sensitive Area – Identify areas that are sensitive to the proposed activity related to the performance standard form which a waiver is sought. Demonstrate that the mitigation site contributes to the same sensitive area.

4. 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.

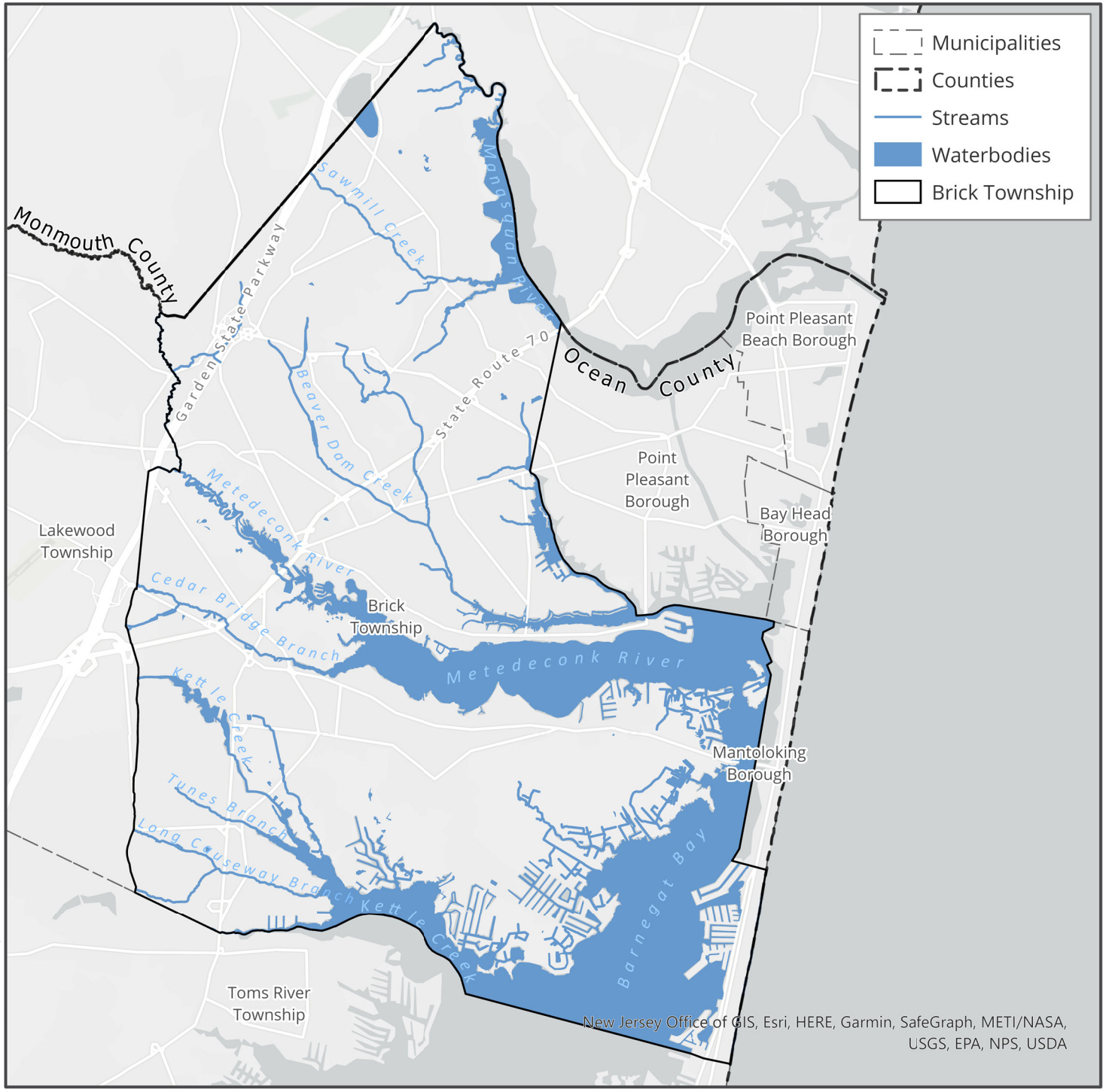
5. Responsible Party – List the party or parties responsible for the construction and the maintenance of the mitigation project. Documentation must be provided to demonstrate that the responsible party's aware of, has authority to, and accepts the responsibility for construction and maintenance. Under no circumstance shall the responsible party be an individual single-family homeowner. Selection of a project location that is under municipal authority avoids the need to obtain authority from a third party for the construction and future maintenance of the project.

    Maintenance – Include a maintenance plan that addresses the maintenance criteria at N.J.A.C. 7:8-5:8. In addition, if the maintenance responsibility is being transferred to the municipality or another entity, the entity responsible for the cost of the maintenance must be identified. The municipality may provide the option for the applicant to convey the mitigation project to the municipality, if the applicant provides for the cost of maintenance in perpetuity.

6. Permits – Obtain any and all necessary local, State or another applicable permit for the mitigation measures or project must be obtained prior to the municipal approval of the project for which mitigation is being provided.

7. Construction – Demonstrate that the construction of the mitigation project coincides with the construction of the proposed project. A certificate or occupancy or final approval by the municipality for the project requiring mitigation 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 that municipality's own projects must be completed within 6 months of the completion of the municipal project. In order to remain in compliance with their NJDPES General Permit.

Appendix C-1 – Township of Brick Waterways Map



TOWNSHIP WATERWAYS

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.5 1 2 Miles

February 2022

NHD Data
from NJDEP
Statewide Boundaries by
NJOGIS

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Colliers Engineering & Design

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Appendix C-2 – Township of Brick USGS Map

USGS TOPOGRAPHIC

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.5 1 2 Miles

February 2022

Point Pleasant Quadrangle
from USGS
Statewide Boundaries by
NJOGIS

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

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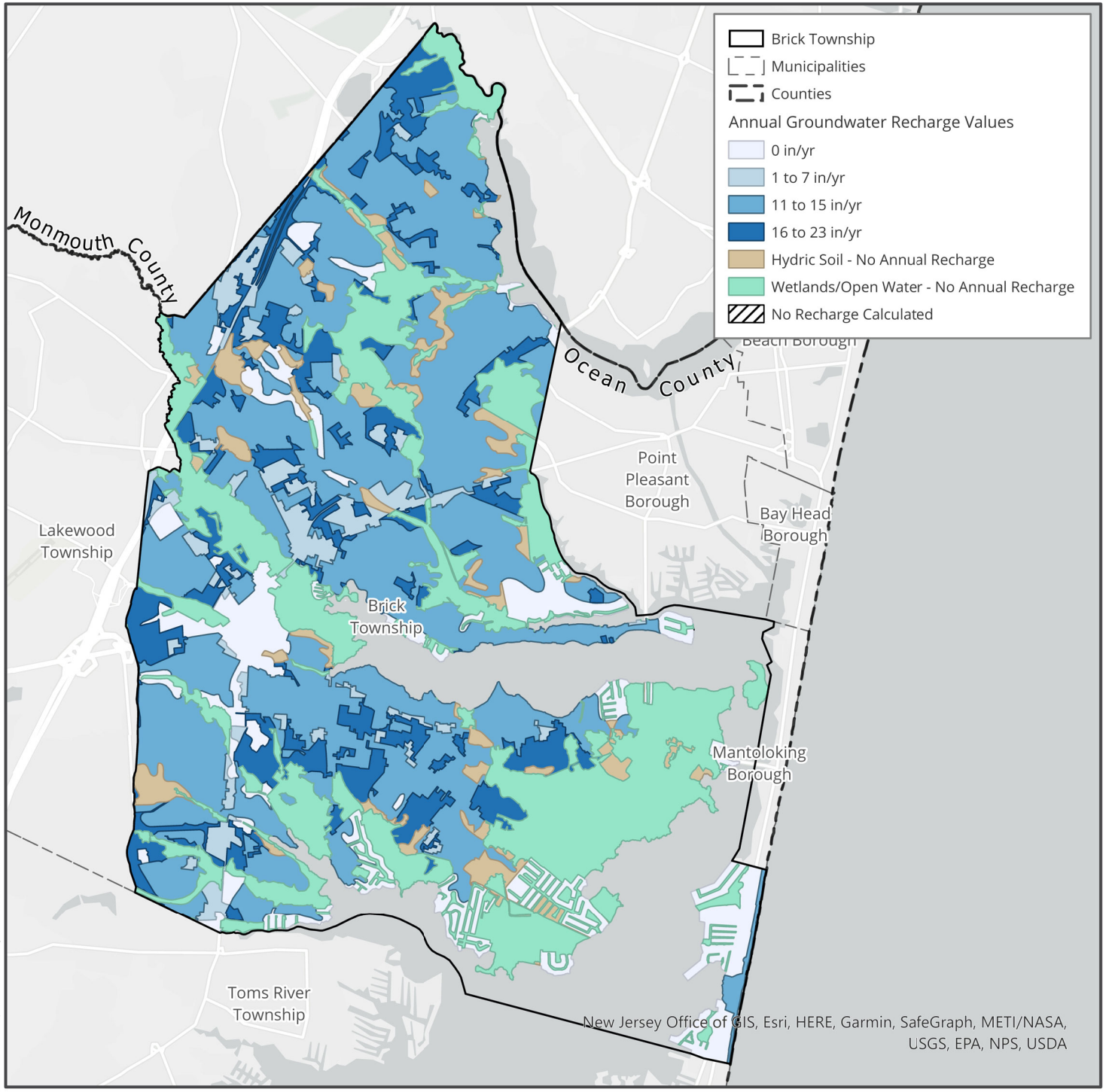
Appendix C-3 – Township of Brick Groundwater Recharge Map



GROUNDWATER RECHARGE AREAS

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.5 1 2 Miles

February 2022

Groundwater Recharge Data from NJDEP
Statewide Boundaries by NJOGIS

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Colliers Engineering & Design

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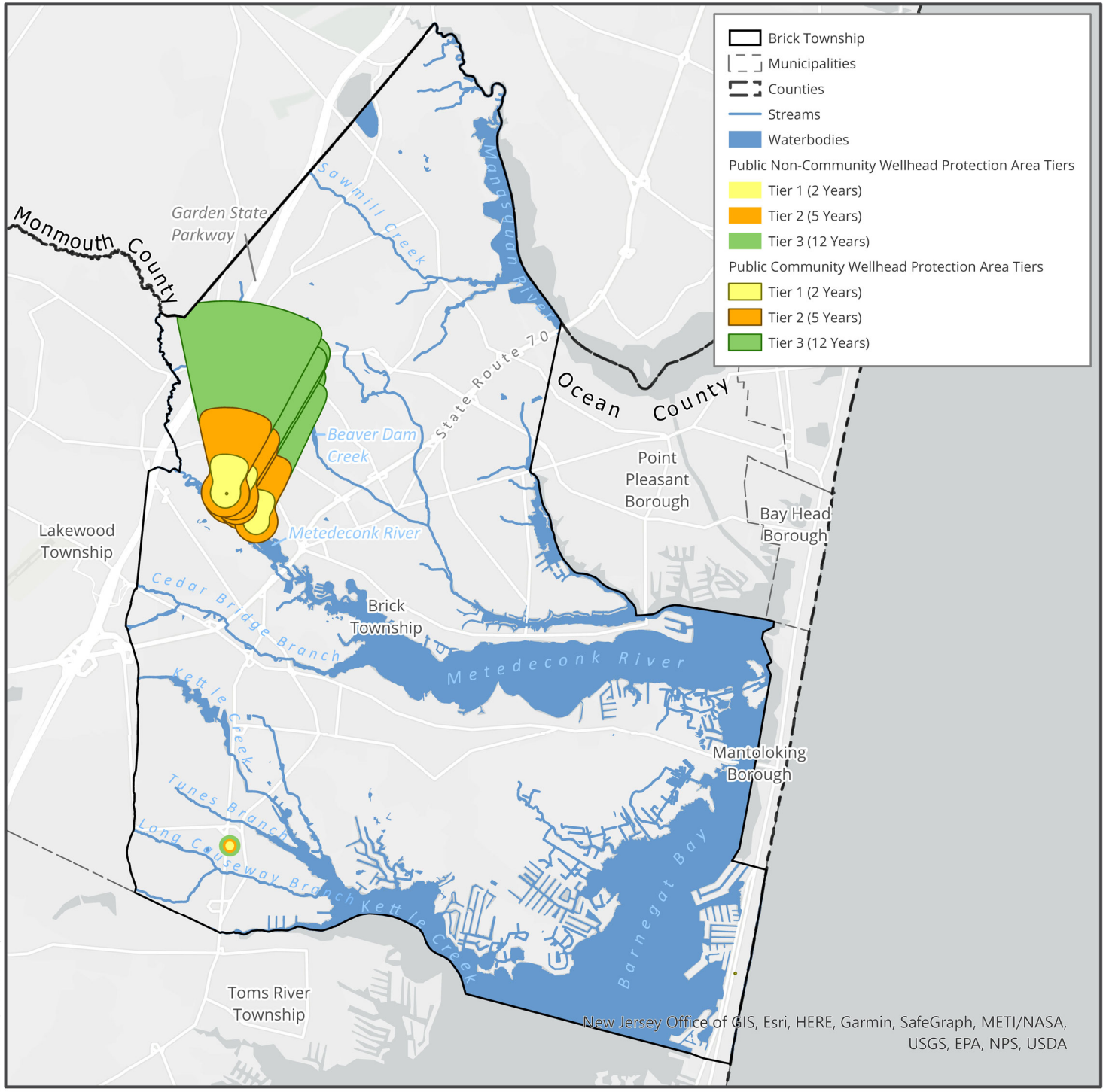
Appendix C-4 – Township of Brick Wellhead Protection Areas Map

WELLHEAD PROTECTION AREAS

TOWNSHIP OF BRICK

Ocean County
New Jersey



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0 0.5 1 2 Miles

February 2022

Wellhead Protection Area Data from NJDEP
Statewide Boundaries by NJOGIS

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Colliers Engineering & Design

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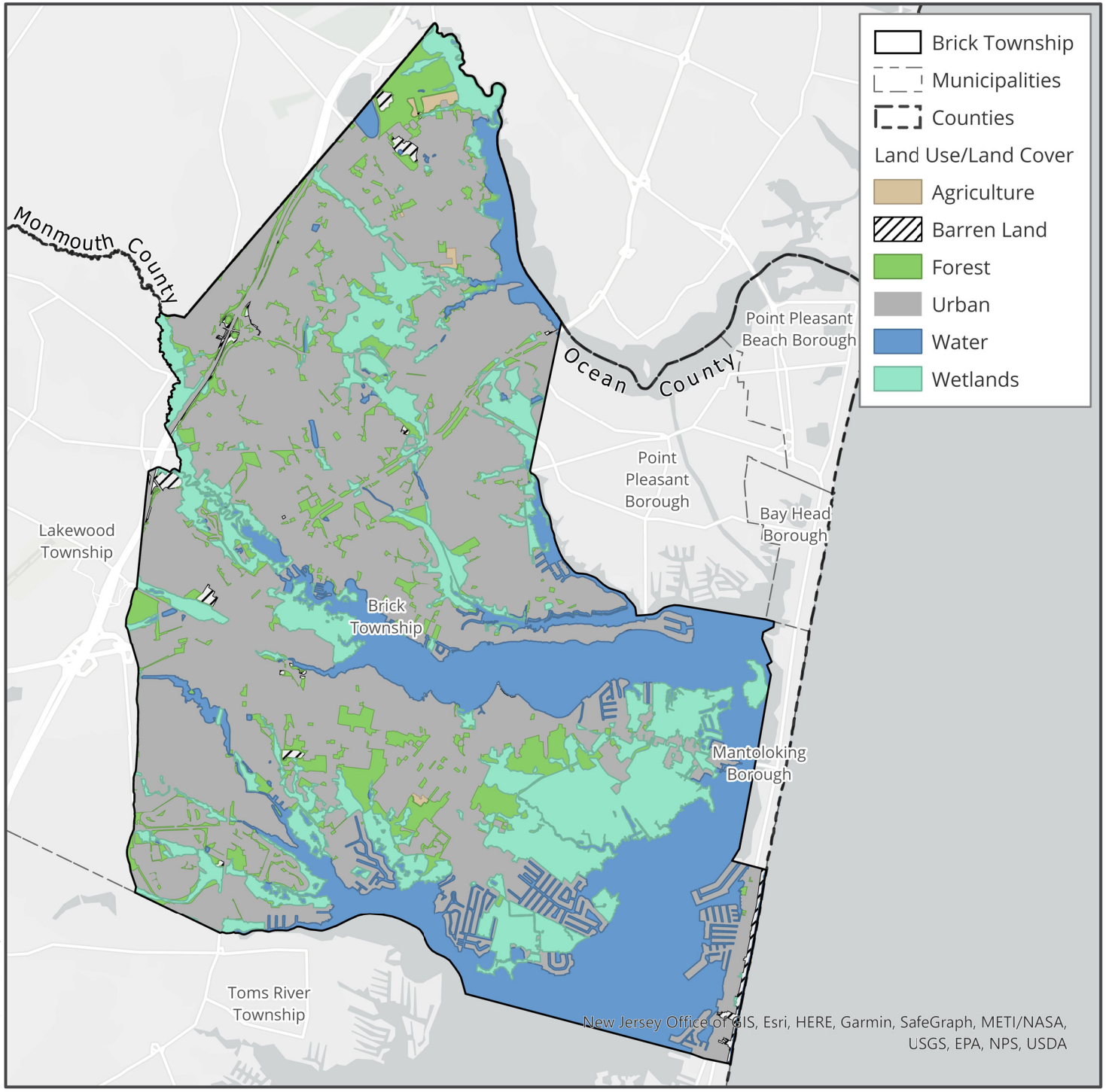
Appendix C-5 – Township of Brick Land Use/Land Cover Map



LAND USE LAND COVER

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.5 1 2 Miles

February 2022

Land Use Land Cover Data from NJDEP
Statewide Boundaries by NJOGIS

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Colliers Engineering & Design

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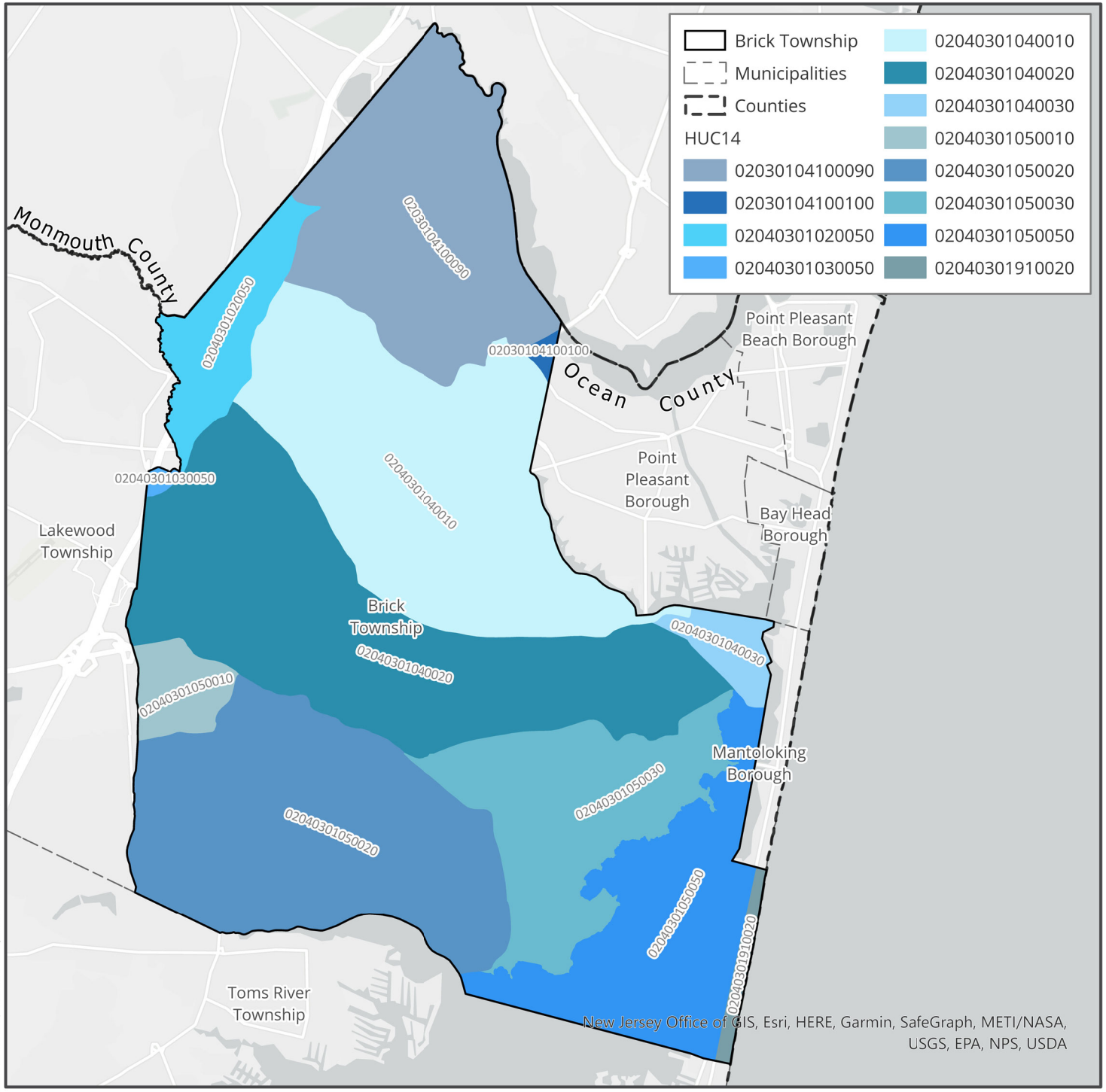
Appendix C-6 – Township of Brick HUC 14's Map



HUC14 WATERSHED BOUNDARIES

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.5 1 2 Miles

February 2022

HUC14 Watershed Data from NJDEP
Statewide Boundaries by NJOGIS

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

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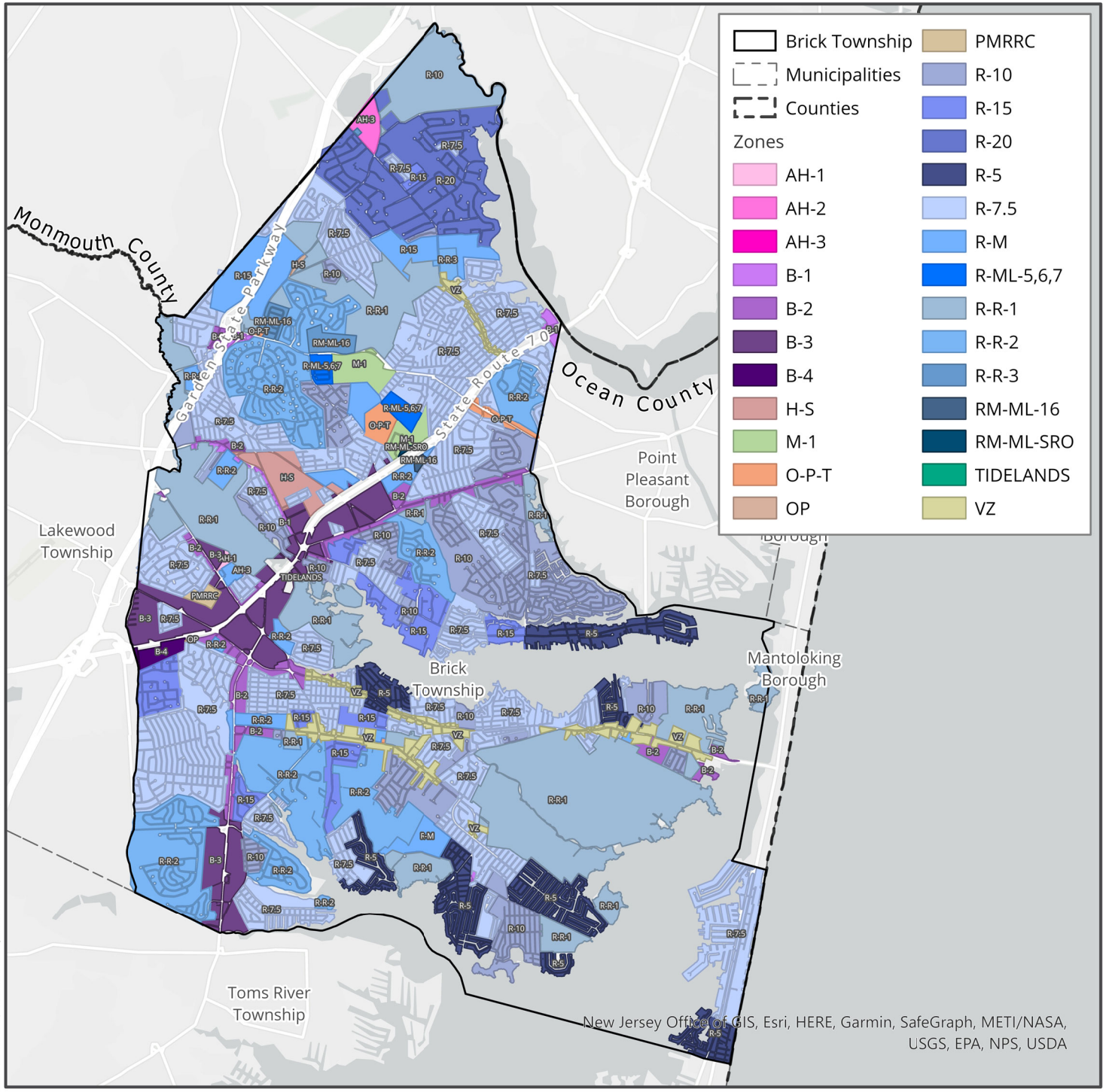
Appendix C-7 – Township of Brick Zoning Map



TOWNSHIP ZONING

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.5 1 2 Miles

February 2022

Zoning Data from
Brick Township
Statewide Boundaries by
NJOGIS

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

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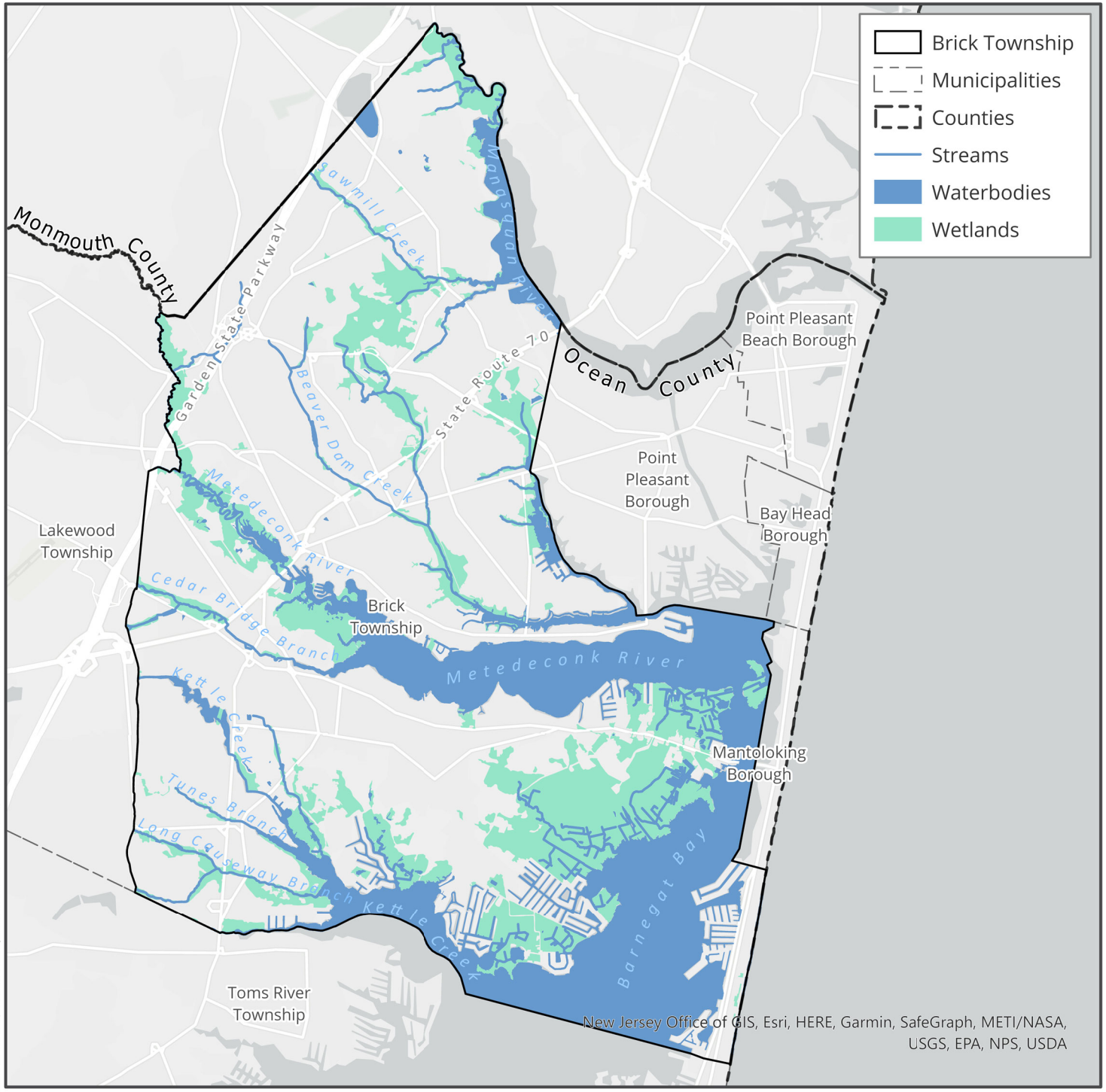
Appendix C-8 – Township of Brick Wetlands and Water Map



WETLANDS AND WATER

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.5 1 2 Miles

February 2022

NHD and Wetlands Data from NJDEP
Statewide Boundaries by NJOGIS

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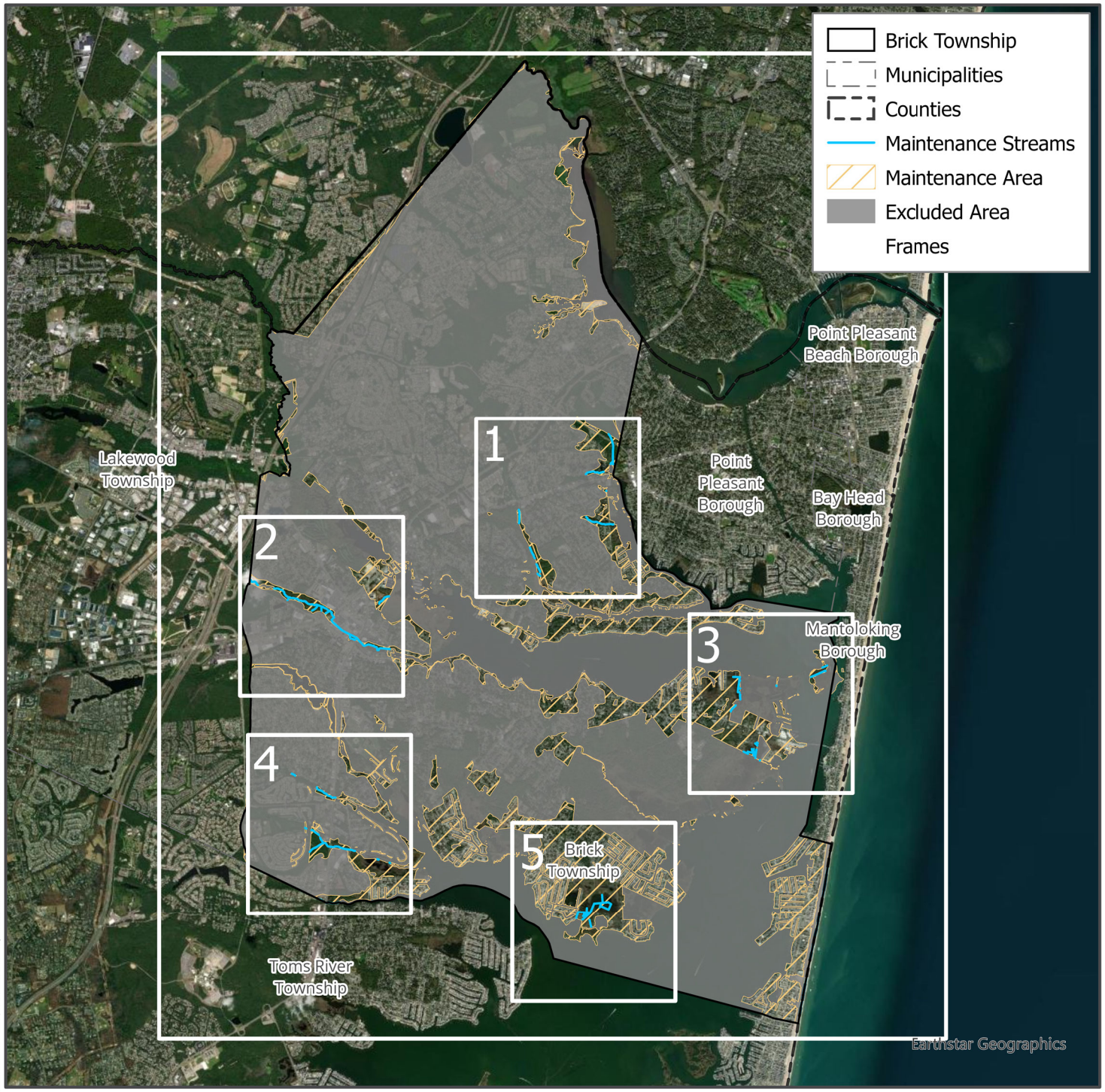
Appendix C-9 – Township of Brick Drainage System Maintenance Map



DRAINAGE SYSTEM MAINTENANCE -REFERENCE MAP-

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.5 1 2 Miles

February 2022

NHD and Land Use Data
from NJDEP,
Flood Zones from FEMA,
Statewide Boundaries by NJOGIS

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DRAINAGE SYSTEM MAINTENANCE -FRAME 1-

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.1 0.3 0.5 Miles

February 2022

NHD and Land Use Data
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Flood Zones from FEMA,
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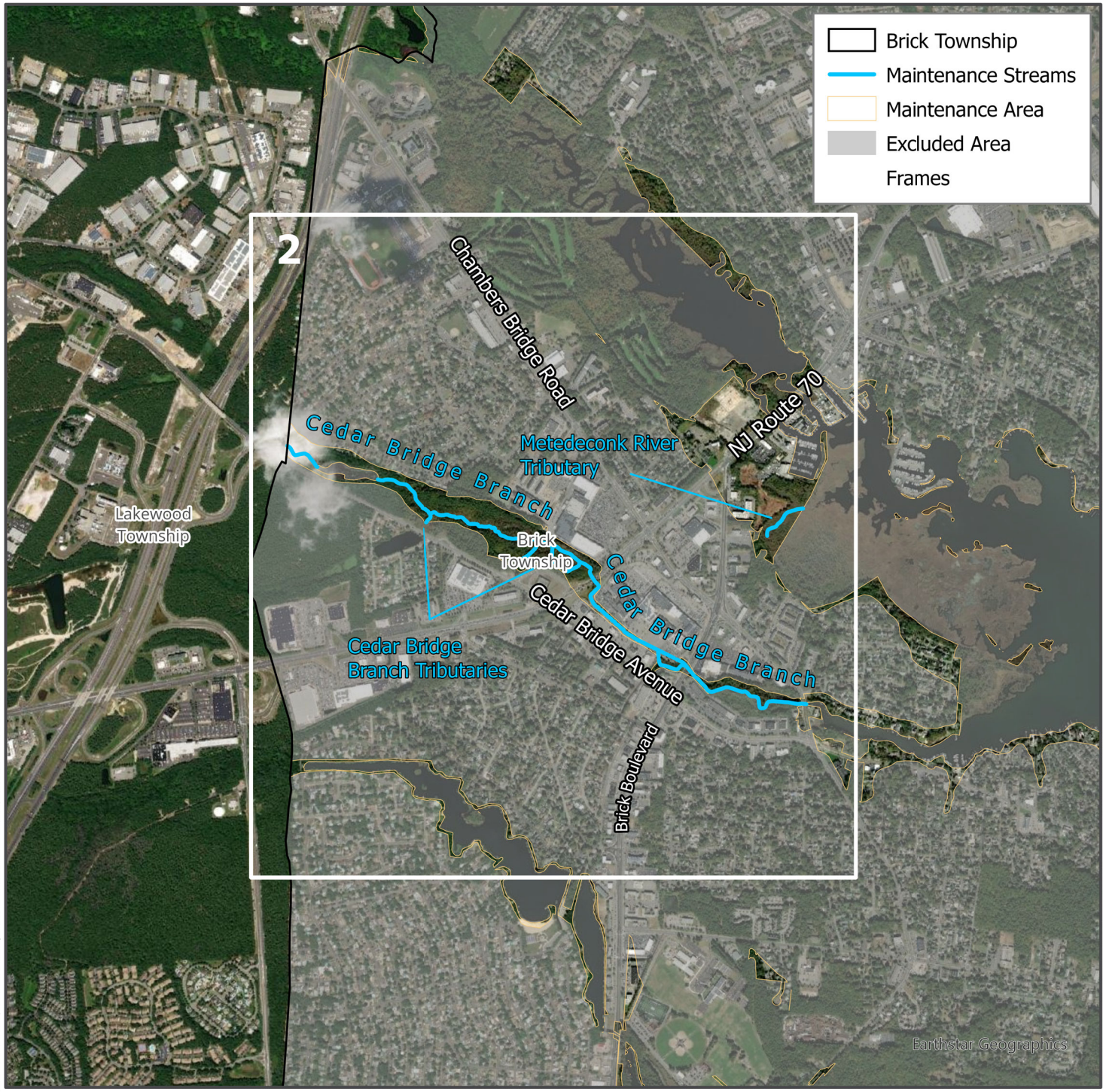

DRAINAGE SYSTEM MAINTENANCE -FRAME 2-

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.1 0.3 0.5 Miles

February 2022

NHD and Land Use Data
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Flood Zones from FEMA,
Statewide Boundaries by NJOGIS

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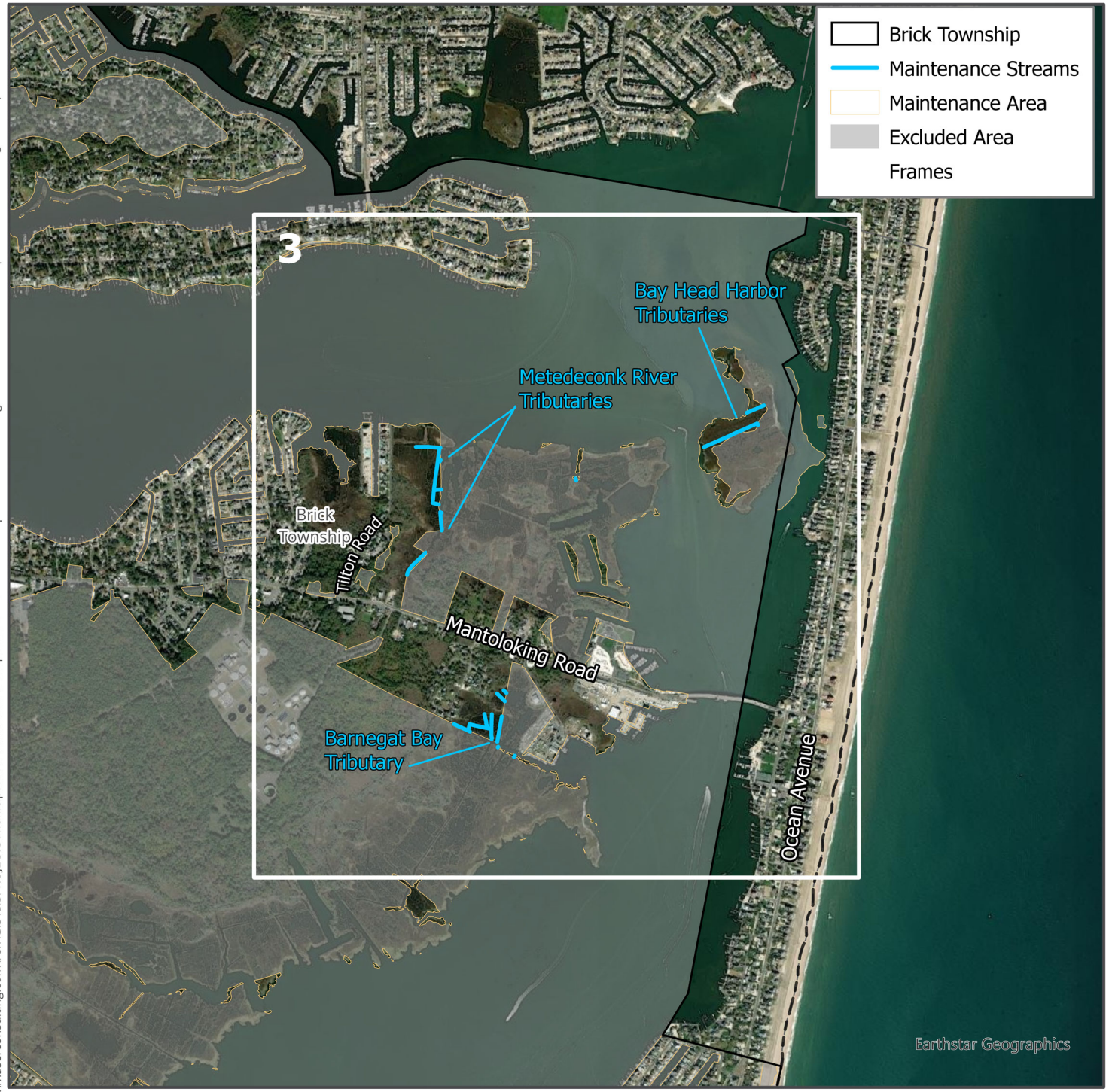

DRAINAGE SYSTEM MAINTENANCE -FRAME 3-

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.1 0.3 0.5 Miles

February 2022

NHD and Land Use Data
from NJDEP,
Flood Zones from FEMA,
Statewide Boundaries by NJOGIS

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DRAINAGE SYSTEM MAINTENANCE -FRAME 4-

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.1 0.3 0.5 Miles

February 2022

NHD and Land Use Data
from NJDEP,
Flood Zones from FEMA,
Statewide Boundaries by NJOGIS

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DRAINAGE SYSTEM MAINTENANCE -FRAME 5-

TOWNSHIP OF BRICK

Ocean County
New Jersey

N

0 0.1 0.3 0.5 Miles

February 2022

NHD and Land Use Data
from NJDEP,
Flood Zones from FEMA,
Statewide Boundaries by NJOGIS

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Table C-1: Build Out Calculations for HUC 14's

HUC14 and Zone	Total Area (ac)	Existing Impervious (%)	Exisiting Impervious (ac)	Constrained Land (ac)	Developable Area (ac)	Allowable Impervious (%)	Build-Out Impervious (ac)
2030104100090- Manasquan River (Rt. 70 br to 74d07m30s)							
AH-2	47.6	8%	3.8	28.2	40.5	30%	12.15
B-1	12.2	53%	6.5	5.2	7	60%	4.2
OP	4.9	31%	1.5	0	4.9	70%	3.43
R-10	27.2	44%	12	0	27.2	60%	16.32
R-15	14.5	25%	3.6	0	14.5	55%	7.975
R-20	765.6	20%	150.6	61.3	704.3	50%	352.15
R-7.5	593.3	36%	213.6	60.8	532.5	65%	346.125
R-M	145.1	43%	62.7	10.3	134.8	65%	87.62
R-R-1	606.3	7%	39.7	285.2	321.1	30%	96.33
R-R-2	35	12%	4.1	6.7	28.3	40%	11.32
VZ	26.5	41%	10.9	4.2	22.3	60%	13.38
Totals	2278.2	22%	509	461.9	1816.3	53%	951
2030104100100 - Manasquan River (below Rt. 70 Bridge)							
B-1	4.7	77%	3.6	0.3	4.4	60%	2.64
R-7.5	25.3	40%	10.2	0	25.3	65%	16.445
Totals	30	46%	13.8	0.3	29.7	63%	19.085
2040301020050 - Metedeconk River NB (Confluence to Rt. 9)							
B-1	7.7	53%	4.1	0	7.7	60%	4.62
B-2	10.9	87%	9.5	0	10.9	65%	7.085
OPT	0.4	75%	0.3	0	0.4	50%	0.2
R-10	23.3	1%	0.2	4.2	19.1	60%	11.46
R-7.5	180	33%	59.6	2.6	177.4	65%	115.31
R-M	204.2	51%	103.7	1.9	202.3	65%	131.495
R-R-1	124.2	16%	19.4	78.7	45.5	30%	13.65
R-R-2	56.3	35%	19.7	0	56.3	40%	22.52
R-R-3	2.2	18%	0.4	0	2.2	50%	1.1
Totals	609.2	36%	216.9	87.4	521.8	54%	307.44
2040301030050 - Metedeconk River SB (Confluence to Rt.9)							
B-2	0.5	20%	0.1	0	0.5	65%	0.325
R-R-1	21.1	17%	3.5	4.4	16.7	30%	5.01
Totals	21.6	17%	3.6	4.4	17.2	48%	5.335
2040301040010 - Beaverdam Creek							
B-2	83.6	56%	47.2	3.1	80.5	65%	52.325
B-3	89.9	66%	59.4	1.8	88.1	65%	57.265
H-S	27.9	43%	12	0	27.9	70%	19.53
M-1	142.1	34%	48.3	61.2	80.9	65%	52.585
OPT	75.4	31%	23.4	12.7	62.7	65%	40.755
R-10	752.7	30%	229.3	136.9	615.8	60%	369.48
R-15	137.6	22%	30.9	12.3	125.3	55%	68.915
R-5	62.2	47%	29.3	9.3	52.9	70%	37.03
R-7.5	703.7	37%	263.4	44.8	658.9	65%	428.285
R-M	107	48%	51.4	7.1	99.9	65%	64.935
R-M -5,6,7	64.5	21%	13.4	30.3	34.2	65%	22.23
R-R-1	128.2	6%	7.2	78.4	49.8	30%	14.94
R-R-2	601.5	28%	166	130.4	471.1	40%	188.44
R-R-3	79.1	24%	19.2	23.8	55.3	50%	27.65
RM-ML-16	6.6	36%	2.4	2.1	4.5	65%	2.925
RM-ML-SRO	3.5	17%	0.6	2.4	1.1	65%	0.715
VZ	3	57%	1.7	0	3	60%	1.8
Totals	3068.5	33%	1005.1	556.6	2511.9	60%	1449.805
2040301040020 - Metedeconk River (Beaverdam Ck to Confl)							
AH-1	7.3	37%	2.7	2.2	5.1	40%	2.04
AH-3	1.7	35%	0.6	0	1.7	40%	0.68
B-1	19.4	60%	11.7	0	19.4	60%	11.64
B-2	99.8	59%	59.3	3.6	96.2	65%	62.53
B-3	435.7	52%	224.6	85.3	350.4	65%	227.76
B-4	0.5	6%	0.03	0	0.5	70%	0.35
H-S	97.1	50%	48.5	0	97.1	70%	67.97
OP	0.9	67%	0.6	0	0.9	70%	0.63
PMRRC	23.7	16%	3.7	2	21.7	50%	10.85
R-10	175.1	15%	26.8	93.1	82	60%	49.2
R-15	133.4	23%	31.3	18.6	114.8	55%	63.14
R-5	174.4	48%	83.9	35.6	138.8	55%	76.34
R-7.5	821.6	42%	343.1	34.5	787.1	65%	511.615
R-M	82.1	52%	42.8	0.6	81.5	65%	52.975
R-R-1	658.1	9%	59.7	457.3	200.8	30%	60.24
R-R-2	4.3	23%	1	0	4.3	40%	1.72
TIDELANDS	0.1	0%	0	0.1	0	0%	0
VZ	111.7	40%	44.4	16	95.7	60%	57.42
Totals	2846.9	35%	984.73	748.9	2098	53%	1257.1
2040301040030 - Metedeconk River (below Beaverdam Creek)							
R-5	24.3	64%	15.5	3.6	20.7	70%	14.49
R-R-1	35.5	0%	0	35.5	0	30%	0
Totals	59.8	26%	15.5	39.1	20.7	50%	14.49
2040301050010 - Kettle Creek (above Lake Riviera Outlet)							
B-2	5.3	94%	5	0	5.3	65%	3.445
B-4	40.1	64%	25.8	0	40.1	70%	28.07
R-15	89.6	31%	27.9	8.4	81.2	55%	44.66
R-7.5	191	35%	67.1	29.4	161.6	65%	105.04
Totals	326	39%	125.8	37.8	288.2	64%	181.215
2040301050020 - Kettle Creek (below Lake Riviera Outlet)							
B-1	1.8	28%	0.5	0	1.8	60%	1.08
B-2	68.8	59%	40.5	1.4	67.4	65%	43.81
B-3	180.2	39%	71	50.5	129.7	65%	84.305
OPT	1	70%	0.7	0	1	65%	0.65
R-10	227.6	23%	52	55	172.6	60%	103.56
R-15	127.9	24%	30.4	8.6	119.3	55%	65.615
R-5	179.7	77%	138.8	6	173.7	70%	121.59
R-7.5	688.5	41%	282.8	97.3	591.2	65%	384.28
R-M	112	43%	48.4	10.7	101.3	65%	65.845
R-R-1	124.3	4%	4.8	88.5	35.8	30%	10.74
R-R-2	991.1	19%	188.2	280.1	711	40%	284.4
VZ	81.7	41%	33.5	2.3	79.4	60%	47.64

Totals	2784.6	32%	891.6	600.4	2184.2	58%	1213.515
2040301050030 -Metedekunk Neck tribs (below Herson ls)							
B-2	33.9	35%	12	24.2	9.7	65%	6.305
R-10	128.8	13%	16.1	79.4	49.4	60%	29.64
R-5	133.4	86%	114.6	2.3	131.1	70%	91.77
R-7.5	126.1	40%	50.7	5.1	121	65%	78.65
R-M	2.9	55%	1.6	0	2.9	65%	1.885
R-R-1	1292.4	3%	39.4	1026.5	265.9	30%	79.77
VZ	64.8	29%	19.1	20.9	43.9	60%	26.34
Totals	1782.3	14%	253.5	1158.4	623.9	59%	314.36
2040301050050 - Barnegat Bay North (above Rt. 37 bridge)							
B-2	1.3	23%	0.3	0.9	0.4	65%	0.26
R-10	4.2	0%	0	4.2	0	60%	0
R-5	53	81%	42.8	7.4	45.6	70%	31.92
R-7.5	185	75%	138.3	30.6	154.4	65%	100.36
R-R-1	32.8	0%	0	32.8	0	30%	0
Totals	276.3	66%	181.4	75.9	200.4	58%	132.54
2040301910020 - Atlantic Coast (Herring ls to Rt. 37)							
R-5	23.7	73%	17.38	0.2	23.5	70%	16.45
R-7.5	85.7	48%	40.9	4.9	80.8	65%	52.52
Totals	109.4	53%	58.28	5.1	104.3	68%	68.97

Table C-2: Pollutant Loads by Land Cover

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

Source: NJDEP Stormwater BMP Manual 2004.

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