
Township of Upper Cape May County Wastewater Management Plan

Amending the Following Areawide Water Quality Management Plans:
Cape May County

Submitted by:
The Board of Chosen Freeholders of the County of Cape May

On Behalf of:
The Township of Upper

Date of Current Submittal:
February 11, 2019

Approved by the New Jersey Department of Environmental Protection:
(to be inserted after NJDEP Approval)

Prepared By:



CAPE MAY COUNTY PLANNING DEPARTMENT

Cape May County Planning Department
4 Moore Road - DN 309
Cape May Court House, N.J. 08210
609.465.6875
www.capemaycountynj.gov



MASER CONSULTING, P.A.

500 Scarborough Drive, Suite 108
Egg Harbor Township, NJ 08234
609.910.4068
www.maserconsulting.com

Chapter 12. TOWNSHIP OF UPPER

TABLE OF CONTENTS

I. INTRODUCTION	12-4
Alternative Assignment of Wastewater Management Planning Responsibility	12-4
Status of Previous Approved Local and Regional WMPs Affected by the County WMP	12-4
Overview of Municipality	12-4
Overview of Current Wastewater Services and Wastewater Responsibilities	12-6
II. SUMMARY OF ACTIONS	12-7
Planning Coordination	12-10
III. EXISTING AND FUTURE WASTEWATER TREATMENT FACILITIES	12-12
Existing Areas Served by Wastewater Facilities	12-13
IV. WASTEWATER TREATMENT CAPACITY ANALYSIS - SEWER SERVICE AREA	12-13
Projecting Future Wastewater Flows	12-14
Future Sewer Service Area Analysis	12-15
V. NITRATE DILUTION ANALYSIS - NON-SEWER SERVICE AREA	12-18
VI. WASTEWATER FACILITIES	12-22
Domestic Wastewater Facilities With Sewer Service Area in Multiple Municipalities	12-22
On-Site Domestic Treatment Facilities	12-23
VII. STRATEGIES TO MITIGATE POTENTIAL CAPACITY DEFICIENCIES	12-37
Strategies to Mitigate Capacity Deficiency in Sewer Service Areas	12-37
Strategies to Mitigate Capacity Deficiency in Non-Sewer Service Areas	12-37
VIII. APPENDIX	12-38

LIST OF TABLES

Table 12-1: Coordination with Municipalities and Sewer Authorities	12-12
Table 12-2: Urbanized Municipality Analysis	12-14
Table 12-3: Buildout Analysis of Sewer Service Areas	12-17
Table 12-4: Wastewater Demand Analysis of Sewer Service Areas	12-17
Table 12-5: Wastewater Capacity Analysis of Sewer Service Areas	12-18
Table 12-6: Buildout Analysis of Septic Management Area	12-19
Table 12-7: Antidegradation Analysis of Septic Management Area	12-21
Table 12-8: Ocean City Wastewater Treatment Facility	12-22



Table 12-9: B.L. England Generating Station/Atlantic Electric	12-23
Table 12-10: Bayberry Cove Campground	12-23
Table 12-11: Bayview Motel	12-23
Table 12-12: Cedar Square Shopping Center	12-24
Table 12-13: Deauville Inn	12-24
Table 12-14: Dino's Seaville Diner	12-24
Table 12-15: Echo Farm Campground	12-25
Table 12-16: Econo Lodge	12-25
Table 12-17: Frontier Campground	12-25
Table 12-18: Guiseppe's Restaurant	12-26
Table 12-19: Heritage Links	12-26
Table 12-20: Hidden Pond	12-26
Table 12-21: Marmora Shop Rite	12-27
Table 12-22: Mildred's Restaurant	12-27
Table 12-23: N.J. Bell Telephone	12-27
Table 12-24: Oak Ridge Campground	12-28
Table 12-25: Oakcrest Complex	12-28
Table 12-26: Ocean Beach Trailer Resort	12-28
Table 12-27: Ocean Sands Resort	12-29
Table 12-28: Osprey Village Age Restricted Housing	12-29
Table 12-29: Petersburg Disability Center	12-29
Table 12-30: Pine Hill Trailer Park I & II	12-30
Table 12-31: Plantation Campground	12-30
Table 12-32: Riverview Campground	12-30
Table 12-33: Seaville Park	12-31
Table 12-34: Seaville Shores Campground	12-31
Table 12-35: Shady Oaks Campground	12-31
Table 12-36: Shaw Farm Park	12-32
Table 12-37: Shore Acres Trailer Park	12-32
Table 12-38: Shore Acres Trailer Park - Phase 2	12-32
Table 12-39: Shore Birds Campground	12-33
Table 12-40: Strathmere Motel	12-33
Table 12-41: Township Senior Apartments	12-33
Table 12-42: Triton Bar	12-34
Table 12-43: Tuckahoe Inn	12-34
Table 12-44: U.S. Coast Guard Housing Facility	12-34
Table 12-45: Upper Township BOE Middle School	12-35
Table 12-46: Upper Township Elementary & Primary School	12-35
Table 12-47: Upper Twp Sand & Gravel	12-35
Table 12-48: Wawa # 758	12-36
Table 12-49: Wayside Village Shopping Center	12-36



Table 12-50: Whippoorwill Campground 12-36

APPENDIX

Municipal Buildout Report
Map 12-1: Existing Land Use
Map 12-2: Existing Zoning
Map 12-3: Adopted Sewer Service Areas
Map 12-4: Hydrologic Features
Map 12-5: Natural Features
Map 12-6: Buildout Results

r:\projects\2017\17005579g\reports\cmcwmp\ch12_upper\cmcwmp chapter 12 upper twp 190211.docx



I. INTRODUCTION

The purpose of this Chapter is to provide a comprehensive Wastewater Management Plan (“WMP”) for the Township of Upper, pursuant to the newest Water Quality Management Planning rules, adopted October 6, 2016 and published in the New Jersey Register on November 7, 2016. This Chapter of the WMP has been submitted to the New Jersey Department of Environmental Protection (“NJDEP”) for approval so that it may be incorporated into the Cape May County Water Quality Management Plan (“WQMP”) via the plan amendment procedure at N.J.A.C. 7:15-3.

Alternative Assignment of Wastewater Management Planning Responsibility

As of the date of submittal, wastewater management planning responsibility for the full County remains with the Cape May County Board of Chosen Freeholders and no alternative assignments have occurred pursuant to N.J.A.C. 7:15-2.8.

The Cape May County Board of Chosen Freeholders is the agency charged with WMP preparation, which has been delegated to the Cape May County Planning Department. The Cape May County Health Department is the designated 208 agency and is responsible for implementation of the WMP. The County of Cape May has retained Maser Consulting, PA to assist in preparation of the WMP.

This WMP Chapter has been prepared by Maser Consulting, PA and the Cape May County Planning Department as the WMP Chapter for the Township of Upper. Cooperation has been provided by the Cape May County Municipal Utilities Authority and the Township of Upper in the preparation of this plan.

Status of Previous Approved Local and Regional WMPs Affected by the County WMP

This WMP incorporates or replaces all or part of any previously approved WMPs prepared by municipality or wastewater authorities for the Township of Upper. The WQMP rule provides that any WMP that was prepared and adopted in accordance with the WQMP rules in effect as of July 7, 2008, or P.L. 2011, c. 203 as amended and supplemented by P.L. 2013, c. 188, will continue in effect for the remainder of the term for which it was originally approved. Therefore, WMPs that were fully compliant with the 2008 rules maintain their expiration date as provided at the time of adoption. The previously approved Cape May County Water Quality Management Plan/Waste Water Management Plan (“CMCWMP” or “208 Plan”) was adopted on September 28, 2001 and was set to expire September 28, 2007. The NJ Permit Extension Act extended the expiration of the plan to December 31, 2012. The 2001 CMCWMP is still considered current through that date. However, adoption of this WMP Chapter for Upper Township would supersede the previously approved WMP.

Overview of Municipality

Upper Township is located at the northern end of Cape May County, which occupies a peninsula at the southern tip of the state of New Jersey, where it adjoins Atlantic and Cumberland Counties. The Township, incorporated in 1798, occupies a land area of approximately 68.5 square miles (or 43,830 acres). Within Cape May County, Upper Township is bordered by Dennis Township and Woodbine Borough to the south and Sea Isle City and Ocean City to the east. Upper is also bordered by Maurice River Township in Cumberland County to the west and Corbin City, Egg Harbor Township and Somers Point City in Atlantic County to the north. The Atlantic Ocean and inter-coastal waterways make up the



eastern border of the Township. Strathmere, located on the northern half of Seven Mile Island, shared with Sea Isle City, is also a part of Upper Township. Tuckahoe River and the Great Egg Harbor Bay form the majority of the Township's northern boundary. Major roadways that run through Upper Township include the Garden State Parkway, U.S. Route 9 and State Routes 49 and 50.

Upper Township is a suburban community with moderate density residential and commercial uses clustered within its Centers along the Route 9 corridor and lower density housing within its villages along other major roadways.

The existing land use patterns within Upper Township are illustrated based on tax class parcel data. (See **Map 12-1: Existing Land Use**.) It is evident that the largest portion of the Township falls into the "public property" category, which is made up environmentally constrained land and wildlife management areas. The Township has approximately half of its total land mass covered by freshwater and tidal wetlands. There are large areas of land within the Township that are owned and managed by State and Federal agencies for the protection of threatened and endangered species and wildlife habitats. These areas represent a significant amount of undeveloped land consisting of the Tuckahoe Wildlife Management Area, Belleplain State Forest and the Cape May National Wildlife Refuge Great Cedar Swamp Division.

The most significant region of undevelopable land is located along the entire eastern portion of the municipality. This stretch of land is situated between the Garden State Parkway and the barrier islands and is constrained by tidal wetlands. There is limited development in these areas with small pockets of commercial development located along Roosevelt Boulevard (Route 623) leading to the barrier island communities of Ocean City and Strathmere.

The existing residential development consists almost exclusively of single-family homes with the most concentrated areas located in the Centers of Seaville, Petersburg and Marmora-Palermo-Beesley's Point and Tuckahoe. In addition, the barrier island community of Strathmere represents the Township's highest density of residential development.

Most of Upper Township's commercial developments are located along its major roadways. A considerable amount of retail, office and service related development is located along the Route 9 corridor. The larger shopping centers and retail stores are located in Seaville and Marmora. In addition, there are commercial uses scattered along the major roads including within Tuckahoe Village Center along Route 50. There are also 12 mining operations (which are classified as commercial uses) located, primarily along Route 610 and Route 664 in the southern portion of the Township adjacent to Woodbine Borough.

Many of the larger farms are located within the Pinelands Management Area or adjacent to public lands in the CAFRA area. The smaller farms along or adjacent to the Route 9 corridor are likely candidates for future development.

Upper Township adopted its first Master Plan in 1975. The last Upper Township Master Plan was adopted on July 21, 1994. A Master Plan Reexamination Report and Master Plan Amendment was adopted on July 19, 2001. Subsequently on June 20, 2001, a Master Plan Reexamination of the Land Use Plan Element was adopted which addressed specific land use recommendation of the 2001 Reexamination Report. The 1993 Master Plan included a comprehensive review through Land Use Plan, Housing Plan, Circulation Plan, Utility Service Plan, Community Facilities Plan, Recreation Plan, Historic Conservation



Plan, Economic Plan and Recycling Plan in addition to the Assumptions that formed the basis of the Plan and Goals and Policy Objectives as required by the MLUL.

In November 2006, the Township adopted a Master Plan - Land Use Plan Update in order to provide a center-based land use policy where growth is focused into centers and the surrounding environs are protected from the impacts of sprawling development. The Land Use Plan refined and updated the goals and objectives to support the Master Plan efforts. Upper Township adopted a revised Zoning Map and Zoning Ordinance in 2007 to effectuate the changes proposed in the 2006 Land Use Plan. The current zoning is shown on **Map 12-2: Existing Zoning**.

Upper Township received Plan Endorsement from the NJ State Planning Commission ("NJSPC") on February 21, 2007, which designated its four Centers (Marmora-Palermo-Beesley's Point Town Center, Seaville Town Center, Tuckahoe Village Center, and Petersburg Village Center) and planning area classifications (PA2 Suburban, PA3 Fringe, PA4 Rural, PA5 Environmentally Sensitive and PA5B Barrier Island/Environmentally Sensitive Planning Areas) of the State Development and Redevelopment Plan ("SDRP").

Upper Township is completely encompassed within either the Coastal Zone (CAFRA) or the Pinelands Management Area. Approximately 46.2 square miles of Upper Township are located within the Coastal Zone; the remaining 22.3 square miles (14,276 acre) are within the Pinelands Management Area. The dividing line runs along State Route 49, State Route 50 and County Route 610. Approximately 33.7 square miles of the Coastal Zone are overlapped by the Pinelands National Reserve. Upper Township has defined its growth areas in CAFRA Centers, which reflect existing development patterns along the Route 9 corridor in the Town Centers of Marmora-Palermo-Beesley's Point and Seaville with smaller Villages reflecting existing development patterns in Tuckahoe and Petersburg.

Although Upper Township has an extensive amount of developable lands remaining, vacant land is limited within the Centers where higher density growth is focused. The Township anticipates that much of the development within the Town Centers will be in the form of private redevelopment or revitalization of existing structures or scattered-lot infill. Much of the developable lands are located outside of the existing and planned sewer service areas and would be subject to on-site septic systems and low density development.

Upper Township's Master Plan has received Plan Endorsement from the NJSPC. The Township's Master Plan creates multiple growth centers, utilizing center-based development with an environmental protection strategy which provides for transferring development rights from the environs to the designated centers. This WMP and the proposed sewer service area herein are consistent with that endorsed plan and are deemed necessary to accomplish the objectives of that plan.

Overview of Current Wastewater Services and Wastewater Responsibilities

There are no existing public sewer service facilities in Upper Township. All existing development is served by on-site wastewater disposal systems. Systems with planning flows of greater than 2,000 gallons per day ("GPD") are regulated by the NJDEP. Systems with planning flows of less than 2,000 GPD are regulated by the Cape May County Health Department.



II. SUMMARY OF ACTIONS

Sewer Service Area Delineation Criteria

This chapter describes the criteria used for the delineation of areas eligible for sewer service area and includes a description of the number of acres added and/or subtracted from the area eligible for sewer service.

Eligible Sewer Service Areas

The term “Eligible for sewer service area” means areas determined to meet the criteria for designation as sewer service in accordance with N.J.A.C. 7:15-4.4, and are identified as “Assigned sewer service area”, differentiating between area that currently conveys sewage to each existing facility and that which is proposed to convey sewage to each existing or proposed facility; or “Unassigned sewer service area”, which are areas mapped for future sewer service with no designated treatment facility.

The Township of Upper is proposing to extend sewer service to the Marmora Town Center District and the existing development along Roosevelt Boulevard to the Ocean City Region Wastewater Treatment Plant (WTP). Alternatively, the Marmora future sewer service area would discharge to groundwater if connection to Ocean City Region WTP is not feasible.

Additional sites are proposed to be served with a future on-site treatment works discharging greater than 2,000 GPD. Future wastewater facilities are detailed further in Section VI.

Upper Township also proposes future sewer service areas to be consistent with the designated Pinelands Villages of Tuckahoe and Petersburg. As there are no existing or proposed public sewers in these areas would, development would be served by on-site or community wastewater treatment facilities.

The amendments to the WQMP Rules also necessitated the removal of areas identified as “General Service Area for Wastewater Facilities with Planning Flows of Less Than 20,000 GPD which Discharge to Ground Water”. These areas have been evaluated as part of this WMP and are designated for wastewater management accordingly. Areas previously designated as “General Service Area for Wastewater Facilities with Planning Flows of Less Than 2,000 GPD which Discharge to Ground Water”, or similar language, are now designated as either “Septic Area (ISSDS 2,000 GPD or Less)” or “Restricted Septic Area (Planning Flows of 2,000 GPD or Less AND Less Than 6 Residential Units)”. Previously, this “General Service Area for Wastewater Facilities with Planning Flows of Less Than 2,000 GPD which Discharge to Ground Water” discharge designation provided that any number of wastewater discharges to ground water could occur as long as each discharge was less than 2,000 GPD. Areas now designated “Septic Area (ISSDS 2,000 GPD or Less)” have demonstrated that the zoning meets the nitrate planning standard of 2 mg/L on a HUC 11 basis. Under the new “Restricted Septic Area (Planning Flows of 2,000 GPD or Less AND Less Than 6 Residential Units)” designation, residential development or subdivisions with a total of less than six (6) dwelling units are allowed, but residential developments of six (6) or more units must undergo a nitrate dilution analysis to ensure that the individual or other subsurface sewage disposal systems can meet the two (2) mg/L nitrate planning standard on-site.

On January 13, 2012, the New Jersey Legislature enacted the ‘180 Day Rule’ (P.L.2011, Chapter 203), which required that Future Sewer Service Area Maps be submitted to NJDEP within 180 days of adoption of the act (July 15, 2012). A public meeting was held by the Cape May County Board of Chosen Freeholders on June 26, 2012 to approve the submission of the Draft Future Sewer Service Area Maps to



NJDEP. A Draft Future Sewer Service Area Map for Upper Township was submitted to NJDEP on July 12, 2012. On November 6, 2013, the NJDEP adopted an amendment to the Cape May County WQMP, which included the Future Wastewater Management Areas Map for Upper Township designating the sewer service areas. The adopted wastewater management areas for Upper Township are reflected on **Map 12-3: Adopted Wastewater Service Areas**.

Sewer Service Areas in Environmentally Sensitive Areas

Under the WQMP rules, large contiguous environmentally sensitive areas, or “ESAs”, defined as 25 acres or larger consisting of habitat for threatened and endangered species as identified on the Landscape Project Maps of Habitat for Endangered, Threatened or Other Priority Species, Natural Heritage Priority Sites, Category One special water resource protection areas, and wetlands, alone or in combination, should be excluded from areas eligible for sewer service. Additionally, Coastal Fringe Planning Areas, Coastal Rural Planning Areas, or Coastal Environmentally Sensitive Planning Areas identified on the CAFRA Planning Map, shall not be identified as eligible for sewer service area. However, the WQMP rule provides, at N.J.A.C. 7:15 – 4.4(i)-(l) and 4.4 (f), several exceptions which allow ESAs and CAFRA areas to be included in areas eligible for sewer service.

In accordance with N.J.A.C 7:113-1.5, "environmentally sensitive areas" means those areas identified in an areawide WQM plan as land areas possessing characteristics or features that are important to the maintenance or improvement of water quality, or to the conservation of the natural resources of the State. Environmentally sensitive areas include, but are not limited to, areas mapped as endangered or threatened wildlife species habitat on the Department's most currently available Landscape Maps of Habitat for Endangered, Threatened or Other Priority Species, Natural Heritage Priority Sites, wetlands and riparian zones.

For the purposes of this buildout analysis, the following environmental constraints, as shown on **Map 12-4: Hydrologic Features**, were assumed to constrain future development within the adopted wastewater service areas:

- Open Water Bodies as delineated by the NJDEP National Hydrography Dataset (NHD) Waterbody GIS data, last updated by NJDEP on November 1, 2010.
- Freshwater Wetlands were extracted from the 2012 NJDEP Land Use/Land Cover data. Transitional area buffers were added to the constrained area. Wetlands areas associated with a primary water body (river, bay, ocean, etc.) and/or containing habitat for threatened and endangered species (Rank 3, 4 and 5 as per the NJDEP Landscape Project Version 3.3) were assumed to have exceptional resource value and 150-foot transition area buffers were applied. Isolated patches of wetlands not containing threatened and endangered species habitat were assumed to have intermediate resource value and 50-foot buffers were applied.
- Category-One (“C1”) Waters and their Tributaries as delineated by the NJDEP Surface Water Quality Standards data were given a 300-foot Special Water Resource Protection Area (SWRPA) buffer included in the constrained area.
- Riparian Buffers were added to non C1 streams in accordance with the NJDEP Flood Hazard Control Act. Streams adjacent to threatened and endangered species habitat are given a 150-foot wide riparian buffer. All other streams are given a 50-foot riparian buffer.



Map 12-5: Natural Features depicts the following layers, which were considered in the adoption of the wastewater service areas:

- Habitat for Endangered, Threatened or Other Priority Species. Rank 3, 4 & 5 habitat patches for state and federally listed threatened and endangered species are shown, as published in Version 3.3 of the NJDEP Landscape Project mapping.
- Natural Heritage Priority Sites as published by the NJDEP March 1, 2007.

USEPA Section 201 Grant Conditions

There are no existing public sewers in Upper Township subject to USEPA Grant Conditions. Although not proposed as part of this plan, the Township has indicated a desire to connect sewer service from Strathmere to the CMCMUA Seven Mile / Middle Twp Region WTP. This CMCMUA Wastewater Treatment Facility is subject to USEPA 201 Grant Restrictions which prohibit the connection of sewer to parcels of land within environmentally sensitive areas. Such environmentally sensitive areas include tidal and freshwater wetlands, intermittent stream corridors, critical uplands and wildlife habitat, beach and dune areas, and flood-prone areas. Environmentally sensitive areas cannot be sewerred unless a mapping revision or waiver is received from the USEPA prior to sewer connection of such parcels.

Upper Township also proposed to connect sewer service from Marmora Town Center to the CMCMUA Ocean City STP. There are no 201 Grant Restrictions for the Ocean City STP.

As set forth in item 3b of the USEPA Grant Conditions Cape May Region (May 6, 1980) and USEPA Grant Condition Letter Cape May Region (April 17, 2002) "no sewer hookup or other connections to the sewage treatment facilities included in the scope of this grant will be allowed or permitted so as to allow the discharge of wastewater from any building, facility or other construction on any parcel of land within any wetland or within 100 year floodplains, which land parcel as of the date of the FNSI/EA was undeveloped, unless approved in writing by the Regional Director." The process for approval is delineated by the USEPA on its regional website, <http://www.epa.gov/region2/water/sewer.html>

Requests for development/sewer connection on parcels that encroach on floodplains are dependent upon whether or not the community in which the project is located participated in the regular phase of FEMA's National Flood Insurance Program and the location of the project within the floodplain. Since Upper Township is a FEMA participant, USEPA typically grants waivers for development/sewer connection in floodplains. However, the USEPA does not typically grant a general mapping waiver for floodplains. At the time development is proposed, the USEPA requires the submission of information for a waiver request on the specific project.

The USEPA's review criteria for wetlands mapping waivers, as detailed on the USEPA's website, are more stringent. As such, the Adopted Future Sewer Service Area accurately reflects the regulatory, statutory and contractual requirements that must be met in order for development/sewer connection of properties located in environmentally sensitive areas to occur. Wherever possible, the SSA excluded wetlands that have been verified by an LOI. In other areas, the NJDEP provided a revised wetlands layer in GIS which is shown as "Potential Environmentally Sensitive Area Subject to EPA Grant Restrictions" on the Adopted Future Sewer Service Area Map.



Planning Coordination

Plan Endorsement

Upper Township received Plan Endorsement from the New Jersey State Planning Commission on February 21, 2007, which designated the Centers and planning area classifications of the SDRP as Suburban (PA2), Fringe (PA3), Rural (PA4), Environmentally Sensitive (PA5) and Barrier Island/Environmentally Sensitive (PA5B) Planning Areas. The designated Centers include the Marmora-Palermo- Beesley's Point and Seaville Town Centers and the Tuckahoe and Petersburg Village Centers. Upper has defined its growth areas in Centers that reflect existing development patterns along the Route 9 corridor in the Town Centers of Marmora-Palermo-Beesley's Point and Seaville; with smaller villages reflecting again existing development patterns in Tuckahoe and Petersburg. These Centers both reflect existing growth and provide opportunities for development and affordable housing. It is noted that Strathmere is not a designated center.

The Township of Upper is proposing to extend sewer service to the Marmora Town Center District, which is entirely within the Marmora-Palermo- Beesley's Point Center, and the existing development along Roosevelt Boulevard to the Ocean City Region Wastewater Treatment Plant (WTP). Alternatively, the Marmora future sewer service area would discharge to groundwater if connection to Ocean City Region WTP is not feasible. In that event, the existing development along Roosevelt Boulevard would continue to discharge to groundwater.

Coastal Zone Management

New Jersey's Coastal Zone has been established pursuant to the federal Coastal Zone Management Act of 1972 and was federally approved in 1978. The Rules on Coastal Zone Management (N.J.A.C. 7:7E) establish the substantive rules of the NJDEP regarding the use and development of coastal resources. These rules provide the basic policy direction for planning actions undertaken by the NJDEP in the Coastal Zone as per Section 306 of the federal Coastal Zone Management Act. Planning decisions affecting New Jersey's Coastal Zone under the New Jersey WQMP Act and Section 208 of the federal Clean Water Act must be consistent with New Jersey's Coastal Zone Management program.

The Rules on Coastal Zone Management include identification of 48 Special Areas requiring special management consideration. In addition to the environmental features previously identified, the Rules on Coastal Zone Management generally prohibit development on beaches, dunes and in coastal high hazard areas. These areas have also been excluded from sewer service under this WMP because providing centralized sewer service would encourage a development pattern inconsistent with the environmental sensitivity, recreational importance, and risk to life and property in these areas.

The Rules on Coastal Zone Management further define planning areas within the coastal zone designed to shape future development patterns along the coast. Among the five coastal planning areas, the Coastal Fringe, Coastal Rural, and Coastal Environmentally Sensitive Planning Areas are identified as areas to encourage growth in compact centers and to maintain low density and low intensity development outside of those centers. The extension of centralized sewer service in these planning areas, outside of the proposed CAFRA Centers is inconsistent with the growth and protection objectives of New Jersey's Coastal Zone Management program and therefore, these coastal planning areas have been excluded from sewer service areas.



Proposed developments tying into existing and proposed sewer service areas which require coastal permits must demonstrate compliance with all applicable sections of the Coastal Zone Management rules including, but not limited to, Wetlands (N.J.A.C. 7:7E-3.27), Wetlands Buffers (N.J.A.C. 7:7E-3.38), Endangered or Threatened Wildlife or Vegetation Species Habitat (N.J.A.C. 7:7E-3.38), Secondary Impacts (N.J.A.C. 7:7E-6.3), Public Facility Use Policies (N.J.A.C. 7:7E-7.6), Water Quality (N.J.A.C. 7:7E-8.4), Ground Water Use (N.J.A.C. 7:7E-8.6) and the policies under General Land Areas rules, Subchapters 5, 5A and 5B.

Coordination with the Coastal Zone Management Program

On May 3, 2008, in accordance with N.J.A.C. 7:7E-5B.3, the NJDEP determined to accept new and changed Planning Area boundaries and Town and Village Center Community Development Boundaries for Upper Township, Cape May County, New Jersey that have been formally approved by the State Planning Commission as new and changed Planning Area boundaries and designated Town and Village Center Community Development Boundaries in the Coastal Zone. The Department has evaluated the boundaries and determined that they are consistent with the purposes of the Coastal Area Facility Review Act, N.J.S.A. 13:19-1 et seq., and the Coastal Zone Management rules at N.J.A.C. 7:7E.

Pinelands Comprehensive Management Plan

The Pinelands Area is established by the Pinelands Protection Act (N.J.S.A. 13:18A-1 et seq.) and the Pinelands National Reserve was created under the National Parks and Recreation Act of 1979, 16 U.S.C. § 471i. Those statutes are implemented through the Pinelands Comprehensive Management Plan (N.J.A.C. 7:50). The Water Quality Management Plan rules require coordination with the Pinelands Commission to ensure that amendments, including wastewater management plans, are consistent with the intent and programs of the Pinelands Protection Act. The Pinelands Commission has also entered into a Memorandum of Agreement with the State Planning Commission that certification of a municipality's land use plan as consistent with the Pinelands CMP by the Pinelands Commission shall be considered as endorsed plans under the State Plan.

The Pinelands Management Area encompasses 24.5 square miles (or 40 percent) of the land area of Upper Township. The Pinelands Comprehensive Management Plan designates the following areas within Upper Township: Forest Area, Rural Development Area and four Pinelands Villages: Belleplain, Eldora, North Dennis and Dennisville. For facilities (including but not limited to sewer connections, sewer extensions and on-site treatment plants) which are located in the Pinelands Area, as defined at N.J.S.A. 13:18A-11, the approval of the Pinelands Commission pursuant to the requirements of the Pinelands Comprehensive Management Plan ("CMP") is required prior to construction. All facilities and activities included within this WMP should be consistent with the requirements of the CMP.

The northwestern section of the Township, outside the Coastal Zone, is part of the Pinelands Management Area. The Pinelands Management area represents a partnership between the State and Federal government to preserve, protect and enhance the natural and cultural resources of Pinelands. The Pinelands Comprehensive Management Plan protects the region in a manner that maintains its unique ecology while permitting compatible development. The communities within the Pinelands are designated as either Pinelands Villages or Towns, which allow traditional development under certain rules. The Pinelands Protection Act established a requirement that county and municipal master plans and land use ordinances be brought into conformance with the Pinelands Comprehensive Management Plan. Upper Township's ordinance is in conformance with the Pinelands Comprehensive Management Plan.



The regulated Pinelands Management Area is within the Pinelands National Reserve, which extends beyond the limits of the Pinelands Management Area. In Upper Township, the Pinelands National Reserve overlaps the Coastal Zone, west of the Garden State Parkway. The Pinelands National Reserve is actually a federally designated area, consisting of approximately one million acres of land across southern New Jersey. This area was established under Section 502 of the National Parks and Recreation Act of 1978 (PL 95-625). Under a Memorandum of Agreement between the NJ Pinelands Commission and the NJDEP Land Use Regulation Program, the NJDEP is the lead agency in review of development applications in the Pinelands National Reserve Area. The NJ Pinelands Commission is a reviewing agency and may provide comments on development in this area.

For facilities (including but not limited to sewer connections, sewer extensions and on-site treatment plants) which are located in the Pinelands Area, as defined at N.J.S.A. 13:18A-11, the approval of the Pinelands Commission pursuant to the requirements of the Pinelands Comprehensive Management Plan (CMP) is required prior to construction. All facilities and activities included within this WMP should be consistent with the requirements of the CMP.

In accordance with the MOU between the New Jersey Pinelands Commission and NJDEP, dated April 9, 2012, all lands located within a Regional Growth Area, Pinelands Village or Pinelands Town shall be deemed to be within a sewer service area. Additionally, the NJDEP will not require that environmentally sensitive areas, as defined above, be removed from such sewer service areas.

Coordination with Municipalities and Sewer Authorities

Table 12-1 lists the municipalities and wastewater utilities that have been consulted during the preparation of the Upper Township WMP. The County consulted with them through mailings and e-mails, as well as a WMP Project Initiation Meeting on September 9, 2011. The County also held a municipal implementation meeting with Upper Township, the NJDEP and the CMCMUA on May 3, 2012 to discuss Sewer Service Area mapping requirements pursuant to P.L.2011, c.203. The Township also consulted with the Pinelands Commission via telephone and e-mail regarding future sewer service area designations in the Pinelands Management Area.

Table 12-1: Coordination with Municipalities and Sewer Authorities	
Municipality	Wastewater Utilities
<ul style="list-style-type: none"> • Dennis Township • Ocean City • Sea Isle City • Woodbine Borough 	<ul style="list-style-type: none"> • Cape May County Municipal Utilities Authority

III. EXISTING AND FUTURE WASTEWATER TREATMENT FACILITIES

This section addresses wastewater treatment facilities utilized by development within the Township of Upper, whether the treatment works itself is located within or outside of the Township.



Existing Areas Served by Wastewater Facilities

Map 12-3 shows the areas actively served by existing wastewater facilities, and the tables in Section VI provide detailed information on each facility. “Actively served” means that the collection lines exist and that the property either is connected or has all regulatory approvals necessary to be connected.

Sewer service areas may include industrial businesses that discharge process and/or sanitary wastewater to the collection system for treatment by a facility not owned by that business.

Existing Public Wastewater Treatment Works and Service Area

There are no existing major domestic wastewater treatment facilities for Upper Township.

Existing On-site, Non-industrial Wastewater Facilities

These facilities serve single developments, sites or other properties under single ownership, but do not treat industrial flows. These facilities typically provide wastewater treatment for apartment complexes, commercial properties and businesses where regional sewerage is not available. Facility tables for all existing on-site, non-industrial treatment facilities that discharge to surface water or that discharge more than 2,000 gallons per day to ground water of domestic wastewater and are regulated under a NJPDES permit can be found in Section VI.

Existing Industrial Treatment Works for Process Wastes and Sanitary Sewage

Some industrial land uses have independent wastewater treatment facilities that treat and discharge manufacturing process waste and/or sanitary sewage. They may be discharged to ground water or to surface water. Facility tables for all existing industrial treatment works that discharge to surface water or that discharge more than 2,000 gallons per day to ground water of process or sanitary wastewater and are regulated under a NJPDES permit can be found in Section VI.

Wastewater Management Areas for Septic Systems and Other Small Treatment Works Not Discharging to Surface Waters

Remaining areas of the Township, not otherwise designated as service areas for treatment facilities requiring a NJPDES permit, are included within one of two wastewater management area designations for septic systems and other small treatment works that treat 2,000 gallons per day or less of wastewater and discharge to ground water. Areas designated “Septic Area (ISSDS 2,000 GPD or Less)” have demonstrated that the zoning meets the nitrate planning standard of 2 mg/L on a HUC 11 basis. Areas designated “Restricted Septic Area (Planning Flows of 2,000 GPD or Less AND Less Than 6 Residential Units)” have not made this demonstration and thus, residential development or subdivisions with a total of less than 6 dwelling units are allowed, but residential developments of 6 or more units must undergo a nitrate dilution analysis to ensure that the individual or other subsurface sewage disposal systems can meet the 2 mg/L nitrate planning standard on-site.

IV. WASTEWATER TREATMENT CAPACITY ANALYSIS - SEWER SERVICE AREA

The existing and future wastewater management needs of each sewer service area of a Domestic Treatment Works (“DTW”), or industrial wastewater facility that receives wastewater from outside the



facility boundaries shall be identified and evaluated in a wastewater treatment capacity analysis. This chapter describes the build out methodology used to calculate existing wastewater flows for assigned sewer service areas (SSAs with a permitted treatment facility), as well as project future wastewater treatment demand for assigned and unassigned sewer service areas within the County.

Projecting Future Wastewater Flows

Wastewater Demand Projections in Urbanized Municipalities' Sewer Service Areas

The WQMP rules (N.J.A.C. 7:15-1.15) define urbanized municipalities as municipalities where 90 percent of the municipality's land area appears as Urban Lands on the most recent Land Use/Land Cover GIS database. Urbanized municipalities also include those municipalities identified as "Urban Aid" pursuant to the New Jersey Redevelopment Act, N.J.S.A. § 55:19-20 et seq.; as an "Urban Enterprise Zone" pursuant to the New Jersey Urban Enterprise Zones Act, N.J.S.A. 52:27H-60 et seq.; as a "Garden State Growth Zone" municipality pursuant to the New Jersey Economic Opportunity Act of 2013, N.J.S.A. 52:27D-489p et seq.; and as Transit Villages approved by the New Jersey Department of Transportation and NJ Transit.

In urbanized municipalities it is assumed that redevelopment of previously developed portions of the municipality will make up the majority of the future wastewater management needs. Therefore, an analysis limited to development potential based solely on the zoning of the undeveloped and developable land area of the municipality in these municipalities may underestimate their future wastewater management needs. In these urbanized municipalities, a 20-year wastewater projection is based on population and employment projections.

As shown in **Table 12-2**, the Township of Upper encompasses 19,851.6 acres within its boundaries, including water and environmentally sensitive lands. According to the 2012 NJDEP Land Use/Land Cover data, only 4,448.7 acres (22.4 percent) of Upper Township are classified as Urban Lands. The municipality does not qualify for Urban Aid, Urban Enterprise Zone, Garden State Growth Zone or Transit Village. Therefore, the Township of Upper does not qualify as an urbanized municipality.

Table 12-2: Urbanized Municipality Analysis	
Total Municipal Area	43,785.1 acres
Urban Land Area	4,179.2 acres
Urban Land Coverage	9.5%
Urban Aid Municipality	No
Urban Enterprise Zone	No
Garden State Growth Zone	No
Transit Village	No
Urbanized Municipality	No

In accordance with the N.J.A.C. 7:15-4.5(b)(2), municipalities that are not defined as urbanized must estimate build-out future wastewater flows from existing development that is not currently connected and future development based on flow projections.



Wastewater Demand Projections in Non-Urban Municipalities' Sewer Service Areas

In assigned and unassigned sewer service areas, where development exists on septic in the sewer service area, future flow is calculated with consideration of the type of development (ex. single family home, restaurant, office building, warehouse) and the amount of wastewater estimated to be generated by the development as provided in N.J.A.C. 7:14A-23.3. The build-out data is then converted to a projected future wastewater flow by applying the planning flow criteria from N.J.A.C. 7:14A based on the type of development. Similarly, for developable or redevelopable areas within the sewer service area, existing zoning is applied to project a build-out condition for use in estimating the future wastewater management needs of each sewer service area.

A municipal buildout analysis has been prepared in order to assess the amount of remaining developable lands within Upper Township and to assess the amount of potential development, if these lands were fully developed to their maximum potential. Utilizing GIS (geographic information system) technology, the amount of developable land has been assessed based on lot area and bulk requirements as compared to the minimum requirements of each individual zone district. (The complete Municipal Buildout Report is included in the **Appendix**).

This analysis has been prepared in order to assess the amount of remaining developable lands within the Township of Upper and to assess the amount of potential development, if these lands were fully developed to their maximum potential. Utilizing GIS (geographic information system) technology, the amount of developable land has been assessed based on lot area and bulk requirements as compared to the minimum requirements of each individual zone district.

This study is meant to demonstrate that the overall extent of potential future development based on the proposed zoning and the implications to the wastewater treatment facilities serving existing and future development. The results generated by these analyses were based on mathematic calculations of lot area and contiguous unconstrained land (land not encumbered with wetlands or riparian buffers) with regards to the requirements of the respective zoning. These analyses represent the total development limits of the municipality and do not account for time factors, economic factors or real estate trends. In other words, the analyses represent the maximum amount of development that could occur based on the amount of remaining developable lands. This study does not make any assumptions as to timeframe for the Township to reach full buildout, or even if it will. The results of this study are meant to illustrate the effects that the zoning would have if the Township were to become fully built-out. The calculated development potential of each parcel is subject to site-specific review of applicable state environmental regulations as well as municipal subdivision and site plan procedures.

Future Sewer Service Area Analysis

This future sewer service area analysis has been prepared to assess the potential wastewater demand generated by potential development and redevelopment within the municipality's future sewer service area. The analysis provides a maximum yield for potential additional residential units and non-residential floor area within the future sewer service area.

Methodology and Assumptions

- The Township of Upper is proposing to extend sewer service to the Marmora Town Center District and the existing development along Roosevelt Boulevard to the Ocean City Region



Wastewater Treatment Plant (WTP). Alternatively, the Marmora future sewer service area would discharge to groundwater if connection to Ocean City Region WTP is not feasible.

- The Township is also proposing to extend sewer to the existing development in Strathmere from the Seven Mile Beach/Middle Township Region WTP. However, this analysis is only based on the adopted Sewer Service Area map, which does not include the Strathmere area. Should the Township wish to consider sewerage Strathmere, the municipality will need to pursue the site-specific amendment process with the NJDEP.
- The buildout analysis of the Marmora Town Center District, performed by the Upper Township Engineer in September 2018, is incorporated into this analysis.
- The analysis assumes that the Marmora Town Center District will be redeveloped in accordance with the underlying MTCD zone district. Future development outside of the Marmora Town Center District is considered under the septic buildout analysis.
- As there is currently no sewer service for Marmora, the total buildout will contribute to future wastewater demand. Existing development is not subtracted from the future flows.
- The permitted use(s) of each zone dictates whether each property is assigned a residential, non-residential or mixed-use development.
- Where a zone permits mixed-use development, the analysis assumes that the first floor will be retail with residential on the upper floors.
- The analysis was performed based on blocks rather than individual parcels in accordance with the concept plan prepared by the Upper Township Engineer.
- NJDEP projected flows for residential dwellings are based on the number of bedrooms in each unit (1 bedroom = 150 GPD, 2 bedrooms = 225 GPD, 3+ bedrooms = 300 GPD). Future residential units are assumed to have 3 or more bedrooms, which would produce an average of 300 GPD per unit.
- NJDEP projected flows for nonresidential development differ based on type of development (i.e. office, retail, restaurant, church, theater, etc.). All nonresidential development is assumed to produce 0.100 GPD/sq. ft., which is the projected criterion for both office and retail.

Buildout Analysis of Future Sewer Service Area

Table 12-3: Buildout Analysis of Future Sewer Service Area shows the existing and future residential dwelling units (DU) and non-residential floor area (SF) potential development for each zone.

The analysis estimates 2,436 residential units and 8.526 million square feet of non-residential space within the Marmora Town Center, which is proposed to be served by the Ocean City Region WTP.

The analysis also shows a total of 777 units planned or approved which would discharge to groundwater greater than 2,000 GPD under individual New Jersey Pollutant Discharge Elimination System (NJPDES) permits.



Table 12-3: Buildout Analysis of Sewer Service Areas								
Future Wastewater Service Area	Zone	Existing to be Connected		New Development		Planned/ Approved	Total	
		(DU)	(SF)	(DU)	(SF)	(DU)	(DU)	(SF)
Ocean City Region WTP	MTCD	0	0	2,436	8,526,505	0	2,436	8,526,505
	Subtotal	0	0	2,436	8,526,505	0	2,436	8,526,505
Proposed Discharge to Groundwater Greater than 2,000 GPD	AHGR	0	0	0	0	8	8	0
	AR	0	0	0	0	60	60	0
	MH	0	0	0	0	210	210	0
	R	0	0	0	0	334	334	0
	R2	0	0	0	0	15	15	0
	TCC	0	0	0	0	150	150	0
	Subtotal	0	0	0	0	777	777	0

Wastewater Demand Analysis for Future Sewer Service Area

Table 12-4: Wastewater Demand Analysis for Sewer Service Areas summarizes the estimated wastewater flows by multiplying the results in **Table 12-3** by the NJDEP projected flows of 300 gallons per day (GPD) per residential unit and 0.100 GPD per square foot of non-residential floor area. Industrial wastewater flow is estimated at 0.030 GPD per square foot of industrial floor area. Campsites use a multiplier of 200 GPD per unit.

Table 12-4: Wastewater Demand Analysis of Sewer Service Areas						
Future Wastewater Service Area	Zone	Total Residential		Total Non-Residential		TOTAL DEMAND
		(DU)	(GPD)	(SF)	(GPD)	(GPD)
Ocean City Region WTP	MTCD	2,436	730,800	8,526,505	852,650	1,583,450
	Subtotal					
Discharge to Groundwater	AHGR	8	2,400	0	0	2,400
	AR	60	18,000	0	0	18,000
	MH	210	63,000	0	0	63,000
	R	334	100,200	0	0	100,200
	R2	15	4,500	0	0	4,500
	TCC	150	45,000	0	0	45,000
	Subtotal	777	233,100	0	0	233,100

Wastewater Capacity Analysis of Future Sewer Service Area

In accordance with N.J.A.C. 7:15-4.5(b)2, the wastewater demand projections for the service area must be compared against the total wastewater capacity of the treatment plant. **Table 12-5: Wastewater**



Capacity Analysis of Sewer Service Areas provides the total projected future wastewater demand for each wastewater service area within Upper Township.

Table 12-5: Wastewater Capacity Analysis of Sewer Service Areas			
Future Sewer Service Area	Existing (MGD)	Future (MGD)	Total (MGD)
Ocean City Region WTP	0	1.583	1.583

Upper Township does not have any wastewater allocation in the Ocean City Region WTP. The analysis estimates that approximately 1.583 MGD will need to be allocated from the Ocean City Region WTP for Upper Township to develop the Marmora Town Center per the MTCD zoning. This will need to be coordinated with the CMCMA and Ocean City.

V. NITRATE DILUTION ANALYSIS - NON-SEWER SERVICE AREA

Buildout Analysis of Septic Management Area

The buildout analysis of the septic management area calculates the future development potential on a parcel-by-parcel basis, based on existing or proposed zoning for the Township of Upper. **Table 12-6: Buildout Analysis of Septic Management Area** shows the development potential for each zone, segregated by watershed, which is calculated as the sum of the approved development, grandfathered parcels, and remaining developable vacant and farmland properties. Future non-residential uses are converted from square feet of floor area to the equivalent number of residential uses.



Table 12-6: Buildout Analysis of Septic Management Area							
HUC11 Watershed	Zone District	Grand-fathered Parcels	Developable Vacant & Farmland Properties	Further Subdividable Residential Properties	Non-Residential		Total Potential Units
					Floor Area (Sq. Ft.)	Equivalent Residential Units	
02040302060 Patcong Creek /Great Egg Harbor Bay	R	1	1	5	0	0.0	7.0
	TC	0	0	0	11,733	2.9	2.9
	Subtotal	1	1	5	11,733	2.9	9.9
02040302070 Tuckahoe River	AR	17	27	0	0	0.0	44.0
	C	2	5	0	0	0.0	7.0
	CM2	0	0	0	23,723	6.0	6.0
	CM4	0	0	0	10,972	2.8	2.8
	R	2	107	43	0	0.0	152.0
	R2	2	32	5	0	0.0	39.0
	RP	0	45	8	0	0.0	53.0
	TC	0	0	0	103,998	26.1	26.1
	TCC	0	0	0	7,663	1.9	1.9
	TR	0	25	1	0	0.0	26.0
	TV	0	8	25	0	0.0	33.0
	MTCD	0	0	0	26,666	6.7	6.7
	Subtotal	23	249	82	173,022	43.5	397.5
02040302080 Cape May Bays & Tribs East	CM2	0	0	0	19,388	4.9	4.9
	R	3	40	37	0	0.0	80.0
	R2	2	37	38	0	0.0	77.0
	TC	0	0	0	32,732	8.2	8.2
	TCC	0	0	0	281,966	70.8	70.8
	MTCD	0	0	0	106,664	26.8	26.8
	Subtotal	5	77	75	334,087	110.7	267.7
02040302940 Atlantic Coast (34th St to Cape May Pt)	N/A	0	0	0	0	0.0	0.0
	Subtotal	0	0	0	0	0.0	0.0
TOTAL		29	327	162	518,842	157.1	675.1

Antidegradation Analysis of Septic Management Area

In areas outside of sewer service areas, the default wastewater management alternative is discharge to groundwater of 2,000 gallons per day or less, commonly referred to as septic systems. The assessment of water quality impacts from development on septic systems relies on nitrate concentration. In this analysis, nitrate acts as a conservative surrogate for any of a number of constituents that could be discharged from a septic system (e.g. cleaners, solvents, pharmaceuticals, etc.). Nitrate is chosen because it is highly soluble in water, and because it is a stable compound that by itself could render water unsuitable for human consumption. The capacity to support septic systems without violating groundwater quality standards is determined by the amount of dilution available. The Water Quality Management Planning Rules advocate a watershed approach to assessing the adequacy of available dilution to meet future development on septic systems. Using this approach, available dilution, (essentially groundwater recharge), is calculated within a HUC 11 watershed and translated into a finite amount of wastewater that can be discharged, which in turn can be translated into a finite number of housing units that can be supported while maintaining a target concentration of nitrate in groundwater. Zoning is then applied to the available land in that same watershed, outside of any sewer service area, to calculate the number of units that could be developed on septic systems. The results of these two analyses are then compared and if the number of units based on zoning does not exceed the maximum units that can be supported, adequate capacity has been demonstrated. If the number of units allowed by zoning exceeds that which can be supported in a particular watershed, then some adjustment to zoning within that watershed is required.

The NJDEP Water Quality Management Planning Rule (N.J.A.C. 7:15-5.25(e)) requires the CMCWMP to determine the development density that can be accommodated in undeveloped and underdeveloped areas that will result in attainment of 2.0 mg/L nitrate in the ground water on a HUC11 watershed basis. This section summarizes the nitrate dilution modeling calculations and results for the lot density (minimum lot size) that can be supported in the septic management areas of the municipality to meet the nitrate target goal.

The Nitrate Dilution Analysis determines the amount of land contributing to nitrate dilution and groundwater recharge, which in turn determined the average septic density within each HUC11 watershed in the municipality required to meet the NJDEP's 2 mg/L target nitrate concentration anti-degradation policy and the maximum number of new septic systems that can be supported in each HUC11.

The Nitrate Dilution Analysis for septic systems is performed in similar fashion to that conducted for sewer service areas, except that environmentally sensitive areas are not removed prior to performing the build-out analysis. This is due to the fact that while certain areas may be unbuildable, such as riparian zones or steep slopes, they still contribute to the overall available dilution of nitrate in groundwater. These areas were also not removed when analyzing the available dilution on a HUC11 basis used to establish the maximum number of units that can be built in a watershed and continue to meet the 2 mg/L nitrate target. Thus, while some areas may contribute less overall groundwater recharge, due to factors such as soils or topography, these limitations have already been taken into consideration when calculating the maximum average density allowable.

This analysis used NJDEP's nitrate-nitrogen target of 2 mg/L, with the assumption that all ammonium and other nitrogen compounds are converted to nitrate within the property, and that the nitrate concentrations dilute evenly across the HUC11 watershed. These assumptions are implicit in the nitrate dilution model developed by NJDEP.



The WQMP Rule does not mandate uniformly zoning minimum lot sizes at the calculated densities across the watershed. Rather, this comparable residential zoning density represents the total number of units that, if built, would not result in a degradation of groundwater quality within a given watershed by exceeding the 2 mg/L nitrate limit. The NJDEP advocates zoning to allow for center-based development, clustering, and protection of environmental features and agriculture land.

Table 12-7: Antidegradation Analysis of Septic Management Area below presents the maximum number of new residential units that can be developed within the septic management area of the Township of Upper without substantially degrading the water quality within each HUC11 Watershed. The Potential New Units is then compared against the Target Septic Units for each HUC11 Watershed to determine whether the zoning will result in degradation of the watershed above the 2 mg/L nitrate standard.

HUC11 Watershed	Recharge (Acres)	Septic Density (Acres / Septic)	Target (Septic Units)	Potential New Units	Surplus(+)/ Deficit(-)
02040302060 Patcong Creek/Great Egg Harbor Bay	38	8.7	4.32	9.9	-5.58
02040302070 Tuckahoe River	3,110	6.1	509.83	397.5	112.33
02040302080 Cape May Bays & Tribs East	514	8.8	58.38	267.7	-209.32
02040302940 Atlantic Coast (34th St to Cape May Pt)	57	8.6	6.61	0	6.61
TOTAL	3,718	N/A	579.14	675.1	-95.96

Based on the buildout analysis, the Cape May Bays & Tributaries East HUC11 watershed (02040302080) within the Township of Upper will exceed the target septic density by 209 units at full buildout and the Patcong Creek/Great Egg Harbor Bay HUC11 watershed (02040302060) will exceed the target septic density by 6 units at full buildout.

In accordance with N.J.A.C. 7:15-5.25(e), the Township is required to adjust the zoning in order to achieve consistency between zoning and the allowable number of additional equivalent dwelling units at build-out in the undeveloped and underdeveloped areas. Unfortunately, due to the number of equivalent units already approved and the number of lots that would be grandfathered, decreasing the density (increasing the minimum lot size) will not resolve the deviation in the Cape May Bays & Tributaries East HUC11 watershed. In order to protect the water quality of this HUC11 Watershed from degradation, the Township is recommended to adopt a Cape May Bays & Tributaries East Overlay Zone. This area is designated “Restricted Septic Area (Planning Flows of 2,000 GPD or Less AND Less Than 6 Residential Units)” on **Map 12-3**. Within this area, residential development or subdivisions with a total of less than 6 dwelling units are permitted in accordance with the underlying zoning, but residential developments of 6 or more units must undergo a nitrate dilution analysis to ensure that the individual or other subsurface sewage disposal systems can meet the 2 mg/L nitrate planning standard on-site.



VI. WASTEWATER FACILITY TABLES

The wastewater facility tables for all sanitary and/or process wastewater discharge to surface water facilities and those sanitary and/or process wastewater discharge to groundwater facilities discharging greater than 2,000 gallons per day (i.e., requiring NJPDES permits) are listed below. They include domestic wastewater treatment facilities which may serve one or multiple municipalities, onsite domestic treatment facilities, onsite sanitary subsurface sewage disposal system general permit (T-1 Permit) treatment facilities, and/or industrial treatment facilities which treat only industrial process wastewater, and/or facilities serving industrial land uses that have independent wastewater treatment facilities that treat and discharge manufacturing process waste and/or sanitary sewage that may be discharged to ground water or to surface water.

Domestic Wastewater Facilities with Sewer Service Area in Multiple Municipalities

Table 12-8: Ocean City Wastewater Treatment Facility		
1. Existing or Proposed Facility:	Existing	
2. NJPDES Permit Number:	NJ0035343	
3. Discharge Type:	A – Domestic Discharge to Surface Water (DSW)	
4. Receiving Water or Aquifer:	Atlantic Ocean	
5. Classification of Receiving Water:	SC	
6. Owner of Facility:	Cape May County Municipal Utilities Authority	
7. Operator of Facility:	Cape May County Municipal Utilities Authority	
8. Co-Permittee of Facility:	Not Applicable	
9. Location of Facility:		
a. Municipality & County	Ocean City, Cape May County	
b. Street Address	45th Street & Simpson Ave	
c. Block(s) and Lot(s)	Block 5150, Lot 13	
10. Location of Discharge:	Latitude: 39° 13' 24.1" N Longitude: 74° 36' 33.5" W	
11. Design Capacity:	8.240 MGD	
12. Summary of wastewater flows:	Existing Summer Flow (MGD)	Build-out or 20-Year Future (Year 2040) (MGD)
Ocean City	5.390	5.637
Upper Township (Marmora)	0.000	1.583
Facility Total	5.390	7.220



On-Site Domestic Treatment Facilities**Table 12-9: B.L. England Generating Station/Atlantic Electric**

1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0077771
3. Discharge Type:	Discharge to Groundwater (GW)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	B.L. England Generating Station/Atlantic Electric
7. Operator of Facility:	B.L. England Generating Station/Atlantic Electric
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	900 N Shore Rd
c. Block(s) and Lot(s)	Block 479, Lot 76
10. Location of Discharge:	Latitude: 39° 17' 23.003" N Longitude: 74° 38' 2.195" W

Table 12-10: Bayberry Cove Campground

1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0075558
3. Discharge Type:	Discharge to Groundwater (GW)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Bayberry Cove Campground
7. Operator of Facility:	Bayberry Cove Campground
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	435 Route 9
c. Block(s) and Lot(s)	Block 599, Lot 16
10. Location of Discharge:	Latitude: 39° 5' 45.709" N Longitude: 74° 52' 36.611" W

Table 12-11: Bayview Motel

1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	Unpermitted
3. Discharge Type:	Unknown
4. Receiving Water or Aquifer:	Unknown
5. Classification of Receiving Water:	Unknown
6. Owner of Facility:	Unknown
7. Operator of Facility:	Unknown
8. Co-Permittee of Facility:	Unknown
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	600 Bayview Dr
c. Block(s) and Lot(s)	Block 826, Lot 6
10. Location of Discharge:	Unknown



Table 12-12: Cedar Square Shopping Center	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0062944
3. Discharge Type:	Discharge to Groundwater (GW)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Cedar Square Shopping Center
7. Operator of Facility:	Cedar Square Shopping Center
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	2087 S Shore Rd
c. Block(s) and Lot(s)	Block , Lot
10. Location of Discharge:	Latitude: 39° 12' 28.624" N Longitude: 74° 42' 6.290" W

Table 12-13: Deauville Inn	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ01019924
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Deauville Inn
7. Operator of Facility:	Deauville Inn
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	201 Willard Rd
c. Block(s) and Lot(s)	Block 560, Lots 1.01 & 1.02
10. Location of Discharge:	Latitude: 39° 12' 0.2" N Longitude: 74° 39' 20.36" W

Table 12-14: Dino's Seaville Diner	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0109550
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Dino's Seaville Diner
7. Operator of Facility:	Dino's Seaville Diner
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	31 RT 50
c. Block(s) and Lot(s)	Block 561, Lot 6
10. Location of Discharge:	Latitude: 39° 12' 47.31" N Longitude: 74° 42' 23.14" W



Table 12-15: Echo Farm Campground	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0135071
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Echo Farm Campground
7. Operator of Facility:	Echo Farm Campground
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	3066 RT 9
c. Block(s) and Lot(s)	Block 558, Lots 17 & 46
10. Location of Discharge:	Latitude: 39° 11' 58" N Longitude: 74° 42' 44.76" W

Table 12-16: Econo Lodge	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0108537
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Econo Lodge
7. Operator of Facility:	Econo Lodge
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	119 Route 9 South
c. Block(s) and Lot(s)	Block 599, Lot 33
10. Location of Discharge:	Latitude: 39° 15' 36.17" N Longitude: 74° 39' 1.03" W

Table 12-17: Frontier Campground	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0084972
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Frontier Campground
7. Operator of Facility:	Frontier Campground
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	Route 50 & Greenfield
c. Block(s) and Lot(s)	Block 548, Lot 20
10. Location of Discharge:	Latitude: 39° 14' 33.39" N Longitude: 74° 42' 24.91" W



Table 12-18: Guiseppe's Restaurant	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	Unpermitted
3. Discharge Type:	Unknown
4. Receiving Water or Aquifer:	Unknown
5. Classification of Receiving Water:	Unknown
6. Owner of Facility:	Unknown
7. Operator of Facility:	Unknown
8. Co-Permittee of Facility:	Unknown
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	108 Route 50
c. Block(s) and Lot(s)	Block 453, Lot 178.03
10. Location of Discharge:	Unknown

Table 12-19: Heritage Links	
1. Existing or Proposed Facility:	Proposed
2. NJPDES Permit Number:	Unpermitted
3. Discharge Type:	Unknown
4. Receiving Water or Aquifer:	Unknown
5. Classification of Receiving Water:	Unknown
6. Owner of Facility:	Unknown
7. Operator of Facility:	Unknown
8. Co-Permittee of Facility:	Unknown
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	1423 Route 9 South
c. Block(s) and Lot(s)	Block 567, Lot 49 & 50.01
10. Location of Discharge:	Unknown

Table 12-20: Hidden Pond	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	Unpermitted
3. Discharge Type:	Unknown
4. Receiving Water or Aquifer:	Unknown
5. Classification of Receiving Water:	Unknown
6. Owner of Facility:	Unknown
7. Operator of Facility:	Unknown
8. Co-Permittee of Facility:	Unknown
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	3011 Route 9 South
c. Block(s) and Lot(s)	Block 559, Lots 36.01, 37 & 39
10. Location of Discharge:	Unknown



Table 12-21: Marmora Shop Rite

1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0167827
3. Discharge Type:	Discharge to Groundwater (GW)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Mamora Shop Rite
7. Operator of Facility:	Mamora Shop Rite
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	Old Tuckahoe Rd & Stagecoach Rd
c. Block(s) and Lot(s)	Block 651, Lots 1, 3, 11 & 16; Block 653.01, Lots 1 & 5
10. Location of Discharge:	Unknown

Table 12-22: Mildred's Restaurant

1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	Unpermitted
3. Discharge Type:	Unknown
4. Receiving Water or Aquifer:	Unknown
5. Classification of Receiving Water:	Unknown
6. Owner of Facility:	Unknown
7. Operator of Facility:	Unknown
8. Co-Permittee of Facility:	Unknown
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	901 S Commonwealth Ave
c. Block(s) and Lot(s)	Block 822, Lot 1
10. Location of Discharge:	Unknown

Table 12-23: N.J. Bell Telephone

1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0071676
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	N.J. Bell Telephone
7. Operator of Facility:	N.J. Bell Telephone
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	11 Route 9 South
c. Block(s) and Lot(s)	Block 599, Lot 51
10. Location of Discharge:	Unknown



Table 12-24: Oak Ridge Campground	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0084891
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Oak Ridge Campground
7. Operator of Facility:	Oak Ridge Campground
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	516 Route 9
c. Block(s) and Lot(s)	Block 600, Lot 62
10. Location of Discharge:	Latitude: 39° 15' 13.94" N Longitude: 74° 39' 38.04" W

Table 12-25: Oakcrest Complex	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	Unpermitted
3. Discharge Type:	Unknown
4. Receiving Water or Aquifer:	Unknown
5. Classification of Receiving Water:	Unknown
6. Owner of Facility:	Unknown
7. Operator of Facility:	Unknown
8. Co-Permittee of Facility:	Unknown
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	69 Route 50
c. Block(s) and Lot(s)	Block 561, Lot 34
10. Location of Discharge:	Unknown

Table 12-26: Ocean Beach Trailer Resort	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0089681
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Ocean Beach Trailer Resort
7. Operator of Facility:	Ocean Beach Trailer Resort
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	1100 S Commonwealth Ave
c. Block(s) and Lot(s)	Block 811, Lots 8 & 9
10. Location of Discharge:	Latitude: 39° 11' 30.67" N Longitude: 74° 39' 42.28" W



Table 12-27: Ocean Sands Resort	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0135470
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Ocean Sands Resort
7. Operator of Facility:	Ocean Sands Resort
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	56 Route 50
c. Block(s) and Lot(s)	Block 453.10, Lots 356 & 357
10. Location of Discharge:	Latitude: 39° 12' 56.67" N Longitude: 74° 42' 27.01" W

Table 12-28: Osprey Village Age Restricted Housing	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0137847
3. Discharge Type:	Discharge to Groundwater (GW)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Osprey Village Age Restricted Housing
7. Operator of Facility:	Osprey Village Age Restricted Housing
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	1731 Route 9 South
c. Block(s) and Lot(s)	Block 567, Lot 27
10. Location of Discharge:	Latitude: 39° 13' 24.048" N Longitude: 74° 41' 18.526" W

Table 12-29: Petersburg Disability Center	
1. Existing or Proposed Facility:	Proposed
2. NJPDES Permit Number:	Unpermitted
3. Discharge Type:	Unknown
4. Receiving Water or Aquifer:	Unknown
5. Classification of Receiving Water:	Unknown
6. Owner of Facility:	Unknown
7. Operator of Facility:	Unknown
8. Co-Permittee of Facility:	Unknown
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	1901 Dennis-Petersburg Road
c. Block(s) and Lot(s)	Block 453, Lot 1
10. Location of Discharge:	Unknown



Table 12-30: Pine Hill Trailer Park I & II	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0100242
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Pine Hill Trailer Park
7. Operator of Facility:	Pine Hill Trailer Park
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	342 Route 9 South
c. Block(s) and Lot(s)	Block 600, Lots 40-43
10. Location of Discharge:	Latitude: 39° 15' 20.8" N Longitude: 74° 39' 31.1" W

Table 12-31: Plantation Campground	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0084964
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Plantation Campground
7. Operator of Facility:	Plantation Campground
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	60 Corson Tavern Rd
c. Block(s) and Lot(s)	Block 453, Lots 260-262
10. Location of Discharge:	Latitude: 39° 12' 28.49" N Longitude: 74° 43' 20.74" W

Table 12-32: Riverview Campground	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0129003
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Riverview Campground
7. Operator of Facility:	Riverview Campground
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	465 Route 49
c. Block(s) and Lot(s)	Block 12, Lot 9
10. Location of Discharge:	Latitude: 39° 18' 20.25" N Longitude: 74° 47' 57.03" W



Table 12-33: Seaville Park	
1. Existing or Proposed Facility:	Proposed
2. NJPDES Permit Number:	Unpermitted
3. Discharge Type:	Unknown
4. Receiving Water or Aquifer:	Unknown
5. Classification of Receiving Water:	Unknown
6. Owner of Facility:	Unknown
7. Operator of Facility:	Unknown
8. Co-Permittee of Facility:	Unknown
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	2058 Route 9 South
c. Block(s) and Lot(s)	Block 561, Lot 25
10. Location of Discharge:	Unknown

Table 12-34: Seaville Shores Campground	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0085309
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Seaville Shores Campground
7. Operator of Facility:	Seaville Shores Campground
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	98 Corson Tavern Rd
c. Block(s) and Lot(s)	Block 453, Lot 255
10. Location of Discharge:	Latitude: 39° 11' 59.24" N Longitude: 74° 43' 12.54" W

Table 12-35: Shady Oaks Campground	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0085171
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Shady Oaks Campground
7. Operator of Facility:	Shady Oaks Campground
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	64 Route 50
c. Block(s) and Lot(s)	Block 453.10, Lots 360 & 362
10. Location of Discharge:	Latitude: 39° 13' 4.97" N Longitude: 74° 42' 30.59" W



Table 12-36: Shaw Farm Park	
1. Existing or Proposed Facility:	Approved April 12, 2012 (AMD110001)
2. NJPDES Permit Number:	Unknown
3. Discharge Type:	Discharge to Groundwater (GW)
4. Receiving Water or Aquifer:	Kirkwood-Cohansey Aquifer
5. Classification of Receiving Water:	Class II groundwater
6. Owner of Facility:	Ralph Clayton
7. Operator of Facility:	Ralph Clayton
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	640 Tuckahoe Rd
c. Block(s) and Lot(s)	Block 639, Lots 14, 15.01, 15.02 & 15.03
10. Location of Discharge:	Unknown

Table 12-37: Shore Acres Trailer Park	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0084743
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Shore Acres Trailer Park
7. Operator of Facility:	Shore Acres Trailer Park
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	1621 Route 9 South
c. Block(s) and Lot(s)	Block 567, Lots 37 & 38
10. Location of Discharge:	Latitude: 39° 13' 39.4" N Longitude: 74° 41' 13.11" W

Table 12-38: Shore Acres Trailer Park - Phase 2	
1. Existing or Proposed Facility:	Proposed
2. NJPDES Permit Number:	Unpermitted
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Shore Acres Trailer Park
7. Operator of Facility:	Shore Acres Trailer Park
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	18 Nadine Blvd & 5 Jason Dr
c. Block(s) and Lot(s)	Block 567, Lots 45.11 & 45.18
10. Location of Discharge:	Unknown



Table 12-39: Shore Birds Campground	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJG0134309
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Shore Birds Campground
7. Operator of Facility:	Shore Birds Campground
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	1314 Stagecoach Rd
c. Block(s) and Lot(s)	Block 549, Lots 38 & 39
10. Location of Discharge:	Latitude: 39° 14' 14.92" N Longitude: 74° 41' 9.89" W

Table 12-40: Strathmere Motel	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	Unpermitted
3. Discharge Type:	Unknown
4. Receiving Water or Aquifer:	Unknown
5. Classification of Receiving Water:	Unknown
6. Owner of Facility:	Unknown
7. Operator of Facility:	Unknown
8. Co-Permittee of Facility:	Unknown
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	513 S Commonwealth Ave
c. Block(s) and Lot(s)	Block 834, Lot 1
10. Location of Discharge:	Unknown

Table 12-41: Township Senior Apartments	
1. Existing or Proposed Facility:	Proposed
2. NJPDES Permit Number:	Unpermitted
3. Discharge Type:	Unknown
4. Receiving Water or Aquifer:	Unknown
5. Classification of Receiving Water:	Unknown
6. Owner of Facility:	Unknown
7. Operator of Facility:	Unknown
8. Co-Permittee of Facility:	Unknown
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	Stagecoach Road
c. Block(s) and Lot(s)	Block 549, Lots 70, 87 & 102-104
10. Location of Discharge:	Unknown



Table 12-42: Triton Bar	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	Unpermitted
3. Discharge Type:	Unknown
4. Receiving Water or Aquifer:	Unknown
5. Classification of Receiving Water:	Unknown
6. Owner of Facility:	Unknown
7. Operator of Facility:	Unknown
8. Co-Permittee of Facility:	Unknown
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	1291 Route 50
c. Block(s) and Lot(s)	Block 445, Lot 1
10. Location of Discharge:	Unknown

Table 12-43: Tuckahoe Inn	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0073725
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Tuckahoe Inn
7. Operator of Facility:	Tuckahoe Inn
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	2 Harbor Rd
c. Block(s) and Lot(s)	Block 682, Lots 1 & 2
10. Location of Discharge:	Latitude: 39° 17' 14.04" N Longitude: 74° 37' 42.17" W

Table 12-44: U.S. Coast Guard Housing Facility	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJG0088561
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	U.S. Coast Guard
7. Operator of Facility:	U.S. Coast Guard
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	1823 Route 9 South
c. Block(s) and Lot(s)	Block 567, Lot 24
10. Location of Discharge:	Latitude: 39° 13' 17.02" N Longitude: 74° 41' 17.21" W



Table 12-45: Upper Township BOE Middle School	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0135623
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Upper Township BOE
7. Operator of Facility:	Upper Township BOE
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	Tuckahoe Rd & Glory Rd
c. Block(s) and Lot(s)	Block 661, Lots 35, 26 & 39
10. Location of Discharge:	Latitude: 39° 15' 46.81" N Longitude: 74° 43' 52.57" W

Table 12-46: Upper Township Elementary & Primary School	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0069922
3. Discharge Type:	Discharge to Groundwater (GW)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Upper Township BOE
7. Operator of Facility:	Upper Township BOE
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	525 Perry Rd
c. Block(s) and Lot(s)	Block 477, Lot 4
10. Location of Discharge:	Latitude: 39° 16' 11.809" N Longitude: 74° 38' 48.004" W

Table 12-47: Upper Twp Sand & Gravel	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0129054
3. Discharge Type:	Industrial Wastewater (B)
4. Receiving Water or Aquifer:	Cedar Swamp Creek (via ditch)
5. Classification of Receiving Water:	FW2-NT/SE1
6. Owner of Facility:	Better Materials Corp.
7. Operator of Facility:	Better Materials Corp.
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	1401 Dennis-Petersburg Rd
c. Block(s) and Lot(s)	Block 453, Lot 4
10. Location of Discharge:	Latitude: 39° 13' 59.4" N Longitude: 74° 45' 06.0" W



Table 12-48: Wawa # 758	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJG0178161
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Wawa # 758
7. Operator of Facility:	Wawa # 758
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	42 Route 9 South
c. Block(s) and Lot(s)	Block 651, Lot 12
10. Location of Discharge:	Latitude: 39° 15' 48.58" N Longitude: 74° 38' 57.66" W

Table 12-49: Wayside Village Shopping Center	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0108227
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Wayside Village Shopping Center
7. Operator of Facility:	Wayside Village Shopping Center
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	Tuckahoe Rd
c. Block(s) and Lot(s)	Block 600, Lots 27-30
10. Location of Discharge:	Latitude: 39° 15' 48.33" N Longitude: 74° 39' 7.08" W

Table 12-50: Whippoorwill Campground	
1. Existing or Proposed Facility:	Existing
2. NJPDES Permit Number:	NJ0085294
3. Discharge Type:	Sanitary Subsurface Disposal (T1)
4. Receiving Water or Aquifer:	Not Applicable
5. Classification of Receiving Water:	Not Applicable
6. Owner of Facility:	Whippoorwill Campground
7. Operator of Facility:	Whippoorwill Campground
8. Co-Permittee of Facility:	Not Applicable
9. Location of Facility:	
a. Municipality & County	Upper Township, Cape May County
b. Street Address	810 Route 9 South
c. Block(s) and Lot(s)	Block 616, Lots 1-5
10. Location of Discharge:	Latitude: 39° 14' 46.47" N Longitude: 74° 40' 6.68" W



VII. STRATEGIES TO MITIGATE POTENTIAL CAPACITY DEFICIENCIES

Strategies to Mitigate Capacity Deficiency in Sewer Service Areas

Where a sewage treatment plant does not have sufficient remaining capacity to meet the future wastewater needs of the sewer service area, the WMP agency must identify and evaluate strategies for addressing the potential capacity deficiencies, including management approaches and infrastructure improvements. There are currently no public sewers in Upper Township; therefore, there are no capacity deficiencies to address. The buildout analysis indicates that there would be sufficient capacity within the Ocean City Region Wastewater Treatment Plant to accommodate the planned sewer connection for Marmora.

Strategies to Mitigate Capacity Deficiency in Non-Sewer Service Areas

As noted previously and tabulated in **Table 12-7**, there are certain HUC11 watersheds where the potential number of equivalent dwelling units under zoned build-out will exceed the nitrate dilution or septic carrying capacity. Based on the buildout analysis, Cape May Bays & Tributaries East HUC11 watershed (02040302080) will exceed the target septic density by 209 units at full buildout. The WQMP rules require that municipalities, in concert with the County and the NJDEP, develop strategies to prevent the build-out from exceeding the available dilution capacity of the remaining undeveloped lands in those watersheds. Strategies to mitigate deficiency in specific watersheds and zoning districts may include:

1. Identification of areas appropriate for sewer service
2. Requiring ISSDS to reach a higher level of treatment
3. Open space acquisition (or preserving undeveloped land to limit future development)
4. Zoning changes – rezoning areas to reduce the potential development yield that may result within the septic management area.

Unfortunately, due to the number of equivalent units already approved and the number of lots that would be grandfathered, decreasing the density (increasing the minimum lot size) will not resolve the deviation in the Cape May Bays & Tributaries East HUC11 watershed. In order to protect the water quality of this HUC11 Watershed from degradation, the Township is recommended to adopt a “Cape May Bays & Tributaries East Overlay Zone”. This area is designated “Restricted Septic Area (Planning Flows of 2,000 GPD or Less AND Less Than 6 Residential Units)” on **Map 12-3**. Within this area, residential development or subdivisions with a total of less than 6 dwelling units are permitted in accordance with the underlying zoning, but residential developments of 6 or more units must undergo a nitrate dilution analysis to ensure that the individual or other subsurface sewage disposal systems can meet the 2 mg/L nitrate planning standard on-site.



VIII. APPENDIX

Municipal Buildout Report
Map 12-1: Existing Land Use
Map 12-2: Existing Zoning
Map 12-3: Adopted Sewer Service Areas
Map 12-4: Hydrologic Features
Map 12-5: Natural Features
Map 12-6: Buildout Results



Cape May County Wastewater Management Plan

Municipal Buildout Report

For

Township of Upper

Chapter 12

JANUARY 15, 2019

Prepared By:



CAPE MAY COUNTY PLANNING DEPARTMENT

Cape May County Planning Department
4 Moore Road - DN 309
Cape May Court House, NJ 08210
609.465.6875
www.cape-may-county-nj.gov



MASER CONSULTING, P.A.

500 Scarborough Drive, Suite 108
Egg Harbor Township, NJ 08234
609.910.4068
www.maserconsulting.com

TABLE OF CONTENTS

CHAPTER 12

I. FUTURE WASTEWATER DEMAND AND CAPACITY ANALYSIS.....	12-2
Data Sources.....	12-3
Future Sewer Service Area Analysis	12-6
<i>Methodology and Assumptions</i>	<i>12-6</i>
<i>Buildout Analysis of Future Sewer Service Area.....</i>	<i>12-7</i>
<i>Wastewater Demand Analysis for Future Sewer Service Area</i>	<i>12-8</i>
<i>Wastewater Capacity Analysis of Future Sewer Service Area</i>	<i>12-8</i>
Future Septic Management Area Analysis.....	12-9
<i>Methodology and Assumptions</i>	<i>12-9</i>
<i>Buildout Analysis of Septic Management Area.....</i>	<i>12-11</i>
<i>Antidegradation Analysis of Septic Management Area.....</i>	<i>12-12</i>

LIST OF TABLES

Table 12-1: Urbanized Municipality Analysis	12-2
Table 12-2: Schedule of Municipal Zoning Requirements	12-4
Table 12-3: Buildout Analysis of Sewer Service Areas	12-7
Table 12-4: Wastewater Demand Analysis of Sewer Service Areas	12-8
Table 12-5: Wastewater Capacity Analysis of Sewer Service Areas.....	12-8
Table 12-6: Buildout Analysis of Septic Management Area	12-11
Table 12-7: Antidegradation Analysis of Septic Management Area.....	12-13

LIST OF MAPS

Map 12-1: Existing Land Use.....	12-14
Map 12-2: Existing Zoning.....	12-15
Map 12-3: Adopted Sewer Service Areas	12-16
Map 12-4: Hydrologic Features.....	12-17
Map 12-5: Natural Features.....	12-18
Map 12-6: Buildout Results	12-19

R:\projects\2017\17005579G\Reports\Buildout\UpperTwp MBOR 190115.docx



I. FUTURE WASTEWATER DEMAND AND CAPACITY ANALYSIS

This section of the report describes the buildout methodology used to project future wastewater treatment demand for future sewer service areas and septic management areas within the Township of Upper. This buildout analysis has been prepared as part of the Cape May County Wastewater Management Plan (CMCWMP).

In urbanized municipalities it is assumed that redevelopment of previously developed portions of the municipality will make up the majority of the future wastewater management needs. Therefore, an analysis limited to development potential based solely on the zoning of the undeveloped and developable land area of the municipality in these municipalities may underestimate their future wastewater management needs. In these municipalities, a 20-year wastewater projection is based on population and employment projections.

The NJDEP Water Quality Management Planning Rule (N.J.A.C. 7:15-1.15) defines urban municipalities as those municipalities where 90 percent of the municipality's land area appears as "Urban" as designated in the NJDEP 2007 Land Use/Land Cover geographical information systems (GIS) database. Urbanized municipalities also include those municipalities identified as "Urban Aid" municipalities pursuant to the New Jersey Redevelopment Act, N.J.S.A. 55:19-20 et seq.; as an Urban Enterprise Zone pursuant to the New Jersey Urban Enterprise Zones Act, N.J.S.A. 52:27H-60 et seq.; as a "Garden State Growth Zone" municipality pursuant to the New Jersey Economic Opportunity Act of 2013, N.J.S.A. 52:27D-489p et seq.; and as Transit Villages approved by the New Jersey Department of Transportation and NJ Transit.

As shown in **Table 12-1**, the Township of Upper encompasses 19,851.6 acres within its boundaries, including water and environmentally sensitive lands. According to the 2012 NJDEP Land Use/Land Cover data, only 4,448.7 acres (22.4 percent) of Upper Township are classified as Urban Lands. The municipality does not qualify for Urban Aid, Urban Enterprise Zone, Garden State Growth Zone or Transit Village. Therefore, the Township of Upper does not qualify as an urbanized municipality.

Table 12-1: Urbanized Municipality Analysis	
Total Municipal Area	43,785.1 acres
Urban Land Area	4,179.2 acres
Urban Land Coverage	9.5%
Urban Aid Municipality	No
Urban Enterprise Zone	No
Garden State Growth Zone	No
Transit Village	No
Urbanized Municipality	No

In accordance with the N.J.A.C. 7:15-4.5(b)(2), municipalities that are not defined as urbanized must estimate build-out future wastewater flows from existing development that is not currently connected and future development based on flow projections.

This analysis has been prepared in order to assess the amount of remaining developable lands within the Township of Upper and to assess the amount of potential development, if these lands were fully developed to their maximum potential. Utilizing GIS (geographic information system) technology, the



amount of developable land has been assessed based on lot area and bulk requirements as compared to the minimum requirements of each individual zone district.

This study is meant to demonstrate that the overall extent of potential future development based on the proposed zoning and the implications to the wastewater treatment facilities serving existing and future development. The results generated by these analyses were based on mathematic calculations of lot area and contiguous unconstrained land (land not encumbered with wetlands or riparian buffers) with regards to the requirements of the respective zoning. These analyses represent the total development limits of the municipality and do not account for time factors, economic factors or real estate trends. In other words, the analyses represent the maximum amount of development that could occur based on the amount of remaining developable lands. This study does not make any assumptions as to timeframe for the Township to reach full buildout, or even if it will. The results of this study are meant to illustrate the effects that the zoning would have if the Township were to become fully built-out. The calculated development potential of each parcel is subject to site-specific review of applicable state environmental regulations as well as municipal subdivision and site plan procedures.

Data Sources

This build-out study is based on existing land use conditions and the most recently adopted zoning standards for the Township of Upper. The following discusses the data sources that were utilized in the preparation of this report and the processes for updating and validating the data:

- Existing Land Use. In order to analyze the remaining developable lands within Upper Township, a parcel database is utilized, which is linked to the Mod-IV property tax information for each parcel. Each parcel's land use type is based on the tax classification. Upper Township's parcel database was provided by the Cape May County Planning Department, dated November 2017. Some properties in the parcel database do not have a corresponding line item in the Mod-IV data, which results in a number of properties being unclassified. The Cape May County Planning Department attempted to classify those properties, to the extent possible, by utilizing the "additional lots" field for other Mod-IV records or Pictometry© images to determine whether a property is developed. (See **Map 12-1: Existing Land Use**)
- Zoning Boundaries. The zoning boundaries and standards are from the Zoning Ordinance (Chapter 20) and the Zoning Map for the Township of Upper, revised August 13, 2018. The zoning requirements utilized are shown in **Table 12-2**. For this build-out, parcels crossed by a zoning boundary are calculated as separate lots within each zone. (See **Map 12-2: Existing Zoning**)



Table 12-2: Schedule of Municipal Zoning Requirements

Zone	Use	Minimum Lot Area	Maximum Dwellings per Acre	Maximum Lot Coverage	Maximum Impervious Coverage	Maximum Building Height	Effective Floor Area Ratio
AHGR	Affordable Housing Group Home	5 acres					
AR	Residential (Single-Family)	120,000					
C	Residential (Single-Family)	10 acres					
CM2	Commercial	40,000		20%	30%	35	10%
		5 acres		15%	35%	35	12%
		10 acres		15%	35%	35	12%
CM4	Commercial	120,000		5%	15%	35	5%
CMP	Commercial	120,000		5%	15%	35	5%
F10	Residential (Single-Family)	10 acres					
F25	Residential (Single-Family)	25 acres					
F3	Residential (Single-Family)	3.20 acres					
M	Mining						
MH	Mobile Homes	20 acres	7				
MTCD	Marmora Town Center	40,000	12	45%	70%	5 stories	225%
		10 acres	12	45%	70%	5 stories	225%
PV	Residential (Single-Family)	1 acres					
R	Residential (Single-Family)	40,000					
R2	Residential (Single-Family)	40,000					
RC	Residential (Single-Family)	6,000					
RD	Residential (Single-Family)	3.75 acres					
RP	Residential (Single-Family)	3.75 acres					
RPPV	Residential (Single-Family)	3.75 acres					
RR	Residential (Single-Family)	4,000					
TC	Mixed Use	40,000	6	30%	50%	45	17%
TCC	Mixed Use	5 acres	6	20%	60%	45	20%
		10 acres	6	15%	60%	45	15%
		40,000	6	35%	60%	45	20%
TR	Residential (Single-Family)	5 acres	6	25%	70%	45	23%
		10 acres	6	20%	70%	45	20%
		2 acres					
TV	Residential (Single-Family)	15,000					
U	Utility						

- Adopted Sewer Service Areas. The NJDEP adopted the Future Wastewater Service Areas Map for Cape May County on November 6, 2013. The boundaries are depicted in the current NJDEP Sewer Service Areas GIS data as published December 20, 2017. (See **Map 12-3: Adopted Sewer Service Areas**)



- Environmental Constraints. Environmentally sensitive areas were spatially attributed to the parcel database for Upper Township to assess the amount of contiguous unconstrained land within each parcel and the constrained lands were removed from the analysis.

In accordance with N.J.A.C 7:15-1.5, "environmentally sensitive areas" means those areas identified in an areawide WQM plan as land areas possessing characteristics or features that are important to the maintenance or improvement of water quality, or to the conservation of the natural resources of the State. Environmentally sensitive areas include, but are not limited to, areas mapped as endangered or threatened wildlife species habitat on the Department's most currently available Landscape Maps of Habitat for Endangered, Threatened or Other Priority Species, Natural Heritage Priority Sites, wetlands and riparian zones.

For the purposes of this buildout analysis, the following environmental constraints, as shown on **Map 12-4: Hydrologic Features**, were assumed to constrain future development within the adopted wastewater service areas:

- Open Water Bodies as delineated by the NJDEP National Hydrography Dataset (NHD) Waterbody GIS data, last updated by NJDEP on November 1, 2010.
- Freshwater Wetlands were extracted from the 2012 NJDEP Land Use/Land Cover data. Transitional area buffers were added to the constrained area. Wetlands areas associated with a primary water body (river, bay, ocean, etc.) and/or containing habitat for threatened and endangered species (Rank 3, 4 and 5 as per the NJDEP Landscape Project Version 3.3) were assumed to have exceptional resource value and 150-foot transition area buffers were applied. Isolated patches of wetlands not containing threatened and endangered species habitat were assumed to have intermediate resource value and 50-foot buffers were applied.
- Category-One ("C1") Waters and their Tributaries as delineated by the NJDEP Surface Water Quality Standards data were given a 300-foot Special Water Resource Protection Area (SWRPA) buffer included in the constrained area.
- Riparian Buffers were added to non C1 streams in accordance with the NJDEP Flood Hazard Control Act. Streams adjacent to threatened and endangered species habitat are given a 150-foot wide riparian buffer. All other streams are given a 50-foot riparian buffer.

Map 12-5: Natural Features depicts the following layers, which were considered in the adoption of the wastewater service areas:

- Habitat for Endangered, Threatened or Other Priority Species. Rank 3, 4 & 5 habitat patches for state and federally listed threatened and endangered species are shown, as published in Version 3.3 of the NJDEP Landscape Project mapping.
 - Natural Heritage Priority Sites as published by the NJDEP March 1, 2007.
- HUC11 Planning Boundary. In order to analyze the development potential for septic areas in conformance with the WQMP Rule, the zoning boundaries are segregated by the HUC11 Watershed in which the land lies. HUC11 boundaries were published by the NJDEP dated



January 20, 2006. The HUC11 boundaries were modified in order to avoid dividing parcels into small slivers of land. The HUC11 Planning Boundaries were snapped to lot lines when possible, not straying more than 500 feet from the HUC11 lines delineated by NJDEP. Larger tracts of land are split into separate subzones according to the HUC11 line. (See HUC11 Planning Boundary shown on **Map 12-6: Buildout Results**)

Future Sewer Service Area Analysis

This future sewer service area analysis has been prepared to assess the potential wastewater demand generated by potential development and redevelopment within the municipality's future sewer service area. The analysis provides a maximum yield for potential additional residential units and non-residential floor area within the future sewer service area.

Methodology and Assumptions

- The Township of Upper is proposing to extend sewer service to the Marmora Town Center District and the existing development along Roosevelt Boulevard to the Ocean City Regional Wastewater Treatment Plant (WTP). Alternatively, the Marmora future sewer service area would discharge to groundwater if connection to Ocean City Regional WTP is not feasible.
- The Township is considering extending sewer to the existing development in Strathmere from the Seven Mile Beach/Middle Township Regional WTP. However, this analysis is only based on the adopted Sewer Service Area map, which does not include the Strathmere area. Should the Township wish to consider sewerage Strathmere, the municipality will need to pursue the site-specific amendment process with the NJDEP.
- The buildout analysis of the Marmora Town Center District, performed by the Upper Township Engineer in September 2018, is incorporated into this analysis.
- The analysis assumes that the Marmora Town Center District will be redeveloped in accordance with the underlying MTCD zone district. Future development outside of the Marmora Town Center District is considered under the septic buildout analysis.
- As there is currently no sewer service for Marmora, the total buildout will contribute to future wastewater demand. Existing development is not subtracted from the future flows.
- The permitted use(s) of each zone dictates whether each property is assigned a residential, non-residential or mixed use development.
- Where a zone permits mixed-use development, the analysis assumes that the first floor will be retail with residential on the upper floors.
- The analysis was performed based on blocks rather than individual parcels in accordance with the concept plan prepared by the Upper Township Engineer.
- NJDEP projected flows for residential dwellings are based on the number of bedrooms in each unit (1 bedroom = 150 GPD, 2 bedroom = 225 GPD, 3+ bedroom = 300 GPD). Future residential



units are assumed to have 3 or more bedrooms, which would produce an average of 300 GPD per unit.

- NJDEP projected flows for nonresidential development differ based on type of development (i.e. office, retail, restaurant, church, theater, etc.). All nonresidential development is assumed to produce 0.100 GPD/sq. ft., which is the projected criterion for both office and retail.

Buildout Analysis of Future Sewer Service Area

Table 12-2: Buildout Analysis of Future Sewer Service Area shows the existing and future residential dwelling units (DU) and non-residential floor area (SF) potential development for each zone.

The analysis estimates 2,436 residential units and 8.526 million square feet of non-residential space within the Marmora Town Center, which is proposed to be served by the Ocean City Regional WTP.

The analysis also shows a total of 777 units planned or approved which would discharge to groundwater greater than 2,000 GPD under individual New Jersey Pollutant Discharge Elimination System (NJPDES) permits.

Table 12-3: Buildout Analysis of Sewer Service Areas								
Future Wastewater Service Area	Zone	Existing to be Connected		New Development		Planned/ Approved	Total	
		(DU)	(SF)	(DU)	(SF)	(DU)	(DU)	(SF)
Ocean City Regional WTP	MTCD	0	0	2,436	8,526,505	0	2,436	8,526,505
	Subtotal	0	0	2,436	8,526,505	0	2,436	8,526,505
Proposed Discharge to Groundwater Greater than 2,000 GPD	AHGR	0	0	0	0	8	8	0
	AR	0	0	0	0	60	60	0
	MH	0	0	0	0	210	210	0
	R	0	0	0	0	334	334	0
	R2	0	0	0	0	15	15	0
	TCC	0	0	0	0	150	150	0
	Subtotal	0	0	0	0	777	777	0

Wastewater Demand Analysis for Future Sewer Service Area

Table 6-4: Wastewater Demand Analysis for Sewer Service Areas summarizes the estimated wastewater flows by multiplying the results in **Table 12-3** by the NJDEP projected flows of 300 gallons per day (GPD) per residential unit and 0.100 GPD per square foot of non-residential floor area. Industrial wastewater flow is estimated at 0.030 GPD per square foot of industrial floor area. Campsites use a multiplier of 200 GPD per unit.

Table 12-4: Wastewater Demand Analysis of Sewer Service Areas						
Future Wastewater Service Area	Zone	Total Residential		Total Non-Residential		TOTAL DEMAND
		(DU)	(GPD)	(SF)	(GPD)	(GPD)
Ocean City Regional WTP	MTCD	2,436	730,800	8,526,505	852,650	1,583,450
	Subtotal					
Discharge to Groundwater	AHGR	8	2,400	0	0	2,400
	AR	60	18,000	0	0	18,000
	MH	210	63,000	0	0	63,000
	R	334	100,200	0	0	100,200
	R2	15	4,500	0	0	4,500
	TCC	150	45,000	0	0	45,000
	Subtotal	777	233,100	0	0	233,100

Wastewater Capacity Analysis of Future Sewer Service Area

In accordance with N.J.A.C. 7:15-4.5(b)2, the wastewater demand projections for the service area must be compared against the total wastewater capacity of the treatment plant. **Table 12-5: Wastewater Capacity Analysis of Sewer Service Areas** provides the total projected future wastewater demand for each wastewater service area within Upper Township.

Table 12-5: Wastewater Capacity Analysis of Sewer Service Areas			
Future Sewer Service Area	Existing (MGD)	Future (MGD)	Total (MGD)
Ocean City Regional WTP	0	1.583	1.583

Upper Township does not have any wastewater allocation in the Ocean City Regional WTP. The analysis estimates that approximately 1.583 MGD will need to be allocated from the Ocean City Regional WTP for Upper Township to develop the Marmora Town Center per the MTCD zoning. This will need to be coordinated with the CMCMUA and Ocean City after the future wastewater demand is established for Ocean City.



Future Septic Management Area Analysis

Methodology and Assumptions

Assumptions

- The permitted use(s) of each zone dictated whether each property is assigned a residential or non-residential development.
- Per the request of the Township, all Township-owned properties are considered preserved and not developable for the purposes of this analysis.
- After locating further developable parcels, the number of new residential dwelling units available for further development under the zoning are based on contiguous unconstrained land area, excluding 10% for necessary utility improvements such as roads or septic/sewer easements is calculated.
 - Vacant or farmland property is assigned a development potential by subtracting 10 percent of the lot area for infrastructure and dividing the remaining 90 percent by the minimum lot area of the zone. (*Contiguous Unconstrained Land X 90% / Minimum Lot Area = Potential Number of New Units*).
 - Residential property is assigned a development potential by subtracting 10 percent of the lot area for infrastructure and dividing the remaining 90 percent by the minimum lot area. One unit is subtracted from the development potential to account for the existing residence. (*Contiguous Unconstrained Land X 90% / Minimum Lot Area - 1 unit = Potential Number of New Units*).
- In accordance with Cape May County Health Department policy, a minimum lot area of 35,000 square feet and a minimum of 15,000 square feet of unconstrained land is needed for the development of a dwelling with a septic system. Any vacant parcel with less than the minimum residential lot size but greater than 35,000 square feet and with at least 15,000 square feet of contiguous unconstrained land is assumed to be grandfathered and is allocated a development potential of one unit.
- In order to assess the wastewater discharge associated with anticipated future nonresidential uses, the development potential must be converted from square feet of non-residential floor area into the equivalent number of residential uses. The following formula is provided by the NJDEP for this calculation: (*Equivalent Residential Units = [Non-Residential Floor Area x 0.125 gal/sq. ft./day] / 500 Gal/ Unit/ Day*).
- Where a zone permits mixed-use development in the Septic Management Area, the analysis assumes single-story retail only.
- Non-residential development exceeding 2,000 GPD of wastewater flow would require connection to public sewer or a NJPDES permit. Non-residential development not connected to sewer is assumed not to exceed 26,666 square feet, which is equivalent to 6.7 dwelling units (or 2,000



- GPD). Similarly, future development in mixed-use zones is assumed not to exceed 26,666 square feet of commercial with no residential component.
- The Pinelands Management Area is removed from the analysis since the Pinelands Management Areas are based on a nitrate dilution analysis performed by the Pinelands Commission.
 - Non-residential development exceeding 2,000 GPD of wastewater flow would require connection to public sewer or a NJPDES permit. Non-residential development not connected to sewer is assumed not to exceed 26,666 square feet, which is equivalent to 6.7 dwelling units (or 2,000 GPD). Similarly, future development in mixed-use zones is assumed not to exceed 26,666 square feet of commercial with no residential component.

Methodology

- Undevelopable parcels are excluded in accordance with the following:
 - The contiguous unconstrained land area of each property is calculated based on Environmental Constraints layers. Inaccessible and non-contiguous areas are removed from the contiguous unconstrained land total acreage for each property.
 - Vacant or farmland properties containing less than 35,000 square feet of total lot area or less than 15,000 square feet of contiguous unconstrained land are considered undevelopable, unless property can be merged with adjacent lot(s) to form a conforming lot.
 - Properties not fronting on a public road are considered undevelopable, except where such properties are contiguous to a property with road frontage under the same ownership.
- Properties with site plan or subdivision approvals are assumed to be developed as per the development approvals. The total number of approved units is subtracted from the total allowable units for the watershed prior to the calculation of any future development potential.
- Vacant or farmland properties containing at least 35,000 square feet in total lot area and at least 15,000 square feet of contiguous unconstrained land, but less than the minimum lot area required in the zone are considered “grandfathered” and assigned a development potential of 1 unit. The total number of grandfathered lots is subtracted from the total allowable units for the watershed prior to the calculation of any future development potential.
- After the approved and grandfathered lots are subtracted from the total allowable units, the future buildout potential of the remaining developable lots is calculated.
 - Vacant or farmland properties containing less than twice the minimum lot area in the zone are considered “Developable but Not Subdividable” and are assigned a development potential of 1 unit.
 - Oversized residential properties containing greater than two times the minimum lot size and containing at least 30,000 sq. ft. of contiguous unconstrained land are considered “Residential Further Subdividable”. Development potential is allocated based on total lot area divided by minimum lot area minus 1 unit to account for the existing dwelling.



Buildout Analysis of Septic Management Area

The buildout analysis of the septic management area calculates the future development potential on a parcel-by-parcel basis, based on existing or proposed zoning for the Township of Upper. **Table 12-5: Buildout Analysis of Septic Management Area** shows the development potential for each zone, segregated by watershed, which is calculated as the sum of the approved development, grandfathered parcels, and remaining developable vacant and farmland properties. Future non-residential uses are converted from square feet of floor area to the equivalent number of residential uses.

Table 12-6: Buildout Analysis of Septic Management Area							
HUC11 Watershed	Zone District	Grand-fathered Parcels	Developable Vacant & Farmland Properties	Further Subdividable Residential Properties	Non-Residential		Total Potential Units
					Floor Area (Sq. Ft.)	Equivalent Residential Units	
02040302060 Patcong Creek /Great Egg Harbor Bay	R	1	1	5	0	0.0	7.0
	TC	0	0	0	11,733	2.9	2.9
	Subtotal	1	1	5	11,733	2.9	9.9
02040302070 Tuckahoe River	AR	17	27	0	0	0.0	44.0
	C	2	5	0	0	0.0	7.0
	CM2	0	0	0	23,723	6.0	6.0
	CM4	0	0	0	10,972	2.8	2.8
	R	2	107	43	0	0.0	152.0
	R2	2	32	5	0	0.0	39.0
	RP	0	45	8	0	0.0	53.0
	TC	0	0	0	103,998	26.1	26.1
	TCC	0	0	0	7,663	1.9	1.9
	TR	0	25	1	0	0.0	26.0
	TV	0	8	25	0	0.0	33.0
	MTCD	0	0	0	26,666	6.7	6.7
	Subtotal	23	249	82	173,022	43.5	397.5
02040302080 Cape May Bays & Tribes East	CM2	0	0	0	19,388	4.9	4.9
	R	3	40	37	0	0.0	80.0
	R2	2	37	38	0	0.0	77.0
	TC	0	0	0	32,732	8.2	8.2
	TCC	0	0	0	281,966	70.8	70.8
	MTCD	0	0	0	106,664	26.8	26.8
	Subtotal	5	77	75	334,087	110.7	267.7
02040302940 Atlantic Coast (34th St to Cape May Pt)	N/A	0	0	0	0	0.0	0.0
	Subtotal	0	0	0	0	0.0	0.0
TOTAL		29	327	162	518,842	157.1	675.1



Antidegradation Analysis of Septic Management Area

In areas outside of sewer service areas, the default wastewater management alternative is discharge to groundwater of 2,000 gallons per day or less, commonly referred to as septic systems. The assessment of water quality impacts from development on septic systems relies on nitrate concentration. In this analysis, nitrate acts as a conservative surrogate for any of a number of constituents that could be discharged from a septic system (e.g. cleaners, solvents, pharmaceuticals, etc.). Nitrate is chosen because it is highly soluble in water, and because it is a stable compound that by itself could render water unsuitable for human consumption. The capacity to support septic systems without violating groundwater quality standards is determined by the amount of dilution available. The Water Quality Management Planning Rules advocate a watershed approach to assessing the adequacy of available dilution to meet future development on septic systems. Using this approach, available dilution, (essentially groundwater recharge), is calculated within a HUC 11 watershed and translated into a finite amount of wastewater that can be discharged, which in turn can be translated into a finite number of housing units that can be supported while maintaining a target concentration of nitrate in groundwater. Zoning is then applied to the available land in that same watershed, outside of any sewer service area, to calculate the number of units that could be developed on septic systems. The results of these two analyses are then compared and if the number of units based on zoning does not exceed the maximum units that can be supported, adequate capacity has been demonstrated. If the number of units allowed by zoning exceeds that which can be supported in a particular watershed, then some adjustment to zoning within that watershed is required.

The NJDEP Water Quality Management Planning Rule (N.J.A.C. 7:15-5.25(e)) requires the CMCWMP to determine the development density that can be accommodated in undeveloped and underdeveloped areas that will result in attainment of 2.0 mg/L nitrate in the ground water on a HUC11 watershed basis. This section summarizes the nitrate dilution modeling calculations and results for the lot density (minimum lot size) that can be supported in the septic management areas of the municipality to meet the nitrate target goal.

The Nitrate Dilution Analysis determines the amount of land contributing to nitrate dilution and groundwater recharge, which in turn determined the average septic density within each HUC11 watershed in the municipality required to meet the NJDEP's 2 mg/L target nitrate concentration anti-degradation policy and the maximum number of new septic systems that can be supported in each HUC11.

The nitrate dilution analysis for septic systems is performed in similar fashion to that conducted for sewer service areas, except that environmentally sensitive areas are not removed prior to performing the build-out analysis. This is due to the fact that while certain areas may be unbuildable, such as riparian zones or steep slopes, they still contribute to the overall available dilution of nitrate in groundwater. These areas were also not removed when analyzing the available dilution on a HUC11 basis used to establish the maximum number of units that can be built in a watershed and continue to meet the 2 mg/L nitrate target. Thus, while some areas may contribute less overall groundwater recharge, due to factors such as soils or topography, these limitations have already been taken into consideration when calculating the maximum average density allowable.

This analysis used NJDEP's nitrate-nitrogen target of 2 mg/L, with the assumption that all ammonium and other nitrogen compounds are converted to nitrate within the property, and that the nitrate concentrations dilute evenly across the HUC11 watershed. These assumptions are implicit in the nitrate dilution model developed by NJDEP.



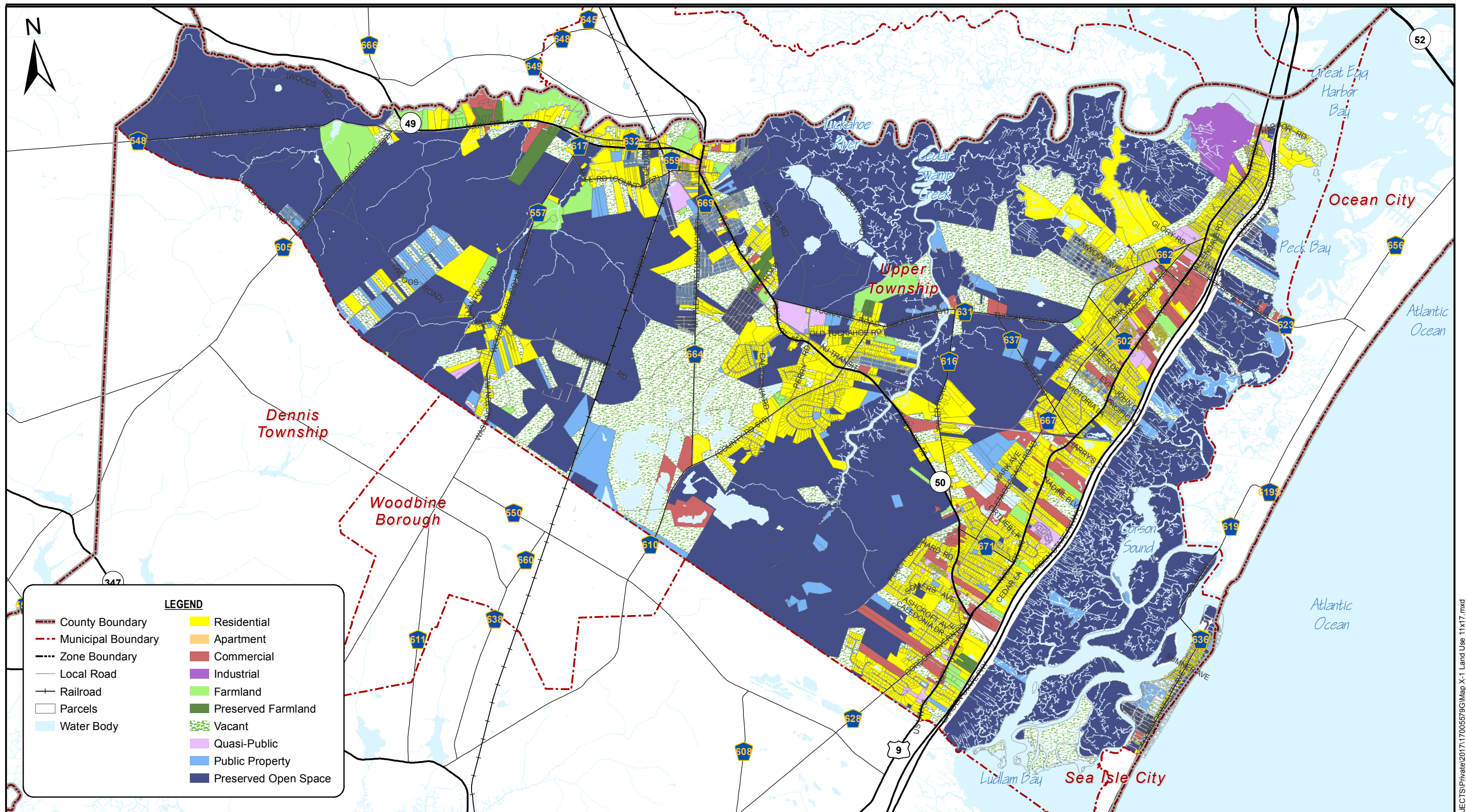
The WQMP Rule does not mandate uniformly zoning minimum lot sizes at the calculated densities across the watershed. Rather, this comparable residential zoning density represents the total number of units that, if built, would not result in a degradation of groundwater quality within a given watershed by exceeding the 2 mg/L nitrate limit. The NJDEP advocates zoning to allow for center-based development, clustering, and protection of environmental features and agriculture land.

Table 12-6: Antidegradation Analysis of Septic Management Area below presents the maximum number of new residential units that can be developed within the septic management area of the Township of Upper without substantially degrading the water quality within each HUC11 Watershed. The Potential New Units is then compared against the Target Septic Units for each HUC11 Watershed to determine whether the zoning will result in degradation of the watershed above the 2 mg/L nitrate standard.

Based on the buildout analysis, the Cape May Bays & Tributaries East HUC11 watershed (02040302080) within the Township of Upper will exceed the target septic density by 209 units at full buildout and the Patcong Creek/Great Egg Harbor Bay HUC11 watershed (02040302060) will exceed the target septic density by 6 units at full buildout.

Table 12-7: Antidegradation Analysis of Septic Management Area					
HUC11 Watershed	Recharge (Acres)	Septic Density (Acres / Septic)	Target (Septic Units)	Potential New Units	Surplus(+)/ Deficit(-)
02040302060 Patcong Creek/Great Egg Harbor Bay	38	8.7	4.32	9.9	-5.58
02040302070 Tuckahoe River	3,110	6.1	509.83	397.5	112.33
02040302080 Cape May Bays & Tribs East	514	8.8	58.38	267.7	-209.32
02040302940 Atlantic Coast (34th St to Cape May Pt)	57	8.6	6.61	0	6.61
TOTAL	3,718	N/A	579.14	675.1	-95.96





0 6,900 13,800 20,700 27,600 Feet

LEGEND

County Boundary	Residential
Municipal Boundary	Apartment
Zone Boundary	Commercial
Local Road	Industrial
Railroad	Farmland
Parcels	Preserved Farmland
Water Body	Vacant
	Quasi-Public
	Public Property
	Preserved Open Space

MAP 12-1: EXISTING LAND USE

TOWNSHIP OF UPPER

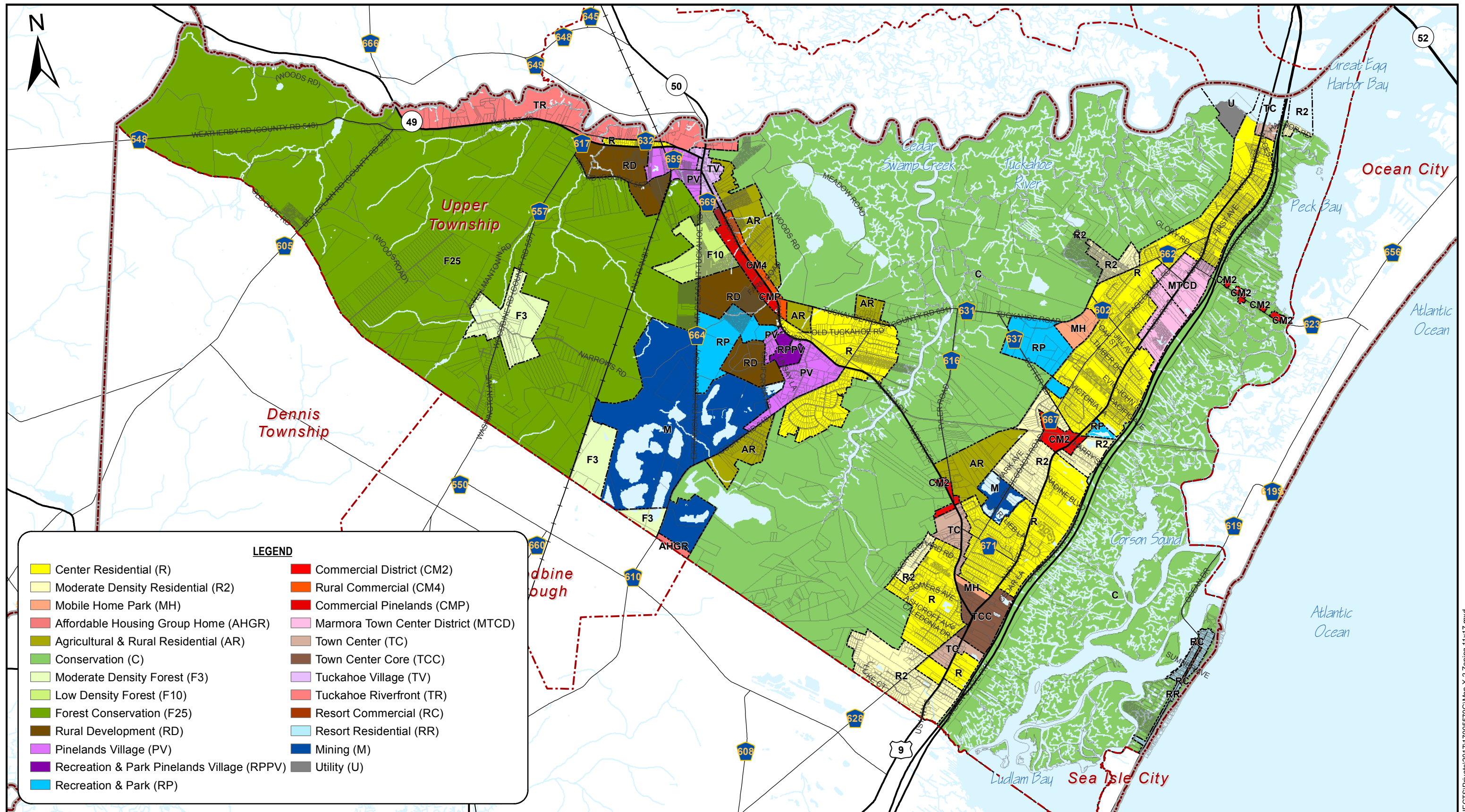
CAPE MAY COUNTY WASTEWATER MANAGEMENT PLAN

COUNTY OF CAPE MAY, NEW JERSEY

MASER
CONSULTING P.A.

May 2018

This product is reproduced from geospatial information prepared by various agencies. Although the County of Cape May has made every attempt to verify the accuracy of the data with representatives of each municipality, these products are for illustration purposes only, are not suitable for site-specific decision making, are subject to constant changes, and may not be complete, accurate or current. For all data contained herein, the County of Cape May makes no warranty of any kind, expressed or implied, including, but not limited to, the warranties of merchantability or fitness for a particular use, or any other matter. This information is prepared specifically for the planning purposes of the Cape May County Wastewater Management Plan and should not be used, and is not intended for, survey, engineering or any other purposes. The County is not responsible for possible errors, omissions, misuse, or misinterpretation.



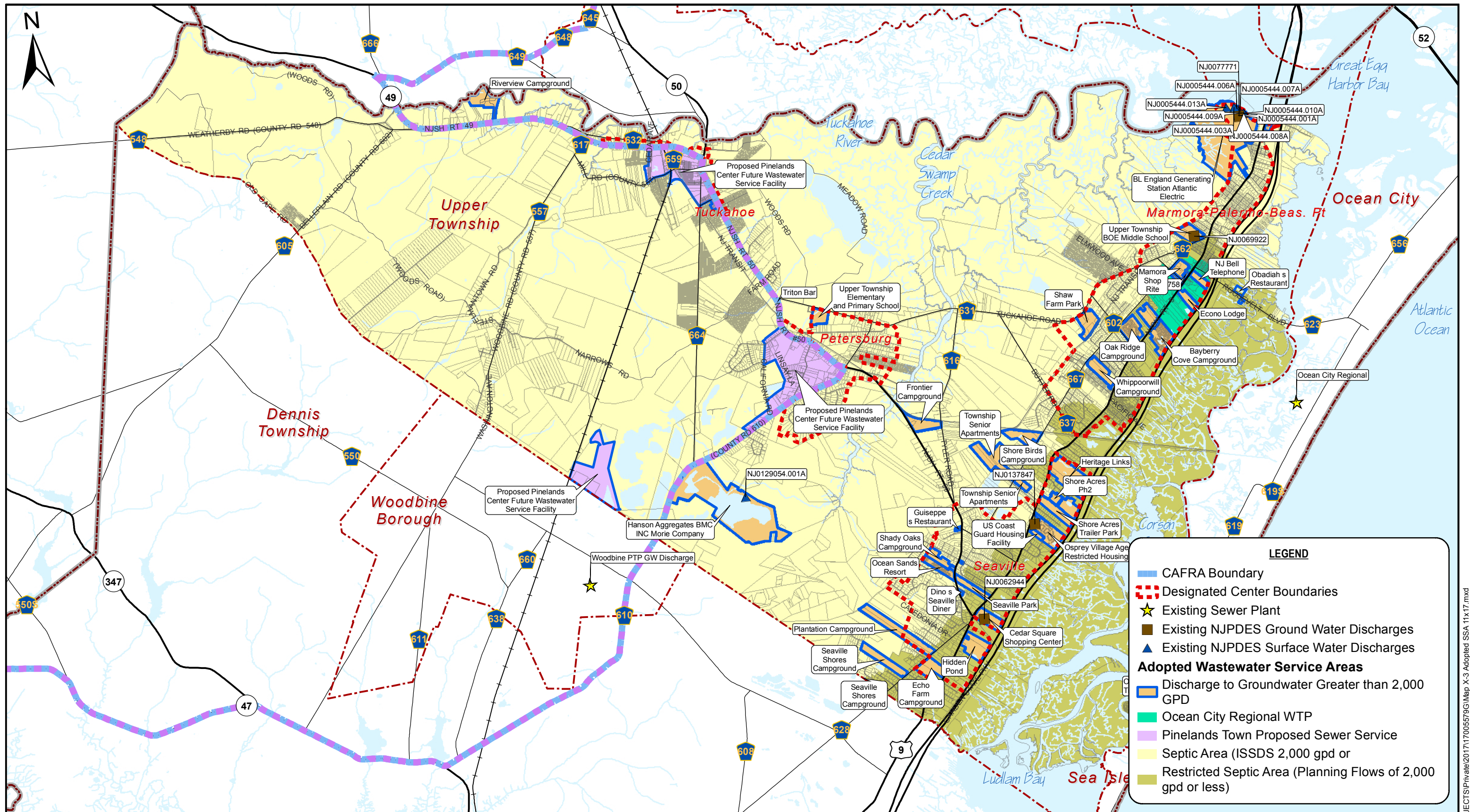
0 6,900 13,800 20,700 27,600 Feet

This product is reproduced from geospatial information prepared by various agencies. Although the County of Cape May has made every attempt to verify the accuracy of the data with representatives of each municipality, these products are for illustration purposes only, are not suitable for site-specific decision making, are subject to constant changes, and may not be complete, accurate or current. For all data contained herein, the County of Cape May makes no warranty of any kind, expressed or implied, including, but not limited to, the warranties of merchantability or fitness for a particular use, or any other matter. This information is prepared specifically for the planning purposes of the Cape May County Wastewater Management Plan and should not be used, and is not intended for,

MAP 12-2: EXISTING ZONING TOWNSHIP OF UPPER CAPE MAY COUNTY WASTEWATER MANAGEMENT PLAN COUNTY OF CAPE MAY, NEW JERSEY



December 2018



0 6,900 13,800 20,700 27,600 Feet

This product is reproduced from geospatial information prepared by various agencies. Although the County of Cape May has made every attempt to verify the accuracy of the data with representatives of each municipality, these products are for illustration purposes only, are not suitable for site-specific decision making, are subject to constant changes, and may not be complete, accurate or current. For all data contained herein, the County of Cape May makes no warranty of any kind, expressed or implied, including, but not limited to, the warranties of merchantability or fitness for a particular use, or any other matter. This information is prepared for specifically for the planning purposes of the Cape May County Wastewater Management Plan and should not be used, and is not intended for,

MAP 12-3: ADOPTED WASTEWATER SERVICE AREAS TOWNSHIP OF UPPER CAPE MAY COUNTY WASTEWATER MANAGEMENT PLAN COUNTY OF CAPE MAY, NEW JERSEY

LEGEND

- CAFRA Boundary
- Designated Center Boundaries
- Existing Sewer Plant
- Existing NJPDES Ground Water Discharges
- Existing NJPDES Surface Water Discharges

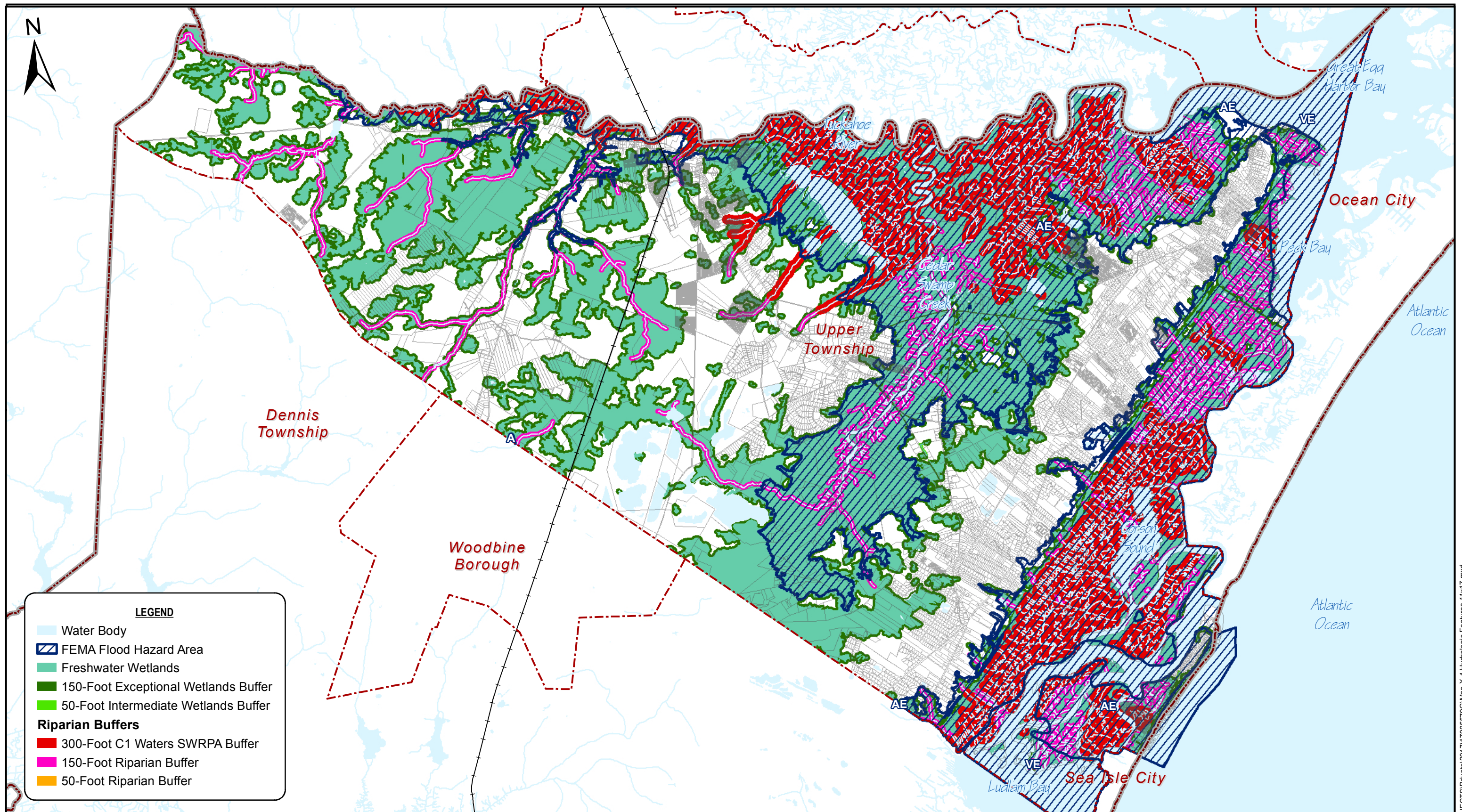
Adopted Wastewater Service Areas

- Discharge to Groundwater Greater than 2,000 GPD
- Ocean City Regional WTP
- Pinelands Town Proposed Sewer Service
- Septic Area (ISSDS 2,000 gpd or
- Restricted Septic Area (Planning Flows of 2,000 gpd or less)



May 2018

\\HOFAS1\Survey\GIS\SPROJECTS\Private\2017\17005579\GMap X-3 Adopted SSA 11x17.mxd



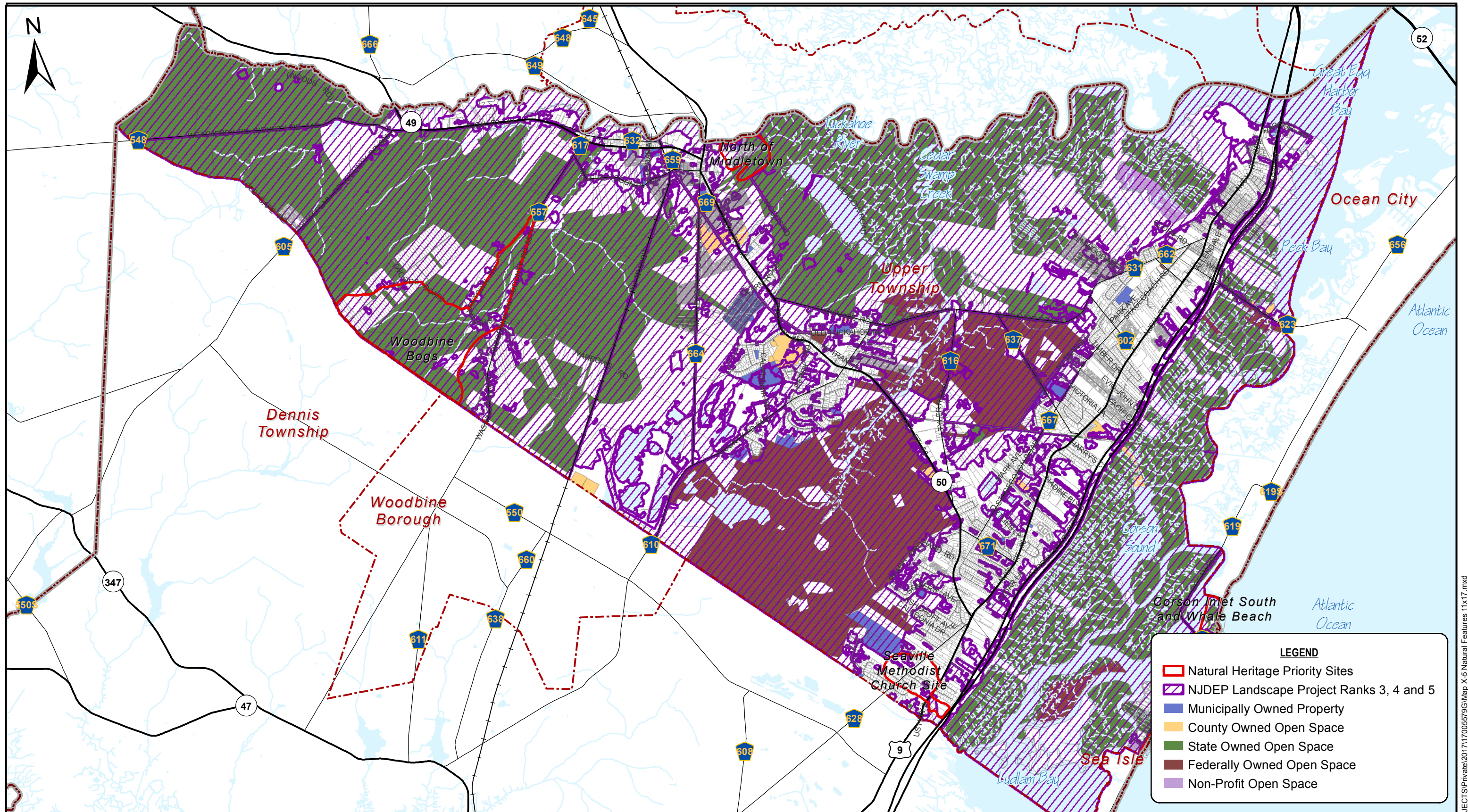
0 6,900 13,800 20,700 27,600 Feet

This product is reproduced from geospatial information prepared by various agencies. Although the County of Cape May has made every attempt to verify the accuracy of the data with representatives of each municipality, these products are for illustration purposes only, are not suitable for site-specific decision making, are subject to constant changes, and may not be complete, accurate or current. For all data contained herein, the County of Cape May makes no warranty of any kind, expressed or implied, including, but not limited to, the warranties of merchantability or fitness for a particular use, or any other matter. This information is prepared specifically for the planning purposes of the Cape May County Wastewater Management Plan and should not be used, and is not intended for, survey, engineering or any other purposes. The County is not responsible for possible errors, omissions, misuse, or misinterpretation.

MAP 12-4: HYDROLOGIC FEATURES **TOWNSHIP OF UPPER** **CAPE MAY COUNTY WASTEWATER MANAGEMENT PLAN** COUNTY OF CAPE MAY, NEW JERSEY



March 2018



0 6,900 13,800 20,700 27,600 Feet

This product is reproduced from geospatial information prepared by various agencies. Although the County of Cape May has made every attempt to verify the accuracy of the data with representatives of each municipality, these products are for illustration purposes only, are not suitable for site-specific decision making, are subject to constant changes, and may not be complete, accurate or current. For all data contained herein, the County of Cape May makes no warranty of any kind, expressed or implied, including, but not limited to, the warranties of merchantability or fitness for a particular use, or any other matter. This information is prepared specifically for the planning purposes of the Cape May County Wastewater Management Plan and should not be used, and is not intended for, survey, engineering or any other purposes. The County is not responsible for possible errors, omissions, misuse, or misinterpretation.

MAP 12-5: NATURAL FEATURES

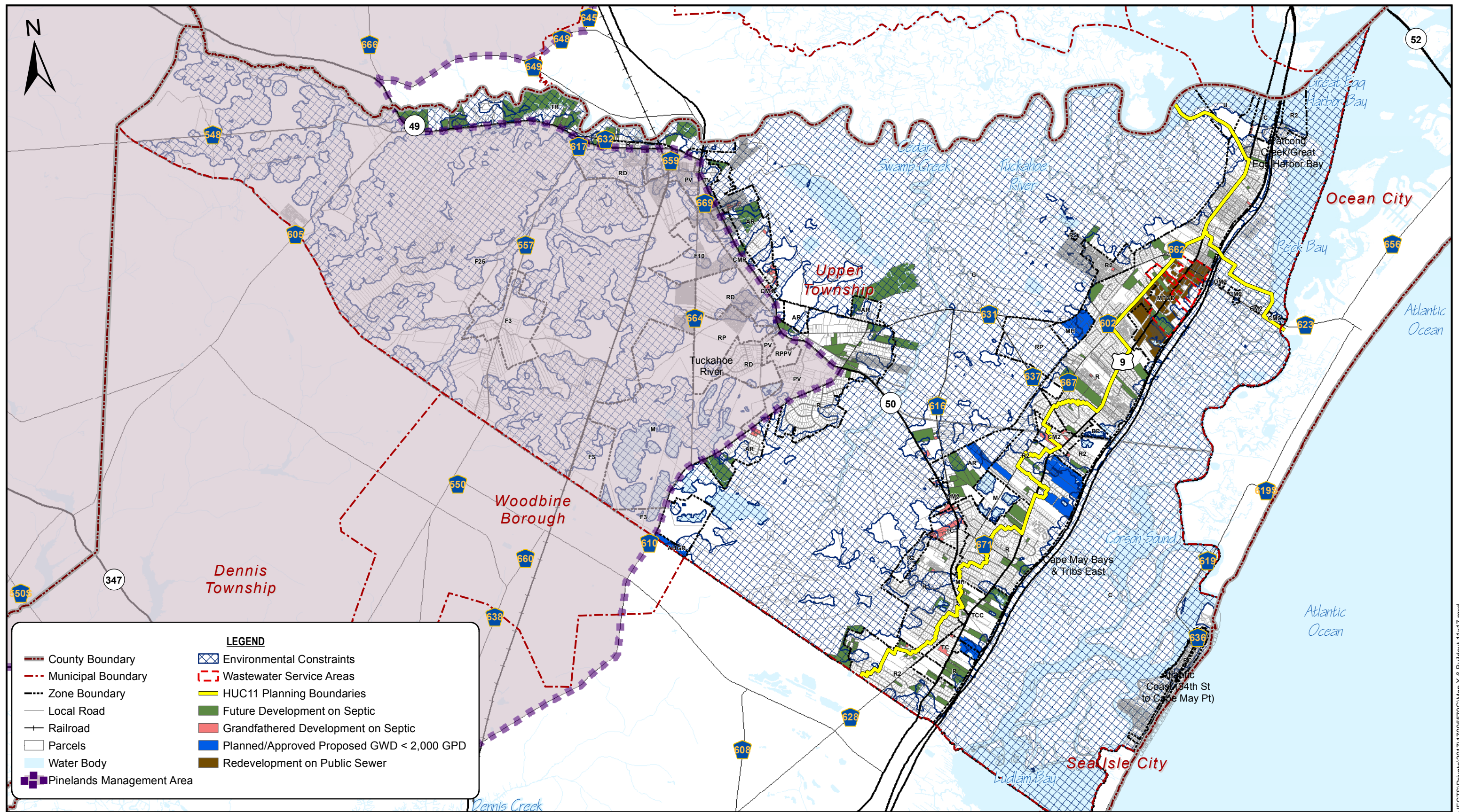
TOWNSHIP OF UPPER

CAPE MAY COUNTY WASTEWATER MANAGEMENT PLAN

COUNTY OF CAPE MAY, NEW JERSEY



May 2018



0 6,900 13,800 20,700 27,600 Feet

This product is reproduced from geospatial information prepared by various agencies. Although the County of Cape May has made every attempt to verify the accuracy of the data with representatives of each municipality, these products are for illustration purposes only, are not suitable for site-specific decision making, are subject to constant changes, and may not be complete, accurate or current. For all data contained herein, the County of Cape May makes no warranty of any kind, expressed or implied, including, but not limited to, the warranties of merchantability or fitness for a particular use, or any other matter. This information is prepared specifically for the planning purposes of the Cape May County Wastewater Management Plan and should not be used, and is not intended for, survey, engineering or any other purposes. The County is not responsible for possible errors, omissions, misuse, or misinterpretation.

MAP 12-6: BUILDOUT RESULT

TOWNSHIP OF UPPER

CAPE MAY COUNTY WASTEWATER MANAGEMENT PLAN

COUNTY OF CAPE MAY, NEW JERSEY



January 2018