ENVIRONMENTAL RESOURCE INVENTORY

Borough of Oceanport

Monmouth County, New Jersey

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This plan was prepared with the assistance of a Smart Growth Planning Grant from the Association of New Jersey Environmental Commissions.

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EXECUTIVE SUMMARY

In July 2012, the Oceanport Environmental Commission was awarded a Smart Growth Planning Grant from the Association of New Jersey Environmental Commissions (ANJEC) to develop its first Environmental Resource Inventory (ERI). A detailed ERI serves to inform the planning process by providing a factual basis for land use decision-making. The mapping and description of sensitive areas facilitate the proper use and protection of existing natural areas, the appropriate development of the few remaining vacant, privately-owned land parcels, and the redevelopment of developed lands. This inventory can serve in the refinement of zoning regulations and land use ordinances. The identification and understanding of natural systems and their inherent and regulatory limitations for development serve to prevent future environmental problems and associated mitigation costs. The inventory can identify possibilities for partnerships and planning activities that can improve environmental conditions and quality of life in Oceanport.

In October 2012, the Borough was struck by Superstorm Sandy and suffered extensive damage to homes and structures along the river and inland due to record high tides. Numerous homes and the Borough Offices were flooded and much of the Borough lost power for three to four days. The completion of this ERI was delayed as our volunteers needed to attend to property loss and damage. Some of our volunteers were unable to follow through as planned due to more pressing concerns brought about by the storm. An extension of time to complete the ERI was allowed by ANJEC.

The ERI has been further complicated by the acquisition of 419 acres of property that was once part of Fort Monmouth. A separate governing body is managing the development, lease, and sale of that acreage, which includes several buildings, as well as a parade field.

The former Fort Monmouth property is enclosed by a gated fence and access to the property is limited.

Prior to the preparation of this Environmental Resource Inventory (ERI), the Borough of Oceanport took the following actions:

The Mayor and Borough Council approved the ANJEC grant proposal

The Mayor and Borough Council worked with members of the Environmental Commission to obtain a Smart Growth Planning Grant from the Association of New Jersey Environmental Commissions (ANJEC) to help fund the ERI. The Grant was awarded to the July 2012.

The ERI is funded through the ANJEC Grant with a 50% match of volunteer hours by Oceanport residents and volunteers.

INTRODUCTION

An Environmental Resource Inventory (ERI) is a compilation of all of the environmental features and characteristics in a municipality. It integrates a variety of data from multiple sources to give the most complete description of natural and cultural resources, critical areas, and other environmental features. A detailed environmental resource inventory serves to inform the planning process by providing a factual basis for land use decision-making. This is especially critical for Oceanport as the redevelopment of Fort Monmouth begins.

The mapping and description of sensitive areas facilitates their proper use and protection, the appropriate development of the vacant, privately-owned land parcels, and the redevelopment of developed lands. It can serve in the refinement of zoning regulations and land use ordinances. The identification and understanding of natural systems and their inherent and regulatory limitations enhance effective management. The inventory can identify possibilities for regional partnerships and planning activities that can improve environmental conditions and quality of life in the Borough of Oceanport.

The Borough of Oceanport encompasses less than four square miles of land, yet due to its configuration of peninsulas and inlets the Borough has a shore line of 14.8 miles. The shoreline is an important element in the appeal of Oceanport as a residential community. Waterfront access has been carefully included in Borough planning, with more than 37 access points to the Shrewsbury River and its tributaries. Many of these access points are street ends, some with bulkheads and others with natural shorelines, but these allow launching of kayaks and small rowboats, and access for fishing and crabbing. It is critical that these access points be documented and preserved. Additionally Oceanport provides a bulkheaded, public motorboat launch at Blackberry Bay Park (permit required) and natural shoreline beachfront at the Seawanaka preserve. There is also a natural bird preserve at the end of Horseneck Point. The quality of the water of the Shrewsbury River that borders so much of Oceanport's shoreline is of importance to the Borough and its residents and is carefully monitored by volunteers,

Oceanport is a well-designed community that includes parks for recreation throughout its various residential neighborhoods. Of the few undeveloped lots in Oceanport, many are freshwater wetlands, which are environmentally sensitive.

1.0 LOCATION

1.1 Regional Setting

The regional setting of a municipality establishes context for the ERI. It is important to understand the regional physiography, geology, climate and geography, which are driving forces behind the localized formation of soils, plant and animal communities. These factors, in turn, affect the human context of land development and its regulation. In this section the location of the Borough, key environmental regulations governing land use and managing natural resources, land use and climate will be discussed.

1.2 Location

The Borough of Oceanport is located in northeaster portion of Monmouth County, New Jersey. Its mapping coordinates are (40.316012,-74.020479). The Borough consists of two major sections: the Borough, which consists of a total area of 3.798 square miles, which includes 3.18 square miles of land and 0.618 square miles of water, (US Census Bureau) and the post Base Realignment and Closure (BRAC) Borough, which includes an additional 419 acres of property (approximately 0.65 square miles) that was once part of Fort Monmouth, which was officially closed in September 2011. Thus the current 2014 Borough is 3.863 square miles.

Oceanport is bordered largely by the Shrewsbury River and the creeks that feed the Shrewsbury. Little Silver is located across the river to the northwest, Long Branch across the river to the east, Eatontown to the southwest, and West Long Branch to the southeast. The borders of the Borough extend out into the Shrewsbury River where we abut Rumson and Monmouth Beach. The Fort Monmouth section of the Borough abuts the Borough of Shrewsbury along a portion of Parkers Creek.

Oceanport has an extensive shoreline along the Shrewsbury River consisting of 14.8 miles (this includes the Fort Monmouth portion).

1.3 Key Environmental Regulations

New Jersey's coastal area provides diverse resources and recreational opportunities. Coastal land provides crucial habitat for a wealth of wildlife, including migrating birds, commercially valuable fish and shellfish, and sporting and recreational species.

Yet the State's coastline is under threat from human activities. Hasty, uncoordinated development along the New Jersey shore has already had an impact on this fragile ecosystem. Regulations are necessary to prevent pollution, destruction of vital wildlife habitat, increases in storm water runoff, and destruction of the natural beauty that attracts visitors. Regulation of coastal activities is also necessary in some cases to prevent loss of life and property from coastal storms, erosion, and flooding (NJDEP Website, ERI City of Long Branch).

The Borough of Oceanport includes a number of areas designated by the State of New Jersey for extra protection, including coastal wetlands, freshwater wetlands and their associated upland transition areas, tidelands, and streams and their associated riparian corridors. Rules and regulations have been adopted by the State to regulate development in these areas. The entire Borough of Oceanport falls within the State's Coastal Zone.

The Federal Coastal Zone Management Act of 1972 gave States the authority to devise strategies and policies to manage development and use of coastal land and water areas. The Coastal Zone in New Jersey is regulated under the Coastal Permit Program Rules (N.J.A.C. 7:7) and the Coastal Zone Management Rules (N.J.A.C. 7:7E). The three major coastal statutes regulating development in the Coastal Zone are the Wetlands Act of 1970, the Waterfront Development Law and the Coastal Area Facility Review Act (CAFRA).

1.3.1 Coastal Area Facility Review Act (CAFRA) (N.J.S.A. 13:19)

The jurisdictional limit of the State's CAFRA zone extends from Old Bridge Township, Middlesex County, at the northern end south to Cape May Point, Borough of Cape May County and north along the Delaware Bay to Carney's Point Township, Salem County. The inland limit of the CAFRA area follows an irregular line drawn along public roads, railroad tracks, and other features. The CAFRA area varies in width from a few thousand feet to 24 miles, measured straight inland from the shoreline. The entire Borough of Oceanport is located within the State's CAFRA Zone.

The law divides the CAFRA area into pieces or zones, and regulates different types of development in each zone. Generally, the closer you are to the water, the more likely it is that your development will be regulated. The CAFRA law regulates almost all development activities involved in residential, commercial, or industrial development, including construction, relocation, and enlargement of buildings or structures; and all related work, such as excavation, grading, shore protection structures, and site preparation (NJDEP Website).

1.3.2 Waterfront Development Act (N.J.S.A. 12:5-3)

The Waterfront Development Act seeks to limit problems that new development could cause for existing navigation channels, marinas, docks, moorings, other existing uses, and the environment. New construction requires a DEP permit. All projects proposed below the mean high water line within the Borough of Oceanport are subject to the NJDEP's Waterfront Development Rules (NJDEP Website).

1.3.3 Wetlands Act of 1970 (N.J.S.A. 13:9A)

The land immediately adjacent to tidal water often contains coastal wetlands. These wetland areas are a vital coastal resource serving as habitat for many creatures. The wetlands also serve as buffers that protect upland areas from the flooding and damage caused by storms.

The Wetlands Act of 1970 requires the NJDEP to regulate development in coastal wetlands. Any time land is located near tidal water, there is a good possibility of coastal wetlands on the property. Some signs that may indicate the presence of wetlands are tall reeds and grasses, or ground that is often soggy. The regulated coastal wetlands are shown on maps prepared by the NJDEP. Unlike NJDEP's freshwater wetlands maps, the coastal wetlands maps are used to determine jurisdiction representing the regulatory limits of the State's authority under the Wetlands Act of 1970. These maps are available for public inspection at each county clerk's office (NJDEP Website). A Coastal Wetlands Permit is required to excavate, dredge, fill or place a structure on any coastal wetland shown on the maps.

1.3.4 Tidelands Act (N.J.S.A. 12:3)

In accordance with the State of New Jersey's Tidelands Act, lands that are now, or formally, flowed by the mean high water line are owned by the State of New Jersey and are referred to as tidelands. This includes lands that were previously flowed by the tide but have been filled and are no longer flowed by the tide. These lands are owned by the people of the State of New Jersey. You must first get permission from the State to use these lands, in the form of a tidelands license, lease or grant, and you must pay for this use. A Tidelands Grant conveys, through a purchase agreement, complete ownership rights to the tidelands from the State to the property owner. A Tidelands Lease or License allows a party to "rent" the use of the tidelands from the State for a fee for a designated period of time. Activities proposed below the mean high water line of any tidal water body require review and approval from the New Jersey Department of Environmental Protection ("NJDEP") Bureau of Tidelands.

1.3.5 New Jersey Freshwater Wetlands Protection Act (N.J.S.A. 13:9B)

Unmapped coastal wetlands and freshwater wetlands are regulated by the NJDEP under the Freshwater Wetlands Protection Act. The Freshwater Wetlands Protection Act regulates all activities in freshwater wetlands and their adjacent upland areas referred

to as 'transition areas". Freshwater wetlands are commonly referred to as swamps, marshes, or bogs. However, many freshwater wetlands in New Jersey are forested and do not fit the classic picture of a swamp or marsh. Previously misunderstood as wastelands, wetlands are now being recognized for their vital ecological and socioeconomic contributions.

Freshwater wetlands contribute to the social, economic, and environmental health of our nation in many ways:

Wetlands protect drinking water by filtering out chemicals, pollutants, and sediments that would otherwise clog and contaminate our waters.
Wetlands soak up runoff from heavy rains and snow melts, providing natural flood control. Wetlands release stored flood waters during droughts. Wetlands provide critical habitats for a major portion of the State's fish and wildlife, including endangered, commercial and recreational species. Wetlands provide high quality open space for recreation and tourism.

Many of these values were not widely appreciated until the 1970s and 1980s. By then, more than half of the nation's wetlands were destroyed. The New Jersey freshwater wetlands program protects freshwater wetlands, and upland areas up to 150 feet of wetlands (called transition areas or "buffers"), from development, which will impair the wetlands' ability to provide the values listed above.

The Freshwater Wetlands Protection Act requires the NJDEP to regulate virtually all activities proposed in freshwater wetlands, including cutting of vegetation, dredging, excavation or removal of soil, drainage or disturbance of the water level, filling or discharge of any materials, driving of pilings, and placing of obstructions.

The most common type of freshwater wetlands permit is a general permit. General permits cover a limited number of very minor activities, such as:

- repair of existing structures
- short roads or driveways
- docks
- utility lines
- stream bank stabilization
- septic system repair

If your activity is not eligible for authorization under a general permit, DEP may, in very limited circumstances, issue a freshwater wetlands individual permit. Individual permits require an extensive alternatives analysis and are therefore much less common than general permits (NJDEP Website).

When the Freshwater Wetland Protection Act was adopted it was structured such that the State of New Jersey would assume jurisdiction over freshwater wetlands regulated

by the Federal Government under Section 404 of the Clean Water Act. The State of New Jersey is only one of two states (the other being Michigan), which have assumed Section 404 authority from the Federal Government.

1.3.6 Flood Hazard Area Control Act (N.J.A.C. 7:13)

Unless properly controlled, development within flood hazard areas can increase the intensity and frequency of flooding by reducing flood storage, increasing storm water runoff and obstructing the movement of floodwaters. In addition, structures that are improperly built in flood hazard areas are subject to flood damage and threaten the health, safety and welfare of those who use them. Furthermore, healthy vegetation adjacent to surface waters is essential for maintaining bank stability and water quality. The indiscriminate disturbance of such vegetation can destabilize channels, leading to increased erosion and sedimentation that exacerbates the intensity and frequency of flooding. The loss of vegetation adjacent to surface waters also reduces filtration of storm water runoff and thus degrades the quality of these waters.

The Flood Hazard Area Control Act (FHACA) Rules regulate activities in flood hazard areas (floodways and floodplains) as well as in riparian corridors. The NJDEP has adopted these new rules in order to better protect the public from the hazards of flooding, preserve the quality of surface waters, and protect the wildlife and vegetation that exist within and depend upon such areas for sustenance and habitat. The rules incorporate stringent standards for development in flood hazard areas and adjacent to surface waters in order to mitigate the adverse impacts to flooding and the environment that can be caused by such development.

The riparian zone width depends on the environmental resources being protected, with the most protective 300-ft riparian zone applicable to waters designated as Category One and certain upstream tributaries. Certain waters supporting trout, or habitats of threatened or endangered species critically dependent on the watercourse to survive, or watercourses which flow through areas that contain acid-producing soil deposits, receive a 150-ft riparian buffer. All other regulated waters are assigned a 50 foot riparian zone.

Within the Borough of Oceanport, these rules would apply to Branchport Creek, Manahassett Creek, Parkers Creek, Oceanport Creek, Troutman's Creek, Blackberry Creek, and the Shrewsbury River, and as well as the riparian corridors adjacent to these waterways.

1.3.7 Rivers and Harbors Act of 1899 (Federal)

The Rivers and Harbors Act of 1899 is the oldest federal environmental law in the United States. It is administered by the U.S. Army Corps of Engineers (USACOE). Section 10 of this Act gives the USACOE the authority to regulate the discharge of refuse matter of any kind into the navigable waters of the United States, or their tributaries. This would include many of the coastal wetlands areas within the Borough (located below the mean high water line). Section 10 of the Rivers and Harbors Act also gives the USACOE the authority to regulate any dredging or placement of structures below the mean high

water line of a navigable water of the United States. Therefore, any structures (docks, piers, buoys, mooring piles, bulkhead, etc.) proposed below the mean high water line of a navigable water of the United States requires a permit from the USACOE. Likewise, any dredging or placement of fill below the mean high water line also requires a permit from the USACOE.

1.3.8 Clean Water Act (Federal)

The Federal Clean Water Act (also known as the Federal Water Pollution Control Act of 1972) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. "Clean Water Act" became the Act's common name with amendments in 1977.

Section 404 of the Clean Water Act (CWA) gives the USACOE the authority to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. In New Jersey this included all freshwater wetlands until the State adopted its own Freshwater Wetlands Protection Act Rules. As mentioned previously, when the Freshwater Wetland Protection Act was adopted it was structured such that the State of New Jersey would assume jurisdiction over freshwater wetlands regulated by the USACOE under Section 404 of the Clean Water Act. Under the “assumption process” the USACOE relinquished regulatory authority over all freshwater wetlands within the State of New Jersey with the exception of those located within 1000 ft. of the mean high water line.

Therefore, in New Jersey, permits for work in freshwater wetlands are required from the NJDEP for those freshwater wetlands located more than 1000 ft. from the mean high water line. Permits are required from both the USACOE and the NJDEP for work in freshwater wetlands located within 1000 ft. of the mean high water line.

Proposed activities are regulated by the USACOE through a permit review process. An *individual permit* is required for potentially significant impacts. Individual permits are reviewed by the U.3S. Army Corps of Engineers, which evaluates applications under a public interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1) guideline. However, for most discharges that will have only minimal adverse effects, a *general permit* may be suitable. General permits are issued on a nationwide, regional, or State basis for particular categories of activities. The general permit process eliminates individual review and allows certain activities to proceed with little or no delay, provided that the general or specific conditions for the general permit are met. For example, minor road activities, utility line backfill, and bedding are activities that can be considered for a general permit.

1.3.9 Federal Emergency Management Agency (Federal)

The Federal Emergency Management Agency (FEMA) provides Federal advisory flood elevation maps. New maps were adopted by the NJ State Government in March 2013. These maps are subject to revision but include these categories:

- AE: An area inundated by 100 year flooding, for which Base Flood Elevations (BFE) have been determined.
- VE: An area inundated by 100-year flooding with velocity hazard (wave action); Base flood elevations have been determined.
- X500: An area inundated by 500-year flooding; an area inundated y 100-year flooding with average depths of less than one foot or with drainage areas less than one square mile; or an area protected by levees for 100-year flooding.

Any construction within the A and V zones must meet certain construction standards, which elevate habitable areas above the base flood elevation line. The NJDEP regulates development in floodplains under the Flood Hazard Area Control Act Rules (N.J.A.C. 7:13). Oceanport participates in the Community Rating System (CRS) under the National Flood Insurance Program (NFIP).

1.3.10 Historic Preservation

Historic Resources must entertain regulations set forth by the State Historic Preservation Office (SHPO). See Section 5.2 for details.

1.4 Existing Land Use and Land Cover

The Borough land area is, for the most part developed as single family residential properties. Most undeveloped property is wetlands. There is a small business district and an even smaller industrial zone. Other significant uses are the 328 acres owned by the New Jersey Sports and Exposition Authority, the 95 acres of Monmouth County's Wolf Hill Recreation Area, the 30 acres of Woodbine Cemetery and the 76 acres of municipal parks and open space. Map 1 shows existing land use.

1.5 Non-vehicular Mobility

Encouraging pedestrian and bicycle mobility as an alternative to the automobile is at the core of reducing Vehicle Miles Traveled (VMT) and the associated emission of greenhouse gasses that affect climate change. Air quality also improves, when fewer motorized vehicles are utilized. Choosing to walk or bike to the bus stop or train station results in fewer automobile trips and less congestion and engine emissions. Oceanport has numerous walkable streets, a limited sidewalk system, a seasonal (racetrack season) train stop at Port-au-Peck Ave. and a bus stop served by a major bus line (Academy) with service to New York City.

2.0 PHYSICAL RESOURCES AND CONDITIONS

2.1 Climate

Climate is the average course or condition of the weather at a place as exhibited by temperature, wind velocity, and precipitation.

Since New Jersey is located about halfway between the Equator and the North Pole, on the eastern coast of the United States, its geographic location results in the State being influenced by wet, dry, hot, and cold airstreams, making for daily weather that is highly variable. The climate zones of NJ are shown in Figure 1, below. With the Borough of Oceanport contained within New Jersey's coastal climate zone.

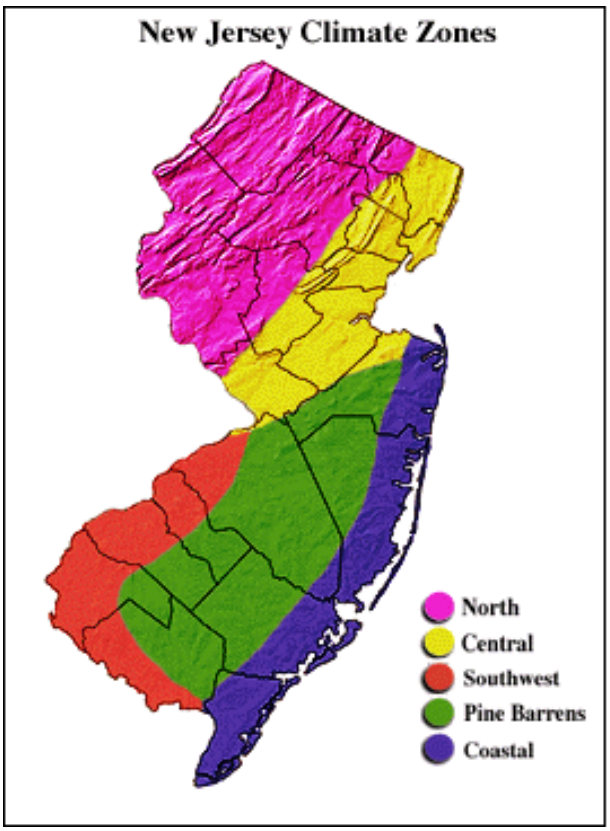

Figure 1: New Jersey's Climate Zones (ONJSC)

The dominant feature of the weather in NJ and actually all of the continental United States, is the movement of weather systems from west to east, known as the "prevailing westerlies." These westerlies shift north and south and vary in strength during the course of the year, exerting a major influence on the weather throughout New Jersey.

The Borough of Oceanport sits in the Coastal Climate Zone and as the name suggest, the borough's climate is dominated by its close proximity to the Atlantic Ocean (as anyone who lives here will be happy to tell you). Ocean sea breezes govern Oceanport's daily weather from March through October. The reason for this is simple, the sun is strong during these months and it heats up the land faster than the ocean. As the air over the

land heats, it begins to rise. When it rises, the cooler air over the ocean rushes in to take its place, creating a sea breeze. The sea breezes have a dramatic effect on the local weather, seemingly extending Winter well into March and many times April, delaying Spring-like conditions until May and June. They have a positive influence in that they moderate sultry, summer temperatures to the point where in many parts of Oceanport, residents can turn off their air conditioners. Figure 2 shows the average ocean temperature measured at Sandy Hook, NJ (NOAA) for 2013.

January		37°F
February		36°F
March		40°F
April		46°F
May		55°F
June		62°F
July		69°F
August		72°F
September		68°F
October		59°F
November		51°F
December		43°F

Figure 2: Average Ocean Temperatures, Sandy Hook, NJ (NOAA)

Another local geographical influence on the borough's weather is the Shrewsbury River. Many of the borough's neighborhoods exist on peninsulas that extend into the river. As with the ocean, the river temperatures are much cooler than the adjacent land and have a similar effect. This is especially dramatic during the spring months when a north or northwest wind will transform a beautiful spring day into a very cold and windy wintry day. Figure 3 depicts the average monthly high and low temperatures, precipitation amounts and record high and low temperatures for Oceanport (NOAA) 2012.

Figure 3: Average Monthly High and Low Temperatures, Precipitation and Record High and Low Temperatures

	High	Low	Ave Precip	Record High	Record Low
Jan	41°F	24°F	4.21 in.	76°F (1950)	-8°F (1984)
Feb	43°F	26°F	3.15 in.	78°F (1985)	-12°F (1934)
Mar	50°F	33°F	4.16 in.	87°F (1945)	4°F (1984)
Apr	59°F	41°F	4.39 in.	92°F (1929)	17°F (1985)
May	68°F	50°F	4.05 in.	94°F (1986)	29°F (1978)
Jun	78°F	61°F	3.48 in.	99°F (1988)	37°F (1938)
Jul	83°F	66°F	4.77 in.	106°F (1936)	46°F (1984)
Aug	81°F	65°F	5.02 in.	101°F (2001)	43°F (1976)
Sep	76°F	58°F	3.62 in.	98°F (1983)	32°F (1983)
Oct	66°F	46°F	4.42 in.	95°F (1941)	24°F (1983)
Nov	56°F	38°F	3.61 in.	83°F (1950)	13°F (1930)
Dec	46°F	29°F	3.89 in.	74°F (1984)	-2°F (1980)

Several storms have caused considerable flooding in Oceanport, most recently Superstorm Sandy in October 2012, as well as powerful nor'easters in December 1992 and March 1961. The flooding from these storms has become more severe progressing from the 1961 storm to the 2012 storm. It seems plausible that future coastal storms will become more severe and more frequent due to climate changes. Sea level rise will probably continue to exacerbate the problem and if current predictions of sea level at the end of this century are correct, a retreat from the lowest elevations of town are likely in the long run.

2.2 Physiography

The Borough of Oceanport is located within the Inner Coastal Plain Province of New Jersey. The Coastal Plain is characterized by unconsolidated sand, gravel, silt, and clay thickening seaward from a featheredge at the Fall Line to more than 6,500 feet (ft) thick in southern Cape May County (Gill and Farlekas 1976). The Coastal Plain Physiographic Province extends along the entire Atlantic Coast from Maine to the Gulf of Mexico. Differences in the amount and type of erosion, coupled with variability in underlying rock composition, influence the nature of sediments throughout the Coastal Plain. In general, the Atlantic Coastal Plain, including Oceanport, is flat and slopes gently seaward.

Oceanport's relatively extensive 14.8 miles of shoreline, combined with its coastal plain geography and location on the southern portion of the Shrewsbury River makes it especially vulnerable to Northeast storms.

2.3 Geology

2.3.1 Subsurface Geologic Formations

Oceanport's subsurface geology consists of sedimentary deposits of varying amounts of clay, sand, silt and glauconite (1) to a depth of several hundred feet. Thus the solid rock is far below the surface in Oceanport and in fact in all of coastal New Jersey. The depth of these deposits within the coastal plain increases from northwest at the margins toward the southeast to a depth of approximately 2000 feet at the mouth of the Manasquan River and 3000 feet at Cape May.

Three sedimentary formations underlying the Borough of Oceanport: Vincentown Formation (in the southwestern part of the Borough), Hornerstown Formation (under the majority of the Borough) and Tinton Formation (along the northern and eastern edge of town which includes part of the Fort Monmouth area, Horseneck Point, Gooseneck Point and the northeastern edge of town formerly called 'Sands Point').

Map 3 provides the location of the subsurface geological formations found in Oceanport

2.3.2 Vincentown Formation

The Vincentown Formation includes some sporadic pieces of ironite, which is a conglomerate rock resembling brown cement with embedded pebbles. This may account for the fact that the southwestern part of town has higher elevations than the remainder of the Borough.

The Vincentown Formation, which underlies the southwestern part of Oceanport, is upper Paleocene in age and has been dated at 56.4 +/- 18 Million Years Ago (MYA) (Owens et al. 1998). It is composed of medium-grained sand, is dusk yellow to pale gray and weathers orange brown to red brown. It is typically very glauconitic and clayey near the base (Owens et al. 1998). The formation averages 10 – 49 feet in thickness, but extends up to 98 ft. The contact with the underlying Hornerstown is disconformable, i.e. represented by a hiatus and period of erosion, and often is characterized by fossil shell beds of 2-55 feet thick in some areas (Owens et al. 1998).

2.3.3 Hornerstown Formation

The Hornerstown Formation is older than the Vincentown Formation and underlies a large central portion of the Borough. It is composed of sand and glauconite; and is locally clayey; massive; and dark to dusky-green (Owens et al. 1998). The Hornerstown Formation weathers readily to iron oxide (dusky yellow to red) because of the high iron content in the glauconite, which is relatively pure in some locations. In some portions of its occurrence, the Hornerstown Formation overlies several older formations unconformably on an erosional surface. The Hornerstown Formation is 5 – 23 feet thick (Owens et al. 1998) and represents the first material deposited locally following the close of the Cretaceous Period and the Age of Dinosaurs. It crops out in the western portion of the state.

2.3.4 Tinton Formation

The Tinton Formation is the youngest of the Cretaceous Formations in New Jersey with an age of approximately 65 MYA at the top of the Formation. The greenish-brown glauconite sands and clays are well hardened in places and in fact form the waterfall at Tinton Falls. The Formation is not differentiated from the underlying Red Bank sand on the geologic map. The Tinton Formation is only 20 feet thick, with every indication of having been deposited in very shallow water.

Glauconite is an iron potassium phyllosilicate (mica group) mineral of characteristic green color with very low weathering resistance and easily crumbled. It is normally found in dark green rounded pellets with the dimension of a sand grain size. It can be confused with some other clay minerals. Normally, glauconite is considered a mineral indicative of continental shelf marine deposits with slow rates of accumulation.

Heavy concentrations of glauconite associated with very fine-grained sediments are recognized in the New Jersey Coastal Plain as deposits which formed during major incursions of the sea. During the Upper Cretaceous Epoch and Tertiary Period, most sediments were deposited in various shelf and beach environments caused by the alternating transgressive and regressive seas.

Glauconite is common in this geologic section and is indicative of mid to outer shelf deposition. Silty and clayey glauconite sands are generally considered to form in marine environments characterized by slow rates of sedimentation. Certain Oceanport soils have heavy glauconite content indicative of the aforementioned geological progressions and processes.

2.4 Surficial Geology

Because of the extensive and long-term alteration of land associated with settlement of the region, and natural woodlands, surface material within the Borough of Oceanport is composed of a combination of soils derived directly from the parent material (i.e., fluvio-marine Tertiary quartz and glauconitic sands), Aeolian surface deposits of coastal sands and reworked parent material, and fill and/or disturbed original soil material.

2.4.1 Topography and Slopes

The topography within and adjacent to Oceanport extends from sea level to a maximum height of approximately 55 feet Mean Sea Level (MSL).

Because of the underlying geology and the tilt of the formations toward the southeast, the northern and eastern section of Oceanport has generally lower elevations than the southwestern part of town. The northern and eastern sections of Oceanport have generally lower elevations of 10 to 20 feet above Mean Sea Level (MSL), with much of this region at or below 10 feet MSL. The southwestern section of town, by contrast, has elevations varying between 20 to slightly over 50 feet above MSL. This topography accounts for the fact that the northern and eastern portions of town are susceptible to flooding during strong storms. Map 2 details the topography of Oceanport.

2.4.2 Soils

Soil is composed of varying proportions of sand, silt and clay particles derived from underlying geologic parent material. These particles are the result of long term forces acting on mountains and rock to break down these large masses into small particles. The native soils of Oceanport Borough were formed in the sediments laid down in glacial outwash plains and marine sediments when the ocean covered this land area. Coastal Plain soils represent a "geologic-ecologic" blend. Unlike soils in the northern part of the state, which can be identified with a particular location, the Coastal Plain soils are influenced by greater variability during geologic formation and subsequent modification.

The Soil Conservation Act of 1935 led to the establishment of the Soil Conservation Service and with it a focus on soil characteristics. The United States Department of Agriculture (USDA) has taken the lead in describing the characteristics of soils in New Jersey. Because of the complexity, soils are described as groups with similar characteristics, often based on location (NRCS 2006)

The soil types found in the Borough are depicted on Map 5 and are described below. Owing to the placement of fill, and other land alterations associated with development within the Borough, native surficial soils have been extensively altered.

Appoquinimink-Transquaking-Mispillion complex, 0 to 1 percent slopes (AptAv). The soil complex consists of mucky silt loam, silt loam, and mucky peat, and is very frequently flooded and frequently ponded. It is associated with tidal marshes. This soil is very poorly drained and annual ponding is frequent. The parent material consists of loamy stream sediments over herbaceous material. This soil type is considered hydric, and as such is an indicator of the potential presence of wetlands (See section 5.3).

Atsion sand, 0 to 2 percent slopes (AtsA). This soil consists of sand with a top layer of peat and has no flooding or ponding. It occurs on flats and is poorly drained. The parent material is sandy fluvio-marine deposits.

Evesboro sand, 5 to 10 percent slopes (EveC). This soil consists of sand to loamy sand and has no flooding or ponding. It occurs on low hills and is excessively drained. The parent material is sandy aeolian deposits and/or sandy fluvio-marine deposits.

Evesboro-Urban land complex, 0 to 5 percent slopes (EvuB). This soil complex consists of sand and loamy sand and has no flooding or ponding. It occurs on low hills and is excessively drained. The percent material is sandy aeolian deposits and/or sandy fluvio-marine deposits.

Freehold sandy loan, 2 to 5 percent slopes (FrkB). This soil consists of sandy loan to sandy clay loam and has no flooding or ponding. It occurs on low hills and knolls and is well drained. The parent material is glauconite bearing loamy Aeolian deposits and/or glauconite bearing loamy fluvio-marine deposits.

Freehold sandy loam, 2 to 10 percent slopes (FrkC). This soil consists of sandy loam and sandy clay loam and has no flooding or ponding. It occurs on hill slopes and knolls and is

well drained. The parent material is glauconite bearing loamy Aeolian deposits and/or glauconite bearing loamy fluvio-marine deposits.

Freehold-Urban land complex, 0 to 10 percent slopes (FrrC). This soil complex consists of sandy loam and sandy clay loam and has no flooding or ponding. It occurs on low hills and knolls and is well drained. The parent material is glauconite bearing loamy Aeolian deposits and/or glauconite bearing loamy fluvio-marine deposits. The Urban land includes surfaces covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil.

Holmdel-Urban land complex, 0 to 5 percent slopes (HofB). This soil complex consists of sandy loam, sandy clay loam, and sand and has no flooding or ponding. It occurs on low hills and is moderately well drained. The parent material is glauconite bearing loamy marine deposits and/or fluvio-marine deposits. The Urban land includes surfaces covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil.

Hooksan sand, 0 to 5 percent slopes, rarely flooded (HorBr). This soil consists of sand, rarely floods, and has no ponding. It occurs on barrier beaches and is excessively drained. The parent material is sandy beach sand.

Humaquents, 0 to 3 percent slopes, frequently flooded (HorBr). This soil consists of loam and sand and frequently floods and ponds. It occurs on floodplains and is poorly drained. The parent material is loamy alluvium.

Klej loamy sand-Urban land complex, 0 to 5 percent slopes (KkhB). This soil complex consists of Klej loamy sand and sand and has no flooding or ponding. It occurs on dunes and is somewhat poorly drained. The parent material is unconsolidated sandy marine deposits. The Urban land includes surfaces covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil.

Shrewsbury sandy loam, 0 to 2 percent slopes (ShrA). This soil consists of sandy loam, sandy clay loam, and loamy sand and has no flooding or ponding. It occurs on flats and is poorly drained. The parent material is fine-loamy marine deposits containing moderate amounts of glauconite.

Udorthents, 0 to 8 percent slopes (UdaB). This soil consists of loam and sandy loam and has no flooding or ponding. It occurs on low hills and is well drained. The parent material is fill and/or disturbed original soil material.

Udorthents-Urban land complex, 0 to 8 percent slopes (UdauB). This complex consists of loam and sandy loam and has no flooding or ponding. It occurs on low hills and is well drained. The parent material is fill and/or disturbed original soil material. The Urban land includes buildings, pavement, and other impervious surfaces over fill and/or disturbed original soil material.

The Soils Map (Map 7) shows the soil survey mapping units. The table below shows the limitations of the Borough soils for certain types of development.

Table 1: Development Limitations of Soils (Jablonski & Baumley 1989)

Mapping Units	Depth to Seasonal High Water Table (inches)	Septic Limitations: Absorption fields	Limitations for Building Foundations (with basements)
Appoquinimink-Transquaking-Mispillion complex, 0 to 1 percent slopes (AptAv)	0	Severe: seepage, wetness	Severe: wetness, flooding
Atsion sand, 0 to 2 percent slopes (AtsA)	>80	Severe wetness; poor filter	Severe: wetness
Evesboro sand, 5 to 10 percent slopes (EveC)	>80	Severe: poor filter	Slight
Evesboro-Urban land complex, 0 to 5 percent slopes (EvuB)	>80	Variable	Variable
Freehold sandy loan, 2 to 5 percent slopes (FrkB)	>80	Severe: poor filter	Slight
Freehold sandy loam, 2 to 10 percent slopes (FrkC).	>80	Severe: poor filter	Slight
Freehold-Urban land complex, 0 to 10 percent slopes (FrrC)	>80	Variable	Variable
Holmdel-Urban land complex, 0 to 5 percent slopes (HofB)	6 – 36	Variable	Variable, including severe: wetness
Hooksan sand, 0 to 5 percent slopes, rarely flooded (HorBr)	48 – 118	Severe: poor filter	Severe: wetness; flooding
Humaquents, 0 to 3 percent slopes, frequently flooded (HorBr).	0 – 12	Severe: seepage, wetness	Severe: flooding
Klej loamy sand-Urban land complex, 0 to 5 percent slopes (KkhB).	12 – 24	Severe: see page, wetness	Severe: wetness
Shrewsbury sandy loam, 0 to 2 percent slopes (ShrA).	0 – 12	Severe: wetness,	Severe: wetness
Udorthents, 0 to 8 percent slopes (UdaB).	>80	Variable	Variable
Udorthents-Urban land complex, 0 to 8 percent slopes (UdauB)	>80	Variable	Variable

2.5 Known Contaminated Sites

The NJDEP Site Remediation Program maintains a list of New Jersey sites that are confirmed to be contaminated and are undergoing remedial investigation or cleanup or are awaiting assignment. These sites note where contamination of soil or groundwater is contaminated. At the time of the mapping for this report, the NJDEP reported 2 active and 1 pending known contaminated sites. See Map 10. Since then, the Fort Monmouth base service station, located at Saltzman Avenue has been added to the NJDEP site list.

Several locations on the Fort Monmouth property have been identified as contaminated. According to a redevelopment study conducted by the Borough of Tinton Falls in 2012, the research and development activities at Fort Monmouth generated a number of wastes, many of which were disposed on site.

The Department of Defense developed the Installation Restoration Program (IRP) to comply with federal guidelines for managing and controlling past hazardous waste disposal actions. Forty-three IRP sites have been identified on Fort Monmouth, many of these being located in Oceanport. These sites include an underground gasoline leak (at the aforementioned Fort Monmouth base service station), inactive landfills and storage facilities where leaks have been reported. As Fort Monmouth is assimilated into the Borough through relocation and redevelopment, careful attention will be required to ensure that contaminated sites are remediated.

3.0 Water Resources and Conditions

Water is a critical resource and Oceanport has both groundwater and surface water. Groundwater provides wells with drinking water and contributes to the base flow of streams and water bodies. Groundwater is found below the ground surface in the spaces between soil and sediment particles in unconsolidated sediment and in the cracks and pore space within bedrock and subsurface formations. Streams, rivers, or creeks are all considered surface water, which provides habitat for fish and other aquatic life and recreational opportunities for Oceanport residents. Both surface and groundwater are subject to pollution: surface water due to run-off and groundwater due to degradation by underground septic disposal, over-application of fertilizers and pesticides and leaking underground fuel and other chemical storage tanks. It is environmentally, technically, and economically more sound to avoid contamination than it is to restore water resources.

3.1 Aquifers and Groundwater

An aquifer is a water-bearing bed or stratum of permeable rock, sand or gravel through which subsurface water can move to supply springs and wells. Groundwater, contained primarily in subsurface formations, is one of our most important resources. Sources of groundwater recharge include direct precipitation and discharge from wetlands and surface water bodies; groundwater may also discharge, or replenish, wetlands and surface water bodies. Because of large areas of impervious surfaces and replacement of woodland with houses and lawns, recharge areas are much reduced in historical times.

Aquifers at or near the land surface in Oceanport are the result of beds of silt and clay contained in the Vincentown, Hornerstown, and Tinton Formations. The surface of groundwater is influenced by atmospheric pressure, with elevations varying with conditions at the land surface.

There are a few locations in Oceanport where the aquifers reach the surface in springs. Among these locations are the wetlands behind the Senior Citizen Housing apartment building located on East Main Street, springs in the area around and behind Osprey Lane off Port-Au-Peck Avenue and springs under the Shrewsbury River and its tributaries, including at least one by the Main Street bridge next to Old Wharf Park.

Most household water for the borough is supplied by The New Jersey American Water Company but several homes in the

Port-Au-Peck section of the Borough maintain private wells. Some of these wells are used for irrigation and others serve all water needs for the household.

Drinking water in the home comes from two sources: surface water and ground water. True to its title, surface water is collected from the upper surface of the earth, from streams, rivers, lakes, reservoirs and lastly even from the ocean. On the other hand, ground water requires drilling as a precursor to collect drinking water. Ground water wells must therefore be drilled below the surface of the ground, entering earth pores and spaces between the rocks.

In either case (surface, ground), water must wend its way through the so-called hydrologic cycle. By the process of transpiration and evaporation, a molecule of water traverses through this timeless and endless cycle in a never-ending ritual. This process makes no distinction between fresh water and salt water. Most everyone is aware that salt water makes up the largest percentage of the earth's water. Yet some folks may be surprised to learn that of all the water on this wonderful planet, fresh water comprises less than 1% of the total! This information should alert us all to conserve the scant supply of this precious commodity. One good start: observe water conservation in the home.

Before any water is delivered to our homes, whether surface or ground water, it must undergo a process using special treatment to render it potable. Water is first passed through a series of treatment systems, operated by the government or by privately-held facilities. New Jersey American Water Company is the designated service provider for the Oceanport community. However, there are still clusters of homes within the Community Center area of the Port-Au-Peck section of the Borough that continue to rely on private wells for all water. Oceanport is located in NJ Water Management Area 12 and is served by the Swimming River sub-watershed.

3.2 Surface Water

Oceanport's location in the Swimming River watershed is at the end of the watershed and much of the Borough borders the Shrewsbury River. The water quality in the Shrewsbury River is of great concern to Borough residents and in 1995 concerned citizens created the Water Watch Committee. Members of this committee conduct monthly water quality testing at nine different sites in the Shrewsbury River and have done so for nearly 20years. Increased laboratory costs have limited current testing to Fecal Coliform only, but the monthly results allow the Water Watch Committee to monitor the condition of Shrewsbury River including Branchport Creek. The testing of the Water Watch Committee was very influential in prompting the improvement of wastewater management at Monmouth Park Racetrack.

3.3 Water Quality

The water quality of the Shrewsbury River has been monitored by Oceanport citizens for more than 10 years.

3.3.1 Water Watch Committee and Water Testing

As a watershed community with a 14.8 mile shoreline, Oceanport residents have had a longstanding concern regarding water quality. The citizen volunteer Water Watch Committee (WWC) has as its mission to assure clear, clean water for our community and our ecosystem. Thus, true to its calling, WWC dutifully dispatches its volunteers to test and monitor our surrounding waters at nine strategic sites every month, throughout the year, rain or shine, for almost 20 years.

The Water Watch Committee (WWC) has conducted regular water testing over the years. The testing is performed every month. Samples are taken from nine separate sites (see map#3) at the outset, these sites were carefully and strategically selected in order to harvest as much information as possible from the data collected.

This is illustrated as follows: Test site #9 (Turtle Mews Creek at Oceanport Avenue bridge) was selected to measure the fecal level of water entering Monmouth Park (MP). These test results are then compared to the results obtained at sites exiting MP, providing an accurate perspective on the impact of MP on water quality. Historically, the data reveals that fecal levels diminish as one ventures further away from the fecal source at MP.

For many years the WWC tested the water for dissolved oxygen, water temperature, turbidity, salinity, wind velocity/direction and others. Financial restrictions now limit testing for fecal colony count. WCC also Notes are recorded during each session as to the general character and condition of the water, including observations pertaining to algae, jellyfish, flotsam, etc. To prevent deterioration, all fecal samples collected are kept and stored under ice, including shipment to a licensed laboratory. The volunteer water testers attempt to stay within the desired "6-hour window" of testing accuracy, and to adhere to all similarly accepted practices of water monitoring.

The mission of WWC - monitoring our waters – makes no claim as to the scientific validity of its findings or its conclusions but its work helps to provide the Borough with a generic and serial indicator as to the over-all cleanliness of our precious watershed.

3.3.2 Water Quality Related to Monmouth Park

Water quality in Oceanport has a direct link to a nationally known racetrack – Monmouth Park (MP). Originally owned and run by a group of private investors, the track was purchased in 1986 by the State of New Jersey, through its New Jersey Sports Exposition Authority (NJSEA), which took on its daily operations. In 2011, the state signed a ten-year lease with a private consortium which now oversees the track's entire operation, including its racing schedule. The racing season at MP extends from May to October, although the facility may be home to any number of transient thoroughbred horses from mid-April to late-November. At any one time, its 38 barns may house up to 1600 horses. Over the years our rivers and creeks showed a steady and worrisome rise in fecal concentration, mainly because of poor oversight of track and state officials and their ineffectual management practices.

The New Jersey Department of Environmental Protection (NJDEP) issue permits to operate the race track, one of which is classified as the Concentrated Animal Feeding Operation (CAFO). This particular permit, similar to those issued to hog farmers, allows NJSEA to operate the racetrack because more than 500 of its horses occupy the facility for more than 45 days out of the year. For years, despite several CAFO stormwater deferments, the remedial measures adopted by the MP were inadequate in controlling or disposing of the horse manure generated by the facility. The problem escalated into a huge concern for the community.

The overriding environmental concern in Oceanport has been the fecal contamination spilling into Branchport Creek (BC). BC separates Oceanport and Long Branch to the east. Its fountainhead originates at a small reservoir (Franklin Lake) in West Long Branch. The outfall from this lake drains downstream in a southerly course, crossing and bordering State Highway #36 as Turtle Mews Creek (TMC). Continuing its southward course, TMC enters Monmouth Park (MP). It is during this leg of its journey that the creek gathers a significant bolus of fecal-laden soil. In effect, the creek

transforms into a conduit dumping its contaminated cargo into Oceanport's Branchport Creek (BC), which joins the wide expanse of the Shrewsbury River. (see Map#2).

3.3.3 Water Quality Remediation at Monmouth Park

For some time, officials at Monmouth Park (MP) have generally been cognizant of the environmental impact imposed by their horse population. On occasion, they have attempted to minimize their environmental impact prompted by the persistence of the state DEP, environmentalists and members of the Water Watch Committee (WWC). The publication of a 10-year study (1992-2002) compiled and published by the WWC confirmed that fecal counts obtained inside Monmouth Park were higher than those obtained outside Monmouth Park.

The fecal level measurements inside Monmouth Park were found in the range of thousand plus, some even in the hundred thousand range! (Any fecal level over 200 is considered above normal and unacceptable.) WWC reported fecal counts ranging in number from 500,000 to 600,000r and over.

Following this study, MP constructed a pumping station (1995). This new facility was designed to transport all waste water from the track directly to the local sewer plant. The system had the capacity to handle 100,000 gallons per day, 700,000 gallons per week. During a rain event, the pump could accommodate up to 900,000 gallons per week. Water above this capacity was dumped directly into Branchport Creek. It was presumed that this overflow would only consist of diluted rainwater having a minimal fecal count.

In 2009 Monmouth Park (MP) embarked on a more ambitious construction project prompted in part by the fact that MP lacked maintenance facilities to handle a 25-year 24-hour storm event. (A 25-year 24-hour storm event is defined as the maximum 24-hour precipitation event with the probable recurrence interval of once in 25 years (85th percentile, National Weather Service). The range is expressed as inches of rain in the 24-hour period. For MP, it is recorded as six inches. The DEP's CAFO regulation requires MP provide containment facilities with sufficient capacity to hold all its process waste water, manure water and contaminated storm water up to a 25-year, 24-hour precipitation event

The 4-year construction project was completed in 2012, under budget, according to MP officials. The ultimate goal: clean up Branchport Creek (BC), guaranteeing that only "clean" water would be permitted to enter our contaminated creek. Rain gutters were soon installed on all horse barns, thereby allowing only "clean" water to be transported through pipes directly into BC. Similarly, "clean," non-point source rain water from the parking lots and grandstand area would not be allowed to comingle with horse wastewater. Rather any water branded as "clean" would be given free and unrestricted access to BC.

A large reservoir in the Elkwood Basin area was later built to store the one million gallons of horse wastewater from the barn area. A pump house with computerized capability was installed to deliver up to 700,000 gallons per day of manure water to the local sewer plant for processing (the 1995 pumping station handled a mere 700,000 gallons per week. The WWC testing reveals improvement as a result of this new system.

For years, the soil in Monmouth Park has been so ingrained through high levels of fecal contamination, that this, in itself, could take years to dissipate, years to resolve. There remains much work to be done and WWC is dedicated to its core mission of monitoring water surrounding Oceanport Borough.

3.3.4 Water Quality Related to Franklin Lake (West Long Branch)

The wellspring for Branchport Creek (Franklin Lake) is beset by two problems: (1) a moderate colony of resident Canadian geese and (2) an invasive and noxious weed Hydrilla (*Hydrilla verticillata)*, which may be taking over the lake. Officials in the Borough of West Long Branch have been aware of these issues and have offered remedial measures in an effort to control them. However, the two contaminants - a plant infestation, and an unwanted bolus of Canada geese droppings – continue their migration downstream, pouring into BC, potentially adding more pollutants to an already fragile ecosystem. The Water Watch Committee has now assigned itself another important second mission - namely, to keep a close watch on Franklin Lake with its twin troubles.

3.6 Watersheds

The New Jersey Department of Environmental Protection (NJDEP) defines watershed as "the area of land that drains into a body of water such as a river, lake, stream or bay. It is separated from other systems in the area by high points such as hills or slopes. It includes not only the waterway itself but also the entire land area that drains to it" (NJDEP Division of Watershed Management 2005)

Watershed Management Areas are a designation used by NJDEP and the Borough of Oceanport is located within Watershed Management Area # 12: Monmouth Watersheds: Raritan Bay and tributaries – Shrewsbury River, Navesink River and Atlantic Ocean and tributaries, including Shark River and Manasquan River.

4.0 Biological Resources

4.1 Vegetation

Oceanport's plant communities prior to European settlement were comprised primarily of mixed woodland forests. Typical trees in these forests included varieties of oaks, pines, beech, poplars, chestnut, and maple trees. Streams and drainages in the forests made their way down to the tributaries of the Shrewsbury River. Vegetation along the river shoreline would have been comprised of plants typical of tidal areas along the Mid-Atlantic Coast dominated by *Spartina* marshes and bordered by marsh elder and groundsel. Over the years, most of the forested areas were cut and the land used for farming or otherwise developed. Today, very little of the original forests remain and the Borough is dominated by a suburban landscape with vegetation typical of what is found in suburban parks, developed home lots, and around commercial properties.

Despite the change to the original character of the vegetation Oceanport's trees, shrubs, plants, and grasses continue to provide a valuable role in the community. The mix of woodlots, open fields, wetlands, and landscaped properties adds to the aesthetic quality of the borough. Vegetation, along with soils, topography and other environmental factors create varied habitats that provide food and shelter for wildlife. Trees and shrubs around our homes help to buffer the noise and light from commercial developments and roadway traffic and serve to filter pollutants such as carbon monoxide, nitrogen dioxide and sulfur dioxide while restoring oxygen to the atmosphere. Trees also contribute to energy conservation by providing shade for our homes in the summer, helping to keep them cool, and by acting as windbreaks in winter to reduce heat loss.

In a community closely tied to the Shrewsbury River Estuary, storm water runoff is an important concern. Vegetation plays a vital role in minimizing the impacts of storm water, as roots stabilize the soil, slopes, and shorelines and reduce the rate of erosion. The leaves and branches help break the impact of falling rain allowing the rainwater to filter through the soil. This prevents storm water containing chemicals and pollutants such as fertilizers, pesticides, oil, and other roadway contaminants from running off lawns and impervious surfaces into the streets and storm drains which flow directly to the river.

Oceanport contains several different plant communities found in both wetland and upland environments. The wetland areas include intertidal marshes, freshwater marshes and forested wetlands. The upland habitats are primarily woodlands, successional old fields, and suburban maintained landscapes.

4.2 Wetland Plants

The US Fish and Wildlife Service wetland classification system defines wetlands as lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. To be a wetland it must

have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes (plants specifically adapted to live in wetlands); (2) the substrate is predominantly undrained hydric (wetland) soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year. Wetlands can occur in five systems within New Jersey (marine, estuarine, riverine, lacustrine, and palustrine). Wetland vegetation in Oceanport is found only in the estuarine and palustrine systems.

4.2.1 Estuarine Wetland Vegetation

Estuarine plant communities are those found in the estuaries and coastal areas inundated by tides where the salinity is more than 0.5 ppt (parts per thousand). They include submerged aquatic vegetation, emergent wetlands dominated by herbaceous plants, and woody species found in scrub-shrub or forested wetlands. These would be represented by the plant communities found along the Shrewsbury River, Blackberry Bay, and Branchport, Parkers, and Oceanport Creeks. Salt marsh cordgrass (*Spartina alteniflora*) is the dominant plant in this community which is flooded twice daily by the high tide. Although bulkheading associated with shoreline development has significantly reduced the amount of *Spartina* marsh along these waterways, a sizeable fringe marsh is still found along much of Oceanport's shoreline. These marshes play a vital role in the water quality of the river and are the foundation of the estuarine food chain. Healthy *Spartina* marshes provide nutrients necessary for phytoplankton growth which feed the zooplankton eaten by bait fish such as silversides and killifish and young game fish such as bluefish and striped bass. The marshes provide a substrate for ribbed mussels and other filter feeders which help to clean the water, mud flats for fiddler crabs to burrow, and a place for smaller fish to seek refuge. Herons, egrets, and other wildlife along the river find the marshes attractive for hunting.

Further inland along the shoreline and still flooded by the tides, although less frequently, are bands and patches of vegetation dominated by marsh elder (*Iva frutescens*), groundsel bush (*Baccharis halimifolia*), Saltmeadow cordgrass (*Spartina patens*), and common reed (*Phragmites australis*). These plants can be found along the high tide line at the end of Horseneck Point, sections of Gooseneck Point, Blackberry Bay Park, and in other less developed portions of the shoreline throughout the borough. Eelgrass (*Zostera marina*) was once common in the subtidal bottom habitats of the Shrewsbury River. This submerged aquatic plant is important in helping to keep the river water clean and to improve habitat for blue crabs and other marine creatures. Although eelgrass beds still

exist in the Shrewsbury and Navesink Rivers a survey would need to be conducted to determine if any eelgrass remains in Oceanport's boundary.

4.2.2 Palustrine Wetland Vegetation

The other wetland plant communities in Oceanport are found in areas not influenced by tidal flow or where the salinity is less than 0.5 ppt. These include freshwater marshes and swamps, floodplain forests, ponds and bogs, drainages, seeps and springs. These are considered palustrine wetlands and unlike the other four wetland systems, there are no deepwater habitats. One example of the palustrine wetland can be found upstream from the estuarine environment in the upper reaches of areas like Parkers Creek and Oceanport Creek. As the salinity drops other semi-aquatic, salt-intolerant plant communities begin to appear along the shoreline (littoral zone). The fringe community of saltgrass becomes replaced by a littoral fringe community composed of arrow arum or tuckahoe *(Peltandra tirginica),* spatterdock *(Nuphar lutea),* cattail *(typha),* and swamp rose mallow *(Hibiscus palustris).* Like the saltmarsh this plant community is an important refuge and nursery area for many aquatic organisms. Unfortunately, much of this plant community has become degraded by the establishment of large dense stands of a nonnative form of common reed (*Phragmites australis).* The reeds choke out the native vegetation, especially in areas where the soil and shoreline has been disturbed.

Freshwater marshes, another form of palustrine wetland, are found in a few locations within the Borough. These marshes are most easily recognized by the presence of cattails which is the dominant species. Other plants that may be present include skunk cabbage *(Sympocarpus foetidus),* arrowhead *(Sagittaria latifolia),* common reed *(Phragmites communis),* various rushes *(Juncus* species*)* and sedges *(Carex* species). Examples can be found in Wolf Hill County Park and adjacent to Woodbine Cemetery.

Palustrine Forested Wetlands are dominated by hydrophytic trees. These are trees with adaptations that allow them to tolerate very moist soils or to grow in areas submerged at least part of the time. Wetlands of this type can be found in the wooded areas east of Myrtle Avenue, north of the Jockey Club Development, and adjacent to Maple Place School.

Tree species likely to be found in these floodplain and forested wetlands include: scarlet oak *(Quercus coccinea),* pin oak *(Quercus palustris),* swamp white oak (*Quercus bicolor*), willow oak (*Quercus phellos*), sweet gum *(Liquidambar styracitlua,* black gum *(Nyssa sylvatica)*, white ash *(Fraxinus americana),* silver maple *(Acer saccharinum),* red maple *(Acer rubrum),* box elder *(Acer egundo),* black willow *(Sala nigra)* and sycamore *(Platanus occidentalis).* Representative understory shrub species include elderberry (*Sambucus canadensis*), highbush blueberry (*Vaccinium corymbosum*), and arrowwood (*Viburnum dentatum*). Some of Oceanport's forested wetlands are in a transitional stage from former use as farmland and contain large areas of non-native trees such as Norway maple (*Acer platanoides*), which would not normally be found in such habitats.

4.3 Terrestrial Vegetation

Terrestrial vegetation includes all the plant types and habitats that are not considered wetlands. These plant communities are often referred to as uplands and have nonhydrophytic vegetation (vegetation not characteristic of wetlands), non-hydric soils (soils not characteristic of wetlands) and negative wetland hydrology (hydrology not characteristic of wetlands). In Oceanport, the upland communities consist of mixed forest, successional open field, and suburban landscape.

Mixed deciduous forests covered most of Oceanport's non-wetland areas before the Borough was settled and the land was converted to agriculture uses or otherwise developed. These trees would have primarily consisted of a variety of oaks, beech, maples, and chestnut. Today, only remnants of these forests remain.

The former agricultural fields that have not been developed for residential or commercial use make up the vegetation type referred to as successional old field. The fields that are earlier in successional development, such as those found at Wolf Hill Park, are made up of primarily grasses including little blue stem (*Schizachyrium scoparium)* and switchgrass (*Panicum virgatum*), herbaceous plants such as goldenrod (*Solidago spp*.), aster (*Aster spp*.) , milkweed (*Asclepias syriaca* L.), Canadian thistle (*Cirsium arvense*), knapweed (*Centaurea spp.)*, Queen Anne's lace (*Daucus carota),* and chicory (*Cichorium intybus)*, and small shrubs and trees such as eastern red cedar (*Juniperus virginiana)* and Norway maple (*Acer platanoides)*. As successional development progressed the open meadows transformed into a combination of successional forest and forested wetlands.

Native trees include eastern red cedar (*Juniperus virginiana)*, black cherry (*Prunus serotina)*, and silver maple (*Acer saccharinum)*; however, other non-native trees such as Norway maple (*Acer platanoides)* and Tree of Heaven (Ailanthis altissima) may be more common. Plants in the understory include poison ivy (*Toxicodendron radicans)*, Japanese honeysuckle (*Lonicera japonica)*, smilax (*Smilax* L), and multiflora rose (*Rosa multiflora)*. The land east of Myrtle Avenue is typical of this type of successional upland habitat

By far, the most common upland habitat in Oceanport is the suburban landscape. This includes the trees, shrubs, lawns, and gardens found around the homes, parks, and other developed lands throughout the Borough. The plant species in this habitat type are very varied and include both native and non-native plants. Plantings are based primarily on functionality (as in the manicured lawns on the athletic fields), personal taste, and environmental conditions. The lawns generally contain fescues (*Festuca* L.), perennial rye (*Lolium perenne* L.), clover (*Trifolium sp.)*, and crabgrass (*Digitaria sp.)*. Ornamental plantings and gardens around our homes typically consist of rhododendrons and azaleas (*Rhododendron sp.)*, privets (*Ligustrum* L.), hydrangeas (*Hydrangea* L.), forsythia (*Forsythia sp.)*, junipers (*Juniperus* L.), both annual and perennial flowers and a variety of vegetables. The Borough's Shade Tree Committee monitors the health and quality of the trees and helps to insure we continue to derive the benefits trees provide to our community. Typical suburban tree species include silver maple (*Acer saccharinum)*, American sweetgum (*Liquidambar styraciflua)*, a variety of oaks (*Quercus* L.), American sycamore (*Platanus occidentalis)*, poplars (*Populus* L.), black cherry (*Prunus serotina)*, white pine (*Pinus strobus)*, Bradford pear (*Pyrus calleryana)*, Norway spruce (*Picea abies)*, and red cedar(*Juniperus virginiana)* .

4.4 Rare Plant Species

The New Jersey Department of Environmental Protection, Division of Parks and Forestry, Office of Natural Lands Management, Natural Heritage Program maintains a list of rare plant species and ecological communities located throughout the state. The New Jersey Natural Heritage Program identifies the state's most significant natural areas through a comprehensive inventory of rare plant and animal species and representative ecological communities. There are no rare plant species known to exist in Oceanport as identified on the NJDEP Natural Heritage Database list of rare plant species for Monmouth County. There are several rare plants found on the ocean beaches and around the coastal ponds in the towns that border Oceanport. Additionally, the 2011 Environmental Resource Inventory for the City of Long Branch identifies a number of rare plant species which

may occur in wetlands along the Shrewsbury River Estuary. These plants include Salt-marsh Spikerush (*Eleocharis halophila),* Salt-marsh Alkali Grass (*Puccinellia fasciculata*), Seaside Plantain (*Plantago maritima var.juncoides),* Seaside Buttercup (*Ranunculus cymbalaria*), Salt-marsh Bulrush (*Bolboschoenus (Scirpus) maritima*), Seaside Arrow-grass (*Triglochin maritime).* It is reasonable to expect these rare plants may also exist along the Oceanport sections of the Shrewsbury River.

The US Fish and Wildlife Service maintain lists and information on Federally Endangered and Threatened species. Information from these lists reveal there are no known federally endangered or threatened plants in Oceanport, and given the existing habitat types, it is unlikely that any federally endangered plant species would be found. Although historically rare plants have been identified within the Borough.

In the 1970 book Oceanport in Retrospect there are references made to two rare plants that were discovered in Oceanport in 1967. A plant identified as gamagrass (*Tripsacum dactyloides*) was discovered along Bridgewater Drive. This plant is thought to be a relative of corn and grows in isolated salt marshes. It had never before been identified in Monmouth County. Another plant thought to have been extirpated in our area is the Soapwort Gentin (*Gentiana saponaria*). The plant produces a deep blue flower, which appears in October contrasting with the otherwise drab environment.

Oceanport's landowners should be aware of the possibility that rare, threatened or endangered plants could exist on their property, especially in parcels that are undeveloped or contain wetland habitats. Although small in size, these areas remain relatively unexplored, as many are difficult to access. Efforts to survey these sites by research students, environmental organizations, citizen scientists, or others should be encouraged with permission of the landowners.

Rare plant species that are known from coastal salt marshes and related environments in Monmouth County (NJDEP-NHP 2010), some of which may potentially occur in wetlands along the Shrewsbury River Estuary, including the following:

- Salt-marsh Spikerush (*Eleocharis halophila*): salt marshes; state species of concern.
- Salt-marsh Alkali Grass (*Puccinellia fasciculata*): salt marshes and shores; state species of concern.
- Seaside Plantain (*Plantago maritima var. juncoides*): salt marshes and shores; state species of concern.
- Seaside Buttercup (*Ranunculus cymbalaria*): mud in brackish marshes; state-listed endangered.
- Salt-marsh Bulrush (*Bolboschoenus (Scirpus) maritimus*): brackish and salt marshes; state-listed endangered.
- Seaside Arrow-grass (*Triglochin maritima*): brackish marshes; state-listed endangered.

4.5 Non-Native and Invasive Species

Native species are generally recognized as those occurring on the continent prior to European settlement. Non-native (alien, exotic) species are organisms ones that have been introduced by people, from other continents, ecosystems, or habitats to places where they do not naturally occur. An invasive species is a not-native species whose introduction may result in harmful effects on human and environmental health and economic costs. Many non-native plants have great economic value for agriculture, forestry, horticulture and other industries and pose little environmental threat. However, others have become invasive and are having a serious and measurable ecological impact. Throughout Oceanport there are many non-native species of plants. They are found largely as ornamental landscape plantings of trees, shrubs, flowers, and grasses.

When non-native plant species do escape from landscaped areas, some become invasive as they have no natural means of control. These invasives displace native plants and can replace wildlife food sources with exotic plants that are inedible, toxic, or otherwise harmful. They cause an overall reduction in biodiversity creating monocultures that spread rapidly, thereby changing forests, meadows, wetlands and other natural plant communities into landscapes dominated by a single species. Invasive exotics draw pollinators away from native plants, hybridize with native species, and push rare species closer to extinction. Recreational activities such as boating, fishing, swimming, hiking and bike riding can be impeded when invasives overgrow trails and riparian areas or form impenetrable tangles in shallow water areas. Once established, invasives can require considerable effort in time, labor and money to manage and most are difficult, if not impossible, to eliminate.

Most all of the undeveloped parcels of land, parks, and natural areas within Oceanport have been impacted to some degree by non-native invasive plant species. Some of the more common species include vines like oriental bittersweet (*Celastrus orbiculatus)* and Japanese honeysuckle (*Lonicera japonica)*, herbaceous forbs including Japanese knotweed (*Fallopia japonica)*, spotted knapweed (*Centaurea maculosa)*, and garlic mustard (*Alliaria petiolata)*, and woody species such as Multiflora Rose (*Rosa multiflora)*, autumn olive (*Elaeagnus umbellate)*, and privet (*Ligustrum* L.) . Invasive tree species such as Norway maple (*Acer platanoides)* and Ailanthus or Tree-of-Heaven (*Ailanthus altissima)* are found in some of the forested areas such as along Myrtle Avenue

Several species of bamboo, a grass, have escaped landscaped parcels and have impacted natural areas in the Borough. Another grass, common reed phragmites (Phragmites australis*)*, is perhaps the most prolific invasive plant in Oceanport. It can be found growing in the disturbed areas of palustrine wetlands where drainages enter the creeks and tributaries of the Shrewsbury River. Blackberry Bay Park, Port-au-Peck Ave. at Comanche Dr., and the end of Horseneck Point are examples of sites impacted by phragmites. In addition to compromising native habitats by creating a large

monoculture these plants create a fire hazard to homes in the community as they burn intensely with long flame lengths and a rapid rate of spread.

Hydrilla (*Hydrilla rerticillata*) is a freshwater aquatic plant that has been discovered in Franklin Lake located in the neighboring Borough of West Long Branch. Franklin Lake drains into Oceanport and has the potential to spread into fresh and slightly brackish waters of Branchport Creek. Hydrilla can out compete native submerged aquatic vegetation and can quickly fill a pond or lake, thus choking off the water body for boating, fishing, swimming and other recreational uses. Although non-native and invasive, it does provide good quality habitat for fish as well as water quality benefits. The Oceanport Borough Environmental Commission and Water Watch Committee are aware of this potential problem and will continue to track the treatment of hydrilla in West Long Branch and watch for its appearance in Oceanport.

4.6 Champion Trees / Century Forests

The New Jersey Department of Environmental Protection Division of Parks and Forestry maintains a list of the largest native and naturalized tree species in the state. These trees have been nominated by residents in the state and have both environmental and historical value. The list includes specimens from all of the unique geographic regions found in the state and while there are currently no tree species on the list from the Borough of Oceanport residents and landowners should be encouraged to compare large trees in town with these lists to see if there may be a new champion tree in the community.

Century Forests are areas of the county that have been identified as forested from aerial photographs in 1930. These photos are compared to photos and ground surveys from today to identify portions of these forests that may still remain. It is anticipated that these forests will continue to remain as forests into the 2030's earning the distinction as century forests.

5.0 Wildlife

With its abundance of shoreline, Oceanport is home to a range of fish, waterfowl, and other wildlife including some endangered species. The Ecological Inventory for the Mid-Coast Region of Monmouth County identifies several different wildlife habitat types for each category of animal. These tables list the common wildlife expected to be present and indicate the habitat most likely used by the species.

5.1 Terrestrial mammals, reptiles, and birds

Dozens of species of mammals, reptiles and birds are known to reside in New Jersey. Species found in Oceanport include gray squirrels (*Sciurus carolinensis)*, raccoons (*Procyon lotor)*, opossums (*Didelphis virginiana)*, mice (Mus sp.), and eastern moles (*Scalopus aquaticus)*, as well as local and migrating songbirds. Birds found in Oceanport include robins (*Turdus migratorius)*, juncos (*Junco sp.)*, house sparrows (*Passer domesticus)*, house finch (*Haemorhous mexicanus)*, northern cardinal (*Cardinalis cardinalis)*, chickadees *(Poecile sp.)*, blue jays (*Cyanocitta cristata)*, tufted titmouse (*Baeolophus bicolor)*, mourning dove (*Zenaida macroura)* and house wrens (*Troglodytes aedon)*. Streams and creeks are homes to snapping turtles (*Chelydra serpentine)*, toads (family *Bufonidae*) and frogs (order *Anura*), The borough is also home to red-tailed hawks (*Buteo jamaicensis)*, ducks (family *Anatidae*), and gulls (family *Laridae*), as well as osprey (*Pandion haliaetus)*. Oceanport is a forging area for a bald eagle (*Haliaeetus leucocephalus)*.

There are white-tailed deer (*Odocoileus virginianus)* in the wooded areas of Oceanport and a black bear (*Ursus americanus)* was sited near the Maple Place School in June 2002 Garter snakes (*Thamnophis sp.)*, common snapping turtle (*Chelydra serpentine)* and eastern box turtle (*Terrapene carolina Carolina)* are found in Oceanport, along with spring peepers (*Pseudacris crucifer)* and American bullfrogs (*Lithobates catesbeianus)* in wetlands throughout the Borough.

5.2 Marine Mammals, Fish, Invertebrates and Amphibians

The aquatic fauna found in the various aquatic habitats within the Borough of Oceanport include representative species of mammals, fish, invertebrates and amphibians. River shad and American herring, which spawn in freshwater, but live the bulk of their lives in salt water were sighted in 2013 in Turtle Mews Creek. The estuarine waters of Branchport Creek and the Shrewsbury River are as essential fish habitat for spawning young life stages of whiting (Family *Merlucciidae*), red hake (*Urophycis chuss)*, winter flounder (*Pseudopleuronectes americanus)*, bluefish (*Pomatomus saltatrix)*, mackerel (family *Scombridae)*, and sharks (order *Selachimorpha*). (NOAA). The natural shorelines of Oceanport are home to blue crab (*Callinectes sapidus)*, mussels (*Geukensia sp.)* and horseshoe crabs (*Limulus polyphemus)*.

The wetlands woods area bordered by Branchport and Myrtle Avenues are homes to an army of Northern Spring Peeper (Pseudacris crucifer crucifer) and other common frogs and toads.

5.3 Threatened and Endangered Species, and Species of Special Concern

Oceanport is home to endangered wildlife species, including the blue heron (*Ardea herodias),* bobolink (*Dolichonyx oryzivorus*) and osprey (*Pandion haliaetus)* and serves as a forging area for bald eagle (*Haliaeetus leucocephalus)*

5.4 Critical Habitats and Special Ecological Communities

Through a study known as the Landscape Project, the New Jersey Department of Environmental Protection's (NJDEP) Division of Fish and Wildlife developed maps identifying critical areas for threatened and endangered species based on land-use classifications and species location. The project focuses on large areas throughout the State that are ecologically similar in regard to plant and animal communities referred to as Landscape Regions. Oceanport is located within the Atlantic Coast Region, identified as one of the most productive coastal habitats in the United States.

The Landscape Project divides the State into five habitat classes: forest, grassland, forested wetland, emergent wetland and beaches.

- **Rank 5** is assigned to areas containing one or more occurrences of at least one wildlife species listed on as endangered or threatened on the Federal list of endangered and threatened species.
- **Rank 4** is assigned to areas containing one or more occurrences of at least one State endangered species.
- **Rank 3** is assigned to areas containing one or more occurrences of at least one State threatened species.
- **Rank 2** is assigned to areas containing one or more occurrences of at least one non-listed State priority species.
- **Rank 1** is assigned to areas that meet habitat-specific suitability requirements such as minimum size criteria for endangered, threatened or priority wildlife species, but do not intersect with any confirmed occurrences of such species.

Oceanport's critical habitat is emergent wetlands and is reported to contain State endangered species (Rank 4).

6.0 LAND USE

6.1 Existing land use

6.1.1 Open space, public and private

Two Borough parks totaling approximately 6.5 acres are undeveloped and held as ecological open space. The Borough parks and open space comprise 75.725 acres. Table 1: Borough of Oceanport – Open Space Inventory / Public Parks provides names and data on municipal parks and Map 1 shows locations. Monmouth County's Wolf Hill Farm Recreation Area's 95 acres in Oceanport is primarily recreational, but a small portion will remain undeveloped for environmental purposes.

The decommissioned military base, Fort Monmouth, is to be converted to civilian use via a 20 year master plan. Fort land along the river banks in Oceanport is to remain undeveloped and would have environmental significance. There are five significant parcels of undeveloped wetlands remaining in private hands, but DEP restrictions are relied on to prevent development.

Table 2: Borough of Oceanport – Open Space Inventory / Public Parks

Name	Block	Lot	Location	Acreage	Uses
Blackberry Bay Park	20 21 25 27	1 1 1 6	Port Au Peck Ave	9.50 1.61 5.46 1.87 18.44	baseball, roller hockey, soccer, tennis, basketball, playground, boat launch, swim club and waterfront
Charles Park	76	21-23	Monmouth Blvd	1.97	playground, basketball and waterfront
Community Center Park	6	1	Port Au Peck Ave & Tohicon Place	3.34	baseball, playground, tennis and community building
Evergreen Park	133	3	Pine Tree Lane	0.85	playground and basketball
Horseneck Preserve	107	2	Horseneck Point Rd	4.95	wildlife preserve
Maria Gatta Community Park	88	26.02	Port Au Peck Ave	39.865	soccer, walking trail
Old Wharf Park	103	1-2	315 E. Main Street	3.07	bocci, community building, waterfront
Seawaneka Preserve	35	2	Seawaneka Ave	1.43	wildlife preserve, kayak launch, waterfront
Somers Park	39 38	1 7	Pocono Ave	0.16 0.40 0.56	passive recreation and waterfront
Trinity Park	115	13	Trinity Place	1.25	playground, basketball, tennis

Charles Park

Old Wharf Park

6.1.2 Roads, railroads, pipelines, reservoirs

Oceanport is almost fully built out and the road network is complete. State Highways 35 and 71 skirt portions of the western and southern borders. Monmouth County roads 537 (Eatontown Blvd), 11(Oceanport Ave), 29 (Branchport Ave), 29A(Myrtle Ave,), and 33 (Monmouth Blvd.) funnel traffic to the bridges over Oceanport Creek and Branchport Creek. The remaining streets are Borough maintained. Evacuation routes are marked by signage. Roads in the Borough are mainly two lane streets, although some are widened at major intersections to produce turning lanes. The surrounding communities are also mature and the regional road systems are well integrated. The New Jersey Transit North Jersey Coast line runs through Oceanport. There are gated grade crossings at Bridgewaters and at Port-au-Peck Ave. There is a Monmouth Park Station offering limited seasonal service, while full service is available nearby at Little Silver and Long Branch. There is a natural gas pipeline running through Oceanport under an abandoned rail right-of-way. Map 1 shows the rail line. There are no reservoirs in Oceanport.

6.1.3 Recreation areas, public and private

The Borough has eight parks, comprising some 76 acres devoted to active and passive recreation. Data on the parks is shown in Table 1 and locations are shown on Map 1. In addition, there are two public schools whose grounds provide a variety of recreational opportunities such as baseball, tennis, basketball, soccer, swimming, boating, walking , and jogging. The County's Wolf Hill Recreation area offers both active and passive recreation.

The Borough of Oceanport provides considerable public access to the Shrewsbury River. Some site are located in parks including Blackberry Bay Park, Sommers Boy Scout Park, Old Wharf Park, and Charles Park and the Sewanaka Preserve. Blackberry Bay Park has a bulkheaded boat launch ramp (permit required), while the Seawanaka Preserve provides a natural shoreline. Motorized boats and jet skis are prohibited at the Seawanaka Preserve, which serves as a popular launch site for kayaks, rowboats, and paddleboards. Additionally, there are 24 street ends in the Borough, which provide residents with access to the Shrewsbury River. These sites are primarily natural shorelines but some are bulkheaded. These are specified on Map 11 : Map of Public Access to Shrewsbury River and its tributaries.

In the future additional opportunities for both active and passive recreation will be provided as the Oceanport portion of the Fort Monmouth land is developed. In the

private sector there are three marinas in Oceanport: Oceanport Landings Marina on Branchport Creek, Pleasure Bay Yacht Club on the South Shrewsbury River, and the Fort Monmouth marina, not currently in operation, on Oceanport Creek. Shrewsbury Sailing and Yacht Club, a private club has sailing regattas and youth and adult sailing instruction. Monmouth Park offers live thoroughbred horse racing in season, simulcasting year round, and picnic facilities, miniature golf, concerts, and special events.

6.1.4 Agricultural areas

The Borough has no Agricultural Zone, but commercial nurseries and greenhouses are permitted exception uses in Zones R-3, R-5, and R-7.5. There is currently one commercial nursery and greenhouse operation in the Borough. There is also a community garden plot located on Borough property on Myrtle Avenue between the Borough Hall and the Public Works garage.

6.1.5 Industrial areas

The Borough has one small industrial zone (Zone I) and a B-1 Professional and Office Zone. The available land and the transportation structure would seem to be suitable only to light industry, such as a computer center or research facility, or offices. The 327 acres that comprise the Monmouth Park's property falls within Zone B-2 (General and Recreational Commercial) and permits horse racing and related activities on the race track property.

6.1.6 Waste treatment and disposal facilities

The Borough is part of the regional Two Rivers Water Reclamation Authority. The piping is underground and the only above ground presence is a few supplemental pumping stations. The Borough collects leaves and brush and conducts its own mulching operation. The Borough does not collect lawn clippings, which is the homeowner's responsibility. Recycling mowing is recommended. Garbage pick up is by contractors who dispose of it off site without use of Borough land. The race track's stable area solid wastes are trucked off site, and the liquids are piped into the Two Rivers Reclamanation Authority's system. The Borough, along with Monmouth County and NJDEP, monitors Monmouth Park's processes for disposal of stable area waste.

6.2 Proposed Land Use

6.2.1 Zoning

The Zoning Code is updated as needed to reflect current trends. In February 2013, the Planning Board approved and forwarded to the Borough Council a number of recommended amendments to the Code including changing the definition of height and how its calculated, definition of "story" and providing limited relief to those property owners elevating existing compliant structures located in flood zones in order to be compliant with base flood elevations. Other issues arising in the aftermath of Superstorm Sandy in October 2012 has brought further scrutiny to parts of the Code. The citizens of Oceanport suffered their share in the toll of devastation caused by Sandy. One result has been an updated revision of its municipal ordinances, mostly through regulations issued by the Federal Emergency Management Agency (FEMA). These revisions, flood maps and other advisory documents may be viewed at the Borough Offices, 345 East Main Street, Oceanport, N. J. 07757 or at the Borough of Oceanport web site (www.oceanportboro.com).

6.2.2. Master Plan

The Planning Board's last amendment to the Master Plan was approval of the updated Open Space and Recreation Plan of September, 2012.

6.2.3 Future Issues

The conversion of Fort Monmouth land from military to civilian use and ownership will have a large impact on the Borough. In effect, the Borough's area is being expanded by 419 acres, or .65 square miles. Oceanport's interests and priorities must be presented within the larger context of the interests and priorities of the Department of Defense, the State of New Jersey, the Fort Monmouth Economic Revitalization Authority (FMERA) Board and staff, the County of Monmouth, the Boroughs of Eatontown and Tinton Falls, and an array of public interest groups seeking to promote various agendas. It is a complex scenario. There have been a number of amendaments to the Master Plan adopted in 1974. A review and recodification would be appropriate but should probably be held off until all planning for and inclusion of the Fort Monmouth land is finalized and approved.

7.0 Historic and Cultural Features

Oceanport is situated on a peninsula jutting into the Shrewsbury River, with Parkers Creek and Branchport Creek as its northerly and southerly boundaries. The Shrewsbury River is largely a navigable estuary offering broad and shallow protected waters to small and midsized watercraft. The Shrewsbury River connects to the Navesink River (originally called the North Shrewsbury) and flows out into Sandy Hook Bay, providing access to New York Harbor and the Atlantic Ocean. There is a dredged channel for the movement of deeper draft vessels.

Direct and indirect access to these waters has been a major factor in shaping the character of the community. Most of the waterfront is residential and most of the waterfront homes have private docks. There is a public launch ramp at Blackberry Park and several other municipal parks provide waterfront access and views. A number of public streets end at the river and thus provide many additional points of access. There are three marinas in the town, although the one on Fort Monmouth is currently not in operation. Shrewsbury Sailing and Yacht Club supports fleet racing in several small sailboat classes, and on summer weekends regattas picturesquely fill the river with sails. As noted in section 6.1.3, there is extensive access to the waterfront including 24 street ends that abut the Shrewsbury. These locations support active recreational fishing for residents of all ages, kayaking, paddleboarding, and other low environmetal impact activities.

The riverfront also has historic significance. Native American tribes, while wintering inland, came to the river in summer to harvest shellfish. Clam and oyster shell middens have been uncovered, and artifacts such as arrow heads and spear points have been found. There are, however, no specific Native American sites within the Borough. Early European settlers first came to the Shrewsbury River area in the 1660s and 1670s. Transportation was by water (there were no roads), so early settlement began along the shorelines. These early settlements were given formal recognition by the Monmouth Patent in 1665. As white settlements grew, Native Americans withdrew from the area. Oceanport honors this history in the many streets named after Native American tribes.

The term “Oceanport” as used here refers to the area now comprising the modern Borough even though in earlier years it would have been merely a district or neighborhood in a larger political jurisdiction. The land of the current borough was originally included in Shrewsbury Township, which was incorporated in 1667. In 1849, Ocean Township was created as a spin off from Shrewsbury Township. In 1873, Eatontown Township was created as a spin off from Ocean Township. Oceanport Borough came into being in 1920 as a carve out from Eatontown Township.

Early settlers in Oceanport were primarily farmers and part time watermen. The easterly portion (Port-au-Peck) of Oceanport is low lying and was originally marshy. The higher ground in the western portion has elevations of up to 55 feet and early settlement

tended to move westerly, the oldest surviving homes are on the higher ground along Main Street and Pemberton Avenue. As the 50th anniversary publication of The Oceanport Historical Society "Oceanport In Retrospect" eloquently phrased it, God "made Port-au-Peck a meadow of softly waving marsh grass and set it aside for his little winged friends—the mosquitos."

As population in the general area increased, commerce also grew. Water continued to be the principal mode of transportation and docks were created on Oceanport Creek. By the mid 19th century there was regular cargo and passenger service from Oceanport to New York. The wharf area, which ran from the current Old Wharf Park and a bit farther east, was known as Eatontown Dock. Main Street was once known as Eatontown Dock Road. With the coming of the railroad in the 1860s, however, the era of Oceanport as an ocean port drew to an end.

The railroad that had obsoleted the river commerce also had the positive effect of enhancing the attractiveness of the area for commuters. The new drawbridges that had been built to accommodate river traffc now facilitated access to nearby railroad stations; the Gooseneck Bridge to the station in Little Silver and the Pleasure Bay Bridge to the North Long Branch station. It became feasible to enjoy the watery pleasures of Oceanport and still have a reasonable way to get to work in metropolis.

This expansion took place in an era before environmental issues became a serious matter of public concern. Filling in swamp areas was considered to be progress and DDT was considered a boon. The problem of mosquitos was hardly unique to Oceanport, and the services of the Monmouth County Mosquito Extermination Commission were in demand in many communities. In today's world wetlands are seen as an integral part of nature that need to be protected and preserved. The remaining undeveloped wetlands in Oceanport are either in public ownership or protected by conservation easements.

Because the river has played an important role in history and in shaping the character of Oceanport living, it follows that water quality is taken very seriously. For many years run off from the stable area of Monmouth Park was a seasonal concern. In 1995, the Borough formed a Waterwatch Committee which takes regular measurements of water quality, and in addition both the Monmouth County Board of Health and the New Jersey Department of Environmental Protection (DEP) also monitor water quality in the river. The New Jersey Sports and Exposition Authority has responded to these concerns and made a substantial investment in systems and equipment to manage stable area run off. Neighboring upstream communities have also cooperated to mitigate polution sources in the headwaters. The regional Sewer Authority brought sewers to Oceanport in the 1970s thus removing the potential for groundwater polution from septic tanks. The Oceanport Environmental Commission cooperates with the New Jersey DEP in efforts to prevent shoreline erosion and to protect shellfish beds.

Monmouth Park race track has been a significant part of Oceanport's history. The original track was built in 1870 on land now part of Fort Monmouth. To a small degree it made Oceanport a part of the guilded era of the Jersey Shore, which had become a summer playground for the rich and famous. In 1894 a constitutional amendment outlawed gambling and bookmaking in New Jersey, and the racetrack went out of business. Thereafter, the touch of glamour and excitement left Oceanport and its resort hotels faded away. A new Monmouth Park was built in Oceanport in 1946 on different land but not far from the former site. Originally private, the track has been owned by the NJ Sports and Exhibition Authority since 1985. Its economic viability is in question and its future uncertain. Proposals by the current lessee call for transforming the property into a themed entertainment complex. If such plans come to fruition, it might again put Oceanport on the map as a destination.

Fort Monmouth came into existence at the start of World War I as an Army Signal Corps base. Its impact on Oceanport was twofold. First, it created many skilled engineering and technical positions that employed many local people and also brought skilled professionals to live in the nearby communities. Secondly, it preempted 419 acres of what would later become the Borough of Oceanport from the market for civilian development, thus keeping population lower and reducing the need for larger schools. Now the Fort is surplus and has been decommissioned. A state agency, the Fort Monmouth Economic Revitalization Authority (FMERA), was created to implement a 20 year development plan for the property, including also the portions in Eatontown and Tinton Falls. Now these 419 acres provide opportunity for balanced residential and commercial development that could significantly impact the future course of the Borough.

According to the listing of NJ historic sites, there are four historic sites within Oceanport (see Table 2). There are several historic homes in Oceanport, most are located in the Pemberton, Aracana Ave. area.

Table 3 Historic sites located within Oceanport

Fort Monmouth Historic District
Hangar Number One Site
New York and Long Branch Railroad Historic District
Oceanport Creek Bridge

Map #7 provides an inventory of historic sites and districts within Oceanport.

8.0 Wetlands

8.1 Introduction and Definition

Wetlands are an environmental resource that Oceanport residents experience daily with the Shrewsbury River surrounding our community on three sides. Residents view waterway and the swaths of wetlands on our waterfront and interior wetlands adjacent to the tributaries of the river. In general terms, wetlands are lands on which water covers the soil or is present either at or near the surface of the soil or within the root zone, all year or for varying periods of time during the year. Wetlands can be a transitional zone from open water to a dry upland. They also can be a smaller area of "lowland" with water present at intermittent times surrounded by dry uplands. Since wetlands blend into their bordering upland environment and open water, the process of defining the edge of a wetland is a highly regulated and complex process involving onsite observations of the soils, vegetation, and the presence of water. For the purposes of this ERI, the definitions and classification laid out in environmental law and subsequent regulations will be used.

According to the U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA) regulations described in Section 404 of the Clean Water Act (33 CFR Section 328.3 and 40 CFR Section 230.3) respectively, wetlands are "...areas that are inundated or saturated with surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Identification and delineation of wetlands are based on a functional approach that is commonly called the three-parameter approach and is outlined in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands, an Interagency Cooperative Publication issued in 1989. The three parameters defining jurisdictional wetlands are hydric soils, hydrophytic vegetation, and wetland hydrology. Other types of non-jurisdictional wetlands can occur at a location based upon different definitions, such as that used for the U.S. Fish and Wildlife Service Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1970), which also has broad acceptance and is used to classify wetlands in general.

8.2 Classification

Wetlands can be classified into systems, subsystems, classes, subclasses, and dominance, soil and habitat types, and other hierarchical categories. Cowardin, et. al. (1979) identified five systems of wetlands for the United States: Marine, Estuarine, Riverine, Lacustrine, and Palustrine. Marine wetlands occur along the intertidal shorelines of oceans, as contrasted to the Marine sub-tidal deep water habitats. Estuarine Wetlands occur in the intertidal zones of estuaries, as contrasted to the Estuarine subtidal deepwater habitats. Riverine Wetlands are characterized by non-persistent plants when vegetated and occur in shallow or intermittent river and stream channels and along shores affected by the energy of flowing water, as compared to sub-

tidal deep water habitats in channels. Lacustrine Wetlands are characterized by non-persistent plants when vegetated and occur in the littoral zones of lakes generally greater than 20 acres and with wave-formed shorelines, as contrasted to the deepwater habitats of lakes. Palustrine Wetlands include those types not classified in the other systems and are represented, for example, by freshwater marshes, floodplain forested, vernal pools, bogs, seeps, and wetland types. There are no deepwater habitats in the Palustrine System.

Wetlands in the Borough of Oceanport include examples classified Estuarine Wetlands (e.g., intertidal salt marshes and mud flats), and Palustrine Wetlands (e.g., freshwater marshes, scrub-shrub wetlands, and forested wetlands). Map 4 identifies wetlands and watersheds.

In New Jersey, use of freshwater wetlands is regulated by the Freshwater Wetlands Protection Act, N.J.S.A 13:9B-1 et seq. (http://www.state.nj.us/dep/landuse/13_9b.pdf) as described in Section 1.3.3. of this document. Wetlands are recognized as important features of the landscape and provide many functions that are also beneficial to people and wildlife.

8.3 Wetland Habitats and Values

Wetland habitat functions and values have been considered a vital aspect of wetlands for many years. A national workshop was convened in 1983 to address the topic (Sather and Stuber 1984) and an overview of functions and values, also referenced as "functional values", was published subsequently by the US Fish and Wildlife Service (Sather and Smith 1984). Wetland "ecosystem functions" have been defined as a process or series of processes that take place within a wetland (Novitzki et al. 1997). They also have been identified as the normal or characteristic activities that take place in wetland ecosystems. These include, for example, the storage of water, transformation of nutrients, growth of living matter, and diversity of wetland plants, which have value for the wetland itself, for the surrounding ecosystem, and for people. Wetland "values" have been defined as attributes that are worthwhile, beneficial, or desirable (Novitzki 1997). The value of a wetland lies in the benefits it provides to the environment or to people, the latter of which also have been called "socio-economic values." Although there have been various approaches proposed to categorize functions and values, the approach to ecosystem functions designed for the U.S Army Corps of Engineers (Smith et al. 1995) is adopted herein for the purpose this ERI:

Wetlands function as part of the natural hydrological process of the surface water and groundwater with the effect of lessening storm damage. The wetlands provide short and long term storage of surface water by reducing the velocity flooding waters. The wetlands themselves are storm buffers acting as erosion control and shoreline stabilization. During a storm they can dissipate energy acting as a natural sponge capturing, storing and slowly releasing waters over time, thereby reducing the impact of

floods. Lastly, the wetlands can recharge an aquifer and moderate groundwater flow. According to United States Department of Agriculture Natural Resources Conservation Service website, "Wetlands are some of the most productive and dynamic habitats in the world. New Jersey is home to a variety of wetlands types, from vernal pools crucial to amphibian breeding in the north to our coastal marshes that are globally significant for migratory birds.

Wetlands function as within the natural biochemical cycle of the transformation of nutrients. Wetlands act as a filter of excess concentrations of nitrogen and phosphorus from fertilizers and the waste materials from animals into the main waterway. Within the wetland, the plants can take up the pollutants or the pollutants settle into the soil and are chemically changed over time. These processes protect the waterway to complete decomposition, dentirfication, toxicant removal, retention of particulates, and sediment removal. Without the wetlands the waterway can suffer from eutrophication. Wetlands function to provide habitat for both plant and animal communities. Plants and animals adapt to the constantly changing water levels. Wetlands are the habitat of threatened and endangered species of both plant and animals. They provide habitat for aquatic invertebrates, shellfish, amphibians, fish, birds and animals.

Wetlands also function for socio –economic values for people. (Sather & Smith 1984) They can be used for harvesting fish, shellfish, lumber, and agriculture. Animals do graze in the wetlands as is observed by our community of migrating and resident waterfowl. Lastly, wetlands are places that people use for recreation, study for scientific reasons, preserve for historic sites, and enjoy for their aesthetic value as part of the landscape.

In 2007, the New Jersey Department of Environmental Protection (NJ DEP) worked with researchers from the University of Vermont to be the first state to assess the economic value of all of New Jersey's natural resources.

"The natural resources inventories included wetlands, forest, riparian buffers, farmland, urban parks, open fresh waters, beaches/dunes, marine waters and mines and quarries. The total acres for each type of natural resource were calculated using state geographic information system data. Monetary values were then assigned to the goods and services provided by each type of natural resource using data from peer-reviewed journals and analysis conducted by the authors. The results of the study reported an annual value of approximately $20 billion/year for the total ecosystem services and values of New Jersey. "

8.4 Oceanport Wetlands

Wetlands as delineated by the New Jersey Department of Environmental Protection (NJDEP) within the Borough of Oceanport are shown on the Wetlands Map (Map # 4 and Table 3). Examples listed include representatives from two wetland systems (Estuarine

and Palustrine). There are thirteen distinct types of wetlands. Each type is defined as follows:

8.4.1 Agricultural Wetlands (modified)

Included in this category are lands under cultivation that are modified former wetland areas, and which still exhibit evidence of soil saturation on the photography. These lands will exhibit the textural signature characteristics described for the other agricultural categories, but will have darker color and tonal signatures. Colors will range from blue-gray to black on winter CIR film and dark gray to black on panchromatic film. In addition, these agricultural wetlands also exist in areas shown on soil surveys of the Natural Resources Conservation Service to have hydric soils.

8.4.2 Cemetery on Wetland

These areas represent large tracts of primarily open land within urban or rural areas on land identified as wetland. Large cemeteries can be identified by layout of driveways, lots, mausoleums and marking stones. Cemeteries associated with small towns, individual churches or family estates may not be easily identifiable.

8.4.3 Deciduous Shrub/Shrub Wetlands

This category will include communities composed primarily of young saplings of deciduous tree species such as red maple (*Acer rubrum),* box elder *(Acer negundo),* sweetgum *(Liquidambar styraciflua),* hazel alder *(Alnus serrulata),* red osier dogwood *(Cornus stolonifera),* and silky dogwood *(Cornus amomum);* and woody shrubs such as highbush blueberry *(Vaccinium corymbosum), bearberry (Vaccinnium macrocarpon),* meadowsweet *(Spirea alba),* southern arrowwood *(Viburnum dentatum),* swamp rose *(Rosa palustris),* northern bayberry *(Myrica pennsylvania),* bog myrtle *(Myrica gale),* sweet pepperbush *(Clethra alnifolia),* buttonbush *(Cephalanthus occidentalis)* and swamp azalea (*Rhododendron viscosum),* among others.

8.4.4 Deciduous Wooded Flatlands

These wetlands are closed canopy swamps dominated by deciduous trees normally associated with watercourses, edges of marshes, and isolated wetlands. The important canopy species includes red maple (*Acer rubrum*), blackgum (*Nyssa sylvatica*), green ash (*Fraxinus pennsylvanica*), black willow (Salix nigra), swamp white oak (*Quercus bicolor*), willow oak (*Q. phellos*), southern red oak (Q. falcate), sweetgum (*Liquidambar styraciflua*), and American sycamore (*Platanus occidentalis*). These species combine to form a series of mixed hardwood lowland habitats throughout the entire state.

8.4.5 Disturbed Wetlands (Modified)

Included in this category are former natural wetlands that have been altered by some form of clearing, leveling, grading, filling and/or excavating, but which still exhibit

obvious signs of soil saturation on the imagery. Because of the alterations, these areas do not generally support typical wetland vegetation, and may in fact be unvegetated. They do, however, exist in areas shown on the US Soil Conservation Service soil surveys to have hydric soils.

8.4.6 Herbaceous Wetlands

These marshes are co-dominated by annual and perennial herbaceous vegetation on substrates associated with tidal waters. Freshwater marsh species are characterized by yellow water lily (*Nuphar lutea)*, green arrow arum and tuckahoe (*Peltandra virginica)*, pickerel weed *(Pontederia cordata)*, wild rice (*Zizania aquatic*), dotted knotweed *(Polygonum punctatum)*, bur-marigold (*Bidens laevis),* and common cattail *(Typha latifolia)*. Marshes exhibiting this cover are found on the tidal Delaware River and tributaries downstream of Trenton to Salem and upstream of the saline marshes on the Atlantic drainage watercourses.

8.4.7 Managed Wetland in Built-up Maintained Recreation Area (WETLANDS)

Included in this category are former natural wetland areas that now are part of an altered managed recreational area, but which still exhibit signs of soil saturation on the imagery. These areas do not support typical wetland vegetation, but are vegetated primarily by grasses and other planted vegetation that may be routinely mowed. Examples of this category would be saturated portions of golf courses, and fields used for baseball and other sports in designated recreation areas. None of the wetlands included in this category are routinely inundated, although portions may be on occasion. These altered wetlands exist on areas shown on the US Soil Conservation Service soil surveys to have hydric soils.

8.4.8 Managed Wetland in Maintained Lawn Greenspace

Included in this category are former natural wetland areas that now are part of an altered managed landscape, but which still exhibit signs of soil saturation on the imagery. These areas do not support typical wetland vegetation, but are vegetated primarily by grasses and other planted vegetation that may be routinely mowed. Examples of this category would be maintained open lawns and storm water swales in residential, commercial or industrial areas. None of the wetlands included in this category are routinely inundated, although the swales may be on occasion. These altered wetlands exist on areas shown on the US Soil Conservation Service soil surveys to have hydric soils.

8.4.9 Mixed Scrub/Shrub Wetlands (Deciduous Dominated)

Included in this category are brush and bog wetlands with a mixture of deciduous and coniferous species, with the deciduous species > 50% but < 75%.

8.4.10 Phragmites Dominated Coastal Wetlands

This category contains saline marsh areas where the common reed, Phragmites (*Phragmites australis)* dominates. The photographic signatures for these areas are rough and puffy and range in color from tan to silvery pale white. Freshwater wetlands will have a cowardin code present in the attributes while saline marshes will have no cowardin code.

8.4.11 Phragmites Dominated Interior Wetlands

This category contains fresh marsh areas where the common reed, Phragmites (*Phragmites australis)* dominates.

8.4.12 Saline Marsh (Low Marsh)

This category contains herbaceous vegetation dominated by saltmeadow cordgrass *(Spartina patens)* where the height is 1 foot to 3 feet.

8.5 Wetlands in Oceanport

Oceanport has a total of 198 acres of mapped wetlands in its 8448 acres (3.2 square miles). These thirteen types of wetlands combine to be 2.3 percent of acreage of the municipality. There are a few sections of saline marshes remaining around Blackberry Bay. The other freshwater wetlands have grasses, shrubs or trees in the saturated soils. There are only two sections left for wildlife habitat to nest and exist. This section is a mixture of old and young trees on the properties between Myrtle Avenue and Branch Avenue. The other section is behind Wolf Hill School through the residential areas. The Maple Place School was built on filled wetlands in the 1960s. Although not included on the wetlands map, the recreation field behind the school and the wooded area to the east of Maple Place School are wetlands. The recreation field falls into the category of Managed Wetland in Built-up Maintained Recreation Area and the wooded area deciduous shrub wetlands and wooded flatlands comprised of several mature sweetgum (*Liquidambar styraciflua*) trees.

There is a ribbon of wetlands along each of the streams in the Borough that exist but are mowed close to the stream bank. There also is one acre of undisturbed parkland on Gooseneck Point that is designated specifically as Open Space. Within the boundaries of the Wolf Hill Park of Monmouth County Park Systems there are three small areas of wetlands with grasses and shrubs. A ribbon of wetlands exists at the waterfront on the three sides of Oceanport and varies from property to property from 18 to 36 inches wide.

Table 4. Oceanport Wetlands as Provided by NJDEP			
System	**Wetlands Type**	**Coverage (Acres)**	**Location**
Palustrine	Agriculture Wetlands (Modified)	2.095	
Palustrine	Cemetary on wetlands	0.856	
Palustrine	Deciduous scrub/shrub wetlands	28.640	
Palustrine	Deciduous wooded wetlands	104.034	
Palustrine	Disturbed wetlands (modified)	13.657	
Palustrine	Herbaceous wetlands	9.773	
Palustrine	Managed wetland in built-up maintained recreation area	4.717	
Palustrine	Managed wetland in maintained lawn greenspace	8.801	
Palustrine	Mixed scrub/shrub wetlands (deciduous dominated)	0.330	
Palustrine	Phragmites dominated coastal wetlands	7.011	
Palustrine	Phragmites dominated interior wetlands	2.775	
Esturaine	Saline marsh (high marsh)	5.120	
Esturaine	Saline marsh (low marsh)	10.9222	
Total wetlands		**198.74**	

Table 5. NJ DEP Threatened and Endangered Wildlife (2012)

BIRDS			
Endangered		**Threatened**	
Bittern, American BR	*Botaurus lentiginosos* BR	Bobolink BR	*Dolichonyx oryzivorus* BR
Eagle, bald BR	*Haliaeetus leucocephalus* BR	Eagle, bald NB	*Haliaeetus leucocephalus* NB
Falcon, peregrine BR	*Falco peregrinus* BR	Egret, cattle BR	*Bubulcus ibis* BR
Goshawk, northern BR	*Accipiter gentilis* BR	Kestrel, American	*Falco sparverius*
Grebe, pied-billed BR	*Podilymbus podiceps* BR	Lark, horned BR	*Eremophila alpestris* BR
Harrier, northern BR	*Circus cyaneus* BR	Night-heron, black-crowned BR	*Nycticorax nycticorax* BR
Hawk, red-shouldered BR	*Buteo lineatus* BR	Night-heron, yellow-crowned	*Nyctanassa violacea*
Knot, red NB	*Calidris canutus* NB	Osprey BR	*Pandion haliaetus* BR
Owl, short-eared BR	*Asio flammeus* BR	Owl, barred	*Strix varia*
Plover, piping**	*Charadrius melodus***	Owl, long-eared	*Asio otus*
Rail, black BR	*Laterallus jamaicensis* BR	Rail, black NB	*Laterallus jamaicensis* NB
Sandpiper, upland	*Batramia longicauda*	Sparrow, grasshopper BR	*Ammodramus savannarum* BR
Shrike, loggerhead NB	*Lanius ludovicianus* NB	Sparrow, Savannah BR	*Passerculus sandwichensis* BR
Skimmer, black	*Rynchops niger*	Woodpecker, red-headed	*Melanerpes erythrocephalus*
Sparrow, Henslow's	*Ammodramus henslowii*		
Sparrow, vesper BR	*Pooecetes gramineus* BR		
Tern, least	*Sternula antillarum*		
Tern, roseate**	*Sterna dougallii***		
Warbler, golden-winged BR	*Vermivora chrysoptera* BR		
Wren, sedge	*Cistothorus platensis*		
**Federally endangered or threatened			
BR - Breeding population only; NB - non-breeding population only			

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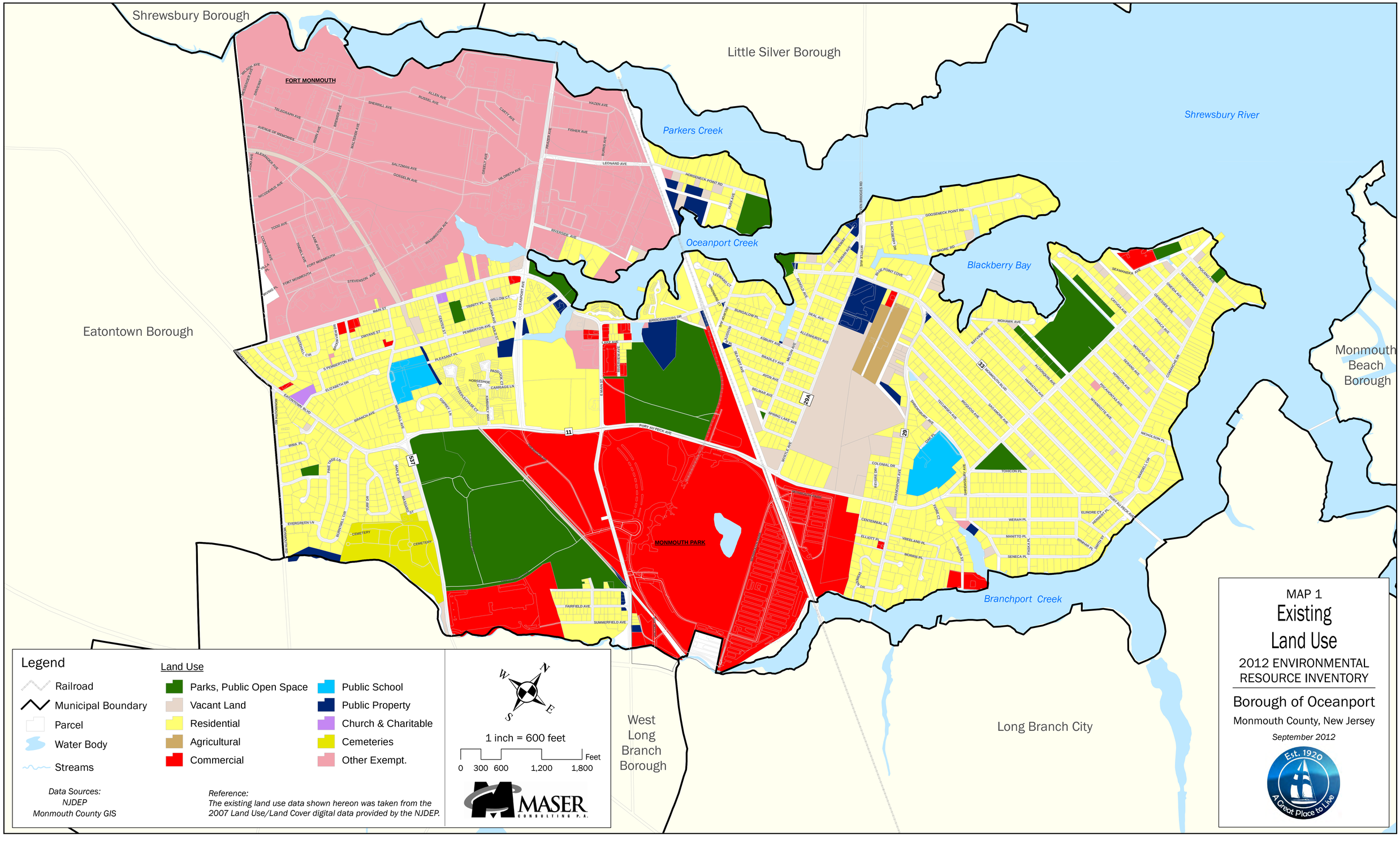
Shrewsbury Borough
Little Silver Borough
Eatontown Borough
Monmouth Beach Borough
West Long Branch Borough
Long Branch City
FORT MONMOUTH
MONMOUTH PARK
Parkers Creek
Oceanport Creek
Shrewsbury River
Blackberry Bay
Branchport Creek
Legend
Railroad
Municipal Boundary
Parcel
Water Body
Streams
Land Use
Parks, Public Open Space
Vacant Land
Residential
Agricultural
Commercial
Public School
Public Property
Church & Charitable
Cemeteries
Other Exempt.
Data Sources:
NJDEP
Monmouth County GIS
Reference:
The existing land use data shown hereon was taken from the 2007 Land Use/Land Cover digital data provided by the NJDEP.
1 inch = 600 feet
0 300 600 1,200 1,800 Feet
MASER CONSULTING P.A.
MAP 1
Existing
Land Use
2012 ENVIRONMENTAL RESOURCE INVENTORY
Borough of Oceanport
Monmouth County, New Jersey
September 2012
Est. 1920
A Great Place to Live

Shrewsbury Borough

Little Silver Borough

Eatontown Borough

Monmouth Beach Borough

West Long Branch Borough

Long Branch City

Parkers Creek

Shrewsbury River

Oceanport Creek

Blackberry Bay

Branchport Creek

FORT MONMOUTH

MONMOUTH PARK

Legend

- Railroad
- Municipal Boundary
- Parcel
- Water Body
- Streams
- Elevation Contours

Data Sources:
NJDEP
Monmouth County GIS

Steep Slope Data

- 10-15%
- 15-20%
- 20%-Greater

1 inch = 600 feet

0 300 600 1,200 1,800 Feet

MASER CONSULTING P.A.

MAP 2

Topography & Steep Slopes

2012 ENVIRONMENTAL RESOURCE INVENTORY

Borough of Oceanport

Monmouth County, New Jersey

September 2012

Est. 1920 A Great Place to Live

Shrewsbury Borough

Little Silver Borough

Eatontown Borough

Monmouth Beach Borough

West Long Branch Borough

Long Branch City

FORT MONMOUTH

MONMOUTH PARK

Parkers Creek

Oceanport Creek

Blackberry Bay

Shrewsbury River

Branchport Creek

Legend

- Railroad
- Municipal Boundary
- Parcel
- Water Body
- Streams

Bedrock Geology

- Kt - Tinton Formation
- Tht - Hornerstown Formation
- Tvt - Vincentown Formation

Data Sources:
NJDEP
Monmouth County GIS

Reference:
The geology data shown hereon was taken from the NJ Geological and Water Survey Digital Geodata Series provided by the NJDEP.

N W E S

1 inch = 600 feet

0 300 600 1,200 1,800 Feet

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BEDROCK GEOLOGY DESCRIPTION TABLE

SYMBOL	GEONAME	LITHOLOGY
Kt	Tinton Formation	quartz sand, glauconitic, locally indurated
Tht	Hornerstown Formation	glauconite sand, fine- to medium-grained
Tvt	Vincentown Formation	quartz sand, medium-grained, clayey; and glauconitic near base; locally a calcarenite or coquina

MAP 3

Subsurface Geological Formation

2012 ENVIRONMENTAL RESOURCE INVENTORY

Borough of Oceanport

Monmouth County, New Jersey

September 2012

Est. 1920 A Great Place to Live

Shrewsbury Borough

Little Silver Borough

Eatontown Borough

West Long Branch Borough

Long Branch City

Monmouth Beach Borough

FORT MONMOUTH

MONMOUTH PARK

Parkers Creek

Oceanport Creek

Parkers Creek / Oceanport Creek

Shrewsbury River

Shrewsbury River (above Navesink River)

Blackberry Bay

Branchport Creek

300' TYP.

WETLANDS

- AGRICULTURAL WETLANDS (MODIFIED)
- CEMETERY ON WETLAND
- DECIDUOUS SCRUB/SHRUB WETLANDS
- DECIDUOUS WOODED WETLANDS
- DISTURBED WETLANDS (MODIFIED)
- HERBACEOUS WETLANDS
- MANAGED WETLAND IN BUILT-UP MAINTAINED REC AREA
- MANAGED WETLAND IN MAINTAINED LAWN GREENSPACE
- MIXED SCRUB/SHRUB WETLANDS (DECIDUOUS DOM.)
- PHRAGMITES DOMINATE COASTAL WETLANDS
- PHRAGMITES DOMINATE INTERIOR WETLANDS
- SALINE MARSH (HIGH MARSH)
- SALINE MARSH (LOW MARSH)
- VEGETATED DUNE COMMUNITIES

Legend

- Railroad
- Municipal Boundary
- Parcel
- Water Body
- Streams
- Category One 300' Buffer
- Category One Waters
- NJDEP HUC14 Subwatersheds

Data Sources:
NJDEP
Monmouth County GIS

N W E S

1 inch = 600 feet

0 300 600 1,200 1,800 Feet

MASER CONSULTING P.A.

Note:
The wetlands information shown on this map was taken from the NJDEP 2007 Land Use/Land Cover data. Actual wetland areas may be more or less extensive than what is shown hereon. The exact location and extent of wetlands can only be determined through field verification.

MAP 4

Wetlands & Watersheds

2012 ENVIRONMENTAL RESOURCE INVENTORY

Borough of Oceanport

Monmouth County, New Jersey

September 2012

Est. 1920 A Great Place to Live

Shrewsbury Borough

Little Silver Borough

Eatontown Borough

Monmouth Beach Borough

West Long Branch Borough

Long Branch City

Shrewsbury River

Parkers Creek

Oceanport Creek

Blackberry Bay

Branchport Creek

FORT MONMOUTH

MONMOUTH PARK

HumAt

UdaB

UdauB

KrhB

WATER

FrkB

AptAv

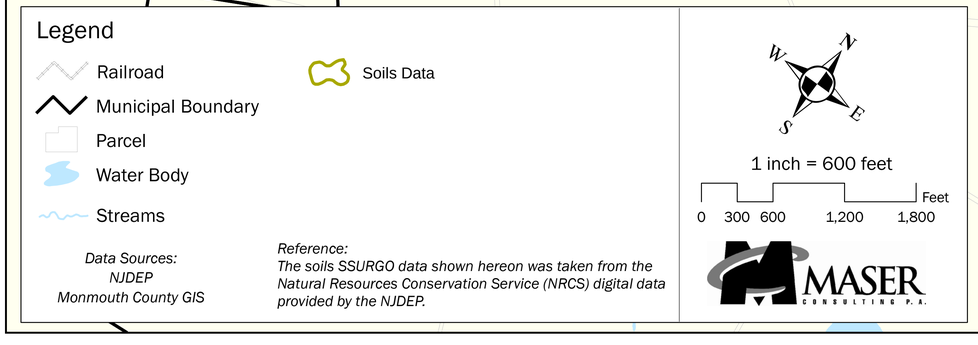
ThgB

EkaAr

HocA

FrrC

KeuC



SOILS DESCRIPTION TABLE

SYMBOL	DESCRIPTION
AptAv	Appoquinimink-Transquaking-Mispillion complex, 0 to 1 percent slopes, very frequent
EkaAr	Elkton loam, 0 to 2 percent slopes, rarely flooded
FrkB	Freehold sandy loam, 2 to 5 percent slopes
FrkC	Freehold sandy loam, 5 to 10 percent slopes
FrrC	Freehold-Urban land complex, 0 to 10 percent slopes
HocA	Holmdel sandy loam, 0 to 2 percent slopes
HumAt	Humaquepts, 0 to 3 percent slopes, frequently flooded
KeuC	Keyport-Urban land complex, 0 to 10 percent slopes
KrhB	Kresson loam, 2 to 5 percent slopes
ThgB	Tinton loamy sand, 0 to 5 percent slopes
UdaB	Udorthents, 0 to 8 percent slopes
UdauB	Udorthents-Urban land complex, 0 to 8 percent slopes

MAP 5

Soils

2012 ENVIRONMENTAL RESOURCE INVENTORY

Borough of Oceanport

Monmouth County, New Jersey

September 2012

Est. 1920 A Great Place to Live

Shrewsbury Borough

Little Silver Borough

Eatontown Borough

Monmouth Beach Borough

West Long Branch Borough

Long Branch City

Parkers Creek

Oceanport Creek

Shrewsbury River

Blackberry Bay

Branchport Creek

FORT MONMOUTH

MONMOUTH PARK

MAP 6
FEMA Flood Hazard Areas
2012 ENVIRONMENTAL RESOURCE INVENTORY
Borough of Oceanport
Monmouth County, New Jersey

September 2012

Est. 1920 A Great Place to Live

Legend

- Railroad
- Municipal Boundary
- Parcel
- Water Body
- Streams

Data Sources:
NJDEP
Monmouth County GIS

Flood Hazard Area

AE: An area inundated by 100-year flooding, for which Base Flood Elevations (BFEs) have been determined.

VE: An area inundated by 100-year flooding with velocity hazard (wave action); Base Flood Elevations (BFEs) have been determined.

X500: An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from 100-year flooding.

Reference:
The flood hazard data shown hereon was taken from the Federal Emergency Management Agency (FEMA) digital data.

N W E S

1 inch = 600 feet

0 300 600 1,200 1,800 Feet

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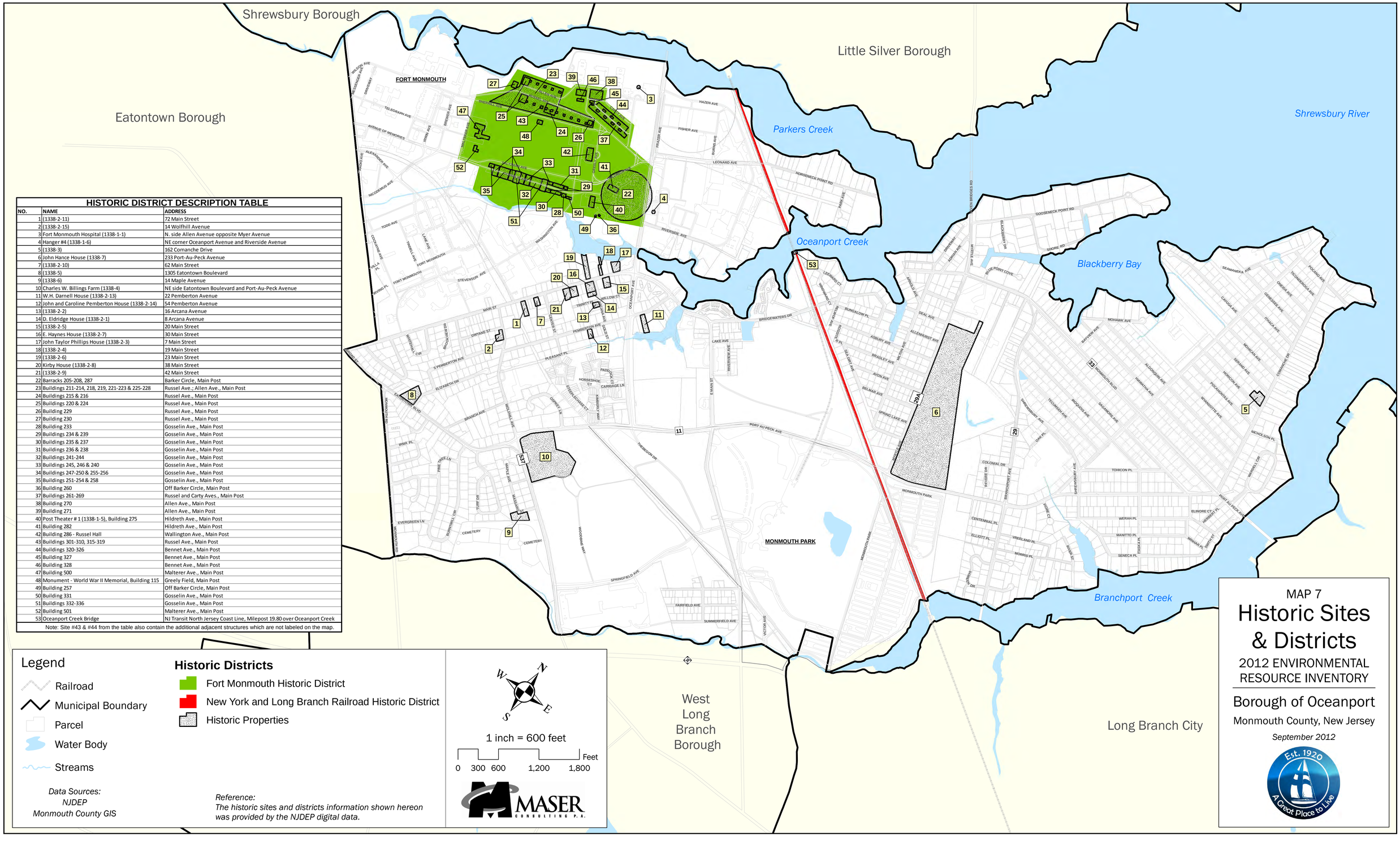
Note:
The flood hazard area for the Fort Monmouth property is undetermined.



HISTORIC DISTRICT DESCRIPTION TABLE

NO.	NAME	ADDRESS
1	(1338-2-11)	72 Main Street
2	(1338-2-15)	14 Wolfhill Avenue
3	Fort Monmouth Hospital (1338-1-1)	N. side Allen Avenue opposite Myer Avenue
4	Hanger #4 (1338-1-6)	NE corner Oceanport Avenue and Riverside Avenue
5	(1338-3)	162 Comanche Drive
6	John Hance House (1338-7)	233 Port-Au-Peck Avenue
7	(1338-2-10)	62 Main Street
8	(1338-5)	1305 Eatontown Boulevard
9	(1338-6)	14 Maple Avenue
10	Charles W. Billings Farm (1338-4)	NE side Eatontown Boulevard and Port-Au-Peck Avenue
11	W.H. Darnell House (1338-2-13)	22 Pemberton Avenue
12	John and Caroline Pemberton House (1338-2-14)	54 Pemberton Avenue
13	(1338-2-2)	16 Arcana Avenue
14	D. Eldridge House (1338-2-1)	8 Arcana Avenue
15	(1338-2-5)	20 Main Street
16	E. Haynes House (1338-2-7)	30 Main Street
17	John Taylor Phillips House (1338-2-3)	7 Main Street
18	(1338-2-4)	19 Main Street
19	(1338-2-6)	23 Main Street
20	Kirby House (1338-2-8)	38 Main Street
21	(1338-2-9)	42 Main Street
22	Barracks 205-208, 287	Barker Circle, Main Post
23	Buildings 211-214, 218, 219, 221-223 & 225-228	Russel Ave., Allen Ave., Main Post
24	Buildings 215 & 216	Russel Ave., Main Post
25	Buildings 220 & 224	Russel Ave., Main Post
26	Building 229	Russel Ave., Main Post
27	Building 230	Russel Ave., Main Post
28	Building 233	Gosselin Ave., Main Post
29	Buildings 234 & 239	Gosselin Ave., Main Post
30	Buildings 235 & 237	Gosselin Ave., Main Post
31	Buildings 236 & 238	Gosselin Ave., Main Post
32	Buildings 241-244	Gosselin Ave., Main Post
33	Buildings 245, 246 & 240	Gosselin Ave., Main Post
34	Buildings 247-250 & 255-256	Gosselin Ave., Main Post
35	Buildings 251-254 & 258	Gosselin Ave., Main Post
36	Building 260	Off Barker Circle, Main Post
37	Buildings 261-269	Russel and Carty Aves., Main Post
38	Building 270	Allen Ave., Main Post
39	Building 271	Allen Ave., Main Post
40	Post Theater # 1 (1338-1-5), Building 275	Hildreth Ave., Main Post
41	Building 282	Hildreth Ave., Main Post
42	Building 286 - Russel Hall	Wallington Ave., Main Post
43	Buildings 301-310, 315-319	Russel Ave., Main Post
44	Buildings 320-326	Bennet Ave., Main Post
45	Building 327	Bennet Ave., Main Post
46	Building 328	Bennet Ave., Main Post
47	Building 500	Malterer Ave., Main Post
48	Monument - World War II Memorial, Building 115	Greely Field, Main Post
49	Building 257	Off Barker Circle, Main Post
50	Building 331	Gosselin Ave., Main Post
51	Buildings 332-336	Gosselin Ave., Main Post
52	Building 501	Malterer Ave., Main Post
53	Oceanport Creek Bridge	NJ Transit North Jersey Coast Line, Milepost 19.80 over Oceanport Creek

Note: Site #43 & #44 from the table also contain the additional adjacent structures which are not labeled on the map.

Legend

- Railroad
- Municipal Boundary
- Parcel
- Water Body
- Streams

Historic Districts

- Fort Monmouth Historic District
- New York and Long Branch Railroad Historic District
- Historic Properties

Data Sources:
NJDEP
Monmouth County GIS

Reference:
The historic sites and districts information shown hereon was provided by the NJDEP digital data.

1 inch = 600 feet

0 300 600 1,200 1,800 Feet

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MAP 7

Historic Sites & Districts

2012 ENVIRONMENTAL RESOURCE INVENTORY

Borough of Oceanport

Monmouth County, New Jersey

September 2012

Est. 1920 A Great Place to Live

Shrewsbury Borough

Little Silver Borough

Eatontown Borough

Monmouth Beach Borough

West Long Branch Borough

Long Branch City

Parkers Creek

Shrewsbury River

Oceanport Creek

Blackberry Bay

Branchport Creek

FORT MONMOUTH

WOLF HILL RECREATION

MONMOUTH PARK

OCEANPORT BOROUGH OPEN SPACE	
NO.	NAME
1	BLACKBERRY BAY PARK
2	EVERGREEN PARK
3	CHARLES PARK
4	TRINITY PLACE PARK
5	COMMUNITY CENTER PARK
6	OLD WHARF PARK
7	SOMMERS PARK
8	SEAWANEKA PRESERVE
9	HORSENECK PRESERVE
10	MARIA GATTA COMMUNITY PARK
11	TRIANGLE PARK

Legend

- Railroad
- Municipal Boundary
- Parcel
- Water Body
- Streams
- Open Space
- County Open Space

Data Sources:
NJDEP
Monmouth County GIS

1 inch = 600 feet

0 300 600 1,200 1,800 Feet

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MAP 8

Parks & Open Space

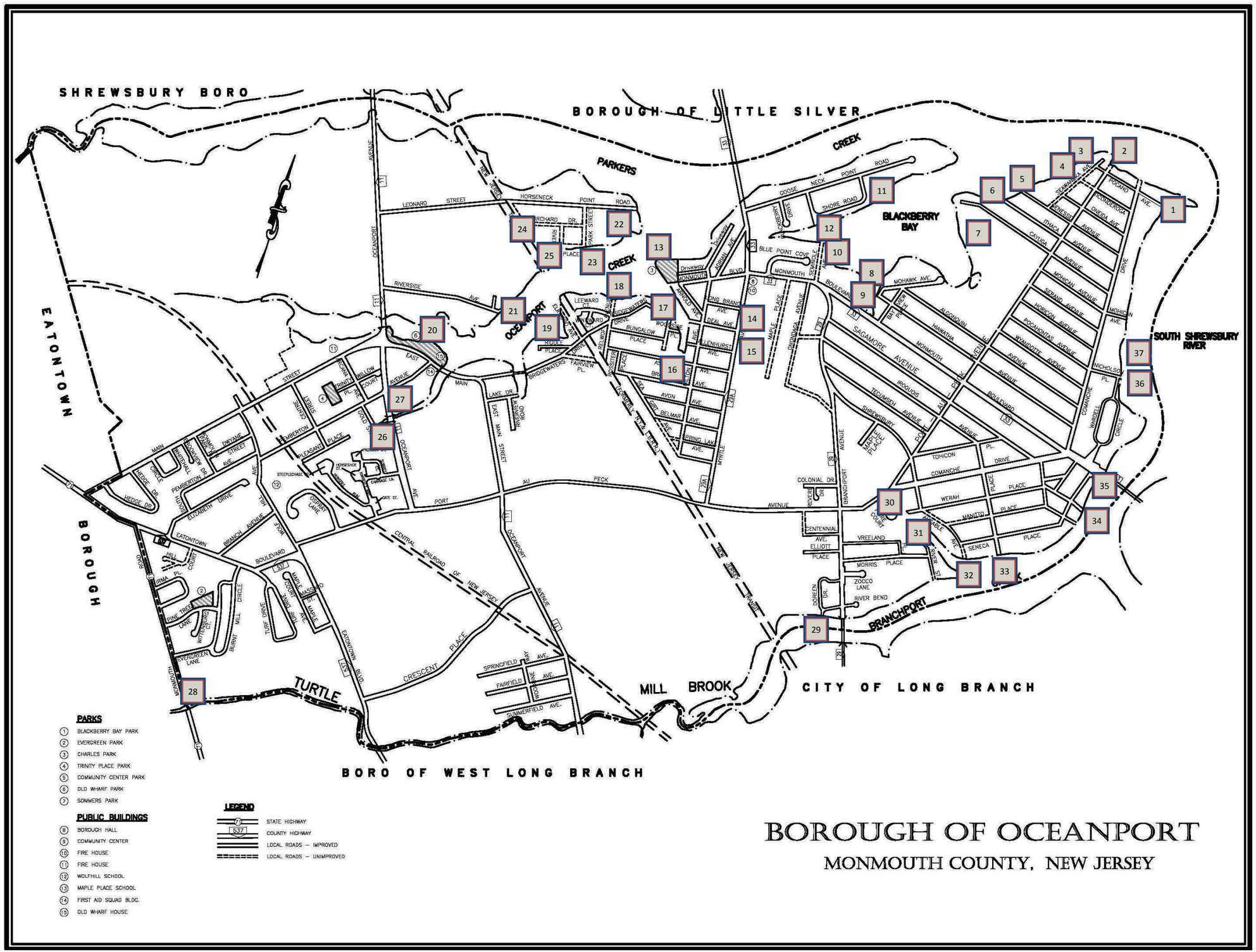
2012 ENVIRONMENTAL RESOURCE INVENTORY

Borough of Oceanport

Monmouth County, New Jersey

September 2012

Est. 1920 A Great Place to Live



BOROUGH OF OCEANPORT

MONMOUTH COUNTY, NEW JERSEY

1. Pocano Avenue – Street End
2. Sommers Park
3. Seawaneka Preserve
4. Ticonderoga Ave - unimproved street end
5. Genesse Ave - unimproved street end
6. Ithaca Avenue – unimproved street end
7. Blackberry Bay Park
8. Mohawk Avenue – Street End
9. Hiawatha Avenue – Street End
10. Seminole Ave – unimproved street end
11. Gooseneck Point Road – Vacant Lot on Lagoon (actually along Shore Road)
12. Shore Road—Street End
13. Charles Park
14. Deal Avenue – Street End
15. Allenhurst Avenue – Street End
16. Asbury Ave - Block 93, Lot 4 (Lagoon End)
17. Woodside Place – Street End
18. Relwof Avenue – Street End
19. Elkwood Avenue – unimproved (along railroad)
20. Old Wharf Park
21. Riverside Avenue – Street End
22. Horseneck Preserve – Horseneck Pt Road
23. Park Street
24. Orchard Drive – unimproved street end
25. Orchard Street – unimproved street end
26. Gold Street – Street End
27. Oceanport Ave – Vacant Lots
28. Monmouth Road – Bird Sanctuary along Turtle Mews Creek
29. Doreen Drive – Street End
30. Werah Place – Street End
31. Ausable Avenue – Block 1, Lot 13 along Bridge Creek off of Branchport Creek
32. Ausable Avenue – Street End
33. Itaska Place – Street End
34. Werah Place – Street End
35. Smith Street – End of Cul-de-sac – owned by Monmouth County
36. Nicholson Place – Street End
37. Pleasure Bay Marina

MAP 9

Street Ends Having Public Access

2012 ENVIRONMENTAL RESOURCE INVENTORY

Shrewsbury Borough

Little Silver Borough

Eatontown Borough

Monmouth Beach Borough

West Long Branch Borough

Long Branch City

FORT MONMOUTH

MONMOUTH PARK

Parkers Creek

Oceanport Creek

Shrewsbury River

Blackberry Bay

Branchport Creek

1 A2

2 A2

3 A2

MAP 10
Known Contaminated Sites
2012 ENVIRONMENTAL RESOURCE INVENTORY
Borough of Oceanport
Monmouth County, New Jersey

September 2012

Est. 1920 A Great Place to Live

Legend

- Railroad
- Municipal Boundary
- Parcel
- Water Body
- Streams
- Known Contaminated Sites

Data Sources:
NJDEP
Monmouth County GIS

Reference:
The known contaminated sites (non-homeowner) data shown hereon was taken from the digital data provided by the NJDEP. The Fort Monmouth property is not included in this dataset.

1 inch = 600 feet

0 300 600 1,200 1,800 Feet

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KNOWN CONTAMINATED SITES DESCRIPTION TABLE

SITE NO.	NAME	ADDRESS	STATUS
1	MONMOUTH PARK (NJS&E AUTHORITY)	175 RT 36	ACTIVE
2	15 DEAL AVE OIL SPILL	15 DEAL AVE	PENDING
3	OCEANPORT BORO	222 MONMOUTH BLVD	ACTIVE