

# Hamilton Township

## ENVIRONMENTAL RESOURCE INVENTORY



DECEMBER 2024

DELAWARE VALLEY  
**dvrpc**  
REGIONAL  
PLANNING COMMISSION



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**Hamilton Train Station**

Source: Mel Musie, DVRPC

# Acknowledgements

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The Hamilton Township Environmental Resource Inventory (ERI) was developed by staff at the Delaware Valley Regional Planning Commission and Hamilton Township through DVRPC's Environmental Planning Fee-Based Services. This program provides assistance to local governments to identify the current state of their resources, articulate what the future should be, involve the public in dialogue, and provide planning assistance, tools, and data that a municipality can use to achieve its goals for resource protection and use.

The following individuals were instrumental in the development of this ERI:

## **Hamilton Township**

- Robert C. Poppert, PP, AICP, Supervising Planner

## **Hamilton Township Environmental Commission**

- John Balletto (Chairman), Regular Member
- Robert Benjamin, Regular Member
- Joann Bruno, Regular Member
- Clinton Griggs, Regular Member
- Haig Kasabach, Regular Member
- Karl Vetter, Regular Member
- Ann Wolf, Regular Member
- Andrew Garcia, Alternate Member
- Nicole Provost, Alternate Member
- Patrick Nemes, Associate Member
- Claudia Shaughnessy, Associate Member
- Cathy Wagner, Associate Member
- Carrie Feuer, Mayor's Representative
- Richard Tighe, Council Liaison



**Field of lance leaved tickseed flowers in Mercer County Park**

Source: Mel Musie, DVRPC

## CHAPTER 1:

# Introduction

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The purpose of an Environmental Resource Inventory (ERI) is to identify and describe the natural resources of a community. A community's natural resources—its soil, water, air, forests, fields, and waterways—are fundamental to its character. The protection and wise use of those resources is essential to the public health, safety, and welfare of current and future residents. The ERI provides the basis for the development of methods and steps to preserve, conserve, and utilize those resources, although it does not include specific recommendations to those ends. It is, instead, a compendium of all the existing information that can be found about a township's natural resources, presented in a form that is useful to a broad audience. The inventory reflects a particular moment in time and should be updated as new data becomes available.

The settlement and growth of Hamilton Township is inherently tied to its natural resources. The area has been inhabited since prehistoric times and contains one of the most important archeological sites in the eastern United States, the Abbott Farm National Historic Landmark, which was occupied by Native Americans for thousands of years. Early settlers from Europe saw the forests, the waters, and the soils as opportunities for industry, development, and prosperity. Hamilton Township's environmental resources enabled the rise of its industries, agriculture, and communities.

As development pressures continue to fluctuate in and around Hamilton Township, documentation of its natural resources become a necessity. Special measures to protect and enhance Hamilton's historic characteristics, agricultural economy, unique forest ecosystems, and water bodies are essential to maintaining these resources in the face of increasing population and development. Hamilton Township's water, wetlands, forests, and grasslands provide significant habitat for a wide variety of plants and animals, many of which are threatened and endangered. These areas are also critically important in protecting the health and vitality of the township. Detailed documentation of these resources will aid Hamilton's citizens in balancing the pressures of growth with conservation, and in maintaining and shaping the community's unique identity while preserving its rich historic fabric and exceptional natural environment.

Additionally, accommodating development sustainably requires an understanding of the critical natural and community resources within the township. This ERI is an important step toward that goal.

Several documents and reports were utilized in preparing the ERI for Hamilton Township, which are listed at the end of this document.

## **Township Overview**

Hamilton Township is a municipality of over 91,819 people and covers 40.2 square miles (25,737.27 acres). The township is located in southern Mercer County, which is in the western part of central New Jersey. As of 2020, it was Mercer County's largest and most populated municipality. Hamilton Township lies mostly in the Inner Coastal Plain, a physiographic province characterized by highly productive prime farmland that is also highly suitable for development. Sixty percent of the land was developed as of 2020.

There are about 141 miles of streams running through Hamilton Township, over 93 miles of which are headwater streams. There are also 200 acres of lakes and ponds, including Gropp Lake, Spring Lake, and Rowan Lake. Hamilton Township receives its public water supply from both the Potomac-Raritan-Magothy (PRM) aquifer system and the Delaware River.

There are portions of two watersheds and 11 subwatersheds located within Hamilton Township. In the 2020 to 2022 New Jersey Integrated Water Quality Report, all of the subwatersheds were impaired for one or more designated uses, and none had reached full attainment of standards. Some of the water quality impairments observed include arsenic, mercury, phosphorus, lead, and other contaminants. See **Chapter 8: Hydrology and Surface Water Resources on page 41** for additional information on the water quality in the region.

Hamilton Township is home to a variety of plant and animal life. The township contains numerous types of habitats, all of which are important for maintaining biodiversity. Wetlands and forests are the two most abundant natural ecosystem types found in the township. The Natural Heritage Database of the NJDEP lists 14 species of rare wildlife found in the township, including the bald eagle, the shortnose sturgeon, Cooper's hawk, the eastern box turtle, and the eastern pond mussel. Hamilton Township is also home to a number of historic sites, 11 of which are currently listed on the National and State Registers of Historic Places, including the Abbott Farm National Historic Landmark, the Isaac Pearson House, and Bow Hill. See **Chapter 2: History of Hamilton Township on page 3** for additional information on the township's historic resources.

### **Sources**

The maps and data relating to natural resources are mainly derived from the New Jersey Department of Environmental Protection's (NJDEP's) Geographic Information System mapping; The Landscape Project, which was produced by the Endangered and Nongame Species Program of the New Jersey Division of Fish and Wildlife; reports by the United States Geological Survey (USGS) and New Jersey Geological Survey (NJGS); and data and maps compiled by the Delaware Valley Regional Planning Commission (DVRPC). Information from these sources specific to Hamilton Township has been included whenever it was available. Information from other reports about specific sites has also been incorporated, along with data provided by the township and county.

Descriptive introductions to some topics have been included in the ERI to give readers background information on various complex topics. The hope is that this information will also assist the Environmental Commission and other township officials in obtaining additional data from state sources in the future and in determining the types of investigations that still need to be conducted.

## CHAPTER 2:

# History of Hamilton Township

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### Settlement

Long before European settlement, various peoples occupied the land that would become Hamilton Township. Excavations from the Abbott Farm National Historic Landmark site indicate that humans have lived in Hamilton Township for thousands of years. This site located within Abbott Marshlands, has a concentration of prehistoric artifacts from the Middle Woodland period (circa A.D. 1 to A.D. 900). An excavated garbage pit contained sturgeon, bear, and beaver bones from over one thousand years ago.

By the time of European arrivals, the indigenous Lenni Lenape were present and spoke Algonquin. The Lenni Lenape occupied the area within the present-day State of New Jersey, the southeast section of New York State, northern areas of the State of Delaware and the eastern part of the Commonwealth of Pennsylvania. The Lenni Lenape valued this region for its rich soils and abundance of fish and game. Agriculture provided a substantial portion of their diet. The regional creeks were extensively utilized by the Lenni Lenape for transportation. In Algonquin, Lenni Lenape means “true men” or “original people.”

Although indigenous people lived in the region for thousands of years while leaving a minimal mark on the land, they succumbed to the violence, diseases, and encroachment of the newly-arrived European settlers. Many departed to areas of New York, Ohio, Wisconsin, and eventually to Oklahoma. By 1758, all remaining Native Americans south of the Raritan River were forced to live in the 3,258-acre reservation called Brotherton, in what is now Shamong Township, New Jersey. Brotherton has been recognized as the first Indians reservation in the country.

The first European settlers in the Delaware Valley were the Dutch, who, in 1623, established Fort Nassau near what is today Gloucester City, Camden County. In 1644, King Charles II of England took control of much of America’s

eastern seaboard, and deeded most of present-day New Jersey to his brother, the Duke of York, who split it into East and West Jersey. Present-day Hamilton Township was located near the divide in West Jersey. The British quickly sought to occupy the land and secure its control. Throughout the 17th century, sections of New Jersey were taken from the Lenni Lenape tribe, including present-day Hamilton Township.

The area of Hamilton Township was first settled by the British over 300 years ago. In November 1677, two British ships, the “Willing Mind” and the “Martha,” carrying 114 passengers, anchored in the Delaware River. These early settlers established “Yorkshire Tenth” (the first name of the township) in West Jersey, named after the division of this land into 10 areas. Yorkshire Tenth was bounded by Assunpink Creek in the north, Rancocas Creek in the south, the Delaware River on the west, and by a province line to the east.



**18th century tea set on display inside Isaac Watson House**

Source: Mel Musie, DVRPC

On December 10, 1678, a ship from Hull, England, the “Shield,” arrived off the shore of Yorkshire Tenth. The passengers, who walked ashore on ice, became the first inhabitants of Nottingham Township, a subsection of Yorkshire Tenth that included present-day Hamilton Township and Trenton south of the Assunpink Creek. The settlement, of what would officially become Hamilton Township in 1842, began along the bluff southeast of Chambersburg and further southeast on Crosswicks Creeks. The earliest inhabitants were Episcopalians, although Quakers soon predominated. Presbyterians and Baptists later settled in this area as well. These early European settlers were farmers, tradesmen, wheelwrights, tailors, shipbuilders, and carpenters. The tidal waterways of the township provided the principal means for the trade of agricultural goods and other commerce.

## **Early Transportation Systems**

The beginning of an extensive transportation system emerged in the 1830s with the construction of both the Delaware and Raritan (D&R) Canal and the Camden and Amboy Railroad. Coal and other freight were pulled down the canal by mule-drawn barges and, later, steam tugboats. The D&R Canal was one of the busiest navigation canals in the country for nearly a century. The Camden and Amboy Railroad was the third formal railroad in the country and was the longest railroad at the time of its construction. Built to connect Trenton and New Brunswick, the right of way of the Camden and Amboy Railroad cut diagonally across many farms in Hamilton Township. The canal and railroad attracted a variety of industries, and by the end of the 19th century, Trenton was a leader in the iron and the steel industry. These and other industries brought economic prosperity and employment to the area.

In 1833, the English-made steam locomotive, the “John Bull,” began its cross-state service through Edgebrook in Hamilton Township. The John Bull was retired from service in 1866 and is currently housed in the Smithsonian’s National Museum of American Industry. In 1981, the Smithsonian brought the John Bull out of retirement for a brief run, declaring the John Bull the world’s oldest operable self-propelled steam locomotive.

Mercer County was officially founded in 1838, when the New Jersey State Legislature redrew county lines and formed 15 counties from the original 13. Mercer County was named in honor of the distinguished Revolutionary War hero General Hugh Mercer, who died from wounds inflicted during the Battle of Princeton in 1777. By the time of its founding, Mercer County was a well-established, economically prosperous, and historically significant area.

One of the primary commercial centers in Hamilton Township during the 1800s was White Horse. By 1875, approximately 30 farms were located in White Horse, in addition to river-facilitated businesses such as John Abbott’s Dock and Warehouse. Goods such as fabric, wheat, and tea were transported to Philadelphia and Trenton through White Horse. Other early settlements in Hamilton included Lakeside Park, Edgebrook, and Duck Island.

In the mid-1800s, multiple trolley companies began to operate in the area, including the City Railroad Company, the Trenton Horse Railroad Company, and the Trenton & Mercer Traction Corporation. In 1868, the City Railroad Company built more rail lines than the Trenton Railroad Company, and the two companies eventually merged. The Trenton & Mercer Traction Company operated several routes through the neighborhoods of Bromley, Mercerville, and Hutchinson’s Mills. In 1863, the Trenton Horse Railroad Company received authorization to lay tracks on State Street from Clinton Avenue to the western edge of town. By 1892, the Hamilton trolley system had converted to electric trolleys, reaching peak popularity in the early 20th century. By the 1920s, however, the trolley system began to decline due to the increasing affordability of the automobile.

Prior to 1860, the crescent-shaped Duck Island had been used primarily for growing crops, including tobacco, horseradish, and corn. With the construction of a gold jewelry factory in 1859, the area began to transform into a community of light industry and commercial enterprises. By 1930, most of the island had been purchased by T. Arthur Karno, who sold the land to oil companies for the housing of petroleum storage tanks. Over the next six years, properties on Duck Island were acquired by numerous oil companies, including the Atlantic Oil Refining



**18th century spinning wheel on display in Isaac Watson House**

Source: Mel Musie, DVRPC

deposits of Hamilton helped to fuel the pottery industry in Trenton, which was at the time considered the pottery capital of the country. The two largest clay mining operations in the township were Moon Kaolin Clay Company and the Morton Company.

## 20th Century and On

In 1932, the D&R Canal closed and went through many years of neglect before becoming a state park in 1974, shortly after being placed on the State and National Registries of Historic Places. A trail along the canal was designated in 1992 as part of the National Recreation Trail System.

After World War II, large areas of farmland in Hamilton Township were developed to accommodate an expanding population and economy. Most existing farms today are located in southeast Hamilton Township. Hamilton Township's rapid growth after World War II was facilitated by the construction of three major highways within its boundaries: The New Jersey Turnpike (1950), I-295 (1958) and I-195 (1968). The Hamilton Township Transit Center of NJ Transit's Northeast Corridor opened in 1999 and is one of the transit system's busiest stations, with over 1.5 million passengers annually.

## Historic Sites

Hamilton Township is home to 11 sites that are listed on the National and State Registers of Historic Places. These and other resources are shown in **Figure 1: Historical Sites (2024) on page 8**. The National Register of Historic Places is the official list of the nation's historic resources that are found to be worthy of preservation. In 1935, Congress established the first historical register through the passage of the Historic Sites Act. Through this act, the Secretary of the Interior was enabled to designate worthy properties as National Historic Landmarks. In 1966, with the passage of the National Historic Preservation Act, the National Register began to include significant districts, sites, structures, buildings, and objects of local, state, and national interest. The governor of each state was enabled to appoint a State Historic Preservation Office (SHPO) to work in conjunction with the National Register Office of the National Park Service. In New Jersey, the NJDEP houses the SHPO.

Company, Shell Oil Company, Mobile Oil Company, and American Oil Distributors. In 1932, the Trenton Marine Terminal was built, serving as the only facility designed for handling general cargo. The terminal would go on to play a significant role in the development and success of the Port of Trenton. By the 1960s, the landscape of Duck Island had been completely transformed by industry. In the 1990s, Duck Island would become the site of a 96-acre wetlands mitigation project, compensating for wetlands destroyed by highway construction, the largest such project undertaken by the New Jersey Department of Transportation.

By the 1880s, clay mining was a flourishing industry in several parts of Hamilton Township, notably Cornell Heights and Mercerville. The natural clay

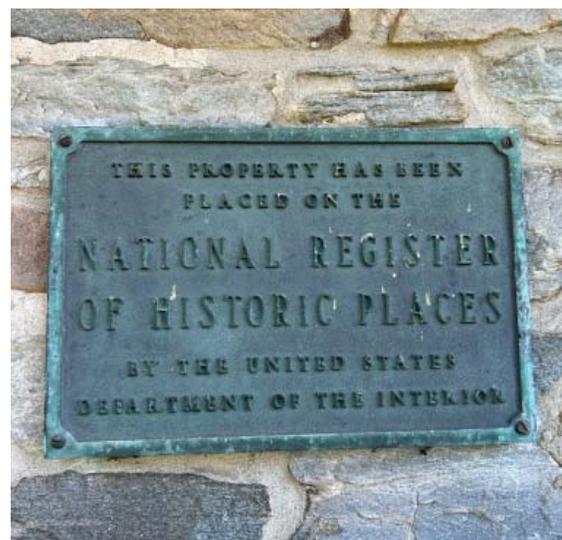
The New Jersey Register of Historic Places is the state’s official list of historic resources of local, state, and national interest. It closely resembles the National Register program and uses the same criteria for eligibility, nomination form, and review process. The inclusion of a property on the New Jersey and National Registers has many benefits, including a degree of protection from public encroachment. In addition, listed properties are eligible for financial assistance for historic rehabilitation or restoration. Interested parties can take advantage of the Rehabilitation Investment Tax Credit, a federal tax incentive to encourage the preservation and reuse of older income-producing properties, including offices, apartment buildings, and retail stores.

New Jersey municipalities are permitted to identify, designate, and regulate their own historic resources through the adoption of historic preservation ordinances, which are recognized as zoning laws under the New Jersey Municipal Land Use Law. The Hamilton Township Historic Preservation Advisory Commission has the responsibility of maintaining the historic character of the municipality. The commission works to further the continued use and reuse of historic resources, to discourage the unnecessary demolition of historic resources, to foster and enhance civic beauty and neighborhood pride, and to safeguard the cultural and architectural heritage of Hamilton Township for the education, pleasure, and general welfare of its citizens and visitors.

The National Park Service and the New Jersey SHPO jointly administer the Certified Local Governments (CLG) program, which provides technical assistance and funding for community-based preservation efforts. As of October 2023, five municipalities in Mercer County were designated as CLGs: Ewing, Hopewell, Lawrence, Princeton Borough, and Princeton Township. A full list of all CLGs in New Jersey is available online via NJDEP’s Bureau of GIS [CLG webmap](#). To participate, municipalities must “have a historic preservation ordinance and a historic preservation commission conforming to the specifications of both the Municipal Land Use Law and the National Park Service approved New Jersey Certified Local Government Guidelines.” If Hamilton Township were to become a CLG, it would be eligible to draw from an exclusive pool of matching federal and state funds for program implementation or rehabilitation work.

Investing in historic preservation efforts can provide a municipality with important and impressive returns. Private and public efforts to preserve and rehabilitate historic districts create attractive places to live, work, and play, and stimulate new investment in older residential and commercial centers. A historic district can become a regional draw for tourists and boutique customers. Furthermore, historic preservation maintains a municipality’s character, distinctly separating it from other rural and suburban communities, for both new and established residents

Hamilton Township has an abundance of historic resources, including homesteads, farmsteads, churches, bridges, and other buildings, structures, and sites. The properties and historic districts found in **Table 1: Historic Sites on State and National Registers (2024) on page 7** and in **Figure 1: Historical Sites (2024) on page 8**, meet the New Jersey and National Register criteria for significance in American history, archaeology, architecture, engineering, or culture, and possess integrity of location, design, setting, materials, workmanship, feeling, and association. In addition to the 11 sites listed on the State and National Registers of Historic Places, there are an additional 33 sites that are eligible for the registers. Other sites, such as the Enoch Middleton House, may have the potential to be listed as local, state, or national landmarks, but have not been nominated by local citizens or identified by SHPO for such a designation.



**Historic designation plaque posted at Isaac Watson House**

Source: Mel Musie, DVRPC

**Table 1: Historic Sites on State and National Registers (2024)**

Type	Name	Location	State ID#	Register Status
Site	Abbott-Decou Mansion	58 Soloff Drive	1656	NR: 7/1/1976 SR: 1/7/1976
Site	Anderson Capner House	700 Trumbull Avenue	1107	NR: 8/15/1972
Site	Bow Hill Mansion (Barnt DeKlyn House)	Jeremiah Avenue	1659	NR: 1/25/1973 SR: 5/1/1972
Site	Isaac Pearson House	Hobson Avenue and Emeline Avenue	4575	NR: 2/1/2006 SR: 11/18/2005
Site	Isaac Watson House	151 Wescott Avenue	1672	NR: 1/21/1974 SR: 1/14/1972
Site	John Abbott II House	2200 Kuser Road	1652	NR: 6/18/1976 SR: 11/20/1975
Site	Thomas Maddock Sons Company	240 Princeton Avenue	4425	NR: 3/14/2008 SR: 1/7/2008
Site	V. Henry Rothschild/F.A. Straus and Co./Atlantic Products Corporation Mill Complex	1 North Johnston Avenue	5793	NR: 11/19/2020 SR: 9/21/2020
District	Abbott Farm Historic District		76001158 (national)	NR: 5/11/1973 SR: 11/30/1972
District	Crosswicks Creek Site III		87001795 (national)	NR: 11/26/1990 SR: 8/31/1987
District	Delaware and Raritan Canal Historic District		74001172 (national)	NR: 5/11/1973

Source: NJDEP Historic Preservation Office, Sites on State and National Registers (2024)

### History of Sites and Districts on the State and National Registers

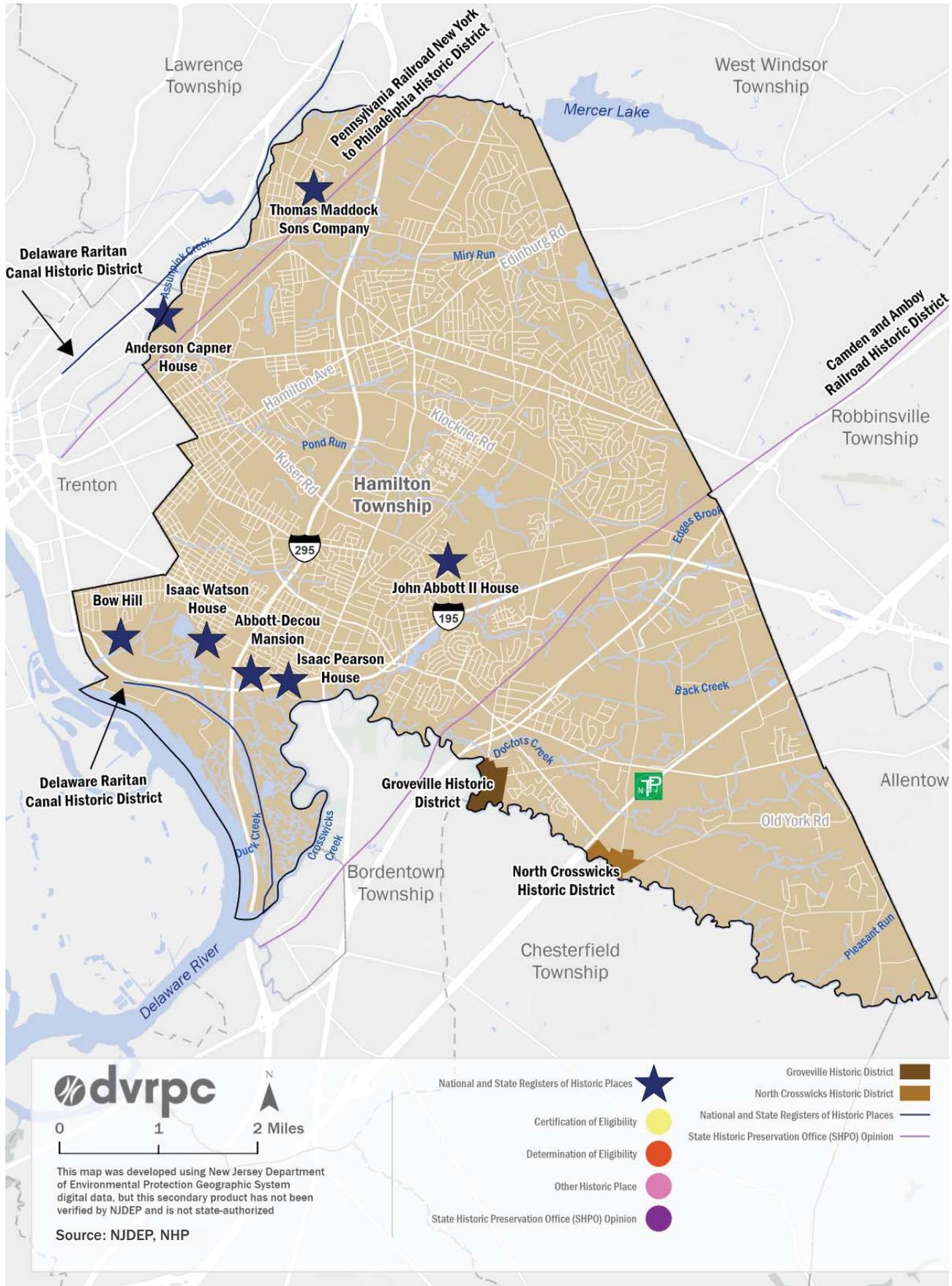
The **Abbott-Decou Mansion**, also known as the homestead of Samuel and Lucy Abbott, was built circa 1797. This brick mansion was built in the Quaker Georgian style. The property was listed to the National Register in 1976.

The **Bow Hill Mansion**, built circa 1785, was first occupied by Barnt DeKlyn, a prosperous merchant descended from French nobility. The house was destroyed by fire shortly after its construction but was rebuilt in 1787. Joseph Bonaparte (exiled King of Spain and brother of Napoleon Bonaparte) once rented the mansion from DeKlyn as a retreat for his mistress, Annette Savage, during the 1820s. After about 50 years of vacancy, the Hamilton Township Historical Society purchased the mansion and the surrounding five acres in 1949. However, not enough funding was raised for renovations and the property was resold.

The **Isaac Pearson House** was built in 1773 near the intersection of Emeline and Hobson Avenues. Pearson was a prominent elected public servant who served as tax collector, justice of the peace, freeholder, township clerk, and delegate to the New Jersey Provincial Assembly. Pearson was murdered in 1776 after the Battle of Trenton, either by robbers or by colonists who suspected him of collaborating with the British. Hamilton Township recently purchased the home and is currently restoring the property to convert it for use as a tourist attraction.

The **Isaac Watson House** is the oldest house in Mercer County. This stone house was built in 1708 on a bluff overlooking Watson's Creek in the area that is now John A. Roebling Park. It is currently the headquarters of the New Jersey State Society of the National Society of the Daughters of the American Revolution (DAR).

Figure 1: Historical Sites (2024)



The **John Abbott II House**, located on the North Side of Crosswicks Creek on Kuser Road, was built in 1730. In 1776, the house hid Patriot funds from the British, who were advancing on Trenton. Today, it is located next to the Civil War and Native American Museum within Veterans Park.

The **Thomas Maddock Sons Company** was a pottery company that manufactured crockery for general use, as well as sanitary earthenware, or bathroom fixtures, in the late 19th and early 20th centuries. Thomas Maddock was among the first to produce sanitary porcelain wares in the U.S. and became one of the leading manufacturers of bathroom fixtures. In 1929, The Maddock Sons Company was acquired by Sanitary Manufacturing Company, which later merged with American Radiator Company to become American Standard.

The **Abbott Farm Historic District**, named after the famed 19th century archeologist Charles Conrad Abbott, is one of the country's most important archeological sites. It is the largest known Middle Woodland village site in the coastal Mid-Atlantic and New England region. The Woodland time period is considered an important cultural development stage for prehistoric Native Americans, when pottery making and the cultivation of crops began. In use from about 500 B.C. to 500 A.D., this archeological site has been the center of a controversy of the antiquity of human occupation of the New World. This site has also been the subject of over 100 books and articles. It was designated a National Historic Landmark in 1976. However, a portion of the site had been slated for development in 2002 (the "Bywater" proposal). The New Jersey Green Acres program was able to preserve this area, which contained archeological remains. An interpretive plan completed in 2009 proposes a cohesive interpretive program and makes recommendations to improve the public understanding and enjoyment of the district.

The **Delaware and Raritan Canal Historic District** is 36 miles long and part of the main D&R Canal and encompasses 22 miles of other nearby feeder canals. Chartered on February 4, 1830, the 44-mile long D&R Canal operated as a barge canal, transporting Pennsylvania coal to New York. This was during the time of the Industrial Revolution in the United States, and there was a high demand for coal to power steam engines. At the height of the canal's usage in the 1860s and 1870s, 80 percent of the D&R Canal's total freight was coal. By the end of the 19th century, canal use declined due to the efficiency of railroad trains. The canal closed in 1932, and during the 1950s was rehabilitated by New Jersey to become the Canal Water Supply Transmission, a water supply system that still serves that purpose today. In 1974, the D&R Canal was designated a state park and placed on the State and Federal Registry of Historic Places.



**Isaac Watson House**

Source: Mel Musie, DVRPC



**Sculpture by Alexander Lieberman located on East State Street**

Source: Mel Musie, DVRPC

## CHAPTER 3:

# Location, Size, and Land Use

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Hamilton Township borders nine municipalities in four counties and is located within both the Inner Coastal Plain and the Piedmont physiographic provinces. There are a number of individual communities and neighborhoods within Hamilton Township, each with its own identity. These include Hamilton Square, Bromley, Yardville, North Crosswicks, White Horse, Mercerville, and Groveville.

Hamilton Township is highly accessible by a number of major roadways, including Interstates 195 and 295, the New Jersey Turnpike (Interstate 95), U.S. Highways 130 and 206, and State Highways 33 and 29. There is also a stop on the New Jersey Transit Northeast Corridor Line in Hamilton Township.

### Land Cover and Use

Land cover is a description of the landscape on the Earth's surface, such as pavement, forest, or grasslands. Land use is a description of society's use of the land, such as commercial or residential. The New Jersey Department of Environmental Protection (NJDEP) and the Delaware Valley Regional Planning Commission (DVRPC) have analyzed the land cover and land use of the state and region based on aerial photography. **Figure 2: Aerial Imagery of Hamilton Township (2022) on page 15** features leaf-off, aerial imagery of the township from NEARMAP in 2022.

### NJDEP Land Cover/Land Use

According to 2020 NJDEP data, the majority of land in Hamilton Township is classified as urban, which makes up almost 60 percent of the township, or 15,412 acres. Wetlands cover 19.7 percent of the township, or just over 5,070 acres. The third most common type of land use in Hamilton Township is forest, comprising almost nine percent, or 2,270 acres. This is followed closely by agriculture, which makes up 7.42 percent of the township, or 1,908 acres.

**Table 2: General Land Cover (2020) on page 12** and **Figure 3: General Land Cover/Land Use (2020) on page 16** show Hamilton Township's land cover grouped into six general categories. **Table 3: Detailed Land Use/Cover (2020) on page 12** provides a more detailed look at Hamilton's land cover, subdividing the general land cover categories into 62 distinct land uses/land cover types.



**View of Mercer Lake**

Source: Mel Musie, DVRPC

Table 2: General Land Cover (2020)

Category	Acres	Percent
Agriculture	1,909.78	7.42%
Barren Land	293.95	1.14%
Forest	2,268.72	8.82%
Urban	15,412.82	59.89%
Water	781.42	3.04%
Wetlands	5,070.58	19.70%
<b>Total</b>	<b>25,737.28</b>	<b>100.00%</b>

Source: NJDEP (2020)

Table 3: Detailed Land Use/Cover (2020)

General Land Use Category	Detailed Land Use Category	Acres	Percent
Agriculture	Confined Feeding Operations	3.27	0.01%
Agriculture	Cropland and Pastureland	1,378.63	5.36%
Agriculture	Orchards/Vineyards/Nurseries/Horticultural Areas	375.71	1.46%
Agriculture	Other Agriculture	151.18	0.59%
Agriculture	Plantation	1.00	0.00%
Barren Lands	Altered Lands	98.23	0.38%
Barren Lands	Transitional Areas	195.72	0.76%
Forest	Coniferous Brush/Shrubland	2.63	0.01%
Forest	Coniferous Forest (>50% crown closure)	7.92	0.03%
Forest	Coniferous Forest (10-50% crown closure)	4.05	0.02%
Forest	Deciduous Brush/Shrubland	265.81	1.03%
Forest	Deciduous Forest (>50% crown closure)	1,278.70	4.97%
Forest	Deciduous Forest (10-50% crown closure)	423.83	1.65%
Forest	Mixed Deciduous/Coniferous Brush/Shrubland	146.59	0.57%
Forest	Mixed forest (>50% coniferous with >50% crown closure)	8.50	0.03%
Forest	Mixed forest (>50% deciduous with >50% crown closure)	17.57	0.07%
Forest	Mixed Forest (>50% deciduous with 10-50% crown closure)	35.75	0.14%
Forest	Old Field (< 25% brush covered)	77.37	0.30%
Urban	Athletic Fields (schools)	205.93	0.80%
Urban	Cemetery	294.71	1.15%
Urban	Commercial/Services	1,931.63	7.51%
Urban	Industrial	594.67	2.31%
Urban	Industrial and Commercial Complexes	16.84	0.07%
Urban	Major Roadway	453.31	1.76%
Urban	Military Installations	4.81	0.02%
Urban	Mixed Transportation Corridor Overlap Area	1.46	0.01%
Urban	Mixed Urban or Built-up Land	36.81	0.14%
Urban	Other Urban or Built-up Land	1,147.42	4.46%
Urban	Railroads	135.76	0.53%

General Land Use Category	Detailed Land Use Category	Acres	Percent
Urban	Recreational Land	584.42	2.27%
Urban	Residential, High Density or Multiple Dwelling	1,503.14	5.84%
Urban	Residential, Rural, Single Unit	949.61	3.69%
Urban	Residential, Single Unit, Low Density	661.00	2.57%
Urban	Residential, Single Unit, Medium Density	5,977.74	23.23%
Urban	Stormwater Basin	302.26	1.17%
Urban	Transportation/Communication/Utilities	382.40	1.49%
Urban	Upland Rights-of-Way Developed	192.61	0.75%
Urban	Upland Rights-of-Way Undeveloped	36.31	0.14%
Water	Artificial Lakes	214.43	0.83%
Water	Bridge over Water	5.98	0.02%
Water	Natural Lakes	11.63	0.05%
Water	Streams and Canals	109.45	0.43%
Water	Tidal Mud Flat	105.06	0.41%
Water	Tidal Rivers, Inland Bays, and Other Tidal Waters	334.88	1.30%
Wetlands	Agricultural Wetlands (Modified)	310.21	1.21%
Wetlands	Deciduous Scrub/Shrub Wetlands	229.94	0.89%
Wetlands	Deciduous Wooded Wetlands	3,402.21	13.22%
Wetlands	Disturbed Tidal Wetlands	11.82	0.05%
Wetlands	Disturbed wetlands (modified)	34.61	0.13%
Wetlands	Former Agricultural Wetland (Becoming Shrubby, not Built-up)	12.35	0.05%
Wetlands	Freshwater Tidal Marshes	421.03	1.64%
Wetlands	Herbaceous Wetlands	208.83	0.81%
Wetlands	Managed Wetland in Built-up Maintained Rec Area	34.30	0.13%
Wetlands	Managed Wetland in Maintained Lawn Greenspace	44.27	0.17%
Wetlands	Mixed Scrub/Shrub Wetlands (Coniferous dom.)	9.93	0.04%
Wetlands	Mixed Scrub/Shrub Wetlands (Deciduous dom.)	55.46	0.22%
Wetlands	Mixed Wooded Wetlands (Coniferous dom.)	5.38	0.02%
Wetlands	Mixed Wooded Wetlands (Deciduous dom.)	19.52	0.08%
Wetlands	Phragmites Dominate Coastal Wetlands	67.84	0.26%
Wetlands	Phragmites Dominate Interior Wetlands	52.25	0.20%
Wetlands	Phragmites Dominate Urban Area	7.90	0.03%
Wetlands	Wetland Rights-of-Way	142.72	0.55%
<b>Total</b>		<b>25,737.28</b>	<b>100.00%</b>

Source: NJDEP (2020)

### DVRPC Land Use

DVRPC’s assessment of the land use in Hamilton Township uses different categories than NJDEP and is shown in **Table 4: DVRPC Land Use (2023)**. According to DVRPC, almost 32 percent of the township is residential, 22 percent is wooded, and almost 10 percent is transportation.

**Table 4: DVRPC Land Use (2023)**

Land Use	Acres	Percent
Agriculture	2,093.75	8.14%
Commercial	1,530.43	5.95%
Industrial	752.86	2.93%
Institutional	907.09	3.52%
Military	4.02	0.02%
Recreation	841.44	3.27%
Residential	8,229.91	31.98%
Transportation	2,490.67	9.68%
Undeveloped	1,779.15	6.91%
Utility	620.84	2.41%
Water	714.77	2.78%
Wooded	5,768.15	22.42%
<b>Total</b>	<b>25,733.14</b>	<b>100.00%</b>

Source: DVRPC (2023)



**Spring in Sayen Gardens**

Source: Mel Musie, DVRPC

Figure 2: Aerial Imagery of Hamilton Township (2022)

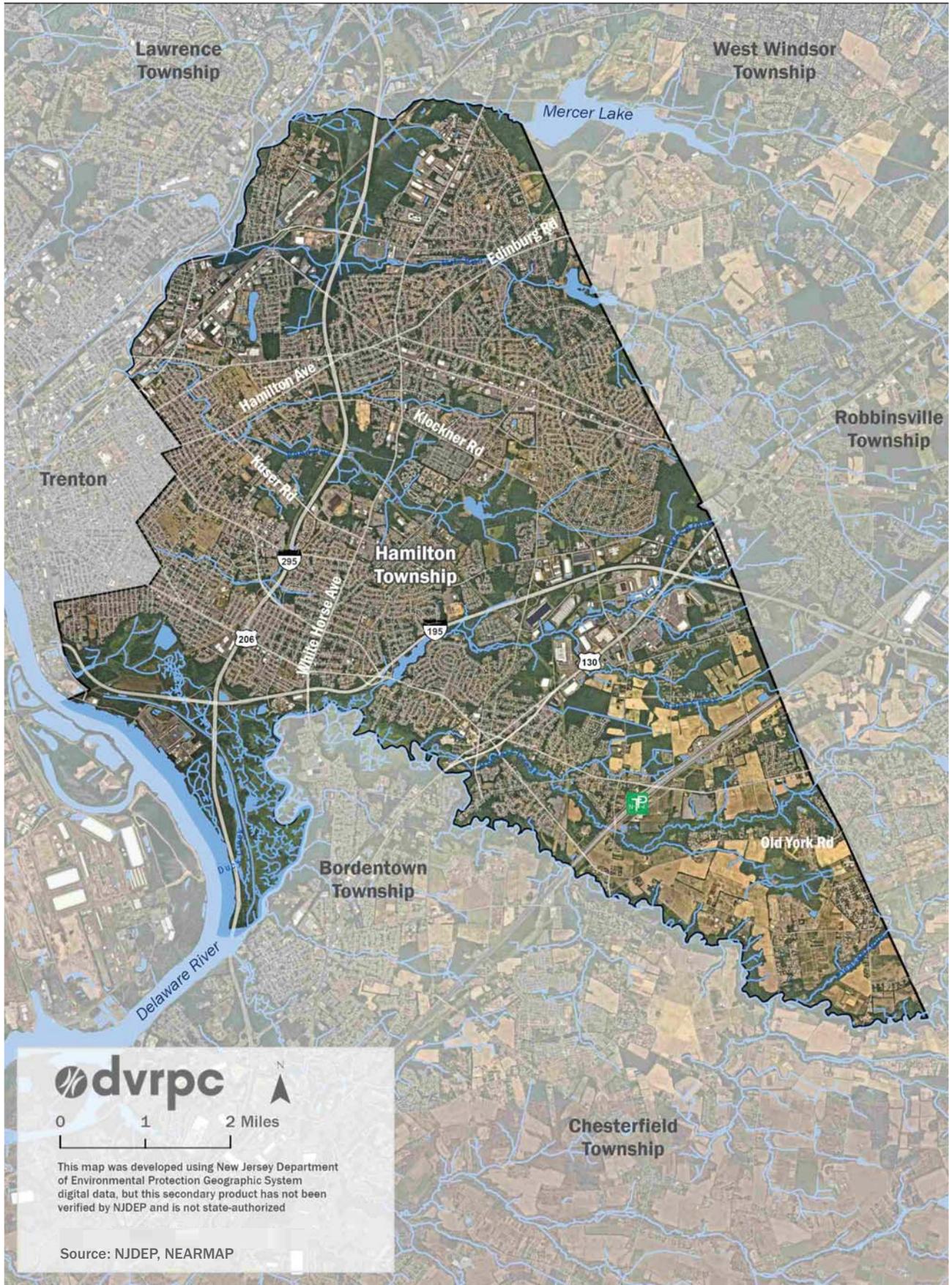


Figure 3: General Land Cover/Land Use (2020)

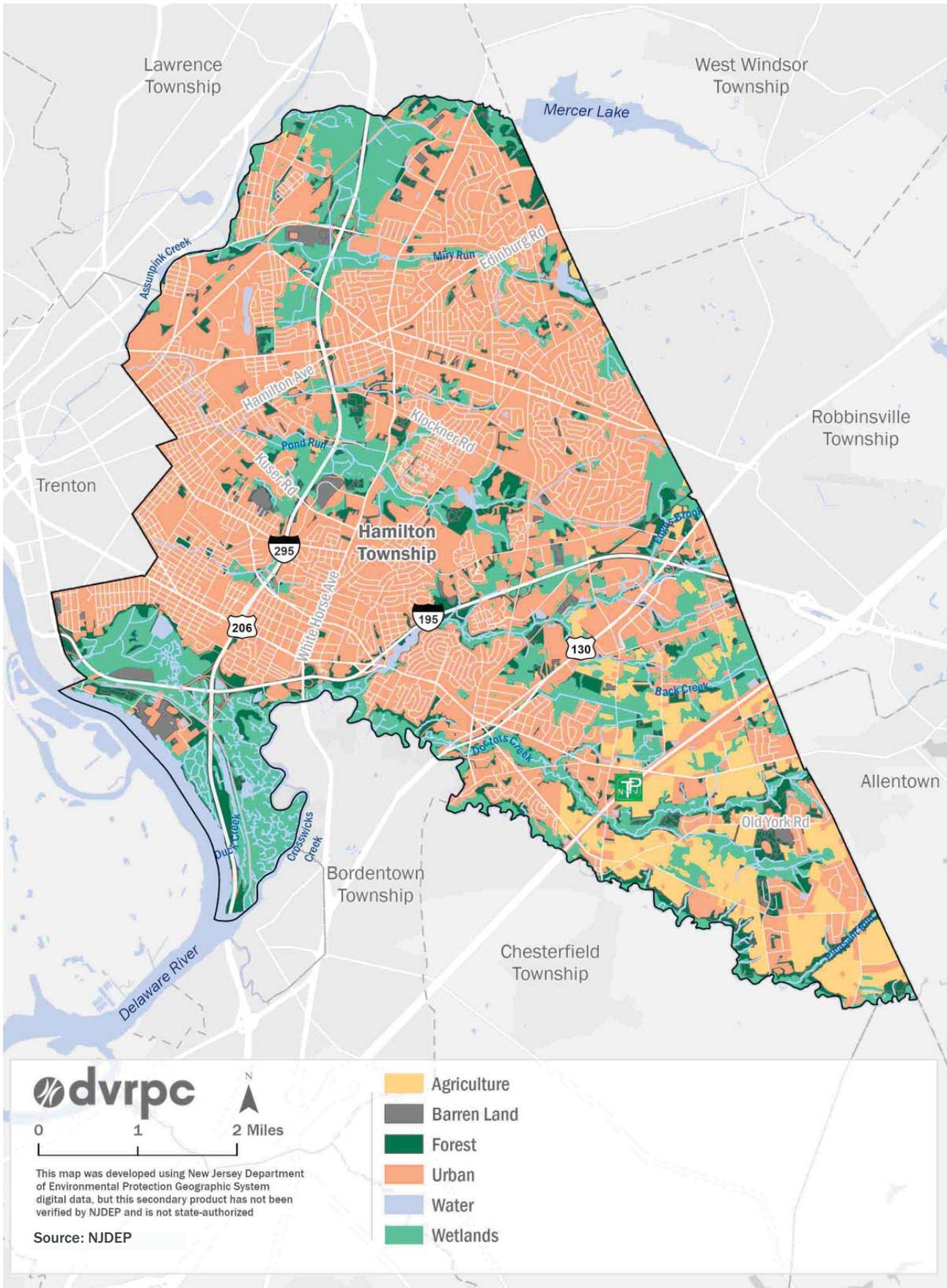
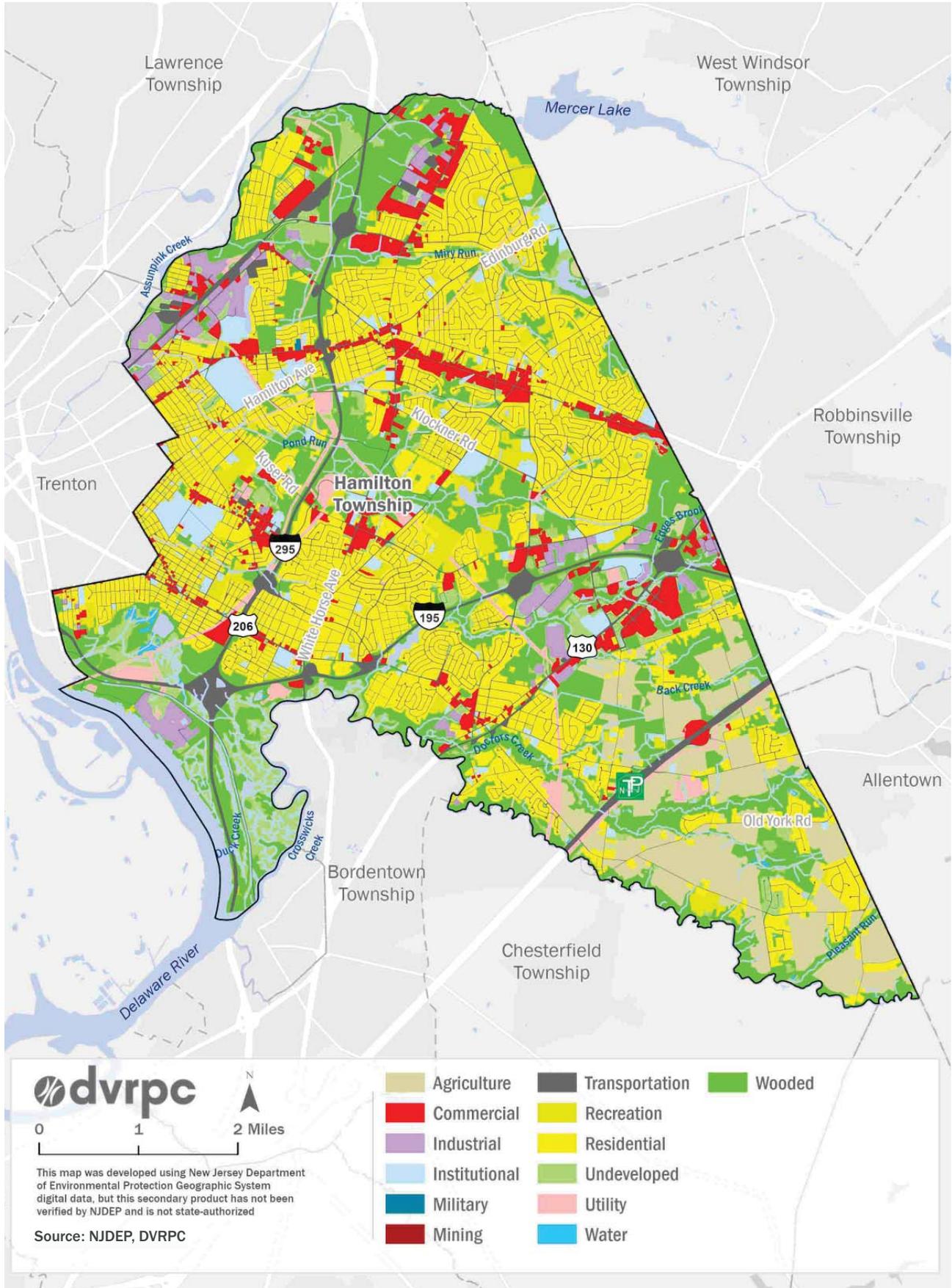


Figure 4: DVRPC Land Use (2023)





**Close up view of tree at Sayen Gardens**

Source: Mel Musie, DVRPC

## CHAPTER 4:

# Climate

Climate is a measure of long-term weather patterns and takes into account temperature, precipitation, humidity, atmospheric pressure, wind, and other meteorological variables. Geographically situated approximately halfway between the Equator and the North Pole, New Jersey’s climate is extremely variable. The state’s temperate, continental climate is influenced by airstreams that vary from hot and humid to cold and dry. From May through September, New Jersey is dominated by moist, tropical air originating in the Gulf of Mexico and carried by prevailing winds from the southwest. In winter, winds generally prevail from the northwest, bringing cold, polar air masses from subarctic Canada.

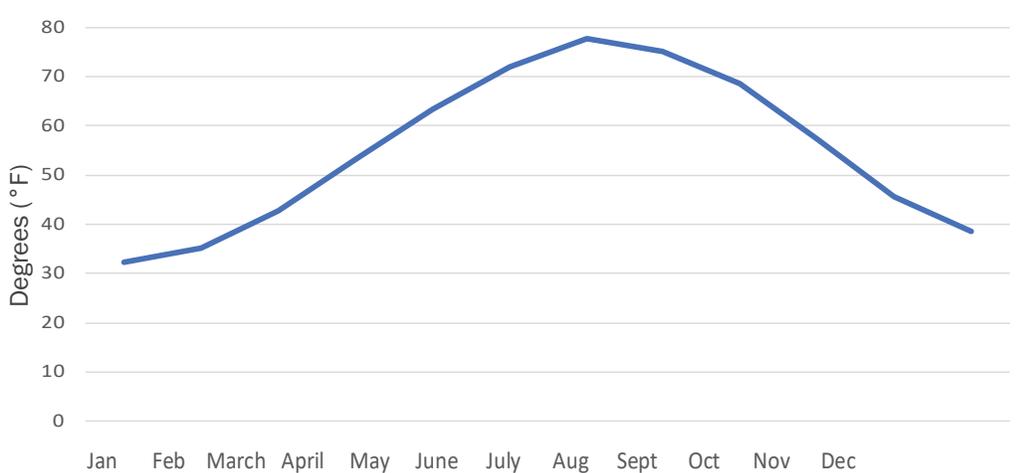
New Jersey has five distinct climate regions: Northern, Central, Southwest, Pine Barrens, and Coastal. The variation between these climate regions is due to a combination of factors, including geology, distance from the Atlantic Ocean, and prevailing atmospheric flow patterns. Hamilton Township lies within the Central Climate Zone, which stretches from New York Harbor to the great bend of the Delaware River near Trenton. There are about 15 to 20 days in the Central Climate Zone that reach above 90°F. The many paved surfaces and buildings of the region affect local temperatures by retaining more heat. This causes nighttime temperatures to generally be warmer than surrounding rural areas. This phenomenon is known as the “heat island effect.”

A number of weather and climate observation stations are located near Hamilton Township. The National Centers for Environmental Information (NCEI), formerly the National Climate Data Center (NCDC), of the National Oceanic and Atmospheric Administration publishes climate data on the NCEI website. The historic climate data shown below comes from both the Trenton Mercer Airport station and the Hamilton 2.3 station in the northeastern part of the township.

### Temperature

Based on the data collected at the Trenton Mercer Airport station, the mean annual temperature in the area between 2010 and 2022 was 55.3°F. January was the coldest month, with an average temperature of 32.4°F, and July was the hottest month, with a mean temperature of 77.7°F, as seen in **Figure 5: Average Monthly Temperature (2010–2022)**.

Figure 5: Average Monthly Temperature (2010–2022)

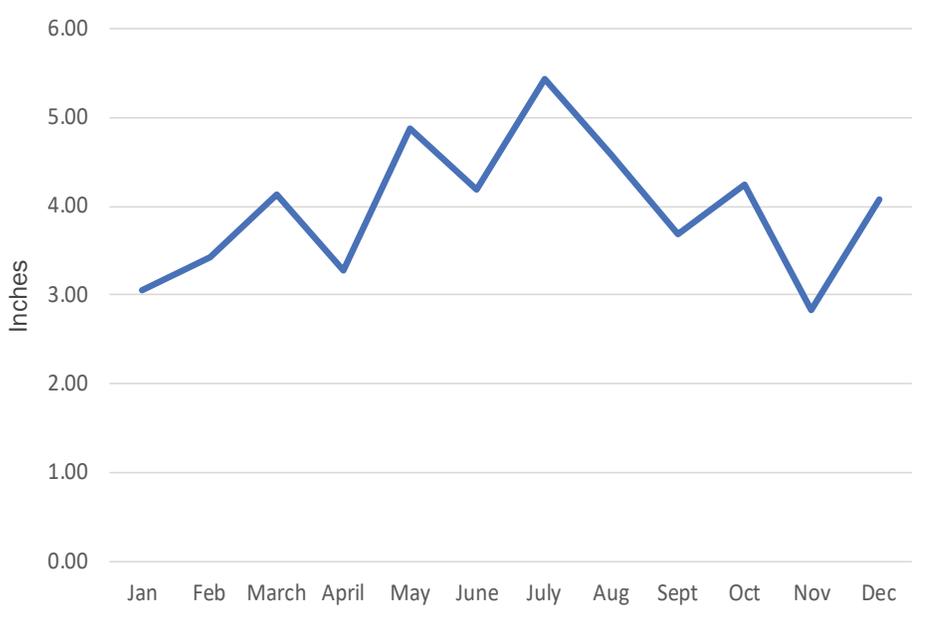


Source: NCEI (2022)

## Precipitation

Based on data recorded at the Hamilton 2.3 station, Hamilton receives an average of 47.78 inches of rain each year. As shown in **Figure 6: Average Monthly Precipitation (2010–2022)** below, July is the rainiest month, with an average monthly precipitation of 5.43 inches, and November is the driest month with an average of 2.84 inches. The statewide annual average precipitation between 2010–2022 was 48.64 inches.

**Figure 6: Average Monthly Precipitation (2010–2022)**



Source: NCEI (2022)

## Snowfall

Snowfall typically occurs in New Jersey when moist air from the south converges with cold air from the north. During the winter, the northern edge of the Central Climate Zone is considered to be the boundary between freezing and nonfreezing precipitation. In Hamilton Township, snowfall may occur from November to mid-April, but is most likely to occur from December to March. The average monthly snowfall is greatest in February, with a mean of 15.56 inches. Between 2010 and 2022, Hamilton received an average of 21.8 inches of snow per seasonal (November through April).

## Severe Weather

Severe storm events, including thunderstorms, tropical storms, hurricanes, blizzards, ice storms, hail storms, and tornadoes, occur in Mercer County with varying frequency. Tornadoes are infrequent, and only about five generally weak tornadoes occur in New Jersey each year. Most areas in the state experience about 25 to 30 thunderstorms a year, although they strike inland areas like Hamilton Township more often than coastal areas. According to the 2021 Mercer County Hazard Mitigation Plan, between 1954 and 2021, Mercer County has been included in six emergency declarations for hurricane and tropical-storm related events. In recent history, two hurricanes have caused significant damage in Hamilton Township. The most recent was Hurricane Sandy in 2012 and before that was Hurricane Irene in 2011.

While not climate related, earthquakes are another natural hazard. They are very infrequent and very small on average in New Jersey. In April of 2024, Tewksbury Township was the epicenter of an earthquake with a magnitude of 4.8, and it was felt across the whole state. Cumberland and Union counties are the only two counties in New Jersey not to have been at the epicenter of an earthquake in recorded state history.

## Growing Seasons

Hamilton Township is located within the U.S. Department of Agriculture (USDA) Plant Hardiness Zone 7A. Hardiness Zones are based on average annual minimum temperatures. The Hardiness Zones are helpful in indicating which plant species are able to survive in each area. There are 13 hardiness zones, with Zone 1 being the coldest and Zone 13 the warmest. The annual minimum temperatures of Zone 7A are typically between 0°F and 5°F.

Hamilton Township's agricultural growing season is approximately six months, or 219 days, from early April through early November. The growing season is generally defined as the period between the last spring frost and the first autumn frost. However, the harvest of grain crops typically continues throughout November, and winter crops, such as broccoli, cauliflower, and cabbage, are grown until the first hard freeze, usually in early January. On average, the last spring frost occurs in New Jersey on April 4th and the average first frost is November 10th. The frost-free growing season in Hamilton Township is about 60 days longer than in northern New Jersey, where frosts generally end in May and begin in October.



**Stream at Sayen Gardens**

Source: Mel Musie, DVRPC



**View of Martin's Lake, Veterans Park**

Source: Rob Poppert, Hamilton Township

# Physiography and Geology

## Physiography

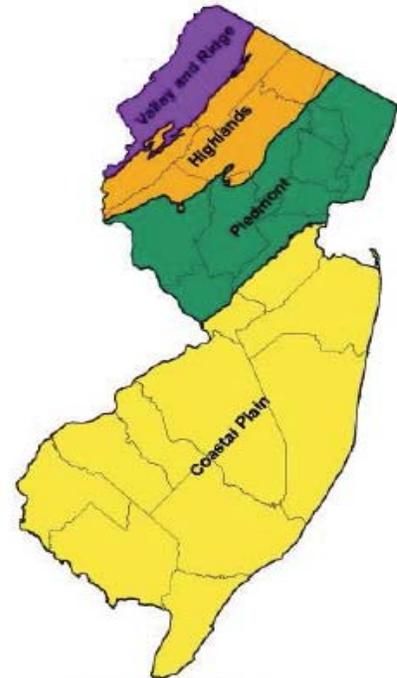
Physiography is the study of a location in relation to its underlying geology. New Jersey is characterized by four main physiographic provinces as shown in **Figure 7: Physiographic Provinces of New Jersey (2024)** to the right. The provinces include the Valley and Ridge, the Highlands, the Piedmont Plateau, and the Coastal Plain. The Coastal Plain Province is further divided into the Inner and Outer Coastal Plains. The terrain of the four provinces is very diverse, with the rocky terrain of the northern provinces at one extreme and the sands of the coast at the other.

Hamilton Township is located mostly within the Inner Coastal Plain, although the northwestern portion lies within the Piedmont Plateau. The fall line of the Coastal Plain and the Piedmont Plateau crosses Hamilton Township diagonally from west to northeast. The fall line is the point of contact where the hard-crystalline rocks of the Piedmont dip under and disappear beneath the sediments of the Coastal Plain. The Piedmont is underlain by 200-million-year-old sedimentary rocks, with igneous rocks forming rocky ridges and outcrops. The Inner Coastal Plain is underlain by sands and gravels that are about 135 to 65 million years old.

The **Coastal Plain** landscape extends from Massachusetts to Texas and generally consists of unconsolidated sands, silts, and clays. As these sediments are prone to erosion, the Coastal Plain is generally characterized by regions of low topography. In New Jersey, the Inner Coastal Plain is made up of interbedded sand and clay. Deposits originating in the breakdown of Appalachian and Catskill sedimentary, metamorphic, and igneous rocks are interbedded with layers formed by oceanic (marine) deposition, which occurred as the ocean shoreline advanced and receded over geologic time. The **Inner Coastal Plain** layers date from the Cretaceous Period, 135 to 65 million years ago. Generally, soils of the Inner Coastal Plain are quite fertile and the topography of the area is mostly flat and low-lying. The Outer Coastal Plain was formed more recently than the Inner Coastal Plain. It was laid down by the ocean and developed during the mid-to-late part of the Cenozoic Era, 65 million years ago to the present. The Outer Coastal Plain soils are sandier and less fertile than those of the Inner Plain. The soils in the Outer Coastal Plain do not hold water as well.

The **Piedmont Plateau** extends from Massachusetts to Georgia. The Piedmont is characterized by slightly folded and faulted Triassic and Jurassic sedimentary rock, and igneous rocks of the Jurassic age. This folding and faulting created the rolling plains of the piedmont, while the igneous intrusions created the mountainous ridges that characterize the province. At the southern edge of the province, small bands of highly metamorphosed rocks from the Middle Proterozoic to Cambrian can be found. The Piedmont Plateau in New Jersey occupies nearly 1,500 square miles, or one-fifth of the state's total land area. It is primarily composed of sandstone, shale, and argillite. Generally, the rocks in this area are more susceptible to erosion than the rocks to the north in the Highlands physiographic province. The soils of the Piedmont Plateau are rich and well-watered and the topography is gently rolling, with hills and valleys lying at elevations between 100 and 400 feet. The region consists of primarily clayey, moderately fertile soils, and historically produced fruits, vegetables, and livestock in the northern portions of New Jersey.

Figure 7: Physiographic Provinces of New Jersey (2024)



Source: NJDEP

## Geologic Formations

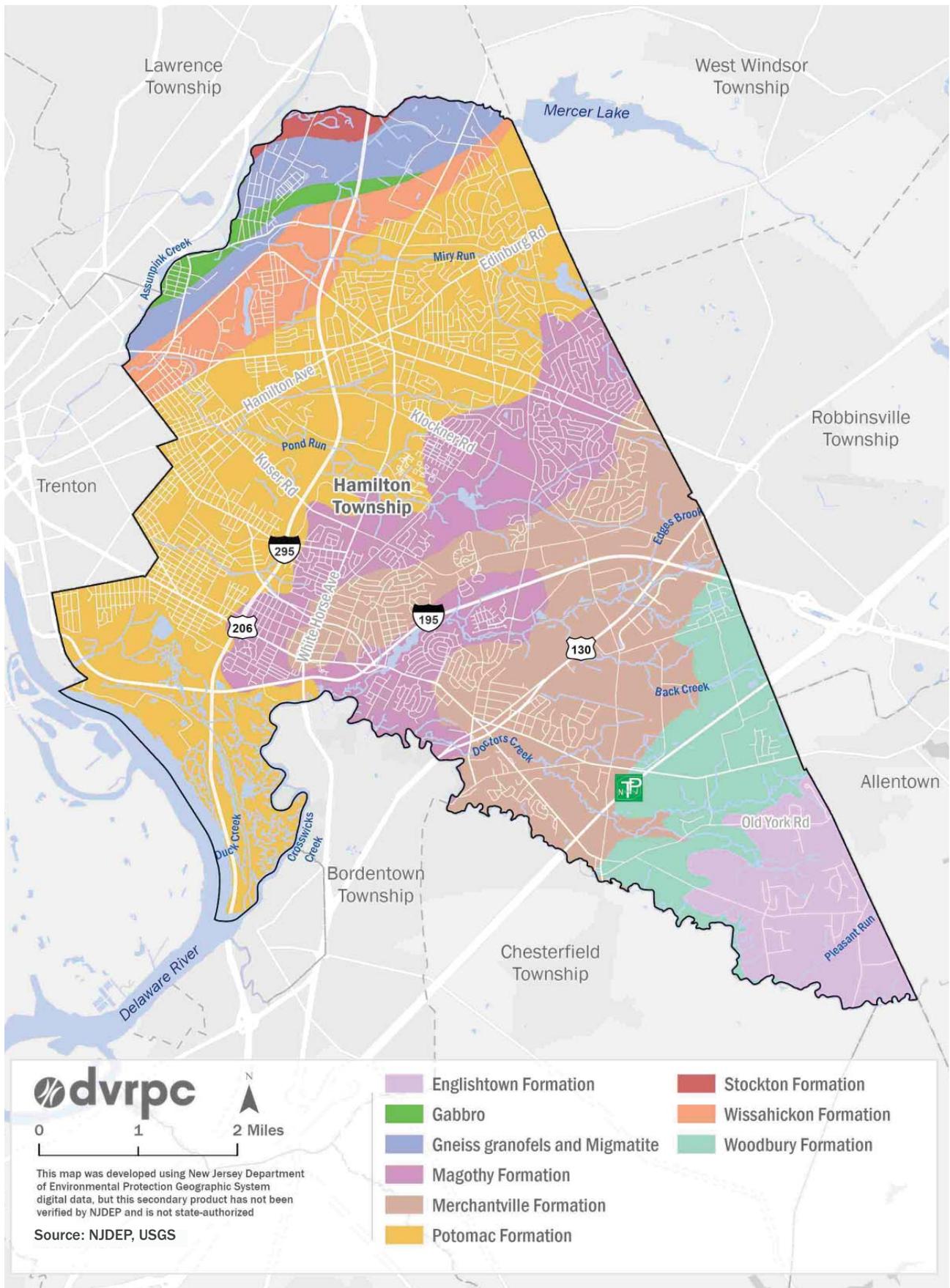
Lying beneath Hamilton Township are eight geologic formations that run roughly southwest to northeast and extend beyond the borders of the township and are shown in **Figure 8: Geologic Formations (2023) on page 25**. The geology underneath the township is also described in **Table 5: Geologic Formations in Hamilton Township (2023)**, where the geologic formations are organized from the most recently formed (top of table) to the oldest (bottom of table). Aquifers containing groundwater that supports the region’s industries, businesses, and residents are located between these geological formations and are discussed in the Groundwater section.

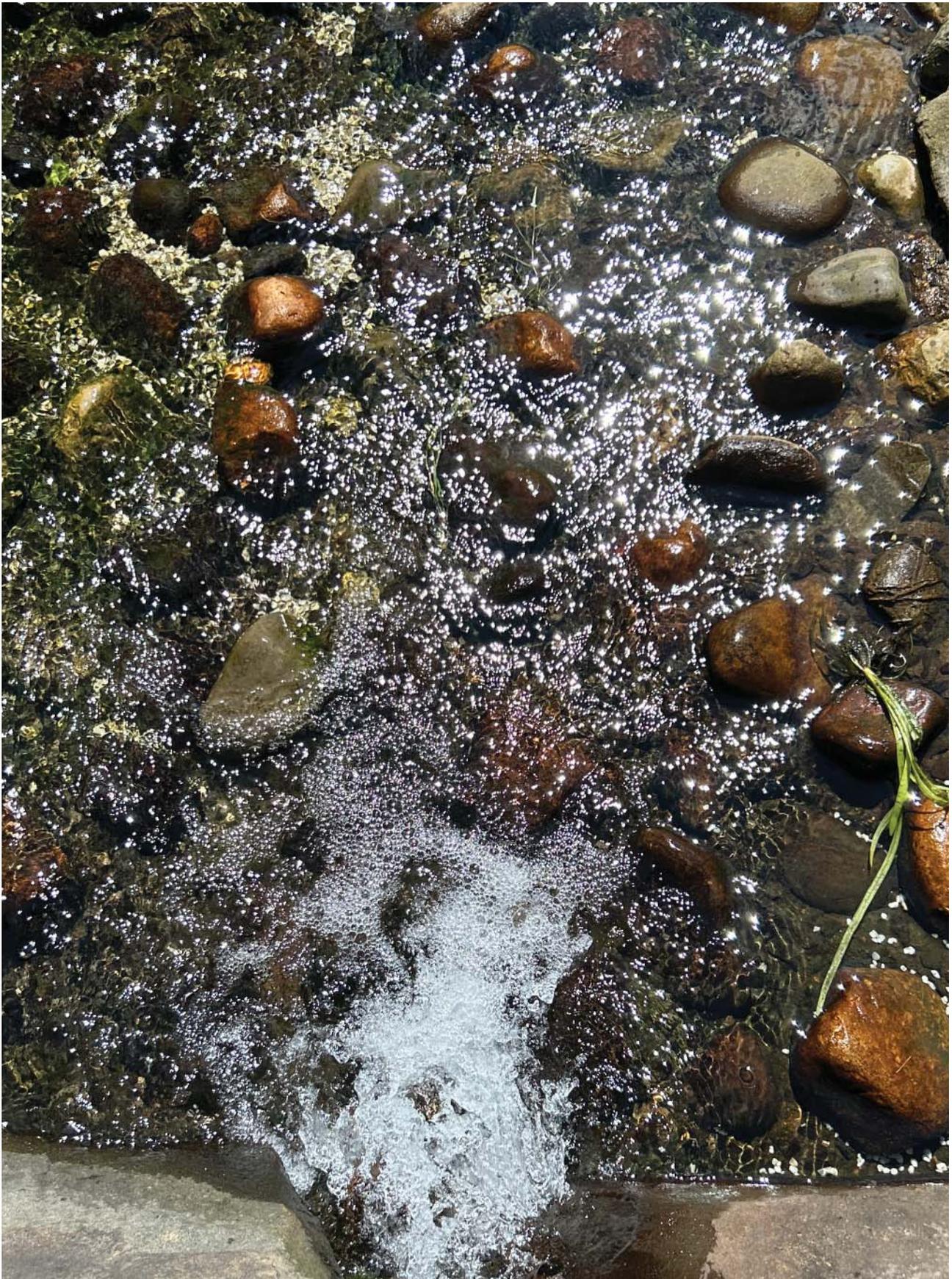
**Table 5: Geologic Formations in Hamilton Township (2023)**

Geologic Name	Lithology	Geologic Age
<b>Englishtown Formation</b>	Quartz sand, medium- to dark-gray, fine- to coarse-grained, gravelly, cross-bedded, locally with dark-gray clay beds. Abundant carbonaceous matter, especially in clay.	Upper Cretaceous
<b>Woodbury Formation</b>	Clay-silt, dark-gray, micaceous, locally quartz or glauconite laminae.	Upper Cretaceous
<b>Merchantville Formation</b>	Glauconite sand, very clayey and silty, grayish-olive-green to dark-greenish-gray; locally abundant quartz.	Upper Cretaceous
<b>Magothy Formation</b>	Quartz sand, white, fine- to coarse-grained, locally gravelly; thin interbedded dark-gray clay or clay-silt in upper part. Wood fragments in clay.	Upper Cretaceous
<b>Potomac Formation</b>	Sand, light-colored, fine- to coarse-grained; local gravel, cross-bedded. Interbedded with white or variegated red and yellow massive clay.	Upper Cretaceous
<b>Wissahickon Formation</b>	Mica Schist and gneiss, Medium- to coarse-grained, foliated, gray to pinkish-gray.	Lower Cambrian and/or Neoproterozoic?
<b>Gneiss, granofels and migmatite</b>	Includes various gneiss and schist. Buff, tan, light-gray, greenish-gray, or pinkish-white, medium- to coarse-grained.	Mesoproterozoic?
<b>Metagabbro and rocks of intermediate composition</b>	Metamorphosed gabbro and/or diorite and andesite, medium-grained, medium-gray to very dark greenish-gray.	Mesoproterozoic

Source: NJDEP, Bedrock Geologic Map of New Jersey (2023)

Figure 8: Geologic Formations (2023)





**Stream located in Sayen Gardens**

Source: Mel Musie, DVRPC

## CHAPTER 6:

# Soils

Soil is the foundation for all land uses. Soil types vary in their physical, chemical, and biological properties, influencing the vegetation. Soil properties also affect the location of wells and septic facilities, often determining development potential in certain areas. Soil is a natural resource that cannot be replenished in the human time scale.

Data on soil types derives from surveys conducted by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). The Soil Testing Laboratory at the Rutgers New Jersey Agricultural Experiment Station tests soil properties for residents throughout New Jersey. The Cooperative Extension of Mercer County sells soil testing kits.

Hamilton Township soils consist of 30 series types and 55 variations within those series (excluding water), as identified by NRCS. All soil types in the township are listed in **Table 6: Soils (2024)** and shown on **Figure 9: Soils (2024) on page 34**. **Table 6** also provides basic information on the soils' suitability for development, agricultural value, and hydric classification.

Over half of all soils in Hamilton Township are considered hydric soils. Hydric soils, as defined by the NRCS, are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic (oxygen-free) conditions in their subsurface. These soils have unique soil properties and are an important element of wetland areas. If a soil is classified as "hydric," land use may be restricted due to the relationship of hydric soils to the definition of wetlands and to laws regarding wetland preservation. Hydric soils can qualify as soils of prime and statewide importance when the limitations are overcome by measures such as drainage or flood control.

**Table 6: Soils (2024)**

Soil Key	Soil Name	Farm Class	Acres	Percent of All Soils	Hydric Soils	Development Capability		
						Buildings Without Basements	Buildings With Basements	Small Commercial
<b>AugmB</b>	Aura sandy loam, moderately firm, 2 to 5 percent slopes	P-1	444.82	1.73%	Y	A	A	B
<b>AugmC</b>	Aura sandy loam, moderately firm, 5 to 10 percent slopes	S-1	27.57	0.11%	Y	A	A	C
<b>BHSGB</b>	Birdsboro gravelly solum variant soils, 0 to 6 percent slopes	L-1	124.55	0.48%	N	A	A	A
<b>ComC</b>	Collington fine sandy loam, 5 to 10 percent slopes	S-1	0.04	0.00%	N	A	A	B
<b>DohgB</b>	Downer fine sandy loam, gravelly clay loam substratum, 0 to 5 percent	P-1	161.16	0.63%	N	A	A	A

Soil Key	Soil Name	Farm Class	Acres	Percent of All Soils	Hydric Soils	Development Capability		
						Buildings Without Basements	Buildings With Basements	Small Commercial
EkaAr	Elkton loam, 0 to 2 percent slopes, rarely flooded	S-1	15.75	0.06%	Y	C	C	C
EkbA	Elkton silt loam, 0 to 2 percent slopes	S-1	524.41	2.04%	Y	C	C	C
EveB	Evesboro sand, 0 to 5 percent slopes	NPF	0.11	0.00%	Y	A	A	A
EvgB	Evesboro loamy sand, 0 to 5 percent slopes	L-1	758.42	2.95%	N	A	A	A
EVXB	Evesboro variant soils, 0 to 5 percent slopes	NPF	488.78	1.90%	N	A	A	A
FamA	Fallsington sandy loam, 0 to 2 percent slopes	S-1	411.44	1.60%	Y	C	C	C
FapA	Fallsington loam, 0 to 2 percent slopes	S-1	8.28	0.03%	Y	C	C	C
FmhAt	Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded	NPF	589.19	2.29%	Y	C	C	C
FmhAv	Fluvaquents, 0 to 3 percent slopes, very frequently flooded	NPF	388.65	1.51%	Y	C	C	C
FodB	Fort Mott loamy sand, 0 to 5 percent slopes	S-1	267.15	1.04%	N	A	A	A
FodC	Fort Mott loamy sand, 5 to 10 percent slopes	NPF	29.94	0.12%	N	A	A	A
FrkB	Freehold sandy loam, 2 to 5 percent slopes	P-1	17.41	0.07%	Y	C	C	C
FrkE2	Freehold sandy loam, 15 to 25 percent slopes	NPF	1.86	0.01%	N	A	A	A
GadB	Galestown loamy sand, 0 to 5 percent slopes	U-1	1,153.03	4.48%	N	A	A	A
GASB	Galloway variant soils, 0 to 5 percent slopes	S-1	523.20	2.03%	N	C	A	A
GKAWOB	Glassboro and Woodstown sandy loams, 0 to 5 percent slopes	P-1	1,214.07	4.72%	Y	C	C	C
HumAt	Humaquepts, 0 to 3 percent slopes, frequently flooded	NPF	39.66	0.15%	Y	C	C	C
KeoE	Keypoint loam, 15 to 25 percent slopes	NPF	0.45	0.00%	N	C	C	C
LenB	Lenoir-Keypoint silt loams, 0 to 5 percent slopes	S-1	446.79	1.74%	Y	C	B	B

Soil Key	Soil Name	Farm Class	Acres	Percent of All Soils	Hydric Soils	Development Capability		
						Buildings Without Basements	Buildings With Basements	Small Commercial
<b>MbaAt</b>	Marsh, fresh water, 0 to 2 percent slopes, frequently flooded	NPF	1,687.07	6.56%	N	Not Rated	Not Rated	Not Rated
<b>MbpA</b>	Matapeake loam, 0 to 2 percent slopes	P-1	73.90	0.29%	N	A	A	A
<b>MbpB</b>	Matapeake loam, 2 to 5 percent slopes	P-1	581.01	2.26%	N	A	A	B
<b>MbpC2</b>	Matapeake loam, 5 to 10 percent slopes, eroded	S-1	14.92	0.06%	N	A	A	C
<b>MBYB</b>	Mattapex and Bertie loams, 0 to 5 percent slopes	S-1	1,338.66	5.20%	Y	C	A	A
<b>OthA</b>	Othello silt loam, 0 to 2 percent slopes	S-1	1,547.38	6.01%	Y	C	C	C
<b>PHG</b>	Pits, sand and gravel	NPF	158.39	0.62%	N	Not Rated	Not Rated	Not Rated
<b>PmmA</b>	Plummer sandy loam, 0 to 2 percent slopes	S-1	530.38	2.06%	Y	C	C	C
<b>PmmwA</b>	Plummer sandy loam, very wet, 0 to 2 percent slopes	NPF	840.21	3.27%	Y	C	C	C
<b>PortA</b>	Portsmouth variant silt loam, 0 to 2 percent slopes	S-1	206.61	0.80%	Y	C	C	C
<b>SaaD</b>	Sandy and silty land, strongly sloping	NPF	139.30	0.54%	N	B	C	C
<b>SaaE</b>	Sandy and silty land, steep	NPF	330.92	1.29%	N	C	B	C
<b>SacA</b>	Sassafras sandy loam, 0 to 2 percent slopes	P-1	48.38	0.19%	Y	A	A	B
<b>SacB</b>	Sassafras sandy loam, 2 to 5 percent slopes	P-1	2,439.05	9.48%	Y	A	A	A
<b>SacC</b>	Sassafras sandy loam, 5 to 10 percent slopes	S-1	614.57	2.39%	Y	A	A	C
<b>SacC2</b>	Sassafras sandy loam, 5 to 10 percent slopes, eroded	S-1	448.17	1.74%	N	A	A	A
<b>SacE</b>	Sassafras sandy loam, 15 to 25 percent slopes	NPF	12.66	0.05%	N	A	C	C
<b>SadB</b>	Sassafras gravelly sandy loam, 2 to 5 percent slopes	P-1	245.94	0.96%	Y	A	A	B
<b>SafA</b>	Sassafras loam, 0 to 2 percent slopes	P-1	5.99	0.02%	Y	A	A	C

Soil Key	Soil Name	Farm Class	Acres	Percent of All Soils	Hydric Soils	Development Capability		
						Buildings Without Basements	Buildings With Basements	Small Commercial
SagC3	Sassafras sandy clay loam, 5 to 10 percent slopes, severely eroded	NPF	104.40	0.41%	N	A	A	C
SaoB	Sassafras-Woodstown sandy loams, 2 to 5 percent slopes	P-1	203.18	0.79%	N	A	A	B
ThgB	Tinton loamy sand, 0 to 5 percent slopes	S-1	544.07	2.11%	N	A	A	A
UddcB	Udorthents, dredged coarse materials, 0 to 8 percent slopes	NPF	528.70	2.06%	N	A	A	B
UdgB	Udorthents, gravelly substratum, 0 to 8 percent slopes	NPF	1,445.99	5.62%	N	A	A	B
UdstB	Udorthents, stratified substratum, 0 to 8 percent slopes	NPF	1,229.21	4.78%	N	A	A	B
UR	Urban land	NPF	1.14	0.00%	N	Not Rated	Not Rated	Not Rated
USGALB	Urban land-Galestown complex, 0 to 5 percent slopes	NPF	1,043.81	4.06%	N	Not Rated	Not Rated	Not Rated
USSASB	Urban land-Sassafras complex, 0 to 5 percent slopes	NPF	613.56	2.38%	N	Not Rated	Not Rated	Not Rated
WATER	Water	NPF	517.61	2.01%	N	Not Rated	Not Rated	Not Rated
WoeB	Woodstown sandy loam, 2 to 5 percent slopes	P-1	0.08	0.00%	Y	C	B	B
WogA	Woodstown loam, 0 to 2 percent slopes	P-1	10.00	0.04%	Y	C	B	B
WomfB	Woodstown-Fallsington sandy loams, 0 to 5 percent slopes	S-1	584.83	2.27%	Y	B	A	B
<b>Total</b>			<b>25,7625.85</b>					

Source: USGS Web Soil Survey Tool (2024)

Key for Farm Class	
P-1	Prime Farmland
L-1	Farmland of Local Importance
S-1	Farmland of State Importance
U-1	Farmland of Unique Importance
NPF	Not Prime Farmland

Key for Development Capability	
A=Not Limited	Little or no limitation(s) or easily corrected by use of normal equipment and design techniques.
B=Somewhat Limited	Presence of some limitation, which normally can be overcome by careful design and management at somewhat greater cost.
C=Very Limited	Limitations that, normally, cannot be overcome without exceptional, complex, or costly measures.

## Agricultural Quality of Soils

### Prime Farmland Soils

Approximately 21 percent (5,445 acres) of all soils in the township are classified as Prime Farmland (P-1). Prime Farmlands are lands that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. They can sustain high yields of crops when managed with correct farming methods. Prime Farmlands are not excessively erodible or saturated with water for long periods of time and do not flood frequently. Prime Farmland is dispersed throughout the township, although much of this land has been converted to residential use.

The NRCS outlines specific criteria for Prime Farmland classification. For example, according to Prime and Unique Farmlands federal regulation, soil horizons (layers) within a depth of 40 inches must have a pH between 4.5 and 8.4 (mildly acidic to mildly basic). In addition, the soils must have an average temperature above 32 degrees Fahrenheit at a depth of 20 inches. The USDA outlines additional Prime Farmland requirements for mean summer soil temperature, erodibility factor, water-table depth, permeability rate, and more. Land classified as Prime Farmland does not have to be farmed, but does have to be potentially available for such use. Thus, water and urban land does not qualify as Prime Farmland.

### Farmland Soils of Statewide Importance

About 31 percent (8,054 acres) of soils are classified as Farmland Soils of Statewide Importance (S-1). These soils are close in quality to Prime Farmland and can sustain high yields of crops when correctly managed under favorable conditions. Criteria for establishing Farmland of Statewide Importance are determined by state agencies. These soils are found throughout the township; however, they are concentrated in the central and southern portions.

### Farmland Soils of Local Importance

About three percent (882 acres) of soils are classified as Farmland Soils of Local Importance (L-1). These soils are not considered to be of prime or statewide importance. Soils considered Farmland of Local Importance can produce food of high value, fiber, or horticultural crops. These soils are located across Hamilton Township.

### Farmland Soils of Unique Importance

Four percent (1,153 acres) of soils are considered to be of Farmland Soils of Unique Importance (U-1). The USDA outlines specific criteria for Soils of Unique Importance, which can support particular food or fiber crops. The criteria include temperature, humidity, air drainage, elevation, aspect, or proximity to market. In order for lands to be classified as Unique Farmland, the land must also be used for a specific high-value food or fiber and have an adequate moisture supply for that crop. These soils are mostly associated with wetlands areas and riparian corridors in Hamilton Township.

### Soils Not Rated for Agricultural Use

Approximately 40 percent (10,191.62 acres) of soils have not been rated for agricultural use by the NRCS and are therefore labeled "NPR." These soils are not considered suitable for farming due to a number of different constraints, including water saturation, soil composition, human disturbance, or slope. Soils that are not rated are not necessarily limited for agricultural use.

The breakdown of agricultural soils is listed in **Table 7: Agricultural Value for Soils (2024)** and shown in **Figure 10: Agricultural Value of Soils (2024)** on page 35.

**Table 7: Agricultural Value for Soils (2024)**

Classification	Acres	Percentage
Prime Farmland	5,445.01	21.16%
Farmland of Statewide Importance	8,054.22	31.31%
Farmland of Local Importance	882.97	3.43%
Farmland of Unique Importance	1,153.03	4.48%
Not Prime Farmland	10,191.62	39.61%
<b>Total</b>	<b>25,726.85</b>	<b>100.00%</b>

Source: USGS Web Soil Survey Tool (2024)

## Soil Series

Several soil series appear more frequently in Hamilton Township than others and are briefly described below according to the NRCS soil database.

### Sassafras Series

Sassafras is the most abundant soil series, making up 15.23 percent of township soils (3,919.16 acres). This series, which tends to be found on summits and side slopes, is located on upland areas. Sassafras soils are well drained and the seasonal high-water table tends to be greater than 72 inches. This soil series is slightly acidic. Considered Prime Farmland, Sassafras soils are mainly used for general crops, truck crops, pastures, fruits, woodland, and a wide variety of non-farming uses. These soils are highly suitable for construction, onsite effluent disposal, and recreational development. Native vegetation is mixed upland hardwoods, with some shortleaf and Virginia pine.

### Udorthents Series

The Udorthents series makes up 12.45 percent of soils (3,203.9 acres). Udorthents, smoothed, consists of areas from which soil material has been excavated, and nearby areas in which this material has been deposited. The original soil material is generally excessively drained to moderately well drained, and ranges from nearly level to very steep. Texture generally ranges from sand and gravel to fine sandy loam, but in some places, it is silt loam. In many areas, Udorthents, loamy, are used for parks, recreation fields, and buildings.

### Freshwater Marsh Series

Freshwater marsh makes up 6.56 percent (1,687 acres) of soils. Poorly drained and containing 85 percent water, freshwater marshes are water saturated and are intermittently or permanently covered by water. Slopes range from zero to two percent. Dominant vegetation includes sedges, cattails, and rushes.

### Urban Series

Urban soils make up 6.45 percent (1,658.51 acres) of soils. Urban soils are defined as soils in areas of high population density in the largely built environment. These soils can be significantly changed, human-transported materials, human-altered materials, or minimally altered or intact “native” soils. Soils in urban areas exhibit a wide variety of conditions and properties and may have impervious surfaces, such as buildings and pavement.

### Othello Series

The Othello series makes up 6.01 percent (1,547 acres) of soils. This series is generally found on lowland areas and is very shallow or poorly drained, with a water table from zero to 10 inches. The soil is strongly to extremely

acidic. The Othello series is used for woodland and cropland, and it is considered a soil of Statewide Importance when drained. The dominant vegetation, where cultivated, is corn and soybeans, along with acreages of pasture or truck crops. Where wooded, the dominant vegetation is wetland hardwoods, mostly sweetgum, black gum, red maple, wetland oaks, loblolly pine, and pond pine.

### **Plummer Series**

The Plummer Series makes up 5.35 percent (1,370 acres) of soils. They are generally found in coastal plains areas and are poorly or very poorly drained, with a water table from zero to 10 inches. The soil is strongly to extremely acidic. Where wooded, the dominant vegetation is mixed stands of slash, loblolly, and longleaf pines with swamp tulips and bald cypress. These soils are concentrated in the Great Bear Swamp.



**Wildlife Habitat Incentive Program Area, Veterans Park**

Source: Rob Poppert, Hamilton Township

Figure 9: Soils (2024)

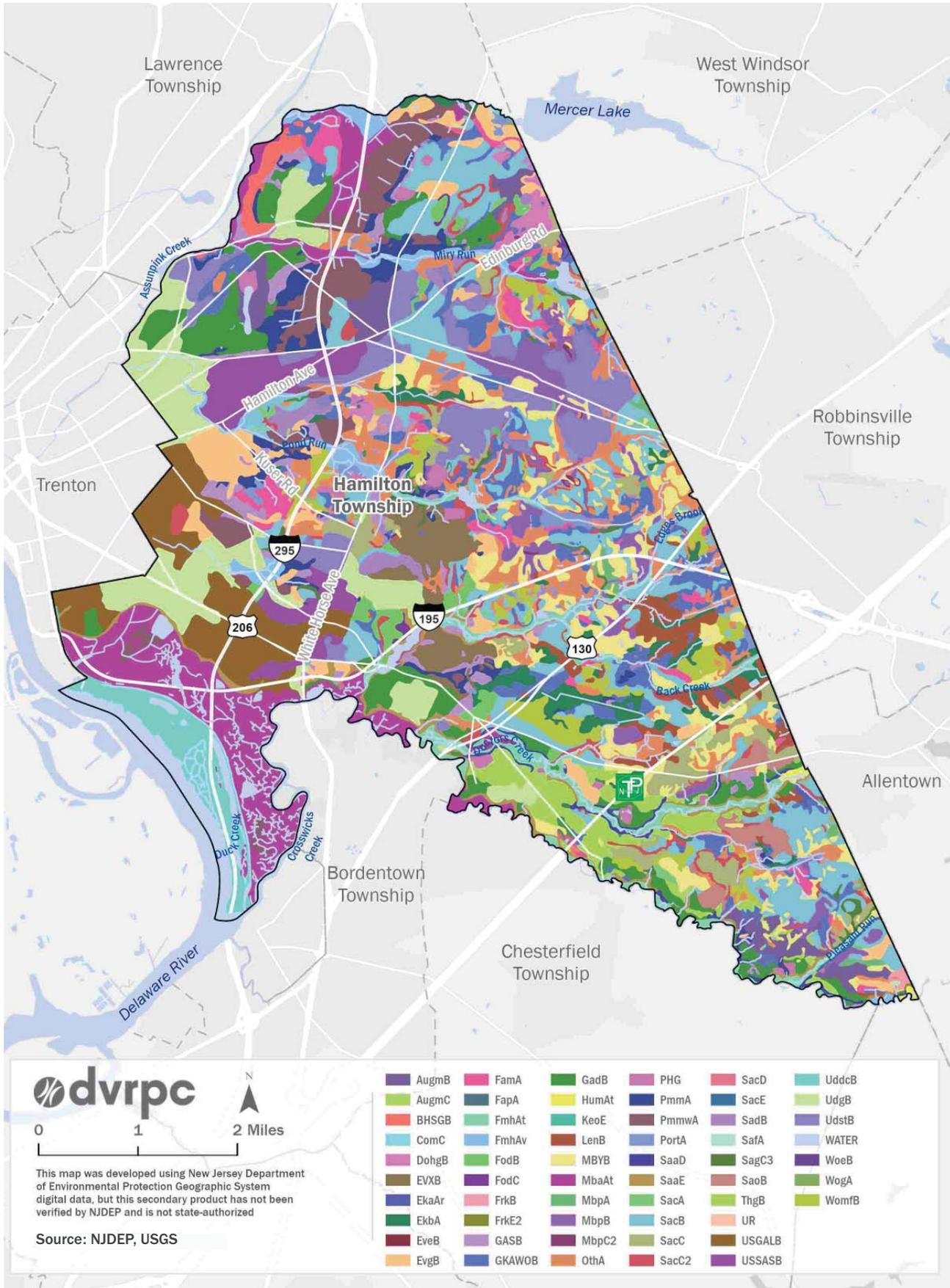
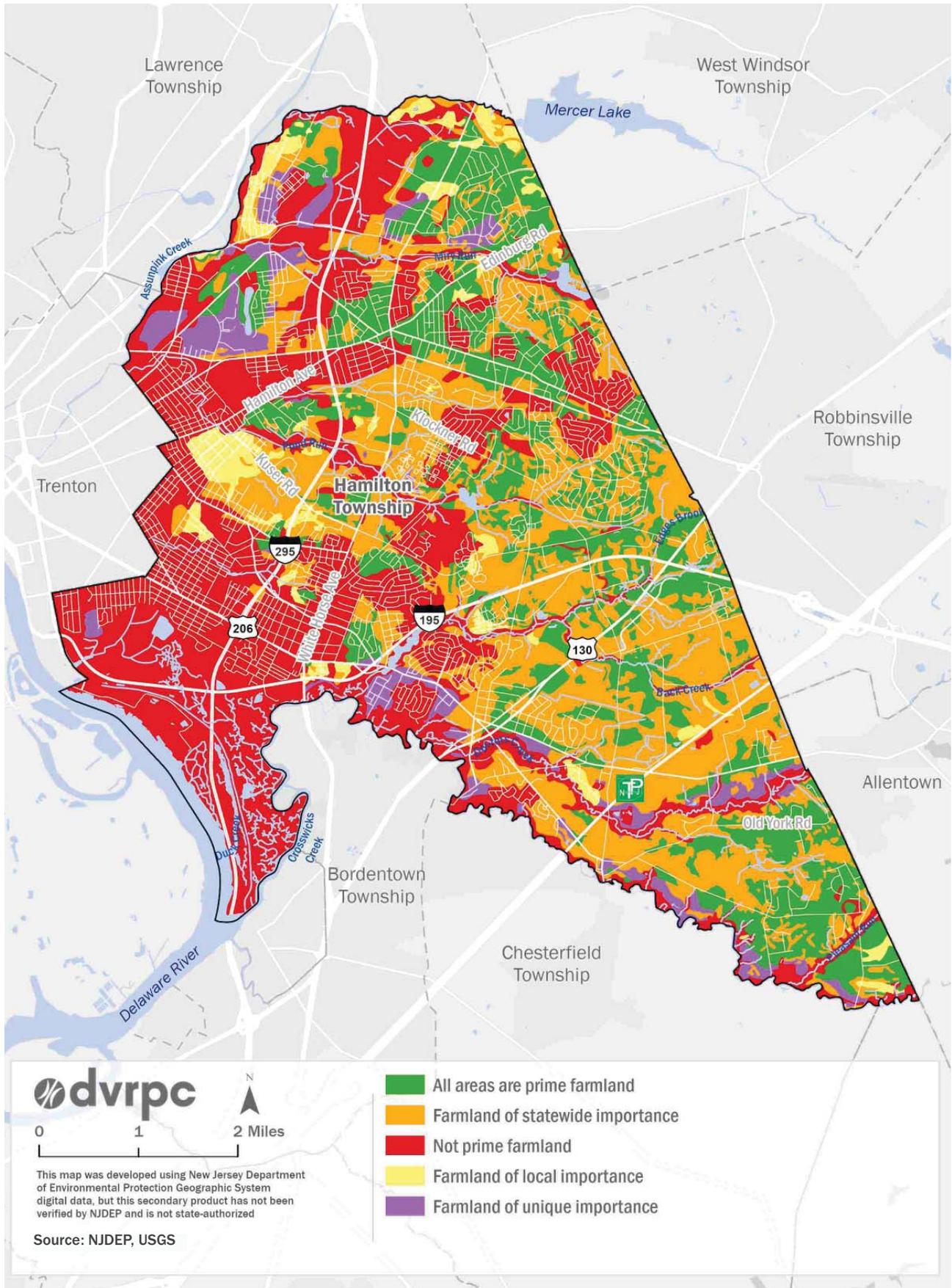


Figure 10: Agricultural Value of Soils (2024)





**Bike Signage in Hamilton Township**

Source: Rob Poppert, Hamilton Township

# Topography and Surface Landscapes

Topography relates to the surface terrain and features of an area. The vast majority of Hamilton Township is generally flat, which is typical of areas in the Inner Coastal Plain. Low ridges and elevations delineate the boundaries of watersheds (see **Watersheds on page 41** for more information). The lowest elevation in Hamilton Township, zero feet above sea level, is located in the western portion of the township along the Delaware River. The highest elevation in the township is 116 feet, which can be found in eastern Hamilton Township north of the U.S. Route 33 and south of Miry Run. More details of Hamilton’s topography are visible in **Figure 11: Elevation (2024) on page 38**.

## Slope

Slope is measured as the percentage of vertical rise to horizontal distance. The majority of Hamilton Township has slopes of less than 10 percent, and steeper slopes are predominantly located in the southern portion of the township. The steepest slopes in the township are located to the east of the Abbott Marshlands, as well as alongside Gropp Lake, Crosswicks Creek, Back Creek, and Doctors Creek. Most of the steep slopes in the township are well vegetated, with a dense forest cover dominated by deciduous trees. Hamilton Township’s steep slopes are detailed in **Table 8: Slopes (2018)** below and depicted on **Figure 12: Slope (2024) on page 39**. In general, development of areas with steep slopes is inadvisable, as it is likely to result in soil instability, erosion, sedimentation of streams, increased stormwater runoff, and increased flooding. These effects are responsible for habitat destruction, water pollution, and potential damage to property. Erosion on steep slopes is especially prevalent where excessive tree removal has taken place.

On steep slopes bordering creeks and streams, it is not unusual to see trees that have fallen into the gully’s or into the streams themselves. In some places, the rate of tree loss is accelerated beyond natural rates by erosion from flash flooding, which is often caused by increases in impervious surface upstream. However, trees on steep slopes fall for other reasons as well, including age, severe storms (especially if their roots have been exposed from erosion), and heat and water loss, which dries the soil. Where steep slopes remain forested, some very old trees can often be found. No detailed inventory of these sites exists at present, although some of Hamilton Township’s rare plant species may inhabit these areas.

Hamilton Township has a steep slope ordinance to protect these features. The ordinance defines steep slopes as any slope equal to or greater than 15 percent, as measured over a minimum run of ten feet. Disturbances of steep slope areas is prohibited; however as indicated on **Table 8: Slopes (2018)**, this steep slope area comprises just over 1,700 acres, or 6.6 percent of the township.

**Table 8: Slopes (2018)**

Slope (Percent Rise)	Acreage	Percentage
0%-5%	16,986	66.04%
5.01%-10%	5,606	21.80%
10.01%-15%	1,426	5.54%
15.01% and above	1,701	6.61%
<b>Total</b>	<b>25,719</b>	<b>100.00%</b>

Source: NJDEP (2018)

Figure 11: Elevation (2024)

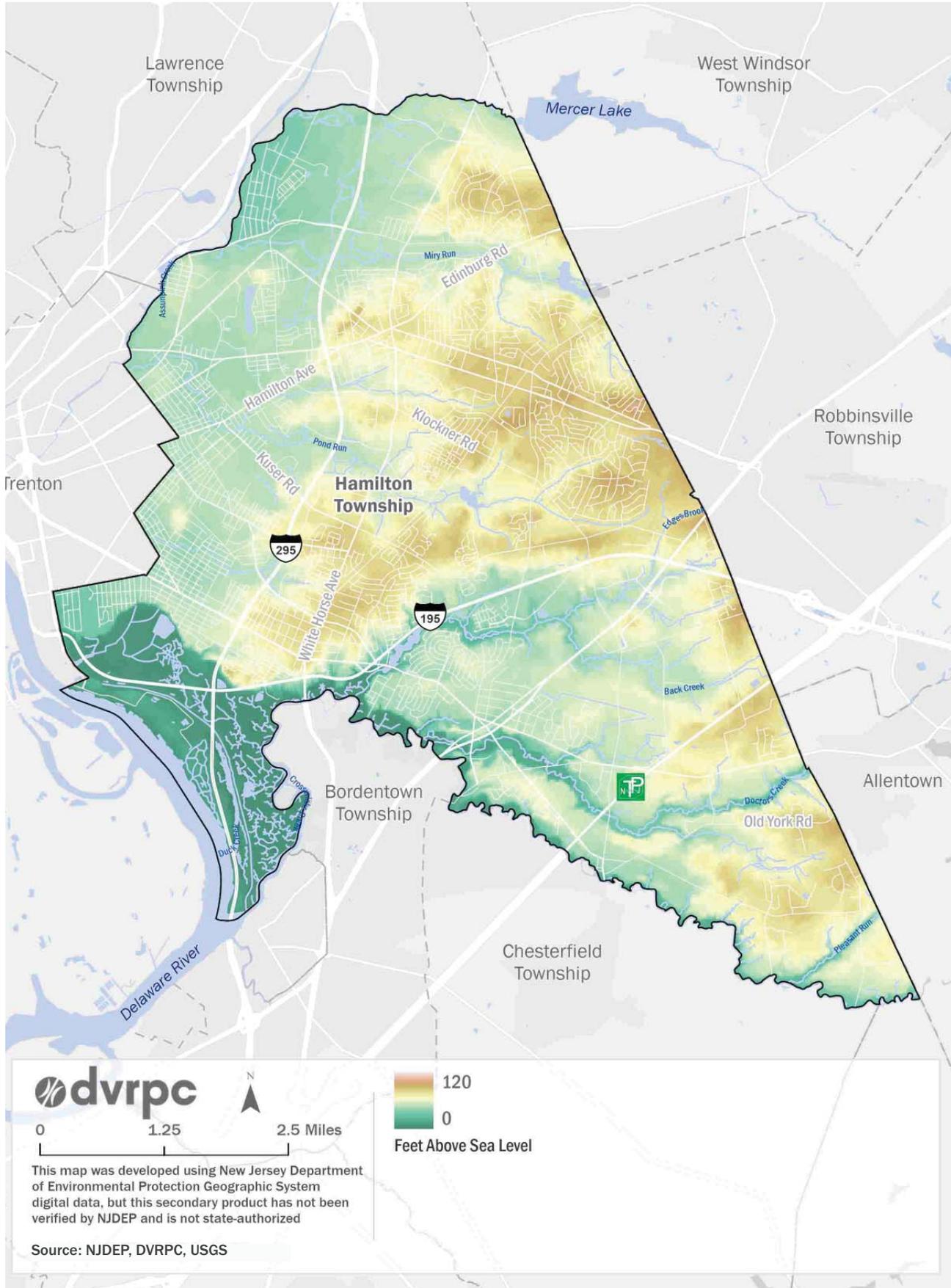
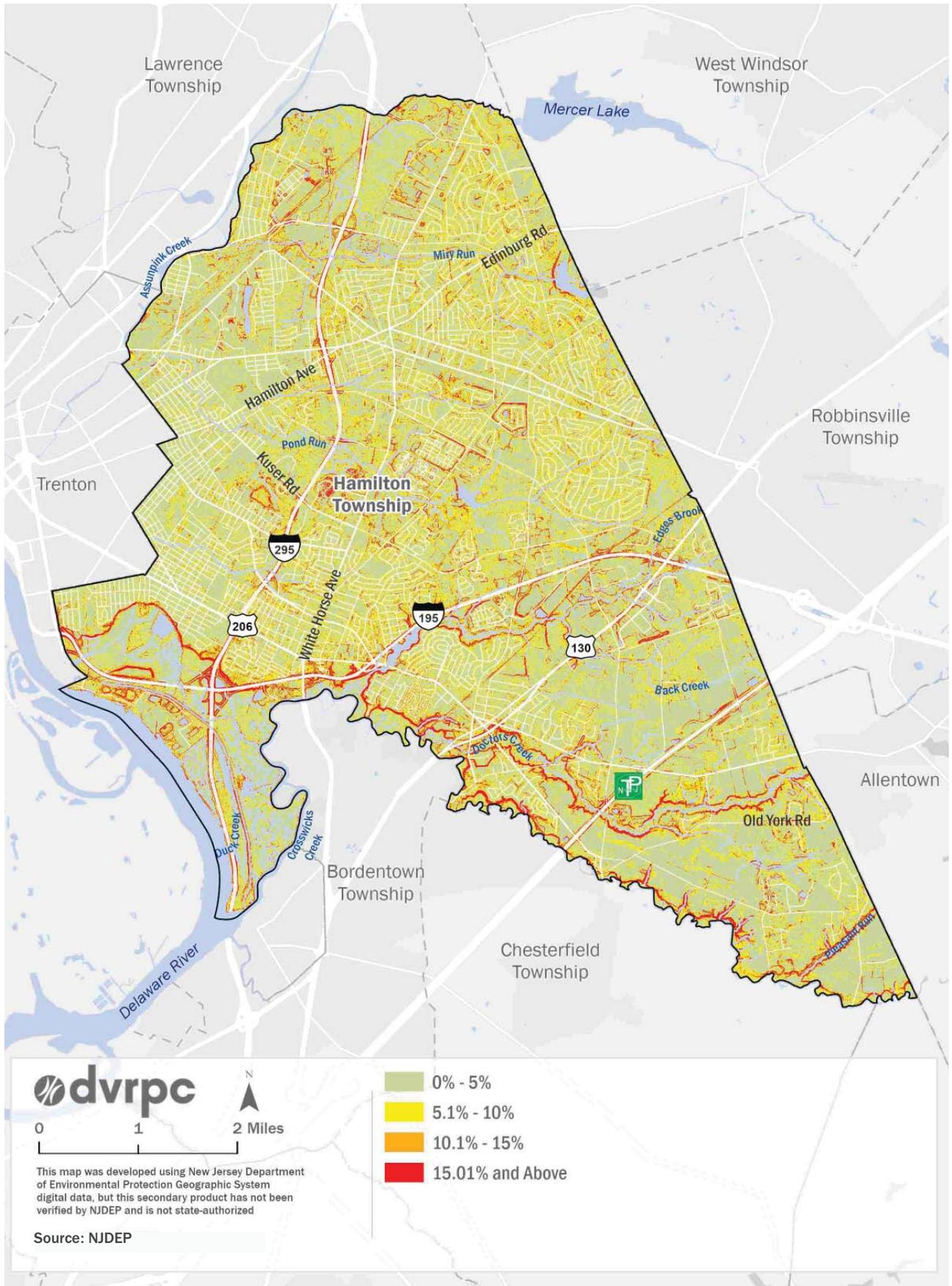


Figure 12: Slope (2024)





**Dam Site #8 at Hughes Drive**

Source: Rob Poppert, Hamilton Township

## CHAPTER 8:

# Hydrology and Water Resources

### Surface Waters

Hamilton Township is physically defined by its water bodies, which form many of the township's borders. The most significant body of water is the Delaware River which forms Hamilton's southwestern border. The Assunpink Creek forms the township's northern border and Crosswicks Creek forms the southern border.

### Watersheds

A watershed is all the land that drains into a particular waterway, such as a river, stream, lake, or wetland. The high points in the terrain, such as hills and ridges, define the boundaries of a watershed. Large watersheds are made up of a succession of smaller ones, down to the catchment area of a local site. For example, the Delaware Watershed is made up of many smaller watersheds, such as the Crosswicks Creek and Rancocas Creek watersheds, which in turn can be broken into smaller subwatersheds, down to the catchment area of a headwater stream. Watersheds are natural ecological units, where soil, water, air, plants, and animals interact in a complex relationship.

The USGS has divided the country into hydrologic units, which are each designated by a hydrologic unit code (HUC). There are 21 regions—the largest hydrologic unit—in the U.S. that contain either the drainage area of a major river or the combined drainage areas of a series of rivers. Hamilton Township is located within the Mid-Atlantic region, which ultimately drains into the Atlantic Ocean. The 21 regions are divided into 221 subregions (HUC 4). Hamilton Township is within the Delaware subregion. Subregions are further divided into hydrologic accounting units (HUC 6) and cataloging units (HUC 8), and then into HUC 11 watersheds. In New Jersey, HUC 11 watersheds (identified by an 11-digit code) range in size from 25 to 143 square miles, and each contains a number of HUC 14 subwatersheds (identified by a 14-digit code). The State of New Jersey has 152 HUC 11 watersheds and over 900 HUC 14 subwatersheds.

Hamilton Township is located within two major watersheds: the Assunpink Creek Watershed and the combined Crosswicks-Doctors Creek Watershed. Within the boundaries of Hamilton Township, these areas are divided into six HUC 11 watersheds, which are further subdivided into 11 smaller HUC 14 subwatersheds. These are listed in **Table 9: Watersheds and Subwatersheds (2022) on page 42.**



**Lily pads in Mercer Lake**

Source: Mel Musie, DVRPC

**Table 9: Watersheds and Subwatersheds (2022)**

Watershed Name	Hydrologic Unit Code (HUC)	Acres Within Township	Percent of Township
<b>Central Delaware (WMA 11)</b>			
<b>Assunpink Creek (above Shipetaukin Ck)</b>	2040105230	1,016.67	3.95%
Assunpink Ck (Shipetaukin to Trenton Rd)	2040105230050	1,016.67	3.95%
<b>Assunpink Creek (below Shipetaukin Ck)</b>	2040105240	10,461.88	40.66%
Miry Run (Assunpink Cr)	2040105240030	3,719.28	14.46%
Pond Run	2040105240040	5,950.5	23.13%
Assunpink Creek (below Shipetaukin Ck)	2040105240060	792.1	3.08%
<b>Assiscunk, Crosswicks, and Doctors (WMA 20)</b>			
<b>Duck Creek and Upper Delaware River (UDRV) to Assunpink Ck</b>	2040201030	901.82	3.51%
Duck Creek and Upper Delaware River (UDRV) to Assunpink Ck	2040201030010	901.82	3.51%
<b>Crosswicks Ck (Doctors Ck to New Egypt)</b>	2040201050	1,851.87	7.20%
Crosswicks Ck (Doctors Ck-Ellisdale trib)	2040201050070	1,098.7	4.27%
Crosswicks Ck (Ellisdale trib - Walnford)	2040201050050	753.17	2.93%
<b>Doctors Creek</b>	2040201060	3,010.36	11.70%
Doctors Creek (below Allentown)	2040201060030	3,010.36	11.70%
<b>Crosswicks Ck (below Doctors Creek)</b>	2040201070	8,485.61	32.98%
Back Creek (above Yardville-H Sq Road)	2040201070010	3,007.23	11.69%
Shady Brook/Spring Lake/Rowan Lake	2040201070030	2,822.67	10.97%
Crosswicks Ck (below Doctors Creek)	2040201070020	2,655.71	10.32%
<b>Total</b>		<b>25,728.20</b>	<b>100.00%</b>

Source: NJDEP, Watershed Management Areas in New Jersey Web Map (2022)

### Watershed Management Areas

NJDEP uses watersheds as a unit of area for managing natural resources. The agency has divided the state into 20 Watershed Management Areas (WMAs), as shown in as shown in **Figure 14: Watershed Management Areas (2023) on page 44**. Hamilton Township is located within two WMAs: Central Delaware (WMA 11) and Assunpink, Crosswicks, Doctors (WMA 20).

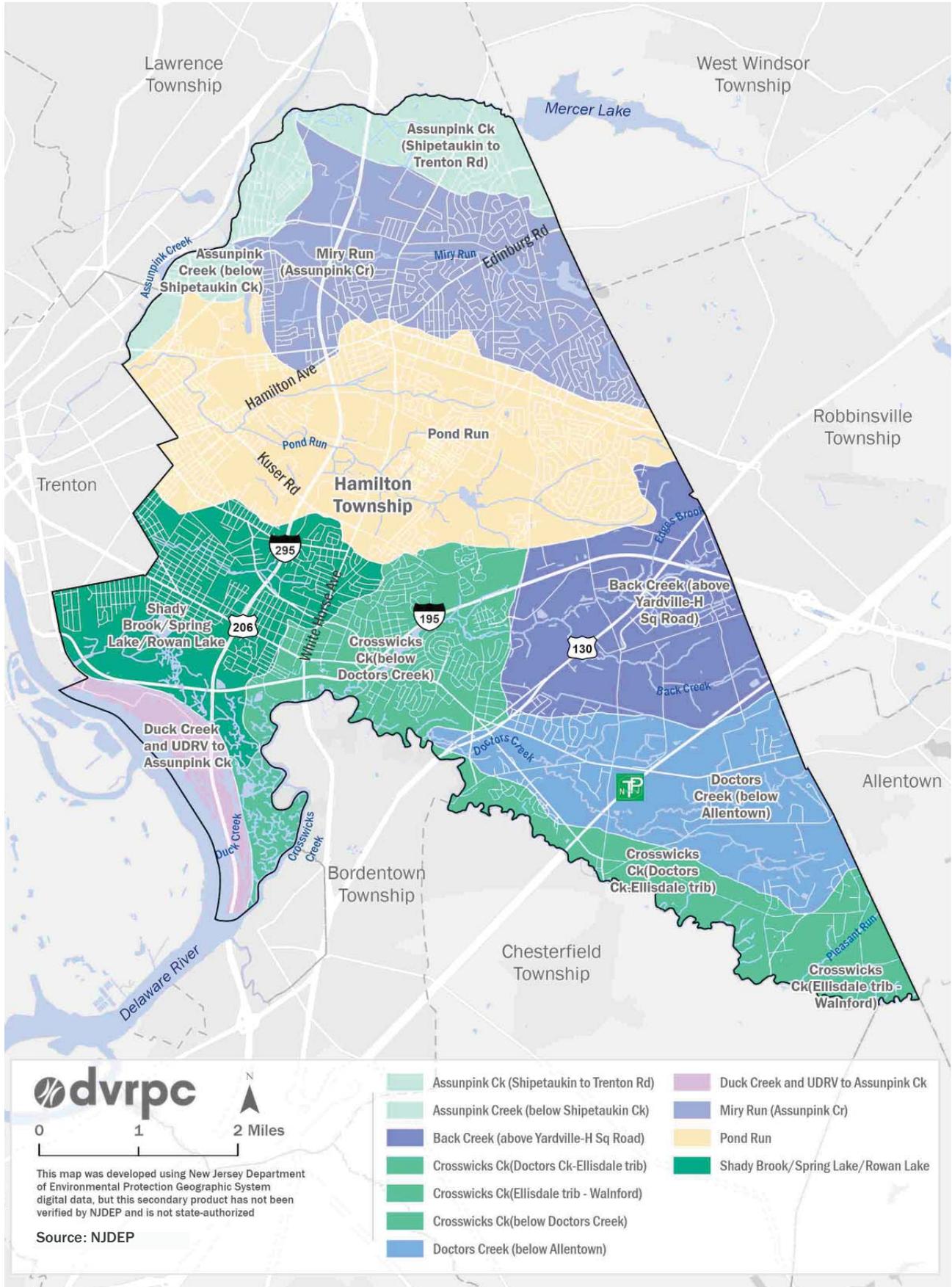
#### WMA 11: Central Delaware Tributaries

Watershed Management Area 11, called the Central Delaware Tributaries, funnels to the Delaware River or the D&R Canal. It encompasses an area of approximately 272 square miles, where the land uses range from agricultural to urban. The dominant waterway is the Assunpink Creek and its tributaries to the south; smaller creeks are found in the north. Suburban development and a dramatic increase in population over the past twenty years has stressed the water resources and impacted the water quality of WMA 11.

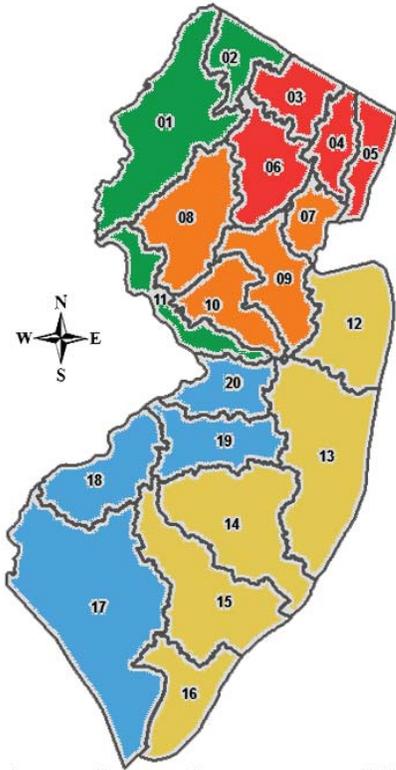
#### WMA 20: Assiscunk, Crosswicks, Doctors

Watershed Management Area 20, located at the upper reaches of the Delaware Estuary, is 253 square miles in size. The major creeks in the area are the Crosswicks, Assiscunk, Blacks, Crafts, Doctors, Duck, and Mill. These freshwater creeks are tidally influenced. Some of the tributaries in WMA 20 include Jumping Brook, Lahaway Creek, North Run and Doctors Creek. WMA 20 is affected by nonpoint sources of pollution that come from agricultural and suburban construction runoff. Elevated levels of phosphorous and fecal coliform bacteria have been recorded in the past in WMA 20.

Figure 13: Watersheds (2024)



**Figure 14: Watershed Management Areas (2023)**



1. Upper Delaware
2. Wallkill
3. Pompton, Pequannock, Wanaque, Ramapo
4. Lower Passaic, Saddle River
5. Hackensack, Hudson, Pascack
6. Upper and Mid Passaic, Whippany, Rockaway
7. Arthur Kill
8. North and South Branch Raritan
9. Lower Raritan, South River, Lawrence
10. Millstone
11. Central Delaware
12. Monmouth
13. Barnegat Bay
14. Mullica
15. Great Egg Harbor
16. Cape May
17. Maurice, Salem, Cohansey
18. Lower Delaware
19. Rancocas
20. Assiscunk, Crosswicks, Doctors

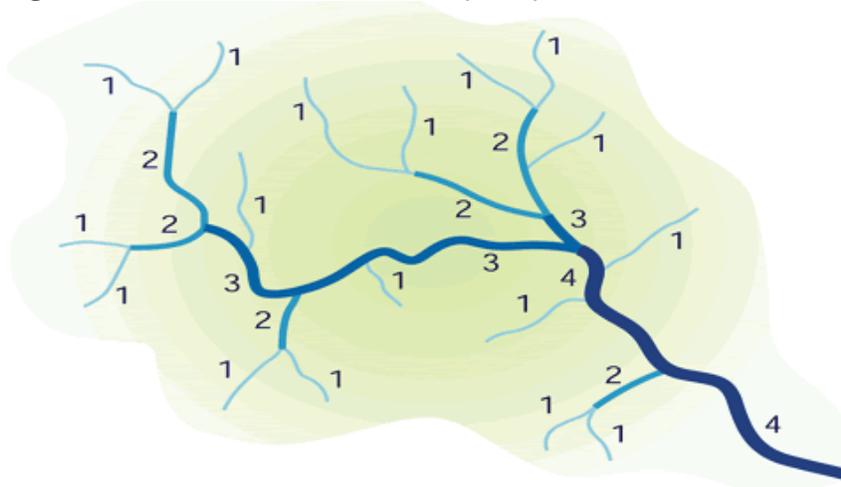
Source: NJDEP (2023)

**Streams**

There are 124 stream miles within the borders of Hamilton Township. Approximately 81 (67 percent) are first- or second-order streams. First-order streams are the initial sections of stream channels with no contributing tributaries, and second-order streams are stream channels formed from only one branching section of tributaries above them. First- and second-order streams are considered “headwater” streams. The headwaters are where a stream is “born” and actually begins to flow. See **Figure 15: Stream Order Classification (2003)** for a diagram depicting stream order. Headwaters are of particular importance because they tend to contain a high diversity of aquatic species, and the condition of these waters affects the water quality found downstream.

Headwaters drain only a small area of land, usually no larger than one square mile (640 acres). Because of their small size, they are highly susceptible to pollution by human activities on the land. First- and second-order streams are narrow and often shallow. They are characterized by a relatively small base flow, which is the portion of stream flow that comes from groundwater seepage, not surface water runoff. These physical characteristics make first- and second-order streams

**Figure 15: Stream Order Classification (2003)**



Source: T.A. Endreny (2003)

subject to greater temperature fluctuations, especially when vegetation on their banks, particularly forest land, is removed. The quality of first- and second-order streams can also easily be degraded by siltation, which is water pollution that occurs when stormwater filled with soils and sediments (eroded or weathered sands and gravels) enters the water. In addition, first-order streams are greatly affected by changes in the local water table (see definition to right) because of their small base flows. Headwaters are important sites for the aquatic life that is at the base of the food chain, and often serve as spawning or nursery areas for fish. See **Table 10: Stream Order by Length (2012)** for stream order length in Hamilton Township and **Figure 16: Surface Water, Wetlands, and Vernal Pools (2024)** on page 50.

**Water table:** The boundary between water-saturated ground and unsaturated ground. Below the water table, water fills all air pockets between soil particles or rocks.

**Table 10: Stream Order by Length (2012)**

Stream Order	Length (miles)
First (smallest)	55.00
Second	26.74
Third	16.77
Fourth	11.89
Fifth	10.76
<b>Total</b>	<b>121.16</b>

Source: NJDEP (2012)

The named streams in Hamilton Township include the Delaware River; Assunpink, Bear, Crosswicks, Doctors, and Duck Creeks; Miry, Pleasant, and Pond Runs; Edges Brook; and Gropp Lake. More information about some of these water bodies can be found below.

The **Delaware River** is the longest undammed river east of the Mississippi and flows 330 miles from its headwaters in New York State to the Delaware Bay (Cape May, NJ/Lewes, DE), where it meets the Atlantic Ocean. The headwaters of the Delaware River flow from two branches in the Catskill Mountains. The main branch, also known as the Mohawk branch, is where the western headwaters rise in Schoharie County, NY. The Eastern branch begins in Delaware County, NY. The Delaware River is an interstate river for its entire length, forming the boundary between Pennsylvania and New Jersey, New Jersey and Delaware, and part of the boundary between Pennsylvania and New York. The Delaware River is tidal for approximately 130 miles; from Trenton, NJ south to the Delaware Bay.

The tidal flow of the Delaware River brings water into the surrounding streams twice a day. Tidal flows both help and hinder maintenance of good water quality in affected streams. The flood (incoming) tide carries leaves and nutrients that are beneficial to aquatic organisms, but it also limits the regular flushing out of silt and pollutant-laden waters coming from upstream. Silt deposition within a stream tends to increase during flood tides, although deposition is also a function of stream shape, the presence of specific flow barriers, and the quantity of silt (the load) being carried by the stream.

**Crosswicks Creek** is a tributary of the Delaware River and crosses four counties: Burlington, Mercer, Monmouth, and Ocean. It forms the southern border of Hamilton Township. Crosswicks Creek’s headwaters flow in a northwesterly direction from the Joint Base McGuire Dix Lakehurst in Pemberton Township. Upon reaching the Abbott Marshlands, Crosswicks Creek takes a sharp turn southward, where it meets the Delaware River in Bordentown.

**Assunpink Creek** is a tributary of the Delaware River. From Millstone Township in Monmouth County, the Assunpink flows westward through the Assunpink Wildlife Management Area and Assunpink Lake. Below Assunpink Lake, the creek turns northwest until it reaches Mercer County Park, where it turns west through the Van Nest Refuge. It turns southwest and parallels the D&R Canal until it empties into the Delaware River in Trenton. The soldiers of the Continental Army held a defensive line along the south shore of the Assunpink Creek during the Second Battle of Trenton of the American Revolutionary War in January 1777.

## Lakes and Ponds

Lakes and ponds cover a total of about 200 acres in Hamilton Township, including the large Gropp Lake and Spring Lake. Artificial lakes and ponds are formed by dams and were often created for purposes of irrigation, flood control, or recreation.

**Gropp Lake**, located south of Interstate 195 in western Hamilton Township on Back Creek, is a lowland depression fed by natural springs. At normal levels, the lake has a surface area of 41 acres. It has a capacity of 495-acre feet, while its normal storage capacity is 211-acre feet. The lake was formed when a dam was constructed on the Back Creek in 1900. The dam is 25 feet high, with a length of 485 feet. The maximum discharge is 1,900 cubic feet per second.

Lakeside Park was developed near the future site of Gropp Lake in the 1800s around a mill, now known as New Albion Mills. This area was used as a summer colony until the homes were winterized and made permanent. In the winter of 1915, an ice jam burst the dam. The dam burst again in 1979 during a storm and was not rebuilt until 1987. Today, Gropp Lake continues to be enjoyed for recreational uses, including fishing and boating (swimming and gas-powered motor boats are not permitted).

Located in the northern portion of the Abbott Marshlands, **Spring Lake** is a spring fed lake, with bluffs vegetated by second-growth forests. The area around the lake was once known as Spring Lake Park and, later, Capitol Park. The White City Amusement Park opened next to Spring Lake in 1907. This renowned park had a roller coaster, scenic railroad, carousel, flume ride, movie theater, dance hall, and many other attractions. The lake was renamed the White City Lake during the park's heyday. The park closed in the 1920s. A remnant of the White City Amusement Park—a concrete staircase—can still be found at the lake, connected to a former trolley stop. Today, the lake is a sanctuary for both people and wildlife. Visitors can fish and paddle in the lake, as well as hike the wooded trails surrounding the lake.

The tidal **Rowan Lake** is a highly vegetated area, located just south of Spring Lake within the Abbott Marshlands and adjacent to the interchange of Interstates 295 and 195. Visitors can paddle the Tidal Water Trail through Rowan Lake and Crosswicks Creek, south to Bordentown Beach.

**Sturgeon Pond**, located in the northwestern corner of the Abbott Marshlands, is named for its former use in storing sturgeon, once a major industry on the Delaware River.

## Wetlands

Wetlands have numerous definitions and classifications because of their diversity and the regulation of their uses. However, a basic definition of a wetland is an area that has enough water at some time during the year to stress plants and animals that are not adapted to life in water or saturated soils.

Wetland soils, which are also known as hydric soils, are areas where the land is saturated for at least seven consecutive days during the growing season. While wetlands almost always require the presence of hydric soils, hydric soils are not always wetlands. For land to be considered a wetland, it must have vegetation unique to wetlands and hydric soils. Additionally, the overall hydrology of the site must be considered.

Wetlands come in a wide range of types. For example, there are saline and freshwater wetlands; tidal and nontidal wetlands; and wetlands that were created through human activity, such as agricultural wetlands or stormwater basins. The transitional area between the wetland and dry land is defined as an emergent wetland. The most common wetland types in Hamilton are deciduous wooded wetlands, freshwater tidal wetlands, and deciduous scrub/shrub wetlands. All of Hamilton's wetlands are freshwater, and the majority of them are associated with the township's streams. Emergent wetlands are present in Hamilton Township, but they are not tabulated or mapped in this report. See **Figure 16: Surface Water, Wetlands, and Vernal Pools (2024) on page 50**

Total wetland acreage in the township, based on NJDEP's land use/land cover data, is about 5,070 acres, of which about 4,352 acres (85 percent) feature natural wetlands vegetation. Wetlands that have experienced less human alteration are likely to contain typical or representative plants and animals that are native to that wetland type. Of Hamilton's naturally-vegetated wetlands, 3,427 acres are classified as forested wetlands, 421 acres are freshwater tidal marshes, 295 acres are scrub/shrub wetlands, and 208 acres are herbaceous wetlands. Additional details on Hamilton's naturally vegetated wetland areas are available in the **Natural Vegetation on page 87**.

Hamilton Township also contains about 718 acres of disturbed or managed wetlands. These wetlands no longer support typical natural wetlands vegetation, but do show signs of soil saturation and exist in areas that the U.S. Soil Conservation Service has shown to have hydric soils. Hamilton's modified wetlands fall into the following categories: 310 acres of agricultural wetlands, 142 acres of wetland rights-of-way, 78 acres of wetlands found in maintained greenspace, recreational areas, or lawn, 46 acres of disturbed wetlands, and 12 acres of former agricultural wetlands.

New Jersey protects freshwater (interior) wetlands under the New Jersey Freshwater Wetlands Protection Act Rules: N.J.A.C. 7:7A. This law also protects transitional areas, or "buffers," around freshwater wetlands. The standard width of the transition area that is protected is 150 feet around a freshwater wetland of "exceptional resource value," which is defined as one that either discharges into trout-supporting waters or has been documented as habitat for a threatened or endangered species. The standard extent of transitional area that is protected around a freshwater wetland of "intermediate resource value" (one that is not of "exceptional resource value" or "ordinary") is 50 feet.

NJDEP's published freshwater wetland maps provide guidance on where wetlands are found in New Jersey, but they are not the final word on location. Only an official determination from NJDEP, called a "letter of interpretation" (LOI), can formally designate the presence of freshwater wetlands on a property. An LOI verifies the presence, absence, or boundaries of freshwater wetlands and transition areas on a site. The activities that are permitted to occur within wetlands are very limited, and permits are required for most of them. Violations of the wetland regulations will result in penalties determined by NJDEP. Additional information on wetland rules and permits is available through the NJDEP Division of Land Use Regulation and on their website under "Freshwater Wetlands."

## **Vernal Pools**

Vernal pools are bodies of water that appear following snowmelt and during spring rains, but disappear or are dry during the rest of the year. They are highly important sites for certain rare species of amphibians. Particular types of frogs and salamanders will only breed in vernal pools (obligate breeders), which provide their offspring with a measure of protection because the pool's impermanence prevents the residence of predators of the eggs and young, especially fish. Other species, called facultative breeders, may use vernal pools but are not limited to them for breeding.

Vernal pools are so intermittent that their existence as wetlands has frequently not been recognized. Consequently, many of them have disappeared from the landscape, or have been substantially damaged. This, in turn, is a principal cause of the decline of their obligate amphibian species.

Since 2001, the New Jersey Division of Fish and Wildlife has been conducting a Vernal Pool Survey Project to identify, map, and certify vernal pools throughout the state. A certified vernal pool is one that occurs in a confined basin without a permanently flowing outlet, has habitat documented for one obligate or two facultative herptile (reptile and amphibian) species, maintains pooled water for at least two continuous months between March and September, and is free of fish populations throughout the year.

Once a vernal pool is certified, regulations require that a 75-foot buffer be maintained around the pool. NJDEP's Division of Land Use Regulation oversees this designation and restricts development around vernal ponds by denying construction permits. Local municipalities can provide additional protection by negotiating conservation easements on the land surrounding the pool or by instituting restrictive zoning, such as passing a stream corridor protection overlay ordinance that specifically includes the vernal pools. A township can also include the pools in its official map. The South Jersey Land and Water Trust provides training sessions every March to teach volunteers how to identify, survey, and certify vernal pools. Information is available at its website: <https://www.sjlandwater.org/copy-of-land-preservation>.

The state has identified 88 potential vernal pools in Hamilton Township and seven vernal habitat locations, which are and shown on **Figure 16: Surface Water, Wetlands, and Vernal Pools (2024) on page 50**. Vernal pools are located throughout the township, with many concentrated in the center of the township in wetlands areas adjacent to Pond Run on both sides of Interstate 295. There are also clusters of potential vernal pools in the southeast agricultural area of Hamilton Township. Surveys of each pool are needed to determine if the pool is still in existence as a natural habitat, and if it is, what species are present. Once surveyed, the New Jersey Division of Fish and Wildlife will review the data, and those pools that meet the criteria will be certified.

### **Agricultural Wetlands**

There are 310 acres of agricultural wetlands in Hamilton Township. Agricultural wetlands are modified former wetland areas currently under cultivation. These areas have saturated soils like wetlands, but they no longer support natural wetland vegetation, and instead are planted with commercial crops. Agricultural wetlands were often created by a technique called "tile drainage." Tile drainage was a common method of removing excess water from farm fields that exhibited one or more of the following characteristics: (1) small areas of isolated wetlands, (2) very flat land that ponded in wet weather, (3) soils that were slow to warm in the spring because of a relatively high-water table, or (4) soils that had a very high clay content and, therefore, drained slowly. Tile drainage was very labor-intensive, as it involved installing subsurface drainage pipes throughout a field at a depth of three to six feet. The existence of tile drainage strongly indicates a natural wetland hydrology. Drainage systems can be quite long-lived and require only the periodic maintenance of drainage ditches and outlets.

While tile drains have allowed more land to become farmable, they also tend to convey nitrogen from the fields into local streams more efficiently than is desired, which can have negative effects on stream health. Because little mapping exists identifying the location of tile lines, municipal, county, and state boards rarely address their existence as part of development approval processes. Yet, tile systems can pose health concerns when land is developed into residential or commercial uses, especially where septic systems are concerned. If a septic system leach field is installed near an unknown existing tile drainage system, discharge may seep into the tile line and directly into the local waterway. Lawn and agricultural chemicals carried through field drains are also a threat to water quality and wildlife and habitat.

As long as agricultural wetland areas remain in agricultural use, they are exempt from New Jersey Freshwater Wetlands Rules N.J.A.C. 7:7A. However, if an agricultural area is removed from agricultural production for more than five years, any wetlands located within that area lose their exempt status.

The Natural Resources Conservation Service sponsors the Agricultural Conservation Easement Program, a voluntary program that bundles multiple funding programs. The Wetland Reserve Enhancement Partnership is a sub-program that offers landowners an opportunity to receive payments for restoring and protecting wetlands on their property, including agricultural wetlands. Restoring agricultural wetlands requires removing them from agricultural use and restoring them to their natural state. This program provides technical and financial assistance to eligible landowners who can enroll eligible lands through different types of easements. NRCS prioritizes applications based the easement's potential for protecting and enhancing habitat for migratory birds and other wildlife.

## **Surface Water Quality**

Water quality standards are established by federal and state governments to ensure that water is suitable for its intended use. The ultimate objective of the Federal Clean Water Act (P.L. 95-217) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Standards aim to restore the quality of the nation's waters, to provide for the protection and propagation of fish, shellfish, and wildlife, and to provide for recreation in and out of the water, wherever attainable.

### **Hamilton's Stream Designations**

All water bodies in New Jersey are classified by NJDEP as either freshwater (FW), pinelands water (PL), saline estuarine water (SE), or saline coastal water (SC). Freshwater is further broken down into freshwater that originates and is wholly within federal or state parks, forests, or fish and wildlife lands (FW1), and all other freshwater (FW2). Freshwater bodies (FW1 and FW2) are further broken down into trout-producing (TP), trout-maintaining (TM), or nontrout waters (NT). The water quality for each of these groups must be able to support designated uses that are assigned to each water body classification in Surface Water Quality Standards N.J.A.C 7:9B-1.12.

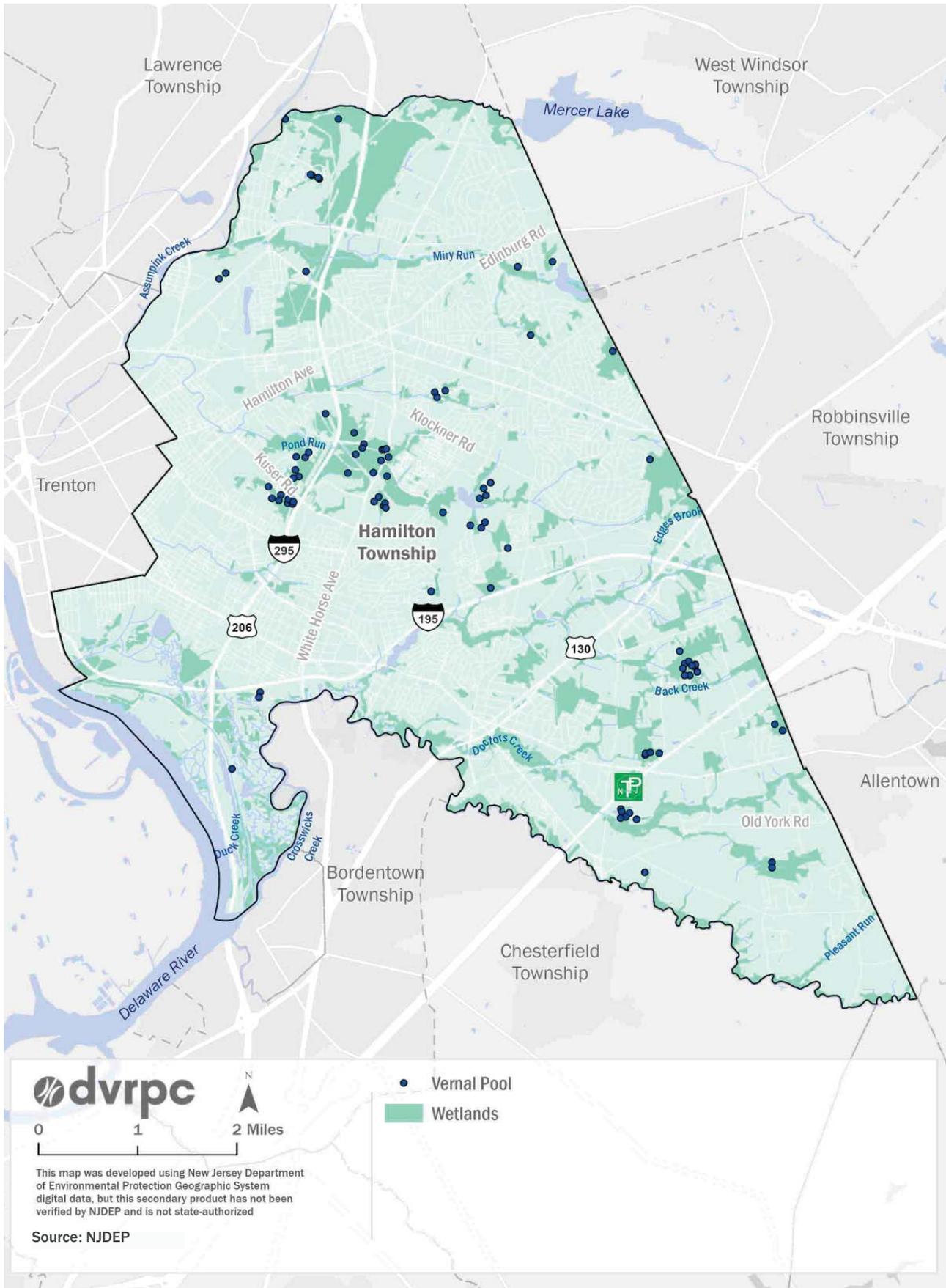
All water bodies in Hamilton Township are classified as FW2-NT, meaning they are freshwater nontrout waters. According to NJDEP rules, FW2-NT waters must provide for (1) the maintenance, migration, and propagation of the natural and established biota; (2) primary and secondary contact recreation (i.e., swimming and fishing); (3) industrial and agricultural water supply; (4) public potable water supply after conventional filtration and disinfection; and (5) any other reasonable uses.

The determination of whether or not water quality is sufficient to meet a body of water's designated use(s) is based on an analysis of certain surface water quality parameters, including fecal coliform, dissolved oxygen, pH, phosphorus, and toxic substances. NJDEP also evaluates water quality by examining the health of aquatic macroinvertebrate life in a stream.

### **Surface Water Quality Protection Categories**

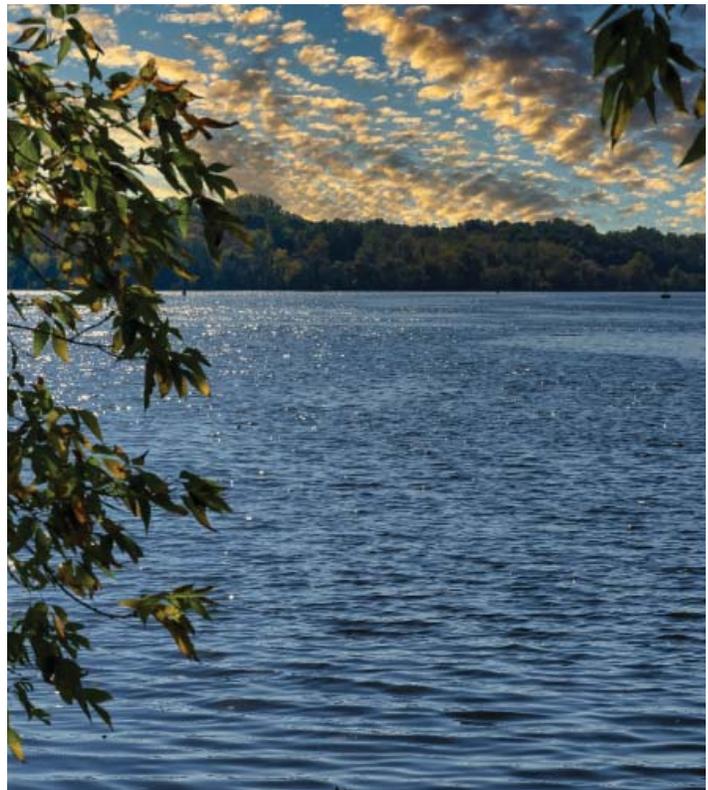
In addition to the classifications above, NJDEP has three tiers of surface water quality protection: Outstanding National Resource Waters (ONRW), Category One waters (C1), and Category Two waters (C2). In the northeast corner of Hamilton Township, a portion of the Assunpink Creek and a tributary are classified as Category One (FW2-NTC1). This portion of the Assunpink Creek is designated C1 because it passes through the Van Nest Refuge Wildlife Management Area. C1 waters are protected from water quality degradation due to their exceptional significance. However, the majority of Hamilton's waterways fit in the C2 tier. C2 includes all waterways that do not match the more specific criteria required for the first two categories, which identify waterways of exceptional significance. Most waterways in the state are C2. The water quality, aesthetic value, and ecological integrity of C2 waters should be protected and maintained, but unlike in ONRW or C1 waters, some amount of reduction in water quality is authorized to accommodate necessary and important social and economic development. For example, C2 waterways require a 50-foot development buffer around them rather than the 300-foot buffer required for C1 waterways.

Figure 16: Surface Water, Wetlands, and Vernal Pools (2024)



## Delaware River

The Delaware River is governed by the Delaware River Basin Commission (DRBC) Water Quality Regulations, which is a separate set of water quality regulations. The segment of the Delaware River that runs past the Hamilton Township is within Zone 2 along the Delaware River, which extends from River Mile (RM) 133.4 to RM 108.4. This zone proceeds south from the head of tidewater at Trenton, NJ to below the mouth of the Pennypack Creek, and also includes tributaries along that segment. The quality of Zone 2 waters is required to be maintained for public water supply after reasonable treatment, industrial water supplies after reasonable treatment, agricultural water supply, maintenance and propagation of resident fish and other aquatic life, wildlife, passage of anadromous fish, recreation, and navigation.



**View of Delaware River from Abbott Marshland**

Source: Thomas Kloc, Getty Images

## New Jersey's Integrated Water Quality Monitoring and Assessment Report

The Federal Clean Water Act mandates that states submit biennial reports to the U.S. EPA describing the quality of their waters. States must submit two reports: The Water Quality Inventory Report or “305(b) Report,” documenting the status of principal waters in terms of overall water quality and support of designated uses, and a list of water bodies that are not attaining water quality standards, or the “303(d) List.”

States must also prioritize 303(d)-listed water bodies for Total Maximum Daily Load (TMDL) analyses. The TMDL quantifies the amount of a pollutant a water body can assimilate (its loading capacity) without violating water quality standards. The TMDL analysis identifies those high-priority water bodies for which states anticipate establishing TMDLs in the next two years.

NJDEP integrates the 303(d) List and the 305(b) Report into a single report according to the U.S. EPA's guidance. The most recent 2022 Integrated Water Quality Monitoring and Assessment Report categorizes water quality assessment into three statuses: Fully Supporting, Not Supporting, and Insufficient Data. These statuses are then placed into sublists for the Integrated Report and to help clarify the response strategy for impairments. Sublist 1 and 2 contain waters that are Fully Supporting designated uses and no uses are threatened. Sublist 3 contains waters for which there is insufficient data to determine their status. Sublist 4 contains waters that do not attain water quality standards, but that meet one of the following three conditions: (1) a TMDL has been completed for the pollutant causing nonattainment; (2) other enforceable pollution control requirements are reasonably expected to result in conformance with the applicable water quality standards; or (3) nonattainment is caused by something other than a pollutant. Sublist 5 contains waters that do not attain their designated use and for which a TMDL is required. Sublist 5 is equivalent to the 303(d) List.

NJDEP bases the assessment of entire HUC-14 watersheds (which serve as “assessment units”) on the results of one or more monitoring sites within the watershed. The results from monitoring sites located within each HUC-14 subwatershed are extrapolated to represent all of the water bodies within the entire HUC boundary. In practice, the

HUC-14 approach provides a more conservative assessment since any impairment of any water body in a given HUC-14 watershed will result in that entire watershed being listed as impaired for that use or parameter. In addition, where a HUC-14 watershed contains waters of different classification, the more stringent classification is used to assess impairment, and that impairment is then applied to the entire watershed. Because of the degree of extrapolation required for this approach, NJDEP performs more detailed testing to determine the actual cause, source, and extent of impairment in the HUC-14 watershed before developing a TMDL or taking other regulatory action to address the impairment.

#### Designated Uses

These refer to specific groups of species that rely on water or human uses of water. Each of these use types is associated with certain water quality standards that must be met. Designated uses include:

- *Aquatic life (general)*
- *Aquatic life (trout)*
- *Primary Recreation*
- *Water Supply*
- *Secondary Recreation*
- *Shellfish Harvesting*

NJDEP identifies the designated uses (see box above) applicable to each HUC-14 watershed and determines whether the watershed meets the water quality standards that correspond with designated uses. Not all designated uses are applicable for all HUC-14 watersheds. The assessment unit (the HUC-14 watershed) is then placed on the appropriate sublist for each use.

All 11 subwatersheds within Hamilton Township are impaired (Sublist 5) for at least one designated use. For aquatic life, the most general and encompassing parameter of water quality, 10 out of 11 subwatersheds are impaired and one subwatershed has insufficient data. Although Assunpink Creek is stocked with trout, it is not considered to be a trout-supporting water, and is not assessed for the aquatic life of trout. As none of the waters in Hamilton support shellfish, this designated use is also not applicable. See **Figure 17: Water Quality Designation (2024) on page 54** and **Table 11: Integrated Water Quality Report (2022) on page 53** for the most recent published status of each of Hamilton's HUC-14 watersheds.

If one or more designated uses are assessed as "non support" (Sublist 5), the pollutant(s) or impairment causing the non-attainment status is identified on the "303(d) List of Impaired Waters with Priority Ranking." When the pollutant causing nonattainment is unknown, the pollutant is listed as "biological cause unknown." The ranking (Low, Medium, High) refers to the priority given a specific assessment unit when determining the schedule for a TMDL. **Table 12: 303(d) List of Impaired Waters with Priority Rankings (2024) on page 55** lists Hamilton's nonattaining assessment units, the water quality parameters that cause them to be nonattaining, and their ranking. The most common causes for impairments include arsenic, phosphorus, and polychlorinated biphenyl (PCB) found in fish tissue. Several are classified as having a biological cause of impairment that is currently unknown. Priority ranking is required by Section 303(d) of the Federal Clean Water Act and its purpose is to focus available resources in the most efficient and productive way, considering environmental, social, and political factors.

Subwatersheds with a high priority ranking are those for which the NJDEP expects to complete a TMDL within the next two years. The NJDEP expects to complete TMDLs for subwatersheds ranked as medium priority in the near future, but not within two years. Subwatersheds with a low priority are those for which TMDLs will likely not be completed in the near future.

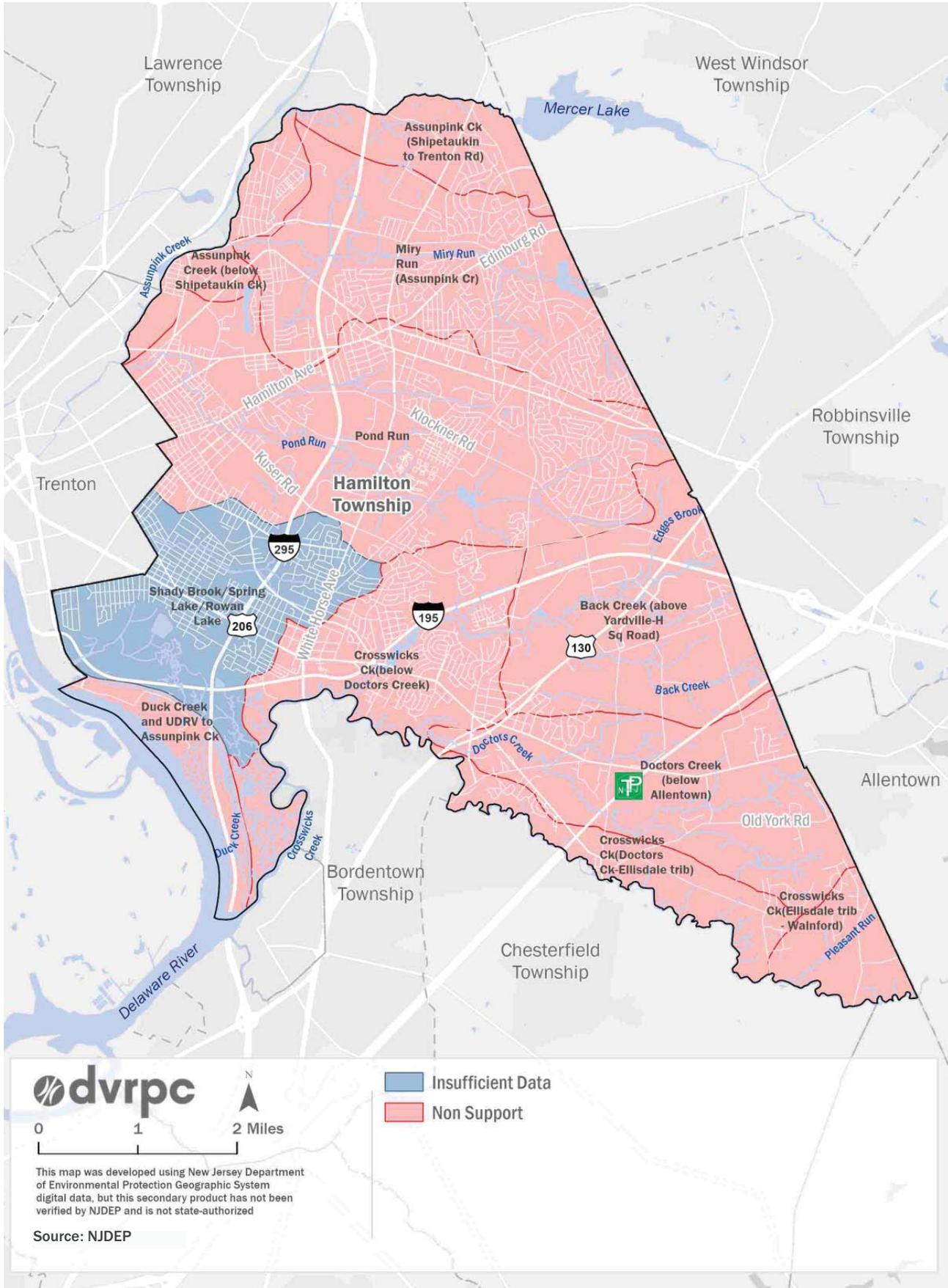
**Table 11: Integrated Water Quality Report (2022)**

WMA	HUC14	Assessment Unit Name	Aquatic Life (General)	Fish Consumption	Public Water Supply	Primary Recreation
11	02040105230050	Assunpink Creek (Shipetaukin to Trenton Rd)	NS	NS	NS	NS
11	02040105240030	Miry Run (Assunpink Creek)	NS	ID	NS	NS
11	02040105240040	Pond Run	NS	ID	NS	ID
11	02040105240060	Assunpink Creek (below Shipetaukin Creekk)	NS	NS	NS	NS
20	02040201030010	Duck Creek and UDRV to Assunpink Creek	ID	NS	ID	ID
20	02040201050050	Crosswicks Creek (Ellisdale trib - Walnford)	NS	NS	NS	NS
20	02040201050070	Crosswicks Creek (Doctors Creekk-Ellisdale trib)	NS	NS	NS	NS
20	02040201060030	Doctors Creek (below Allentown)	NS	ID	FS	FS
20	02040201070010	Back Creek (above Yardville-H Sq Road)	NS	ID	NS	NS
20	02040201070020	Crosswicks Creek (below Doctors Creek)	NS	NS	NS	NS
20	02040201070030	Shady Brook/Spring Lake/Rowan Lake	NS	NS	ID	ID

Source: NJDEP, Draft New Jersey Integrated Water Quality Assessment Report (2022)

Key	
NS	Non Support
ID	Insufficient Data
FS	Full Support

Figure 17: Water Quality Designation (2024)



**Table 12: 303(d) List of Impaired Waters with Priority Rankings (2024)**

WMA	HUC14	Assessment Unit Name	Parameter	Designated Use	Priority Ranking for TMDL	Cycle First Listed
11	02040105230050	Assunpink Ck (Shipetaukin to Trenton Rd)	Arsenic	Public Water Supply	Low	1998
			Chlordane in Fish Tissue	Fish Consumption	Low	2014
			Escherichia Coli (E. Coli)	Recreation Primary	Medium	2014
			Biological-Cause Unknown	Aquatic Life	Low	2006
			PCBs In Fish Tissue	Fish Consumption	Low	2012
			Phosphorus, Total	Aquatic Life	Medium	2022
11	02040105240030	Miry Run (Assunpink Cr)	Arsenic	Public Water Supply	Low	2012
			Biological-Cause Unknown	Aquatic Life	Low	2016
11	02040105240040	Pond Run	Arsenic	Public Water Supply	Low	2018
			Biological-Cause Unknown	Aquatic Life	Low	2016
			pH	Aquatic Life	Medium	2020
			Phosphorus, Total	Aquatic Life	High	2020
			Total Suspended Solids (TSS)	Aquatic Life	Medium	2006
11	02040105240060	Assunpink Ck (below Shipetaukin Ck)	Arsenic	Public Water Supply	Low	1998
			Biological-Cause Unknown	Aquatic Life	Low	2016
			Lead	Public Water Supply	Low	1998
			Mercury in Fish Tissue	Fish Consumption	Low	2010
			Phosphorus, Total	Aquatic Life	Medium	2010
20	02040201030010	Duck Creek and UDRV to Assunpink Ck	Mercury in Fish Tissue	Fish Consumption	Low	2006
			PCBs In Fish Tissue	Fish Consumption	Low	2006
20	02040201050050	Crosswicks Ck (Ellisdale trib - Walnford)	Arsenic	Public Water Supply	Low	2006
			Lead	Public Water Supply	Low	2012
			Phosphorus, Total	Aquatic Life	Medium	2002

WMA	HUC14	Assessment Unit Name	Parameter	Designated Use	Priority Ranking for TMDL	Cycle First Listed		
20	02040201050070	Crosswicks Ck (Doctors Ck- Ellisdale trib)	Arsenic	Public Water Supply	Low	2006		
			Mercury in Fish Tissue	Fish Consumption	Low	2006		
			PCBs In Fish Tissue	Fish Consumption	Low	2006		
			Phosphorus, Total	Aquatic Life	Medium	2002		
			Total Suspended Solids (TSS)	Aquatic Life	Medium	2018		
			Turbidity	Aquatic Life	Medium	2006		
20	02040201060030	Doctors Creek (below Allentown)	Dissolved Oxygen	Aquatic Life	Medium	2016		
			Biological-Cause Unknown	Aquatic Life	Low	2016		
				Back Creek (above Yardville-H Sq Road)	Low	2018		
		20		20	Escherichia Coli (E. Coli)	Recreation Primary	Medium	2018
					Biological-Cause Unknown	Aquatic Life	Low	2016
					Phosphorus, Total	Aquatic Life	Medium	2006
					Total Dissolved Solids (TDS)	Public Water Supply	Medium	2022
20	02040201070020	Crosswicks Ck (below Doctors Creek)	Arsenic	Public Water Supply	Low	2008		
			Arsenic in Fish Tissue	Fish Consumption	Low	2022		
			Escherichia Coli (E. Coli)	Recreation Primary	Medium	2012		
			Biological-Cause Unknown	Aquatic Life	Low	2016		
			PCBs In Fish Tissue	Fish Consumption	Low	2006		
			Phosphorus, Total	Aquatic Life	Medium	2006		
			Total Dissolved Solids (TDS)	Public Water Supply	Medium	2022		
			Total Suspended Solids (TSS)	Aquatic Life	Medium	2006		
20	02040201070030	Shady Brook/Spring Lake/ Rowan Lake	PCBs In Fish Tissue	Fish Consumption	Low	2006		

Source: NJDEP, Draft New Jersey Integrated Water Quality Assessment Report (2022)

## Common Pollutants

**Total suspended solids (TSS)** refer to solid materials, both organic and inorganic, that are suspended in water. High concentrations of TSS warm water by absorbing sunlight. By blocking sunlight from reaching aquatic plants, photosynthesis is decreased amount of oxygen is reduced, which then kills aquatic animal life. TSS enters water bodies through stormwater runoff, streambank erosion, industrial wastes, wastewater discharges, improperly managed construction sites, and other sources.

**Dissolved oxygen (DO)** is necessary for almost all aquatic life; therefore, its concentration provides a good indicator of the health of an aquatic ecosystem. Under low DO conditions, fish are more susceptible to the effects of other pollutants, such as metals and toxics. At very low DO levels, trace metals from sediments are released into the water column. Summer algal bloom die-off has been implicated as a cause of low DO concentrations.

Lead (Pb) is a toxic metal found naturally in the environment. It is also emitted into the air from motor vehicles and industrial sources. It can enter tap water through corrosion of plumbing materials. Lead was used for many years to manufacture everyday products, including paint. Lead can have adverse health effects, including behavioral problems, learning disabilities, kidney problems, high blood pressure, seizures, and death. Children six years old and under are most at risk. The main source of exposure to lead is ingestion of paint chips and inhaling dust. EPA estimates that 10 to 20 percent of human exposure to lead may come from drinking water.

**Mercury** is an element in the earth's crust that occurs naturally in the air, water, and soil. Mercury in the air eventually settles into water or onto land, where it can be washed away into water. Once in the water, microorganisms can change it into methylmercury, a highly toxic form that accumulates in fish, shellfish, and animals that eat fish. The most common way humans are exposed to mercury is through the ingestion of fish or shellfish that are contaminated with mercury. Exposure to mercury can affect the nervous system and harm the brain, heart, kidney, lungs, and immune system.

**Phosphorus** exists naturally at low levels within the environment, although excess phosphorus can lead to harmful algae blooms. As the excess algae dies and its decomposition uses the oxygen, "dead zones" can develop where no aquatic life can survive. Causes of phosphorus pollution include the following: over-fertilization of lawns and agricultural areas; runoff from impervious surfaces like parking lots, lawns, rooftops, and roadways; discharge from waste-water treatment plants; and overflow from septic systems. Soil erosion is a major contributor of phosphorus to streams, and streambank erosion occurring during floods can transport high quantities of phosphorus into the water system.

**Arsenic** is an odorless and tasteless semi-metal element that occurs naturally in rocks, soil, water, air, plants, and animals. It can enter drinking water supplies from natural deposits in the earth or from agricultural and industrial practices. Higher levels of arsenic tend to be found more in groundwater sources than in surface water sources. Arsenic has been linked to cancer of the bladder, lungs, skin, kidney, nasal passages, liver, and prostate. Some noncancer effects include thickening and discoloration of the skin, stomach pain, nausea, vomiting, diarrhea, numbness in hands and feet, partial paralysis, and blindness.

## Total Maximum Daily Loads (TMDLs)

For impaired waterways (waters on Sublist 5), the state is required by the U.S. EPA to establish a TMDL. As mentioned previously, a TMDL quantifies the amount of a pollutant that a waterbody can assimilate (its loading capacity) without violating water quality standards. The purpose of a TMDL is to initiate a management approach or restoration plan based on identifying the sources of a pollutant and determining the percentage reductions of the pollutant that must be achieved by each source. These sources can be point sources, like sewage treatment plants, or nonpoint sources, such as stormwater runoff.

As shown in **Table 12: 303(d) List of Impaired Waters with Priority Rankings (2024) on page 55**, the Pond Run subwatershed had a high priority for remediation of phosphorus in the statewide TMDL schedule in 2020. Since then, no TMDLs with a high priority ranking for Hamilton’s subwatersheds were approved. In 2022, TMDLs with a medium priority were established for Crosswicks Ck (below Doctors Creek) for total dissolved solids and arsenic in fish tissue and also the Back Creek (above Yardville-H Sq Road) for total dissolved solids. Both of these subwatersheds involve the public water supply. See **Table 13: TMDLs for Lakes and Streams in Hamilton Township (2019)** for more information on the existing TMDLs that apply to streams and lakes in Hamilton.

**Table 13: TMDLs for Lakes and Streams in Hamilton Township (2019)**

Stream TMDLs		
Date	Pollutant	Waterbody
2003	Fecal Coliform	Assunpink Creek, Pond Run, Crosswicks Creek, Pleasant Run, Miry Run, Doctors Creek
2003	PCBs	Back Creek (above Yardville-H Sq Road)
2003	PCBs	Crosswicks Ck (Doctors Ck-Ellisdale trib)
2003	PCBs	Crosswicks Ck (Ellisdale trib - Walnford)
2003	PCBs	Crosswicks Ck (below Doctors Creek)
2003	PCBs	Doctors Creek (below Allentown)
2003	PCBs	Duck Creek and UDRV to Assunpink Ck
2003	PCBs	Shady Brook/Spring Lake/Rowan Lake
2007	Total Phosphorus	Doctors Creek and Miry Run
Lake TMDLs		
Date	Pollutant	Waterbody
2003	Total Phosphorus	Spring Lake

Source: Rutgers Cooperative Extensions Water Resources Program, *Review and Evaluation of Total Maximum Daily Loads in Hamilton Township (2019)*

## Water Quality Monitoring Networks

New Jersey’s Integrated Report is based on the water quality assessments of a number of different monitoring networks. The Ambient Surface Water Quality Monitoring Network (ASWQMN) and the Ambient Biological Monitoring Network (AMNET) are the two sources of surface water monitoring data. There are six AMNET monitoring sites in Hamilton Township, two of which also serve as ASWQMN stations. There are a total of four ASWQMN stations in Hamilton Township. Beyond the information included in the Integrated Report, additional water quality data gathered from these monitoring stations is available through the USGS and the NJDEP at <https://www.nj.gov/dep/wms/bfbm/amnet.html>.

The ASWQMN is a cooperative network between USGS and NJDEP that samples surface water quality at 123 stations in the state, four of which are located in Hamilton Township. These stations monitor stream flow, as well as temperature, dissolved oxygen (DO), pH, carbon dioxide, nitrogen, ammonia, phosphorus, arsenic, and many other parameters.

AMNET, which is administered solely by NJDEP, evaluates the health of aquatic life as a biological indicator of water quality. The network includes over 760 non-tidal monitoring stations located throughout the state. Each station is sampled once every five years and each site is tested only for the diversity of aquatic life. In testing this water quality parameter, the NJDEP samples streams for benthic (bottom-dwelling) macroinvertebrates, which include such insects as dragonfly and caddisfly larvae, clams, mussels, snails, worms, and crustaceans that are large enough to be seen by the naked eye. Macroinvertebrates are studied because they are good indicator species: if pollution harms a stream, their populations are adversely affected and require a significant amount of time to recover. While chemical tests measure water quality on a given day, the presence or absence of macroinvertebrates represents water quality changes over a longer period preceding the testing day. Water bodies are rated on the number of different species of organisms present as well as the number of individuals within those populations.

New Jersey’s five major water regions are sampled on a rotational schedule once every five years. Visual observations, stream habitat assessments, and limited physical/chemical parameters are performed on each site. Past AMNET reports are available online, though recently their results have been rolled into the U.S. EPA’s National Environmental Performance Partnership System (NEPPS).

Visit NJDEP’s website for more information and access to past reports: <https://www.nj.gov/dep/wms/bfbm/amnet.html>. See **Table 15: Ambient Stream Quality Monitoring (ASWQM) Stations (2024)** and **Table 14: Ambient Biomonitoring Network (AMNET) Stations (2024)** below. These tables correspond with **Figure 18: AMNET and ASWQM Stations (2024)** on page 60.

**Table 14: Ambient Biomonitoring Network (AMNET) Stations (2024)**

Map Label	Station ID
1	AN0115
2	AN0117
3	AN0131A
4	AN0129B
5	AN0126B

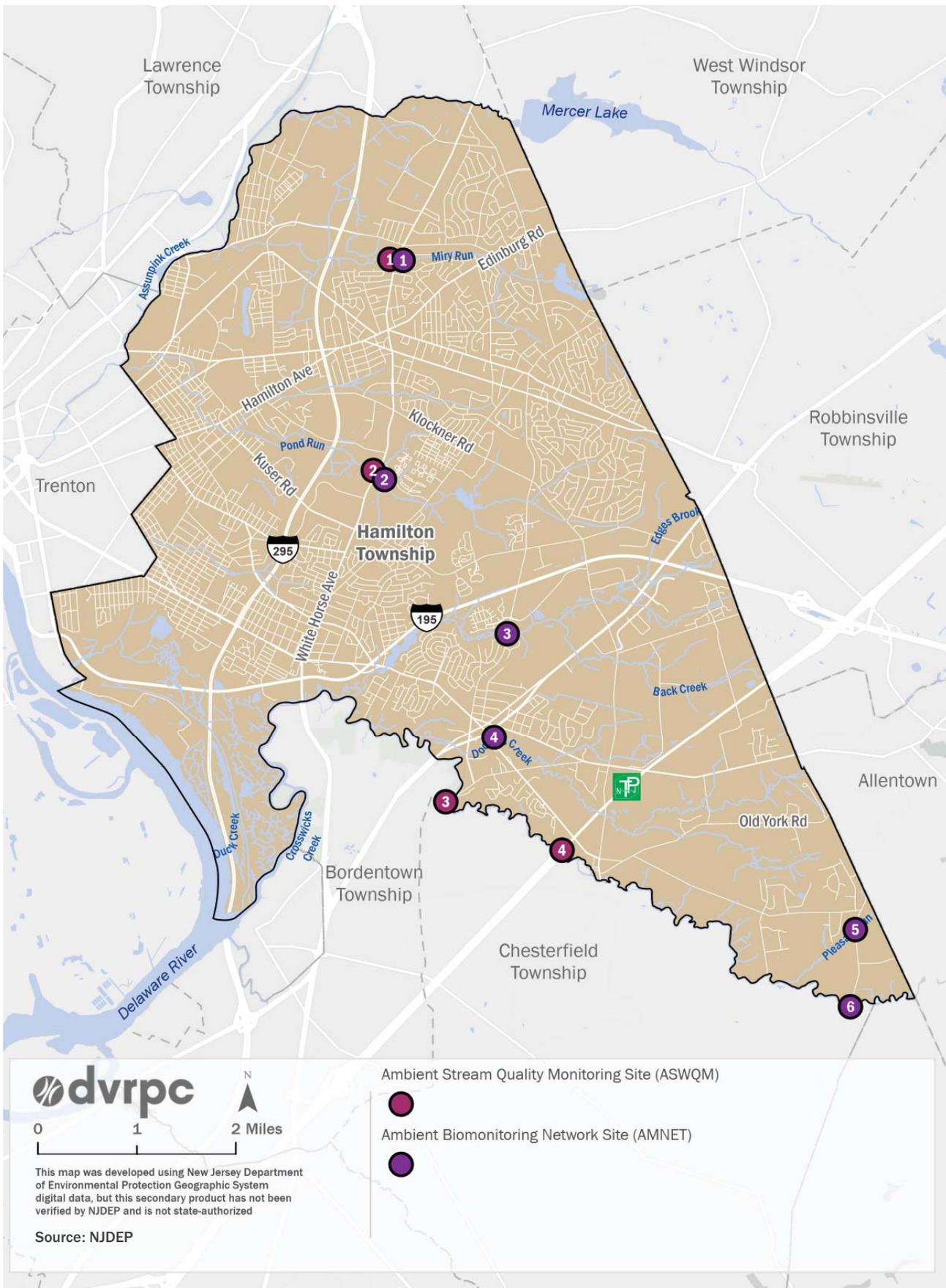
Source: NJDEP, Water Monitoring Standards (2024)

**Table 15: Ambient Stream Quality Monitoring (ASWQM) Stations (2024)**

Map Label	Station ID	Station Name
1	1463850	Miry Run at Rt 533 at Mercerville
2	1463920	Pond Run near White Horse
3	1464504	Crosswicks Creek ay Groveville Rd at Groveville
4	1464503	Crosswicks Creek Crosswicks NJ

Source: NJDEP, Water Monitoring Standards (2024)

Figure 18: AMNET and ASWQM Stations (2024)



## DRBC: Delaware Estuary Boat Run

The Delaware River and its tributaries are also assessed by the Delaware River Basin Commission (DRBC). The Commission conducts sampling of bacteria, nutrients, dissolved oxygen, heavy metals, chlorophylla, dissolved silica, and volatile organics. The closest Boat Run monitoring station to Hamilton is at the Biles Channel (RM 131.04).

## Fish Consumption Advisories

Certain fish may contain toxic chemicals, such as PCBs, dioxins, or mercury, which accumulate in bottom sediments and aquatic life, including fish tissue. Chemical contaminants, such as dioxin and PCBs, are classified by the U.S. EPA as probable cancer-causing substances in humans. Elevated levels of mercury can pose health risks to the human nervous system. Infants, children, pregnant women, nursing mothers, and women of childbearing age are considered to be at higher risk from contaminants in fish than other members of the general public. Since 1982, NJDEP has been catching fish at numerous sampling stations throughout the state and testing for contaminant levels. It then adopts advisories to guide residents on safe consumption practices.

The consumption advisories for fish caught in general freshwater are listed in **Table 16: Fish Consumption Advisories (2023) on page 61**. More details on preparation and consumption of fish are found at the advisory website: [www.state.nj.us/dep/dsr/njmainfish.html](http://www.state.nj.us/dep/dsr/njmainfish.html).

**Table 16: Fish Consumption Advisories (2023)**

Species	General Population	High Risk Population
Trout	One meal per week	One meal per week
Largemouth Bass	One meal per week	One meal per month
Smallmouth Bass	One meal per week	One meal per month
Chain Pickerel	One meal per week	One meal per month
Sunfish	No restrictions	One meal per week
Common Carp	One meal per month	Do not eat
Yellow Bullhead	No restrictions	One meal per month
Brown Bullhead	No restrictions	One meal per month

Source: NJDEP (2023)

## Causes of Water Quality Impairments

### Point Sources of Pollution

Point sources of pollution, which come from a single source or point, such as an industrial pipe discharge, are regulated by NJDEP through the New Jersey Pollution Discharge Elimination System (NJPDES). New Jersey created NJPDES in response to the Federal Clean Water Act of 1972, which mandated that each state develop water quality standards and regulate the amount of pollution entering water bodies. The act classified all water pollution into one of two categories: point source and nonpoint source pollution, which comes from many diffuse sources. Although the Federal Clean Water Act only required states to regulate point sources, New Jersey also regulates nonpoint sources through the authority of the NJPDES rules. See **Nonpoint Sources of Pollution on page 62**.

NJDEP, through the Division of Water Quality and the Bureau of Point Source Permitting, administers the NJPDES program (N.J.A.C. 7:14A). Under NJPDES, any facility discharging domestic or industrial wastewater directly into surface water or groundwater (generally through a septic system) must apply for and obtain a permit for discharging. Rather than creating individually tailored permits for every facility, the Division of Water Quality uses scientific standards to create and issue general permits for different categories of dischargers. NJDEP enforces the terms of the NJPDES permit by visiting discharging facilities and requiring facilities to periodically conduct and

submit water quality, biological, and toxicological analyses, and thermal impact and cooling water assessments.

As of 2024, NJDEP had issued 80 NJPDES active permits for point source pollution to individual facilities in Hamilton Township. Of the 80 permits, 69 discharge to stormwater (codes CPM, R9, RF, 5G2, 5G3, and SM2), four discharge to surface water (codes BPW, B4B, CG, and A), four discharge to groundwater (codes GW, K2, and I2), and three are permitted residuals (codes WTRG and SG4). See **Table 17: NJPDES Permits for Point Source Pollution (2024)** for more information.

### Nonpoint Sources of Pollution

Nonpoint source pollution can have a detrimental effect on the water quality and ecology of streams. These sources are the most difficult to identify and remediate because they are diffuse, widespread, and cumulative in their effect. Nonpoint source pollution in Hamilton is derived from stormwater drainage off paved surfaces such as streets and parking lots, commercial or industrial areas, residential sites (with and without detention basins), lawns, and from agricultural fields that lack adequate vegetative buffers. Some of this runoff comes to the waterways from similar sources in upstream townships, and some of it derives from Hamilton land uses.

Some examples of nonpoint source pollutants contained in stormwater runoff include the following: excess fertilizers, herbicides, and insecticides from residential lawn areas and agricultural lands; oil, grease, rubber, and toxic chemicals from automobiles and improper disposal of household wastes; acid rain and mercury from fossil fuel-fired energy production; sediment from improperly managed construction sites, crop and forest lands, and eroding stream banks; salt from streets treated during winter precipitation events; nutrients from yard waste left to decompose on the street; and bacteria and nutrients from livestock, geese, pet wastes, and faulty septic systems.



**Storm Sewer in Hamilton Township**

Source: Mel Musie, DVRPC

**Table 17: NJPDES Permits for Point Source Pollution (2024)**

NJPDES Permit	Program Interest Number	Name	Facility Information	Expiration Date	Permit Type	Status
NJ0026301	46419	Hamilton Township WPCF	300 Hobson Avenue Hamilton, NJ 08610	06/30/28	Sanitary Wastewater (IP) (A)	Approved
NJ0031895	46054	Congoleum Corp Plant 2	1945 E State Street Hamilton, NJ 08619	01/31/23	Individual Stormwater (IP) (RF)	Expired
NJ0159191	251939	USPS Trenton Process and Distribution Center	680 Route 130 Hamilton, NJ 08650	07/31/23	Discharge to Groundwater (IP) (GW)	Expired
NJG0001198	46376	Robert Frost WTF	300 Hobson Avenue Hamilton, NJ 08610	06/30/28	Potable Water Treatment Plant (GP) (BPW)	Approved

NJPDES Permit	Program Interest Number	Name	Facility Information	Expiration Date	Permit Type	Status
NJG0032832	46992	The Trane Company	2231 E State Street Hamilton, NJ 08619	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0101923	46138	Bordentown City WFP	120 Route 206 N Hamilton, NJ 08610	07/31/24	Potable WTP Basins & Drying Beds (GP) (I2)	Approved
NJG0118290	48471	United Parcel Service Inc NJTRN	4 Fairgrounds Road Hamilton, NJ 08619	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0118974	48532	PGT Trucking Inc	110 Patterson Avenue Hamilton, NJ 08610	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0119105	48545	Clayton Block Co. Inc/ Yardville	111 Martins Lane Yardville, NJ 08620	10/31/13	Concrete Products Manufacturing Stormwater (GP) (CPM)	Expired
NJG0129135	49345	Buoy 98 Marine Db Ross Marine	2445 Lambertson Road Hamilton, NJ 99999	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0136646	46376	Robert Frost WTF	Robert Frost & Surrey Drive Hamilton, NJ 08690	07/31/24	Potable WTP Basins & Drying Beds (GP) (I2)	Approved
NJG0142590	187743	Hamilton Bus Garage	600 Sloan Avenue Hamilton, NJ 08619	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0143332	194843	Gaum Inc	1080 Route 130 Hamilton, NJ 08691	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0150258	198044	Hamilton Township	2090 Greenwood Avenue Hamilton, NJ 08650	12/31/27	MS4 - Tier A Municipal Stormwater (GP) (R9)	Approved
NJG0157490	245602	XPO Logistics Freight Inc.	107 Youngs Road Mercerville, NJ 08619	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0158259	46419	Hamilton Township WPCF	300 Hobson Avenue Hamilton, NJ 08610	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0159140	251939	USPS Trenton Process and Distribution Center	680 Route 130 Hamilton, NJ 08650	03/31/24	Non-Contact Cooling Water (GP) (CG)	Expired
NJG0159701	253560	New Penn Motor Express Inc	15 Thomas J Rhodes Industrial Boulevard Mercerville, NJ 08619	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0162230	280402	White Eagle Printing Co	2550 Kuser Road Hamilton, NJ 08691	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0163716	285047	H. Liedtka Co Inc	340-B Patterson Avenue Hamilton, NJ 08610	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0165492	290934	KNF Neuberger Inc	2 Black Frst Road Hamilton, NJ 08691	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0165557	291152	Pitt Ohio Express LLC	900 Klockner Road Hamilton, NJ 08690	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0169714	453972	Jersey Precast Corp	853 Nottingham Way Hamilton, NJ 08638	10/31/13	Concrete Products Manufacturing Stormwater (GP) (CPM)	Expired
NJG0172073	477659	NJDOT Route 33 Over Conrail	268 Evergreen Avenue , 22 Fir Hamilton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved

NJPDES Permit	Program Interest Number	Name	Facility Information	Expiration Date	Permit Type	Status
NJG0172979	480885	RS Family Dental	2550 Kuser Road Hamilton, NJ 08691	10/31/23	Dental Facilities Onsite WW Treatment Systems (GP) (K2)	Expired
NJG0174068	491838	YRC Freight 112	49 Thomas J Rhodes Industrial Drive Hamilton, NJ 08619	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0189251	552187	Walgreens - Hamilton	2021 Nottingham Way Hamilton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0198293	46419	Hamilton Township WPCF	300 Hobson Avenue Hamilton, NJ 08610	12/31/26	Sludge Quality Category 4 (GP) (S4G)	Approved
NJG0213349	600225	Amtrak Substation 34a - Hamilton Substation	Amtrak Row, Off Industrial Avenue Hamilton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0215503	605576	The Homestead at Hamilton	Kuser Road Hamilton, NJ 08691	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0220001	617063	Troil Warehouse & Recycling Center	2485 E. State Street Extension Hamilton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0220604	619120	Acres Auto Recycling	74 Youngs Rd Hamilton, NJ 08619	09/30/18	Scrap Metal Processing Stormwater (GP) (SM2)	Expired
NJG0224537	46138	Bordentown City WFP	120 Route 206 N Hamilton, NJ 08610	12/31/24	Sludge Quality Categories 10 - 13 (GP) (WTRG)	Approved
NJG0224707	46376	Robert Frost WTF	Robert Frost & Surrey Drive Hamilton, NJ 08690	12/31/24	Sludge Quality Categories 10 - 13 (GP) (WTRG)	Approved
NJG0227706	638864	Chambers Street / Hamilton Square	Chambers Street/Cedar Lane Hamilton, NJ 08610	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0228567	646727	Briad Residence Inn Hotel	559 Route 130 Hamilton, NJ 08961	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0234133	663216	NJDOT I-295 Median Crossover #2205855	I-295 Hamilton, NJ 08690	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0241202	684804	Bossi Residence	55 Tattletown Road Hamilton, NJ 07610	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0249921	713833	PSE&G Mercer Coal Pile Stormwater Conveyance	2512 Lambertson Road Hamilton, NJ 08611	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0251232	717742	Fairway Building Products LLC	2075 E State Street Ext Hamilton, NJ 08619	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0253618	722790	Polaris Executive Center LLC	Cabot Drive Hamilton, NJ 08690	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0266671	751329	Highglen Clover Square	3100 Mercerville- Quakerbridge Road, & 101 Sloan Trenton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved

NJPDES Permit	Program Interest Number	Name	Facility Information	Expiration Date	Permit Type	Status
NJG0269484	756397	PSE&G Hamilton Substation - Outside Plant	1855 East State Street Hamilton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0269557	756415	2622 Kuser Road Subdivision	2622 Kuser Road Subdivision Hamilton, NJ 08690	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0272485	761881	Wingate Apartments Clubhouse & Rec. Fac.	210 Wert Avenue. Hamilton, NJ 08610	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0272728	763228	Congoleum Facility Demo	861 Sloan Avenue Hamilton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0274861	766239	Colonial Pipeline Line 3 Ac Mitigation Pipeli	South Broad Street Hamilton, NJ 08691	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0275107	766855	2551 South Broad, LLC	2549-2555 South Broad Street Hamilton, NJ 08610	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0283002	782908	Hamilton Trans LLC	1732 S Olden Avenue Hamilton, NJ 08610	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0291943	799339	Proposed Residential Development	Kuser Road Hamilton, NJ 08650	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0295892	807021	VG Resources LLC SWT&M Recycling Center	2100 Lambertson Road Hamilton, NJ 08611	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0297437	811059	Manchester 270 Development Phase 1	861 Sloan Avenue Trenton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0303143	835078	Capital Quick Lubes-Mercerville, Inc.	702 NJ Route 33 Hamilton, NJ 08619	12/31/23	Groundwater Petroleum Product Cleanup (GP) (B4B)	Expired
NJG0310131	879694	Lehigh, Vetterlien and Bucknell Avenues	Lehigh Avenue, Vetterlien Avenue, Hamilton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0317853	929675	Hamilton Marketplace Retail Building	130 Marketplace Boulevard Robbinsville, NJ 08690	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0318205	930421	Chapel Bridge At Hamilton	381 Ward Avenue Hamilton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0319431	933155	Horizon Center Drive	Horizon Drive Hamilton, NJ 08691	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0319783	934331	PSE&G Hamilton Substation - Laydown Site	Rosalia Avenue Hamilton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0320561	936452	Retail Development	1170 Route 130 Hamilton, NJ 08690	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0320668	936739	Bergey's Truck Center	5 Commerce Way Hamilton, NJ 08691	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0321010	937514	Duck Island Terminal Site	2470 Lambertson Road Hamilton, NJ 08611	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved

NJPDES Permit	Program Interest Number	Name	Facility Information	Expiration Date	Permit Type	Status
NJG0322636	942344	AMC Parking Lot Expansion & Site Improvement	240 Princeton Avenue Hamilton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0323691	945596	Amazon.com Services LLC DNK2	537-557 Route 130 Hamilton, NJ 08620	01/31/28	Basic Industrial Stormwater (GP) (5G2)	Approved
NJG0324019	946341	Woodrow Wilson Service Area	NJ Turnpike, Mile Post 58.7 Hamilton, NJ 08620	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0328651	973202	MDLI Headquarters	Adjacent To Exit 3B Exit Ramp Route195 Hamilton, NJ 08690	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0328707	973267	South Broad Street-South Bound Lane Improvements	South Broad Street Hamilton, NJ 08610	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0330787	978757	Hamilton Distribution Center	646 Highway 130 Hamilton, NJ 08691	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0334880	991402	Klockner Road Apartments	1651 Klockner Road Hamilton, NJ 08620	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0335053	991789	Hamilton Distribution Center (Ph2)	646 US Hwy 130 Hamilton, NJ 08691	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0336246	995439	Chick-Fil-A Hamilton, NJ	500 Market Boulevard, Hamilton, NJ 08691	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0337544	998729	Switlik Parachute Co., Inc.	1325 East State Street Hamilton, NJ 08609	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0341142	1009194	Isles, Inc.	57 North Johnston Avenue Hamilton, NJ 08618	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0341452	1009980	Hamilton West Turf Field	2720 South Clinton Avenue Hamilton, NJ 08690	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0343455	1015226	Steinert High School Track & Field Renovation	900 Klockner Road Hamilton, NJ 08690	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0344648	1018615	Nottingham High School Track & Field Renovation	1055 Klockner Road Hamilton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0352136	1039939	1384 Yardville	1384 Yardville Hamilton Square Road Hamilton, NJ 08691	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0355437	1050259	Princetel, Inc.	2560 East State Street Extension Hamilton, NJ 08619	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0356158	1052351	PSE&G Mercer County GSMP Sub 1 - 2024	Various Hamilton, NJ 08610	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0356336	1053160	Hewitt Street Self Storage	Henry Street Hamilton, NJ 08611	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved
NJG0356701	1053999	2023-515 Hamilton Storage LLC	1514 Kuser Road Hamilton, NJ 08260	02/28/27	Construction Activity Stormwater (GP) (5G3)	Approved

Source: NJDEP Data Miner (2024)

## Stormwater Management

In February of 2004, NJDEP issued a new Stormwater Management Rule, as required by U.S. EPA's Phase II Stormwater Management Program for Municipal Separate Stormwater Sewer Systems (MS4). NJDEP updated the rule in 2020 and amended it in 2023. It applies to all municipalities, county road departments, and public institutional facilities on large sites (such as hospitals and colleges) that contain stormwater sewer systems that are separated from regular sewer systems. Each entity with this type of sewer system is required to obtain an MS4 general permit for the stormwater system.

Under the NJPDES permit, a municipality must meet certain specific requirements in planning, ordinance adoption, education, management of township facilities, and investigation of parts of the stormwater system. Municipalities are classified as either Tier A or Tier B under the stormwater rules. Hamilton is listed among the Tier A municipalities, which have higher population levels and densities, as well as more stringent requirements than Tier B municipalities.

Hamilton Township addressed the NJPDES permit requirements with multiple ordinances, including the Stormwater Control Ordinance, which it first adopted in 2005 and amended in 2021. Hamilton updated its Municipal Stormwater Management Plan (MSWMP) in 2018. The MSWMP adopted the performance standards set out in N.J.A.C. 7:8 and included design and performance standards for stormwater facilities for new major development projects, build-out analyses for the township and its HUC-14 watersheds, and low impact development recommendations for mitigating stormwater runoff, among other elements. The township also adopted a Municipal Stormwater Pollution Prevention Plan in 2005, with updates in 2018, 2019, and 2023.

In March 2021, NJDEP adopted the Green Infrastructure Rule as an amendment to the Stormwater Management rules, N.J.A.C. 7:8. It now requires all new public and private development to incorporate green infrastructure to the maximum extent practicable, rather than grey infrastructure.

NJDEP adopted the Inland Flood Protection Rule in July 2023. This rule seeks to ensure that new development and redevelopment are well-suited to manage both current and future levels of rainfall, runoff, and flooding. Municipalities with a MS4, including Hamilton Township, are required to update their stormwater control ordinances to incorporate the new rule changes by July 17, 2024. Related to stormwater, the Inland Flood Protection Rule requires stormwater Best Management Practices (BMPs) to be designed to manage runoff for both today's storms and future storms and removes use of Rational and Modified Rational methods for stormwater calculations.

Hamilton has a number of recent green stormwater infrastructure projects that have been implemented, such as a recent infrastructure update in Roebbling Park, located within Abbott Marshlands. The parking lot is slated to be redesigned into a stormwater friendly lot. The previous stormwater runoff was eroding the parking lot, and making the lake a less enjoyable place to go. Rain gardens are a big part of the redesign, due to their ability to catch runoff. Additionally, native plants will be planted in the area, helping to catch runoff and also beautify the area for those visiting the park.

A primary goal of the statewide Stormwater Management Rules is to promote the use of low-impact and nonstructural stormwater management practices, such as preserving open space, protecting natural systems, clustering development, reducing or disconnecting impervious coverage, and utilizing existing natural features to manage stormwater. These practices are in contrast to structural stormwater management facilities like basins (by far the most commonly used stormwater structure), infiltration beds, pervious pavement, and green roofs. Although the Stormwater Management Rules state that nonstructural stormwater management practices should be utilized to the maximum extent practicable, land developers tend to maximize ratable area in site plan design rather than holistically planning a site to preserve its natural elements, open space, and inherent stormwater retention functions.

## Floodplains

Areas susceptible to being inundated by floodwaters from any source are called floodplains, or flood hazard areas. Floodplains encompass a floodway, which is the portion of a floodplain subject to high velocities of moving water, and the adjacent flood fringe, which includes lands outside the floodway that hold excess water during overflow of the normal stream channel. The floodway is the most dangerous part of the floodplain.

The 1-percent floodplain, also known as the 100-year floodplain, is defined as the land area that will be inundated by the overflow of water that has a 1 percent chance of occurring in any given year (the 100-year flood). The probability of flooding is computed based on historical river flows and flood events. At least 10 years of data is required to calculate flood probabilities. This number represents a moving average and can be periodically recalculated to account for changes in flood trends in an area.

Floodplains require protection in order to prevent loss to residents, especially within the boundaries of the floodway. Equally important is the preservation of the environmentally sensitive aquatic communities that exist in floodplains. As food for many other species, these aquatic communities support the aquatic ecosystem as a whole. In addition, floodplains remove and mitigate various pollutants dissolved in stormwater, particularly fertilizer, when vegetation located within them absorbs the pollutants through their roots. The vegetation can also physically trap nutrients and sediments and prevent them from traveling farther downstream. All efforts to keep development out of floodplains will help to preserve the flood-carrying capacity of streams and their water quality.

In New Jersey, construction in areas subject to flooding is regulated to protect lives, property, and the environment through the the Flood Hazard Area Control Act, N.J.S.A. 58:16A-50 et seq., and its implementing rules at N.J.A.C. 7:13. Proposed activities in a flood hazard area require issuance of a flood hazard area permit or a letter of non-applicability from the NJDEP.

In July 2023, NJDEP adopted the Inland Flood Protection Rule. This rule updates New Jersey's existing flood hazard regulations, in addition to its stormwater management regulations, by using the best climate-informed precipitation data. It establishes a new design flood elevation that states that the elevation of habitable first floors will be two feet higher than currently indicated on NJDEP state flood maps and three feet higher than indicated on FEMA maps. It also requires the use of future projected precipitation when calculating flood elevations. **Figure 19: Floodplains (2023) on page 70** depicts the NJ Inland Design Flood Elevation, as modeled by the NJ Climate Change Resource Center at Rutgers University.

FEMA maps show that, as of 2019, almost 6,000 acres (21 percent) of Hamilton Township's land is within the 100-year flood hazard area, and an additional 853 acres (three percent) is within the 500-year flood hazard area. This indicates about a 5 percent increase of land within the 100-year floodplain since 2008, when it was at about 16 percent. Only a slight increase of land within the 500-year floodplain was seen in this time frame. The floodplains within Hamilton Township are located along Assunpink, Doctors, Crosswicks, and Back creeks, as well as the Delaware River, Miry Run, and Pond Run. The total land area of each flood zone is listed in **Table 18: Floodplains (2019)** and the extent of the flood zones is shown in **Figure 19: Floodplains (2023)**. For more information on stormwater management, see the **Stormwater Management on page 67**.

**Table 18: Floodplains (2019)**

Zone	Acres	Percent of Township
100-Year	5,598	21.8%
500-Year	853	3.31%
NJ Inland Design Flood	6,484	25.2%

Source: FEMA, Floodplain Data (2019) and Rutgers University, NJ Climate Resource Center Inland Design Model (2020)

## Impervious Coverage

The volume of stormwater runoff that is carried to a stream impacts the stream channel condition. Increased volume usually results from increased impervious surface within a subwatershed. As an area becomes developed, more stormwater is directed to the streams from neighborhood storm drains, residential and commercial stormwater facilities, and road drainage. In general, scientists have found that levels of impervious cover of 10 percent or more within a watershed are directly linked to increased stormwater runoff, enlargement of stream channels, increased stream bank erosion, lower dry weather flows, higher stream temperatures, lower water quality, and declines in aquatic wildlife diversity. When impervious cover reaches 25 to 30 percent, streams can become severely degraded. As shown in **Table 19: Impervious Coverage by Subwatershed (2014)**, impervious coverage is relatively high in many of the subwatersheds of Hamilton Township.

Special attention should be paid to new developments in the Pond Run subwatershed (HUC 14 ID: 02040105240040). Within this subwatershed, located in the center of Hamilton Township, nearly one-third of the land is covered with impervious surfaces. Shady Brook, Miry Run, and Pond Run have exceeded the 25 to 30 percent threshold that entails eventual severe stream degradation. However, there are still some larger areas of undeveloped, unpreserved lands that may be facing development pressure.

**Table 19: Impervious Coverage by Subwatershed (2014)**

Subwatershed	Total Area		Land Use Area		Water Area		Impervious Coverage		
	(ac)	(mi <sup>2</sup> )	(ac)	(mi <sup>2</sup> )	(ac)	(mi <sup>2</sup> )	(ac)	(mi <sup>2</sup> )	%
Pond Run	5,596	9.3	5,900	9.2	55.7	0.09	1,797	2.8	30.5
Miry Run	3,716	5.8	3,653	5.7	63	0.1	1,026	1.6	28
Shady Brook	2,838	4.4	2,787	4.4	50	0.08	823	1.3	29.5
Assunpink Creek	1,809	2.8	1,783	2.8	25.8	0.04	429	0.7	24
Doctors Creek	3,053	4.8	3,017	4.7	36	0.06	232	0.4	7.6
Back Creek	2,980	4.7	2,969	4.6	11.3	0.02	563	0.9	19
Delaware River and Crosswicks Creek	5,489	8.6	4,927	7.7	563.2	0.91	804	1.2	16
<b>Total</b>	<b>25,841</b>	<b>40.4</b>	<b>25,036</b>	<b>39.1</b>	<b>805</b>	<b>1.3</b>	<b>5,674</b>	<b>8.9</b>	<b>22.7</b>

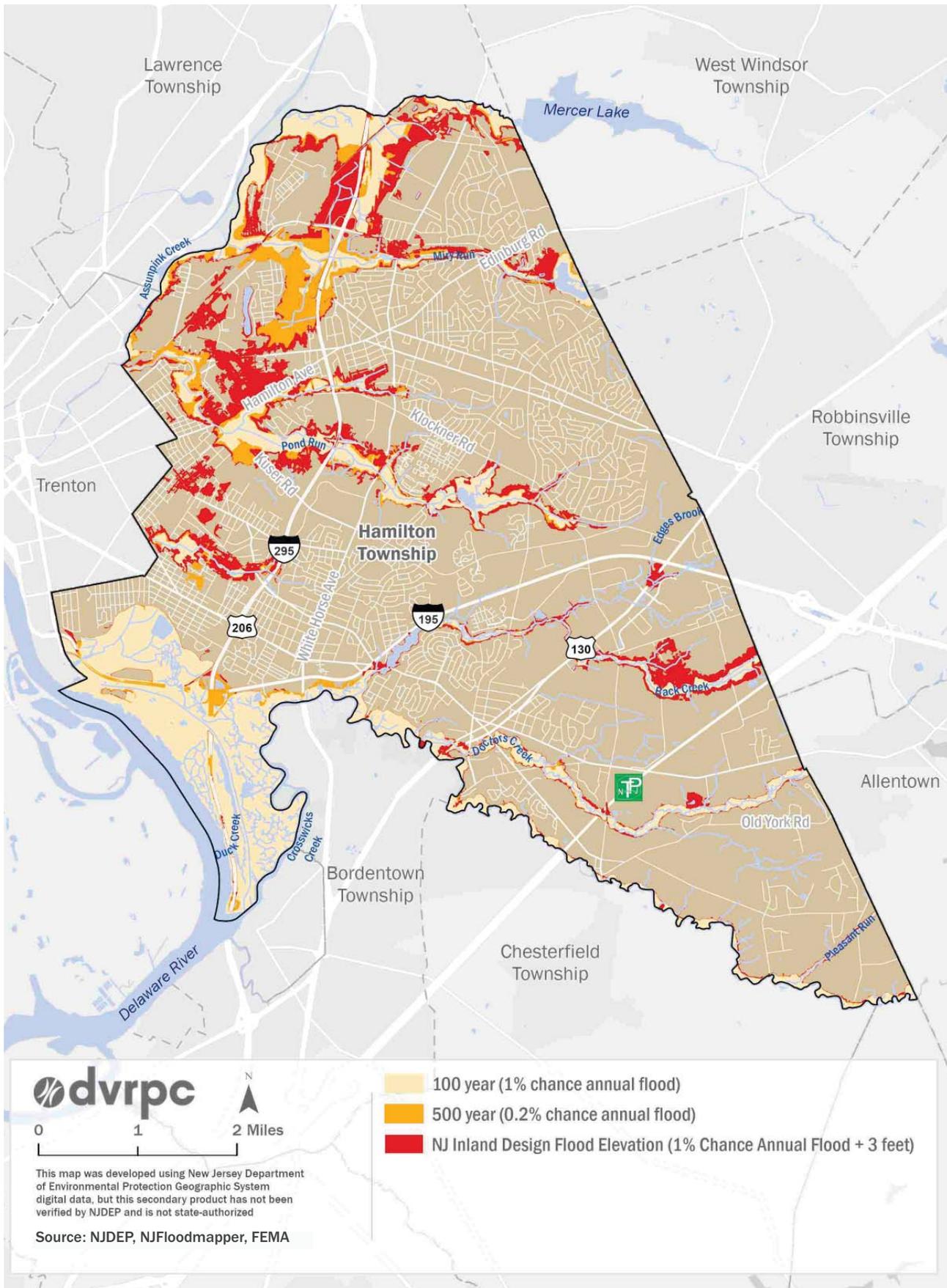
Source: Rutgers Cooperative Extension Water Resources Program, Impervious Cover Assessment for Hamilton Township (2014)

## Stream Buffers and Greenways

A stream buffer is the region immediately beyond the banks of a stream that serves to limit the entrance of sediment, pollutants, and nutrients into the stream itself. Stream buffers are quite effective at filtering substances washing off the land. The vegetation of the buffer traps sediment and can utilize (uptake) a percentage of the nutrients flowing from lawns and farm fields. When forested, a stream buffer promotes bank stability and serves as a major control of water temperature. The buffer region also serves as a green corridor (a greenway) for wildlife to move between larger forested habitat areas. Residents can utilize these greenways for recreation with the addition of trails, bikeways and access points to the water for fishing and canoe or kayak launching.

The importance of a healthy, intact buffer zone (also referred to as a riparian corridor)—especially for headwater streams—has been well documented scientifically over the past 20 years. However, there is less agreement and much continuing research on the appropriate minimum width of a buffer. In addition to restrictions of development in the floodplain (discussed in the **Figure 19: Floodplains (2023) on page 70**), New Jersey state law requires a 50-foot buffer along most streams, although municipalities can establish wider buffers. In the scientific literature on this issue, a recommended minimum buffer width of 100 feet is most common. Buffers of up to 300 feet are required in New Jersey for category 1 waterways and are recommended for wildlife corridors and potential passive recreational use, such as walking trails.

Figure 19: Floodplains (2023)



## Regulations

In 2005, Hamilton Township adopted a Stream Buffer Conservation Zone ordinance, which details performance standards and permitted land uses within the stream buffers. This ordinance establishes a 150-foot buffer along C1 waterways, and a 75-foot buffer along all other waterways. These buffers are measured from the top of each bank at full flow, maximum pool elevation, the centerline of intermittent streams, or the 100-year floodplain, whichever is greater. The 75-foot stream buffer regulated by Hamilton Township is less than the 100-foot minimum buffer recommended by experts, but more than the state minimum buffer. As shown in **Figure 24: Natural Vegetation (2022) on page 88**, the majority of streams in Hamilton Township have vegetated buffers, typically made up of wooded deciduous wetlands. However, the presence, width, and integrity of buffers vary greatly across the township.

The New Jersey Freshwater Wetlands Protection Act incorporates buffer requirements into its wetland protection regulations. The width of the transition zone extending beyond a wetland is determined by the value of the wetland, based on its current use and the documented presence or absence of threatened or endangered species. Municipalities may not establish buffers on wetlands that exceed those required by the state statute. However, the municipality can make certain that those limits are accurate through its review of the wetland's delineation process, and it can also monitor use of the land within the transition area and act against encroachments.

Hamilton Township's Open Space and Recreation Plan (OSRP), created in 2003 and updated in 2009 and 2021, promotes the creation of greenways along creeks and streams to preserve water quality and create hiking trails. It can be found here: <https://www.hamiltonnj.com/285/Planning>. This plan recommends the acquisition of approximately 21 miles of stream corridors within the township and 344 acres of additional park land. At an average of 200-feet in width, the total area of these preserved stream corridors would occupy 500 acres. Currently, the stream buffers along 23 miles of streams in Hamilton Township, occupying 1,806 acres of land, are owned by the township, county, or state.

The Crosswicks-Doctors Creek Watershed Association, Inc. (CDCWA), formerly known as the Greenway Group, published the Crosswicks Creek/Doctors Creek Watershed Greenway Plan in 2004. The greenway plan identified priorities for protecting water quality, including managing stormwater and protecting riparian areas, steep slopes, and headwaters areas. The Greenway Plan also recommended that a feasibility study should be performed to identify the specific location of proposed trails and historic markers. The group published the Doctors Creek to Assunpink Trail Feasibility Study in 2007.

The D&R Canal Greenway runs adjacent to the Abbott Marshlands, providing a key corridor for wildlife. The nonprofit D&R Greenway Land Trust has preserved over 22,000 acres along and beyond the D&R Canal.

Restoration of stream buffers on agricultural lands is supported by various programs, such as the Conservation Reserve Program, administered by the U.S. Department of Agriculture's Farm Service Agency and the New Jersey Department of Agriculture. This program compensates farming landowners for the loss of land being converted to a buffer or other habitat. It also funds or directly creates new buffers where they are absent. Programs such as the Environmental Quality Incentive Program, administered by the NRCS, encourage the due care management of agricultural lands, involving the proper levels of fertilizer and pesticide applications to farmland. It funds up to 75 percent of the costs of eligible conservation practices. These are all programs in which individual landowners volunteer to take part.

Protecting riparian areas from development and enhancing or maintaining healthy vegetation in the stream corridor can help improve water quality, reduce flooding, and encourage biodiversity. Environmental commissions can

encourage the preservation of existing vegetation and replanting of native vegetation along bare stream banks. Use of native vegetation in landscaping minimizes the need for pesticide and fertilizer use and requires less frequent watering and mowing.

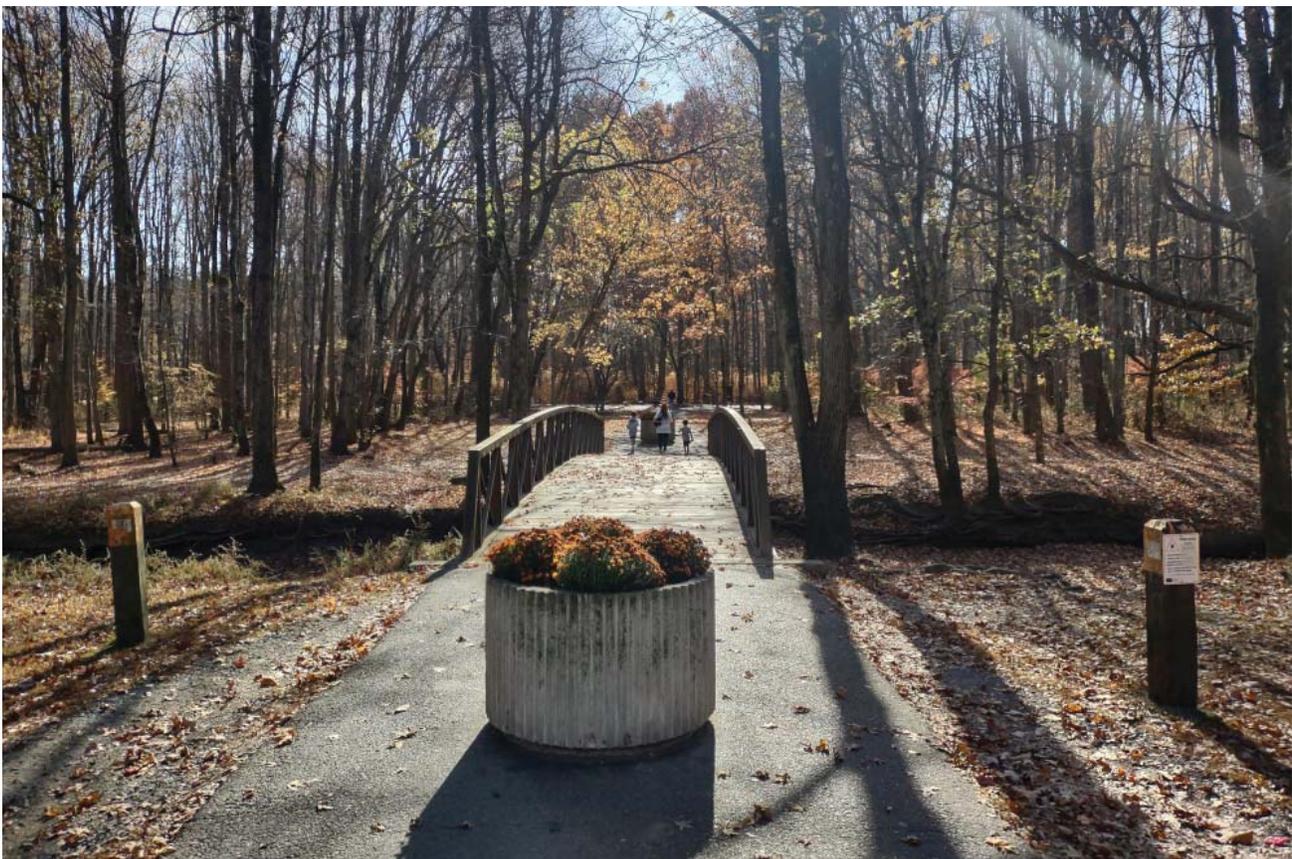
## Groundwater

### Aquifers

In the Inner Coastal Plain, precipitation seeping through the soil accumulates in the empty spaces between rock particles; this underground water is known as groundwater. An aquifer is an underground layer of rock and soil through which water can easily move. The silt and clay layers, which impede the movement of water, are called confining beds. Confining beds help slow the entry of any surface contaminants into the groundwater.

Coastal Plain aquifers are not horizontal layers, but tilt toward the southeast, getting deeper as they cross the state toward the Atlantic Ocean. Because of this tilting, each aquifer emerges on the land surface in a sequential manner. The deepest strata emerge on the surface near the Delaware River. Where each individual layer emerges is called its outcrop area. Preventing contamination of the land in outcrop areas is extremely important in order to maintain a safe drinking supply. **Table 5: Geologic Formations in Hamilton Township (2023) on page 24** shows the geologic formations found in Hamilton Township.

In the Piedmont Plateau, groundwater is drawn from joints and fractures, or networks of fractures, in the rock. The number and size of these joints and fractures decrease with increasing depth below the ground surface. Shallow parts of bedrock aquifers are generally unconfined, meaning they are not bounded by confining layers made of less permeable materials, while deeper sections may be semi-confined or fully confined.



**Walking bridge over Pond Run, Veterans Park**

Source: Rob Poppert, Hamilton Township

### **Potomac-Raritan-Magothy Aquifer System (PRM)**

Water supply wells in Hamilton Township, used both for drinking water and irrigation, tap the PRM aquifer system, the deepest and most abundant aquifer in the Atlantic Coastal Plain. The PRM is a deep geological formation underlying the Coastal Plain portion of Hamilton Township. This formation outcrops in a southwest to northeast band across Hamilton Township.

This multiple aquifer system is actually a large series of formations that have been combined and described as a single unit because the individual formations—the Potomac group and the Raritan and Magothy formations—are lithologically indistinguishable from one another over large areas of the Coastal Plain. That is, they are composed of materials of like kind and size laid down by both an advancing and retreating sea across southern New Jersey, and by deposits of material that came from the breakdown and erosion of the Appalachian and Catskill Mountains beginning in the Cretaceous Period.

### **Groundwater Recharge**

The water stored in aquifers enters the groundwater system when precipitation seeps into, or infiltrates, the soil in groundwater recharge areas. The amount of precipitation that infiltrates the soil and actually enters an aquifer to become groundwater, recharging the aquifer, is a function of many factors, including climatic conditions, the nature of the soil, the vegetation of an area, and the nature and structure of the aquifer itself. **Figure 20: Groundwater Recharge (2024) on page 74** illustrates areas that have the potential for higher groundwater recharge.

The New Jersey Geological Survey (NJGS) developed a methodology for evaluating land areas for their ability to transmit water to the subsurface, using precipitation records, soil surveys, and land use/land cover data. NJDEP has used this methodology to map the groundwater recharge potential of land areas throughout the state. Recharge is equivalent to the amount of precipitation per year that could reach the water table in an area with a particular combination of soils and land use. It is expressed as inches per year.

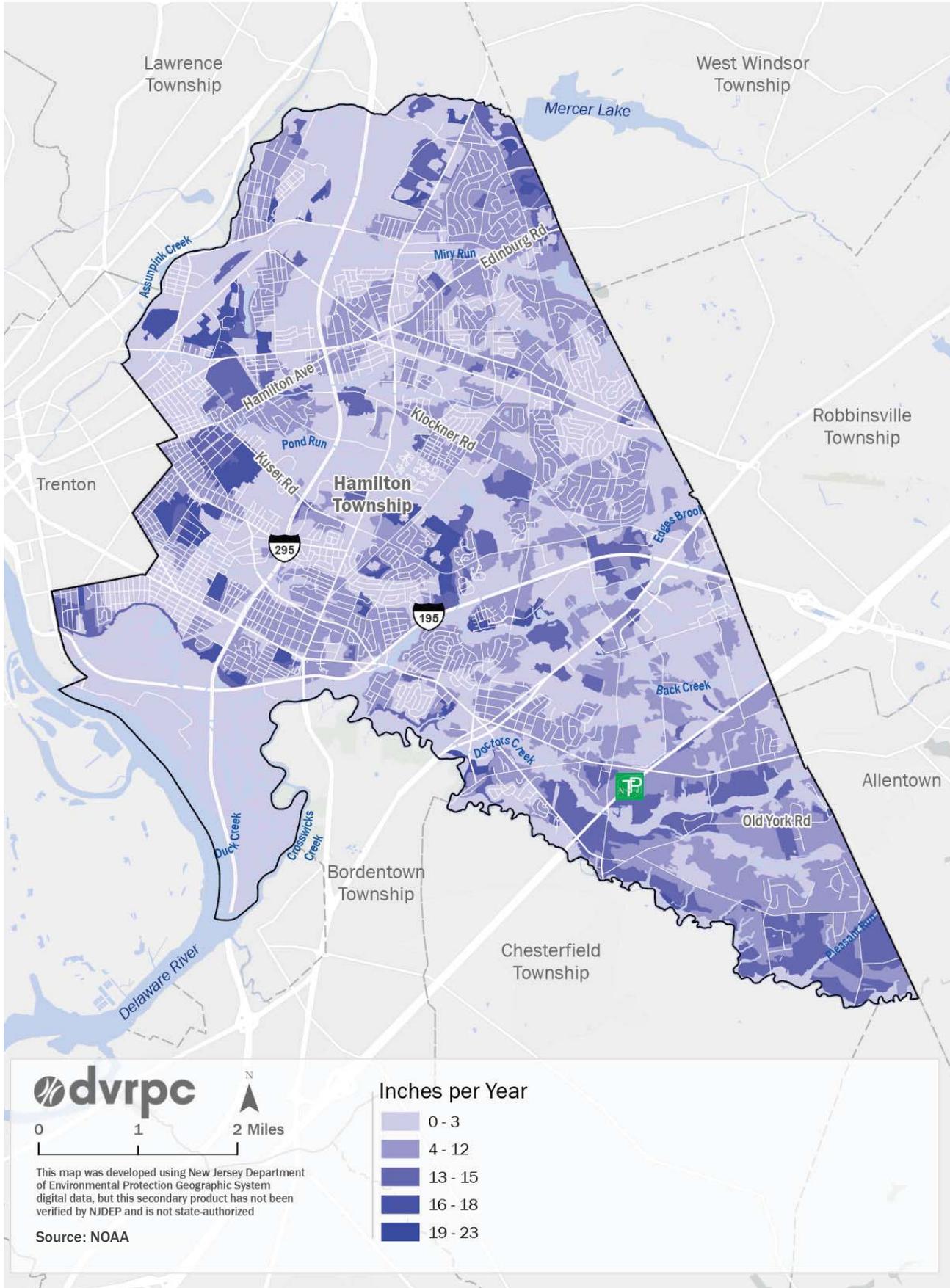
The NJGS is limited and this method only evaluates groundwater recharge potential, not aquifer recharge. It should be considered accordingly. The NJGS has stated that this method only evaluates groundwater recharge potential, not aquifer recharge, and should be considered accordingly. Groundwater recharge potential is not the same as aquifer recharge, which the NJGS has defined as the recharge rate for those geological formations that yield economically significant quantities of water to wells.

When areas with high rates of groundwater recharge potential are developed, less precipitation infiltrates the soil and more is lost as stormwater runoff, thereby decreasing the amount of water available for aquifer recharge. This can increase flooding and erosion, destabilize streambanks, and further impair water quality.

Areas with the highest rates of groundwater recharge are found throughout the township, particularly in the agricultural southeastern portion of the township. In general, lands immediately adjacent to the creeks' floodplains, marshes, and wetlands of the township exhibit less groundwater recharge. Large amounts of paving and impervious cover on high recharge lands will have the most detrimental impact, although these areas are also usually the places most suitable for building because they are well drained. Conversely, these are also regions where the dilution of substances from septic systems, such as nitrates, may require a larger land area because the soils are usually more "porous." For example, minimum average lot sizes of two to four acres are often needed for proper nitrate dilution from septic systems in areas having 10 or more inches-per-year of groundwater recharge, depending on the soils.

While the surest way to protect groundwater recharge is to leave land undeveloped, there are ways in which urbanized areas can preserve ground and stormwater standards. Best Management Practices, such as tree

Figure 20: Groundwater Recharge (2024)



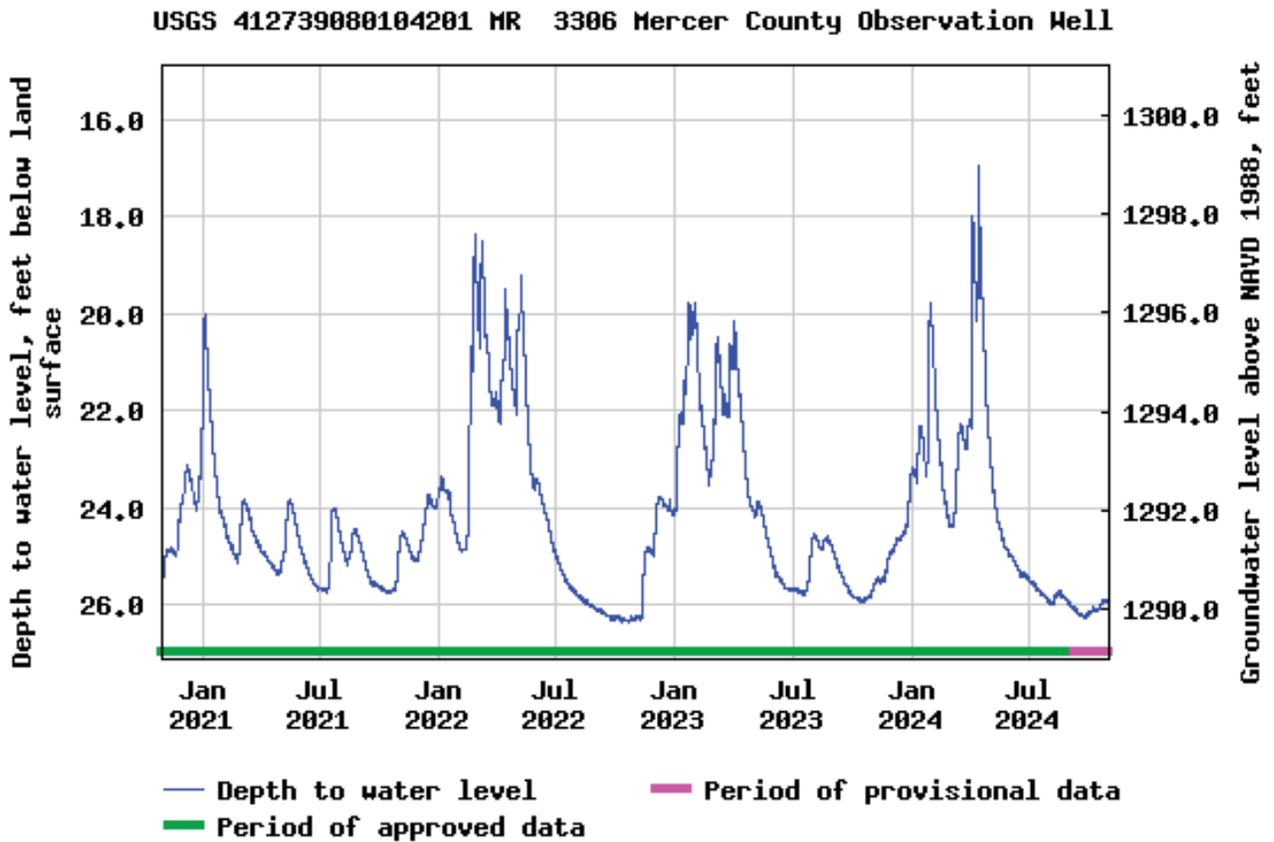
trenches, bioswales, rain gardens, rain barrels, and porous pavement, can be used with great success to capture, treat, and infiltrate precipitation in developed areas from all but the most significant storm events. Also referred to as “green stormwater infrastructure,” these techniques are used in more developed communities to manage stormwater and protect drinking water supplies.

### Groundwater Monitoring

The USGS maintains a network of active groundwater observation sites to provide basic statistics about groundwater levels in the U.S. Within Mercer County, there is one groundwater observation site that is maintained by the New Jersey Water Science Center of USGS. It is located at Cranston Farms.

The groundwater level indicates the depth of the water below the surface of the land. With increased water level depth, wells must be drilled deeper to reach sizable and usable quantities of water. The groundwater levels of the observation site within Hamilton Township has varied little over the past 50 years. Groundwater fluctuations occur naturally and may be due to changes in precipitation. See **Figure 21: Groundwater Observation Site Water Levels (2021–2024)** for a chart depicting fluctuations in groundwater levels from 2021 to 2024.

Figure 21: Groundwater Observation Site Water Levels (2021–2024)



Source: USGS (2023)

## Air Quality Criteria Pollutants

**Ground-level ozone (O<sub>3</sub>)** is formed when volatile organic compounds (VOC) and nitrogen oxides react with sunlight and heat. It is produced more in the summer months and is the primary constituent of smog. Ground-level ozone is a pulmonary irritant, which, even in low levels, can be dangerous to sensitive populations such as people with asthma or emphysema and the elderly. It can also affect plant growth and is responsible for hundreds of millions of dollars in lost crop production.

**Particulate matter (PM)**, or particle pollution, is made up of dust, ash, smoke, and other small particles formed from the burning or crushing of materials such as wood, rocks, and oil. When ingested, particulate matter can lodge deep in the lungs and can contribute to serious respiratory illnesses such as asthma or lung disease. Particulate matter also creates haze, reduces visibility, and covers buildings in dirty soot.

**Carbon monoxide (CO)** is a colorless, odorless gas that is formed when carbon fuel is not burned completely. It is a component of motor vehicle exhaust; therefore, higher levels of CO generally occur in areas with heavy traffic congestion. The highest levels of CO typically occur during the colder months when air pollution becomes trapped near the ground beneath a layer of rising warm air.

**Nitrogen oxides (NO<sub>2</sub>)** are a group of highly reactive gasses that contain nitrogen and oxygen in varying amounts. Motor vehicles, electric utilities, and homes and businesses that burn fuels emit nitrogen oxides; they can also be found naturally. Nitrogen oxides are primary components in ground-level ozone (smog), acid precipitation, and other toxic chemicals. Acid precipitation can cause lung ailments in humans, property damage, harm to aquatic life, and other environmental and human health problems.

**Sulfur dioxide (SO<sub>2</sub>)** is released into the atmosphere when fuel containing sulfur, such as coal and oil, is burned, and when gasoline is refined from oil. Sulfur dioxide dissolves in water vapor to form acid precipitation.

**Lead (Pb)** is a pollutant that was historically released by cars and trucks burning leaded fuel, in addition to its historic use in paint. Today, metal processing plants and trash incinerators are the major source of lead emissions. Lead tends to be a localized air pollutant, found in urban or high-traffic areas, and it is deposited in soil and water, harming fish and wildlife.

## CHAPTER 9:

# Air Quality

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Air quality is one of the most difficult environmental resources to measure because its sources are diffuse and regional in nature. Common sources of air pollution include industry, cars, trucks, buses, fires, and dust. For example, the burning of coal in Ohio, Michigan, and Western Pennsylvania to generate electricity sends pollutants such as sulfur, nitrogen, and particulate matter all the way to the East Coast. Locally produced sources of air pollution include daily roadway traffic and industrial facilities.

Increasing public awareness regarding air pollution led to the passage of a number of state and federal laws, including the original Clean Air Act of 1963 and a much stronger Clean Air Act of 1970 (CAA). In 1990, the CAA was amended and expanded by Congress to include a market approach to reducing air pollution by allowing certain companies to buy and sell emission “allowances,” or “credits.” The 1990 CAA also required transportation projects receiving federal funding to be in conformity with state air quality goals. Additionally, the 1990 CAA revised the way that air toxins are regulated, increasing the number of regulated toxic air pollutants from seven to 187.

In 1970, the U.S. EPA was formed to enforce the CAA. In New Jersey, the U.S. EPA allowed NJDEP to enforce the CAA because the state agency developed more stringent air standards and created a State Implementation Plan (see NJAC 7:27). The CAA identified six criteria pollutants (ozone, particulate matter, sulfur dioxide, nitrogen oxides, carbon monoxide, and lead) that are destructive to human health and the built and natural environment (see explanation of **Criteria Pollutants** in the box on **page 76**). The U.S. EPA sets National Ambient Air Quality Standards (NAAQS) for these pollutants based on human health effects, as well as environmental and property damage.

Between 1980 and 2019, total emissions of the six criteria air pollutants decreased by more than 70 percent. Stricter emissions standards in the auto industry have made cars 99 percent “cleaner” than 1970 models. Cars also pollute less because refineries are required to produce cleaner fuels; leaded gasoline was completely banned in 1995. As of 2023, industrial sources emitted about 1.5 million tons less toxic air pollution per year than in 1990.

### Air Quality Monitoring

The U.S. EPA created the Ambient Air Monitoring Program to help protect and assess air quality. The program is carried out by state and local agencies. The NJDEP’s Bureau of Air Quality Monitoring (BAQM) operates ambient air monitoring sites across the state. These sites assess various air quality parameters, including pollutant concentrations, population exposure, major pollution sources, background levels, regional pollutant transport, and secondary impacts in rural areas.

As of August 2024, NJDEP’s Bureau of Air Monitoring maintains a network of 29 air quality monitoring stations across the state and is working on the establishment of two new stations. Most of the monitoring stations are clustered in the New York metropolitan area. Each station monitors at least one of 23 parameters, which include many air pollutants, along with wind speed, wind direction, solar radiation, or other parameters.

Air quality data from monitoring stations in Trenton (120 Academy Street) and at Rider University (2083 Lawrenceville Road) assess air pollution relevant to Hamilton Township. Both stations are monitored at the neighborhood spatial scale, representative of one to 10 kilometers from the station, which would include Hamilton Township. In 2022, Trenton measured real-time PM<sub>2.5</sub> and Rider University measured PM<sub>2.5</sub> and Ozone, along with nine other different parameters. Results from these stations are shown in **Table 20: Annual and 24-hour Averages of PM2.5 (g/m3) (2022) on page 78**.

## Particulate Matter

Particulate matter, or particle pollution, is composed of a number of different elements, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. Particles smaller than 10 micrometers in diameter are able to be inhaled and can affect the heart and lungs, causing serious health effects, such as difficulty breathing, aggravated asthma, chronic bronchitis, irregular heartbeat, and premature death in people with heart and lung disease. “Fine particles” (PM<sub>2.5</sub>) are those smaller than 2.5 micrometers, while “inhalable particles” (PM<sub>10</sub>) are those between 2.5 and 10 micrometers in diameter. Fine particles may be emitted from fires, power plants, industries, and automobiles, while inhalable particles may be found near roadways and dusty industries. Particle pollution from fine particles is the primary cause of reduced visibility (haze) in the United States.

In summer of 2023, an occurrence of extremely high PM<sub>2.5</sub> levels were recorded in the area caused by wildfire smoke coming from Canada. This heavily impacted the State of New Jersey, including Hamilton Township, and residents were encouraged to stay inside to mitigate the health risks. The air quality reached ‘Very Unhealthy’ and even ‘Hazardous’ on the Air Quality Index rankings.

As of 2022, 20 sites in New Jersey collected data on particulate matter for particles less than 2.5 microns (PM<sub>2.5</sub>), 16 of which are Beta Attenuation Monitors that transmit real-time hourly PM data to NJDEP; ten sites are filter-based samples that require daily to weekly visits to pick up and replace the samples. Both can be used to determine compliance with NAAQS. Currently, fine particulate (PM<sub>2.5</sub>) annual primary and secondary standards are set at 12 and 15 micrograms per cubic meter (µg/m<sup>3</sup>) respectively, and the 24-hour (daily) standard primary and secondary are set at 35 µg/m<sup>3</sup>. The 24-hour primary and secondary standards for inhalable particles (PM<sub>10</sub>) are set at 150 µg/m<sup>3</sup>. In 2022, there were no exceedances of the annual PM<sub>2.5</sub> standard; however, the Brigantine monitor exceeded the 24-hour standard in June due to the Mullica River Fire in Wharton State Forest. **Table 20: Annual and 24-hour Averages of PM<sub>2.5</sub> (g/m<sup>3</sup>) (2022)** for more information on the annual PM<sub>2.5</sub> averages for continuous monitors in at Trenton and Rider University.

**Table 20: Annual and 24-hour Averages of PM<sub>2.5</sub> (g/m<sup>3</sup>) (2022)**

Monitoring Site	Annual Average	24-Hour Average	
		Highest	98th Percentile
Trenton	7.4	21.3	7.4
Rider University	7.8	22.7	15.4
NAAQS	12	35	35

Source: NJDEP, New Jersey Air Quality Report (2022)

As of 2022, all areas in New Jersey were in attainment for both the annual and 24-hour PM<sub>10</sub> standards. There are no monitors within Mercer County tracking PM<sub>10</sub>. The highest daily concentration of inhalable particles was 58µg/m<sup>3</sup>, at the Camden Spruce Street Station and the second highest was 28µg/m<sup>3</sup> at the Newark Firehouse Station (which no longer exists).

## Ground-Level Ozone

Ozone (O<sub>3</sub>) is a gas consisting of three oxygen atoms. Atmospheric ozone occurs naturally and is beneficial in protecting earth from ultraviolet rays. At the ground level, ozone can have detrimental effects on humans and the environment (see **Criteria Pollutants** on **page 76**). For ground-level ozone, NAAQS primary and secondary standards are the same. In 1970, the U.S. EPA set a one-hour ozone standard at 0.08 parts per million (ppm). The ozone standard was revised in 1979 to a one-hour ozone standard of 0.12 ppm. This standard proved to be inadequate in protecting the public from the adverse health effects of ground-level ozone. In 1997, the one-hour standard was replaced with an eight-hour standard of 0.08 ppm. The U.S. EPA lowered the 8-hour standard to 0.075 ppm in 2018 and to 0.070 ppm in 2016. New Jersey retains hourly average of 0.12 ppm as its primary state standard.

NJDEP monitored O<sub>3</sub> at 16 stations across New Jersey in 2022, of which 10 operated year-round and six operated only during the ozone season, which is March 1st through October 31st. The two stations nearest to Hamilton are the Rider University station, which measures ozone year-round, and the Colliers Mills station, which measures ozone seasonally. There is also an ozone monitor at Washington Crossing State Park in Mercer County, which is maintained and operated by U.S. EPA. The site is included when determining New Jersey’s NAAQS compliance status, although the data is not presented in the 2022 NJDEP Air Quality Report. It can be obtained from U.S. EPA at <https://www.epa.gov/outdoor-air-quality-data>.

The 2022 ozone season had eight days in which the NAAQS (8-hour daily maximum average concentration of 0.070 ppm) was exceeded, as shown in **Table 21: Exceedances of the O<sub>3</sub> NAAQS (2022)**. Seven monitoring sites recorded levels above the standard at least once. Colliers Mills and Rider University had the most with three exceedances. **Table 22: Ozone Concentrations (2022) on page 80** details the 1-hour daily maximum and 8-hour average ozone concentrations in 2022 for both the Rider University and Colliers Mills stations.

The entire State of New Jersey is considered a nonattainment area for ozone, although conditions have been improving greatly since the 1980s.

**Table 21: Exceedances of the O<sub>3</sub> NAAQS (2022)**

Date	Site	8-Hour Maximum Average Concentration (ppm)	Air Quality Index Rating
6/4/2022	Clarksboro	0.071	Unhealthy for Sensitive Groups
	Ancora	0.073	Unhealthy for Sensitive Groups
6/30/2022	Clarksboro	0.078	Unhealthy for Sensitive Groups
	Colliers Mills	0.072	Unhealthy for Sensitive Groups
7/11/2022	Rider University	0.071	Unhealthy for Sensitive Groups
7/14/2022	Monmouth University	0.090	Unhealthy
	Bayonne	0.075	Unhealthy for Sensitive Groups
7/20/2022	Colliers Mills	0.071	Unhealthy for Sensitive Groups
	Rider University	0.071	Unhealthy for Sensitive Groups
7/22/2022	Colliers Mills	0.071	Unhealthy for Sensitive Groups
	Bayonne	0.072	Unhealthy for Sensitive Groups
7/23/2022	Clarksboro	0.075	Unhealthy for Sensitive Groups
	Monmouth University	0.073	Unhealthy for Sensitive Groups
7/27/2022	Rider University	0.076	Unhealthy for Sensitive Groups
	Rutgers University	0.071	Unhealthy for Sensitive Groups

Source: NJDEP, New Jersey Air Quality Report (2022)

**Table 22: Ozone Concentrations (2022)**

Monitoring Site	1-Hour Daily Maximum	8-Hour Averages		
		Highest Daily Maximum	4th Highest Daily Maximum	2019-2022 Average of the 4th-Highest Daily Max
Trenton	0.087	0.072	0.069	0.066
Rider University	0.087	0.076	0.068	0.069
NJAAQS	0.12	0.070	0.070	0.070

Source: NJDEP, New Jersey Air Quality Report (2022)

### Nitrogen Dioxide

Nitrogen dioxide (NO<sub>2</sub>), a reddish-brown, highly reactive gas, is one of the several nitrogen oxides (NO<sub>x</sub>). Most nitrogen oxides are emitted as nitric oxide (NO) from cars, trucks, buses, power plants, and off-road equipment. However, NO is easily converted into NO<sub>2</sub> in the atmosphere through the oxidation of NO. When NO<sub>2</sub> reacts with other chemicals, it can form ozone, particulate matter, and other compounds that contribute to regional haze and acid rain.

Short-term exposure to low levels of NO<sub>2</sub>, ranging from 30 minutes to 24 hours, can aggravate pre-existing respiratory illnesses such as asthma, cause respiratory illnesses (particularly in children ages five to twelve), and inflame airways in healthy people. Symptoms of low-level exposure include irritation to eyes, nose, throat, and lungs, as well as coughing, shortness of breath, fatigue, and nausea. Long-term exposure to NO<sub>2</sub> may increase susceptibility to respiratory infection and cause permanent damage to the lungs. Environmental impacts of NO<sub>2</sub> include changes in the composition of some plants in wetland and terrestrial ecosystems, acidification of freshwater bodies, eutrophication of estuarine and coastal waters, increased levels of toxins harmful to fish and other aquatic life, and visibility impairment.

The primary and secondary annual NAAQS for NO<sub>2</sub> are the same and are set at a calendar-year average concentration of 53 parts per billion (ppb). New Jersey uses a standard of 53 ppb annually and 100 ppb hourly as a guideline in assessing short-term impacts from specific sources.

Routine monitoring for NO<sub>2</sub> in New Jersey began in 1966. The last year that concentrations of NO<sub>2</sub> exceeded the NAAQS in New Jersey was in 1974. In 2022, none of the ten NJDEP monitoring sites that measure NO<sub>2</sub> recorded an exceedance of either the national or New Jersey Ambient Air Quality Standards (NJAAQS) for NO<sub>2</sub>. The Rutgers University and Camden Spruce Street sites are the air monitoring stations nearest to Hamilton that measure NO<sub>2</sub>. **Table 23: 1-Hour and Annual NO<sub>2</sub> Concentration near Hamilton, NJ (2022)** shows the 1-hour and annual concentrations.

**Table 23: 1-Hour and Annual NO<sub>2</sub> Concentration near Hamilton, NJ (2022)**

Monitoring Site	1-Hour Daily Average (ppb)			24-Hour Average	
	Maximum	98th Percentile	2020-2022 98th-%ile 3-Year Avg	Highest	98th Percentile
Camden Spruce Street	68	48	46	21.3	7.4
Rutgers University	48	43	40	22.7	15.4
NJAAQS			100	53	53

Source: NJDEP, New Jersey Air Quality Report (2022)

## The Air Quality Index

The U.S. EPA created the Air Quality Index (AQI) to indicate a region’s air quality by measuring levels of five of the six criteria pollutants (excluding lead). The AQI is focused on the potential human health hazards experienced by breathing unhealthy air. Scores for the AQI range from 0 to 500 and are divided into six color-coded categories, as shown in **Figure 22: Air Quality Index (2024)**. The higher the AQI value, the greater the level of air pollution and associated health concerns.

Figure 22: Air Quality Index (2024)

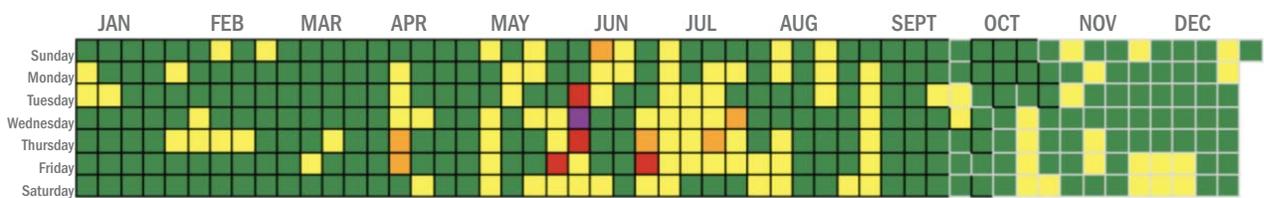
Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

Source: AirNow.gov (2024)

The daily score is based on the highest individual pollutant score reported. For example, if ozone scored 150 and particulate matter scored 100, the daily AQI would be 150, which is considered “Unhealthy for Sensitive Groups.” The index is also used to measure overall air quality by counting the number of days per year when the AQI of each metropolitan region exceeds 100. An AQI value of 100 generally corresponds to the national air quality standard for the pollutant, which is the level the U.S. EPA has set to protect public health.

In 2023, the Rider University station measured three instances of AQI surpassing 100. As a state overall, NJDEP reported 189 good (green) days, 167 moderate (yellow) days, seven days that were unhealthy for sensitive groups (orange), two unhealthy (red) days, and zero very unhealthy (purple) days. The daily AQI for Mercer County over the course of 2023 is displayed on **Figure 23: Daily AQI in Mercer County (2023) Mercer County**.

Figure 23: Daily AQI in Mercer County (2023)



Source: US EPA, Air Quality Data Collected at Outdoor Monitors Across the US (2023)

## Point Sources of Air Quality Pollution

Under the CAA, the U.S. EPA limits the amount of air pollutants and toxins that are emitted by point sources, such as power plants, oil refineries, dry cleaners, food processing centers and manufacturing plants. The NJDEP Air Quality Permitting Program issues permits for stationary sources of air pollution and regulates and monitors their emissions. As of February 2024, there were 142 facilities with active air quality permits in Hamilton, listed in **Table 24: Facilities with Active Air Quality Permits (2024) on page 82**. For additional information on specific facilities, please visit the New Jersey Geographic Information Network Open Data portal where users can access

interactive web maps with additional downloadable data. NJDEP Data Miner also allows users to search for sites by location, name, or ID number (all of which are listed in the table) .

**Table 24: Facilities with Active Air Quality Permits (2024)**

Facility	Address	PI Number
7-Eleven #41892	1850 Klockner Road	C0129
AAA Hoc Club Alliance Inc	700 Horizon Drive	61217
Administration Building	90 Park Avenue	60637
Alexander Elementary School	20 Robert Frost Drive	60596
Altice USA	2435 Kuser Road	61609
Amazon.Com Services LLC - Dnk2	537-557 Route 130	61659
Apco Broad Street Service Station	4165 S Broad Street	A6053
Arena Drive Exxon Service Station	1511 South Olden Avenue	A6022
AT&T Corp	1300 Whitehorse-Ham Square Road	60499
B&E Service Inc	86 Klockner Road	A3748
BJs Wholesale Club #141	900 Marketplace Boulevard	61232
Bob's Citgo Service Station	101 Shady Lane	A6170
Bond Cleaners	2052 Nottingham Way	L6026
Bordentown City-White Horse Water Plant	White Horse	60435
BP Service Station #14637	1060 Route 33	A6002
Care One @ Hamilton	1660 Whitehorse Hamilton Square Road	61340
Clayton Block Co Inc	4407 South Broad Street	61006
Complete Care at Mercerville	2240 Whitehorse Mercerville Road	61363
Consumers Oil Corp	1473 Lamberton Road	60029
Crockett Middle School	2631 Kuser Road	60638
Delta Service Station	1711 South Olden Avenue	A6197
Delta Service Station	2111 Route 33	A9922
Duck Island Ts Mrf	2100 Lamberton Road	61434
Fairway Building Products LLC	2075 East State Street	60580
Fresenius Medical Care Na Hamilton	2 Hamilton Health Place	61397
G&E Auto Body	135 Miami Avenue	G6043
Greenwood Elementary School	2069 Greenwood Avenue	60585
Greenwood Village Apartments	114 Washington Court	61046
Grice Middle School	901 White Horse-Ham Square Road	60597
Hamilton Bus Garage	600 Sloan Avenue	61013
Hamilton DPW Klockner Road Pump Station	54 Klockner Road	61124
Hamilton Grove Healthcare & Rehabilitation	2300 Hamilton Avenue	60142
Hamilton High School East	2900 Klockner Road	60505
Hamilton High School North	1055 Klockner Road	60491
Hamilton High School West	2720 Clinton Avenue	60506
Hamilton Honda	655 Route 130	61309
Hamilton Pet Meadow	1500 Klockner Road	61068
Hamilton Square Fuels	1296 Route 33	A6195
Hamilton Station Park & Ride	800 Sloan Avenue	61291

Facility	Address	PI Number
Hamilton Township Dept of Water Poll Control Wtp	300 Hobson Avenue	60168
Hamilton Township DPW	240 Tampa Avenue	61408
Hamilton Township DPW	240 Tampa Avenue	H8899
Hamilton Township Library	1 Justice Samuel A Alito Jr Way	60167
Hamilton Township Police Dept	1270 Whitehorse Mercerville Road	61435
Hargun Inc	2340 S Broad Street	A9988
High Q Cleaners	334 Route 33	L6057
Home Depot Inc #927	750 Route 130	61087
HS & Sons LLC DbA Gulf Service Station	2582 Whitehorse-Mercerville Road	A5731
HSR Co Inc	511 Route 33	A6066
Jersey Precast	853 Nottingham Way	61323
Joes Hamilton Transmission Service	2161 Nottingham Way	61245
K Cleaners	233 Route 33	L6028
Kisthardt Elementary School	215 Harcourt Drive	60598
Kuser Elementary School	70 Newkirk Avenue	60599
Lakeside Shell Service Station & Auto Service	3750 South Broad Street	A3852
Lalor Elementary School	25 Barnt De Klyn Road	60639
Langtree Elementary School	2080 Whatley Road	60607
Linearizer Technology Inc	3 Nami Lane	61214
Lockwood's Electric Motor Service	2239 Nottingham Way	60088
Loefflers Gourmet Inc	482 Whitehead Road	60205
Lowe's of Hamilton Store #1046	1000 Marketplace Boulevard	61224
Lukoil Service Station #57326	249 Route 33	A6086
Lukoil Service Station #57340	1070 Whitehorse-Mercerville Road	A6034
Mcgalliard Elementary School	1600 Arena Drive	60586
Mercerville Elementary School	60 Regina Avenue	60587
Molina Information System LLC Him Trenton	3705 Quakerbridge Road	61120
Monro Muffler & Brake Inc	Kusser Road & Whitehorse Road	61005
Morgan Elementary School	38 Stamford Road	60608
Municipal Building	1220 Whitehorse Avenue	60166
New Penn Motor Express	15 Thomas J Rhodes Industrial Drive	61241
Neyra Industries Inc	27 Industrial Drive	61102
NJ0221	1824 Whitehorse-Mercerville Road	A6131
NJDOC Yardville Youth Correctional Facility	11401 Highbridge Road	61395
NJDOT Duck Island Landfill	Route 29	61092
NJDOT Hamilton Maintenance Facility	2279 Kuser Road	H6056
NJLG Ust1 NJ0010 Service Station	1201 Route 33	A6005
NJLG Ust1 NJ0034 Service Station	1930 Nottingham Way	A6134
NJLG Ust1 NJ0048 Service Station	3217 Quakerbridge Road	A6089
Nottingham Apartments	1310 Nottingham Way	61331
Our Lady of Sorrows RC Church	3816 E State Street	60535

Facility	Address	PI Number
Picernos	4495 S Broad Street	A6120
Pioneer Service Station	2101 2105 S Broad Street	A9912
PMG 9562	2006 Route 33 & George Dye Road	A6179
PMP Composites Corp	575 Whitehead Road	61003
Pond Run Housing	9 Lamont Avenue	60165
Preferred Care at Hamilton	1501 Route 33	61285
Prime Petroleum Inc	1741 Greenwood Avenue	A6251
Pristine Realty, LLC Service Station	1140 Chambers Street	A6013
PSE&G Hamilton M&R Station	Beech & Exton Streets	60081
PSE&G Mercer	2512 Lambertson Road	60001
PSE&G Trenton Switching Station	1401 Klockner Road	60795
Pullens Garage	3060 Quarkerbridge Road	A6157
Pure Management Inc Service Station	1053 S Olden Avenue	A5891
Quakerbridge Service Station #3732	3732 Quakerbridge Road	A6057
Quick Chek Corp #22	1100 S Olden Avenue	A5916
Red Oak Manor Apartments	2300 S Broad Street	60163
Reynolds Middle School	2145 Yardville Hamton Sq Road	60588
Richard Stockton Service Area 6s	NJ Tpk Mm 58.7 S	H6029
Robinson Elementary School	495 Gropp Avenue	60600
Rogers Service Center LLC	1380 S Olden Avenue	A6150
Run Way Gas	1704 Greenwood Avenue	A5924
RWJ University Hospital of Hamilton	1 Hamilton Health Place	60164
Sayen Elementary School	3333 Nottingham Way	60614
Selmons Service Station	2231 S Olden Avenue	A6004
S&B Collision LLC DbA K&H Automotive	23 Industrial Drive	G8932
SS & Sons Inc	1870 Kuser Road	A6198
Starr Transit Co	2531 East State Street	60543
Stonite Coil Corp	476 Route 156	60048
Sunnybrae Apartments	4134 S Broad Street	61076
Sunnybrae Elementary School	166 Elton Avenue	60615
Sunoco Service Station	1685 Nottingham Way	A6155
Sunoco Service Station	1761 Greenwood Avenue	A6162
The Seward Johnson Atelier Inc	60 Sculptors Way	60465
Tpk Woodrow Wilson Sa 6n	NJTA Mm 58.7 N	61512
Trane Technologies	2231 East State Street	61044
Tri State Petro Inc Hamilton	2409 Nottingham Way	A6060
United Parcel Service	4 Fairgrounds Road	60502
University Heights Elementary School	645 Paxson Avenue	60603
USPS Trenton Processing & Dist Ctr	680 Route 130	61508
USPS Vehicle Maintenance Facility	680 Route 130	60300
Vehicle Maintenance Facility	680 Hwy 130 Sb	H6049
Venenum	8 Black Forest Road	61484

Facility	Address	PI Number
Verizon Business (MrcvNS)	37 Hobbs Road	61049
Verizon Call Center 53akg	600 Horizon Drive	61135
Verizon NJ Mercerville Co #53600	2360 Nottingham Way	60447
Verizon NJ White Horse Co #53030	3101 South Broad Street	60450
Walmart Supercenter #5012	1750 Nottingham Way	61586
Ward's Fuel Service	301 Kuser Road	60110
Warner Village Apartments	1378 Nottingham Way	61160
Waste Management of NJ Inc	208 Patterson Avenue	61163
Wawa Food Market #8342	Route 130 & Crosswicks-Hamilton Road	A6706
Wawa Food Market #8356	Quakerbridge Road & Flock Road	C0149
Wawa Food Market #8357	1200 Route 33	A6718
Wawa Food Market #8452	Route 206 & White Horse Avenue	C0112
Wilson Elementary School	600 E. Park Avenue	60609
Wingate Apartments	104 Wert Avenue	60287
Woodrow Wilson Service Area 6n	NJ Tpke Mm 58.7 N	H6028
Yardville Elementary School	450 Yardville-Allentown Road	60602
Yardville Garden State Fuel Service Station	646 Route 130	A6095
Yardville Gasco Service Station #1109	4364 South Broad Street	A6070
Yardville Heights Elementary School	3880 Broad Street	60601
Yardville Supply Co	47 Church Street	60084

Source: NJDEP, Dataminer (2024)

## Emissions Statements

NJDEP enacted the Emission Statement Rule in 1992, requiring certain sites that have an air quality permit to report specific air contaminants, including CO, SO<sub>2</sub>, ammonia (NH<sub>3</sub>), respirable particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), Pb, total suspended particulate matter (TSP), VOC, NO<sub>2</sub>, and 38 other toxic air pollutants. Reporting requirements differ depending on whether a facility is considered a major or minor facility. NJDEP makes the determination of whether a facility is considered minor or major based on the facility's potential to emit.

There were three facilities in Hamilton Township that had been required to submit emissions statements in accordance with the 1992 Emissions Statement Rule. However, two of these facilities have since closed, the former PSEG Mercer Generating Station and Congoleum Corporation. Consumers Oil Corporation remains open but no longer requires an emissions statement.

The former PSEG Mercer Generating Station was built in 1960 and decommissioned in early 2018. Hilco Redevelopment Partners (HRP) purchased it in December 2018 and facilitated brownfield remediation of the area. Today it is Mercer Logistics Park, an industrial campus situated on 90 acres of land.

The former Congoleum Corporation also closed their flooring manufacturing facility in 2014. Manchester 270 Development Inc. purchased the site in 2015, with Environmental Liability Transfer, Inc. taking over all environmental remediation processes. In January 2024, Lincoln Equities Group and PGIM purchased 48 acres of the site to build a 420,000-square-foot industrial facility.



**Rhododendron flowers in Sayen Park**

Source: Mel Musie, DVRPC

## CHAPTER 10:

# Natural Resources

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When a community protects wildlife and habitat, it is also protecting biodiversity, which is important for the health and productivity of ecosystems and their inhabitants, including humans. Biodiversity refers to the variety of genetic material within a species population, the variety of species (plants, animals, and microorganisms) within a community, and the variety of natural communities within a given region. Biodiversity facilitates adaptation and evolution, improving a species' chance of survival as the environment changes. A diversity of plant and animal species is also necessary to maintain healthy human environments, working landscapes, and productive ecosystems. Lower organisms, many not well known, contribute to nutrient cycling, decomposition of organic matter, soil rehabilitation, pest and disease regulation, pollination, and water filtering. Once biodiversity declines, it is extremely difficult for an ecosystem to recover or replace species.

Scientists have discovered and named somewhere between 1.5 and 1.8 million plant and animal species. Far more species—possibly 10 to 20 times the number of known species—are unknown to science. Alarmingly, this great diversity of species is now diminishing at an unprecedented rate. Researchers generally agree that the extinction rate is now catastrophically high; somewhere between 1,000 and 10,000 times the rate before human beings began to exert significant pressure on the environment. Given these trends, and barring significant increases in conservation efforts, approximately one-half of the world's species will be gone by the end of this century.

While the decline of biodiversity is indeed a global problem, conservation needs to occur on both global and local levels if it is to succeed. Hamilton township contains numerous types of habitats, all of which are important for maintaining biodiversity. Wooded wetlands and upland forests are the two most abundant natural ecosystems found in the township. Herbaceous wetlands and scrub wetlands are also present in large areas adjacent to Hamilton Township's stream corridors and creeks. The following sections identify and describe in more detail the plant and animal communities that inhabit these unique ecosystems within Hamilton Township.

### Natural Vegetation

A region's vegetation is dependent upon many factors, the most important of which are climate and soils. As noted in **Chapter 4: Climate on page 19**, the climate of New Jersey, including Hamilton Township, is variable. Due to its geographic location on the East Coast, halfway between the North Pole and the Equator, the state is influenced by wet, dry, hot, and cold air streams and has a median annual temperature of 52 °F. The mean annual precipitation is 47 inches and is fairly well distributed throughout the year. A majority of Hamilton Township soils are well-drained and support a diversity of trees and crops. However, there is a great deal of poorly-drained soils that exhibit ponding and sustain wetland plants. See the **Soil Series on page 32** for a detailed description of Hamilton Township's soils.

Hamilton Township's natural vegetation types, along with human-influenced types of land cover, have been tabulated and mapped by NJDEP's 2020 land-cover analysis. The 2020 dataset, which is based on infrared aerial photography, is the most recent available. The designation of a particular land cover as a vegetation type is based on definitions provided by the Anderson Land Use Classification System, created by USGS. See **Figure 22: Natural Vegetation (2022) on page 88**.

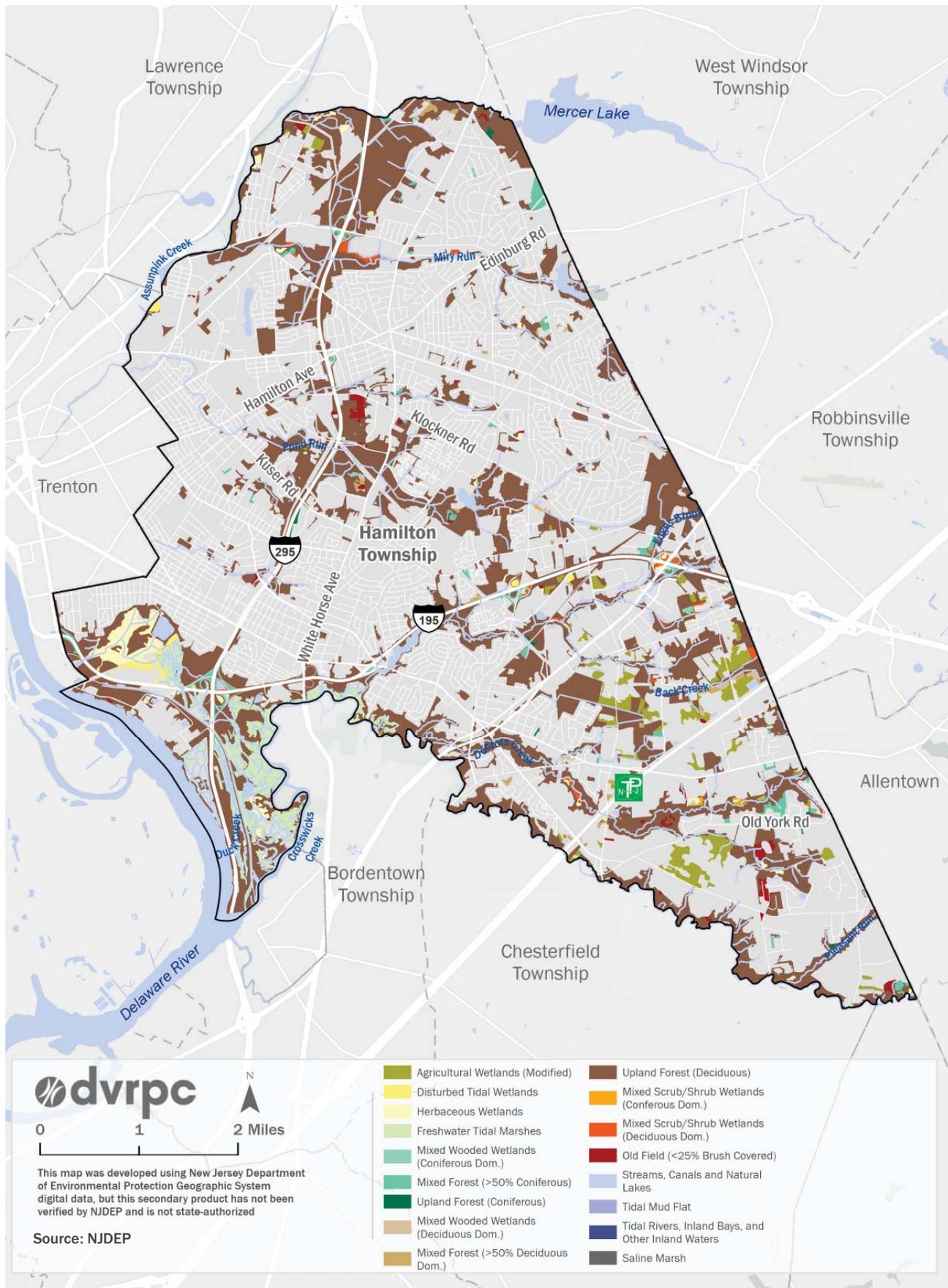
The main types of land cover in Hamilton are briefly described in the subsections following.



**Bog Garden Boardwalk, Veterans Park**

Source: Rob Poppert, Hamilton Township

Figure 24: Natural Vegetation (2022)



## **Wetlands**

Wetlands are a critical ecological resource, supporting both terrestrial and aquatic animals and boasting biological productivity far greater than that found on dry land. A wetland, in basic terms, is an area that has enough water at some time during the year to stress plants and animals that are not adapted to life in water or saturated soils. Wetlands play a vital role in maintaining water quality by naturally filtering surface and ground waters. The ecological importance of wetlands, however, has not always been appreciated.

For over three centuries, people have drained, dredged, filled, and leveled wetlands to make room for development and agriculture. Although the pace of wetland destruction has slowed markedly since the early 1980s, human activities have destroyed over 50 percent of the original 221 million acres of wetlands in the United State since the beginning of European settlement.

Wetlands are the second most common land-use classification in Hamilton Township, covering 19.7 percent of the township's total land, or 5,070 acres. Most wetlands in Hamilton Township are found in association with the township's many streams and tributaries. Hamilton Township's most abundant wetlands are deciduous wooded wetlands, freshwater tidal marshes, and agricultural (modified) wetlands. Ponds, marshes, swamps, and impoundments caused by beavers are found in many nontidal wetlands areas. The dominant vegetation in the wetlands of Hamilton Township includes rice cutgrass, skunk cabbage, cinnamon fern, northern wild raisin, northern arrowhead, black gum, common greenbrier, pitch pine, and red maple.

Phragmites are a native reed that colonizes easily and pushes into wetland areas from adjacent dry land areas, spreading through an underground root system that is difficult to eradicate. In addition to its tendency to aggressively spread, Phragmites often become a dominant monoculture and are therefore considered an extremely invasive species. Hamilton Township contains 125 acres of wetlands dominated by Phragmites.

### **Wooded Wetlands**

Deciduous wooded wetlands sometimes referred to as wetland forests or, more typically, hardwood swamps, are found in the Abbott Marshlands west of Spring Lake, as well as on the floodplain of Crosswicks Creek upstream of the Route 206 bridge. Deciduous wooded wetlands occupy approximately 3,402 acres (13.22 percent) of Hamilton Township's total land area and support mixed hardwoods that flourish in lowlands. Deciduous wooded wetlands provide important habitat for a wide variety of mammals, birds, reptiles, and amphibians.

The wetland forests west of Spring Lake are dominated by red maple and sweet gum. Some types of ferns found there include rattlesnake ferns and netted chains. Grey squirrels, chipmunks, white-tailed deer, raccoons, and red-tailed hawks are found there. Tree species found in wooded wetlands on the floodplain of Crosswicks Creek include willows, box elder, and white ash. Vines of grape, Virginia creeper, and poison ivy are found there as well.

### **Scrub/Shrub Wetlands**

Closely associated with deciduous wooded wetlands are scrub/shrub wetlands, occupying about 230 acres (less than one percent) of Hamilton Township. These wetlands are generally composed of young, medium-height, primarily deciduous woody plants. Scrub/shrub wetlands are usually in early successional stages and will later become shrub-dominated or wooded wetlands. Hamilton's scrub/shrub wetlands are found in the Abbott Marshlands along its edges adjacent to upland areas. The scrub/shrub wetlands in Hamilton Township may include silky dogwood, buttonbush, alder, arrowhead, red maple, swamp ash, bittercress, fringed loosestrife, purple stemmed aster, and turtlehead. Baltimore butterflies, woodchucks, willow flycatchers, Eastern kingbirds, cardinals, and brown snakes have been sighted in these areas.

### **Herbaceous Wetlands**

Other types of wetlands found in Hamilton Township include herbaceous wetlands, which cover about 209 acres, less than one percent of the land cover. Herbaceous wetlands generally occur along lake edges, on open

floodplains, and in former agricultural fields. Herbaceous wetlands are found near wooded wetlands along some of Hamilton Township's major and minor streams. Herbaceous wetland plants may include rice cutgrass, reed canary grass, pond lily, tearthumb, arrow-leaved tearthumb, broadleaf cattail, and the common reed (*Phragmites*). Herbaceous wetlands may often be dominated by *Phragmites*.

### **Modified Wetlands**

Modified wetlands are areas that have been altered by human activities and do not support natural wetland vegetation, but do show signs of soil saturation on aerial infrared surveys. Modified wetlands encompass agricultural wetlands, former agricultural wetlands, disturbed wetlands, wetland right-of-ways, and wetlands that occur in maintained green spaces, such as open lawns, golf courses, and stormwater swales. Hamilton Township has several large tracts of modified wetlands, covering 578 acres (about two percent of the township's land area). Some of Hamilton's modified wetlands can be found along the edges of highways built throughout the Abbott Marshlands. These "edge habitats" provide a transitory habitat for a variety of bird species, including goldfinches, white-throated sparrows, and indigo buntings.

Duck Island, located between the Abbott Marshlands and the Delaware River, was one of the largest wetland mitigation projects in New Jersey constructed by the state Department of Transportation. Highway construction destroyed 57 acres of wetlands on this 95-acre site. As mitigation, NJDOT created 70 acres of wetlands, of which 70 percent are tidal. A series of tidal channels and eight islands of varying sizes and elevations above mean high tide were also constructed. Since the completion of the project in 1995, more than 300 plant species, not including landscaping plants, have been found. Some species include the swamp beggar's tick, American waterwort, subulate arrowhead, Torrey's rush, narrow paniced rush, water willow, and hop tree. More than 100 species of birds, including egrets, waterfowl, herons, black vultures, snipe, bobolinks, and blue grosbeaks have also been observed. Other animals include carp, bullhead, banded killfish, shiner, Fowler's toad, American toad, snapping turtle, ribbon snake, raccoon, opossum, woodchuck, white-footed mouse, and microtus. Bluecrabs, Asiatic clams, and river mussels are a few invertebrates found on Duck Island.

### **Upland Forests**

Upland areas are those locations without water at or near the soil surface. Upland forests are located where drainage is sufficient so that soils do not become saturated for extended periods. Most of Hamilton Township's upland forests have been cleared and converted to residential or industrial development. The remaining uplands are relegated to a few remnants along stream corridors or patchy woodlands associated with farms and areas with less desirable soils. Upland forests are the second most abundant natural vegetative land cover in Hamilton Township after wetlands, covering about 2,269.72 acres (8.82 percent).

#### **Deciduous Upland Forest**

Practically all upland forests in Hamilton Township are deciduous forests (1,702.43 acres). The composition of these upland deciduous forests is largely one of mixed oaks, such as black, red, chestnut, scarlet, white, and willow, joined by other hardwoods like American beech, hickory, red maple, tulip-poplar, and sweet gum. Along stream corridors, the Atlantic white cedar and holly tree can also be found. Dominant species in the township's upland forests include black walnut, tulip-poplar, red oak, shagbark hickory, and white oak. The understory is dominated by flowering dogwood, American holly, Greenbriar, and sassafras. Spicebush, arrowwood, high bush blueberry, amelanchier, sweet pepperbush, and black haw are common shrubs in moister locations. Vines, such as Virginia creeper, wild grapes, Japanese honeysuckle, and poison ivy, are common.

#### **Coniferous Forest**

About 11.87 acres (less than one percent) of Hamilton Township is covered in coniferous upland forests. These forests are mostly made up of successional, or pioneer, plants—like Virginia pine, scrub pine, and pitch pine—that will eventually be overgrown by dominant deciduous trees, such as walnut, oak, and hickory.

### Tree Inventories

There is no comprehensive inventory of tree varieties in Hamilton Township. However, extensive inventories of plants, including trees, at Duck Island, John A. Roebling Memorial Park, and Van Nest Refuge have been compiled by Doctors Mary and Charles Leck. Tree composition in these areas includes oak, maple, spruce, birch, pine, elm, willow, basswood, beech, holly, cherry, dogwood, and cedar.

### Grasslands and Agricultural Lands

Grasslands are considered to be one of the most endangered ecosystems globally. They are threatened by human development, new agricultural technology, grazing, desertification, soil erosion, and invasive species. Grasslands provide habitat for specialized species such as grassland birds and shade-intolerant herbaceous plants that cannot live elsewhere. Many species of increasingly rare grassland birds require large contiguous patches of grassland for successful breeding and roosting. NJDEP defines grassland habitat as brushland, shrubland, or old fields that were cleared or disturbed at one time and then abandoned. Following abandonment, old fields are overgrown by perennial herbs and grasses. These pioneer plants remain the dominant species for three to 20 years. Later, woody plants take over. This habitat is especially visible along wood edges, roadsides, and in landscapes where mowing is infrequent and where woody plants are not yet the dominant vegetation.

About 557.8 acres (two percent) of Hamilton Township's land cover consists of brushland, shrubland, or old field. In Hamilton Township, brushland and old fields are generally found adjacent to residential and industrial development, and occur more often near wetland areas. Trees such as sassafras, black cherry, red cedar, and white oak are common on old field lands. Meadow onion, broom-sedge, common dogbane, and vines of Japanese honeysuckle can also be found in grassland habitat.

### Landscape Project Priority Habitats

The Landscape Project, developed by the Endangered and Nongame Species Program of the NJDEP Division of Fish and Wildlife, documents the value of various types of habitats within New Jersey. It categorizes these habitats into one of five groups according to their importance, with Rank 5 being the highest importance. Rank 3 through 5 includes habitats throughout the state that possess two exceptional conditions: (1) a documented occurrence of one or more species on either the federal or the state threatened and endangered species lists, and (2) a sufficient amount of habitat type to sustain these species. These habitats are collectively known as "critical habitat." Rank 1 and 2 includes habitats that either have a documented occurrence of a Species of Special Concern in New Jersey, or are deemed suitable for species on the state or federal threatened and endangered species lists, but for which there are no documented occurrences or sightings. These habitats are labeled "suitable habitats."

Approximately 39 percent (10,084.81 acres) of Hamilton Township has been identified by the Landscape Project as critical or suitable habitat for threatened or endangered species. It is important to preserve both levels of habitat in order to maintain the diversity of species that still exists in the township. The majority of these lands in Hamilton Township provide critical or suitable habitat for the great blue heron or the eastern box turtle. There are also areas in the southeastern corner of the township that provide habitat for the cliff swallow, Fowler's toad, Cooper's hawk, eastern meadowlark, and grasshopper sparrow. See **Figure 25: Landscape Project Priority Habitats (2017) on page 93** and **Table 25: Landscape Project Priority Habitats (2017) on page 92** for more information on these important areas.

### Habitat Protection

Hamilton Township has prioritized preserving a variety of habitats within its boundaries, including forestland, wetlands, riparian areas, farms and grasslands. For more information on sites and areas that the township has protected or has prioritized for protection, see **Conservation Areas on page 102**.

**Table 25: Landscape Project Priority Habitats (2017)**

Ranking	Acres
1	4,657.46
2	2,117.90
3	322.20
4	2,623.18
5	364.08
<b>Total</b>	<b>10,084.81</b>

Source: NJDEP (2017)

## **Animal Communities**

Although no comprehensive inventory of the different animal species within Mercer County or Hamilton Township exists, there are records of sightings, biological studies of range, and assessments of endangered and threatened species status. Using federal, state, and other scientific sources, it is possible to identify and describe known and possible animal communities in Hamilton Township. For the most up-to-date information, please visit NJDEP Fish and Wildlife online for a list of current endangered and threatened species status.

### **Invertebrates**

Invertebrates are the basis of a healthy environment and are part of every food chain; they provide food for amphibians and fish, and are part of the nutrient cycling systems that create and maintain fertile soils. Invertebrates consist of insects (beetles, butterflies, moths, dragonflies, ants, termites, bees, wasps, flies, and others); arachnids (spiders, ticks, and mites); crustaceans (crayfish and microscopic copepods); mollusks (mussels, clams, snails, and slugs); and worms.

Macroinvertebrates are invertebrates that are visible to the naked eye but are smaller than 50 millimeters. As mentioned in the Water Quality Monitoring Networks, benthic macroinvertebrate communities can be monitored to track a water body's ecological health, and are relatively simple to collect from shallow freshwater stream beds. These communities consist largely of the juvenile stages of many insects, such as dragonflies and mayflies, as well as mollusks, crustaceans, and worms. Monitoring for diverse assemblages of macroinvertebrates reveals the effect of pollutants over a long period of time.

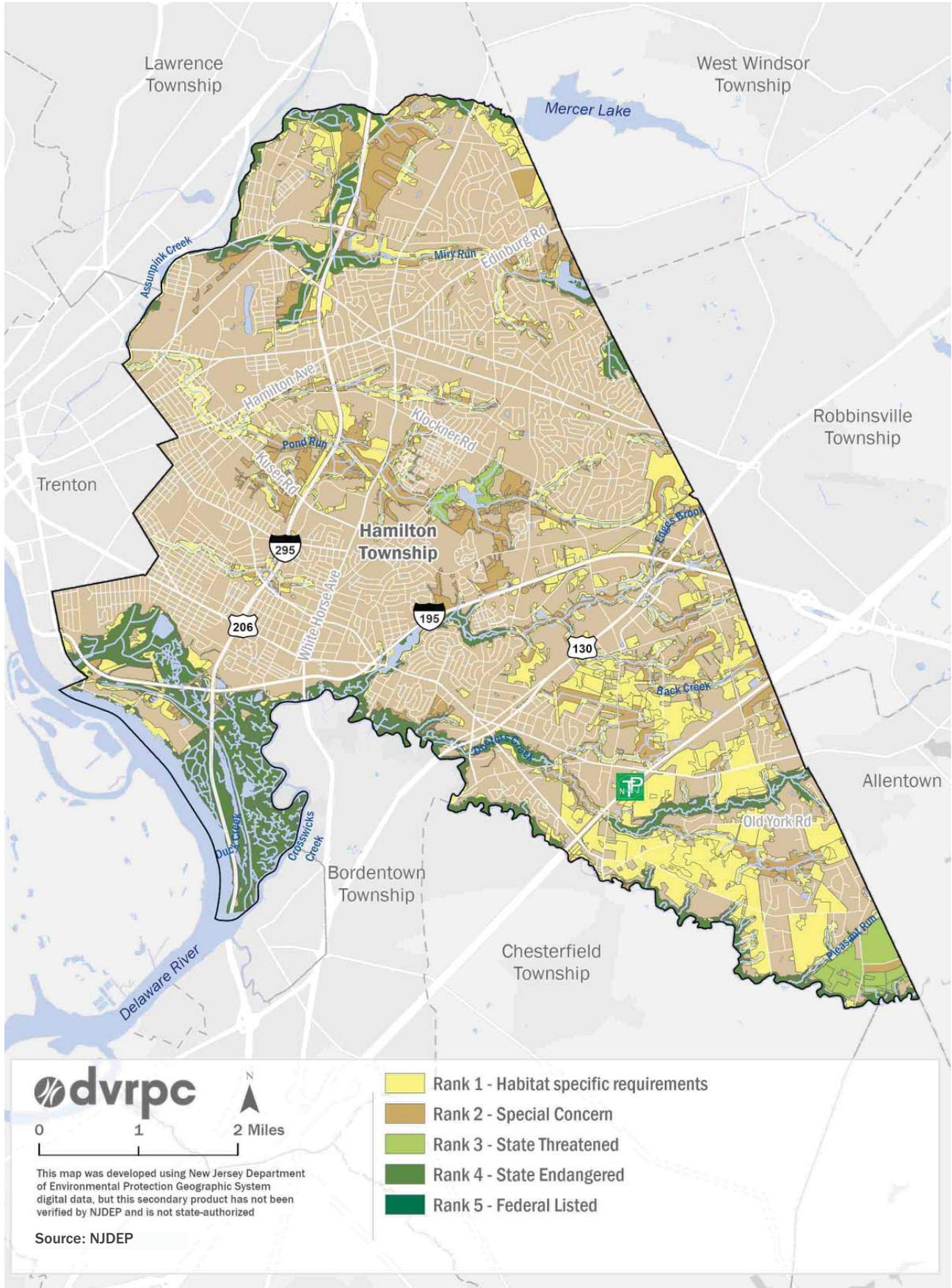
### **Rare Invertebrates**

In New Jersey, there are ten endangered invertebrate species (four butterfly species, three mussel species, two beetle species, and one dragonfly species) and 14 threatened invertebrate species (six dragonfly species, five mussel species, and three butterfly species). Of the species on the New Jersey Endangered and Threatened List, four are listed as endangered under the federal Endangered Species Act: the burying American beetle, Mitchell's satyr, dwarf wedgemussel, and the Northeastern beach tiger Beetle. The tidewater mucket and Eastern pondmussel are threatened invertebrates that are found in Hamilton Township.

### **Vertebrates**

Vertebrates are less numerous than invertebrates, but their larger size makes them much more visible, and thus better studied and recorded. Fish species are fairly well documented, as are mammals. There are about 450 species of vertebrate wildlife that can be found within the state, along with 336 marine finfish, 85 freshwater fish, and 28 marine mammals. Although elusive, reptile and amphibian species found in Hamilton Township have been inventoried in environmental site assessments. Birds that nest in the township are also known, but migrants that depend on Hamilton Township's wetlands and wet forests as stopover sites in which to rest and feed are not as thoroughly inventoried.

Figure 25: Landscape Project Priority Habitats (2017)



## Reptiles and Amphibians

Reptiles and amphibians can be quite elusive when surveys attempt to document them. Some reptiles and amphibians, called herpetological species, are rare because they depend on vernal ponds, as discussed in the **Surface Waters on page 41**. Amphibians in particular tend to be very sensitive to environmental changes, offering a visible warning to humans that significant changes are occurring.

New Jersey is home to approximately 71 reptile and amphibian species. There are eight endangered reptile species, five of which are turtles. Some common herpetological species that have been documented in Hamilton Township include the bullfrog, green frog, pickerel frog, northern spring peeper, eastern painted turtle, snapping turtle, eastern garter snake, northern brown snake, northern water snake, red-bellied snake, and eastern ribbon snake. Several rarer herpetological species have been sighted in Hamilton Township, including the Fowler's toad, eastern box turtle, and wood turtle.

## Mammals

Mammals appear to be abundant because they tend to be larger and live in habitats also ideal for human development. There are over 60 mammal species in New Jersey, ten of which are listed as endangered and none as threatened by the state. Nearly 40 of the mammal species are non-game terrestrial (land) mammal species and another 20 are marine mammals living along coastal waters.

Some common mammals found in Hamilton Township include the beaver, Eastern chipmunk, Eastern grey squirrel, vole, muskrat, opossum, raccoon, river otter, white-footed mouse, white-tailed deer, and woodchuck. Coyotes have also been sighted in Veterans Park, and feral domestic cats are present in some parts of the township. None of these animals are considered threatened or endangered in the state.

### White-tailed Deer

White-tailed deer are a common species in New Jersey, and their conflict with humans in suburban areas is an increasing concern. Officially, their state-wide population status is considered "decreasing" due to the combined impacts of habitat loss, crop damage, and vehicle collisions. However, many areas in the state are experiencing great increases in deer populations, as herds are forced to find new habitats. Managing deer populations is difficult, as herds have the ability to double, or even triple, their numbers within a single year. Although highly dependent upon the ecological carrying capacity of the land, a healthy deer concentration is estimated to be 20 deer or less per square mile.

Deer thrive in fragmented "edge" conditions and altered areas, since these habitats support the new plant growth and mixed vegetation that deer prefer. New Jersey's agricultural and suburban landscapes are prime examples of these habitats, and they provide deer with food year-round. An overpopulation of deer will decimate plant communities through overgrazing, which destroys the growth of seedlings and young trees. This loss of habitat then causes the health of deer to decline, making them more susceptible to disease and malnutrition. Habitat loss through overgrazing also threatens the entire ecosystem, since other animals depend upon the same plants for survival.

New Jersey's Community-Based Deer Management Permit program allows alternative and traditional techniques to manage deer populations in the state. Traditional and controlled hunting, as well as bait and shoot tactics, are lethal ways to control deer numbers. Minimizing the amount of edge habitat also controls numbers and is best achieved by preserving large, contiguous tracts of land. Another strategy to minimize human-deer conflicts is modifying habitat by planting deer-repellant plants, such as lavender, shadbush, ornamental sage, yarrow, and plants with thorns. Other deer management strategies can also be utilized, such as installing reflectors and reducing speed limits on roads, employing traps for relocations, and administering fertility control measures.

## Birds

New Jersey has between 350 and 500 species of birds, an exceptional number given the state's small size. Not only is the state an important "rest stop" for birds migrating to warmer climates in Central and South America, but the New Jersey Atlantic Coast and the Delaware Bay are major parts of the Atlantic Flyway, an established migratory air route in North America. In New Jersey, there are 20 endangered bird species, and 14 threatened species.

Hamilton Township is home to a great abundance and variety of birds. Within the township's boundaries, there have been documented sightings of over 230 species of birds. Some birds that are frequently seen include the turkey vulture, mallard, herring gull, laughing gull, ring-billed gull, red-tailed hawk, mourning dove, red-bellied woodpecker, downy woodpecker, northern flicker, eastern kingbird, blue jay, American crow, tree swallow, barn swallow, Carolina chickadee, tufted titmouse, white-breasted nuthatch, Carolina wren, American robin, gray catbird, brown thrasher, European starling, common yellowthroat, eastern towhee, chipping sparrow, field sparrow, song sparrow, northern cardinal, red-winged blackbird, common grackle, and house sparrow.

## Canadian Geese

Another common bird is the Canadian goose. New Jersey now has a "resident" Canada goose population of approximately 63,000 birds that no longer migrate to more southern locales. While geese can provide enjoyable wildlife viewing opportunities, they can also cause property and environmental damage. Goose droppings that wash into lakes during storms can pollute surface waters and close lakes to swimming. Also, because geese can be quite aggressive during the nesting season, they can potentially injure humans.

Removing geese or preventing them from residing in park areas is a difficult task. Because geese move freely, the most effective management solutions are best conducted at the community level. Management techniques include planting shrubby vegetation around streams, lakes, and ponds to block waterfowl access; discouraging humans from feeding geese; using fertility reduction techniques such as egg addling or removal, and regulated hunting. For more information on best practices for managing geese, visit the website by Rutgers University New Jersey Agricultural Experiment Station, titled "[Strategies for Resident Canada Goose Control and Management in New Jersey](#)".

## Fish

When European settlers arrived in present-day Mercer County, they encountered the Lenni Lenape, who regularly fished along the inland streams and gathered shellfish in the Delaware River. Shad fishing was an important industry along the Delaware River until the early 20th century, when it collapsed due to overfishing. Due to the unintended consequences of overfishing, urban development, industrial advancement, and mechanized agriculture, the amount and diversity of aquatic life has decreased dramatically throughout most of New Jersey. The New Jersey Division of Fish and Wildlife, under the Bureau of Freshwater Fisheries, monitors and actively aids the propagation, protection, and management of the state's freshwater fisheries. The bureau raises several million fish for stocking in suitable waterbodies and conducts research and management surveys. There are over 90 species of freshwater fish in the state. Sixty of the 90 species are native to the state, whereas the others are introduced species or migratory.

## Rare Wildlife, Plants, and Ecological Communities

The New Jersey Natural Heritage Program identifies the state's most significant natural areas through a comprehensive and continuously updated inventory of rare plant and animal species and representative ecological communities. The Natural Heritage Database compiles information on the distribution, biology, status, and preservation needs of these species and communities. Those threatened and endangered plants and animals identified in Hamilton Township by NJDEP Fish and Wildlife's Endangered and Nongame Species program are listed in **Table 26: Endangered and Threatened Species in New Jersey (2024)**.

**Table 26: Endangered and Threatened Species in New Jersey (2024)**

Type	Endangered	Species	Threatened	Species
Birds	Bittern, American BR	<i>Botaurus lentiginosus</i> BR	Bobolink BR	<i>Dolichonyx oryzivorus</i> BR
Birds	Eagle, bald BR	<i>Haliaeetus leucocephalus</i> BR	Eagle, bald NB	<i>Haliaeetus leucocephalus</i> NB
Birds	Falcon, peregrine BR	<i>Falco peregrinus</i> BR	Egret, cattle BR	<i>Bubulcus ibis</i> BR
Birds	Goshawk, northern BR	<i>Accipiter gentilis</i> BR	Kestrel, American	<i>Falco sparverius</i>
Birds	Grebe, pied-billed BR	<i>Podilymbus podiceps</i> BR	Lark, horned BR	<i>Eremophila alpestris</i> BR
Birds	Harrier, northern BR	<i>Circus hudsonius</i> BR	Night-heron black-crowned BR	<i>Nycticorax nycticorax</i> BR
Birds	Hawk, red-shouldered BR	<i>Buteo lineatus</i> BR	Night-heron, yellow-crowned	<i>Nyctanassa violacea</i>
Birds	Knot, red** NB	<i>Calidris canutus</i> ** NB	Osprey BR	<i>Pandion haliaetus</i> BR
Birds	Owl, short-eared BR	<i>Asio flammeus</i> BR	Owl, barred	<i>Strix varia</i>
Birds	Plover, piping**	<i>Charadrius melodus</i> **	Owl, long-eared	<i>Asio otus</i>
Birds	Rail, black** BR	<i>Laterallus jamaicensis</i> BR	Rail, black** NB	<i>Laterallus jamaicensis</i> NB
Birds	Sandpiper, upland	<i>Bartramia longicauda</i>	Sparrow, grasshopper BR	<i>Ammodramus savannarum</i> BR
Birds	Shrike, loggerhead NB	<i>Lanius ludovicianus</i> NB	Sparrow, Savannah BR	<i>Passerculus sandwichensis</i> BR
Birds	Sparrow, Henslow's	<i>Centronyx henslowii</i>		
Birds	Sparrow, vesper BR	<i>Poocetes gramineus</i> BR		
Birds	Tern, least	<i>Sternula antillarum</i>		
Birds	Tern, roseate**	<i>Sterna dougallii</i> **		
Birds	Warbler, golden-winged BR	<i>Vermivora chrysoptera</i> BR		
Birds	Wren, sedge	<i>Cistothorus stellaris</i>		
Birds	Cornsnake, red	<i>Elaphe guttata</i>	Pinesnake, northern	<i>Pituophis melanoleucus melanoleucus</i>
Reptiles	Queensnake	<i>Regina septemvittata</i>	Turtle, green sea**	<i>Chelonia mydas</i> **
Reptiles	Rattlesnake, timber	<i>Crotalus horridus</i>	Turtle, wood	<i>Glyptemys insculpta</i>
Reptiles	Turtle, bog**	<i>Glyptemys muhlenbergii</i> **		
Reptiles	Turtle, hawksbill sea**	<i>Eretmochelys imbricata</i> **		
Reptiles	Turtle, Kemp's Ridley sea**	<i>Lepidochelys kempii</i> **		
Reptiles	Turtle, leatherback sea**	<i>Dermodochelys coriacea</i> **		
Reptiles	Turtle, loggerhead sea**	<i>Caretta caretta</i> **		
Amphibians	Salamander, blue-spotted	<i>Ambystoma laterale</i>	Salamander, eastern mud	<i>Pseudotriton montanus</i>
Amphibians	Salamander, eastern tiger	<i>Ambystoma tigrinum</i>	Salamander, longtail	<i>Eurycea longicauda longicauda</i>
Amphibians	Treefrog, Cope's gray	<i>Hyla chrysocelis</i>	Treefrog, Pine Barrens	<i>Hyla andersonii</i>
Invertebrates	Beetle, American burying**	<i>Nicrophorus americanus</i> **	Baskettail, robust (dragonfly)	<i>Epitheca spinosa</i>

Type	Endangered	Species	Threatened	Species
Invertebrates	Beetle, northeastern beach tiger**	<i>Habroscelimorpha dorsalis dorsalis</i> **	Clubtail, banner (dragonfly)	<i>Gomphus apomyius</i>
Invertebrates	Copper, bronze	<i>Lycaena hyllus</i>	Clubtail, harpoon (dragonfly)	<i>Gomphus descriptus</i>
Invertebrates	Floater, brook (mussel)	<i>Alasmidonta varicosa</i>	Elfin, frosted (butterfly)	<i>Callophrys irus</i>
Invertebrates	Floater, green (mussel)	<i>Lasmigona subviridis</i>	Emerald, Kennedy's (dragonfly)	<i>Somatochlora kennedyi</i>
Invertebrates	Petaltail, gray (dragonfly)	<i>Tachopteryx thoreyi</i>	Floater, triangle (mussel)	<i>Alasmidonta undulata</i>
Invertebrates	Satyr, Mitchell's (butterfly)**	<i>Neonympha m. mitchellii</i> **	Fritillary, silver-bordered (butterfly)	<i>Bolaria selene myrina</i>
Invertebrates	Skipper, arogos (butterfly)	<i>Atrytone arogos arogos</i>	Jewelwing, superb (dragonfly)	<i>Calopteryx amata</i>
Invertebrates	Skipper, Appalachian grizzled (butterfly)	<i>Pyrgus centaureae wyandot</i>	Lampmussel, eastern (mussel)	<i>Lampsilis radiata</i>
Invertebrates	Wedgemussel, dwarf**	<i>Alasmidonta heterodon</i> **	Lampmussel, yellow (mussel)	<i>Lampsilis cariosa</i>
Invertebrates			Mucket, tidewater (mussel)	<i>Leptodea ochracea</i>
Invertebrates			Pondmussel, eastern (mussel)	<i>Ligumia nasuta</i>
Invertebrates			Snaketail, brook, (dragonfly)	<i>Ophiogomphus aspersus</i>
Invertebrates			White, checkered (butterfly)	<i>Pontia protodice</i>
Mammals	Bat, Indiana**	<i>Myotis sodalis</i> **		
Mammals	Bat, Northern long-eared**	<i>Myotis septentrionalis</i> **		
Mammals	Bobcat	<i>Lynx rufus</i>		
Mammals	Whale, North Atlantic right**	<i>Eubalaena glacialis</i> **		
Mammals	Whale, blue**	<i>Balaenoptera musculus</i> **		
Mammals	Whale, fin**	<i>Balaenoptera physalus</i> **		
Mammals	Whale, humpback**	<i>Megaptera novaeangliae</i> **		
Mammals	Whale, sei**	<i>Balaenoptera borealis</i> **		
Mammals	Whale, sperm**	<i>Physeter macrocephalus</i> **		
Mammals	Woodrat, Allegheny	<i>Neotoma magister</i>		

**Note:** \*\* indicates Federally Endangered, 'BR' indicates Breeding population only, 'NB' indicates non-breeding population only

Source: NJDEP, Database of Rare Biodiversity (2024)

### Rare Wildlife

According to NJDEP Fish and Wildlife, many species of rare wildlife have been documented in Hamilton Township over the past 100 years. Brief descriptions of the rare species found listed in Hamilton Township, provided by the New Jersey Fish and Wildlife Service, are below.

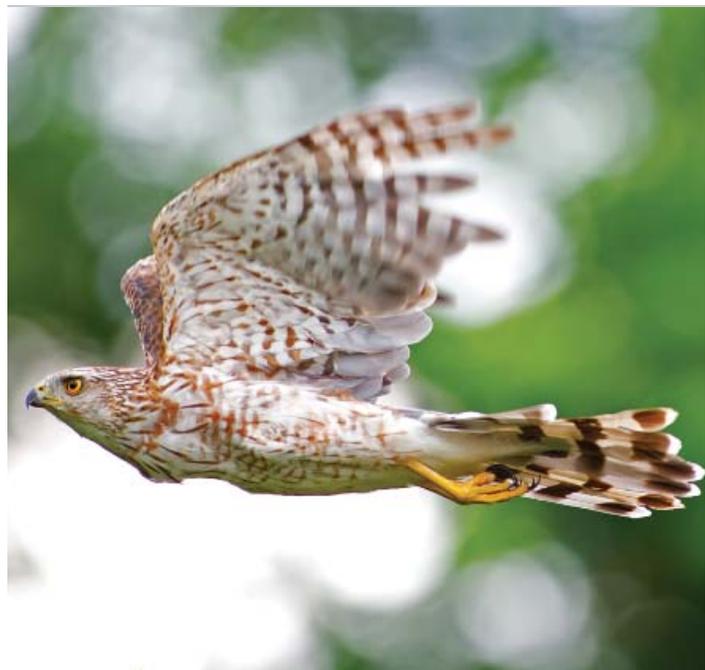
The **bald eagle** (*Haliaeetus leucocephalus*), an endangered species in New Jersey, was listed as an endangered species in New Jersey in 1974, and as endangered in the lower 48 states in 1978. The bald eagle was removed

from the federal endangered species list in 2007. Bald eagles are sensitive to human disturbance and are proven indicators of a healthy environment. Only found in North America, bald eagles inhabit New Jersey year-round. They mostly consume fish, and thus often choose to build nests in forested areas near water bodies. Population decline caused by hunting, poisoning, and egg collecting was accelerated after the introduction of the pesticide dichlorodiphenyltrichloroethane (DDT) into the environment during the 1950s. DDT causes the thinning of the eggshells, which crack under the weight of the incubating adult bird. Since the ban of DDT in 1972 and with an active state restoration program, bald eagle populations in New Jersey have increased from a single nesting pair in 1970 to 286 nesting pairs in 2023 (njconservation.org). As of April 2024, there were four nesting pairs of bald eagles in Mercer County (Conserve Wildlife Foundation)). Within Hamilton Township, bald eagle foraging areas have been identified along the Delaware River.

The **shortnose sturgeon** (*Acipenser brevirostrum*) is a federal and state endangered fish species. It is a freshwater amphidormous species, meaning they spawn and remain in freshwater for most of their lives, but spend some time in saline waters. River mouths, tidal rivers, estuaries, and bays are the prime habitats of the shortnose sturgeon. A significant portion of the New Jersey shortnose sturgeon population inhabits the upper tidal Delaware River. Industrialization from the late 1800s to 1900s caused a substantial loss of suitable habitat for the shortnose sturgeon. Pollution, overfishing, and the construction of dams have also contributed to population decline. By the 1950s, the U.S. Fish and Wildlife Service concluded that the shortnose sturgeon was eliminated from the rivers in its historic range and was in danger of extinction. It has been listed as endangered since the passage of the Endangered Species Act in 1973.

The **Cooper's hawk** (*Accipiter cooperii*) is a species of special concern in New Jersey. This raptor resides in both wetland and upland forests and is present year-round in the state. The Cooper's hawk lives in old-growth forests with closed canopies and moderate to heavy shrub cover. It prefers nesting in dense woods, such as cedar forests and conifer groves. The population of the Cooper's hawk began to decline in the 1950s, as development encroached upon its habitat. Like the bald eagle, the Cooper's hawk was affected by the use of DDT. It was placed on the endangered species list for New Jersey in 1974; however, it does not have federal endangered species status. Also, like the bald eagle, the population of the Cooper's hawk rebounded greatly after the federal ban on DDT, and its status in New Jersey changed from endangered to threatened in 1999. The loss of large, contiguous forest land in the state continues to be a threat to the species. Additionally, the American Bird Conservancy cites collisions with glass as an additional significant threat to the species.

The **eastern box turtle** (*Terrapene carolina*) is listed as a species of special concern in New Jersey. This small, four- to six-inch turtle can be found all over the state and lives in many different habitats. They are mostly terrestrial and enjoy soaking themselves in water or mud during the summer. Continued residential



**Cooper's hawk**

Source: Brian E. Kushner, Getty Images

development has limited suitable habitats and reduced their numbers over the years. People encountering these turtles often keep them as pets, which prevents them from breeding. As with all species, the collection and possession of eastern box turtles is prohibited in New Jersey.

The **eastern pondmussel** (*Ligumia nasuta*), imperiled due to its rarity, is a threatened species of freshwater mussels in New Jersey. It is found from Cape Fear River Basin, North Carolina, to the Saint Lawrence River basin, Canada, and westward through the northern parts of the continent's Interior Basin. In New Jersey, the species inhabits the Delaware River and several of its tributaries. Over the past century, one in 10 of North America's freshwater mussel species has become extinct. The remaining 75 percent are either rare or imperiled. Their decline is directly related to the degradation and loss of habitat due to pollution, dam construction, channelization, and dredging, as well as the invasion of exotic species that compete for space and food with native mussels. Eastern pondmussels were listed as threatened in New Jersey in 2002.



**Eastern box turtle**

Source: "milehightraveler", Getty Images

The **piebilled grebe** (*Podilymbus podiceps*) is a duck-like diving bird that is endangered in New Jersey. Grebes are well adapted for swimming underwater and waterproof their feathers by pruning them with secretions from an oil gland at the base of their tail. They nest in freshwater marshes associated with ponds, bogs, lakes, reservoirs, or slow-moving rivers. Breeding sites typically contain open water with submerged or floating vegetation. They can be found in a variety of habitats outside the breeding season. Although common during the 19th century, the piebilled grebe population suffered from hunting for food and feathers, which were used in earmuffs and hats. Increased habitat loss and degradation led to further population decline, and the species was listed as threatened in 1979 and endangered in 1984. Human disturbance, flooding, contaminated runoff, and the continued loss of wetlands through draining, dredging, filling, pollution, and siltation still threaten the viability of the piebilled grebe.

The breeding population of the **American bittern** (*Botaurus lentiginosus*), a vocal wading bird, is endangered in New Jersey. During the breeding season, these birds inhabit emergent wetlands, such as cattail ponds, sedge marshes, and marshes created by impoundments or beaver dams. They prefer to nest in shallow water with dense vegetation. Occasionally, American bitterns may nest in wet fields or grasslands containing tall grasses. During the nonbreeding season, American bitterns may occupy a variety of wetlands or grassland habitats. The American bittern was a common species before hunting and wetland destruction caused initial declines by the 1920s. Accelerated habitat loss since the 1950s, however, caused the population to decline at an alarming rate. The American bittern has been documented in the Abbott Marshlands.

The **Northern harrier** (*Circus cyaneus*) is a medium- to large-sized hawk with an endangered status in New Jersey. It was commonly called a "marsh hawk" because its preferred habitat is wet open areas, such as tidal marshes, emergent wetlands, fallow fields, grasslands, meadows, airports, and agricultural areas. Northern harrier nests are found in brackish or saline marshes along the Delaware Bay shore, as well as in freshwater tidal marshes



### Northern harrier

Source: MattCuda, Getty Images

that contain the common reed (*Phragmites australis*), like the Abbott Marshlands. Like the Northern goshawk and other raptors, the Northern harrier was commonly shot in the early 20th century because of its predatory nature. The destruction of its wetlands habitat through deforestation, the draining and filling of coastal marshes, and the loss of farmland also contributed to its decline. An additional threat to the Northern harrier was the widespread use of DDT, which was found to cause reproductive failure in the species during the 1950s and 1960s. Since DDT was federally banned in 1972, the numbers of Northern harriers have gradually increased. The Northern harrier was listed as a threatened species in New Jersey in 1979, a status that was elevated to endangered in 1984.

The **osprey** (*Pandion haliaetus*) is a threatened species in New Jersey. Ospreys live near coastal and inland bodies of water that support adequate fish populations. The birds build nests near fishing areas on structures such as trees, telephone poles, and channel markers. Occasionally, ospreys nest on the ground in coastal marshes. Habitat destruction, the loss of nesting trees, egg collecting, and shooting contributed to population declines evident by the end of the 19th century. Osprey numbers then dropped further after DDT was introduced into the New Jersey environment in the 1950s. As a result, the osprey was placed on the New Jersey endangered species list soon after the 1974 passage of the New Jersey Endangered Species Act. After DDT was banned, ospreys generally began to recover. Extensive building of nesting platforms also helped its recovery. In 1985, the species was moved to the threatened species list. Monitoring of nesting sites along the Atlantic Coast and Delaware Bay has shown that the osprey population continues to grow. The New Jersey Osprey Project documented 808 occupied osprey nests in 2023, the most in the history of the project. However, they also found that the statewide average productivity rate (percent of ospreys that are successfully reproducing) was 1.16 in 2023, the lowest recorded since 2003 (0.86).

The **peregrine falcon** (*Falco peregrinus*) is an endangered species in New Jersey that has been observed in Hamilton Township. The peregrine falcon is the world's fastest bird, able to reach diving speeds of up to 200 miles per hour. Peregrines traditionally nested on rocky cliffs, but because of human intrusion in these areas, they have taken to nesting in man-made structures, such as buildings and bridges. Peregrines also nest on artificial nesting platforms that have been constructed in the last 20 years in coastal marshes. The population of peregrine falcons decreased due to the looting of nests by egg collectors and falconers, as well as the shooting of the predatory birds by gunners, game wardens, and pigeon fanciers. Like a number of other birds, the peregrine falcon population was devastated by the introduction of DDT; by the 1960s, there were no known nesting peregrine falcons in the eastern United States. It was listed as an endangered species for the United States in 1970 and for New Jersey in 1974. Young peregrines were released into the wild in the late 1970s to reestablish their nesting populations. By 1986, there were 10 breeding pairs in the state, which increased to a high of 44 pairs by 2021. Peregrine falcons were removed from the federal endangered species list in 1999, although they remain listed as endangered in New Jersey due to the continued threat of environmental contamination and human disturbance.

## Rare Plants

NJDEP's Natural Heritage program has identified and monitored 356 native species listed as endangered in New Jersey. More information on these species, and a full list of recorded rare plant species across Mercer County can be found on the Office of Natural Lands Management [website](#). NJDEP utilizes a ranking system for identifying rare species and ecological communities most endangered with extinction, with different classifications for state, federal, or globally threatened and endangered plants.

Threatened and endangered plants that have been recorded in Hamilton Township include the purple giant hyssop, pawpaw, and death camas. There are several rare plant species that have been documented in Hamilton Township, and the list below is nonexhaustive. Descriptions of those plant species listed on the Natural Heritage Database for Hamilton Township, provided by the New Jersey Fish and Wildlife Service, follow.

The **purple giant hyssop** (*Agastache scrophulariifolia*) is a plant species protected by the Highlands Water Protection and Planning Act. According to NJDEP, it is classified as an S1 species, meaning that it is critically imperiled in New Jersey due to extreme rarity (5 or fewer occurrences). Globally, it is apparently secure; however, it may be quite rare in parts of its range, especially at the periphery. The purple giant hyssop flowers are purplish-red petals in a crowded, terminal spike with purple bracts. Growing three to six feet high, the purple giant hyssop is a perennial plant that blooms in July, August, and September. Its native habitat is rich woods and thickets, particularly along edges. It requires sun and shade, as well as rich, moist soil.

The **paw paw** (*Asimina triloba*) is an endangered plant species whose prospects for survival within New Jersey are in immediate danger. It is protected by the Pinelands Commission and the Highlands Water Protection and Planning Act. The paw paw is currently ranked as an S3 species, which means that it has only estimated of 21-100 occurrences in the state. It is not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.

The paw paw is native to the U.S. and is a small, short-trunked tree or large, multistemmed shrub. It grows 10 to 40 feet tall, with large, tropical-like leaves. In the fall, the deciduous leaves turn yellow and green. Purple, six-petal flowers blossom in April and May before leaf emergence. Large, cylindrical, dark green or yellow edible fruit follows. Native habitats include ditches, ravines, depressions, flood plains, and bottomland. Paw paws grow in rich, moist, slightly acid soils, as well as in sandy, sandy loam, medium loam, and clay loam or clay soils.

The **death camas** (*Zigadenus leimanthoides*), last observed in 1913, is an endangered species whose prospect for survival within the state is in immediate danger. It is critically imperiled in New Jersey because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres). It is protected by the Pinelands Commission and the Highlands Water Protection and Planning Act. The death camas is apparently secure globally, although it may be quite rare in parts of its range, especially at the periphery. Growing three to five feet high, the stem of the



**Purple giant hyssop**

Source: Robert Winkler, Getty Images

death camas bears elongated, branching clusters of small, creamy or yellow star-like flowers. It is found in wet pinelands and bogs mostly in Virginia south to Florida and west to Texas.

### **Conservation Areas**

Within Hamilton Township, there are several natural areas that have special significance for the conservation of rare species and ecological communities. The Natural Heritage Database provides the foundation for the designation of NHP sites. NHP sites are exemplary natural communities within the state that provide critically important habitat for rare plant and animal species. Preserving these areas should be a top priority in efforts to conserve biological diversity in New Jersey. Designation as an NHP site does not carry any specific requirements or restrictions on the land. Rather, the designation is made because of a site's high biological diversity value. Owners of NHP sites are encouraged to become informed stewards of the property and to consider working with the local community, nonprofit groups, or the state to preserve the land permanently.



**Paw paw tree**

Source: Jon Kraft, Getty Images

The most ecologically important area in the township is the Abbott Marshlands, which have been designated a NJDEP Natural Heritage Priority (NHP) site and an Audubon Important Bird Area (IBA). Additionally, the Walnford Floodplain NHP site, Trenton Boat Launch NHP site, and the Van Nest Refuge Fish and Wildlife Management Area (WMA) are other significant natural areas. The New Jersey WMA system is administered by the Division of Fish and Wildlife's Bureau of Land Management. From the Delaware Bay coastal marshes to Kittatinny Ridge Mountains, the WMA system preserves a diversity of fish and wildlife habitats.

The IBA Program is a global effort by the Audubon Society, with the help of other groups, to identify and conserve areas that are vital to birds and other species. The Abbott Marshlands IBA is the largest IBA in Hamilton Township, covering about 2,800 acres. The Delaware Canal and Raritan State Park and the Assunpink Wildlife Management area are two other IBA's that are partially within Hamilton Township.

Natural Heritage grid maps exist that show the general locations of rare plant species and ecological communities, without providing the sensitive detailed information that could place these resources at risk for vandalism or illegal collection. These maps are available to Environmental Commissions and for research projects, but are otherwise not public.

### **Abbott Marshlands**

The Abbott Marshlands (previously known as the Hamilton-Trenton-Bordentown Marsh) are one of New Jersey's most significant natural areas despite being intersected by two major interstates and a railroad line, and containing uses like a former landfill, sewage treatment plant, and a power generating plant. A popular destination for bird watching, hiking, fishing, canoeing, and photography, the Abbott Marshlands are the northernmost tidal freshwater wetlands on the Delaware River. The Abbott Marshlands, located on the eastern side of the Delaware River, are situated among the urbanized areas of Trenton, Hamilton Township, and Bordentown Township. The marsh is bordered by a dense infrastructure network that includes the River LINE, Interstates 295 and 195, and the

associated development. The entire area referred to as the marshlands is about 3,000 acres, although the areas designated an NHP site and IBA are smaller.

The Abbott Marshlands have been called a number of names including Trenton Marsh, Hamilton–Trenton Marsh, White City Meadows, and Hamilton-Trenton-Bordentown Marsh. However, in 2010, during the development of the Hamilton-Trenton-Bordentown Marsh Cooperative Stewardship Plan, it became clear that the current name was cumbersome and that a better understanding of the importance of the area needed to be expressed. With funding from the NJ Historic Trusts, Mercer County worked with many stakeholders to determine a suitable name. Ultimately, they chose “Abbott Marshlands” to recognize both the important archaeological legacy of the marsh and of Charles Conrad Abbott, a 19th and early 20th century archaeologist and naturalist, who lived on the bluffs near the marsh and wrote extensively about it.

Marshes are wetlands that are frequently or continually inundated with water and are characterized by emergent soft-stemmed vegetation adapted to saturated soil conditions. They are invaluable natural resources because they store floodwaters, improve water quality, control erosion, provide wildlife habitat, offer recreational opportunities, and provide other environmental services. Influenced by the motion of the tides, freshwater tidal marshes occur in estuaries where freshwater from rivers and streams meet ocean tides. The freshwater tidal marsh complex is considered a rare ecological community in the state. The Abbott Marshlands are made up of tidal and nontidal wetlands, shrub forest wetlands, constructed wetlands, deciduous woodland, and upland forests containing second-growth woods and oak woods. The Marshlands are also home to lakes, including Spring Lake, Rowan Lake, and Sturgeon Pond in the north. The Delaware & Raritan (D&R) Canal greenway also passes through the marsh. The rich diversity of habitats within the marsh supports over 1,200 species of plant and animal life.

The Abbott Marshlands NHP Site, covering 1,250 acres, is a varied landscape of tidal and non-tidal wetlands and is home to several state endangered plant and animal species.

Over 900 plant species have been identified in the marsh, including 30 species considered endangered, threatened, or rare in the state. The wetlands area of the marsh is defined by the tidal waters of the Delaware River and the Crosswicks, Watson, Rowan, and Duck creeks. Plants found here include New York ironweed, sneezeweed, yellow pond lily, and water smartweed. A more detailed list of animals and plants in Abbott Marshlands can be found in **Appendix A: Plant and Animal Species in Abbott Marshlands on page A-1.**

To the southeast of the marsh are the uplands on a bluff overlooking Crosswicks Creek. Tulip, black gums, Eastern hemlocks, and pitch pines are the dominant trees. Dense thickets of mountain laurel and great rhododendron, which are unique for New Jersey, are found here as well. Second-growth forests are found to the northeast of the marsh along the bluffs near Spring Lake, as well as on the islands off of Spring Lake and the Hamilton Water Treatment Plant. These are former agricultural fields or places that have been altered by human activities, where the second growth of oaks, tulip trees, and other hardwood trees has occurred. Brown thrashers, song sparrows, and Carolina chickadees reside in the second growth forests.

Phytoplankton–tiny microscopic photosynthetic cells–are in these waters as well. Phytoplankton is the foundation of the food web and supports other fish found in the Abbott Marshlands, such as the killifish, Johnny Darter, alewife, shad, yellow perch, and the short-nosed sturgeon. These fish populations, in turn, support fish-eating birds such as mergansers, cormorants, osprey, egrets, and herons. The river otter also has recently reestablished the Abbott Marshlands as home.

In the Abbott Marshlands IBA, 245 species of birds have been sighted, 100 of which nest in the marsh. Several state-threatened and endangered birds inhabit the Abbott Marshlands, including ospreys, pied-billed grebes, Cooper’s hawks, and bald eagles. A variety of birds, especially migratory species, inhabit the upland forests. Titmice

and Carolina chickadees are commonly found in the mountain laurel- rhododendron thickets. It also is host to breeding forested wetland bird species, such as wood ducks, prothonotary warblers, and fish crows. During the spring and fall migration period, migratory songbirds are also found in the marsh. A list of birds observed in the Abbott Marshlands can be found online: <https://abbottmarshlands.org/wp-content/uploads/2021/04/BIRDS- ABBOTT MARSHLANDS 2021.pdf>

Wetlands are fragile ecosystems susceptible to pollution, development, and nonnative species. Although they are regulated under the New Jersey Freshwater Wetlands Protection Act, this law does not guarantee protection. Under current regulations, wetlands can still be disturbed, drained, or filled. Commercial and residential development threatens the Abbott Marshlands. Effluent from the Hamilton Township sewage treatment plant contributes to pollution problems as well. Recreational overuse from activities such off-road vehicles and unauthorized digging for archaeological artifacts destroy habitats. The marsh is disturbed by construction and maintenance activities along roadways, as well as the railroad. Habitat diversity has been reduced due to nonnative flora, such as the common reed (*Phragmites australis*) and mile-a-minute weed (*Persicaria perfoliata*).

A northern portion of the marsh is designated as the Abbott Farm National Historic Landmark, discussed in **Historic Sites on page 5**. This district is a collection of several sites of archaeological significance. Among these are prehistoric excavation sites, historic homes, and remnants of the D&R Canal and the Camden and Amboy Railroad. The Abbott Farm National Historic Landmark Interpretive Plan, developed in 2009 by Jane Clark Chermayeff & Associates, provides a vision and framework for understanding the cultural and natural resources of the area.

The 400-acre John A. Roebling Memorial Park is also located in the northern end of the marsh, close to Abbott Farm. The park is home to the Tulpehaking Nature Center and Interpretive Center. Housed in a former residence, the center serves as an educational and recreational gateway to the marsh. A master plan for this center was developed in 2007.

A Cooperative Stewardship Plan for the marsh was completed in 2010 by the Friends of the Marsh organization, a project of the D&R Greenway Land Trust. The Abbott Marshlands Cooperative Stewardship Council, which is comprised of the following organizations, released an updated Cooperative Stewardship Plan in 2024:

- City of Bordentown;
- City of Trenton;
- Bordentown Township;
- Mercer County;
- D&R Canal Commission;
- D&R Greenway Land Trust;
- Friends for the Abbott Marshlands;
- Hamilton Township;



**Abbott Marshlands sign**

Source: [abbottmarshlands.org](http://abbottmarshlands.org)

- New Jersey Department of Environmental Protection;
- New Jersey Division of Parks and Forestry, State Park Service;
- New Jersey Department of Transportation; and
- New Jersey Transit.

Specifically, Hamilton Township notes that it “is a large land owner within the Abbott Marshlands, owning and maintaining over 450 acres of (mostly) undeveloped open space/marshlands as well as several active and recreational park properties, including the historic Isaac Pearson house.

Township residents also currently enjoy direct access to County facilities such as Spring Lake and Roebling Park from Sewell Avenue and Independence Avenue.

The Abbott Farm National Historic District is also within Hamilton Township and extends from the Whitehorse Circle, along South Broad Street to Trenton and then bordered by the Delaware River and Crosswicks Creek—thereby overlapping with the Abbott Marshlands.”



**Japanese Stiltgrass**

Source: Sherry Barr Photography, Getty Images

### **Walnford Floodplain**

The Walnford Floodplain NHP site encompasses an extensive floodplain forest adjacent to Crosswicks Creek and forested slopes. This NHP site crosses four municipalities, including Hamilton Township, Upper Freehold Township in Monmouth County, and Chesterfield and North Hanover townships in Burlington County. Its biodiversity rank is B3, meaning the site contains a high-quality example of a floodplain forest natural community. Floodplain forests are diverse natural communities that occupy bottomlands, low-lying areas along streams and rivers. These areas experience seasonal floods that often deposit rich soil and physically remove shrubs and other low-growing plants. Flooding frequency and duration, as well as the species, compositions, and community structure of floodplain forests, vary regionally; however, these forests are typically dominated by silver maples (*Acer saccharinum*) and red ash (*Faxinus pennsylvanica*). Floodplain forests represent an interface between terrestrial and aquatic ecosystems and are considered a rare ecological community in the state.

### **Van Nest Refuge**

The Van Nest Refuge Fish and Wildlife Management Area, covering 98 acres, is the only WMA within Hamilton Township. It is located in the northern part of the township on Hughes Drive near the intersection with Province Line Road (Route 533), bordering Mercer County Park and West Windsor Township. The Van Nest Refuge has trails for walkers and bikers that follow the Assunpink Creek. The entire property is owned by the State of New Jersey.

## **Threats to Natural Vegetation**

### **Invasive Plant Species**

A significant threat to the native vegetation and ecological integrity of Hamilton Township is the spread of invasive species. Invasive species not only crowd out native species, but they also tend to diminish biodiversity, thereby creating ripple effects throughout an ecosystem. A primary characteristic of an invasive species is its rapid growth due to the lack of natural controls present in its native lands, which include herbivores, parasites, and diseases. This phenomenal growth allows invasive species to overwhelm and displace existing vegetation to form one-species stands. The spread of invasive species has directly contributed to the decline of many threatened and endangered plant species. Not all nonnative plant species prove to be invasive. In addition, a small number of native species can behave aggressively enough to be considered invasive in some circumstances.

The dietary preference of deer for native species has given invasive nonnative species an additional competitive advantage. In particular, many native spring ephemeral wildflower species have been grazed into rarity or oblivion, as have some native shrub species and tree seedlings. Nonnative species tend to be inedible for local wildlife, or provide food that is lower in nutritional value than the native plant species that they have displaced. Many invasive species are successful due to their allelopathic properties, meaning that the plant releases toxins that inhibit the growth of other plants. Invasive species showing allelopathic properties include the tree of heaven, garlic mustard, and spotted knapweed. Some nonnative invasives may also be altering the chemistry and porosity of the soil, with long-term consequences for forest health and water quality. Such species include Japanese stiltgrass, garlic mustard, black locust, and autumn olive.

Over 200 invasive plant species have been identified in Mercer County. Some of the more prevalent species found in Hamilton Township include Japanese knotweed, Japanese stiltgrass (also known as Nepalese browntop), English ivy, purple loosestrife, and the common reed.

### **Bacterial Leaf Scorch**

Bacterial leaf scorch is an infectious chronic disease that causes slow decline and death of shade trees. It is caused by the bacterium *Xylella fastidiosa* and is spread by insects of the families Cercopidae (spittlebugs), Cicadellidae (leafhoppers), and Membracidae (treehoppers). The bacterium multiplies rapidly and clogs the tree's water-conducting tissue, disrupting water transport to roots, branches, and leaves. Symptoms include leaf browning, which begins at the leaf edges. Symptoms recur each year, and the trees slowly die over a number of years. Bacterial leaf scorch affects a range of shade tree species, including sycamore, mulberry, red maple, sugar maple, sweetgum, American elm, and a number of oaks. It is also known to affect a variety of herbaceous and woody plants, as well as some grass species.

In Hamilton Township, bacterial leaf scorch has had a devastating effect on oak trees, including those in Veterans Park. In the 2010's, the Environmental Commission collaborated with the NJDEP in surveying and identifying trees infected by bacterial leaf scorch. This disease leaves many trees with dead branches that can be hazardous to people and property, necessitating early removal of the trees. Unfortunately, there is no known preventative treatment or cure for the disease. There are some measures that can be taken to suppress symptoms or to make the trees more presentable, including pruning of symptomatic branches and mulching and irrigating during periods of little rainfall to reduce moisture stress. Another disease management strategy is to inject the trunks of infected trees with antibiotics in late May or early June. The antibiotic oxytetracycline has been shown to cause remission of symptoms, but does not provide a cure to the disease, and must be administered annually.



**Black Locust**

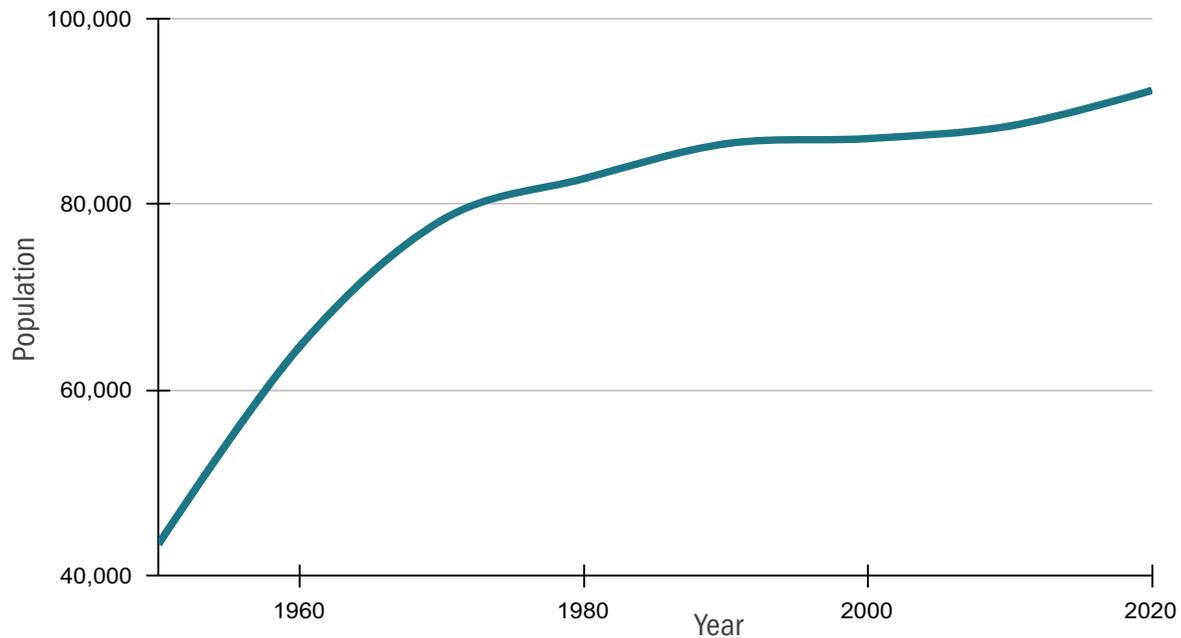
Source: apugach, Getty Images

# The Built Environment

## Population

As of 2020, Hamilton Township had a population of 92,297. Hamilton’s population increased steadily during much of the twentieth century, almost doubling in population. The population has continued to grow since then, although at a much slower rate. See **Figure 26: Hamilton Township Population (1950–2020)**.

Figure 26: Hamilton Township Population (1950–2020)



Source: *New Jersey Population Trends: 1790 to 2000*, New Jersey Data Center (2001)

## Race

Over two-thirds of Hamilton identify as White, which is higher than the countywide rate of 54 percent. Approximately 13 percent of Hamilton residents identify as Black and 5 percent identify as Asian, which is similar to nationwide rates but lower than countywide rates (see **Table 27: Hamilton Township Population By Race (2022)**).

Table 27: Hamilton Township Population By Race (2022)

Race	Percent of Township	Percent of County	Percent of United States
<b>One Race</b>	<b>93.4%</b>	<b>93.0%</b>	<b>91.2%</b>
White	69.7%	53.8%	65.9%
Black or African American	12.9%	19.7%	12.5%
American Indian or Alaska Native	0.0%	0.3%	0.8%
Asian Alone	5.2%	12.2%	5.8%
Native Hawaiian and Other Pacific Island Alone	0.1%	0.0%	0.2%
Some Other Race	5.5%	7.0%	6.0%
<b>Two or More Races</b>	<b>6.6</b>	<b>7.0%</b>	<b>8.8%</b>

Source: U.S. Census Bureau, ACS 5-Year Estimates, DP05 Demographic and Housing Estimates (2022)

## Housing

There were 37,716 housing units in Hamilton Township in 2020, according to the 2020 US Census, which is approximately a 4.2 percent increase from the total of 36,170 housing units in Hamilton Township in 2010. Of these, 36,125 (95.7 percent) were occupied and 1,591 (4.2 percent) were vacant in 2020. Mercer County as a whole had a vacancy rate of 7.8 percent in 2020, so the township is doing better comparably.

Additionally, Hamilton Township had an owner-occupancy rate of 72.5 percent, which is higher than the county-wide rate of 63.7. The median value of owner-occupied homes in Hamilton, was \$284,300, which was lower than the county-wide median value of \$327,600.

In Hamilton, the median gross rent was \$1,467 per month, closely mirroring that of Mercer County, which was \$1,454 per month. Seventy-seven and a half percent of the homes in Hamilton are single family homes, and 21.7 percent are multi-family homes or apartments, with the rest being other types of housing such as mobile homes. Seventy-six percent of the occupied housing units in Hamilton were built prior to 1980. Also, only five percent of these units do not have a vehicle.

## Transportation

Hamilton Township is located in a highly strategic location for transportation accessibility by both car and public transit. The New Jersey Turnpike, Interstate Highways 195 and 295, U.S. Highways 130 and 206, and State Highways 33 and 29/129 pass through the township. Trenton, the state capitol, is located directly to the west of Hamilton. Hamilton Township is about 60 miles southwest of New York City, equivalent to an 80-minute car ride or a 70-minute train ride. Philadelphia is 40 miles southwest of the township, about 50 minutes by car or 70 minutes by train. New Jersey shore points are also easily accessible via Interstate 195.

Hamilton Township contains one of the most active train stations on New Jersey Transit's Northeast Corridor Rail Line. Built in 1999, the Hamilton Station is an intermodal hub between rail, bus, and automobile. The station is located directly off of Interstate 295/Sloan Avenue and contains over 2,000 parking spaces, plus 750 overflow spots, as well as bike racks and lockers. The station offers NJ Transit rail service along the Northeast Corridor to the Trenton Transit Center and Penn Station in New York City. NJ Transit also offers bus service from this station via two routes.

Also crossing through Hamilton Township is the Camden and Amboy rail line, although it is inactive. According to the Mercer County Bicycle Master Plan (2020), rail company Conrail retains right-of-way on this rail line, and the county believes it could be a suitable candidate for future bicycle and walking trail development.

According to the 2020 American Community Survey, of the 45,321 employed Hamilton residents, 80.92 percent (36,674 people) drove to work alone, 9.19 percent (4,164 people) carpooled, 2.83 percent (1,284 people) took public transit to work, 1.33 percent (602 people) walked to work, and 0.5 percent (224 people) took a cab, biked, or utilized other means of transportation. The remaining 5.23 percent



**Bike Lane Signage in Hamilton**

Source: Rob Poppert, Hamilton Township

(2,373) worked from home. The majority of workers in Hamilton Township had a commute between 15 and 24 minutes, which falls below both the New Jersey average of 31.1 minutes and the Mercer County average of 27.5 minutes.

## Energy Use

DVRPC's greenhouse gas (GHG) and energy use inventory estimates annual emissions and energy use for the entire region, as well as in each county and each municipality within the region, including Hamilton. (See **Figure 27: Energy Use per Person and Job by Municipality (BBTUs) (2015) on page 110**)

The combustion of fuels for this consumed energy, in combination with several non-energy sources of greenhouse gases, resulted in the estimated release of about 918,000 metric tons of CO<sub>2</sub>-equivalent gases. The presence of forest habitat and other undeveloped open space in Hamilton serves as a “carbon sink,” absorbing carbon and thus reducing the township’s total emissions by about 16,000 metric tons of CO<sub>2</sub>-equivalent gases.

In its most recent estimation for Hamilton, using 2015 data, DVRPC calculated that Hamilton households and jobs consumed a combined 12,200 billion British thermal units (BBTUs) of energy in a year. A British Thermal Unit (BTU) is the amount of energy needed to cool or heat one pound of water by one degree Fahrenheit. A gallon of gasoline contains about 114,000 BTUs, so Hamilton’s total energy use in 2015 was equivalent to about 10.7 million gallons of gasoline. Hamilton performed similarly to the average municipality in the region in terms of energy use per capita, which includes both residents and the number workers. The total cost of Hamilton’s energy use was estimated to be about \$241 million.

The energy use totals are broken out into four main categories or sectors: residential, commercial and industrial energy consumption, on-highway (road) vehicle energy consumption, and public transit vehicles. Energy use in the residential, and commercial and industrial sectors is described as being “stationary” and energy use in vehicles is described as being “mobile.” Also, energy use in the residential and commercial and industrial sectors includes both fuels combusted on-site for heat, hot water, cooking, and other uses, as well as all the electricity consumed within residential, commercial, and industrial buildings and facilities.

For data that was able to be allocated to the municipal level, the mobile highway sector (in other words, passenger and commercial vehicles operating in Hamilton) consumed the most energy in Hamilton. Their total consumption was 4,802 BBTUs of energy, or 39 percent of the total energy consumed in the township (see **Table 28: Energy Use and Cost (2018) on page 110**). The residential sector held the second-highest energy use, with an estimated consumption of 3,817 BBTUs, or 31 percent of the total. Commercial and industrial came in third, with 3,599 BBTUs consumed, or about 29 percent of the total. Energy use for mobile-transit was negligible.

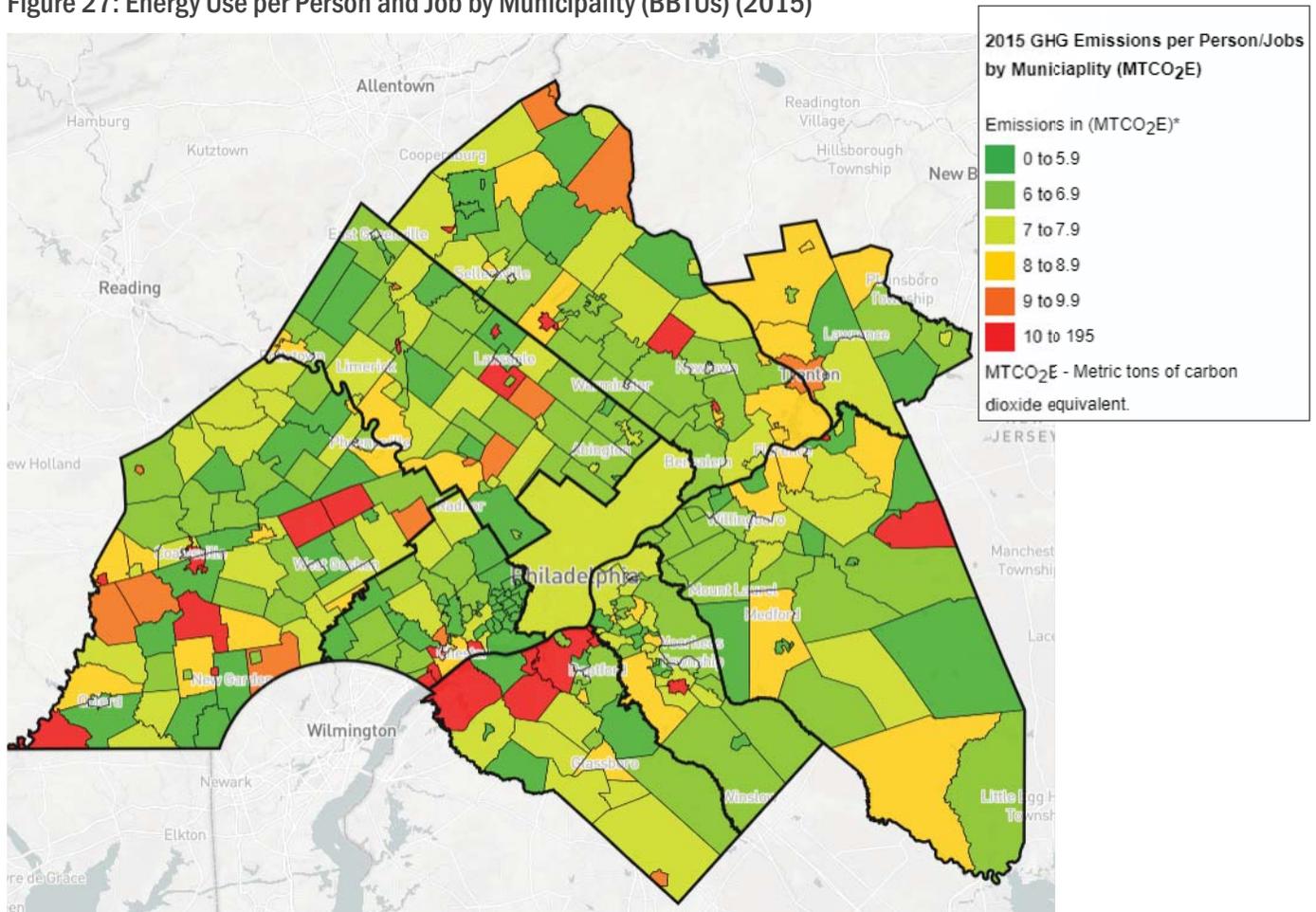
The energy expenditures in Hamilton were highest for the mobile-highway sector, at about \$100 million, or 42 percent of the total energy costs for the township. The second and third highest expenditures came from the residential sector (\$72 million, or 34 percent of the total) and the commercial and industrial sector (\$68 million, or 28 percent of the total).



**NJ Transit Train**

Source: Mel Musie, DVRPC

Figure 27: Energy Use per Person and Job by Municipality (BBTUs) (2015)



Source: DVRPC (2018)

Table 28: Energy Use and Cost (2018)

Sector	Energy Use (BBTU)	Percent of Total Energy Use	Total Energy Expenditures
Residential	3,817	31%	\$72,500,922
Commercial & Industrial	3,599	29%	\$68,625,960
Mobile-Highway	4,802	39%	\$100,337,452
Mobile-Transit	14	<1%	N/A
<b>Total</b>	<b>12,231</b>	<b>100%</b>	<b>\$241,464,333</b>

Source: DVRPC, Municipal Energy and Greenhouse Gases Emissions Profiles (2018)

## Open Space Preservation

### Open Space

Although Hamilton Township is a highly urbanized municipality, it still retains large areas of preserved and publicly owned open space, shown in **Table 29: Preserved Open Space (2021) on page 111** and in **Figure 28: Preserved Open Space (2020) on page 113**. Over 5,700 acres, or just over one-fifth of the township is permanently preserved. About half of all preserved land in Hamilton (over 2,600 acres) is either owned by the township or is preserved through a township-held easement. Mercer County owns almost 1,200 acres of open space and holds protective easements on an additional 1,077 acres of farmland within the township. Over 700 acres of land are owned and preserved by the State through either the NJDEP or the Department of Transportation (DOT).

**Table 29: Preserved Open Space (2021)**

Owner/Designation	Acreage (Approx.)	Percentage of Total Township Acreage
State of New Jersey	269	1.0%
State of New Jersey (Farmland)	518	2.0%
Mercer County	1,174	5.0%
Mercer County (Farmland)	1,077	4.0%
Township Parks (Developed)	668	3.0%
Township Open Space (Township owned or deed restricted as Greenbelt, Farmland, or Open Space)	1,991	8.0%
Nonprofit Lands	25	5.0%
<b>Total</b>	<b>5,722</b>	<b>22.0%</b>

Source: Hamilton Township, Open Space and Recreation Plan (2021)

In 2021, Hamilton published its [Open Space and Recreation Plan](#), detailing the current status and future direction of open space in the township. The report states that Hamilton Township has one of the most “extensive park systems and recreational facilities within Mercer County and the State”. It also notes that as of 2021, there were a total of 36 township-owned parks and 668 designated park acres, ranging from active parks to passive gardens and arboretums, including Veterans Park, Sayen Gardens, and Kuser Farm. The report identifies four major goals pertaining to acquiring undeveloped land and preserving open space to be achieved over the next 20 years.

- **Goal 1:** To preserve adequate open space for the current and future needs of township residents.
- **Goal 2:** To develop adequate open space and recreational facilities to meet the needs of Hamilton Township now and in the future
- **Goal 3:** To preserve and enhance the social and ecological environment for the inhabitants of Hamilton Township
- **Goal 4:** To balance the provision of open space with other land uses

The Hamilton Open Space and Recreation Plan notes that preserved farmland offers economic, environmental, and aesthetic benefits, and can generate a higher return on investment than other land uses. About 1,223 acres farmland in the township are preserved, according to the plan, and the intention is for that number to continue to grow.

Stream corridors have been identified as an opportunity for future green corridor and trail development to link open spaces together. As of 2021, there were 44 miles of stream corridors in Hamilton Township. Currently 23 miles are owned by the township, county, and state, and the township aims to acquire the remaining 21 miles. Protecting a buffer strip of 100 feet or more along either side of these streams would also offer abundant opportunities for trail development.

**Figure 28: Preserved Open Space (2020) on page 113** is derived from DVRPC’s 2020 Protected Open Space Inventory and depicts various types of protected open space across the township. For more details on how this inventory was compiled, visit: <https://www.dvrpc.org/environment/openspace/inventory.htm>.

### Farmland

Farmland is also an important open space resource for Hamilton Township. It has many benefits, such as providing habitat for wildlife, groundwater recharge, aesthetic greenery, and the ability to grow fresh food, all of which boost the local and regional economy. The County of Mercer Comprehensive Farmland Preservation Plan, published in 2020, documents Mercer County’s agriculturally assessed lands. Most of the farmland assessed is located in Hopewell Township, Lawrence Township, West Windsor, Robbinsville, and East Windsor Township. Hamilton Township also holds significant farmland, near the borders of Burlington and Monmouth county. See **Table 30: Assessed Farmland in Hamilton Township (2018) on page 112** for a breakdown of farmland in Hamilton.

**Table 30: Assessed Farmland in Hamilton Township (2018)**

Type of Land	Acres
Cropland Harvested	1,795
Cropland Pastured	46
Permanent Pasture	79
Unattached Woodland	301
Attached Woodland	292
Equine Acres	8
Renewable Energy	0
<b>Total for Ag Use</b>	<b>2,521</b>

Source: Mercer County Agricultural Development Board, Comprehensive Farmland Preservation Plan (2020)

Farmland preservation helps to ensure that these resources remain in agricultural production, guaranteeing a future food supply and maintaining a way of life in the community. It also helps limit urban sprawl and protect local waterways. Farmland preservation has generally been made possible through the state’s farmland preservation program or with county funds. Most, though not all, of the farmland in Hamilton has already been preserved. See **Table 31: Agricultural Use Acres by Tax Year (2020)** for a breakdown of farmland loss over time.

**Table 31: Agricultural Use Acres by Tax Year (2020)**

Location	2018	2008	2001	1996
East Windsor Twp	2,308	2,652	3,426	4,358
Hamilton Twp	2,521	2,942	4,599	5,312
Hopewell Twp	14,674	15,807	19,475	19,830
Lawrence Twp	1,805	1,829	2,186	3,166
Robbinsville Twp	3,353	4,556	6,276	7,140
West Windsor Twp	1,630	2,392	4,486	5,546
<b>Total</b>	<b>26,291</b>	<b>30,178</b>	<b>40,448</b>	<b>35,352</b>

Source: Mercer County Agricultural Development Board, Comprehensive Farmland Preservation Plan (2020)

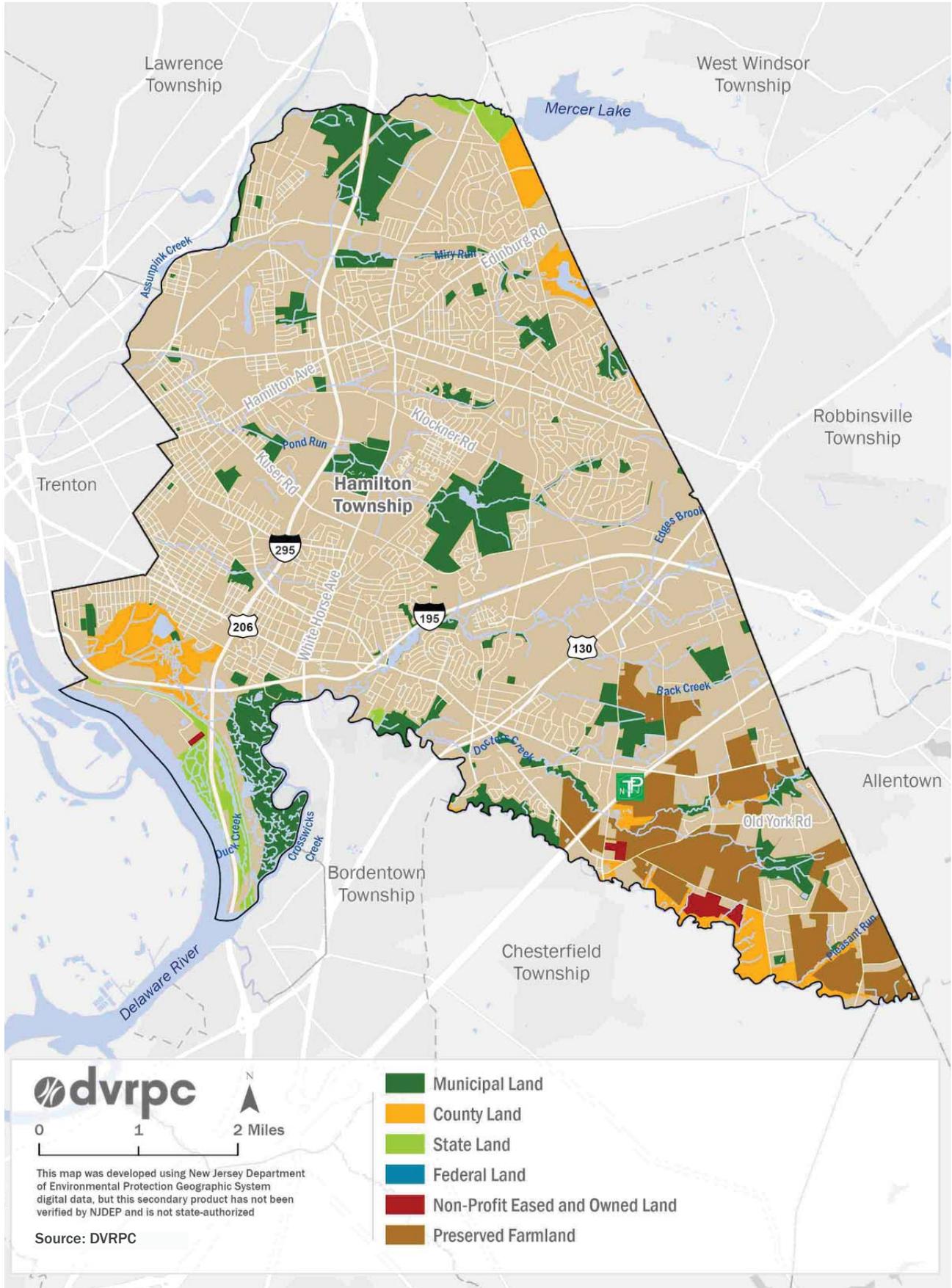
## Parks and Recreation

There are over 36 municipal parks in Hamilton Township. Township-owned parks, as well as school facilities, provide a wide variety of active recreational opportunities for local citizens. Within Hamilton there are 47 tennis courts, 30 full-sized soccer fields, 27 full-court basketball courts, 18 half-court basketball courts, 15 Little League baseball fields, 12 baseball fields, 10 football fields, seven softball fields, four outdoor volleyball courts, three tracks for track and field events, three indoor swimming pool complexes, two street hockey rinks, one field hockey field, one lacrosse field, and one skateboard park. Additionally, there are almost 50 playgrounds and 22 picnic groves with facilities for outdoor cooking and activities such as fishing, lawn bowling, bocce, quoit, and shuffleboard. The municipal Open Space and Recreation Plan recommends acquiring an additional 171 acres of land to build additional basketball, baseball, football, soccer, and softball facilities.

Private facilities in the township offer additional recreational amenities such as outdoor swimming complexes, indoor soccer fields, indoor skating rinks, and a golf course.

The Hamilton Township Recreation Division coordinates a range of programs, including both youth and adult sports leagues and a summer camp program. The Recreation Division also organizes a number of annual special events, such as Septemberfest Community Day, the Azalea Festival, the Independence Day Fireworks and Concert celebration, Fall Harvest, and Winter Wonderland.

Figure 28: Preserved Open Space (2020)



## Parks

The following sections highlight some of Hamilton’s major parks, including county-owned parks, all of which offer many ways for residents to engage in recreation and connect with nature.

### Veterans Park

Built in 1977 to honor Hamilton’s veterans, the nearly 350-acre Veterans Park is centrally located in Hamilton Township. The park has four entrances, each dedicated to a branch of the military. The park provides walking paths through wooded areas, Martin’s Lake, picnic grounds, an athletic field complex, roller hockey rink, skate park, senior pavilion, outdoor special needs exercise complex, dog parks, and large playground facilities. Veterans Park is the location of the Recreation Division’s Septemberfest and also hosts outdoor concerts, firework displays, and an annual Civil War reenactment.

### Mercer County Park

Primarily located in West Windsor Township, Mercer County Park also extends into Hamilton and Lawrence townships. Boasting a total of 2,500 acres, the park covers nearly four square miles of grassy fields and tree cover. Mercer County Lake, formed by an impoundment on Assunpink Creek, is located within the park. A variety of activities are offered at the park, including boating, fishing, rowing, mountain biking, nature observation, dog parks, and picnic areas.

### Sayen House and Gardens

Hamilton Township is also home to the Sayen House and Gardens, located in historic Hamilton Square. This 30-acre parcel was purchased by Hamilton Township in 1987 with assistance from the Green Acres funding program. It was formerly the private home of Frederick Sayen, an avid gardener who collected plants and flowers in his world travels. Today, there are more than 1,000 azaleas, almost 500 rhododendrons, and more than 250,000 flowering bulbs in the spring. The Sayen House and Gardens is the location of the Azalea Festival held annually on Mother’s Day.

In 2023, the NJDEP’s Green Acres program awarded Sayen House and Gardens a grant to restore two of the main ponds, and restore the nearby habitat. A list of the wildlife in Sayen House and Gardens, specifically bird and

herpetological data, can be found online: <https://www.hamiltonnj.com/sayengardens>.



### Sayen Gardens in Fall

Source: Marcello Sgarlato, Getty Images

### Grounds for Sculpture

The Grounds for Sculpture is a 35 acre public park built on the former site of the New Jersey State Fairgrounds. It was designed by J. Seward Johnson to promote an understanding of and appreciation for contemporary sculpture. Construction of the park began in 1989 and the site was opened to the public in 1992. The grounds contain over 240 permanent sculptures, including pieces by Clement Meadmore, Anthony Caro, Beverly Pepper, Kiki Smith, and George Segal. There is also a museum with seasonal exhibits, many educational programs, and two restaurants on the property. A list of plants located in the park can be found here: <https://www.groundsforsculpture.org/gardens/horticultural-highlights/>.

## **John A. Roebling Memorial Park**

Located within the Abbott Marshlands is the 257-acre John A. Roebling Memorial Park. Mercer County purchased the park from the Broad Street Park Civic Association in 1958 for \$1.00 with the condition that the land be preserved and used only for passive recreation. Facilities include eight miles of walking trails, 11 miles of canoe and kayak trails, and several picnic areas. Today, the park is a popular spot for fishing, bird watching, and nature walks.

The volunteer group Friends of the Marsh was formed in 2002 to promote and protect the park through education, outreach, and maintenance. This group organizes several recreational outings in the marsh, including nature walks, bird watching, kayaking, and canoe trips. Many other organizations also use the marsh for educational and recreational activities like class field trips and workshops, hiking, bird watching, photography, and botanical and nature studies. The Tulpehaking Nature and Interpretive Center at Roebling Park is an educational welcome center for the marsh.

## **Trails**

Hamilton is home to many trails that can be used for recreation or getting around town. Many are located within the townships's vast park system, but some serve as connectors to neighboring communities and support the use of alternative transportation methods, such as biking. Below is a list of notable trails in the township.

### **Delaware Heritage Trail and D&R Canal Towpath**

This proposed 30-plus mile trail runs along the Delaware River in New Jersey from Camden to Trenton. A completed piece of the trail runs through Hamilton for approximately 3.5 miles and is entirely co-terminus with the D&R Canal Towpath. The D&R Canal Towpath itself, which has branches extending north to Frenchtown and northeast to New Brunswick is designated as a historic site by the National Register of Historic Places. The trail accommodates walking, biking, and mountain biking. The elevation is fairly flat, and the material varies from crushed stone to compact dirt. The D&R Canal Towpath is a major regional connector, and the portion within Hamilton is a spur of the East Coast Greenway, a major initiative to connect Maine to Florida via a 3,000-mile trail along the coast.

### **Spring Lake, Abbott Brook, and Watson Woods Trails**

The Spring Lake, Abbott Brook and Watson Woods trails are located within the Abbott Marshlands and provide scenic views of nature. Totalling 4.7 miles, they are primarily used for walking and hiking, although biking is permitted in specific sections of the park. The elevation is fairly flat and the difficulty level is designated as easy. There is also a canoe launch along the Watson Woods trails.

### **Veteran's Park Trails**

There are 4 miles of walking trails and two miles of paved bikeways in the park. Some of the trails take visitors around Robert G. Martin Lake and others pass by tributes to the township's veterans, including former military hardware like an M-60 tank and F-4 Phantom fighter bomber. Maintained by Hamilton Township, these trails are relatively flat and wide, with benches and outlooks among many of them.

## **Cultural and Civic Resources**

### **Hamilton Township Free Public Library**

The Hamilton Township Free Public Library, located at 1 Justice Samuel A. Alito Jr. Way, provides residents with access to books, resources, services for education, and information such as internet access, DVDs, and programs for children and teens. Programs for children include story time, toddler time, baby rock and rhyme, a summer reading program, family game night, and crafts. Anyone who lives, works, or goes to school in Hamilton Township may be issued a library card.

### **Civil War and Native American Museum**

The Civil War and Native American Museum is located within Veterans Park behind the John Abbott II House. It occupies “The Pepper House,” a two-story, seven-room house that was once a part of the John Abbott Farm. The property also has an historic smokehouse, doctor’s office, and herb garden. The exhibit showcases uniforms, weapons, equipment, and material relating to the Civil War, as well as Delaware Native American artifacts. It was the first Civil War Museum in New Jersey.

### **Bromley Neighborhood Civic Center**

The Bromley Neighborhood Civic Center, operated by the Catholic Youth Organization of Mercer County, is dedicated to providing services and programs that will enrich the lives of Hamilton Township and Bromley neighborhood residents. The Bromley Neighborhood Civic Center offers youth services every weeknight for children ages nine to 17 years old. The center has computers, video games, board games, pool tables, foosball, ping pong, and air hockey. It offers summer camps and a summer food program for Hamilton children. The Center also operates a food pantry on Tuesdays and Thursdays for eligible residents.

### **Arts and Culture Zone**

To further support Hamilton as a destination for arts and culture, the Hamilton Township Planning Board adopted an Arts and Culture Amendment to the Land Use Plan in September 2009. The amendment established an Arts and Culture Overlay Zone District in order to encourage development that specifically promotes arts and culture. This district extends from the Hamilton Train Station to the Bromley Neighborhood.

## **Township Utilities and Services**

### **Drinking Water**

Much of Hamilton Township receives public water from either Trenton Water Works or Aqua New Jersey (formerly Consumers NJ Water Company). A small portion of Hamilton Township, south of the intersection of Interstate 295 and U.S. Highway 206, is within the Bordentown Water Department service area.

The Trenton Water Works is owned and operated by the City of Trenton and provides water to 205,000 people within Trenton and parts of Hamilton, Ewing, Lawrence, and Hopewell townships. The Trenton Water Filtration Plant can treat up to 50 million gallons of water each day. Trenton Water Works draws its water supply from the Delaware River through one intake. See **Appendix B: 2023 Trenton Water Quality Report on page B-1** to view a copy of the water supply quality report for the Trenton Water Works.

Residents in and around the North Crosswicks, Mercerville, and Hamilton Square neighborhoods, are served by Aqua New Jersey. Water in the Aqua New Jersey Hamilton system also serves Robbinsville, Chesterfield, and Upper Freehold townships. Aqua New Jersey receives its drinking water supply from five wells in the Potomac–Raritan–Magothy aquifer, a groundwater source. The residents of Hamilton Township located outside of a public water service area receive drinking water from private wells.

### **Sewer Service**

The approved sewer service area in Hamilton Township is shown in **Appendix C: Approved Sewer Service Area on page 1**. Three sewer service providers are responsible for the collection, treatment, and disposal of wastewater in Hamilton Township: the Hamilton Township Department of Water Pollution Control (WPC), Trenton Sewer Utility, and the US Postal Service, which serves a few parcels in the southwest corner of the township.

The Hamilton WPC covers over 40 square miles of service area and provides service to over 100,000 residents of three municipalities, including most of the residents in Hamilton Township. At its regional wastewater treatment center, the Hamilton Township WPC has the capacity to treat 16 million gallons of water per day (mgd) and has an

average daily flow of 7.5 mgd (as of 2021). The collection system contains 350 miles of sewer lines and 27 pumping stations. The Hamilton Township WPC has been in operation for over 80 years.

Trenton Sewer Utility provides sewer collection within 78 acres in Hamilton Township, southwest of the intersection of Interstates 295 and 195.

### Trash and Recycling

The Mercer County Improvement Authority (MCIA) administers the disposal of the county's solid waste. The MCIA, in coordination with Central Jersey Waste and Recycling, also operates a curbside recycling program for all municipalities within its jurisdiction (except for East Windsor and Hightstown). Central Jersey Waste and Recycling provides comprehensive waste and recycling services to municipalities, industries, businesses, and office complexes in New Jersey and the Greater Philadelphia region

Residents of Hamilton Township receive curbside collection of recycling. Small businesses are eligible to participate in the curbside recycling program. Commercial and industrial businesses that are ineligible for the small business program must make their own arrangements for recycling. On January 1, 2010, the recycling process shifted from "dual stream" to "single stream," so now one truck hauls away all residential and commercial recycling, rather than several separate trucks picking up plastic, aluminum, and paper.

The MCIA also sponsors disposal days for household chemical and electronics waste.

Residents can dispose of dangerous chemicals or unwanted electronic material in an eco-friendly and safe manner. Items such as aerosol cans, used motor oil, pesticides, propane/gas tanks, car batteries, anti-freeze, mercury, fluorescent lights, computers, printers, copiers, laptops, microwaves, stereos and televisions are accepted.

The Hamilton Ecological Facility (1360 Kuser Road) is where residents can drop off brush, newspapers, grass clippings, motor oil, leaves, unpainted/untreated wood, junk and office mail, tires without rims and auto batteries. Residents may also pick up compost and mulch on a seasonal basis. At the site, vegetative waste is ground, hauled, composted, and then sold to third parties.



**Hamilton Free Public Library**

Source: Mel Musie, DVRPC



**Hamilton Free Public Library item return**

Source: Mel Musie, DVRPC

Hamilton Township offers a fall leaf pick-up program. During these times, residents may rake and pack leaves into bags for curbside collection. NJDEP stormwater regulations forbid the placement of leaves within 10 feet of a storm drain. At other times of the year, residents can dispose of leaves and yard waste by securing them in bags and taking them to the Ecological Facility.

The Hamilton Township Department of Public Works is responsible for road and drain maintenance, street sweeping, snow removal, leaf and brush collection, and maintenance of all municipally owned buildings, grounds, and park facilities, including lawns and shrubs.

## Education

Hamilton Township has the 13th largest public school district in the State of New Jersey, providing education to over 11,800 children. The Hamilton Township School

District has 17 public elementary schools: Alexander, Greenwood, Kisthardt, Klockner, Kuser, Lalor, Langtree, McGalliard, Mercerville, Morgan, Robinson, Sayen, Sunnybrae, University Heights, George E. Wilson, Yardville, and Yardville Heights. The three public middle schools are Albert Grice, Emily Reynolds, and Richard Crockett. The three public high schools are Hamilton High School West, Nottingham High School–North, and Steinert High School–East. There is also an alternative education school, the Hamilton Educational Program, which serves students in grades 6 through 12.

Within Hamilton Township, there are 11 private nursery through kindergarten schools, eight private elementary and middle schools, and one private high school. In neighboring municipalities, there are a number of higher education opportunities, including the College of New Jersey, Mercer County Community College, Thomas Edison State College, Princeton Theological Seminary, Princeton University, Rider University, and Westminster Choir College.

## Green Initiatives

Hamilton Township has an active Environmental Advisory Commission that was established by Township Ordinance in 1971. In 2018, an ordinance was approved adopting an Advisory Commission on green initiatives. This “Green Team” is partnered with the Environmental Commission and is responsible for advising the Mayor and Council on how to best focus the township efforts to improve its sustainability and pursue local initiatives and actions that will lead to Sustainable Jersey Municipal Certification.

Hamilton Township’s Department of Public Works has implemented and is in the process of adopting several green initiatives in order to reduce energy usage and harmful emissions. Hamilton Township has an anti-idling policy for all municipal vehicles and is considering expanding the policy to Board of Education vehicles, or even township-wide. The anti-idling policy is intended to reduce fuel usage costs, reduce emissions, and extend the life of municipal government vehicles. To decrease air pollution, Hamilton Township was also the first in the state to require the use of cleaner natural gas solid waste (garbage) vehicles as an alternative to diesel-powered vehicles.



**Bromley Neighborhood Civic Center**

Source: Mel Musie, DVRPC

The Green Fleet Policy requires the township to purchase clean-burning fuel vehicles like flexible fueled vehicles, biofueled vehicles, hybrids, and electric vehicles. Hamilton Township's comprehensive and innovative Green Fleet policies help lower costs for government operations and reduce illnesses related to emissions.

Hamilton Township has proposed to increase mass transit access to the Hamilton Train Station. The Township plans to work with NJ Transit and new local service providers to increase bus, van, and jitney access between local shopping centers and the Hamilton Trenton Train Station. Lack of mass transit access to the train station has resulted in growing congestion on the approaches to the Hamilton Rail Station and increased parking expenses for commuters. Currently, there are only two NJ Transit bus lines (606 and 608), with limited schedules during rush hour, that stop at the train station.

The Community Forestry Management Plan for 2009 through 2014 seeks to preserve and promote the township's urban tree resources. Goals and initiatives include the Tree Planting Program and reducing the number of hazard trees and trees impacting sidewalks or curbs. Developers in Hamilton are required to compensate for the cost of replacing trees lost to development at a cost of \$250 per tree. Funds are then allocated to the Tree Replacement Fund. In the past five years, an estimated 1,000 new trees have been planted in the township.

Below are a few recent initiatives that the township has undertaken to reduce greenhouse gas emissions:

- Upgrading to LED lighting in several township buildings and facilities;
- Installing LED lights on park athletic fields (and coming plans to install LED lights at Kuser Park);
- Using solar panels and two waste oil heating systems at the Public Works Department Garage;
- Participating in State of New Jersey sponsored energy efficiency programs and initiatives to fund efficiency upgrade projects;
- Installing a modernized air conditioning system and efficient windows in the Municipal Building to reduce energy usage;
- Placing lighting controls, where applicable, in various township buildings;
- Using materials and methods to increase energy efficiency, when conducting building maintenance;
- Implementing an anti-idling policy for township vehicles (when not actively conducting work responsibilities);
- Planting shade trees in public rights-of-way (which reduce energy costs);
- Holding rain barrel workshops in coordination with Rutgers Cooperative Extension Water Resources Program (which helps residents conserve more water, thereby reducing water costs and reducing energy consumption associated with the treatment of drinking water)

Hamilton Township has drafted an ordinance to require all future building construction to meet Leadership in Energy and Environmental (LEED) standards. Although it is still in the developmental stages, this ordinance should result in major reductions in overall building energy costs.

Hamilton Township has consistently been Bronze Certified by Sustainable Jersey since 2018 and continues to maintain that level of certification. Also, in 2024, Hamilton was recognized as a Tree City USA for the 17th year in a row by the Arbor Day Foundation. To be named a Tree City USA, a community must meet four standards established by the Foundation: a tree board or department, a tree-care ordinance, an annual community forestry budget of at least \$2 per capita, and an Arbor Day observance and proclamation. For more information visit [the Tree City website](#).

In 2023, Hamilton Township installed its first Electric Vehicle (EV) level 2 public charging station in Veterans Park. This charging station is available for use by anyone wishing to charge their EV while visiting Veterans Park.



**Footbridge in Sayen Gardens**

Source: Thomas Takacs, Getty Images

# Environmental Issues

## Known Contaminated Sites

The NJDEP New Jersey Known Contaminated Sites List includes former factory sites, landfills, locations of current or former leaking underground storage tanks, sites where chemicals or wastes were once routinely discharged, and places where accidents have resulted in spills and pollution. Contamination may have affected soil, groundwater, surface water, or a combination of site conditions.

The most dangerous known contaminated sites, from a human health standpoint, can be listed on the National Priorities List (NPL), under the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLA is commonly referred to as “Superfund” because sites on the NPL are eligible for federal and state clean-up funds. Other sites may be remediated by state clean-up funds via the New Jersey Spill Compensation and Control Act. The majority of the sites are remediated by the responsible parties, as required pursuant to state and federal regulations. Responsible parties may be the current or former owners or users of the site.

In New Jersey there are more than 13,000 contaminated sites. As of 2024, there were 123 active sites within Hamilton Township, listed in **Table 32: Active Known Contaminated Sites (2024)** and shown in **Figure 29: Known Contaminated Sites (2024) on page 127**. These are active sites with confirmed contamination of the soil, groundwater, and/or surface water. Three of these sites are at private residences, two are landfills, and other sites include garages, gas stations, laundromats, a school, and municipal buildings.

**Table 32: Active Known Contaminated Sites (2024)**

Site ID	PI Number	PI Name	Address
710117	1012270	105 Atkins Avenue	105 Atkins Avenue
647414	834472	Private Residence	Private Residence
455328	680017	125 Nebraska Avenue	125 Nebraska Avenue
6515	011825	24 Seven Fuel	1685 Nottingham Way
92021	129991	265 Whitehead Road	265 Whitehead Road
150907	578438	3048 South Broad Street LLC	3048 S Broad Street
673815	947222	Private Residence	Private Residence
596242	749140	434 Hughes Drive	434 Hughes Drive
6504	010382	56027 Hamilton Square Fuels	1296 Route 33
6517	010394	56101 Kuser Road Fuels	1870 Kuser Road
47064	011973	57 N Johnston Avenue	57 N Johnston Avenue
615220	778347	79 Ziegler's Lane	79 Zieglers Lane
649309	838773	Private Residence	Private Residence
38558	003091	AAA Trucking Corp (Former)	3630 Quakerbridge Road
42818	003883	Aetna Roofing	1320 E State Street
6209	257625	Albert E. Barrett Inc	2485 E State Street Ext
14634	015061	American Standard Inc	240 Princeton Avenue
633101	811136	Amtrak Track 2 @ MP 52.9, Hamilton, NJ	Klockner Avenue
6491	006501	APCO Petro Corp Broad St	4165 South Broad Street
171707	231176	Aqua NJ Inc Well# 14	2000 Whatley Road

Site ID	PI Number	PI Name	Address
66535	G000006712	Arco Petroleum Products	1470 Lambertson Road
6480	499665	Automated Waste Equip Co Inc	3 5 Tennis Court
66906	G000009743	BCS Associates	1437 E State Street
6528	001217	B & E Service Center	86 Klockner Road
6541	008435	Bhavani Fuel Stop NJ0048	3217 Quakerbridge Road
6426	007061	BP Service Station 14637	1060 Route 33
6496	011200	Broad Street BP	2596 S Broad Street
354256	831263	Capital Quick Lubes - Mercerville, Inc.	702 Route 33
6509	012148	Centroid Corp T/A Mr Bond Cleaner	2052 Nottingham Way
53583	021872	Chris-Craft Industrial Products (Former)	1980 E State Street
15649	005399	Congoleum Corp	861 Sloan Avenue
15828	003097	Congoleum Corporation Plant 2	1945 E State Street
720414	1035541	Conrail Corp Block 1634 Lot 3	Whitehead Road
15884	000214	Consumers Oil Corp Terminal	1473 Lambertson Road
43787	007153	Coopers Cycle Ranch Inc	866 Route 33
112877	150087	Dana Transport Mva	I-195 E & I-295
41364	000074	Delaware Valley Bus Lines Inc	62 Hovey Avenue
6551	010714	Delta	1406 Chambers Street
6484	010390	Delta Gas	1711 S Olden Avenue
15387	011353	Delta Gas	1704 Greenwood Avenue
51145	015855	Department of Public Works	240 Tampa Avenue
69524	G000030173	Dover Park Plaza Shopping Center	S Broad Street & Sunnybrae Boulevard
66242	G000004402	Duck Island Sanitary Landfill	Lambertson Road
6518	002809	Duck Island Terminal Inc	1463 Lambertson Road
196065	030256	Duck Island Terminal Inc	2470 Lambertson Road
46190	007069	East State Atlantic	1679 E State Street
68566	G000025490	Eddies Donut (Former)	628 Arena Drive
341955	422938	Environmental Education Center	157 Wescott Avenue
6520	001060	ExxonMobil Trenton Terminal	2785 Lambertson Road
16178	008634	Exxon Store 3-2026	3151 S Broad Street
43523	006005	Flock Road Associates LLC	53 Flock Road
703284	996758	Former Ruby Tuesday	500 Marketplace Boulevard
259280	1051129	Gary Betsy Autobody	275 Route 156
20801	994778	Gaum, Inc.	1808 Route 130
15880	G000001904	General Electric Company	2231 E State Street
15830	018689	General Felt Industries	1936 E State Street
45449	001722	Getty 00656	2735 2737 S Broad Street
6482	025401	Goodall Rubber Co	572 573 Whitehead Road
6479	008691	Gsfm NJ 0030	1824 Whitehorse Mercerville Road
689434	967717	Hamilton Cell Tower	Whitehead Road
6477	661828	Hamilton Cleaners	1201 Whitehorse Mercerville Road
6459	015181	Hamilton Square Shell	Route 33 & George Dye Road

Site ID	PI Number	PI Name	Address
219518	968968	Hamilton Transit Corporate Center	572 Whitehead Road
6532	009935	Hamilton Water Pollution Control	300 Hobson Avenue
366501	013541	IMO Industries - Trans America Corp	853 Nottingham Way
6495	031417	Independence Mall	2465 S Broad Street
566667	709891	International Paper Company	E State Street
6499	005450	James Carr	1625 S Broad Street
57970	033789	James M Blakley	1664 E State Street
20869	024561	J.P. Bud Company Warehouse	2616 E State Street Ext
54847	031037	Kalex Facility (Former)	4400 4407 S Broad Street
179639	928500	Kbhkd Real Estate Partners, LLC	3 Nami Lane
45104	012003	Ked Automotive	100 Yardville Allentown Road
716536	1026335	Klockner Road & White Horse Avenue Gw Contam	Klockner Road & White Horse Avenue
18044	G000031860	Kuser Road	Kuser Road & Whitehorse Mercerville Road
6489	007602	Lakeside Auto Service LLC	3750 S Broad Street
6529	007063	Loc 1103 Fast Trac	1761 Greenwood Avenue
13016	004908	Lukoil	2482 S Broad Street
6508	006280	Lukoil #57326	249 Route 33
692849	975919	Matrix Hamilton Land	Cabot Drive
341268	G000031859	Matrix Hamilton Land Development LLC	Quakerbridge Plaza Drive
173732	726308	Matrix Hamilton Land Holding LLC	524 Route 130
465769	587891	Medi Transport of NJ	245 Whitehead Road
6434	027016	Mercer County Geriatrics Center	2300 Hamilton Avenue
25631	944769	Mercer Spring Corporation	215 Miami Avenue
6497	006692	Mercerville Shell	511 Route 33
6419	004466	Mr Gus's Cleaners	233 Route 33
6545	001332	National Packaging Companies	1400 E State Street
66098	G000001910	Nearpara Rubber Company (Former)	1849 E State Street
168935	222023	New Penn Motor Express Inc	15 Thomas J Rhodes Industrial Drive
61460	298915	NJ State Police Technology Center	1200 Negrón Drive
6581	531800	Nottingham Cleaners	4445 Nottingham Way
25736	969225	Pilgrim Properties	533 Whitehead Road
673815	947222	Private Residence	Private Residence
647414	834472	Private Residence	Private Residence
649309	838773	Private Residence	Private Residence
15887	004197	PSE&G Fossil LLC Mercer Generating Station	2512 Lambertson Road
16789	G000026549	PSE&G Trenton Switching Station	1325 Klockner Road
18033	G000006597	Quickmart Gas Station	2232 S Olden Avenue
76144	G000001915	Raritan Plated Metals	2670 E State Street
19100	013301	Richard Stockton Service Area 6s 80006824	New Jersey Tpke Mm 58.7
6472	G000006955	Rylco Rubber Products	1218 Walnut Avenue
6443	007628	Selmon's Service Station LLC	2231 S Olden Avenue
391431	007603	Shell Service Station 138425	2582 Whitehorse Mercerville Road

Site ID	PI Number	PI Name	Address
6492	030214	Site 1109	4364 S Broad Street
54783	024381	Sparteck Corp	123 Hewitt Avenue
6481	610224	Spolem Provisions LLC	482 Whitehead Road
6533	005525	Starr Transit Co Inc	2531 E State Street Ext
15408	007347	Stars Service NJ 0034	1930 Nottingham Way
13794	014078	Sterling Drug Inc	2144 E State Street
6537	G000004373	Sun Chemical Corporation	584 Route 130
198407	967708	Sweet Briar West Industrial Park	533 Whitehead Road
20276	005159	TransAmerica Delaval Inc-Delroy	121 1st Avenue
6445	025873	Trenton Folding Box	2424 E State Street Ext
6505	009062	Tri State Petro Trenton	2409 Nottingham Way
16447	000071	US Gas	2340 S Broad Street
6507	008521	USPS Trenton Vehicle Maintenance Facility	680 Route 130
720399	1035522	Vacant Lot @ 2nd Avenue & Assunpink Boulevard	Assunpink Boulevard & 2nd Avenue
724602	1046654	Vacant Lot @ Basin Road Properties	
6549	002200	VKVA LLC	3060 Quakerbridge Road
6547	013341	Waste Management of NJ	208 Patterson Avenue
6456	013300	Woodrow Wilson Service Area 6n 80006825	New Jersey Tpke Mm 58.7 N
712837	1017723	Woodvine & Taft Avenues Gw Contam	Woodvine Ave & Taft Avenue
164447	004309	W.R. Grace & Co Construction Products Div	35 Industrial Drive
6552	000896	Yardville Supply Co	47 Yardville Groveville Road
13820	005559	Yardville Truck Stop Garden State Fuel	646 Route 130

Source: NJDEP, Dataminer (2024)

## Superfund Sites

There are five active superfund sites in Hamilton Township; however none of the sites are on the NPL. Sites not currently listed on the NPL are not eligible for Superfund Trust Funds for remediation. See **Table 33: Superfund Sites (2024)** for more information on individual sites.

**Table 33: Superfund Sites (2024)**

EPA ID	Site ID	Street Address	NPL Status	Non-NPL Status Category
NJN000203583	Anton's Dry Cleaners & Laundromat	1722 Whitehorse-Mercerville Road	Not NPL	Not Eligible for the NPL/No Further Remedial Action Planned
NJD980505051	Duck Island Sanitary LF	Lamberton Road	Not NPL	Referred to Cleanup Program
NJN000201737	Independence Cleaners	2465 South Broad Street	Not NPL	Referred to Cleanup Program
NJD067387472	WR Grace Hamilton Twp	15 Industrial Drive	Not NPL	Referred to Cleanup Program
NJN000205935	WR Grace Offsite	15 Industrial Drive	Not NPL	Assessment Needed or Ongoing

Source: NJDEP, Dataminer (2024)

## W.R. Grace Company/Zonolite Site

The Zonolite Company leased the approximately 8-acre site, located at 15 Industrial Drive in Hamilton, from 1948 to 1963. W.R. Grace then operated at the site between 1963 and 1994. Both Zonolite and W.R. Grace used the site to make vermiculite-based products such as structural fireproofing, thermal insulation for masonry products,

lightweight concrete aggregates, and horticultural vermiculite. Records show that between 1966 and 1988, over 200,000 tons of vermiculate ore from a mine in Libby, Montana, were shipped to the site. After W.R. Grace ceased operations in 1994, the site sat vacant until a paper recycling company leased a portion of it. The recycling company ceased operation in 2005 after a fire.

The U.S. EPA first conducted sampling in 2000, which found elevated levels of asbestos in the soils at the site. In 2004, The U.S. EPA completed the first phase of clean-up. They removed approximately 9,200 tons of soil and shipped it to a secure landfill in Pennsylvania. In 2006, fearing asbestos may have contaminated neighboring areas, the U.S. EPA assessed the asbestos content in soil samples from public recreation areas and 22 residential properties across Hamilton, Lawrence, and Ewing townships and the City of Trenton. No asbestos was found above the level that a sophisticated lab instrument can reliably measure. Within that year, an additional 6,500 tons of contaminated soil was removed from a wetland adjacent to the facility.

In 2007, the U.S. EPA, with support from the Department of Justice, agreed on a settlement with W.R. Grace. It was a bankruptcy settlement for \$34 million dollars to cover cleanup costs at 32 other Superfund sites throughout the United States. W.R. Grace was still held responsible for clean up on their sites. Seven years later, W.R. Grace paid the United States over \$63 million dollars, again related to settling claims. Later, the U.S. EPA ended up receiving over \$52 million dollars to address W.R. Grace’s liability at their sites.

### Underground Storage Tanks

An Underground Storage Tank (UST) system is any one or combination of tanks including appurtenant pipes, lines, fixtures, and other related equipment that are used to contain an accumulation of hazardous substances, the volume of which is 10 percent or more beneath the surface of the earth. A hazardous material may be motor fuel, petroleum products, toxic pollutants, or other hazardous wastes or substances. Property owners in Hamilton may use storage tanks to store fuel oil, or in the case of service stations, gasoline or diesel fuel. Older storage tanks are increasingly likely to have outdated leak control and corrosion prevention measures and must be monitored for emissions. Corrosion and leakage of underground storage tanks can become a serious threat to the groundwater and soil surrounding it. There may also be private residences in Hamilton Township that still have underground storage tanks, primarily used to hold home-heating oil. Those private residences are not publicly listed by NJDEP unless they pose a human health hazard

Sites with underground storage tanks are monitored under an NJDEP program called the Office of Contaminated Site Remediation and Redevelopment. Sites are registered, receive permits, and are monitored for leaks at regular intervals. As of 2024, there were 50 active and compliant USTs, which means that they were in compliance with NJDEP’s requirements for leak detection, spill, overfill and cathodic protection. There were 48 UST sites with active remediation underway, including 15 sites also on the active and compliant list. See **Table 34: Active and Compliant UST in Hamilton Township (2024)**.

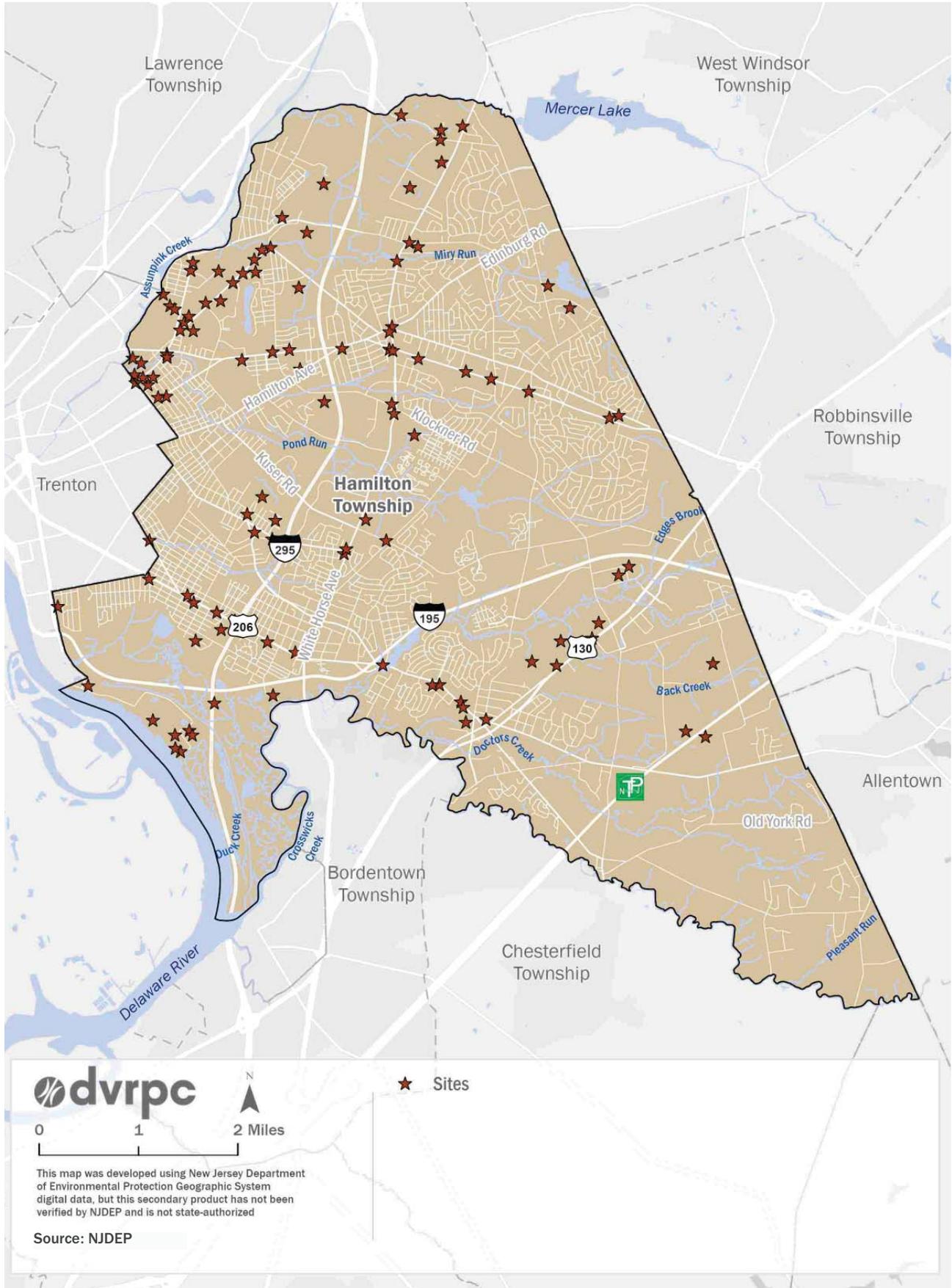
**Table 34: Active and Compliant UST in Hamilton Township (2024)**

Facility ID	Facility Name	Street Address
011825	24 Seven Fuel	1685 Route 33 (Nottingham Way)
010394	56101 Kuser Road Fuels	1870 Kuser Road
764631	7-Eleven #41892	1850 Klockner Road
006501	APCO Petro Corp Broad Street	4165 South Broad Street
008436	Arena Drive Exxon	1511 South Olden Avenue
007740	AT&T NJ 0190	1300 White Horse Hamilton Square Road
001217	B & E Service Center	86 Klockner Road

Facility ID	Facility Name	Street Address
008435	Bhavani Fuel Stop NJ0048	3217 Quakerbridge Road
007061	Bp Service Station 14637	1060 Route 33 (Nottingham Way)
011200	Broad Street BP	2596 South Broad Street
006699	Chambers Serv Station	1106 Chambers Street
010714	Delta	1406 Chamber Street
011353	Delta Gas	1704 Greenwood Avenue
007059	Fast Trac	1140 Chambers Street
008691	Gsfm NJ 0030	1824 White Horse Pike
032649	Hamilton Bus Garage	600 Sloan Avenue
006720	Hamilton Delta	2111 Route 33
514097	Hamilton Gulf	2582 Whitehorse Mercerville Road
015181	Hamilton Square Shell	2006 Route 33
007602	Lakeside Auto Service LLC	3750 South Broad Street
007063	Loc 1103 Fast Trac	1761 Greenwood Avenue
004908	Lukoil	2482 Broad Street South
003792	Lukoil #57340	1070 White Horse Mercerville Road
006692	Mercerville Shell	511 Route 33
007933	Picernos Yardville Fuels LLC	4495 South Broad Street
010715	Pioneer Service Station	2101 South Broad Street
285745	Pitt Ohio Express LLC	209 Whitehead Road
000832	Quakerbridge Shell	3732 Quaker Bridge Road
962700	Quickchek Corp #177	704 Sloane Avenue
555697	Quickchek Corp #22	1100 Olden Avenue South
013301	Richard Stockton Service Area 6s 80006824	NJ Tpke Mm 58.7 Service Area 6s
001444	Roadrunner	1053 South Olden Avenue
006740	Roger's Service Center	1380 Olden Avenue South
007628	Selmon's Service Station LLC	2231 South Olden Avenue
030214	Site 1109	4364 South Broad Street
005525	Starr Transit Co Inc	2531 E State Street Ext
007347	Stars Service NJ 0034	1930 Nottingham Way
009062	Tri State Petro Trenton	2409 Nottingham Way
016899	United Parcel Service	4 Fairgrounds Road
000071	US Gas	2340 S Broad Street
002200	Vkva LLC	3060 Quakerbridge Road
701881	Wawa Food Market #8342	Route 130 & Crosswicks Hamilton Road
1014131	Wawa Food Market #8356	3161 Quakerbridge Road
726128	Wawa Food Market #8357	1200 Route 33
985286	Wawa Food Market #8452	Broad Street
013300	Woodrow Wilson Service Area 6n 80006825	NJ Tpke Mm 58.7 Service Area 6n
000896	Yardville Supply Co	47 Yardville Groveville Road

Source: NJDEP, DataMiner (2024)

Figure 29: Known Contaminated Sites (2024)



## Radon

Radon is a radioactive gas that comes from the breakdown of naturally occurring uranium found in nearly all soils. It is invisible, odorless, and tasteless. It moves up through the ground to the air above, and into all types of homes through cracks and other holes in foundations. A build-up of radon-contaminated air within a home can pose a long-term health hazard to residents, specifically for lung cancer. The only method of detection is to conduct a test of the air within a home. Fortunately, radon testing is inexpensive. All radon test results conducted in the state are reported to NJDEP by certified companies, which perform the tests or manufacture the test kits. This data is used to classify municipalities into a three-tier system, which identifies the potential for homes with indoor radiation problems.

NJDEP classifies municipalities into three categories according to the potential for indoor radon problems: high (Tier 1), moderate (Tier 2), and low (Tier 3). According to the [NJDEP 2015 Radon Tier Assignment Report](#), Hamilton Township is classified as a Tier 2 municipality, indicating a moderate potential risk of high radon levels in homes. The average indoor radon level in the United States is about 1.3 picocuries per liter (pCi/L). At the level of 4 pCi/L, NJDEP recommends a homeowner consider steps to reduce long-term exposure to radon gas. If radon levels are high in a home, NJDEP suggests that the homeowner take the following actions: (1) prevent radon from entering the house by repairing cracks and insulation; and (2) dilute radon concentrations currently in the house by installing a radon extraction system and/or frequently ventilating indoor air.

## Flooding Hazards

Hamilton Township experienced major flood events in August 1971, July 1975, September 1999, June 2006, April 2007, September 2018, August 2021, and September 2021. The 1971, 1975, and September 2021 events were severe enough to warrant federal disaster declarations. During the 1971 flood, over 650 residential structures suffered flood damage, and numerous municipal buildings and roads were temporarily closed. In 1975, over 800 residences experienced basement and/or first floor flooding. After the 1975 flood, Hamilton installed various flood control structures, including dams, culverts, and stream channel improvements. Existing flood control structures in the township include 10 floodwater-retarding structures, a 2.4-mile flood control concrete channel, culverts under the D&R Canal, and a stormwater diversion dam at Shady Brook. In spite of these flood-control structures, Hamilton has continued to be vulnerable to flooding. During the 1999 flooding event, Cornell Heights and Whitehead were flooded, and in 2006, Lambertson Road and surrounding areas were flooded. The April 2007 flood impacted areas surrounding Pond Run, including Veterans Park and the Senior Center. Seventy-one properties in the township are considered repetitive loss properties as documented by paid National Flood Insurance Program claims; however, many other properties flood as well.

The DRBC and New Jersey Office of Emergency Management published a Multi-Jurisdictional Flood Mitigation Plan for the Non-Tidal, New Jersey Section of the Delaware River Basin in 2008. The Mercer County portion of the plan addresses Hamilton Township, in addition to Ewing, Hopewell, Lawrence, Pennington, and Trenton. This plan identifies impassable roads and flooded basements as major risks and impacts for Hamilton Township during flooding events. Municipal mitigation actions identified for the township include property acquisition, public education and outreach, development of flood-threat recognition and advanced flood-warning systems, retrofitting Greenwood Avenue, and enforcement of the flood damage prevention ordinance.

Mercer County published a Mercer County Multi-Jurisdictional, Multi-Hazard Mitigation Action Plan in 2021. The update identifies certain sections of the township that are prone to severe and chronic flooding, such as along Nottingham Way and along the border of Trenton and Hamilton Township. Chronic flooding is also identified in neighboring Ewing and Trenton, compounding the issue. Additionally, Dam Site 8 was identified as a potential hazard for flooding; however, it has recently undergone improvements, with assistance from USDA and funding

from NRCS. Certain residential properties, such as those located at Cornwell Heights, the intersection of East State Street extension, Sweet Briar Avenue, and the Rutgers Avenue neighborhood also face a high flooding risk. Route 156, Donald Drive, and the Whitehead Road Bridge have also been identified as problem flooding areas.

Sea-level rise and dam failure are also concerns in Hamilton Township. According to the [Mercer County Multi-Jurisdictional Hazard Mitigation Plan](#), a number of critical facilities in Hamilton are at risk of flood losses in 500-year and 100-year flooding scenarios. The Floodplain Damage Prevention Ordinance of Hamilton Township, adopted on February 7, 2023 to replace the previous Flood Damage Prevention Ordinance, is intended to regulate development in the floodplains in order to prevent the flooding by the Assunpink Creek, Miry Run, Pond Run, and other waterways in the township. The ordinance outlines the standards for development, site permits, and other regulatory controls.

All proposed developments require permits if they are located within the floodplain and/or 25 feet from the top of the channel bank. Proposed developments within 50 feet from the top of the channel bank require permits if they contain acid-producing soils, are adjacent to category one or trout-producing waters, or contain critical habitat (either current or historic) for threatened or endangered plant or animal species. This ordinance specifies that no building or structure can be erected, enlarged, expanded, externally altered or modified, nor can there be any paving, fill, excavation, or improvement permitted within a floodplain without site plan submittal and approval by the Planning Board or Zoning Board of Adjustments.

Hamilton's Flood Damage Protection Ordinance prohibits the storage, dumping, or processing of various types of materials within the floodplain, including the following: solid waste, debris, or vehicles; domestic sewage or industrial waste, either solid or liquid; pesticides; materials buoyant, flammable, or explosive in times of flooding; and hazardous materials that could injure humans, plants, or animals in times of flooding. Critical facilities such as schools, firehouses, nursing homes, hospitals, pumping stations, power stations, or other life-support systems are also prohibited within the floodplain.

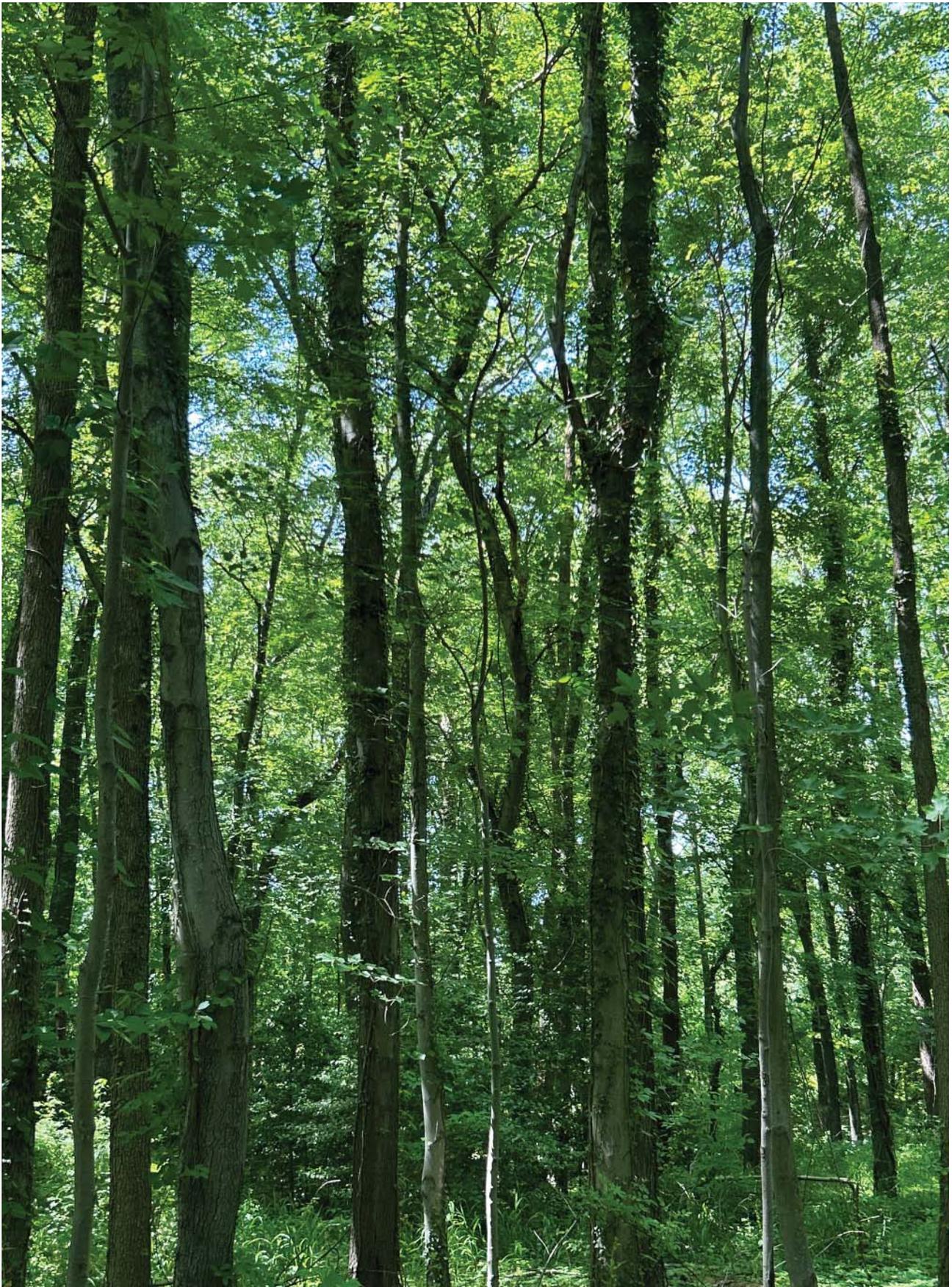
in 2018, the Township took on another protective measure by joining [FEMA's Community Ratings System Program \(CRS\)](#). They are rated by FEMA as a CRS Class 7, and this helps support residents who currently reside in designated Special Flood Hazard Areas, by automatically discounting 15% to all insurance premium bills. Generally, those who also live in areas with minimal risk for flooding may also be eligible to save 5%, depending on their individual location. More information can be found here: <https://www.hamiltonnj.com/217/Floodplain-Information>

## **Brownfield Remediation**

In 2022, Hamilton Township was awarded a [\\$500,000 Brownfields Cleanup grant](#) from the US EPA for the remediation of the Nearpara Rubber Factory site located at 1849 East State Street. The three-acre site was formerly a rubber manufacturing and recycling plant that has been vacant and non-operational since 1993 and is contaminated with PCBs and metals co-mingled with petroleum products. In addition to clean up and remediation activities, grant funds will also be used to conduct community outreach.

## **Sustainable Future**

Hamilton is a township with many natural and built environment resources and that its residents are working to address ongoing environmental challenges, while preserving its existing resources for future generations. Despite a number of ongoing remediation efforts required to address past challenges, the township is making strides in promoting energy efficiency, increasing access to open space, and preserving natural resources. Initiatives such as upgrading municipal buildings to meet green standards, transforming brownfields, planting trees and developing green spaces to accommodate many uses, reflect a strong commitment to sustainability. Continued focus on these efforts is essential for Hamilton Township to achieve its long-term sustainability goals and ensure a healthier, more livable and sustainable community for future generations.



**Forested trail in Sayen House and Gardens**

Source: Mel Musie, DVRPC

## CHAPTER 13:

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# Appendices

**A: Plant and Animal Species in Abbott Marshlands**

**B: Water Supply Quality for the Trenton Water Works 2023 Water Quality report**

**C: Approved Sewer Service Area**

## APPENDIX A: PLANT AND ANIMAL SPECIES IN ABBOTT MARSHLANDS

Plants in Abbott Marshland	
Trees and Shrubs	
New York Ironweed	Black Oak
Silky Dogwood	Red Maple
Swamp Azalea	Sweet Gum
Buttonbush	Tupelo (Black Gum)
Elderberry	Pin Oak
Spicebush	Alder
Arrowwood Viburnum	Swamp Ash
Tulip Trees	Winterberry
Beech	Mountain Laurel
Flowers and Herbaceous Plants	
Sneezeweed	Bur Marigold
Spatterdock (Yellow Pond Lily)	Spring Bittercress
Pickeralweed	Canada Lily
Swamp Rose Mallow	Turtlehead
Swamp Milkweed	Violets
Swamp Rose	Spring Beauty
Bur-reed	Trout Lilies
Cattail	Mayapples
Jewelweed	Wild Oats
Water Hemp	Golden Club
Aquatic Plants	
Bladderwort	Wild Rice
Duckweeds	Azolla
Other Vegetation	
River Bulrush	Sweet Flag

Source: [abbottmarshlands.org](http://abbottmarshlands.org), 2024

Animal Species Sighted in Abbott Marshlands
<b>Insects</b>
Butterflies
Ground-nesting bees
<b>Amphibians &amp; Reptiles</b>
Frogs (Spring Peepers and Green Frogs)
Turtles (Red-bellied, Eastern Painted, Snapping)
Northern Watersnakes
Ribbon Snakes
Salamanders (Red Backed Salamander - historical records, newly discovered salamander found by Boy Scouts)
Garter Snake
<b>Birds</b>
Canada Geese
Mute Swans
<b>Mammals</b>
Crayfish
Freshwater mussels
Asiatic Clam
Beavers
Muskrats
River Otters
Squirrels
Chipmunks
Raccoons
Red Foxes
Opossums
White-footed Mice
White-tailed Deer
<b>Other</b>
Dragonflies
Damselflies

Source: [abbottmarshlands.org](http://abbottmarshlands.org)

# 2023 Trenton Water Quality Report

## Acronyms and Definitions

**Maximum Contaminant Level (MCL):** The highest level of contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

**Maximum Contaminant Level Goal (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**Recommended Upper Limit (RUL):** The level of a secondary contaminant in drinking water below which there is no known or expected adverse effect of the taste, color, odor, or appearance of such water, or which may adversely affect the public welfare.

**Maximum Residual Disinfectant Level (MRDL):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**Maximum Residual Disinfectant Level Goal (MRDLG):** The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.

**Treatment Technique (TT):** A required process intended to reduce the level of a contaminant in drinking water.

**Action Level:** The concentration of a contaminant that, if exceeded, triggers treatment or other requirements which a water system must follow.

**Variations and Exceptions:** State or EPA permission not to meet a MCL or a treatment technique under certain conditions.

**ppm:** Concentration in parts per million or milligrams per liter (mg/L); this is equivalent to \$0.01 of \$10,000.

**ppb:** Concentration in parts per billion or micrograms per liter (µg/L); this is equivalent to \$0.01 of \$10,000,000.

**pCi/L:** Picocuries per liter; a measure of radioactivity.

**NLE:** No Level Established

**NTU:** Nephelometric turbidity units (units describing how cloudy a water sample appears).

**MFL:** million fibers per liter.

<: When seen in the table, it usually refers to below detectable levels.

≤: Less than or equal to; when seen in the table, it usually refers to below or equal to detectable levels.

**Contaminant:** Anything found in water (including microorganisms, minerals, chemicals, radionuclides, etc.) that may be harmful to human health.

**Raw Water:** Water in its natural state prior to any treatment for drinking.

**Source Water:** Water in its natural state originating from the water-shed that supplies a water system with its raw water.

**Watershed:** The land area from which water drains into a stream, river, or reservoir.

**Treated Water:** Water to be used by a public water system that has received the application of approved water treatment chemicals.

**Drinking Water:** Water that has been treated to comply with EPA regulations and is pumped to the water customer for use.

**Turbidity:** Turbidity is a measure of the cloudiness of the water, which is a good indicator of water quality. High turbidity can hinder the effectiveness of disinfectants.

## FOOTNOTES

1. TWW averages 151 samples per month. The requirement is 120 samples monthly. An MCL violation would be triggered if > 5% of the samples had TC detected or any detection of E-coli.
2. Beginning in 2017, Trenton Water Works was required to sample 100 sites every six months as are all large systems in the state.
3. Stage 2 DBPR monitoring is conducted quarterly. The results are shown are from the 2022 quarterly sampling.
4. The highest Locational Running Annual Average (LRAA) for TTHM and HAA5 is reported per regulation. All LRAAs which exceed the MCL shall be included. The LRAA is the average of the current and three previous quarterly results for each sample site location.
5. Data presented is derived from quarterly sample site results.
6. Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of water quality. High turbidity can hinder the effectiveness of disinfectants, 99.93% of the turbidity readings in 2022 were below the treatment requirement of 0.3 NTU.
7. Chlorine residuals are taken during Coliform (bacteria) sampling in the distribution system.
8. Radioactive Contaminants (radionuclide) sampling is required once every 9-year monitoring period. The current compliance period is 2020-2028. Only detected results are reported. The results presented were sampled in 2014.
9. Inorganic compounds were tested in February of 2022.
10. NJDEP standards (SMCL).
11. Unregulated Contaminant Rule sampling assesses the potential risks associated with certain contaminants. The EPA will use this to determine if regulation is warranted.
12. Cryptosporidium is a microbial pathogen found in surface water throughout the United States. Although filtration removes Cryptosporidium, the most commonly-used filtration methods cannot guarantee 100 percent removal. Our monitoring indicates the presence of these organisms in our source water. Current test methods do not allow us to determine if the organisms are viable or capable of causing disease. Ingestion of Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people, infants and small children, and the elderly are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to cause disease, and it may spread through means other than drinking water.

Drinking Water Quality Results									
<i>Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 1-800-426-4791.</i>									
BACTERIA									
		2022 Positive Bacteria Results	TT		MCLG	Violation (Y/N)	Potential Source		
Total Coliform (TC)		5 positive samples out of 2,073 (0.24%)	Presence of coliform bacteria > 5% of monthly samples.		0	N	Naturally present in the environment; their presence indicates potential contamination		
METALS									
Lead and Copper Rule <sup>2</sup>		Units	2022 Samples Exceeding Action Level	90% of samples were less	AL (90% Action Limit)	MCLG	Violation (Y/N)	Potential Source	
Lead (1st Draw)	Jan-Jun	ppb	6 out of 120	7.24	15	0	N	Corrosion of household plumbing	
	Jul-Dec		3 out of 95	3.33					
Copper (1st Draw)	Jan-Jun	ppm	2 out of 120	0.07109	1.3	0	N	Corrosion of household plumbing	
	Jul-Dec		14 out of 95	0.13907					
DISINFECTANT BYPRODUCTS (DBP) – STAGE 2 <sup>3</sup>									
Sampling Sites (8 Sites)	Units	2022 Highest LRAA <sup>4</sup>	2022 Range of Values <sup>5</sup>	MCL (LRAA)	MCLG	Violation (Y/N)	Potential Source		
Haloacetic Acids (HAA5)									
HAA5's	ppb	49 (HAA5-4)	19.3 – 83.4	60	NLE	N	Byproduct of drinking water disinfection		
Total Trihalomethanes (TTHM)									
TTHM's	ppb	68 (ST2ADD)	23 – 93	80	NLE	N	Byproduct of drinking water disinfection		
CLARITY CHARACTERISTICS – TESTED AT WATER TREATMENT PLANT <sup>6</sup>									
		Units	2022 Highest Reported Level	2022 Range of Values	2022 Average Value	MCL	MCLG	Violation (Y/N)	Potential Source
Turbidity		NTU	0.620	0.015 - 0.620	0.059 99.93%	TT = 1 NTU 95% of monthly samples must be at or below 0.3	0	N	Soil runoff; river sediment
FREE CHLORINE RESIDUAL <sup>7</sup>									
		Units	2022 Annual Average	2022 Range of Values	2022 Highest Monthly Average Result	MRDL	MRDLG	Violation (Y/N)	Potential Source
Chlorine Residual		ppm	0.84	0.05-2.20	1.40	4	4	N	Chemicals added to control microbes
INORGANIC COMPOUNDS <sup>8</sup>									
		Units	2022 Constituent Level	MCL	MCLG	Violation (Y/N)	Potential Source		
Barium		ppm	0.02	2	2	N	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits		
Chromium		ppb	1.1	100	100	N	Discharge from steel and pulp mills; erosion of natural deposits		
Fluoride		ppm	0.8	4	4	N	Erosion of natural deposits; water additive which promotes strong teeth; discharge for fertilizer and aluminum factories.		
Nickel		ppm	0.0023	NLE	NLE	N	Erosion of natural deposits; found in the earth's crust		
Nitrate (as Nitrogen)		ppm	1	10	10	N	Runoff from fertilizer use; leaching from septic tanks; erosion of natural deposits		
SOURCE WATER PATHOGEN MONITORING <sup>9</sup>									
Contaminant		TWW Source Waters			Typical Source				
Cryptosporidium, Oocysts/L		0 – 0.28			Microbial pathogens found in surface waters throughout the United States				
Giardia, Cysts/L		0 – 0.28							
ORTHOPHOSPHATE									
		Units	MCL	MCLG	Average Level Detected	Range of Values		Potential Source	
Orthophosphate		mg/L	NLE	NLE	0.36	0.18 – 0.58		Corrosion control chemical	
TOTAL ORGANIC CARBON									
		Units	MCL	MCLG	Highest Level Detected	Range of Values		Potential Source	
Total Organic Carbon		mg/L	NLE	NLE	1.3	1.1 – 1.3		Naturally Present in the environment	
SECONDARY CONTAMINANTS <sup>10</sup>									
		Units	2022 Constituent Level	RUL	Exceedance (Y/N)	Potential Source			
Chloride <sup>10</sup>		ppm	56.5	250	N	Naturally present in the environment and road salt			
Hardness <sup>10</sup>		ppm	80.6	250	N	Naturally occurring			
Sodium <sup>10</sup>		ppm	24.3	50	N	Naturally occurring			
Sulfate <sup>10</sup>		ppm	9.7	250	N	Naturally occurring			
Zinc		ppm	0.003	5	N	Naturally present in soils and ground & surface waters			
EMERGING CONTAMINANTS <sup>11</sup>									
		Units	2022 Constituent Level	MCL	MCLG	Exceedance (Y/N)	Potential Source		

HAA5 is reported per regulation. All LRAAs which exceed the MCL shall be included. The LRAA is the average of the current and three previous quarterly results for each sample site location.

5. Data presented is derived from quarterly sample site results.
6. Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of water quality. High turbidity can hinder the effectiveness of disinfectants. 99.93% of the turbidity readings in 2022 were below the treatment requirement of 0.3 NTU.
7. Chlorine residuals are taken during Coliform (bacteria) sampling in the distribution system.
8. Radioactive Contaminants (radionuclide) sampling is required once every 9-year monitoring period. The current compliance period is 2020-2028. Only detected results are reported. The results presented were sampled in 2014.
9. Inorganic compounds were tested in February of 2022.
10. NJDEP standards (SMCL).
11. Unregulated Contaminant Rule sampling assesses the potential risks associated with certain contaminants. The EPA will use this to determine if regulation is warranted.
12. Cryptosporidium is a microbial pathogen found in surface water throughout the United States. Although filtration removes Cryptosporidium, the most commonly-used filtration methods cannot guarantee 100 percent removal. Our monitoring indicates the presence of these organisms in our source water. Current test methods do not allow us to determine if the organisms are viable or capable of causing disease. Ingestion of Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people, infants and small children, and the elderly are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection. Cryptosporidium must be ingested to cause disease, and it may spread through means other than drinking water.
13. Secondary contaminants are non-enforceable guidelines regulating contaminants that may cause cosmetic effects or aesthetic effects in drinking water.
14. The recommended upper limit for iron is based on unpleasant taste of the water and staining of laundry. Iron is an essential nutrient, but some people who drink water with iron levels well above the recommended upper limit could develop deposits of iron in a number of organs of the body.
15. Per- or polyfluoroalkyl substances (PFAS) are man-made substances used in a variety of products, such as: stain resistant fabric, nonstick coatings, firefighting foam, paints, waxes, and cleaning products. They are also components in some industrial processes like electronics manufacturing and oil recovery. The New Jersey Department of Environmental Protection (NJDEP) has begun regulating one of these compounds: perfluorononanoic acid (PFNA). While all other PFAS are not regulated, New Jersey American Water recognizes the importance of testing for these contaminants.
16. Trenton Water Works Lead Service Line (LSL) Inventory is available publicly and available online at [www.twwleadprogram.com](http://www.twwleadprogram.com).
17. Trenton Water Works received a Synthetic Organic Compound (SOC) waiver from the NJDEP for the 2020-2022 compliance period.

SOURCE WATER PATHOGEN MONITORING <sup>13</sup>						
Contaminant	TWW Source Waters		Typical Source			
<i>Cryptosporidium</i> , Oocysts/L	0 – 0.28		Microbial pathogens found in surface waters throughout the United States			
<i>Giardia</i> , Cysts/L	0 – 0.28					
ORTHOPHOSPHATE						
	Units	MCL	MCLG	Average Level Detected	Range of Values	Potential Source
Orthophosphate	mg/L	NLE	NLE	0.36	0.18 – 0.58	Corrosion control chemical
TOTAL ORGANIC CARBON						
	Units	MCL	MCLG	Highest Level Detected	Range of Values	Potential Source
Total Organic Carbon	mg/L	NLE	NLE	1.3	1.1 – 1.3	Naturally Present in the environment
SECONDARY CONTAMINANTS <sup>14</sup>						
	Units	2022 Constituent Level	RUL	Exceedance (Y/N)	Potential Source	
Chloride <sup>10</sup>	ppm	56.5	250	N	Naturally present in the environment and road salt	
Hardness <sup>10</sup>	ppm	80.6	250	N	Naturally occurring	
Sodium <sup>10</sup>	ppm	24.3	50	N	Naturally occurring	
Sulfate <sup>10</sup>	ppm	9.7	250	N	Naturally occurring	
Zinc	ppm	0.003	5	N	Naturally present in soils and ground & surface waters	
EMERGING CONTAMINANTS <sup>15</sup>						
	Units	2022 Constituent Level	MCL	MCLG	Exceedance (Y/N)	Potential Source
Perfluorooctanoic Acid (PFOA)	ng/L	2.7	13	NLE	N	Discharge from industrial chemical factories
Perfluorooctanesulfonic Acid (PFOS)	ng/L	3.1	13	NLE	N	Discharge from industrial chemical factories

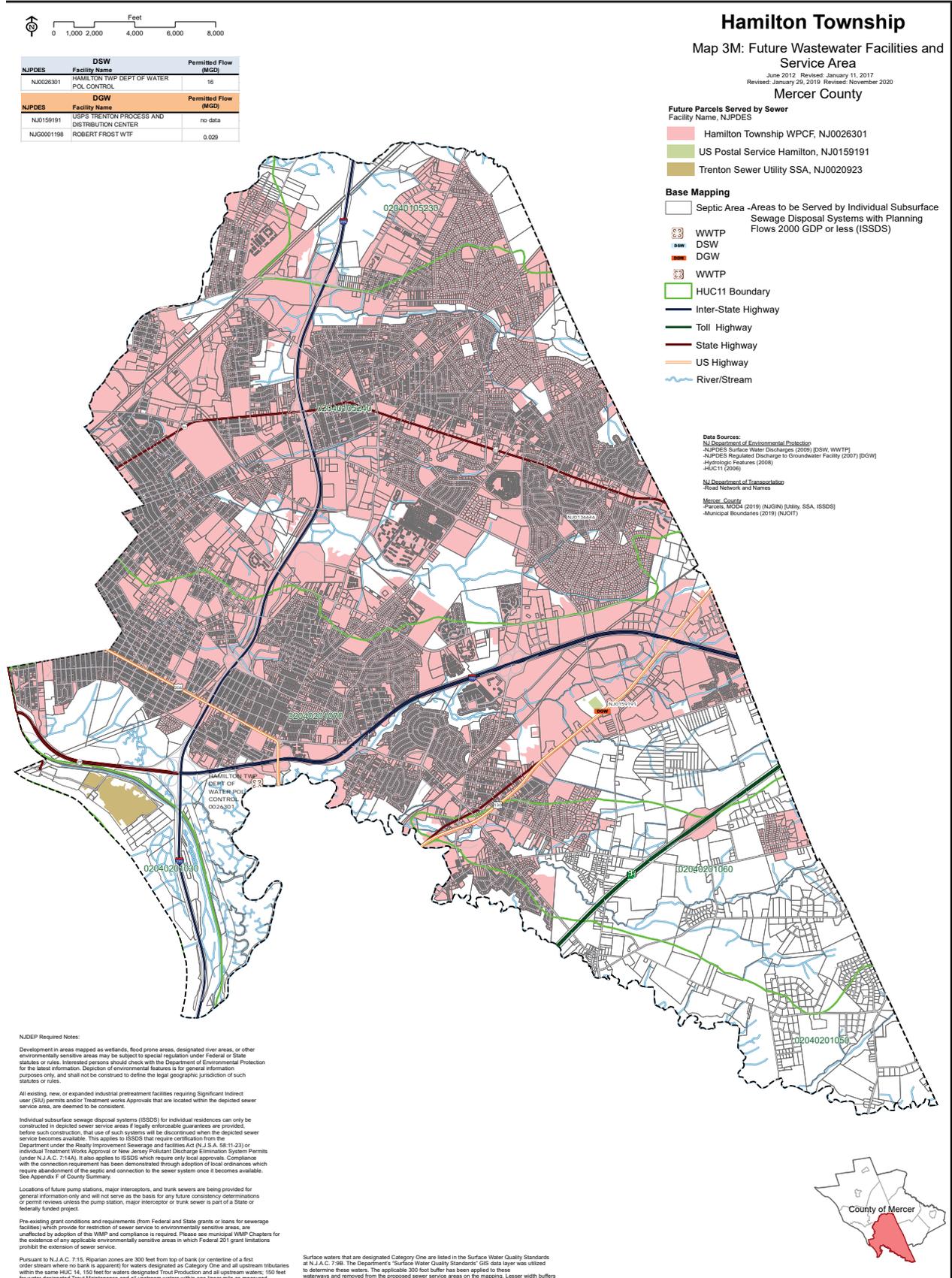
**Other Notes:**

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Trenton Water Works is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 2 to 3 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).

Trenton Water Works also has access to purchased groundwater as emergency water source from an adjacent water system. For further source water information, contact NJDEP Drinking Water Watch.



# APPENDIX C: APPROVED SEWER SERVICE AREA



# Hamilton Township

## ENVIRONMENTAL RESOURCE INVENTORY

**Publication Number:**

25123

**Date Published:**

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**Geographic Area Covered:**

Hamilton Township, Mercer County, New Jersey

**Key Words:**

Agriculture, air quality, aquifers, Assunpink Creek, biodiversity, biological resources, built environment, climate, conservation, Crosswicks Creek, Delaware River, development, endangered species, environmental issues, environmental resource inventory, floodplains, forests, grasslands, groundwater, habitat, land preservation, Landscape Project, master planning, Mercer County, natural resources, New Jersey, open space, population, soils, steep slopes, topography, U.S. Census, vernal pools, water quality, watersheds, wetlands.

**Abstract:**

This publication documents the natural and community resources of Hamilton Township, Mercer County, New Jersey. The natural resource information includes descriptions, tables, and maps of: land use; soils; drinking water, aquifers, and wells; surface waters, including watersheds, streams, lakes, wetlands, and floodplains; impacts on water resources and surface water quality; impervious coverage; vegetation, including wetlands, forests, and grasslands; animal communities; threatened and endangered species; Natural Heritage Priority Sites; Landscape Project Priority Habitats; and known contaminated sites. Community resources that are briefly described include population, transportation, township utilities and services, historic sites and buildings, and protected open space. A short history of the community is also included.

**Staff Contact:**

Mel Musie, Environmental Planner

Phone: 215.238.2943

Email: [mmusie@dvrpc.org](mailto:mmusie@dvrpc.org)



190 N Independence Mall West

8th Floor

Philadelphia, PA 19106-1520

215.592.1800 | fax: 215.592.9125

[www.dvrpc.org](http://www.dvrpc.org)

