4.3.7 HAZARDOUS MATERIALS RELEASE

The following section provides the hazard profile (hazard description, location, extent, previous occurrences and losses, probability of future occurrences, and impact of climate change) and vulnerability assessment for the hazardous materials hazard in Mercer County.

2021 HMP UPDATE CHANGES

- Previous occurrences were updated with events that occurred between 2015 and 2020.
- A spatial exposure analysis was conducted to examine the assets proximate to fixed sites, and major roads and rail lines.

Profile

Hazard Description

Hazardous substances are materials that are considered severely harmful to human health and the environment, as defined by the United States Environmental Protection Agency (USEPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Superfund Law). Many are commonly used substances which are harmless in their normal uses but are quite dangerous if released. The Superfund law designates more than 800 substances as hazardous and identifies many more as potentially hazardous due to their characteristics and the circumstances of their release (USEPA 2013). Superfund's definition of a hazardous substance includes the following:

- Any element, compound, mixture, solution, or substance designated as hazardous under section 102 of CERCLA.
- Any hazardous substance designated under section 311(b)(2)(a) of the Clean Water Act (CWA), or any toxic pollutant listed under section 307(a) of the CWA. There are over 400 substances designated as either hazardous or toxic under the CWA.
- Any hazardous waste having the characteristics identified or listed under section 3001 of the Resource Conservation and Recovery Act.
- Any hazardous air pollutant listed under section 112 of the Clean Air Act, as amended. There are over 200 substances listed as hazardous air pollutants under the Clean Air Act (CAA).
- Any imminently hazardous chemical substance or mixture which the EPA Administrator has "taken action under" section 7 of the Toxic Substances Control Act (USEPA 2013).

If released or misused, hazardous substances can cause death, serious injury, long-lasting health effects, and damage to structures and other properties, as well as the environment. Accidental or intentional release of hazardous materials can be particularly dangerous when resulting in contamination of drinking water supplies. Many products containing hazardous substances are used and stored in homes and these products are shipped daily on highways, railroads, waterways, and pipelines.

Transportation of hazardous substances on highways involves tanker trucks or trailers, which are responsible for the greatest number of hazard substance release incidents. New Jersey is composed of approximately 39,000 miles of highway, many of which are used to transport hazardous substances (New Jersey Department of Transportation [NJDOT] 2019). These roads cross rivers and streams at many points; hazardous substance spills on roads have the potential to pollute watersheds that serve as domestic water supplies for parts of the State. Potential also exists for hazardous substance releases to occur along rail lines as collisions and derailments of train cars can result in large spills.

Additionally, oil is shipped by rail throughout New Jersey. The adoption of hydraulic fracturing ("fracking") to extract oil and gas has led to an increase in the production and shipment of energy products. Lack of pipelines connecting the energy-producing regions with refineries or ports, coupled with the flexibility that railroad transportation provides, have resulted in significant shipments of oil by rail. Major commodities shipped by rail include petrochemicals (including plastic pellets and crude oil), construction materials, food products, raw materials, and finished goods for manufacturers (NJ DOT 2018).

Pipelines can also transport hazardous liquids and flammable substances such as natural gas and petroleum. Incidents can occur when pipes corrode, when they are damaged during excavation, incorrectly operated, or damaged by other forces. In New Jersey, most of the large pipeline leaks have been caused by marine traffic hitting or the anchors of ships effecting pipelines in the waterways. In addition, hazardous substances can be transported by aircraft or by watercraft. Crashes, spills of materials, and fires on these vessels can pose a hazard.

Nuclear incidents can also be considered a form of environmental hazard. Nuclear incidents generally refer to incidents involving (1) release of significant levels of radioactive materials or (2) exposure of workers or the general public to radiation. Primary concerns following a nuclear incident or accident are impact on public health from direct exposure to a radioactive plume; inhalation of radioactive materials; ingestion of contaminated food, water, and milk; and long-term exposure to deposited radioactive materials in the environment that may lead to either acute (radiation sickness or death) or chronic (cancer) health effects.

The Mercer County Division of Public Health (MCDPH)-County Environmental Health Agency (CEHA) Agency responses to all hazardous material emergencies in the county. This is performed by three local hazardous materials (HAZMAT) teams. The Mercer County HAZMAT teams have over 100 responders trained by the New Jersey State Police to the technician level. The City of Trenton's team is made up of full-time firefighters on duty 24 hours a day, seven days a week. At any given time, there are 10 to 15 HAZMAT technicians on duty. The West Windsor and Hamilton HAZMAT teams are made up of police and fire personnel and some have on-duty staff levels that fluctuate daily (Mercer County 2018).

Location

The following provides information regarding the location of hazardous substance incidents.

Hazardous Substances Fixed Site

Years ago, numerous wastes were dumped on the ground, in rivers, or left out in the open. As a result, thousands of uncontrolled or abandoned contaminated sites were created. These sites included abandoned warehouses, manufacturing facilities, processing plants, and landfills. In response to concerns regarding health and environmental risks, Congress established the Superfund program in 1980 to clean up these sites. The Superfund program is administered by the USEPA in cooperation with individual states. In New Jersey, the Department of Environmental Protection (NJDEP) Site Remediation Program oversees the Superfund program (NJDEP 2013).

Federal regulations include the CERCLA, and the Superfund Amendments and Reauthorization Act (SARA) required that a National Priorities List (NPL) of sites throughout the United States be maintained and revised at least annually (NJDEP 2013).

Fixed-site facilities that use, manufacture, or store hazardous substances in New Jersey pose risk and must comply with Title III of the federal SARA. SARA was signed into law on October 17, 1986. It is a federal law that applies nationwide. It must be realized that this law is linked to N.J.S.A. 34:5A, the New Jersey Worker and Community Right to Know Act. SARA requires the governor of each state to establish a State Emergency Response Commission (SERC). New Jersey's SERC was established by Executive Order on February 13, 1987.

SARA also requires that the emergency planning districts be established by the SERC. The Act specified that these districts can be existing political subdivisions. The function of the emergency planning district is to facilitate preparation and implementation of emergency plans. In New Jersey, all municipalities and counties have been designated emergency planning districts (total of 588). The Local Emergency Planning Committees (LEPC) is the policy body for the emergency planning district (New Jersey Division of Fire Safety 2021).

The State enacted the Toxic Catastrophe Prevention Act (TCPA), N.J.S.A. 13:1K-19 et seq. Currently, implementation of the requirements established under this Act is facilitated by the TCPA Program. Certain industrial facilities using materials considered extraordinarily hazardous must take steps to prevent releases and protect public safety. New Jersey has also mandated that facilities storing large quantities of hazardous substances take preventative measures to reduce the likelihood of a leak or discharge. Established under the New Jersey Spill Compensation and Control Act (N.J.S.A. 58:10-23.11), these requirements include testing and inspection of storage tanks, training of employees, and emergency response planning. The Discharge Prevention Containment and Countermeasure (DPCC) program facilitates implementation of these requirements. Regulations related to reporting of chemical and petroleum discharges are also administered under this program. The Program is sometimes referred to by the acronym DPCC, which refers to an important preparedness document that major facilities develop under the program (NJDEP 2019).

The Community Right to Know (CRTK) program collects, processes, and disseminates the chemical inventory, environmental release and materials accounting data required to be reported under the New Jersey Worker and Community Right to Know Act, N.J.S.A.34:5A and the federal Emergency Planning and Community Right to Know Act of 1986 (EPCRA). EPCRA is also known as Title III of the SARA. This information is used by the public, emergency planners, and first responders to determine the chemical hazards in the community (NJDEP 2020).

The U.S. EPA Hazardous Waste Report, which is a biennial report, collects data on the generation, management, and minimization of hazardous waste. This report provides detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage, and disposal facilities. This report lists 36 facilities in Mercer County (U.S. EPA 2021).

Superfund is a program administered by the U.S. EPA to locate, investigate, and cleanup the worst hazardous waste sites throughout the U.S. Data from the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database indicated that Mercer County has 29 Superfund sites located throughout the County (U.S. EPA 2021).

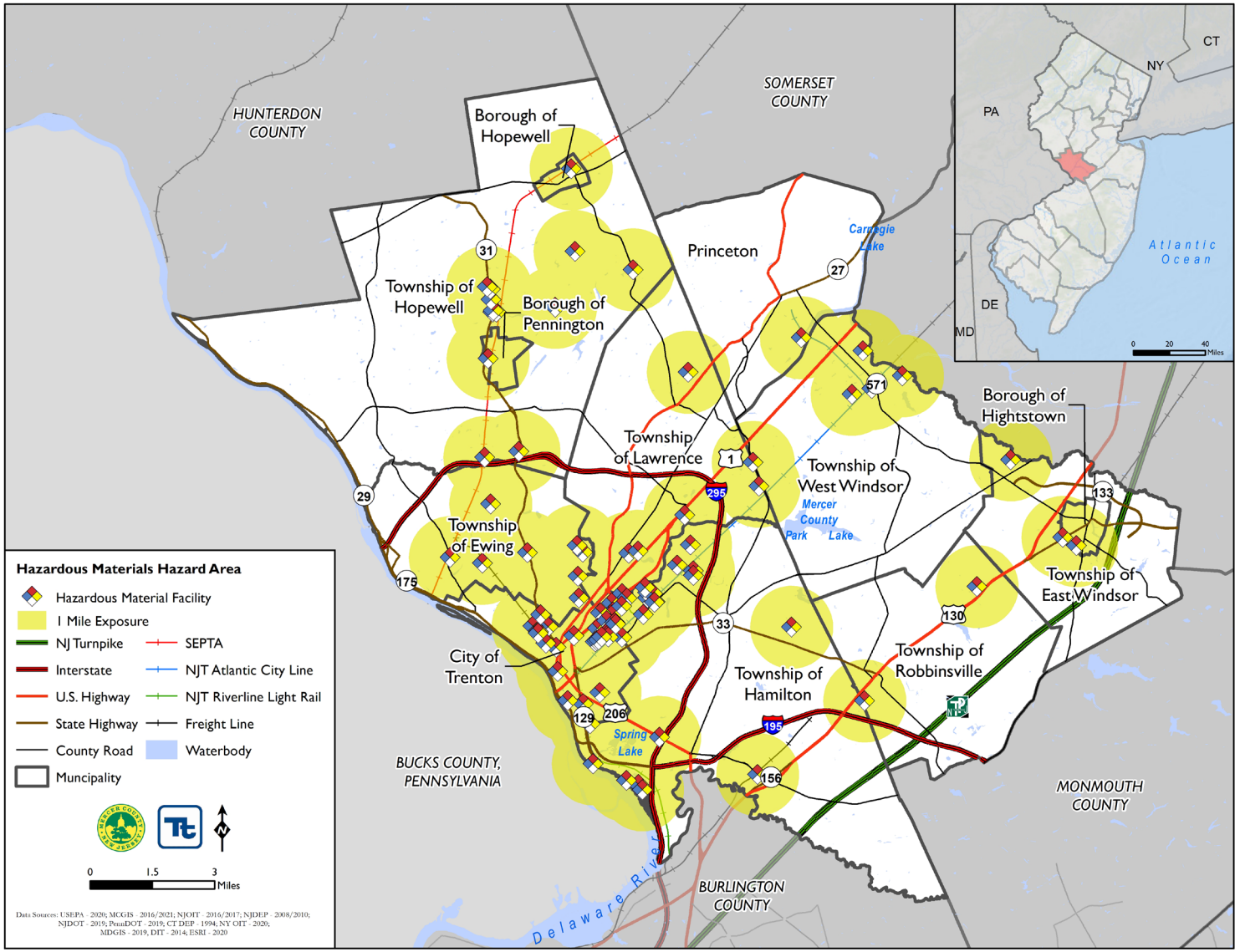
New Jersey employers, whose businesses are assigned North American Industry Classification System (NAICS) codes listed in the New Jersey Worker and Community Right to Know (CRTK) regulations, are required to submit CRTK surveys listing the environmental hazardous substances (EHSs) present at their facilities in quantities that exceed 500 pounds, unless the EHS is on the federal Emergency Planning and Community Right to Know Act (EPCRA) Section 302 list of extremely hazardous substances with a lower reporting threshold. In addition, Section 312 of EPCRA requires owners and operators of federal facilities and private sector facilities that are subject to the United States Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard to report their inventories of any chemical that requires a Materials Safety Data Sheet (MSDS) and is present on site in quantities that exceed 10,000 pounds, unless the chemical is an Extremely Hazardous Substance with a lower reporting threshold (NJDEP 2018).

Owners and operators of manufacturing, and select non-manufacturing companies, having the equivalent of 10 or more full-time employees, and manufacturing, importing, processing or otherwise using toxic chemicals listed on the EPCRA Section 313 (TRI) list in quantities that exceed specified thresholds, are required to annually

report their releases of these chemicals for the previous year. Approximately 500 New Jersey companies are required to file federal Toxic Chemical Release Inventory (TRI) forms. TRI Form R requires the listing of environmental releases, on-site waste management and off-site transfers while the simplified Form A Certification Statement requires the listing of the chemical only. These companies are also required to submit to NJDEP the Release and Pollution Prevention Report (RPPR) listing the quantities of environmental release, on-site waste management, waste transfer, and chemical throughput information. Most of these facilities are also subject to Pollution Prevention Planning Requirements and, therefore, required to report pollution prevention progress information on the RPPR (NJDEP 2018).

Figure 4.3.7-1 displays hazardous material facilities and a 1-mile exposure buffer to these facilities in Mercer County. A 1-mile buffer was used as an estimated area that may be exposed should there be a hazardous materials release. However, there are several factors that affect how the hazard occurs and develops including but not limited to the properties of the hazardous material itself, weather conditions, controls and mitigation measures in place, and emergency response times.

Figure 4.3.7-1. Hazardous Material Facilities in Mercer County and a 1-Mile Buffer

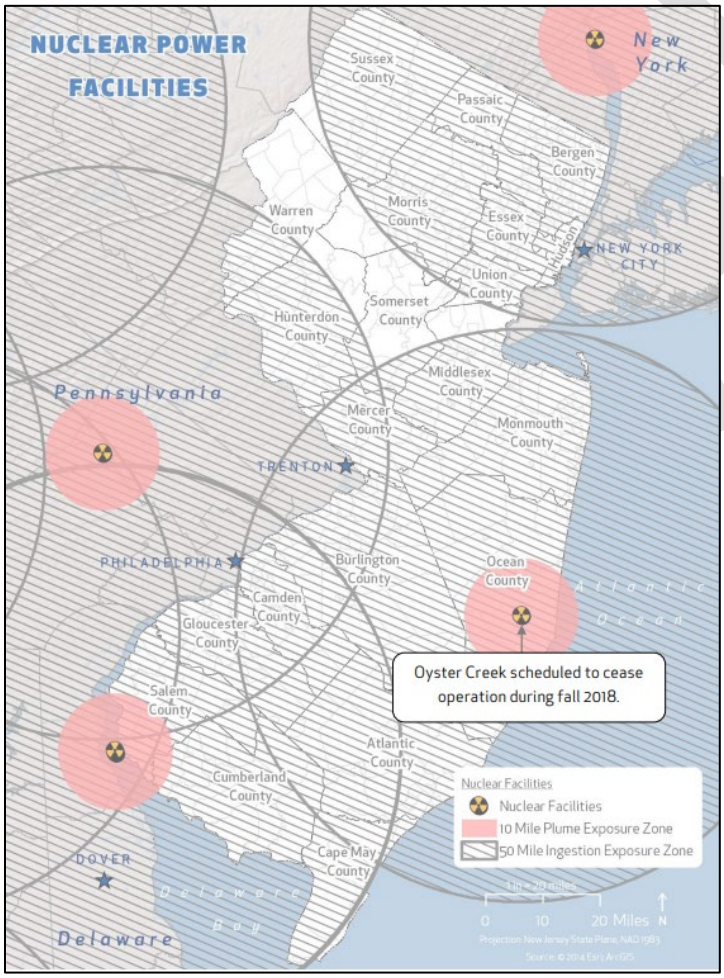


Nuclear Facilities

Although there are no nuclear facilities within Mercer County limits, the County is within 50 miles of Limerick Nuclear Power Plant and the Oyster Creek Nuclear Generating Plant. Limerick Nuclear Power Plant is located in Pottstown, Pennsylvania and provides power to two million customers (Exelon 2020). Oyster Creek Generating Station is located in Forked River, New Jersey (Ocean County). It is in the process of being decommissioned (Holtec 2021).

In nuclear preparedness planning, the 10-mile and 50-mile radiuses around nuclear facilities are important location boundaries. The Nuclear Regulatory Commission encourages the use of Probabilistic Risk Assessments (PRA) to estimate quantitatively the potential risk to public health and safety considering the design, operations, and maintenance practices at nuclear power plants. Preparedness plans typically consider the Plume Exposure Pathway Emergency Planning Zone (EPZ), which has a radius of 10 miles from the facility, and the Ingestion Exposure Pathway (IEP), which has a radius of 50 miles from each facility. Mercer County is located within the 50-mile IEP of Limerick and Oyster Creek. Should an accident occur at either of these facilities, the area within the IEP could receive some radioactive contamination. Figure 4.3.7-2 illustrates Mercer County relative to the EPZ and IEP of the facilities.

Figure 4.3.7-2. Indian Point Energy Center's EPZ and IEP



Source: NJOEM 2019

Hazardous Substances In-Transit

Incidents involving hazardous substances in transit can occur anywhere in Mercer County. The main concerns in the County are highways and railroads. New Jersey Transit and Amtrak offers passenger service to and from Mercer County, with stops in Princeton, Hamilton, and Trenton. In addition to passenger service, there are rail freight routes in the county, both private and public ownership. There is a total of 43.91 miles (23.23 miles private lines and 20.68 miles of freight rail and these lines provide existing or potential rail freight service to 11 municipalities (Delaware Valley Regional Planning Commission 2011). The County freight rail lines move approximately 96,040 tons inbound and 52,860 tons outbound (NJDOT 2014). Figure 4.3.7-3 shows the location of freight lines in Mercer County.

Hazardous substances can also be transported via pipeline across the State. New Jersey has an extensive network of natural gas and petroleum pipelines. Several of the petroleum pipelines originate in the Gulf Coast region (Colonial Pipeline and Buckeye Pipeline). Figure 4.3.7-4 shows the approximate locations of pipelines throughout the northeastern United States.

Figure 4.3.12-3. Hazardous Material Incidence Zones from Road and Railway in Mercer County

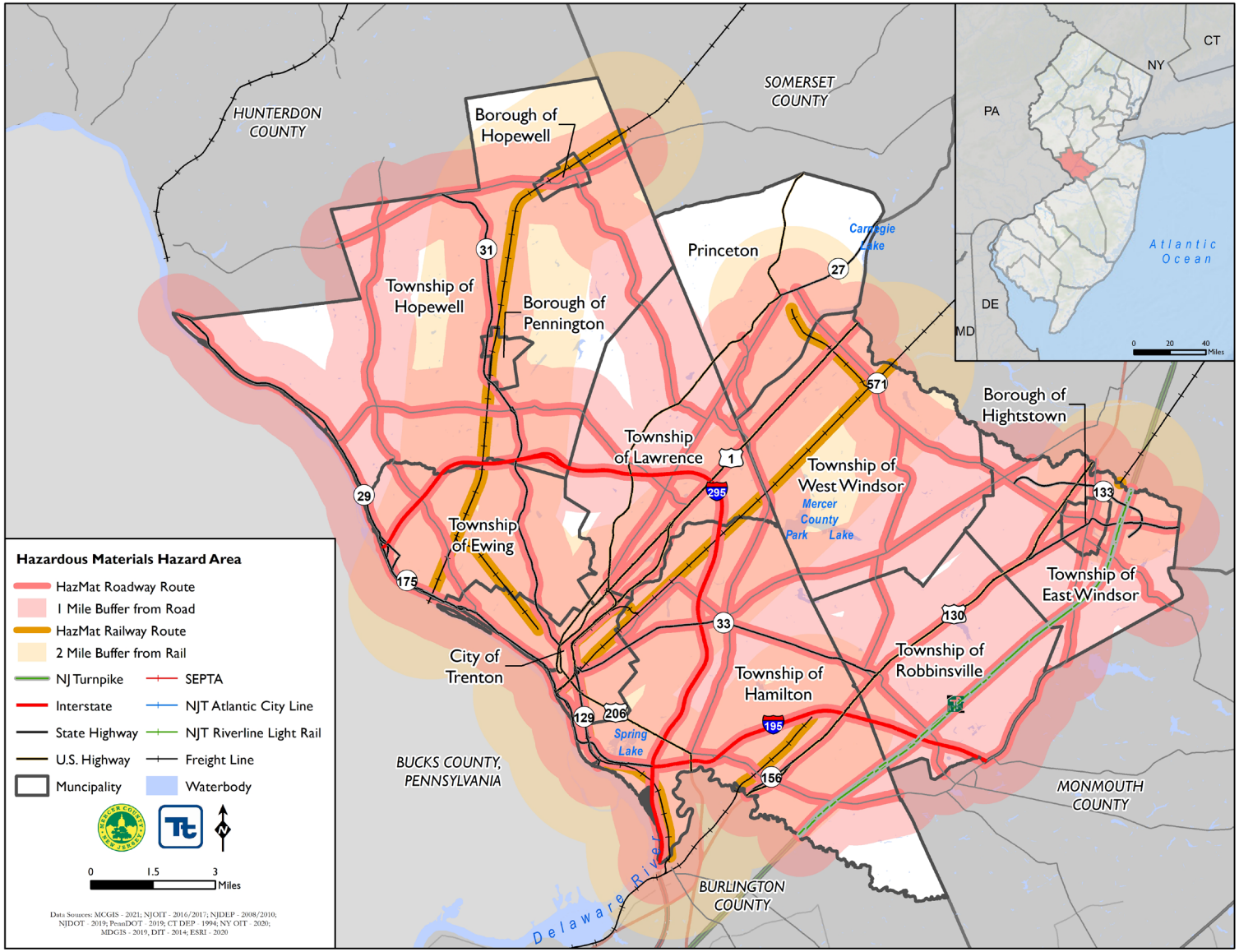
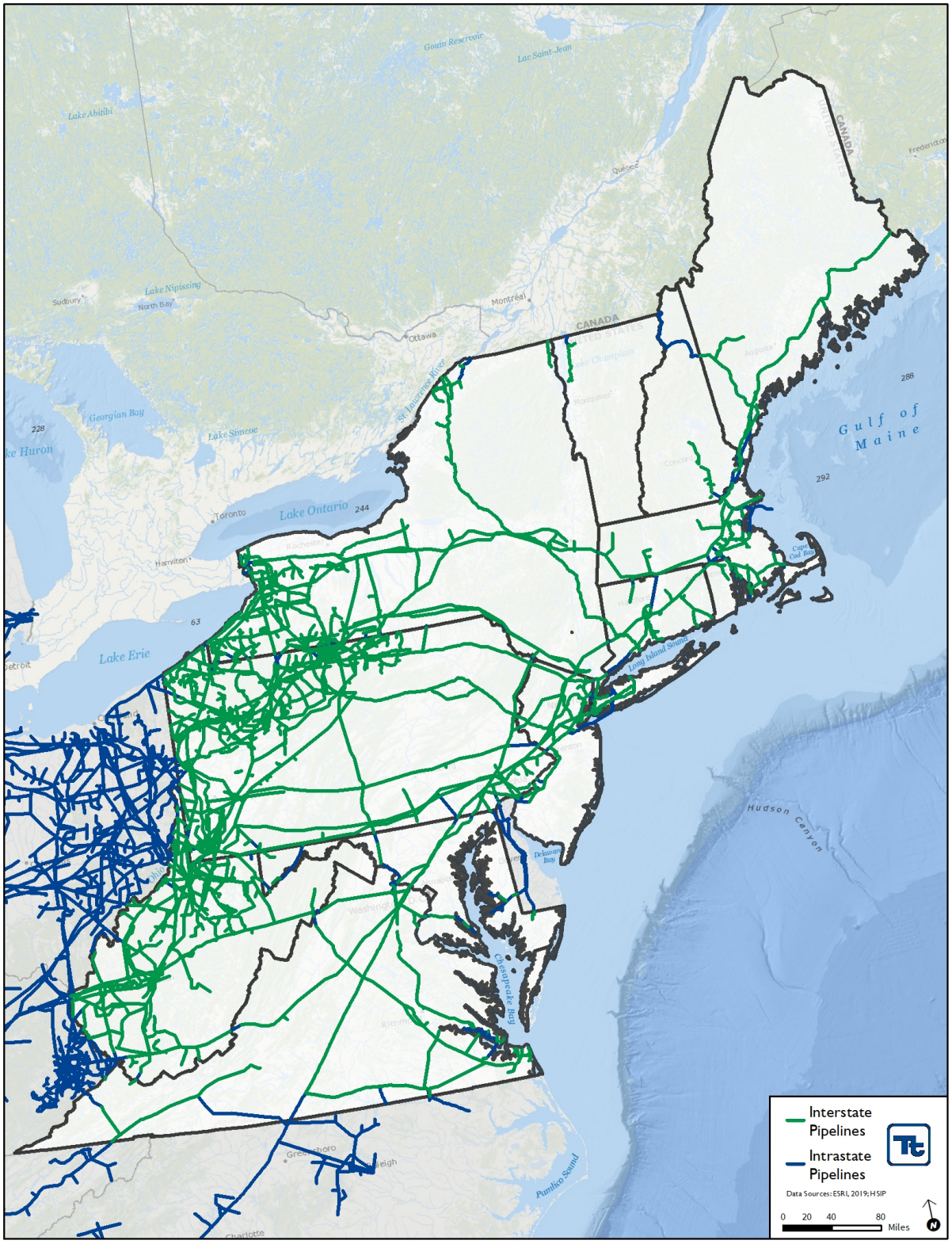


Figure 4.3.12-4. Interstate Natural Gas Pipelines in the Northeast



Water Supply Contamination

Water supply contamination through exposure to hazardous materials, either accidental or intentional, is most likely to occur in surface waterbodies that serve as sources for water supply, including the Trenton Water Supply Reservoirs that provide water to the County Delaware River & Delaware Raritan Canal.

Extent

The extent of a hazardous substance release will depend on whether it is from a fixed or mobile source, the size of impact, the toxicity and properties of the substance, duration of the release, and the environmental conditions (for example, wind and precipitation, terrain, etc.).

Hazardous substance releases can contaminate air, water, and soils, possibly resulting in death and/or injuries. Dispersion can take place rapidly when the hazardous substance is transported by water and wind. While often accidental, releases can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary events. Hazardous substances can include toxic chemicals, radioactive substances, infectious substances, and hazardous wastes. Such releases can affect nearby populations and contaminate critical or sensitive environmental areas.

With a hazardous substance release, whether accidental or intentional, several potentially exacerbating or mitigating circumstances will affect its severity or impact. Mitigating conditions are precautionary measures taken in advance to reduce the impact of a release on the surrounding environment. Primary and secondary containment or shielding by sheltering-in-place measures protects people and property from the harmful effects of a hazardous substance release. Exacerbating conditions, characteristics that can enhance or magnify the effects of a hazardous substance release, include:

- Weather conditions, which affect how the hazard occurs and develops
- Micro-meteorological effects of buildings and terrain, which alters dispersion of hazardous substances on-compliance with applicable codes (such as building or fire codes)
- Maintenance failures (such as fire protection and containment features), which can substantially increase the damage to the facility itself and to surrounding buildings

As discussed earlier, the severity of the incident is dependent not only on the circumstances described above, but also with the type of substance released and the distance and related response time for emergency response teams. The areas proximate to the releases are generally at greatest risk; however, depending on the agent, a release can travel great distances or remain present in the environment for a long period of time (i.e., centuries to millennia).

The 1974 Safe Drinking Water Act and its 1986 amendments require the USEPA set standards for contaminants in drinking water that may pose health risks to humans. Drinking water standards apply to public water systems, which provide water for human consumption through at least 15 service connections, or regularly serve at least 25 individuals. Public water systems include municipal water companies, homeowner associations, schools, businesses, campgrounds, and shopping malls. The USEPA standard for lifetime exposures in drinking water, the maximum contaminant level (MCL), is the highest amount of a contaminant allowed in drinking water supplied by municipal water systems. Regulators use the reference dose to establish an MCL for a contaminant, assuming that the exposure comes from drinking 2 liters of contaminated water per day for 70 years (USEPA 2020).

Previous Occurrences and Losses

FEMA Disaster Declarations

Between 1954 and 2021, neither Mercer County or the State of New Jersey were included in any FEMA declared disasters (DR) or emergencies (EM) related to hazardous substances incidents (FEMA 2021).

USDA Disaster Declarations

Agriculture-related disasters are quite common. The USDA Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. From 2015 to 2021, Mercer County was not included in any agriculture-related disasters (USDA 2021).

Hazardous Substance Events

For the 2021 HMP update, known hazardous substances incidents that have impacted Mercer County between 2015 and 2021 are identified in Table 4.3.7-1. Refer to Section (Jurisdictional Annex) 9 for detailed information regarding impacts and losses to each municipality, where available.

Table 4.3.7-1. Hazardous Substances Events in Mercer County, 2015 to 2021

Date(s) of Event	Event Type	FEMA Declaration Number (if applicable)	Mercer County Designated?	Description
2015	Chemical Release	N/A	N/A	In 2015, 9,328 pounds of chemicals were released on-site, and 274 pounds of chemicals were released off-site in Mercer County.
May 15, 2015	Suspicious Fumes	N/A	N/A	A New Jersey U.S. mail handling facility in Hamilton Township was evacuated as a precaution Friday as hazmat crews evaluated the area following workers' reports of a strong, sweet smell in the building, authorities said
2016	Chemical Release	N/A	N/A	In 2016, 9,233 pounds of chemicals were released on-site, and 55 pounds of chemicals were released off-site in Mercer County.
October 5, 2016	Gas Explosion	N/A	N/A	Emergency crews were on the scene of a natural gas explosion that took place in Trenton, leading to a partial house collapse.
2017	Chemical Release	N/A	N/A	In 2017, 6,585 pounds of chemicals were released on-site, and 95 pounds of chemicals were released off-site in Mercer County.
August 19, 2017	Suspicious Fumes	N/A	N/A	The Hughes Justice Complex in Trenton was evacuated after suspicious fumes were identified. Some residents inside the building reported burning eyes from the odor, but no injuries were reported.
2018	Chemical Release	N/A	N/A	In 2018, 5,959 pounds of chemicals were released on-site, and 111 pounds of chemicals were released off-site in Mercer County.
2019	Chemical Release	N/A	N/A	In 2019, 12,224 pounds of chemicals were released on-site, and 111 pounds of chemicals were released off-site in Mercer County.
November 19, 2019	Gas Leak	N/A	N/A	A gas leak shut down a portion of US-1 near the Quaker Bridge Mall in Lawrence Township.
January 24, 2020	Gas Leak	N/A	N/A	Route 1 was closed in both directions for about three hours. According to officials, contractors working in the area struck a gas line along the highway near the Mercer Mall and the very busy swath of Route 1 between I-295 and Quakerbridge Road in Lawrence Township, causing a gas leak.
September 5, 2020	Gas leak	N/A	N/A	A gas leak Saturday afternoon caused Walmart to close in the Hamilton Marketplace, 700 Marketplace Blvd, Hamilton Township.

Source: NJOEM 2019; EPA TRI Explorer 2021; North American Hazmat Situations and Deployments Map 2021

With hazardous substances incidents for New Jersey and Mercer County being so extensive, not all sources have been identified or researched. Therefore, not all events that have occurred in the County may be included.

Probability of Future Occurrences

Predicting future hazardous substance incidents in Mercer County is difficult. They can occur at anytime and anywhere in the county. Incidents can be sudden without any warning or slowly develop. Small spills, both fixed site and in-transit, occur throughout the year and the probability for these events are high. The risk of major incidents in a given year is rare. It is estimated that the county will continue to experience direct and indirect impacts of hazardous substance incidents annually that may induce secondary hazards such as infrastructure deterioration or failure, water quality and supply concerns, and transportation delays, accidents, and inconveniences.

In Section 4.4, the identified hazards of concern for Mercer County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for the hazardous substances hazard in the County is considered 'frequent'. The ranking of the hazardous substances hazard for individual municipalities is presented in the jurisdictional annexes.

Climate Change Impacts

Hazardous substance incidents are non-natural incidents; however, their release may be the result from natural hazard events. As noted in the risk assessment, climate change may potentially increase the frequency and magnitude of flood and severe weather events which may lead to an increased release of hazardous substances at both fixed sites and in-transit. Secondary impacts, such as excessive heat on containers may occur, but also can occur during normal fluctuations in temperature.

Vulnerability Assessment

The following section discusses Mercer County's vulnerability referencing an exposure analysis of the County's assets (i.e., population, buildings, critical facilities, and new development) built within a 1-mile buffer around hazardous material facilities, within one mile of selected roadway routes, and within two miles of all railways.

Impact on Life, Health and Safety

Depending on the type and quantity of chemicals released and the weather conditions, an incident can affect larger areas that cross jurisdictional boundaries. When hazardous substances are released in the air, water or on land they may contaminate the environment and pose greater danger to human health. Exposure may be either acute or chronic, depending upon the nature of the substance and extent of release and contamination.

Due to the varied location of different hazardous substances and waste sites in Mercer County, the entire County is considered vulnerable to this hazard. Those particularly vulnerable include populations located along freight railway routes because of the quantities of chemicals transported on these major thoroughfares. Potential losses from hazardous substances incidences include human health and life and property resources. These types of incidents can lead to injury, illnesses, and/or death from both the involved persons and those living in the impacted areas.

Table 4.3.7-2 summarizes the estimated population located within 1 mile of fixed sites and major roadways, and 2 miles of rail lines. The City of Trenton has the greatest number of people living within two miles of hazardous material railways and the greatest number of people within one mile of hazardous material facilities; 83,412 and 79,160 respectively. The Township of Hamilton has the greatest number of people, 85,922 living within 1 mile of a roadway.

Table 4.3.7-2. Estimated Number of Persons Living Near Hazardous Materials Hazard Areas

Jurisdiction	American Community Survey (2015-2019) Population	Number of Persons Located within 1 Mile of Hazardous Material Roadway Routes*	Percent of Total	Number of Persons Located within 2 Miles of Hazardous Material Railway Routes	Percent of Total	Number of Persons Located within 1 Mile of Hazardous Material Facilities	Percent of Total
East Windsor (Twp)	27,245	27,239	100.0%	10,627	39.0%	9,634	35.4%
Ewing (Twp)	36,037	35,262	97.8%	33,545	93.1%	29,374	81.5%
Hamilton (Twp)	87,424	85,922	98.3%	76,734	87.8%	52,872	60.5%
Hightstown (B)	5,375	5,375	100.0%	5,375	100.0%	4,594	85.5%
Hopewell (B)	1,915	1,915	100.0%	1,915	100.0%	1,915	100.0%
Hopewell (Twp)	18,067	15,700	86.9%	11,408	63.1%	6,630	36.7%
Lawrence (Twp)	32,614	31,910	97.8%	19,409	59.5%	21,577	66.2%
Pennington (B)	2,531	2,522	99.6%	2,531	100.0%	2,515	99.4%
Princeton	31,000	18,276	59.0%	23,376	75.4%	2,085	6.7%
Robbinsville (Twp)	14,365	14,316	99.7%	3,873	27.0%	4,365	30.4%
Trenton (C)	83,412	82,756	99.2%	83,412	100.0%	79,160	94.9%
West Windsor (Twp)	27,937	25,173	90.1%	16,967	60.7%	8,360	29.9%
Mercer County (Total)	**367,922**	**346,367**	**94.1%**	**289,174**	**78.6%**	**223,081**	**60.6%**

Source: Mercer County GIS - 2020; American Community Survey - 2019; EPA - 2020; NJOIT – 2016/2017/2019; NJDOT - 2019

Note: B – Borough; C - City; Twp – Township; % - Percent

**HazMat Roads include 100 series (NJ Tpke), 200 Series (I 195, I 295, etc.), US 1, US 130, State 33, State 129, State 206, State 29, State 31, 500-series County roads*

Impact on General Building Stock

Potential losses to the general building stock caused by a hazardous substance releases, whether in transit or at fixed sites, is difficult to quantify. The degree of damages depends on the scale of the incident. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content losses if an explosion occurs. The closure of waterways, railroads, airports, and highways as a result of a hazardous substance incident has the potential to impact the ability to deliver goods and services efficiently. Potential impacts may be local, regional, or statewide depending on the magnitude of the event and level of service disruptions.

An exposure analysis was conducted to estimate the number of buildings located within the specified area within the hazardous materials fixed sites, major roadways, and rail lines. Refer to Table 4.3.7-3 through Table 4.3.7-5 for the total number of buildings and replacement cost located within the hazardous materials hazard areas by municipality.

Table 4.3.7-3. Estimated Number of Buildings and Replacement Cost Value Within 1 Mile of Hazardous Material Roadway Route

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Number of Buildings Located within 1 Mile of Hazardous Material Roadway Routes*	Percent of Total	Replacement Cost Value of Buildings Located within 1 Mile of Hazardous Material Roadway Routes*	Percent of Total
East Windsor (Twp)	5,439	$7,712,408,240	5,436	99.9%	$7,710,294,594	100.0%
Ewing (Twp)	12,054	$18,161,858,212	11,778	97.7%	$17,767,885,862	97.8%
Hamilton (Twp)	29,515	$30,878,928,699	28,975	98.2%	$30,319,239,180	98.2%
Hightstown (B)	1,624	$1,867,544,787	1,624	100.0%	$1,867,544,787	100.0%
Hopewell (B)	844	$850,167,003	844	100.0%	$850,167,003	100.0%
Hopewell (Twp)	7,719	$11,709,101,176	6,528	84.6%	$9,897,590,775	84.5%
Lawrence (Twp)	9,027	$14,232,035,476	8,844	98.0%	$14,040,191,295	98.7%
Pennington (B)	953	$1,009,760,468	950	99.7%	$1,006,959,937	99.7%
Princeton	7,527	$12,608,393,758	4,576	60.8%	$8,322,297,439	66.0%
Robbinsville (Twp)	4,162	$7,167,631,183	4,150	99.7%	$7,155,588,360	99.8%
Trenton (C)	17,152	$36,604,311,832	17,033	99.3%	$36,460,905,235	99.6%
West Windsor (Twp)	7,563	$13,179,360,332	6,827	90.3%	$11,901,193,445	90.3%
Mercer County (Total)	**103,579**	**$155,981,501,165**	**97,565**	**94.2%**	**$147,299,857,912**	**94.4%**

Source: Mercer County GIS - 2019/2020; MOD-IV – 2019; RS Means - 2021; EPA - 2020; NJOIT – 2016/2017/2019; NJDOT - 2019
Note: B – Borough; C - City; Twp – Township; % - Percent
**HazMat Roads include 100 series (NJ Tpke), 200 Series (I 195, I 295, etc.), US 1, US 130, State 33, State 129, State 206, State 29, State 31, 500-series County roads*

Table 4.3.7-4. Estimated Number of Buildings and Replacement Cost Value Within 2 Miles of Hazardous Material Railway Route

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Number of Buildings Located within 2 Miles of Hazardous Material Railway Routes	Percent of Total	Replacement Cost Value of Buildings Located within 2 Miles of Hazardous Material Railway Routes	Percent of Total
East Windsor (Twp)	5,439	$7,712,408,240	2,064	37.9%	$3,667,161,779	47.5%
Ewing (Twp)	12,054	$18,161,858,212	11,283	93.6%	$17,550,175,792	96.6%

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Number of Buildings Located within 2 Miles of Hazardous Material Railway Routes	Percent of Total	Replacement Cost Value of Buildings Located within 2 Miles of Hazardous Material Railway Routes	Percent of Total
Hamilton (Twp)	29,515	$30,878,928,699	25,848	87.6%	$27,826,382,943	90.1%
Hightstown (B)	1,624	$1,867,544,787	1,624	100.0%	$1,867,544,787	100.0%
Hopewell (B)	844	$850,167,003	844	100.0%	$850,167,003	100.0%
Hopewell (Twp)	7,719	$11,709,101,176	4,877	63.2%	$7,873,259,661	67.2%
Lawrence (Twp)	9,027	$14,232,035,476	5,310	58.8%	$8,642,927,512	60.7%
Pennington (B)	953	$1,009,760,468	953	100.0%	$1,009,760,468	100.0%
Princeton	7,527	$12,608,393,758	5,713	75.9%	$9,662,721,604	76.6%
Robbinsville (Twp)	4,162	$7,167,631,183	1,063	25.5%	$768,214,920	10.7%
Trenton (C)	17,152	$36,604,311,832	17,152	100.0%	$36,604,311,832	100.0%
West Windsor (Twp)	7,563	$13,179,360,332	4,707	62.2%	$9,650,410,002	73.2%
Mercer County (Total)	**103,579**	**$155,981,501,165**	**81,438**	**78.6%**	**$125,973,038,303**	**80.8%**

Source: Mercer County GIS - 2019/2020; MOD-IV – 2019; RS Means - 2021; EPA - 2020; NJOIT – 2016/2017/2019; NJDOT – 2019
Note: B – Borough; C - City; Twp – Township; % - Percent

Table 4.3.7-5. Estimated Number of Buildings and Replacement Cost Value Within 1 Mile of Hazardous Material Facilities Hazard Area

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Number of Buildings Located within 1 Mile of Hazardous Material Facilities	Percent of Total	Replacement Cost Value of Buildings Located within 1 Mile of Hazardous Material Facilities	Percent of Total
East Windsor (Twp)	5,439	$7,712,408,240	1,951	35.9%	$2,571,584,877	33.3%
Ewing (Twp)	12,054	$18,161,858,212	9,939	82.5%	$15,679,923,493	86.3%
Hamilton (Twp)	29,515	$30,878,928,699	17,690	59.9%	$16,843,081,631	54.5%
Hightstown (B)	1,624	$1,867,544,787	1,399	86.1%	$1,673,111,586	89.6%
Hopewell (B)	844	$850,167,003	844	100.0%	$850,167,003	100.0%
Hopewell (Twp)	7,719	$11,709,101,176	2,761	35.8%	$5,353,088,004	45.7%
Lawrence (Twp)	9,027	$14,232,035,476	5,978	66.2%	$9,539,322,162	67.0%
Pennington (B)	953	$1,009,760,468	948	99.5%	$1,005,621,548	99.6%

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Number of Buildings Located within 1 Mile of Hazardous Material Facilities	Percent of Total	Replacement Cost Value of Buildings Located within 1 Mile of Hazardous Material Facilities	Percent of Total
Princeton	7,527	$12,608,393,758	649	8.6%	$2,588,482,177	20.5%
Robbinsville (Twp)	4,162	$7,167,631,183	1,327	31.9%	$1,096,969,096	15.3%
Trenton (C)	17,152	$36,604,311,832	16,392	95.6%	$36,033,801,610	98.4%
West Windsor (Twp)	7,563	$13,179,360,332	2,434	32.2%	$5,098,086,246	38.7%
Mercer County (Total)	**103,579**	**$155,981,501,165**	**62,312**	**60.2%**	**$98,333,239,433**	**63.0%**

Source: Mercer County GIS - 2019/2020; MOD-IV – 2019; RS Means - 2021; EPA - 2020; NJOIT – 2016/2017/2019; NJDOT – 2019
Note: B – Borough; C - City; Twp – Township; % - Percent

Impact on Critical Facilities and Lifelines

Potential losses to critical facilities caused by a hazardous substances incident is difficult to quantify. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content losses if an explosion occurs. Table 4.3.7-6 through Table 4.3.7-11 summarize the number of critical facilities and lifelines built within the hazardous materials hazard areas by jurisdiction. Appendix E summarizes the distribution of critical facilities by critical facility type located in the hazardous material hazard areas by jurisdiction.

Table 4.3.7-6 Estimated Number of Critical Facilities and Lifelines Built Within 1 Mile of Roadways

Jurisdiction	Total Number of Critical Facilities	Total Number of Lifelines**	Number of Critical Facilities and Lifeline Facilities Located Within 1 Mile of Hazardous Material Roadway Routes*			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
East Windsor (Twp)	171	154	171	100.0%	154	100.0%
Ewing (Twp)	266	215	258	97.0%	207	96.3%
Hamilton (Twp)	639	537	627	98.1%	526	98.0%
Hightstown (B)	70	63	70	100.0%	63	100.0%
Hopewell (B)	47	39	47	100.0%	39	100.0%
Hopewell (Twp)	438	406	366	83.6%	340	83.7%
Lawrence (Twp)	334	304	329	98.5%	300	98.7%
Pennington (B)	44	40	44	100.0%	40	100.0%
Princeton	252	209	152	60.3%	118	56.5%
Robbinsville (Twp)	136	127	135	99.3%	126	99.2%
Trenton (C)	701	478	701	100.0%	478	100.0%
West Windsor (Twp)	288	234	257	89.2%	208	88.9%
Mercer County (Total)	**3,386**	**2,806**	**3,157**	**93.2%**	**2,599**	**92.6%**

Source: Mercer County GIS – 2016/2020; EPA - 2020; NJOIT – 2016/2017/2019; NJDOT – 2019
Note: B – Borough; C - City; Twp – Township; % - Percent
**HazMat Roads include 100 series (NJ Tpke), 200 Series (I 195, I 295, etc.), US 1, US 130, State 33, State 129, State 206, State 29, State 31, 500-series County roads.*
***The lifeline totals are the number of critical facilities identified as lifelines by the Planning Partnership. These facilities are not unique and are captured in the critical facility total.*

Table 4.3.7-7. Estimated Number of Critical Facilities and Lifelines Built Within 2 Miles of Hazardous Material Railway Routes

Jurisdiction	Total Number of Critical Facilities	Total Number of Lifelines	Number of Critical Facilities and Lifeline Facilities Located Within 2 Miles of Hazardous Material Railway Routes			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
East Windsor (Twp)	171	154	78	45.6%	74	48.1%
Ewing (Twp)	266	215	255	95.9%	204	94.9%
Hamilton (Twp)	639	537	519	81.2%	429	79.9%
Hightstown (B)	70	63	66	94.3%	59	93.7%
Hopewell (B)	47	39	47	100.0%	39	100.0%
Hopewell (Twp)	438	406	302	68.9%	281	69.2%
Lawrence (Twp)	334	304	227	68.0%	205	67.4%
Pennington (B)	44	40	44	100.0%	40	100.0%
Princeton	252	209	176	69.8%	140	67.0%
Robbinsville (Twp)	136	127	32	23.5%	29	22.8%
Trenton (C)	701	478	701	100.0%	478	100.0%
West Windsor (Twp)	288	234	227	78.8%	183	78.2%
Mercer County (Total)	**3,386**	**2,806**	**2,674**	**79.0%**	**2,161**	**77.0%**

Source: Mercer County GIS – 2016/2020; EPA - 2020; NJOIT – 2016/2017/2019; NJDOT – 2019
Note: B – Borough; C - City; Twp – Township; % - Percent
***The lifeline totals are the number of critical facilities identified as lifelines by the Planning Partnership. These facilities are not unique and are captured in the critical facility total.*

Table 4.3.7-8. Estimated Number of Critical Facilities and Lifelines Built Within 1 Mile of Hazardous Material Facilities

Jurisdiction	Total Number of Critical Facilities	Total Number of Lifelines	Number of Critical Facilities and Lifeline Facilities Located Within 1 Mile of Hazardous Material Facilities			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
East Windsor (Twp)	171	154	68	39.8%	64	41.6%
Ewing (Twp)	266	215	224	84.2%	178	82.8%
Hamilton (Twp)	639	537	343	53.7%	278	51.8%
Hightstown (B)	70	63	66	94.3%	59	93.7%
Hopewell (B)	47	39	47	100.0%	39	100.0%
Hopewell (Twp)	438	406	181	41.3%	167	41.1%
Lawrence (Twp)	334	304	247	74.0%	223	73.4%
Pennington (B)	44	40	44	100.0%	40	100.0%
Princeton	252	209	29	11.5%	25	12.0%
Robbinsville (Twp)	136	127	47	34.6%	44	34.6%
Trenton (C)	701	478	694	99.0%	472	98.7%

Jurisdiction	Total Number of Critical Facilities	Total Number of Lifelines	Number of Critical Facilities and Lifeline Facilities Located Within 1 Mile of Hazardous Material Facilities			
			Critical Facilities	Percent of Total Critical Facilities	Lifelines	Percent of Total Lifelines
West Windsor (Twp)	288	234	139	48.3%	116	49.6%
Mercer County (Total)	**3,386**	**2,806**	**2,129**	**62.9%**	**1,705**	**60.8%**

Source: Mercer County GIS – 2016/2020; EPA - 2020; NJOIT – 2016/2017/2019; NJDOT – 2019
Note: B – Borough; C - City; Twp – Township; % - Percent
***The lifeline totals are the number of critical facilities identified as lifelines by the Planning Partnership. These facilities are not unique and are captured in the critical facility total.*

Table 4.3.12-9. Estimated Number of Lifelines Built Within 1-Mile of a Hazardous Materials Facility by FEMA Category

FEMA Lifeline Category	Total Number of Lifelines in Mercer County	Number of Lifelines Located within 1 Mile of Hazardous Material Facilities
Communications	160	104
Energy	132	96
Food, Water, and Shelter	620	402
Hazardous Materials	95	95
Health and Medical	422	267
Safety and Security	587	364
Transportation	790	377
Mercer County (Total)	**2,806**	**1,705**

Source: Mercer County GIS 2020; EPA 2018; NJ Transit – 2018; FEMA 2020

Table 4.3.12-10. Estimated Number of Lifelines Built Within 2 Miles of Hazardous Material Railway Routes by FEMA Lifeline Category

FEMA Lifeline Category	Total Number of Lifelines in Mercer County	Number of Lifelines Located within 2 Miles of Hazardous Material Railway Routes
Communications	160	137
Energy	132	108
Food, Water, and Shelter	620	490
Hazardous Materials	95	89
Health and Medical	422	321
Safety and Security	587	474
Transportation	790	542
Mercer County (Total)	**2,806**	**2,161**

Table 4.3.12-9 Estimated Number of Lifelines Built Within 1 mile of Hazardous Material Roadway Routes by FEMA Lifeline Category

FEMA Lifeline Category	Total Number of Lifelines in Mercer County	Number of Lifelines Located within 1 Mile of Hazardous Material Roadway Routes
Communications	160	157
Energy	132	128
Food, Water, and Shelter	620	594
Hazardous Materials	95	93
Health and Medical	422	401
Safety and Security	587	549
Transportation	790	677
Mercer County (Total)	**2,806**	**2,599**

Source: Mercer County GIS 2020; NJDOT 2019

Impact on Economy

If a significant hazardous substances incident occurred, not only would life, safety, and building stock be at risk, but the economy of Mercer County may be impacted as well. A significant incident in an urban area may force businesses to close for an extended period of time because of contamination or direct damage caused by an explosion, if one occurred. Estimated impacts on the economy are difficult to determine, given the uncertain nature of the size and scope of incidents.

Hazardous substance incidents have the potential to lead to major transportation route closures in Mercer County. The closure of waterways, railroads, airports, and highways as a result of hazardous material release incidents has the potential to impact the ability to deliver goods and services. Potential impacts may be local, regional, or statewide, depending on the magnitude of the event and the level of services disruptions.

Impact on Environment

Hazardous wastes that are released into the environment can be harmful to species and their habitat. Wastes that get into waterways will be disruptive and sometimes deadly to aquatic species. Consequentially, wastes that get into waterways can also contaminate drinking water supplies. Hazardous wastes can also leach into soils and travel with wind, which not only impacts the localized habitat, but can create issues for surrounding communities. Strict disposal regulations have been defined by organizations like the EPA to ensure that the environment and community is protected from these types of events (EPA 2020).

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development.
- Projected changes in population.
- Other identified conditions as relevant and appropriate, including the impacts of climate change.

Projected Development

Any areas of growth could be potentially impacted by the hazardous materials hazard areas. Development near the transit routes for hazardous materials and facilities will increase the County's overall risk. Therefore, the County should take precautions with the location of new development and the development's proximity to hazardous material facilities and transit routes. The County may also want to consider implementing designs into the new development that enables improved evacuation or protection from residual impacts from the hazardous materials. Refer to Section 3 (County Profile) for more information about the County's anticipated and recent new development plans.

Projected Changes in Population

According to the 2019 5-year population estimates from the ACS, the population of Mercer County (i.e., 367,922 persons) has increased by 0.4-percent since 2010. Any changes in the density of population can impact the number of persons living near hazardous materials facilities and transit routes.

Climate Change

As temperatures change, excessive heat on containers that contain hazardous materials may alter the material properties. In addition, hazardous substances stored at fixed locations in the floodplain may experience an increase in flood events due to the project changes in increased precipitation events; magnitude and frequency

Change of Vulnerability Since the 2016 HMP

Overall, the County's vulnerability has not changed, and the entire County will continue to be exposed and vulnerable to hazardous substance incidents.