



## 5.4.11 HAZARDOUS MATERIALS RELEASE

### 2016 HMP UPDATE CHANGES

- For the 2016 HMP update, the hazardous materials profile has been significantly enhanced to include a detailed hazard description, location, extent, previous occurrences, probability of future occurrence, and potential change in climate and its impacts on the hazardous materials hazard is discussed. The hazardous materials hazard is now located in Section 5 of the plan update.
- New and updated figures from federal and state agencies are incorporated.
- Previous occurrences were updated with events that occurred between 2008 and 2015.
- A vulnerability assessment was conducted for the hazardous materials hazard and it now directly follows the hazard profile.

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 Sussex County.

#### 5.4.11.1 PROFILE

##### Hazard Description

Hazardous materials are substances 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 2010).

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. 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 contains over 39,000 miles of highway, many of which are used to transport hazardous substances (New Jersey Department of Transportation [NJDOT])





2015). 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, there has been 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. Refineries in New Jersey are experiencing a surge in petroleum shipments by rail unit train ("rolling pipelines"). The top three rail-transported commodities in New Jersey are freight of all kinds, chemical products, and waste or scrap materials (NJ Transit 2012).

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 Sussex County, there are natural gas transmission pipelines in the Townships of Montague, Wantage, and Vernon. The pipeline operators for these systems are Tennessee Gas Pipeline Company and Elizabethtown Gas Company (National Pipeline Mapping System 2015).

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 Sussex County Hazardous Materials (HAZMAT) Team was developed to support the County in the response of any HAZMAT or Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) incident. The team is comprised of approximately 20 full-time County employees who have completed the Hazardous Materials Technician course and is a collaborative effort between the County's Sheriff's Office, Office of the Prosecutor, Division of Public Works, and Department of Environmental and Public Health Services. It has also been recognized by the New Jersey Department of Environmental Protection as a Model Program for HAZMAT response (Sussex County 2015).

### **Location**

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

#### **Hazardous Substances Fixed Site**

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Many 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 (USEPA 2014). In New Jersey, the Department of Environmental Protection (NJDEP) Site Remediation Program oversees the Superfund program (NJDEP 2015).



Federal regulations, include the Comprehensive Environmental Response, Compensation and Liability Act (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 2015).

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 (NJOEM 2002).

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 2015).

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 (NJOEM 2014). In Sussex County, there are nine Superfund sites (USEPA 2015).

New Jersey employers, whose businesses are assigned covered 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) of safety data sheets (SDS) 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 2011).

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 2011). In 2011, New Jersey had a total of over 11 million pounds of on-and off-site disposal and other releases under TRI (EPA 2015). As of October 2015, Sussex County had 10 facilities reporting under TRI (EPA 2015).

The NJDEP maintains a list of Known Contaminated Sites of New Jersey (KCSNJ). It is an inventory that includes all sites in the State where contamination is known to exist. The remediation for these sites is currently active or pending in the NJDEP's Site Remediation Program (SRP). As of April 17, 2012, there are over 13,000 active KCSNJ sites in New Jersey, with 315 of those sites in Sussex County (NJDEP 2012).

### **The Right-to-Know Network**

The Right-to-Know Network provides access to databases and resources on the environment. The databases include: Toxic Release Inventory (TRI), National Response Center Spills and Accidents (ERNS), Risk Management Plans (RMP), Hazardous Waste Biennial Reporting System (BRS), and Resource Conservation and Recovery Act Information System - violations and permits (RCRIS).

- Toxic Release Inventory (TRI) Database - TRI is a database of information about releases and transfers of toxic chemicals from facilities in certain industrial sectors, including manufacturing, waste handling, mining, and electricity generation. Facilities must also report the total amount of toxic chemicals in waste that they produce.
- National Response Center (NRC) Spills and Accidents database - the Spills and Accidents database contains data on toxic chemical spills and other accidents reported to the NRC. This database used to be called ERNS, the Emergency Response Notification System, and is still referred to as ERNS in many situations. Incidents reported to NRC range from minor to serious, from an oil-sheen on water to a release of thousands of gallons. NRC reports are extensive, but also known to be incomplete, as many incidents are never reported, and those that are reported generally are not subject to verification.
- Risk Management Plan (RMP) database - Federal law requires industrial facilities that use large amounts of extremely hazardous substances to file a RMP with the U.S. Environmental Protection Agency (EPA). These RMP data are intended to save lives, protect property, and prevent pollution. In particular, some industrial facilities are switching to safer and more secure chemicals that reduce the danger to employees and surrounding communities. EPA does not release to the public some of the most important data in the RMP database; these data can only be obtained by going to a federal reading room.
- Biennial Reporting System (BRS) database – the BRS database contains data on the generation, shipment, and receipt of hazardous waste. BRS contains information from the Hazardous Waste Reports that must be filed every two years under the Resource Conservation and Recovery Act (RCRA), the Federal statute that regulates the generation, treatment, storage, disposal, or recycling of solid and hazardous waste.
- Resource Conservation and Recovery Act Information System (RCRIS) database – this database contains data on hazardous waste handler permits and activities. The RCRIS database, unlike many EPA databases, does not have "reporting years". It is a continuously updated set of data that includes records from the early years of RCRA through the present.



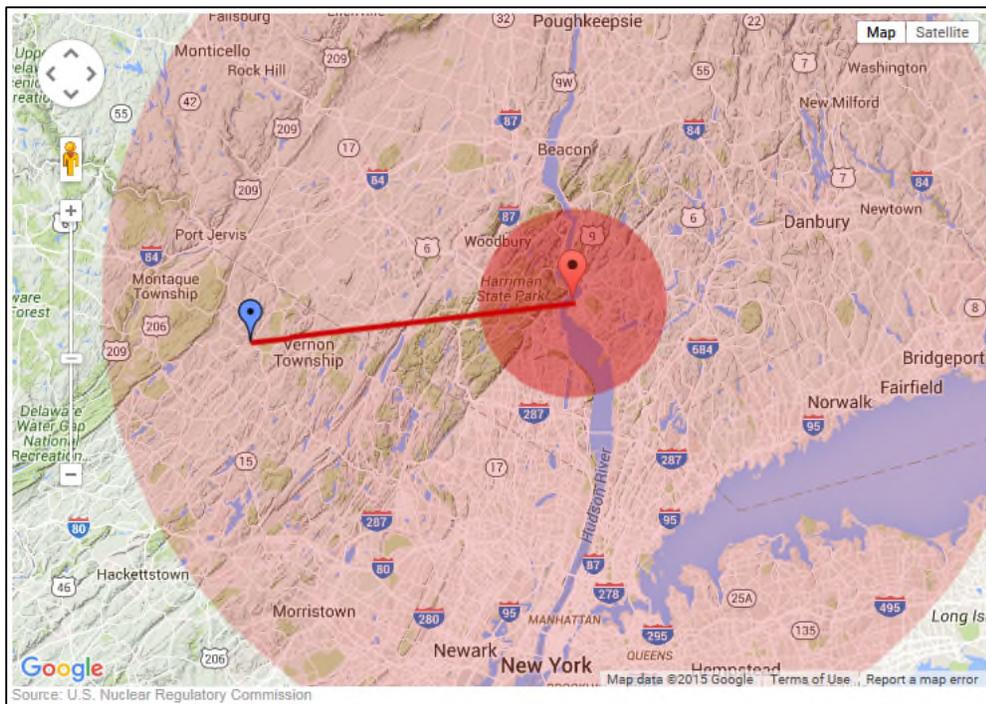
Between 1989 and 2011, there were 82 facilities in Sussex County that generated 29,759 tons of hazardous waste. Most of the waste was generated (76 percent) was part of production processes at facilities within the County, while 20.7 percent was from pollution control, spills and remediation and 3.3 percent was from intermittent events. The Town of Hamburg had the largest amount of waste generated between 1989 and 2011 (22,529 tons). The other top cities in the County for generated waste include Lake Hopatcong, Edison, Newton, and Franklin (Right to Know Network 2015).

### Nuclear Facilities

Although there are no nuclear facilities within Sussex County limits, the County is within 50 miles of Indian Point Energy Center. Indian Point Energy Center is located in Buchanan, New York, and provides about 25 percent of New York City and Westchester’s power (Safe.Secure.Vital 2015).

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. Sussex County is located within the 50-mile IEP. Should an accident occur at the Indian Point Energy Center, the area within the IEP could receive some radioactive contamination. Figure 5.4.11-1 provides visual representation of where Sussex County falls in Indian Point Energy Center’s EPZ and IEP.

Figure 5.4.11-1. Indian Point Energy Center’s EPZ and IEP



Source: CNN 2015

Note: The red marker indicates the nuclear facility and the blue marker indicates Sussex, NJ.



### **Hazardous Substances In-Transit**

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Incidents involving hazardous substances in transit can occur anywhere in Sussex County. The main concerns in the county are highways and railroads. While Sussex County does not offer passenger service, it does maintain freight rail. This freight rail is operated by regional and short line railroads. The rail lines move between 100,001 and 300,000 tons of inbound rail freight and less than 10,000 tons of outbound rail freight (New Jersey Rail System 2012).

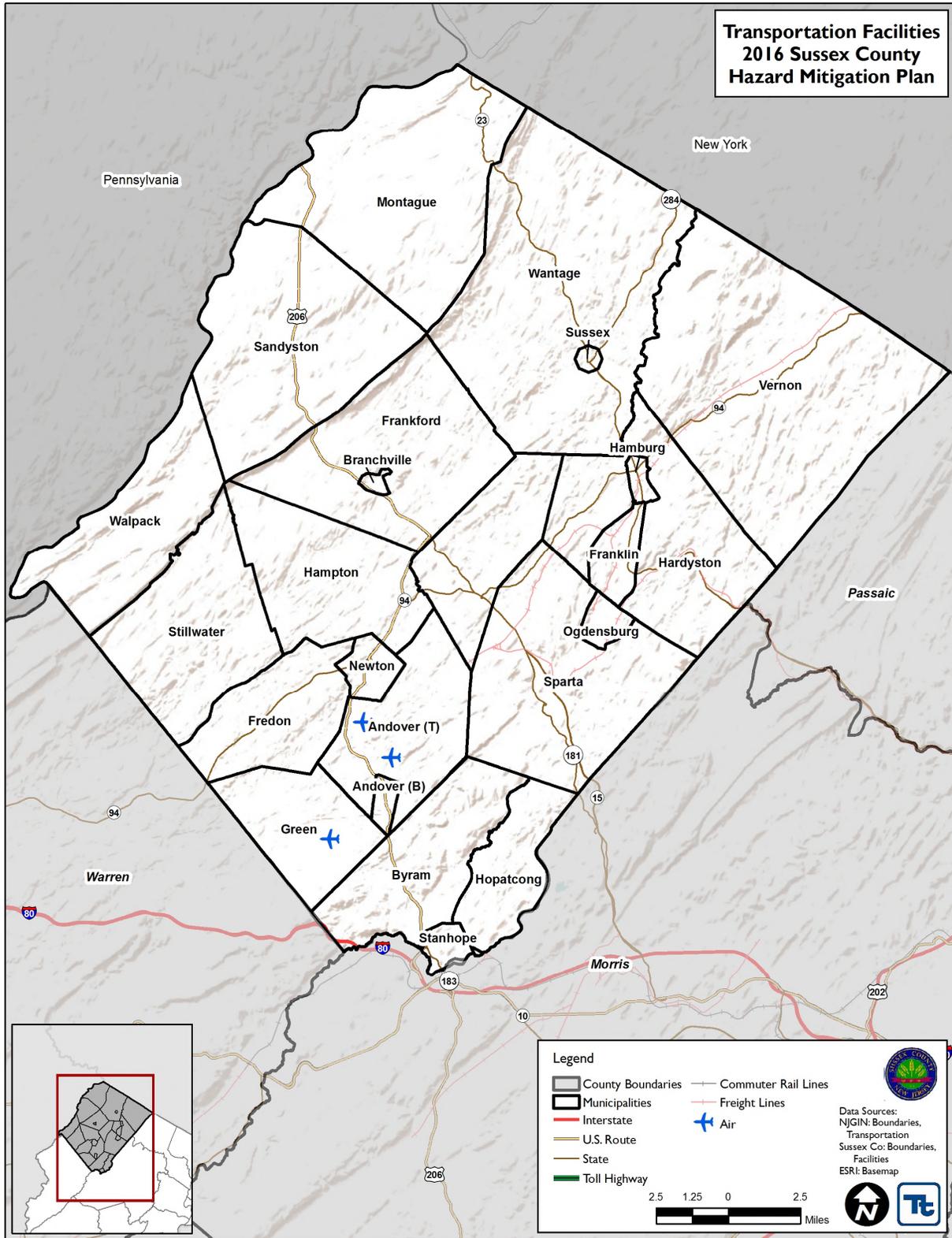
Bakken oil is a concern for the county based off the relatively high number of related derailments and fires and off the potential impact to residents living near rail lines. Additionally, in January 2014, PHMSA issued a safety alert advising the general public, emergency responders, shippers and carriers that the Bakken crude oil may be more flammable than traditional crude oil. Bakken oil is a light oil with a low flashpoint, which results in a significant fire risk when the material is released from packaging in an accident (PHMSA 2014).

An investigation by PHMSA into the transportation of Bakken oil also highlighted another concern for this material. Results from Operation Classification show that crude oil taken from cargo tanks en-route to rail loading facilities was not properly classified. Testing indicated that 11 of the 18 samples were not assigned to the correct packing group, meaning that the oil was not necessarily stored in the type of container that offers the most appropriate level of safety (Transportation.Gov 2014). Improper storage and classification increases the risk of accidents and of harm to rail operators, other rail employees, and residents along freight lines.

Major highways in the county over which hazardous materials are transported daily include U.S. Route 206 and State Highway 15. A very small portion of Interstate 80 runs through and near the southern portion of the county, and U.S. Route 209 runs parallel and close to the northwestern border of Sussex County although it does not enter county limits.



Figure 5.4.11-2. Major Transportation in Sussex County





## **Extent**

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The extent (or severity) of a hazardous material release relates primarily to its impact on human health and safety and on the threat to the environment. As for hazardous material incidents through transportation, the severity is similar to that of a fixed-site incident. Threat to human health and safety includes: poisoning of water or food sources and/or supply; presence of toxic fumes or explosive conditions; damage to personal property; need for the evacuation of people; and interference with public or commercial transportation. Threats to the environment include: injury or loss of animals or plants or habitats that are of economic or ecological importance such as commercial, recreation, or subsistence fisheries or livestock; impact to recreational areas such as public beaches; and impact to ecological reserves, forests, parks, archaeological and cultural sites.

There is a system used for classifying hazardous material responses. The classification is broken down into three categories which are based on three levels of response function:

- Level 1 – emergencies involving minor situations requiring defensive actions only
- Level 2 – emergencies often requiring only defensive actions but may involve some offensive response
- Level 3 – emergencies requiring more involved defensive and offensive actions and will most likely involve consideration such as public exposure and/or evacuation.

Concerning nuclear threats, as indicated earlier, locations within the IEP could receive some radioactive contamination in the event of a nuclear incident. The amounts are of little concern in terms of external exposure. A bigger threat is internal exposure, through the contamination of the food chain, particularly milk from local dairy cattle. Should an accident occur, state and federal agencies would sample and monitor milk, livestock feed, storage crops, and water supplies within the IEP. The Sussex County's Sheriff's Office may be asked to assist in gathering samples, and if requested by the state agencies, also participate in implementing control of foods, foodstuffs and water.

## **Previous Occurrences and Losses**

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The U.S. Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) provides an incident report database for information on incidents throughout the U.S. The data is from the hazardous materials incident report. According to this database, between 2008 and 2014, there have been 3 incidents in Sussex County (all highway) (PHMSA 2015). Hazardous substances incidents on-site or in-transit occur frequently across the State and in Sussex County. These incidents are typically small, localized events. EPA maintains records of the amount of chemicals released at facilities each year in the EPA Release Chemical Report. Between 2008 and 2014, Sussex County had a total of 80,795 pounds of on-site disposal or other releases reported by facilities within the TRI Program. No off-site disposals or other releases were reported during this time period for the county (U.S. EPA 2015). There have been no major incidents at the Indian Point Energy Center, although minor incidents and fires have occurred. Both local and New York State agencies are actively involved in ensuring the continued safety of the site (NY Times 2015).

Between 1954 and 2015, the State of New Jersey was not included in any FEMA declared disasters (DR) or emergencies (EM) related to hazardous substances incidents (FEMA 2015).

For this 2016 HMP update, known hazardous substances incidents that have impacted Sussex County between 2008 and 2015 are identified in Appendix E. For events prior to 2008, please refer to the 2011 Sussex County HMP.

## **Probability of Future Occurrences**

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Predicting future hazardous substance incidents in Sussex 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.

According to the 2011 HMP, the Right-to-Know Network database, and the Pipeline and Hazardous Materials Safety Administration (PHMSA), Sussex County experienced 96 hazardous material incidents (fixed site and in-transit) between 1950 and 2015. Please note that only readily available data was used for the calculations and not all events may have been included. Based on the number of occurrences, the county has a 145.45 percent chance of a hazardous material incident (fixed site or in-transit) of occurring in any given year. The table below shows these statistics, as well as the annual average number of events and the percent chance of these incidents occurring in Sussex County in future years (Sussex County HMP 2011; Right-to-Know Network 2016; PHMSA 2016).

Table 5.4.11-1. Probability of Future Hazardous Materials Incidents

Hazard Type	Number of Occurrences Between 1950 and 2015	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	Percent chance of occurrence in any given year
Hazardous Materials (fixed site)	54	0.83	1.22	0.82	81.8%
Hazardous Materials (in-transit)	42	0.65	1.57	0.64	63.6%

Source: Sussex County HMP 2011; Right-to-Know Network 2016; PHMSA 2016

In Section 5.3, the identified hazards of concern for Sussex 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 release of hazardous materials in the county is considered ‘frequent’ (likely to occur within 25 years, as presented in Table 5.3-3).

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.



### 5.4.11.2 VULNERABILITY ASSESSMENT

To understand risk, a community must evaluate what assets are exposed and vulnerable to the identified hazard. For the hazardous substances hazard, all of Sussex County is exposed to the hazard. Therefore, all assets in the county (population, structures, critical facilities and lifelines), as described in the County Profile (Section 4), are exposed and potentially vulnerable to the release of hazardous substances. The following text evaluates and estimates the potential impact of the hazardous substances hazard on the county including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy, and (5) future growth and development
- Effect of climate change on vulnerability
- Change of vulnerability as compared to that presented in the 2011 Sussex County HMP
- Further data collections that will assist understanding this hazard over time

#### Overview of Vulnerability

Overall, it is difficult to quantify potential losses of hazardous substances incidents due to the many variables and human elements. Human safety and welfare can become compromised from negative health effects of poisoning or exposure to toxic substances, fires, or explosions.

#### Data and Methodology

For this hazard, data was obtained from the U.S. Environmental Protection Agency.

#### Impact on Life, Health and Safety

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 542 EPA-regulated facilities in Sussex County.

As noted earlier, 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 Sussex County has nine Superfund sites located throughout the county; two in Hamburg, two in Sparta, one in Sussex, one in Vernon, one in Byram Township, one in Franklin Borough, and one in Andover. However, the CERCLIS database has been retired by the EPA in favor of the Superfund Enterprise Management System (SEMS). SEMS includes the same data and content as CERCLIS. The SEMS database also indicated that Sussex County has nine Superfund sites, but the locations for these are listed as two in Hamburg, two in Sparta, two in Byram/Byram Township, one in Wantage, one in Vernon, and one in Franklin Borough (U.S. EPA 2015).

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. The general population may be exposed to a hazardous substances release through inhalation, ingestion, absorption, injection or dermal exposure. Exposure may be either acute or chronic, depending upon the nature of the substance and extent of release and contamination.



Sussex County residents and animals could be exposed to radiation contamination from a nuclear event both internally and externally. External contamination consists of direct contact with radioactive gases and particles lying on the surface of an object or the ground. More concerning is internal contamination, which occurs by breathing radioactive gases and particles, eating contaminated food, or drinking contaminated milk or water. Such contamination can lead to long-term health complications (NJ OEM N.D.).

Due to the location of these different hazardous substances and wastes sites in Sussex County, the entire county is considered vulnerable to this hazard. Those particularly vulnerable to the effects of hazardous substances incidents are populations located along major transportation routes because of the quantities of chemicals transported on these major thoroughfares; including Bakken oil via rail. 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.

### **Impact on General Building Stock**

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Potential losses to the general building stock caused by a hazardous substances incident is difficult to quantify. The degree of damages to the general building stock 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.

### **Impact on Critical Facilities**

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Potential losses to critical facilities caused by a hazardous substances incident is also difficult to quantify. Potential losses may include inaccessibility, loss of service, contamination and/or potential structural and content losses if an explosion occurs. Refer to Section 4 (County Profile) which summarizes the number and type of critical facilities in Sussex County.

### **Impact on Economy**

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If a significant hazardous substances incident occurred, not only would life, safety, and building stock be at risk, but the economy of Sussex 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 on contamination or direct damage caused by an explosion, if one occurred. The exact impact on the economy is difficult to determine, given the uncertain nature of the size and scope of incidents.

Hazardous substances incidents have the potential to lead to major transportation route closures in Sussex County. The closure of waterways, railroads, airports, and highways as a result of these incidents 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 the level of services disruptions.

### **Future Growth and Development**

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As discussed in Sections 4 and 9, areas targeted for future growth and development have been identified across Sussex County. Any areas of growth could be potentially impacted by hazardous substances incidents because the entire county is exposed and vulnerable. An increase in development and population has the ability to increase the likelihood of a hazardous substance incident. Please refer to the specific areas of development indicated in tabular form and/or on the hazard maps included in the jurisdictional annexes in Volume II, Section 9 of this plan.



### **Effect of Climate Change on Vulnerability**

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A hazardous substance incident is human-caused hazard; however, as noted, their release may be the result from natural hazard events. 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.

### **Change of Vulnerability**

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Overall, Sussex County remains vulnerable to hazardous materials release events. The increased transport of Bakken oil via rail through the county may increase the risk to areas along the rail lines. The entire county will continue to be exposed and vulnerable to hazardous substances incidents.

### **Additional Data and Next Steps**

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For the HMP update, any additional information regarding localized concerns and past impacts will be collected and analyzed. This data will be developed to support future revisions to the plan. Mitigation efforts could include building on existing New Jersey, Sussex County, and local efforts. Further, the regional plan with Somerset, Hunterdon and Warren Counties will further evaluate the transport of Bakken oil and other hazardous materials along rail lines throughout the county.