4.8 Hazardous Materials

4.8.1 Description

According to the Ohio Environmental Protection Agency, hazardous materials can be defined in different ways depending on the law or regulation administered by the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the Department of Transportation (DOT), and the U.S. Nuclear Regulatory Commission (NRC).

- The Institute for Hazardous Materials Management defines hazardous materials as "any item or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors."
- OSHA's definition includes any substance or chemical which is a health hazard or a physical hazard, including carcinogens, toxic agents, irritants, corrosives, and sensitizers, as well as agents that interact to be harmful to the human body, explosive, or flammable.
- The Environmental Protection Agency's definition includes the Occupational Safety and Health Administration definition. It also adds any item or chemical which can cause harm to people, plants, or animals when released into the environment.
- The Department of Transportation defines hazardous materials as any item or chemical which, when being transported or moved in commerce, is a risk to public safety or the environment.

The Ohio Environmental Protection Agency (Ohio EPA) indicates that there are five categories in which materials can be hazardous including acute, chronic, fire, reactive, or sudden release of pressure.

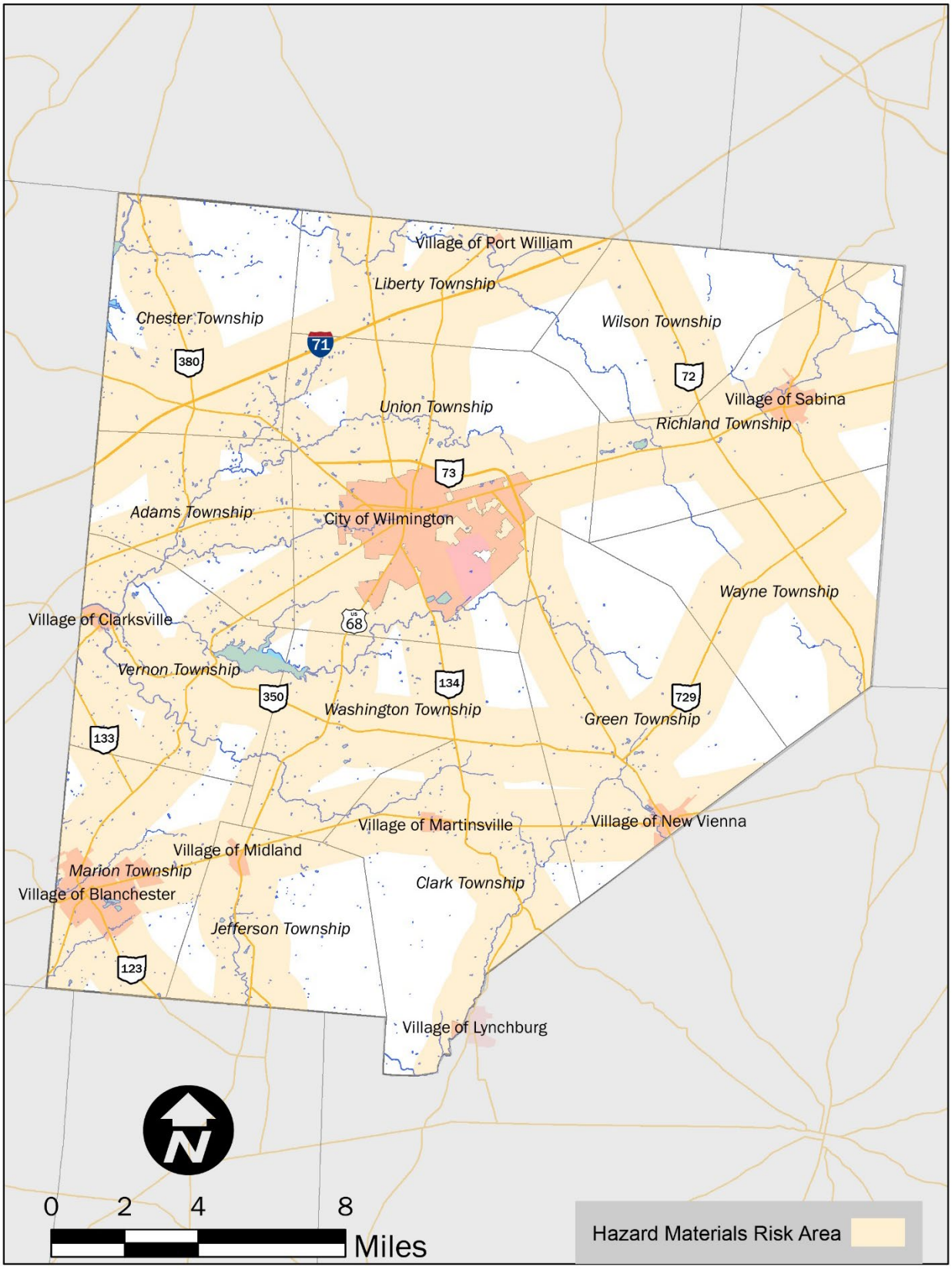
The U.S. Nuclear Regulatory Committee regulates materials that produce ionizing radiation, which includes by-product material and radioactive substances.

The Emergency Planning and Right-to-Know Act, or EPCRA, was passed as Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), which requires a facility that processes, uses, or stores extremely hazardous substances or hazardous substances as classified by the Occupational Safety and Health Administration Hazard Communication Standard. This is also codified in the Ohio Revised Code (ORC) Chapter 3750 and the Ohio Administrative Code Chapter 3750.

4.8.2 Location

Hazardous material spills can occur wherever hazardous materials are stored and during shipment to these facilities. **Figure 4.8.1** shows the areas which are at the highest risk of being impacted by hazardous materials spills. These areas were calculated by identifying normal shipping routes and placing a one mile buffer around these routes.

Figure 4.8.1: Hazardous Materials Risk Area



4.8.3 Extent

The EPA keeps records for Extremely Hazardous Substance facilities because these facilities have a higher probability of spills due to the higher amounts of hazardous materials at their sites. Each potential hazardous material has varying levels of toxicity. The concentration of these materials should be measured in parts-per-million to determine whether they present a threat. Many chemicals are safe at low amounts and low concentrations but can become dangerous and even toxic at high amounts and concentrations. Additionally, some chemicals can be flammable and can become more volatile when exposed to oxygen. In ground spills, untreated chemical and waste spills can contaminate the soil and drinking water creating toxic environmental conditions. Corrosive, flammable, or explosive chemicals can create infrastructure damage depending on the location, amount spilled, and the circumstances of the incident. In worst-case scenarios, large spills can trigger evacuations of residents and close transportation routes used for hazardous materials transportation, which can also affect local residents.

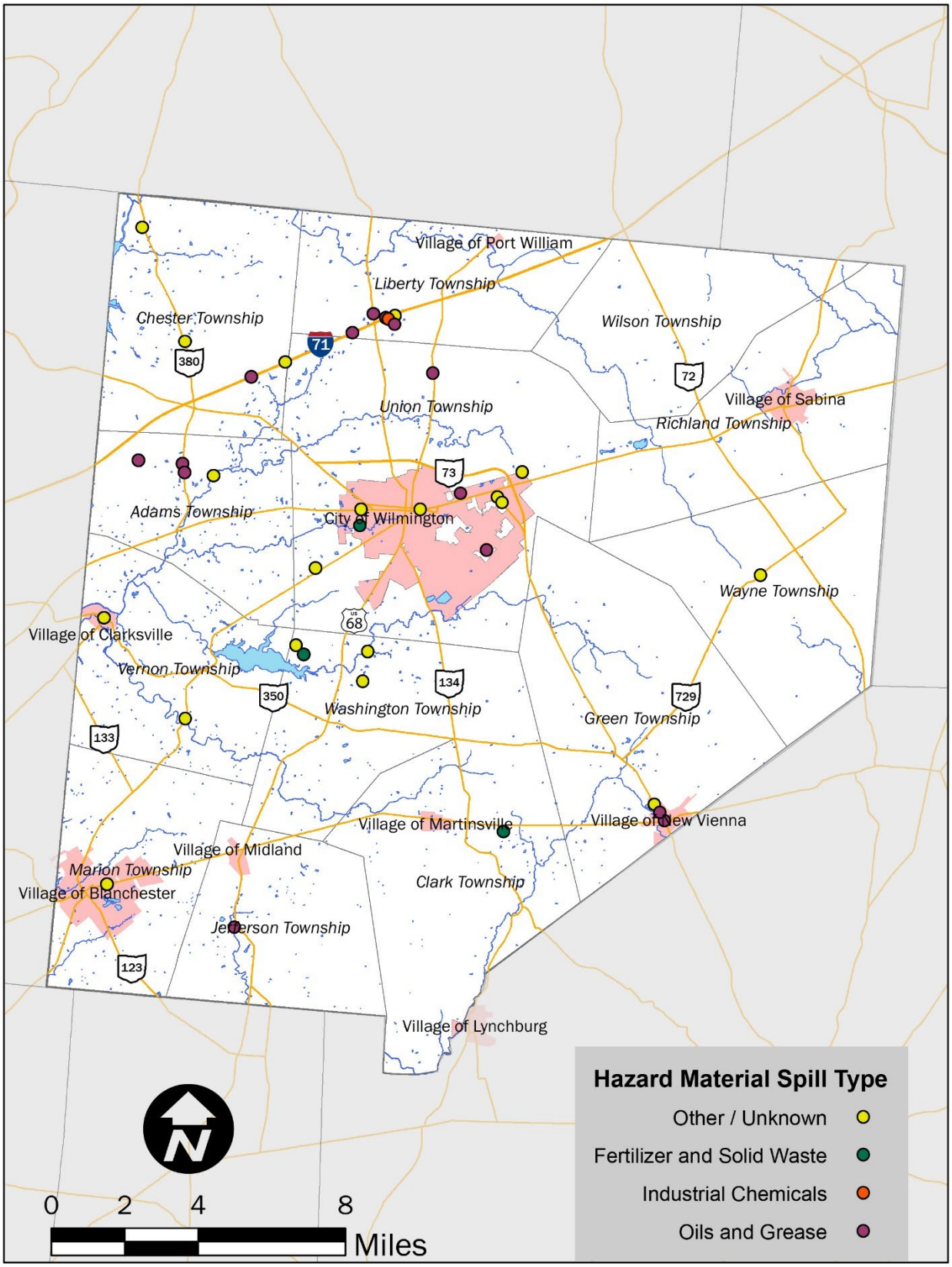
4.8.4 History

There have been 49 recorded hazardous material spills and releases in Clinton County from May 2017 through March 2020. Estimated property and crop damages have not been recorded. **Figure 4.8.2** shows the locations and types of hazardous materials spills in Clinton County as recorded by the Ohio Environmental Protection Agency (OEPA). A table containing all recorded hazardous materials spills can be found in **Appendix A**.

4.8.5 Probability

Due to their unpredictable nature and the influence of human error, the probability of hazardous materials spills is difficult to quantify. Since hazardous material spills can occur at any time, they should be considered likely events.

Figure 4.8.2: Hazardous Materials Spills



4.8.6 Vulnerability Assessment

Infrastructure Impact

Roadways, waterways, and groundwater may be impacted by hazardous materials spills. Road closures may occur as a direct or indirect result of hazardous materials spills.

Population Impact

The local population may be directly exposed to hazardous materials. If a large spill occurs, some residents may need to be evacuated and given shelter elsewhere.

Property Damage

Depending on the chemical, property damage is likely. Properties near Extremely Hazardous Substance facilities are likely to be damaged during a spill.

Loss of Life

While some hazardous materials can be toxic, loss of life from hazardous materials spills is unlikely. It is possible, however, and extreme precaution should be taken in the event of a spill.

Economic Losses

Economic losses can occur from the loss of hazardous materials that may be needed in manufacturing or for other processes. Road closures may lead to slowed commerce, and businesses impacted by hazardous materials spills may suffer property damage, damage to goods, or be required to close.

Table 4.8.2: Vulnerability of Land and Structures within Hazardous Materials Risk Area

Structure Type	Number of Properties Exposed	Value of Vulnerable Structures		
		Land	Building	Total
Residential	16,833	$101,852,780	$377,246,550	$479,099,330
Non-Residential	7,782	$457,765,350	$312,092,240	$769,857,590
Critical Facilities	102	$7,359,920	$56,094,270	$63,454,190
Total	**24,615**	**$559,618,130**	**$689,338,790**	**$1,248,956,920**

**Note: Critical Facilities are non-residential structures and their value is incorporated into the non-residential totals as well. Calculated totals are determined by summing the residential and non-residential values.*

4.8.7 Land Use and Development Trends

Development that has occurred since the previous plan and any future development near hazardous materials storage facilities may be impacted by hazardous materials spills. All land uses are equally impacted by potential hazardous materials spills.