


2.0 RISK ASSESSMENT

2.3.8 Severe Winter Storms

Severe winter weather is a combination of heavy snow, blowing snow, and dangerous wind chills that could threaten life or property.				
 <p>Vulnerability</p> <p>HIGHEST</p> <p>HIGH</p> <p>MEDIUM</p> <p>LOW</p> <p>LOWEST</p>	Period of Occurrence:	At any type, typically during the winter months	Hazard Index Ranking:	Medium
	Warning Time:	Over 24 hours	State Risk Ranking:	4-High
	Probability:	Highly likely	Severity:	Critical
	Type of Hazard:	Natural	Disaster Declarations:	EM-3029 (1977) EM-3055 (1978) DR-1580 (2005)

Hazard Overview

During winter, there are multiple instances of cold weather, snow, and storms. This profile includes only those winter weather events that are damaging enough to be considered “severe.” These include NOAA-labeled winter storms, heavy snow, blizzards, and ice storms.

- **Winter Storm:** A winter storm is a combination of heavy snow, blowing snow, and dangerous wind chills.
- **Heavy Snow:** Heavy snow refers to snowfall accumulating to 4” or more in 12 hours or less or snowfall accumulating to 6” or more in 24 hours or less.
- **Blizzard:** A blizzard is a dangerous winter storm that is a combination of blowing snow and wind and results in very low visibility (less than ¼ mile). Heavy snowfall and severe cold usually accompany blizzards, but not always. Sometimes strong winds can pick up fallen snow, creating a ground blizzard.
- **Ice Storm:** An ice storm is a storm that results in the accumulation of at least 0.25” of ice on exposed surfaces. It can create hazardous driving and walking conditions, and tree branches and power lines can easily snap under the weight of the ice.

Just like with other storms, the right combination of ingredients is necessary for a winter storm to develop. The three key components of a winter storm are cold air, lift, and moisture.

Location and Extent

Generally, severe winter weather affects all areas of the county similarly. More specifically, winter weather affects several jurisdictions simultaneously, yet with varying severity and duration. There is no widely-used scale to classify snowstorms, but Paul Kocin and Louis Uccellini from the National Weather Service developed the Northeast Snowfall Impact Scale (NESIS). The NESIS characterizes and ranks high-impact Northeastern snowstorms from “notable” to “extreme.”

NORTHEAST SNOWFALL IMPACT SCALE		
<i>Category</i>	<i>NESIS Value</i>	<i>Description</i>
1	1.0-2.499	Notable
2	2.5-3.99	Significant
3	4.0-5.99	Major
4	6.0-9.99	Crippling
5	10.0+	Extreme

Significantly, the NESIS does not predict the impacts of a forecasted storm; rather, it is a mechanism for rating impacts after a storm occurs.

Impacts and Vulnerability

According to the National Severe Storms Laboratory (NSSL), most deaths from winter storms are not related to the storm itself. People die from traffic accidents on icy roads, heart attacks while shoveling snow, and hypothermia from prolonged exposure to cold. During severe storms, everyone is potentially at risk, particularly those stranded in their vehicle or outside during the storm. Recent data shows that 70% of injuries related to ice and snow occur in automobiles, and 25% are people caught out in the storm. Most victims are males over 40 years old.

Ice accumulation can topple power lines, utility poles, and communication towers. Disruption in communication and utility services can last several days. Even minimal ice accumulation can pose a serious threat to motorists and pedestrians. Bridges and overpasses are particularly dangerous, as they freeze before other surfaces. The following graphic shows the location of the bridges and overpasses throughout Columbiana County.

COLUMBIANA COUNTY HAZARD MITIGATION PLAN

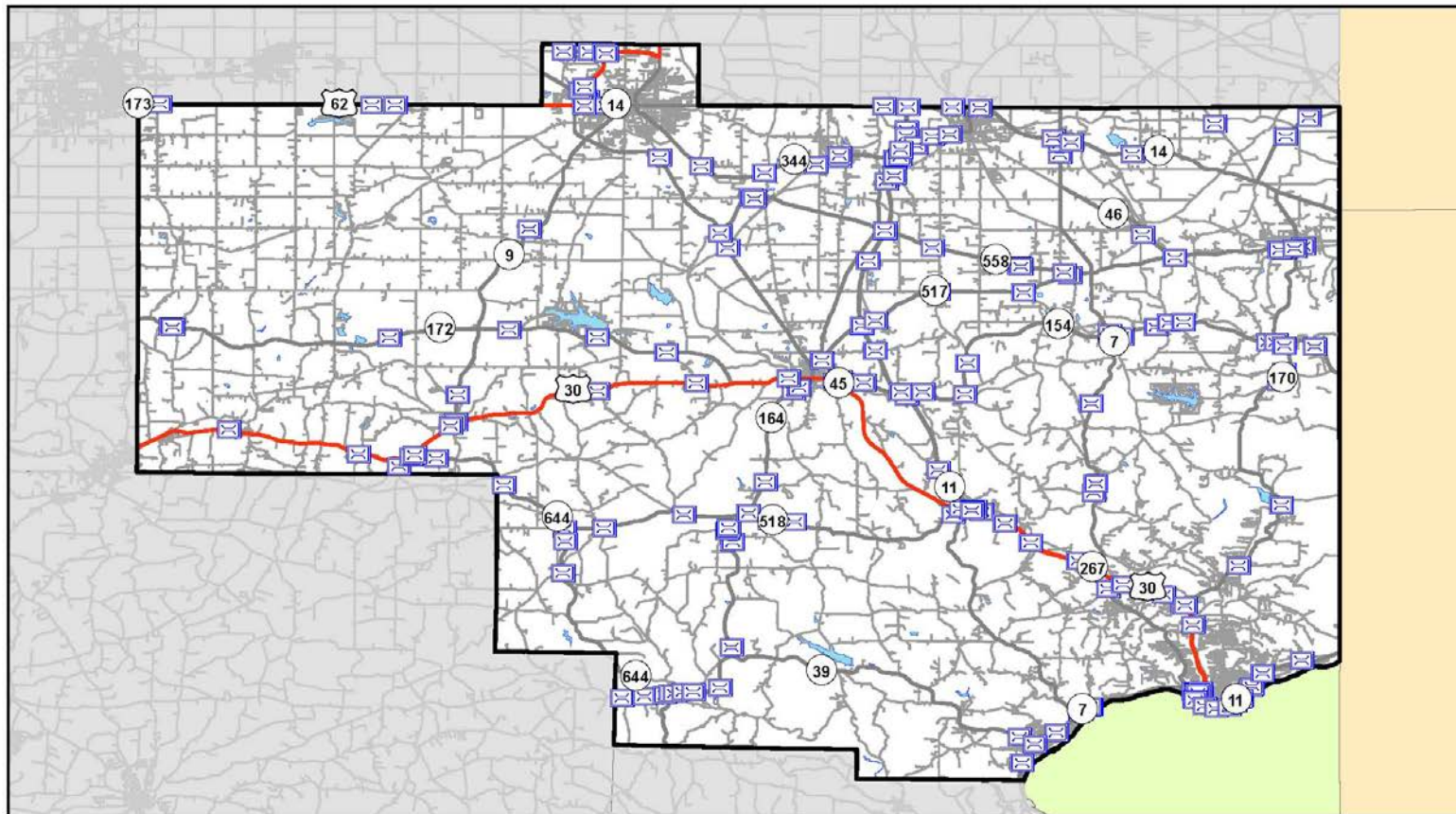
Columbiana County Bridges

Data Source(s):
ODOT

DISCLAIMER: Data is meant for use as reference only. Some sources may be intended to be used at national or regional scales and are thus used beyond their original intent for demonstrative purposes.



-  Bridge Locations
-  US Routes
-  State Routes



Historical Occurrences

According to the NOAA National Centers for Environmental Information Storm Event Database, there have been 29 winter storm, ice storm, and heavy snow events in Columbiana County since 1999. The following table summarizes those events.

HISTORICAL OCCURRENCES SEVERE WINTER WEATHER (Source: NCEI Storm Events Database)						
<i>Location</i>	<i>Date</i>	<i>Type</i>	<i>Deaths</i>	<i>Injuries</i>	<i>Property Damage</i>	<i>Crop Damage</i>
Columbiana (Zone)	1/2/1999	Winter Storm	0	0	0.00K	0.00K
Columbiana (Zone)	1/8/1999	Winter Storm	0	0	0.00K	0.00K
Columbiana (Zone)	1/13/1999	Winter Storm	0	0	5.00K	0.00K
Columbiana (Zone)	3/9/1999	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	12/13/2000	Winter Storm	0	0	0.00K	0.00K
Columbiana (Zone)	2/16/2003	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	12/5/2003	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	12/14/2003	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	2/5/2004	Ice Storm	0	0	0.00K	0.00K
Columbiana (Zone)	1/22/2005	Ice Storm	0	0	2.00K	0.00K
Columbiana (Zone)	3/1/2005	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	2/13/2007	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	2/12/2008	Winter Storm	0	0	0.00K	0.00K
Columbiana (Zone)	3/7/2008	Winter Storm	0	0	0.00K	0.00K
Columbiana (Zone)	1/9/2009	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	1/27/2009	Ice Storm	0	0	0.00K	0.00K
Columbiana (Zone)	2/5/2010	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	2/15/2010	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	1/31/2011	Ice Storm	0	0	0.00K	0.00K
Columbiana (Zone)	2/1/2011	Ice Storm	0	0	0.00K	0.00K
Columbiana (Zone)	2/21/2011	Heavy Snow	0	0	0.00K	0.00K

HISTORICAL OCCURRENCES SEVERE WINTER WEATHER (Source: NCEI Storm Events Database)						
<i>Location</i>	<i>Date</i>	<i>Type</i>	<i>Deaths</i>	<i>Injuries</i>	<i>Property Damage</i>	<i>Crop Damage</i>
Columbiana (Zone)	3/10/2011	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	12/26/2012	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	11/26/2013	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	2/4/2014	Winter Storm	0	0	0.00K	0.00K
Columbiana (Zone)	2/15/2016	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	1/12/2018	Winter Storm	0	0	0.00K	0.00K
Columbiana (Zone)	2/7/2018	Heavy Snow	0	0	0.00K	0.00K
Columbiana (Zone)	1/18/2019	Winter Storm	0	0	0.00K	0.00K
TOTALS			0	0	7.00K	0.00K

January 2005 Ice Storm

Snow began at approximately 4:00 a.m., and it changed to freezing rain and sleet at about 10 or 11:00 a.m. By 3:00 p.m., the ice was approximately ¼" thick. The incident resulted in approximately \$2,000 in property damage in Columbiana County alone.

November 2018 Winter Storm

The November 2018 winter storm significantly affected Columbiana County. According to the Lisbon Morning Journal, a layer of ice covered with two inches of wet snow caused electric lines throughout the county to fall. Large portions of the county, including the entirety of East Palestine Village, were without power. Fire departments and the American Red Cross opened warming shelters for residents.

Loss and Damages

Winter storms caused \$7,000 in damages in Columbiana County over 20 years, with an average of \$241 per event. This likely underestimates damages caused to infrastructure and power lines. Severe winter storms can impact all areas and jurisdictions of Columbiana County. Regionally (i.e., in neighboring Mahoning County, December 2004), winter storms have caused up to \$2,200,000 in property damage. Planners considered the entire building stock as exposed and used the regional worst-case scenario as the representative historical occurrence for completion of the following table.

SEVERE WINTER STORMS LOSS ESTIMATE – SHARPP DATA ENTRY		
Structure Type	Number	Loss Estimate
Residential	6	\$1,590,500
Non-Residential	2	\$503,400
Critical Facilities	1	\$106,100
TOTALS	9	\$2,200,000


Risk Assessment

This section summarizes the risk to Columbiana County from severe winter storms. The following table assigns point totals based on the research presented in this profile for each category that appears in Ohio EMA's SHARPP tool.

SEVERE WINTER STORM RISK SUMMARY			
Category	Points	Description	Notes
Frequency	4	High	NOAA has listed 29 events since 1999, for an average of 1.45 events per year. On any given year, severe winter weather is likely.
Response	3	1 week	Clearing snow and ice from infrastructure, such as roads and power lines, could take up to a week.
Onset	2	12-24 hours	Winter storms can be predicted 24 hours or more in advance, leaving ample time to prepare; however, most include accurate warnings between 12 and 24 hours before a storm.
Magnitude	4	More than 50% of land area	Winter weather is not an isolated event, and would likely affect most of Columbiana County and surrounding counties.
Business	1	Less than 24 hours	Businesses would likely remain open during winter weather. Early closures or late openings due to ice or snow could occur.
Human	1	Minimum	Winter weather has not caused any injuries or deaths in Columbiana County.
Property	4	More than 50% affected	More than 50% of the county's property will be affected by severe winter weather. As stated in the magnitude section, severe winter weather is not an isolated event and would affect the better part of Columbiana and surrounding counties.
TOTAL	19	Medium	

2.0 RISK ASSESSMENT

2.3.9 Dam and Levee Failure

A dam is a barrier built across a waterway to control the flow or raise the water level. A dam failure occurs when the barrier constructed does not obstruct or restrain water as designed, which can rapidly result in a large area of completely inundated land. Levees, though similar, are embankments built to prevent the overflow of a river.			
 <p>Vulnerability</p> <p>HIGHEST</p> <p>HIGH</p> <p>MEDIUM</p> <p>LOW</p> <p>LOWEST</p>	Period of Occurrence:	At any time, typically after a period of prolonged precipitation causing damages or a prolonged period of drought causing erosion	Hazard Index Ranking: Lowest
	Warning Time:	Over 24 hours	State Risk Ranking: 3-Medium
	Probability:	High	Severity: Limited
	Type of Hazard:	Technological	Disaster Declarations: None

Hazard Overview

The three main causes of dam failure in the U.S. include overtopping, foundation defects and slope instability, and piping.

- **Overtopping** occurs when water spills over the top of the dam. Overtopping due to inadequate spillway design, debris blockage of spillways, or settlement of the dam crest account for approximately 34% of all dam failures in the U.S.
- **Foundation Defects and Slope Instability**, including settlement, cause approximately 30% of all dam failures.
- **Piping** is the internal erosion caused by seepage. Seepage occurs around hydraulic structures, such as pipes and spillways, through animal burrows, around roots of vegetation, and through cracks in the dam. Piping accounts for another 20% of dam failures in the U.S.

Dam failures can be “sunny day” or “rainy day” failures. Sunny day failures occur during non-flooding situations when reservoirs are at normal levels. Rainy day failures occur during periods of excessive rainfall or flooding and can exacerbate inadequate spillway capacity. Sunny day failures are generally more hazardous due to their unexpected nature and little warning time for evacuation.

Though levees are designed to a certain level of potential flood, the U.S. Army Corps of Engineers (USACE) notes that levees are not subject to consistent design, construction, operations, and maintenance standards. Those under the auspices of the USACE receive regular inspections, but this represents an estimated 15% of the levees in the country (USACE, n.d.). Levees function as part of a system. In other words, a levee in one area may overtop by design to protect larger populations downstream (USACE, n.d.).

“Levee failure’ implies that something about the levee failed to prevent flooding on the land side of the levee” (USACE, n.d.). Levee failures can result from overtopping, water flow through or under a levee, erosion, by an object hitting the levee, or by an object on the levee (e.g., tree or building) falling and taking a portion of the structure with it (USACE, n.d.).

Location and Extent

Ohio Administrative Code Rule 150:21-13-01 classifies dams in Ohio as Class I, Class II, Class III, or Class IV, based on height and storage volume.

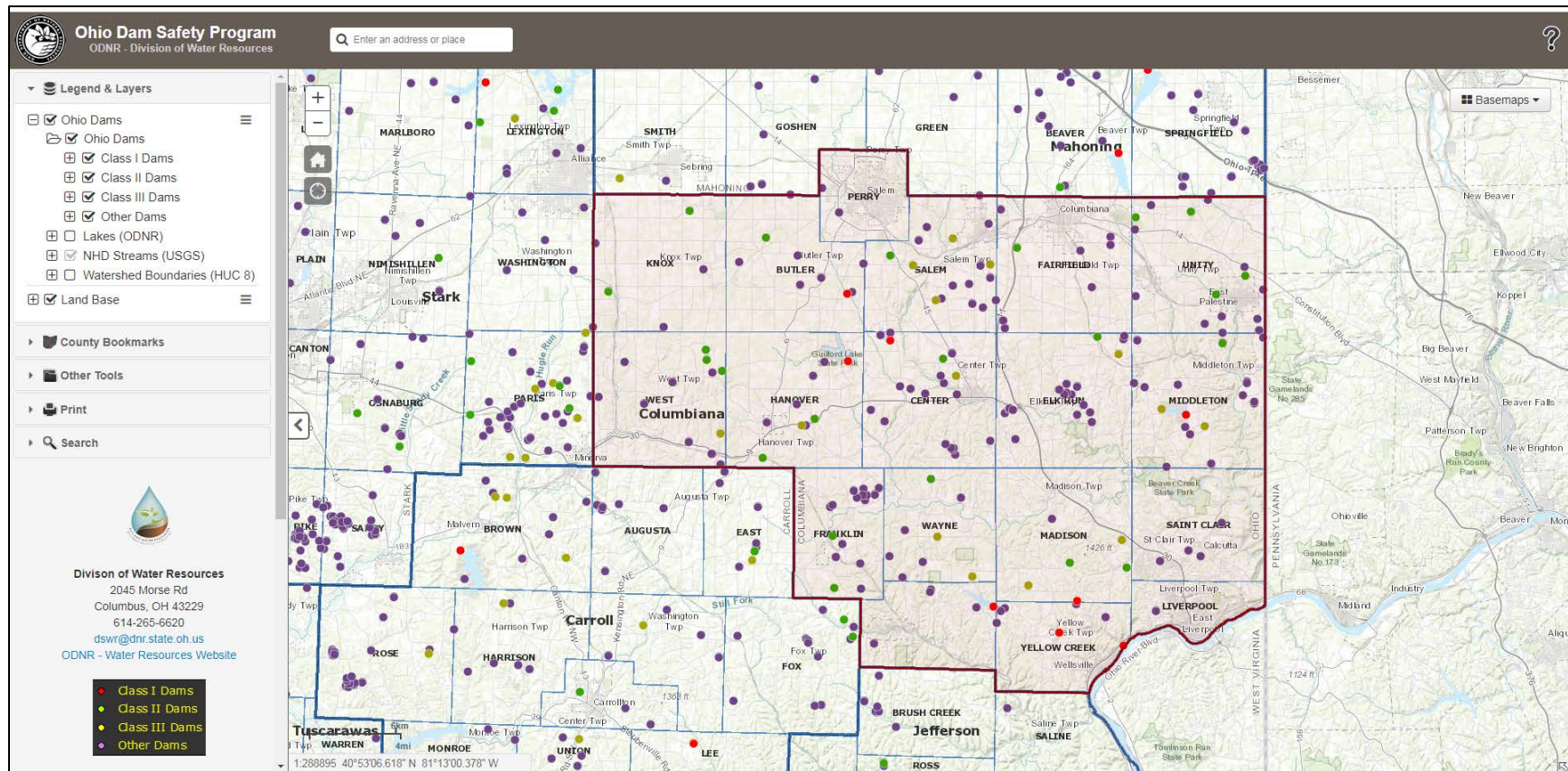
- **Class I:** A storage volume greater than five thousand acre-feet or a height of greater than sixty feet.
- **Class II:** A total storage volume greater than five thousand acre-feet or a height greater than forty feet.
- **Class III:** A total storage volume greater than fifty acre-feet or a height of greater than twenty-five feet.
- **Class IV:** Dams which are twenty-five feet or less in height and have a total storage volume of fifty acre-feet or less.

The U.S. Army Corps of Engineers (UCACE) maintains the National Inventory of Dams (NID). According to the NID, there are 37 dams in Columbiana County. The Ohio Department of Natural Resources (ODNR) also maintains a database of dams and levees in the state. Ohio’s Region 3, which includes Columbiana County, contains 163 Class I, 500 Class II and III, 398 Class IV Dams, and 1,506 “other” dams (i.e., proposed, unclassified, exempt, or abandoned structures). Columbiana County is home to 131 total dams, per ODNR’s listing, with seven Class I, 36 Class II and III, and 21 Class IV Dams. The remaining 67 are “other.” The difference between the ODNR and NID’s number of dams in Columbiana County is likely due to regulatory differences between the agencies.

LIST OF CLASS I-III DAMS IN COLUMBIANA COUNTY (Source: ODNR)						
<i>Dam Name</i>	<i>ODNR Hazard Class.</i>	<i>Owner Type</i>	<i>Height (Ft.)</i>	<i>Storage (acre-ft.)</i>	<i>EAP (Y/N)</i>	<i>Also in NID (Y/N)</i>
Beaver Lake Dam	Class II	Private	17.7	1072	N	Y
Bibbee's Little Rock Lake Dam	Class III	Private	27	184	N	Y
Big Rock Lake Dam	Class III	Private	32.2	159	N	Y
Buckeye Water District Reservoir	Class I	Local Government	56	32.4	Y	Y
Caldwell Spruce Lake Dam	Class III	Private	21.3	49	N	N
Csonka Brothers Pond Dam	Class II	Private	24	57	N	Y
Dickey Lake Dam	Class III	Private	13.5	54.6	N	Y
East Palestine Reservoir Dam	Class II	Local Government	18.1	31.6	Y	Y
Flying Finn Lake Dam	Class II	Private	29.3	155	N	Y
Fritz Pond Dam	Class III	Private	26.4	79.2	N	Y
Guilford Lake Dam	Class I	State	34.5	5650	Y	Y
Hammond Lake II Dam	Class III	Private	17	70	N	Y
Hide Away Hollow Dam	Class III	Private	19.6	30.4	N	N
Highlandtown Lake Dam	Class I	State	44	5710	Y	Y
Hillyer Lake Dam	Class III	Private	18.5	28.1	N	N
Ismond Pond Dam	Class III	State	27	86	N	Y
Lake Cha-Vel Dam	Class II	Private	35	155	N	Y
Lake Copeland Dam	Class II	Private	27.8	261.8	N	Y
Lake P NA Dam	Class II	Private	17	139	Y	Y
Lake Tomahawk Dam	Class I	Private	61.9	2589	N	Y
Lower Wallace Lake Dam	Class II	Private	22	62.4	N	Y
Ludwig Dam	Class III	Private	14.8	54.9	N	Y
Manfull Lake Dam	Class II	Private	18	88	N	Y
Maroscher Lake Dam	Class III	Private	14.6	37	N	N
Mill Pond Lake Dam	Class II	Private	21.9	72.2	N	Y
Paradise Lake Dam	Class II	Private	30.2	318	N	Y
Rayls Lake Dam	Class II	Private	22.4	65.2	N	Y
Salem Regional Campus Lake Dam	Class II	State	26	49.7	N	Y
Salem Reservoir (South Embankment)	Class I	Local Government	47.6	2182	Y	Y
Shrontz's Lake Dam	Class II	Private	15.9	31.5	N	N
Sevakeen Country Club Lake Dam	Class II	Private	16.5	77.5	Y	Y
Slates Lake Dam	Class II	Private	27.8	70	N	Y
Spring Valley Lake Dam	Class III	Private	14	58.2	N	Y
Spring Valley Park Lake Dam	Class I	Local Government	28.5	391.4	Y	Y
Summitcrest Farm Pond Dam	Class II	Private	38.9	66	N	Y
Summitville Lake Dam	Class II	Private	26.3	179.2	N	Y

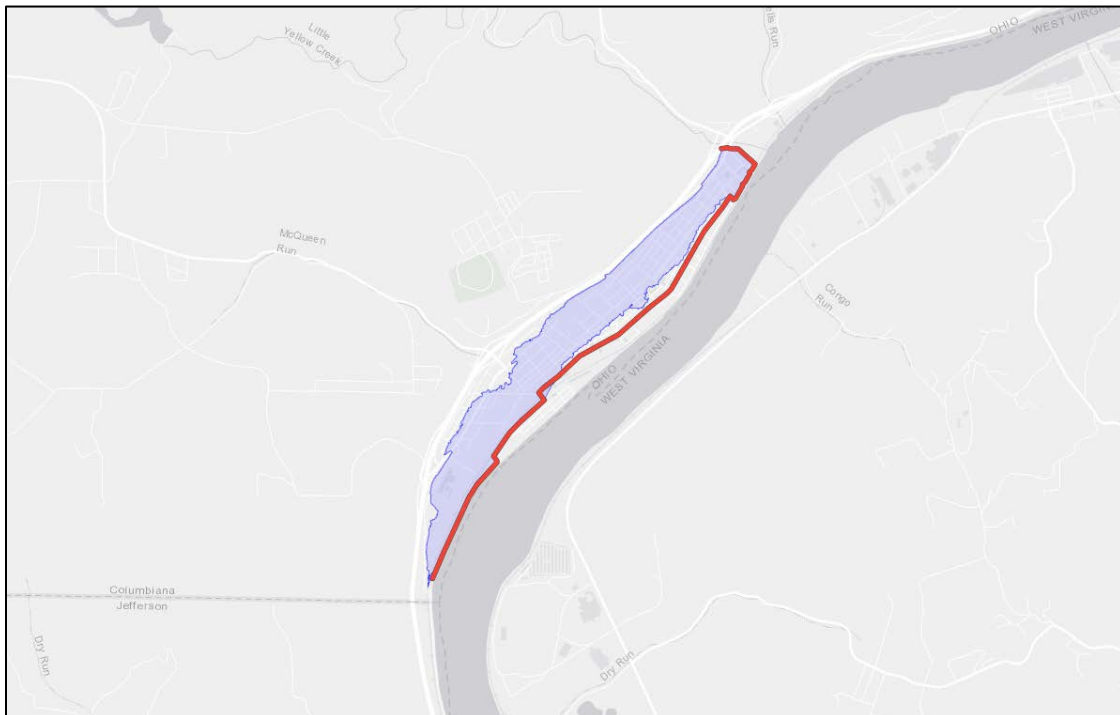
LIST OF CLASS I-III DAMS IN COLUMBIANA COUNTY (Source: ODNR)						
<i>Dam Name</i>	<i>ODNR Hazard Class.</i>	<i>Owner Type</i>	<i>Height (Ft.)</i>	<i>Storage (acre-ft.)</i>	<i>EAP (Y/N)</i>	<i>Also in NID (Y/N)</i>
Sunshine Lakes Dam	Class II	Private	37.5	211	N	Y
Wellsville Reservoir Dam	Class I	Local Government	61.5	410	N	Y
Werner/Duncan Lake Dam	Class II	Private	19.1	49	N	Y
Westville Lake Dam	Class II	Local Government	29	1039	N	Y
Woodland Lake Dam	Class II	Private	19	109	N	Y
Zepernick Lake Dam	Class II	State	13.8	214.9	N	Y

The following graphic shows the locations of dams in Columbiana County (per ODNR data) (SOURCE: <https://gis.ohiodnr.gov/MapView/?config=ohiodams>). NOTE: The graphic below contains dams not listed in the above table (i.e., the “Other” dams).



The USACE also maintains the National Levee Database (NLD). There is one levee system located in Columbiana County, in Wellsville Village. The Wellsville levee system was constructed in 1942 to prevent flooding from the Ohio River. The system, which consists of north and south sections, contains 1.06 miles of embankment and 0.37 miles of floodwall. Per a May 2016 assessment, there are 1,868 people at risk and 1,113 structures (with a combined property value of \$250M) at risk behind the structure. USACE classifies the risk associated with Wellsville levee system as moderate (LSAC 3) for prior to overtopping and low (LSAC 4) for overtopping.

The USACE notes uncertainties associated with the structure's risk levels. There are concerns regarding seepage and piping as well as stability under full load conditions. These concerns largely derive from unknown foundation materials, the presence of large trees, encroachments, burrowing animal activity, the age of multiple culverts in the area, etc. Fortunately, the potential for overtopping is low; high river levels in preceding days would allow for reasonable warning time (USACE, 2016). The image below shows the location of the levee in the Village of Wellsville.



Impact and Vulnerability

The hazard potential of a dam corresponds to its class (noted above), but the hazard potential is different than the impact. Downstream damage characterizes the impact of a dam failure. The table below describes the downstream impacts of dam failure.

Class	Downstream Impact
Class I	<ul style="list-style-type: none"> • Probable loss of life • Structural damage to high-value property (i.e., homes, industries, major public utilities).
Class II	<ul style="list-style-type: none"> • Disruption of a public water supply or wastewater treatment facility, the release of health-hazardous industrial or commercial waste, or other health hazards • Flooding of residential, commercial, industrial, or publicly owned structures • Flooding of high-value property • Damage or disruption to major roads including but not limited to interstate and state highways, and the only access to residential or other critical areas such as hospitals, nursing homes, or correctional facilities as determined by the chief • Damage or disruption to railroads or public utilities • Damage to downstream class I, II or III dams or levees, or other dams or levees of high value. • Damage to dams or levees can include but is not limited to, overtopping of the structure
Class III	<ul style="list-style-type: none"> • Property losses including but not limited to rural buildings not otherwise described, and class IV dams and levees not otherwise listed as high-value property. At the request of the dam owner, the chief may exempt dams from the criterion of this paragraph if the dam owner owns the potentially affected property • Damage or disruption to local roads including but not limited to roads not otherwise listed as major roads.
Class IV	<ul style="list-style-type: none"> • Losses restricted mainly to the dam.

There are several clusters of dams throughout Columbiana County. Clusters in central Elk Run Township, northeastern Franklin Township, and southeastern Salem Township are all “Other” dams, and most likely contribute to minimal risk. The USACE lists Wellsville as the nearest downstream town from three high-hazard dams: the Wellsville Reservoir Dam on Little Yellow Creek, the Highlandtown Lake Dam on Little Yellow Creek, and the Buckeye Water District Reservoir off stream of Little Yellow Creek.

Similarly, the impacts of levee failures correspond to the class of the structures. Ohio Administrative Code Rule 150:21-13-09 specifies levees classes as follows.

- **Class I:** Probable loss of human life, structural collapse of at least one residence or one commercial or industrial business
- **Class II:** Disruption of a public water supply or wastewater treatment facility, or other health hazards; flooding of residential, commercial, industrial, or publicly owned structures; flooding of high-value property; damage or disruption to major roads including but not limited to interstate and state highways, and the only access to residential or other critical areas such as hospitals, nursing homes, or correctional facilities as determined by a chief; damage or disruption to railroads or public utilities

- **Class III:** Property losses including but not limited to rural buildings not otherwise described in this rule; damage or disruption to local roads including but not limited to roads not otherwise listed in this rule
- **Class IV:** A levee having a height of not more than three feet; losses restricted mainly to the levee owner's property and rural lands

The previous section lists potential impacts at the Wellsville structure. The ODNR, Dam Safety Program classifies the Wellsville Levee as a Class I (OEMA, 2019).

Historical Occurrences

The National Performance of Dams Program (NPDP) at Stanford University maintains records all modifications, repairs, incidents and their consequences, and inspections for dams in the U.S. and worldwide. Seven of Columbiana County's dams appear on the NPDP incident list, as listed below.

DAM INCIDENTS IN COLUMBIANA COUNTY			
<i>Dam Name</i>	<i>Class</i>	<i>Incident Type</i>	<i>Date</i>
Beaver Lake Dam	Class II	Inadequate Spillway Capacity	10/26/1999
Lake P'NA Dam	Class II	Inadequate Spillway Capacity	8/10/2000
Lake Tomahawk Dam	Class I	Inadequate Spillway Capacity	10/26/1999
Lower Wallace Lake Dam	Class II	Inadequate Spillway Capacity	6/12/2001
Rayls Lake Dam	Class II	Inadequate Spillway Capacity	5/17/2001
Spring Valley Park Lake Dam	Class I	Inadequate Spillway Capacity	3/19/1996
Woodland Lake Dam	Class II	Concrete Deterioration	7/21/1998

There have been no recorded levee failures in Ohio. The northern portion of the Wellsville Levee has been loaded up to 50%, and the southern portion has never been loaded.

Loss and Damages

The owners of nine dams in Columbiana County submitted emergency action plans (EAPs) to the Columbiana County Emergency Management Agency. Those plans identified downstream hazards. For this estimate, planners averaged the number of impacted structures specifically noted in the EAPs (per structure). Figures in the HAZUS database (i.e., 46,946 structures with a total replacement value of \$11,601,664,000) suggest a generalized, rounded value of \$247,128 per structure. Planners used that figure to calculate loss estimates for SHARPP entry. NOTE: The percent composition of structures also comes from HAZUS.

DAM AND LEVEE FAILURE LOSS ESTIMATE – SHARPP DATA ENTRY		
Structure Type	Number	Loss Estimate
Residential (72% of structures in county)	14	\$3,459,792
Non-Residential (23% of structures in county)	5	\$1,235,640
Critical Facilities (5% of structures in county)	1	\$247,128
TOTALS	20	\$4,942,560

Risk Assessment

This section summarizes the risk to Columbiana County from dam and levee failures. The following table identifies the assets located in Wellsville that are within the protected area of the village's levee.


ASSET	ADDRESS	CITY	TYPE				
			General	Built	People	Economy	Natural
Garfield Elementary School	1600 Lincoln Avenue	Wellsville	School		X		
Wellsville High School	1 Bengal Boulevard	Wellsville	School		X		
Buckeye Water District	1925 Clark Avenue	Wellsville	Utility	X			

The following table assigns point totals based on the research presented in this profile for each category that appears in Ohio EMA's SHARPP tool.

DAM AND LEVEE FAILURE RISK SUMMARY			
<i>Category</i>	<i>Points</i>	<i>Description</i>	<i>Notes</i>
Frequency	4	High	There have been seven dam incidents and zero levee failures in Columbiana County since 1999 (for an average of 0.4 incidents per annum).
Response	1	Less than 1 day	Due to frequent inspections of dams in Columbiana County and minimal recorded historical damage downstream, the response to an event would be expected to be minimal.
Onset	1	More than 24 hours	Because dams are frequently inspected, and their inundation can be predicted based on weather, warning of a critical failure is expected. Further, high river levels on the Ohio River would likely yield warning time for a potential overtopping of the Wellsville levee.
Magnitude	1	Less than 10% of land area	Most dams are in rural areas, and the single levee protects less than one square mile of land area.
Business	1	Less than 24 hours	Most dams are in rural areas, and the single levee protects less than one square mile of land area. The county's economy should not be disrupted by either failure.
Human	1	Minimum (minor injuries)	Most dams in the county are Class IV or unclassified. Failure would not cause significant human harm.
Property	1	Less than 10% of property affected	Most dams in the county are Class IV or unclassified, suggesting that property loss would be primarily from loss of the dam itself and the owner's property.
TOTAL	10	Lowest	

2.0 RISK ASSESSMENT

2.3.10 Hazardous Materials Incident

A hazardous material is a chemical or biological material that may pose a threat to life, health, property, or the environment. For this profile, the hazardous materials incidents include only those that are not intentional.			
 <p>Vulnerability</p> <p>HIGHEST</p> <p>HIGH</p> <p>MEDIUM</p> <p>LOW</p> <p>LOWEST</p>	Period of Occurrence:	At any time	Hazard Index Ranking: Medium
	Warning Time:	Less than 6 hours	State Risk Ranking: Not ranked
	Probability:	Likely	Severity: Limited
	Type of Hazard:	Technological	Disaster Declarations: None

Hazard Overview

A hazardous material is a substance or material which, because of its chemical, physical or biological nature, poses a threat to life, health, or property if released from a confined setting. A release may occur by spilling, leaking, emitting toxic vapors, or any other process that enables the material to escape its container, enter the environment, and create a potential hazard. Several common hazardous materials include those that are explosive, flammable or combustible, poisonous or radioactive. Related combustible hazardous materials include oxidizers and reactive materials, while toxins produced by etiological (biological) agents are types of poison that can cause disease.

A hazmat release while in transit is of great concern to the U. S. Department of Transportation (DOT). While fixed sites store and use hazardous materials, the materials are usually produced elsewhere and shipped to a fixed facility by rail car, truck, or onboard ships or barges. Signs or placards denoting the hazard identify the vehicles carrying hazardous materials. The possibility of release is present at any time. Hazardous materials constantly move through Ohio on interstate highways, the rail system, and on shipping lanes in rivers and tributaries.

The hauling, storage, and use of hazardous materials play a vital role in the economy of our nation. Over four billion tons of hazardous materials are transported annually, and 100,000 trucks haul hazardous materials on the country's highways each day. Almost half of all freight trains carry hazardous materials. The transportation infrastructure utilized to move hazardous

materials through Columbiana County is spread throughout the county, with a slight concentration in the southeastern corner of the county along the Ohio River. An incident causing the accidental release of a hazardous material is spontaneous, with little time of warning. Further, the recovery and clean-up activities involved in a hazmat incident may require several hours, days, or even weeks to complete. Hazardous materials can release as a secondary result of a natural disaster like an earthquake or flood. In either case, buildings or vehicles can release their hazardous materials inventories when structurally compromised or involved in traffic accidents.

Location and Extent

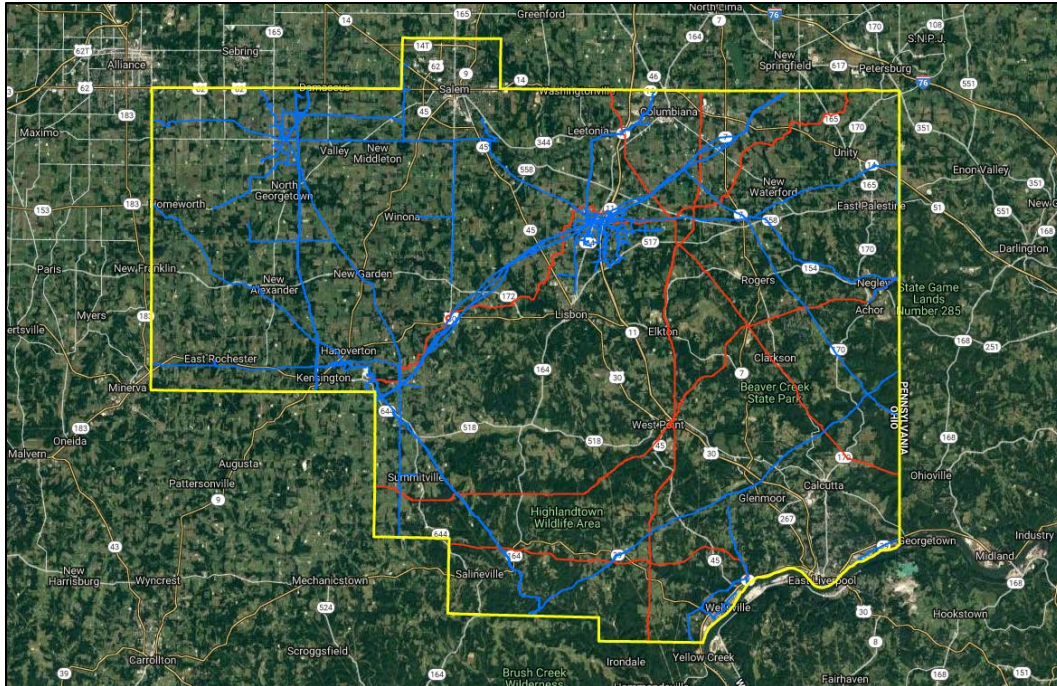
Two major agencies collect data as they relate to hazardous materials incidents the Pipeline and Hazardous Materials Safety Administration (PHMSA) governed by the U.S. DOT and the National Response Center (NRC), governed by the U.S. Coast Guard (USCG). The types of materials that can cause a hazmat release are wide-ranging and may include chlorine, sodium hydroxide, sulfuric acid, radioactive isotopes, anhydrous ammonia, gasoline, and other hydrocarbons, as well as medical/biological waste from hospitals or clinics. Hazardous materials subject to reporting under the Emergency Planning and Community Right-to-Know Act (EPCRA) or Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) include these four groups.

- **Extremely Hazardous Substances (EHS):** These are materials with acutely toxic properties that may do irreversible damage or cause death to people or harm the environment when released or used outside their intended use. Examples include ammonia, chlorine, and sulfuric acid.
- **Hazardous Substances:** These are any materials posing a threat to human health and the environment or any substance designated by the U.S. Environmental Protection Agency (EPA) to be reported if a designated quantity of the substance is spilled into the waters of the United States or otherwise released into the environment.
- **Hazardous Chemicals:** If present at a chemical facility in certain amounts, these substances require a safety data sheet (SDS) under the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard. Such substances are capable of producing fires and explosions or adverse health effects such as cancer, burns, or dermatitis.
- **Toxic Chemicals:** Chemicals or chemical categories that appear on the list because of their chronic or long-term toxicity.

While hazardous materials spills, leaks or accidents may occur anywhere in Columbiana County, they are more likely to occur on transportation routes (such as roads or railways) and at facilities that routinely handle hazardous materials (such as gas stations, chemical companies, and other Tier II reporting or Toxic Release Inventory [TRI] facilities). Columbiana County's major highway routes transverse the county. The rail system is limited, with one line located in the westernmost portion of the county and another in the northernmost portion.

In Columbiana County, 32 fixed facilities report to the EPA's Toxic Release Inventory. These facilities are primarily located in Columbiana City, East Liverpool, East Palestine, and Salem. There is one EPA Superfund site located in Lisbon. This site, the former Chemlime Corp. facility, is not on the National Priorities List. In addition to these facilities/locations, there is one brownfield property located in Columbiana City. This site is a 37.31-acre plot, the former National Refractories location. Brownfield properties are those formerly used for industrial or commercial purposes, where future use is affected by either real or perceived environmental contamination. The extent of damage for hazardous material incidents can vary from a small spill on a road to contamination of source water via storm drains, rivers, and streams.

Columbiana County is home to 300.48 miles of gas transmission pipelines and 113.80 of hazardous liquid pipelines. Transmission lines traverse all areas of the county with clusters between Lisbon and Columbiana, as well as north of North Georgetown. Hazardous liquid pipelines also appear throughout the county; however, they appear more frequently in the central and eastern portions. The following image, taken from the National Pipeline Mapping System (NPMS) (PHMSA, 2019), shows the locations of pipelines. Red lines are hazardous liquid lines, while blue lines are transmission pipelines.



Impacts and Vulnerability

Due to the wide variety of substances used, transported, and stored in the area, it is difficult to assign an overall impact of these substances to public health, the environment, the economy, and the infrastructure. Some spills cause minor if any damage to the area. For example, spilling a few gallons of gasoline on concrete during transfer causes minimal economic impact; rarely does the spilled substance cause any environmental impacts. This is not to say that all spills are minor; some can be very harmful to human health and the environment and costs thousands, if not millions of dollars to clean up. Spills into waterways and those that reach the groundwater are of particular concern due to the threat they impose to drinking water and subsequently public health, the environment, and fauna in the area.

Additionally, transportation-based hazard incidents have the potential to result in cascading impacts. For example, a rail-based incident could isolate a community in Columbiana County as well as several other communities in the region. Officials from such operators as CSX Transportation concur. In a recent interview, the company's hazmat manager out of Pittsburgh noted that a significant problem associated with rail incidents, particularly those involving hazardous materials, is that a stopped train can block several roadway intersections, essentially cutting some areas off. These blocks not only hinder evacuation from those areas but also emergency services access to those areas. The following map shows the location of railroad/highway crossings in Columbiana County; there are 181 crossings.

COLUMBIANA COUNTY HAZARD MITIGATION PLAN

Columbiana County Railway/Highway Crossings

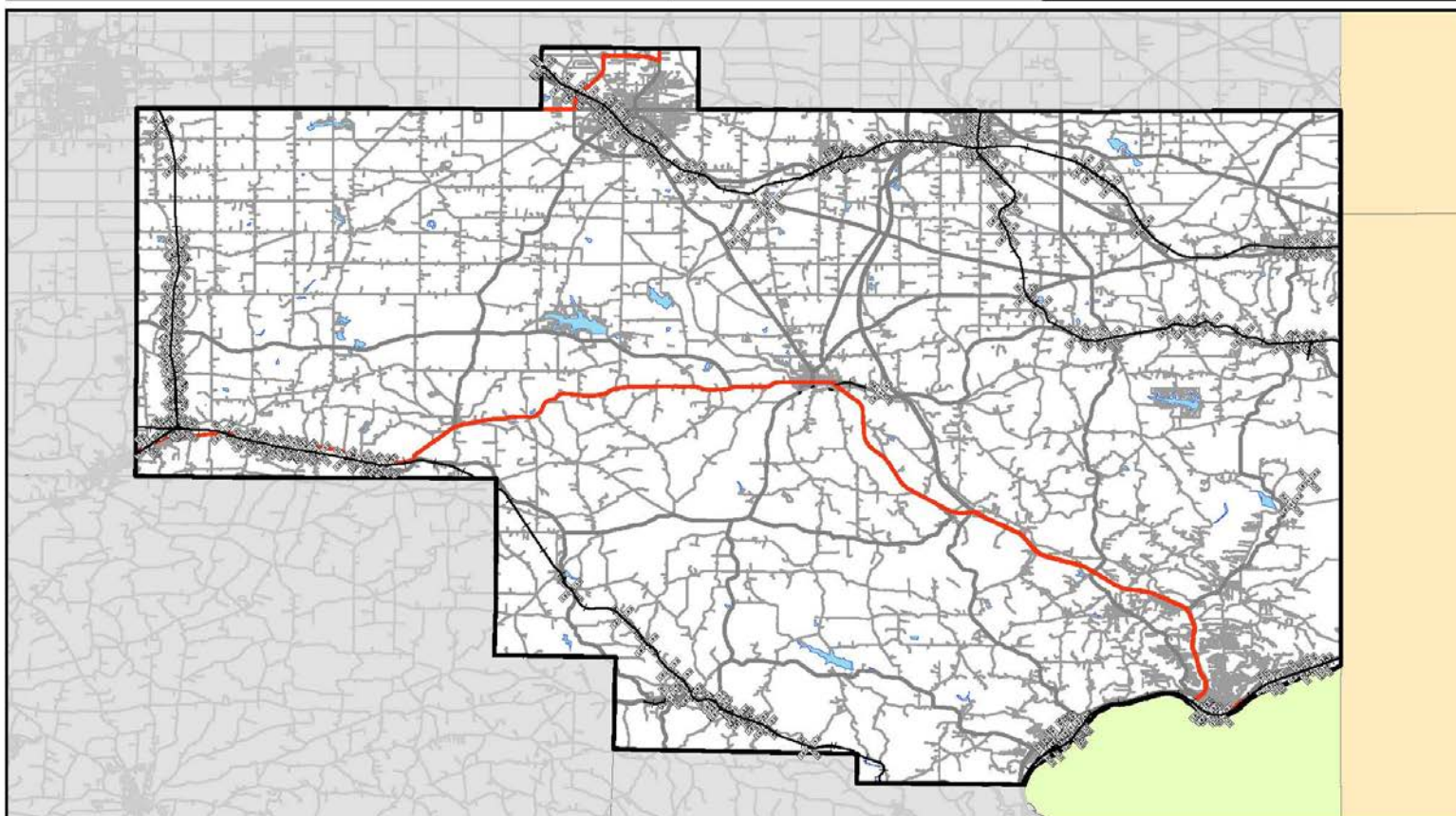
Data Source(s):

FRA, U.S. Census Bureau, U.S. DOT

DISCLAIMER: Data is meant for use as reference only. Some sources may be intended to be used at national or regional scales and are thus used beyond their original intent for demonstrative purposes.



-  Railroads
-  Railroad Crossings
-  US Routes
-  State Routes



Hazardous materials incidents can occur rapidly over a large area. The chemical, physical, and biological properties of hazardous materials pose a potential risk to life, health, the environment, and property when not properly contained. Many factors determine the impact of a potential incident, including quick and solid decision-making by emergency officials, location and type of release, evacuation and shelter-in-place needs, public health concerns, and relevant economic considerations. Additionally, while most incidents are generally brief, the resulting recovery and cleanup may take time to exact.

If evacuation is necessary due to a chemical emergency, road closures and traffic jams may result. If a large-scale evacuation is deemed necessary, it can pose serious long-term economic consequences to the involved population area. A delay in the resumption of industry commerce may cause economic losses for both business owners and employees. Also, an evacuation ordered on short-notice could cause serious problems for businesses requiring time to shut down specialized equipment. Public or private emergency response organizations agencies may be challenged by the expenses dictated by a hazardous material release and may need to wait an uncomfortable length of time for the responsible party to reimburse any outstanding costs, further straining the economic resources of the region.

A major incident involving significant injuries may severely tax regional medical services, as medical facilities aren't generally designed to handle mass amounts of victims on short notice. Consequently, in the event of a major incident, hospitals and other medical facilities must still be able to provide their customary level of service to all patients, regardless of whether they were incident victims or not.

Historical Occurrences

There have been 30 incidents at fixed facilities, 344 highway (or mobile) incidents, two waterway incidents, 18 rail incidents (with a release), and five pipeline incidents involving hazardous materials in Columbiana County. The total approximate number of occurrences in Columbiana County between 2010 and 2019 are 399 incidents. The source of information for these incidents in the National Response Center (NRC) (USCG, 2019). The following list outlines the findings.

- **Fixed Facilities:** According to the Coast Guard's NRC, there have been 30 incidents at fixed facilities between 2010 and 2019. Nine were due to natural phenomena, seven to "dumping," one to operator error, and four "other." The cause of nine incidents was unknown.

- **Transportation:** Ohio experienced 10,961 transportation-based hazardous material incidents in the ten years (2010-2019) (PHMSA, 2019).
 - **Highway:** According to PHMSA, there were 344 highway incidents in Columbiana County between 2010 and 2019; these account for 3.14% of the total highway incidents in the state.

HIGHWAY INCIDENTS IN COLUMBIANA COUNTY 2010-2019											
City	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Columbiana	3	7	22	15	26	50	60	44	34	74	335
East Liverpool	1		1				2			2	6
Leetonia		1									1
Salem								1			1
Salineville				1							1
Total	4	8	23	16	26	50	62	45	34	76	344

Source: PHMSA, 2019

According to the NRC (USGC, 2019), there were 10 mobile incidents (indicating that they are related to transportation, including highway incidents) in Columbiana County between 2010 and 2019.

- **Waterway:** According to the NRC, two incidents involving vessels occurred; callers reported barges sinking, one near East Liverpool in 2018 and another near Wellsville in 2014.
- **Rail:** PHMSA did not record rail incidents in Columbiana County during the period 2010 to 2019. The NRC noted 18, with the cause of ten of them as “equipment failure.”
- **Pipeline:** According to the NRC, five incidents involving pipelines occurred. Incidents have occurred in a variety of locations, include one each in Hanoverton, Wellsville, East Liverpool, Columbiana, and Minerva.

Loss and Damages

The NRC does not provide losses or damages, but PHMSA provides loss data for some incidents. The Columbiana County PHMSA data included 159 incidents with “damages” reported. Those reported damages were \$642,534, or an average of \$4,041 per incident.

Further, these losses were over a period of ten years. Another perspective on these estimated losses would be an average of approximately \$64,250 per year.

The average estimated loss comprises 0.00001% of the total building stock exposure in Columbiana County. Planners thus applied that percentage to the categorized number of structures and exposure to derive SHARPP loss figures.

HAZMAT LOSS ESTIMATE – SHARPP DATA ENTRY		
<i>Structure Type</i>	<i>Number</i>	<i>Loss Estimate</i>
Residential	1	\$46,450.00
Non-Residential	1	\$14,703.00
Critical Facilities	1	\$3,097.00
TOTALS	3	\$64,250.00

Risk Assessment

This section summarizes the risk to Columbiana County from hazardous material incidents. The map image graphically depicts potential risk areas in Columbiana County.

COLUMBIANA COUNTY HAZARD MITIGATION PLAN

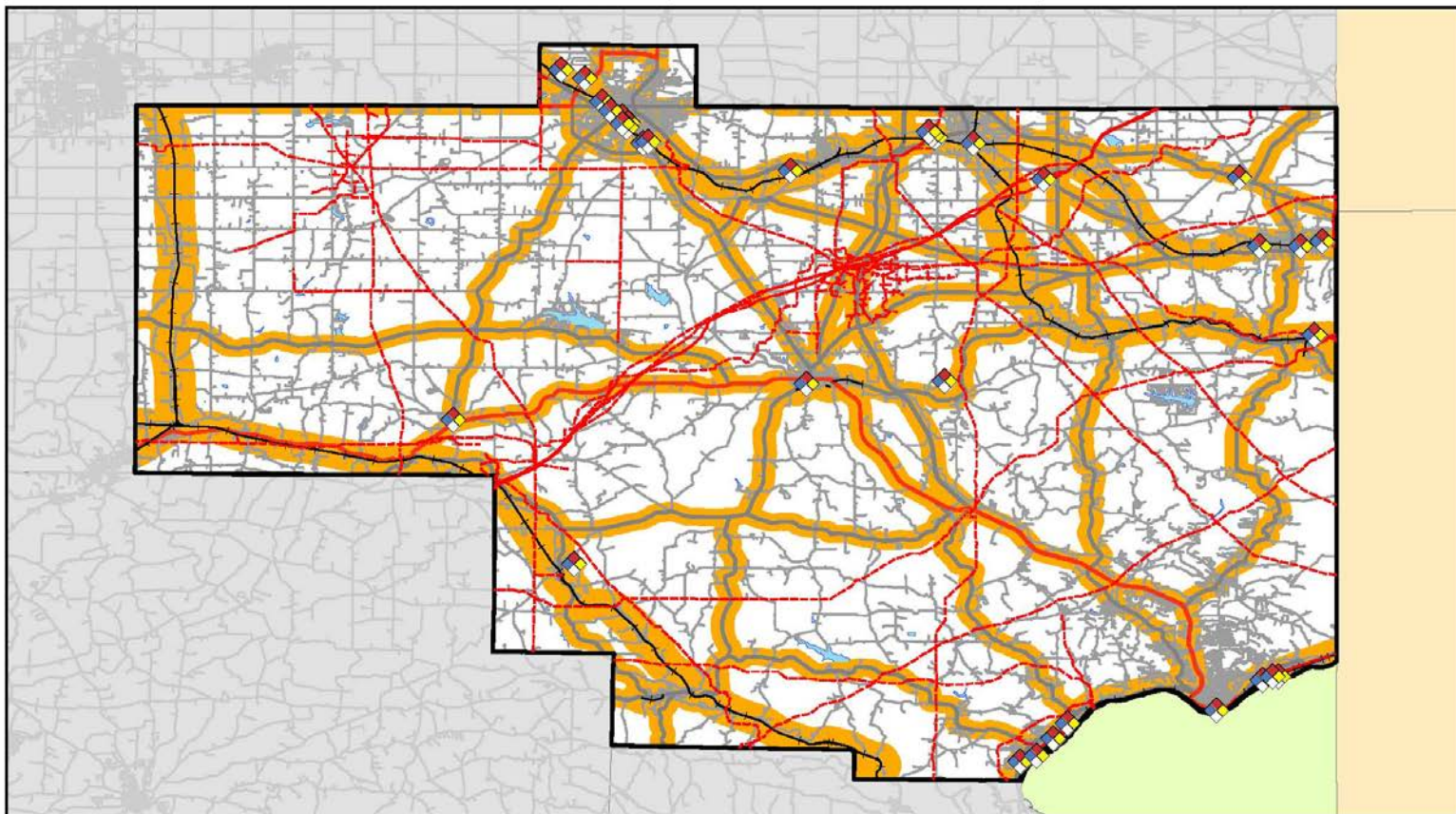
Columbiana County Hazmat Risk Map

Data Source(s):
FRA, U.S. Census Bureau, U.S. DOT

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- Hazmat Risk Areas
- NPMS Break-Out Tanks
- NPMS Pipelines
- TRI Facilities
- Railroads
- US Routes
- State Routes



The following table identifies the assets located in hazmat risk areas.

ASSET	ADDRESS	CITY	TYPE				
			General	Built	People	Economy	Natural
Ambulance Service Inc.	231 Webber Way	East Liverpool	Emergency Services	X			
Calcutta Fire Department	15455 Pugh Road	Calcutta	Emergency Services	X			
Columbiana County 911 Center	105 South Market Street	Lisbon	Emergency Services	X			
Columbiana County EMA	215 South Market Street	Lisbon	Emergency Services	X			
Columbiana County Sheriff	8473 Countryhome Road	Lisbon	Emergency Services	X			
Columbiana EMS	28 West Friend Street	Columbiana	Emergency Services	X			
Columbiana Fire Department	28 West Friend Street	Columbiana	Emergency Services	X			
Columbiana Police Department	28 South Vine Street	Columbiana	Emergency Services	X			
East Liverpool Fire Department	626 St. Clair Avenue	East Liverpool	Emergency Services	X			
East Liverpool Police Department	126 West Sixth Street	East Liverpool	Emergency Services	X			
East Palestine EMS	67 East Clark Street	East Palestine	Emergency Services	X			
East Palestine Fire Department	67 East Clark Street	East Palestine	Emergency Services	X			
East Palestine Police Department	75 East Main Street	East Palestine	Emergency Services	X			
EMT Ambulance	383 North Lincoln Avenue	Salem	Emergency Services	X			
Franklin Township Volunteer Fire Department	32046 Spruce Street	Summitville	Emergency Services	X			
Glenmoor Volunteer Fire Department	16320 Annesley Road	East Liverpool	Emergency Services	X			
Guilford Lake Fire Department	32120 Sunset Avenue	Hanoverton	Emergency Services	X			
Hanoverton Volunteer Fire Department	10235 Second Street	Hanoverton	Emergency Services	X			
Highlandtown Volunteer Fire Department	18371 Steubenville Pike Road	Salineville	Emergency Services	X			
Homeworth Volunteer Fire Department	4354 Middle Street	Homeworth	Emergency Services	X			
KLG Ambulance / MICU	1516B South Lincoln Avenue	Salem	Emergency Services	X			
Lacroft Volunteer Fire Department	2360 Sherwood Avenue	East Liverpool	Emergency Services	X			

ASSET	ADDRESS	CITY	TYPE				
			General	Built	People	Economy	Natural
Leetonia EMS	300 Main Street	Leetonia	Emergency Services	X			
Leetonia Fire Department	330 East Main Street	Leetonia	Emergency Services	X			
Leetonia Police Department	300 East Main Street	Leetonia	Emergency Services	X			
Lifeteam EMS Inc.	740A Dresden Avenue	East Liverpool	Emergency Services	X			
Lisbon Fire Department	113 S Jefferson Street	Lisbon	Emergency Services	X			
Lisbon Police Department	203 North Market Street	Lisbon	Emergency Services	X			
Liverpool Township Police Department	353 Adam Avenue	East Liverpool	Emergency Services	X			
Maple-Cotton Funeral Home and EMS	11009 SR 644	Kensington	Emergency Services	X			
Negley Volunteer Fire Department/EMS	50683 Richardson Avenue	Negly	Emergency Services	X			
New Waterford EMS	3766 East Main Street	New Waterford	Emergency Services	X			
New Waterford Fire Department	3766 East Main Street	New Waterford	Emergency Services	X			
New Waterford Police Department	3700 Village Park Drive	New Waterford	Emergency Services	X			
North Star Critical Care	16356 SR 267	East Liverpool	Emergency Services	X			
Ohio State Highway Patrol	9423 SR 45	Lisbon	Emergency Services	X			
Perry Township Volunteer Fire Department	2198 North Ellsworth Avenue	Salem	Emergency Services	X			
Rogers Village Fire Department	7580 Farr Street	Rogers	Emergency Services	X			
Salem Fire Department	260 South Ellsworth Avenue	Salem	Emergency Services	X			
Salem Police Department	397 Columbia Street	Salem	Emergency Services	X			
Salineville Police Department	34 Washington Street	Salineville	Emergency Services	X			
Salineville Volunteer Fire Department	34 Washington Street	Salineville	Emergency Services	X			
St. Clair Township Police Department	15442 Pugh Road	Calcutta	Emergency Services	X			
Washingtonville Police Department	415 South County Road	Washingtonville	Emergency Services	X			
Wellsville Police Department	1200 Main Street	Wellsville	Emergency Services	X			
Wellsville Volunteer Fire Department	1202 Main Street	Wellsville	Emergency Services	X			

ASSET	ADDRESS	CITY	TYPE				
			General	Built	People	Economy	Natural
Columbiana City Hall	28 West Friend Street	Columbiana	Governmental Facility	X			
Columbiana County Courthouse	203 South Market Street	Lisbon	Governmental Facility	X			
East Liverpool City Hall	126 West Sixth Street	East Liverpool	Governmental Facility	X			
East Palestine Village Offices	144 North Market Street	East Palestine	Governmental Facility	X			
Elkrun Township Hall	41725 State Route 154	Lisbon	Governmental Facility	X			
Hanoverton Village Offices	10180 1st Street	Hanoverton	Governmental Facility	X			
Leetonia Village Offices	300 East Main Street	Leetonia	Governmental Facility	X			
Lisbon Village Offices	203 North Market Street	Lisbon	Governmental Facility	X			
Madison Township Hall	13011 State Route 45	Lisbon	Governmental Facility	X			
New Waterford Village Offices	3760 Park Drive	New Waterford	Governmental Facility	X			
Salem City Hall	231 South Broadway Ave	Salem	Governmental Facility	X			
Salem Township Hall	37638 Old State Route 556	Leetonia	Governmental Facility	X			
Salineville Village Offices	34 Washington Street	Salineville	Governmental Facility	X			
Washingtonville Village Offices	415 South County Road	Washingtonville	Governmental Facility	X			
Wellsville Village Offices	1200 Main Street	Wellsville	Governmental Facility	X			
American Health Care	107 Royal Birkdale Drive	Columbiana	Healthcare		X		
Assisted Living Ministry Services	650 St. Clair Avenue	East Liverpool	Healthcare		X		
Blossom Nursing and Rehab. Center	109 Blossom Lane	Salem	Healthcare		X		
Brookdale Salem	1916 South Lincoln Avenue	Salem	Healthcare		X		
Century House of Salem	1171 East State Street	Salem	Healthcare		X		
Circle of Care	19895 East Pershing Street	Salem	Healthcare		X		
Columbiana County Mental Health	40722 State Route 154	Lisbon	Healthcare		X		
Continuing Health Care Solutions	100 Vista Drive	Lisbon	Healthcare		X		
East Liverpool City Hospital	425 W 5th Street	East Liverpool	Healthcare	X	X		
Grace Woods Senior Living	1166 Benton Road	Salem	Healthcare		X		
Harmony Village	901 S Main Street	Columbiana	Healthcare		X		

ASSET	ADDRESS	CITY	TYPE				
			General	Built	People	Economy	Natural
Parkside Healthcare Center	930 East Park Avenue	Columbiana	Healthcare		X		
Salem East Health Care	250 Continental Drive	Salem	Healthcare		X		
Salem North Health Care	230 Continental Drive	Salem	Healthcare		X		
Salem Regional Medical Center	1995 E State Street	Salem	Healthcare	X	X		
Salem West Health Care	2511 Bentley Drive	Salem	Healthcare		X		
The Renaissance at Vista	100 Vista Drive	Lisbon	Healthcare		X		
Twin Oaks Retirement Center	1166 Benton Road	Salem	Healthcare		X		
Valley Oaks Care Center	500 Selfridge Street	East Liverpool	Healthcare		X		
Whispering Pines Village	937 East Park Avenue	Columbiana	Healthcare		X		
Burchfield Homestead	867 E 4th Street	Salem	Historical				X
Cassius Clark Thompson House	305 Walnut Street	East Liverpool	Historical				X
Charles Nelson Schmick House	110 Walnut Street	Leetonia	Historical				X
Cherry Valley Coke Ovens	999 Cherry Valley Road	Leetonia	Historical				X
Church Hill Road Covered Bridge	42164 SR 154	Lisbon	Historical				X
Daniel Howell Hise House	1100 Franklin Avenue	Salem	Historical				X
Diamond Historic District	410 Market Street	East Liverpool	Historical				X
East Liverpool Historic District	112 E 5th Street	East Liverpool	Historical				X
East Liverpool Pottery	112 E 2nd Street	East Liverpool	Historical				X
Elks Club	139 W 5th Street	East Liverpool	Historical				X
Godwin Knowles House	422 Broadway Street	East Liverpool	Historical				X
Hanna-Kenty House	251 East High Street	Lisbon	Historical				X
Hanoverton Canal Town District	30093 US 30	Hanoverton	Historical				X
Hiram Bell Farmstead	43628 SR 517	Columbiana	Historical				X
Homer Laughlin House	414 Broadway Street	East Liverpool	Historical				X
Hostetter Inn	32901 State Route 172	Lisbon	Historical				X
Ikirt House	200 6th Street	East Liverpool	Historical				X

ASSET	ADDRESS	CITY	TYPE				
			General	Built	People	Economy	Natural
John Street House	631 N. Ellsworth Avenue	Salem	Historical				X
Lisbon Historic District	108 N Market Street	Lisbon	Historical				X
Mary A. Patterson Memorial	224 E 4th Street	East Liverpool	Historical				X
Nicholas Eckis House	45838 High Street	New Waterford	Historical				X
Odd Fellows Temple	120 W 6th Street	East Liverpool	Historical				X
Potters National Bank	216 E 4th Street	East Liverpool	Historical				X
Salem Downtown Historic District	100 N Ellsworth Avenue	Salem	Historical				X
Travelers Hotel	115 E Fourth Street	East Liverpool	Historical				X
YMCA	500 E 4th St	East Liverpool	Historical				X
Carnegie Public Library	219 East Fourth Street	East Liverpool	Library	X			
Columbiana Public Library	322 North Middle Street	Columbiana	Library	X			
East Palestine Memorial Public Library	309 North Market Street	East Palestine	Library	X			
Leetonia Community Public Library	181 Walnut Street	Leetonia	Library	X			
Lepper Library	303 East Lincoln Way	Lisbon	Library	X			
Salem Public Library	821 East State Street	Salem	Library	X			
Wellsville Public Library	115 Ninth Street	Wellsville	Library	X			
Calcutta Post Office	15713 SR 170	East Liverpool	Post Office	X			
Columbiana Post Office	149 South Main Street	Columbiana	Post Office	X			
East Liverpool Post Office	700 Dresden Avenue	East Liverpool	Post Office	X			
East Palestine Post Office	269 North Market Street	East Palestine	Post Office	X			
East Rochester Post Office	24781 US 30	East Rochester	Post Office	X			
Elkton Post Office	42188 SR 154	Elkton	Post Office	X			
Hanoverton Post Office	29959 Market Street	Hanoverton	Post Office	X			
Homeworth Post Office	4434 Middle Street	Homeworth	Post Office	X			
Kensington Post Office	11011 SR 644	Kensington	Post Office	X			
Leetonia Post Office	235 Main Street	Leetonia	Post Office	X			
Lisbon Post Office	7983 Dickey Drive	Lisbon	Post Office	X			

ASSET	ADDRESS	CITY	TYPE				
			General	Built	People	Economy	Natural
Negley Post Office	7560 Commerce Street	Negly	Post Office	X			
New Waterford Post Office	3818 West Main Street	New Waterford	Post Office	X			
Rogers Post Office	7529 Depot Street	Rogers	Post Office	X			
Salem Post Office	275 Penn Avenue	Salem	Post Office	X			
Salineville Post Office	37 West Main Street	Salineville	Post Office	X			
Summitville Post Office	15521 SR 644	Summitville	Post Office	X			
Washingtonville Post Office	195 East Main Street	Washingtonville	Post Office	X			
Wellsville Post Office	1075 Main Street	Wellsville	Post Office	X			
American Standards Brands	605 South Ellsworth Avenue	Salem	Private Sector			X	
Columbiana Foundry Company	501 Lisbon Street	Columbiana	Private Sector			X	
Flex-N-Gate/Ventra Salem	800 Pennsylvania Avenue	Salem	Private Sector			X	
Fresh Mark Inc.	1735 South Lincoln Avenue	Salem	Private Sector			X	
Pioneer Pottery Inc.	761 Dresden Avenue	East Liverpool	Private Sector			X	
Wal-Mart Stores Inc.	16280 Dresden Avenue	East Liverpool	Private Sector			X	
Zarbana Industries	41738 Esterly Drive	Columbiana	Private Sector			X	
Beaver Local Elementary School	46090 Bell School Road	East Liverpool	School		X		
Beaver Local High School	46090 Bell School Road	East Liverpool	School		X		
Beaver Local Middle School	46090 Bell School Road	East Liverpool	School		X		
Columbiana Co. Career and Technical Center	9364 SR 45	Lisbon	School		X		
Columbiana High School	700 Columbiana-Waterford Road	Columbiana	School		X		
Crestview Middle School/High School	44100 Crestview Road	Columbiana	School		X		
David Anderson Jr/Sr High School	260 West Pine Street	Lisbon	School		X		
DAW Middle School	929 Center Street	Wellsville	School		X		
East Elementary School	1417 Etruria Street	East Liverpool	School		X		
East Liverpool Christian School	46682 Florence Street	East Liverpool	School		X		
East Palestine Elementary School	195 West Grant Street	East Palestine	School		X		
East Palestine High School	360 West Grant Street	East Palestine	School		X		

ASSET	ADDRESS	CITY	TYPE				
			General	Built	People	Economy	Natural
East Palestine Middle School	320 West Grant Street	East Palestine	School		X		
Garfield Elementary School	1600 Lincoln Avenue	Wellsville	School		X		
Heartland Christian School K-12	28 Pittsburgh Street	Columbiana	School		X		
Joshua Dixon Elementary School	333 North Middle Street	Columbiana	School		X		
Lacroft Elementary School	2460 Boring Lane	East Liverpool	School		X		
Mckinley Elementary School	441 East Chestnut Street	Lisbon	School		X		
Reilly Elementary School	491 Reilly Avenue	Salem	School		X		
Salem Jr./Sr. High School	1200 East Sixth Street	Salem	School		X		
South Side Middle School	720 Columbiana-Waterford Road	Columbiana	School		X		
Southern Local K-12	38095 SR 39	Salineville	School		X		
St. Aloysius Elementary School	335 West Fifth Street	East Liverpool	School		X		
St. Paul Elementary School	925 East State Street	Salem	School		X		
United K-12	8143 SR 9	Hanoverton	School		X		
Wellsville HS	1 Bengal Boulevard	Wellsville	School		X		
Westgate Middle School	810 West Eighth Street	East Liverpool	School		X		
Columbiana County Port Authority	7860 Lincolne Place	Lisbon	Transportation	X		X	
Buckeye Water District	1925 Clark Avenue	Wellsville	Utility	X			
Columbiana City Water Works/Sewer Dept.	43477 E Metz Road	Columbiana	Utility	X			
East Liverpool Water Works	2220 Michigan Avenue	East Liverpool	Utility	X			
East Palestine Sewer and Water	166 Park Drive	East Palestine	Utility	X			
Leetonia Sewage Plant	300 Main Street	Leetonia	Utility	X			
Leetonia Water Board	300 Main Street	Leetonia	Utility	X			
Lisbon Village Water Department	8077 State Route 164	Lisbon	Utility	X			
New Waterford Water / Waste Water Plant	47250 SR 46	New Waterford	Utility	X			
Salem Sewage Plant	1600 Pennsylvania Avenue	Salem	Utility	X			

ASSET	ADDRESS	CITY	TYPE				
			General	Built	People	Economy	Natural
Salineville Sewer Plant	39 State Street	Salineville	Utility	X			
Washingtonville Water and Sewer	415 Boston Street	Washingtonville	Utility	X			
Wellsville Filtration Plant	17547 SR 45	Wellsville	Utility	X			
Wellsville Sewage Disposal	100 16th Street	Wellsville	Utility	X			

The following table assigns point totals based on the research presented in this profile for each category that appears in Ohio EMA's SHARPP tool.

HAZARDOUS MATERIALS INCIDENT RISK SUMMARY			
Category	Points	Description	Notes
Frequency	5	Excessive	Columbiana County experienced 399 incidents between 2010 and 2019 (a ten-year period), for an average of 39.9 incidents per year.
Response	2	One Day	A full day serves as a conservative estimated duration of a hazmat response.
Onset	4	Less than 6 hours	Hazmat incidents typically occur with no warning.
Magnitude	1	Localized (Less than 10% of land area affected)	Hazmat incidents are site-specific, and thus highly localized.
Business	1	Less than 24 hours	Hazmat incidents in Columbiana County rarely disrupt an area for longer than 24 hours.
Human	2	Low (some injuries)	There is a potential for minor injury though no injuries were reported in Columbiana County data.
Property	1	Less than 10% of property affected	Again, as a site-specific hazard, hazmat impacts are highly localized.
TOTAL	16	Medium	

2.0 RISK ASSESSMENT

2.4 Hazard Rankings

One of the components of the risk assessment is to determine the risk of and vulnerability to hazards, determined by the probability of occurrence and the potential severity of hazard events. This process helps identify which hazards pose the most significant concerns to Columbiana County and its municipalities. The probability of an event derives from the number of historical events within a certain timeframe. Timeframes vary based on information available from different sources (and they can vary widely).

The Ohio State Hazard Analysis Resource and Planning Portal (SHARPP) supports an overall ranking for the hazards considered in the state's mitigation plans. Like the SHARPP tool, this plan recognizes the value of implementing several categories to determine the overall risk and vulnerability. The following narrative and tables describe the categories utilized by this plan and how they relate to the available data.

Historical occurrences inform all calculations, not worst-case scenarios. In cases with zero occurrences, other available data (which varies across the hazards and is outlined in each profile) support determinations.

"Frequency" refers to the number of times a hazard occurs in a specific period (based on available historical data). In most instances, the total occurrences (e.g., three occurrences) are divided by the length of time (in years) that data is available (e.g., ten years). Thus three occurrences divided by ten years equals 0.3. The table above translates the resultant numeric values into a narrative description of frequency (that corresponds to SHARPP categories). In the example described here, the hazard would have a 'low' frequency. At times, no historical data is available; in these cases, the hazard receives the lowest possible points for

FREQUENCY			
Value	Score	Description	Definition
.76 - >1.0	5	Excessive	Will occur during a year (SHARPP: hazard or event resulted in nine or more declarations)
.51 - .75	4	High	Likely to occur in a year (SHARPP: hazard or event resulted in six to eight declarations)
.26 - .50	3	Medium	May (or may not) occur in a year (SHARPP: hazard or event resulted in three to five declarations)
0 - .25	2	Low	Unlikely to occur in a year (SHARPP: hazard or event resulted in one to two declarations)
0	1	None	So unlikely that it can be assumed it will not occur in a year (SHARPP: hazards or events result in no local disaster declarations)

the category (i.e., one). The table below presents the remainder of the categories (including “frequency”).

SHARPP CATEGORIES							
	<i>Frequency</i>	<i>Response</i>	<i>Onset</i>	<i>Magnitude</i>	<i>Business</i>	<i>Human</i>	<i>Property</i>
1	None	Less than half a day	Over 24 hours	Localized (Less than 10% of land area affected)	Less than 24 hours	Minimum (minor injuries)	Less than 10% of property affected
2	Low	One day	12-24 hours	Limited (10-25% of land area affected)	One week	Low (some injuries)	10-25% of property affected
3	Medium	One week	6-12 hours	Critical (25-50% of land area affected)	At least two weeks	Medium (multiple severe injuries)	25-50% of property affected
4	High	One month	Less than 6 hours	Catastrophic (More than 50% of land area affected)	More than 30 days	High (multiple deaths)	More than 50% of property affected
5	Excessive	More than one month	N/A	N/A	N/A	N/A	N/A

Each hazard receives a score for each category that corresponds to the number in the far left column. Hazards receive scores of between 7 (i.e., all seven categories receive a value of one) and 30 points (i.e., all seven categories receive a value of four or five). The list below represents an overall range by which planners ranked all of the hazards in this plan.

<u><i>Range of Points (Score)</i></u>	<u><i>Hazard Ranking</i></u>
7 - 10	Lowest
11 - 15	Low
16 - 20	Medium
21 - 25	High
26 - 30	Highest

The following table summarizes risk and vulnerability rankings for all of the hazards included in the plan. It outlines the points each hazard received per the above methodology.

SUMMARY OF HAZARD RANKINGS									
Hazard	Risk	Frequency	Response	Onset	Magnitude	Business	Human	Property	Total
Natural Hazards									
Drought	Low	2	4	1	3	1	1	1	13
Earthquake	Low	2	2	4	1	1	1	1	12
Extreme Temperatures (Heat and Cold)	Low	4	1	1	1	1	2	1	11
Flooding	Medium	5	3	2	5	1	2	1	19
Public Health Emergencies	Medium	4	5	1	1	2	2	1	16
Severe Thunderstorms and Hail	Low	4	3	2	2	2	1	1	15
Severe Wind and Tornado	Medium	4	3	4	2	2	3	2	20
Severe Winter Storms	Medium	4	3	2	4	1	1	4	19
Technological Hazards									
Dam and Levee Failure	Lowest	4	1	1	1	1	1	1	10
Hazardous Materials Incident	Medium	5	2	4	1	1	2	1	16