Mercer County Multi-Jurisdictional Natural Hazards Mitigation Plan 2023 Update

Mercer County, Illinois






Participants:

Mercer County
Abington Township
Aledo, City of
Aledo Fire Protection District
Bay Island Drainage & Levee District
Genesis Medical Center
Greene Township Fire Protection District
Joy, Village of
Keithsburg, City of
Matherville, Village of
Preemption Township
Sherrard, Village of
Sherrard Community Unit School District #200
Sherrard Community Fire Protection District

January 2024

The five year update of this Plan must be completed on or before (date).

Cover photographs courtesy of Mercer County Office of Emergency Management from left to right and top to bottom:

- *Trees were uprooted as a result of two EF1 tornadoes on July 12, 2014*
- *Buildings were flooded during the 2008 record setting Mississippi River flood*
- *An outbuilding was destroyed between Viola and Swedona by a EF1 tornado on July 12, 2014*
- *Riverine flooding during July 2014 resulted in road closures in and around Keithsburg*
- *Crops were damaged as a result of one EF0 and two EF1 tornadoes on July 12, 2014*
- *An ice storm on January 20, 2010 brought down electrical and communication lines as well as tree branches*

MERCER COUNTY MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN

MERCER COUNTY, ILLINOIS

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Researched and written for the Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee
by American Environmental Corporation

1.0 INTRODUCTION

Each year natural hazards (i.e., severe thunderstorms, tornadoes, severe winter storms, flooding, etc.) cause damage to property and threaten the lives and health of the residents of Mercer County. Since 1965, Mercer County has been included in 11 major federally-declared disasters. **Figure I-1** identifies each declaration including the year the disaster was declared and the type of natural hazard that triggered the declaration. Since 2010, the County has been included in eleven state disaster proclamations. **Figure I-2** identifies the year the proclamation was issued and the type of natural hazard that triggered the declaration. The natural hazard(s) recognized as contributing to the declaration for Mercer County is identified in bold.

Figure I-1
Major Federal Disaster Declarations: Mercer County

Declaration #	Year	Natural Hazard(s) Covered by Declaration
194	1965	**tornadoes**; severe storms; **flooding**
262	1969	**flooding**
373	1973	severe storms; **flooding**
438	1974	severe storms; **flooding**
997	1993	severe storms; **flooding**
1368	2001	**flooding**
1771	2008	severe storms; **flooding**
1960	2011	**severe winter storm; snowstorm**
4116	2013	severe storms; straight-line winds; **flooding**
4461	2019	severe storms; **flooding**
4489	2020	**COVID-19 pandemic**

Figure I-2
State Disaster Proclamations: Mercer County

Year	Hazard(s) Covered by Declaration
2010	**severe storms**; high winds; torrential rain
2011	**winter weather**
2011	**high wind**; tornadoes; torrential rain
2013	severe storms; straight-line winds; heavy rainfall; **flooding**
2014	**heavy snowfall; frigid temperatures**
2019	**winter storm** (frigid temperatures)
2019	**flooding**
2020	**COVID-19**
2021	**winter storms**
2022	**winter storms**
2022	**Monkeypox**

In the last 10 years alone (2013 – 2022), there have been 41 extreme cold events, 41 excessive heat events, 29 severe winter storms, 27 thunderstorms with damaging winds, 21 riverine flood events, 13 flash flood events, 10 tornadoes, 8 severe storms with hail one inch in diameter or greater, 3 lightning strike events with verified damages, and one drought in the County.

While natural hazards cannot be avoided, their impacts can be reduced through effective hazard mitigation planning. This prevention-related concept of emergency management often receives the least amount of attention, yet it is one of the most important steps in creating a hazard-resistant community.

What is hazard mitigation planning?

Hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural hazards. This process helps the County and participating jurisdictions reduce their risk from these hazards by identifying vulnerabilities and developing mitigation actions to lessen and sometimes even eliminate the effects of a hazard. The results of this process are documented in a hazard mitigation plan.

Why update a natural hazards mitigation plan?

By updating and adopting a natural hazards mitigation plan, participating jurisdictions become eligible to apply for and receive federal hazard mitigation funds to implement mitigation actions identified in the plan. These funds can help provide local government entities with the opportunity to complete mitigation projects and activities that would not otherwise be financially possible.

The federal hazard mitigation funds are made available through the Disaster Mitigation Act of 2000, an amendment to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, which provides federal aid for mitigation projects, but only if the local government entity has a Federal Emergency Management Agency (FEMA) approved hazard mitigation plan.

How is this plan different from other emergency plans?

A natural hazards mitigation plan is aimed at identifying projects and activities that can be conducted prior to a natural disaster, unlike other emergency plans which provide direction on how to respond to a disaster after it occurs. This is the second time that Mercer County has updated its hazard mitigation plan. The original plan was completed in 2010 and the first update was competed in 2016. This update describes in detail the actions that can be taken to help reduce or eliminate damages caused by specific types of natural hazards.

1.1 PARTICIPATING JURISDICTIONS

Recognizing the benefits of having an updated natural hazards mitigation plan, the Mercer County Board authorized the update of the Mercer County Multi-Jurisdictional Natural Hazards Mitigation Plan (hereto referred to as the Plan). The County then invited all the local government entities within Mercer County to participate. **Figure I-3** identifies the participating jurisdictions represented in the Plan update who sought Plan approval.

While all of the municipalities within the County were invited and encouraged to participate in the Plan update via both electronic and verbal communications, none of the remaining municipalities chose to engage in the process and therefore are not included as participating jurisdictions in the Plan update.

The Village of Alexis is split almost equally between Mercer County and Warren County. Alexis chose to participate in the Warren County Hazard Mitigation Plan which was completed in 2023. While a small portion of Reynolds extends into Mercer County, a majority of the Village is located in Rock Island County. As a result, the Village chose to participate in the Rock Island County Hazard Mitigation Plan which was updated in 2021. Therefore, risk and/or vulnerability of Alexis and Reynolds not discussed in this Plan.

Figure I-3
Participating Jurisdictions Represented in the Plan

- Abington Township
- Aledo, City of
- Aledo Fire Protection District
- Bay Island Drainage & Levee District
- Genesis Medical Center
- Green Township Fire Protection District (Viola/Matherville)
- Joy, Village of
- Keithsburg, City of
- Matherville, Village of
- Preemption Township
- Sherrard, City of
- Sherrard Community Unit School District #200
- Sherrard Community Fire Protection District

1.2 COUNTY PROFILE

Mercer County is located in northwestern Illinois and covers approximately 569 square miles. **Figure I-4** provides a location map of the County and the participating municipalities while **Figures I-5** identifies the boundaries of the census tracts located in the County. **Figures I-6, I-7, I-8** and **I-9** identify the boundaries of the Mercer County townships, school districts, fire protection districts, and drainage & levee districts.

The County is bounded to the north by Rock Island County, to the east by Henry and Knox Counties, to the south by Henderson and Warren Counties, and to the west by the Mississippi River beyond which are the Iowa counties of Louisa and Muscatine. The City of Aledo is the county seat. The topography consists largely of broad, gently rolling uplands dissected by large and small tributaries of the Mississippi River, which form well defined valleys and broad flood plains as they approach the river. .

The County is situated in the northern portion of the Till Plains Section of the Central Lowland Province of the Interior Plains. The majority of the County is part of the glaciated Galesburg Plain. The surface of the upland area of the County has loess deposits and is nearly level to slightly rolling. About 56% of the County soils are classifies as prime farmland. Most areas are well-drained for crops grown in this area. The Mississippi watershed encompasses almost the entire County. The remaining portion of the County along the northeastern edge is drained by the Rock watershed.

According to the Multi-Resolution Land Characteristics (MRLC) Consortium, in 2021 approximately 94% of the County's land cover was vegetation, including developed open spaces, cultivated crop land, pasture/hay, and deciduous/mixed forest while 5.2% of the County's land cover was considered developed with 1.4% impervious surfaces. Between 2016 and 2021 approximately 2.2 square miles or 0.4% of the land cover in the County changed with 0.02 square miles of development and 0.08 square miles of impervious surfaces gained. **Figure I-10** illustrates the changes by land cover type.

Figure I-10
Mercer County Land Cover Data: 2016 to 2021

Land Cover Categories	Area 2016	Area Lost	Area Gained	Area 2021	Net Change	Percent Change
Developed, High Intensity	0.52	0.00	0.03	0.55	0.03	6.11%
Developed, Medium Intensity	3.50	0.00	0.13	3.62	0.13	3.58%
Developed, Low Intensity	15.46	-0.05	0.04	15.44	-0.02	-0.11%
Developed, Open Space	9.80	-0.13	0.01	9.68	-0.12	-1.27%
Cultivated Crops	409.08	-0.20	0.07	408.95	-0.13	-0.03%
Pasture/Hay	40.81	-0.07	0.04	40.78	-0.03	-0.07%
Grassland	1.06	-0.06	0.21	1.21	0.15	14.14%
Deciduous Forest	55.34	-0.12	0.04	55.26	-0.08	-0.15%
Evergreen Forest	0.23	-0.01	0.00	0.22	-0.01	-5.25%
Mixed Forest	9.00	-0.09	0.00	8.91	-0.09	-1.00%
Scrub/Shrub	0.19	-0.03	0.09	0.25	0.06	30.36%
Woody Wetland	11.85	-0.78	0.02	11.09	-0.76	-6.40%
Emergent Herbaceous Wetland	2.86	-0.08	1.32	4.10	1.24	43.40%
Barren Land	0.07	-0.01	0.10	0.16	0.10	142.71%
Open Water	8.98	-0.55	0.08	8.51	-0.47	-5.18%
Perennial Snow/Ice	0.00	0.00	0.00	0.00	0.00	0.00%
*All numbers expressed in square miles						

Source: Multi-Resolution Land Characteristics Consortium's National Landcover Database.

Agriculture is the major enterprise in Mercer County. According to the 2017 Census of Agriculture, there were 748 farms in Mercer County occupying approximately 78.6% (282,230 acres) of the total land area in the County. In comparison, there were 713 farms occupying 70.2% (251,200 acres) of the total land area in the County in 2012. The major crops include corn, soybeans, and winter wheat while the major livestock includes hogs and cattle. The County ranks 35th in the State for crop cash receipts and 17th in the State for livestock cash receipts.

The largest employment sectors in Mercer County are manufacturing and health care/social assistance followed by retail trade and educational services according to the Illinois Department of Commerce and Economic Opportunity. According to data from Mercer County Better Together and County Officials, leading employers include General Grind & Machine, Inc., Genesis Medical Center, Mercer Manor, Brookstone Assisted Living, Aledo Rehabilitation and Health Care, Sherrard CUSD #200, Mercer County CUSD #404, Diamond Ag, Gold Star FS, Nutrien Ag, and Wal-Mart.

Figure I-11, located at the end of this section, provides demographic and socio-economic data for the County, township, and municipalities. Two of the five municipalities and one of the two townships meet the definition of an Economically Disadvantaged Rural Community (EDRC). FEMA defines an EDRC as a community of 3,000 or fewer individuals whose residents have an average per capita annual income not exceeding 80 percent of the U.S. per capita income based on best available data.

Figure I-12, also located at the end of this section, provides additional demographic information by census tract with the U.S. Council on Environmental Quality Climate and Economic Justice

Screening Tool (CEJST) and the CDC/ATSDR Social Vulnerability Index (SVI) and overall level of vulnerability. CEJST is a geospatial mapping tool that identifies census tracts across the nation where communities are faced with significant burdens, which are grouped into eight categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. Communities are considered disadvantaged if they are in census tracts that meet the thresholds for at least one of these categories. In Mercer County, none of the participating jurisdictions are considered disadvantaged.

The SVI is a database that uses U.S. Census Bureau American Community Survey data to rank census tracts and counties on 16 social factors within four themes: Socioeconomic Status, Household Characteristics, Racial & Ethnic Minority Status, and Housing Type & Transportation. The goal of the SVI is to help emergency response planners and public health officials identify, map, and plan support for communities that will most likely need support before, during, and after a public health emergency.

The rankings generated by the SVI describe a county's or census tract's relative vulnerability among all other U.S. counties and census tracts. The SVI data used in this document is based on 2020 census tract information. Rankings are based on percentiles ranging from 0 to 1, with higher values indicating greater vulnerability. Each ranking is assigned to one of four levels of vulnerability: Low (0 – 0.2499), Low to Medium (0.2500 – 0.4999), Medium to High (0.5000 – 0.7499), and High (0.7500 – 1). A community with an SVI of 0.6000 or greater is considered an underserved and/or disadvantaged community. In Mercer County, none of the participating jurisdictions meet this definition.

Figures I-13, I-14, and **I-15** provide basic demographic information about the size and populations served by the participating school districts, fire protection districts and drainage and levee districts.

Figure I-13
Demographic Data by Participating School District

Participating District	Number of Schools in District	Estimated Population Served	Area Served (Sq. Miles) (2020)	Communities / Unincorp. Areas Served in the County	Census Tracts Falling with the District
Sherrard Community Unit School District #200	4	9,165	171	Matherville, Preemption, Sherrard, Viola, Windsor	401, 404

Source: Capability Assessment Worksheets – School Districts.

1.3 LAND USE AND DEVELOPMENT TRENDS

Population growth and economic development are two major factors that trigger changes in land use. Mercer County is largely rural with a population that has seen a 22% decrease between 1900 and 2010 from 20,945 to 16,434. Between 2010 and 2020 the population decreased by 4.5% from 16,434 to 15,699. During that same time period, all of the participating municipalities experienced population decreases with the exception of Sherrard, which increased by about 8%.

Land use in Mercer County is primarily agricultural. As discussed in the previous section, approximately 78.6% of the land within the County is used for farming practices. Agriculture is and will continue to be a major industry within the County and a mainstay of the County's economy.

Figure I-14
Demographic Data by Participating Fire Protection District

Participating District	Number of Fire Stations	Estimated Population Served	Area Served (Sq. Miles) (2020)	Communities / Unincorp. Areas Served in the County	Census Tracts Falling with the District
Aledo Fire Protection District	1	4,500	88	Aledo	401, 402, 403, 404
Greene Township Fire Protection District (Viola/Matherville)	1	2,000	25	Boden, Matherville, Gilchrist, Viola	404
Sherrard Community Fire Protection District	1	3,500	59	Cable, Preemption, Sherrard, Swedona	401

Source: Capability Assessment Worksheets – Fire Protection Districts.

Figure I-15
Demographic Data by Participating Drainage & Levee District

Participating District	Estimated Population Served	Area Served (Acres)	Communities / Unincorp. Areas Served in the County	Census Tracts Falling with the District
Bay Island Drainage & Levee District	80	25,000	---	402

Source: Capability Assessment Worksheets – Drainage & Levee Districts.

According to the Mercer County Health Department and Mercer County Better Together, there has been some smaller changes in development within the County since the previous Plan was approved. The Viola Boyz Backroads Speedway opened in 2021 about two miles southwest of Viola. This facility features an oval go-kart track, food vendor, and storage/maintenance buildings. Mercer County Motorsports, an off-road ATV and UTV track with trails has been developed about 1.5 miles southwest of Matherville. The Hawthorne Ridge Golf Course south of Aledo has closed and is being redeveloped as the Haven Hills Campground and Resort scheduled to open in April 2024. Neither development has increased the County's vulnerabilities to any of their identified hazards.

Of the participating jurisdictions, only Aledo is experiencing any small residential development (i.e., new home subdivisions, multi-family use housing, etc.). The City has approved development of Breezy Acres, a 15-lot residential subdivision, just south of 100th Avenue between NW 3rd Avenue and NE 3rd Avenue. The area has been graded and lots are for sale but construction as yet to begin. It is not anticipated that the subdivision will increase or decrease the City's vulnerabilities to any of their identified hazards.

In terms of future development and economic initiatives within the County and the participating jurisdictions, the County Clerk reported that the County has updated an ordinance allowing for solar energy development; however, there are no specific solar energy projects on the immediate horizon. There are no other large-scale economic development initiatives underway in the County. Substantial changes in land use (from forested and agricultural land to residential, commercial, and industrial) are not anticipated within the County in the immediate future. No sizeable increases in commercial or industrial developments are expected within the next five years.

Figure I-4
Location Map

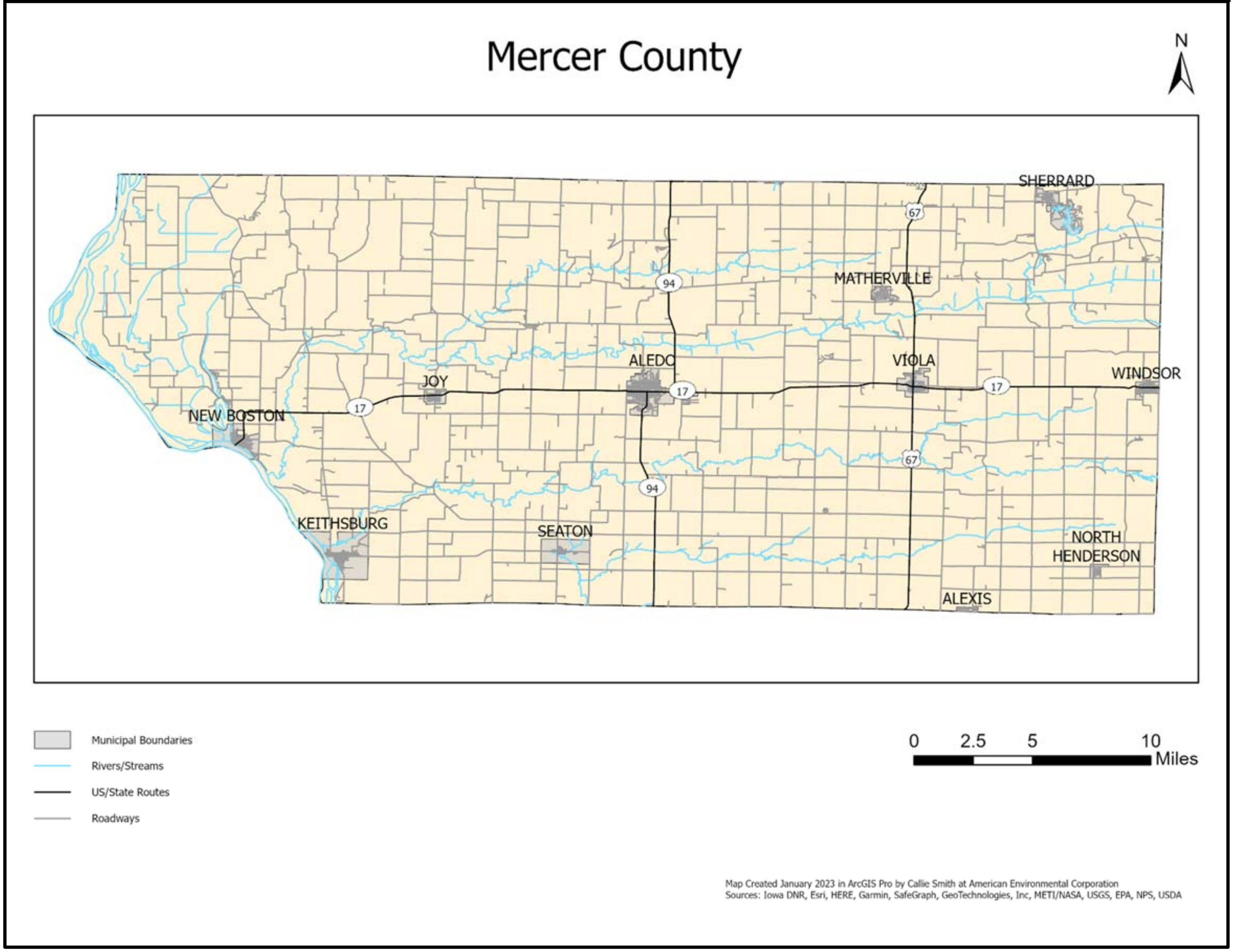


Figure I-5
Mercer County 2020 Census Tract Map

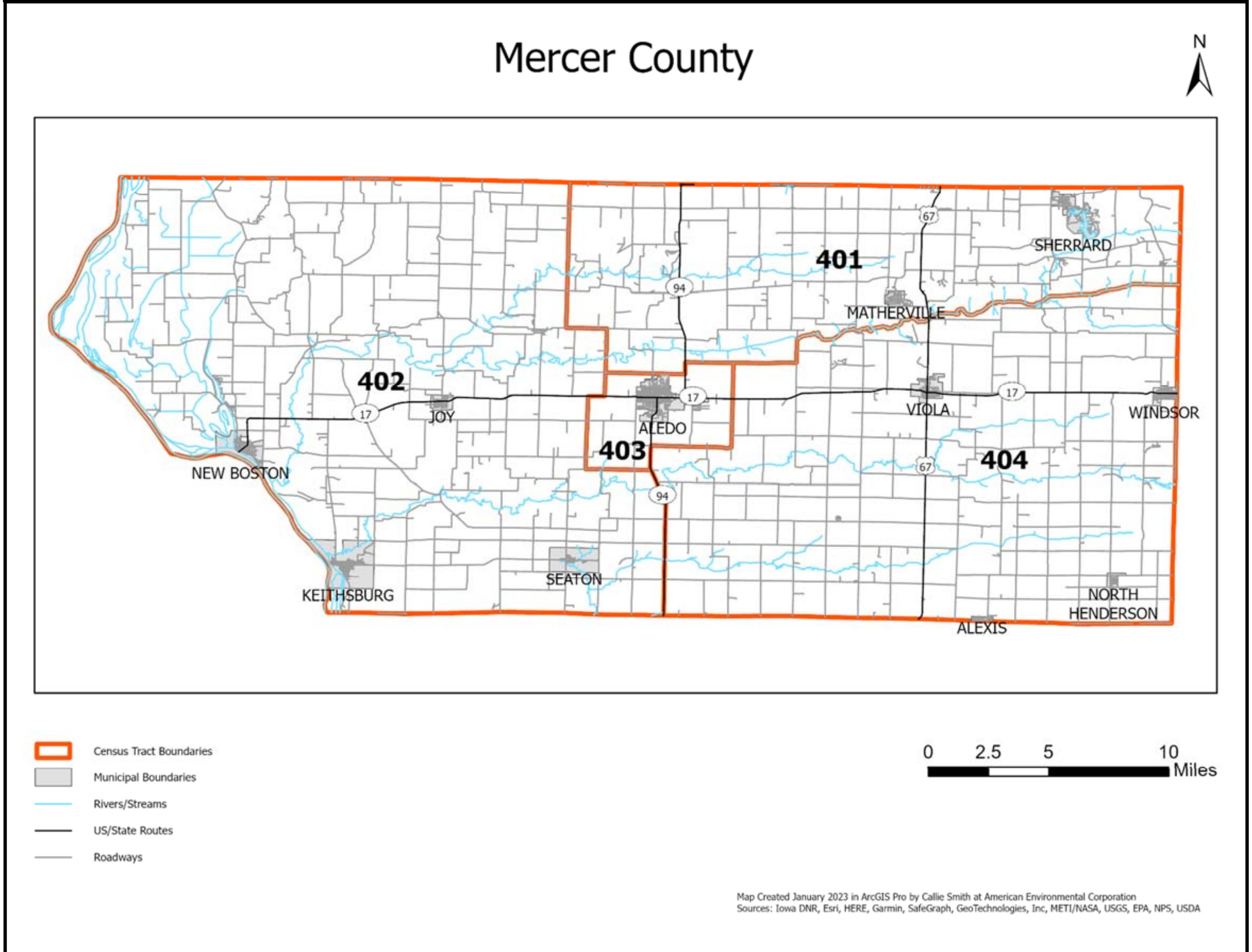


Figure I-6
Township Boundary Map

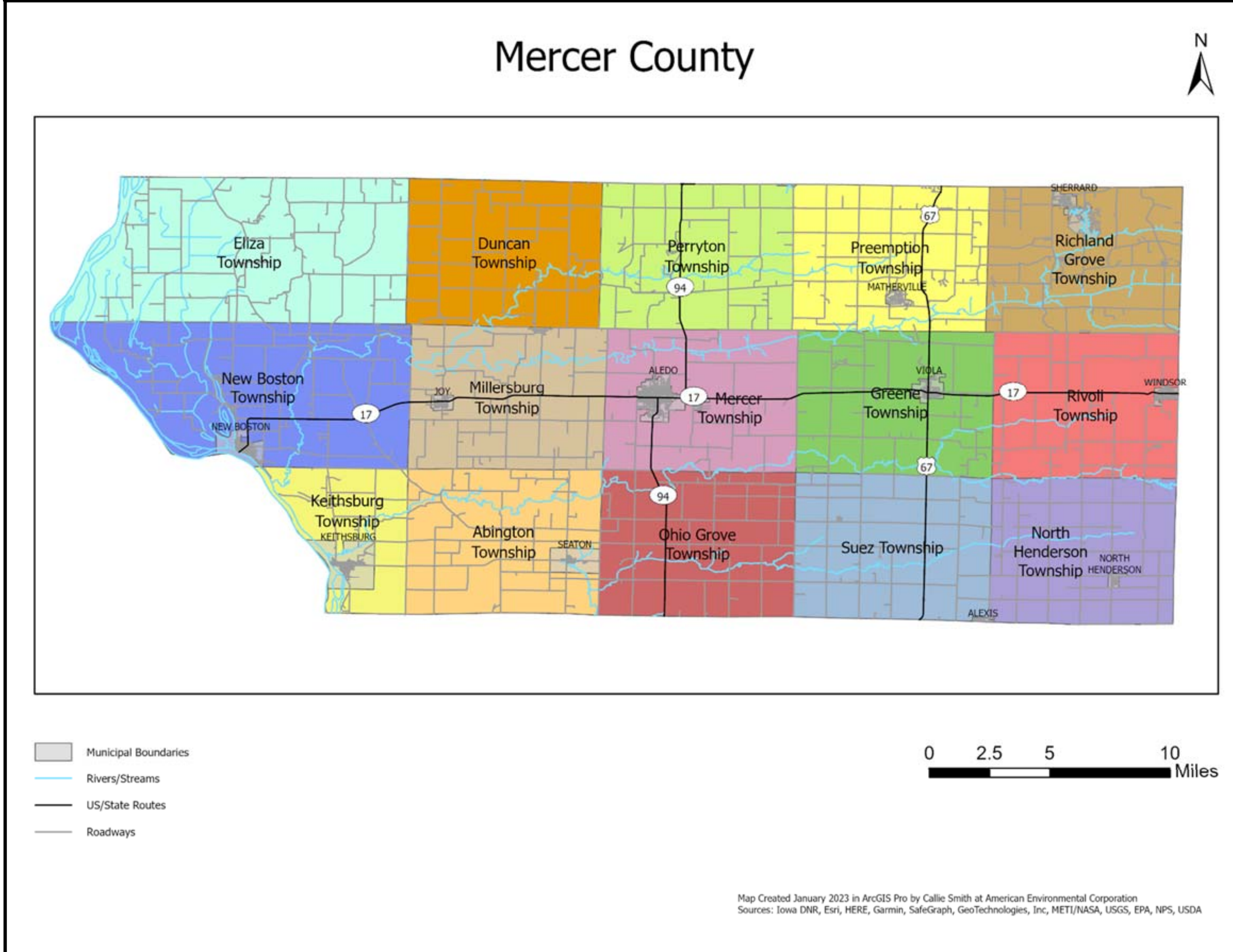


Figure I-7
School District Boundary Map

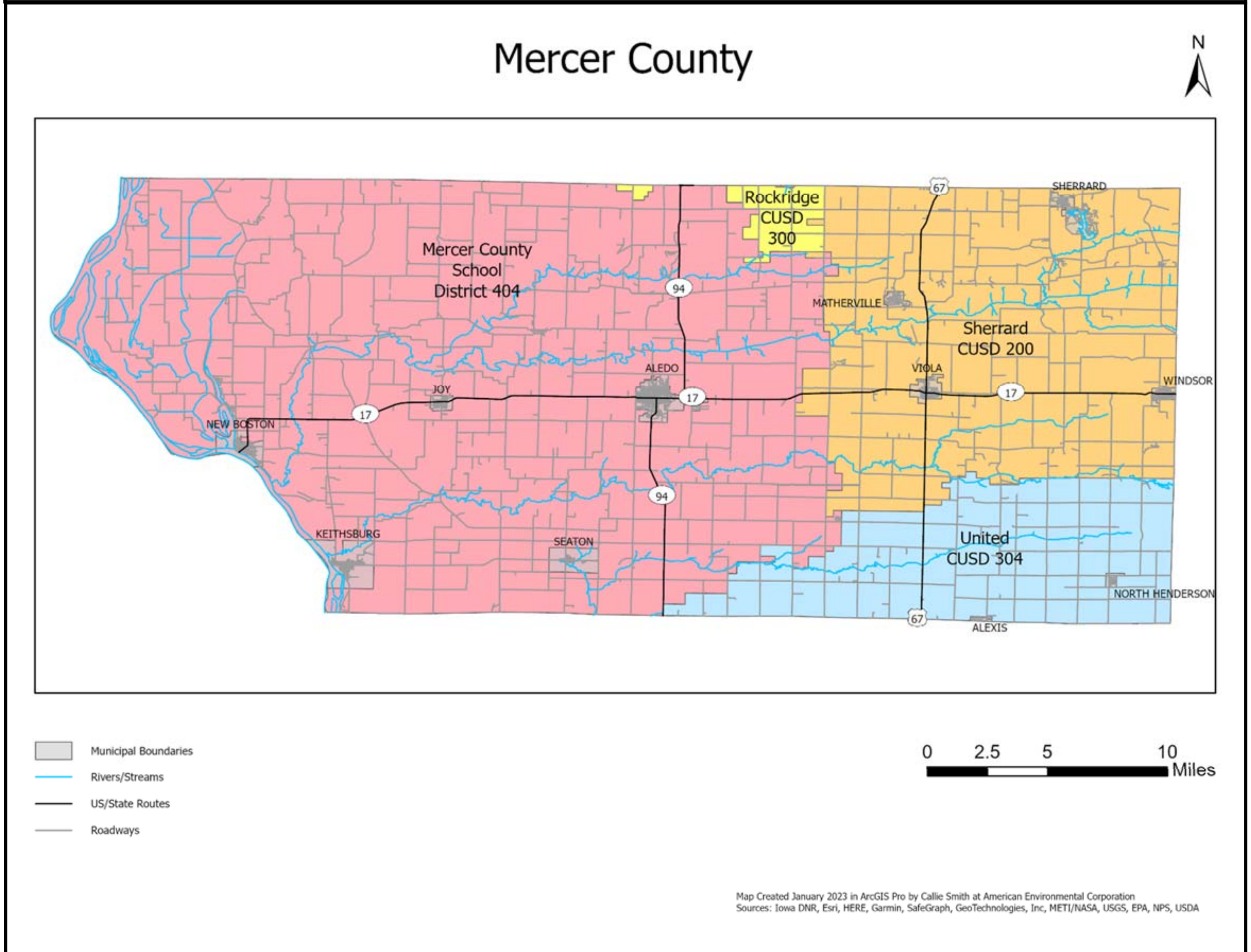


Figure I-8
Fire Protection District Boundary Map

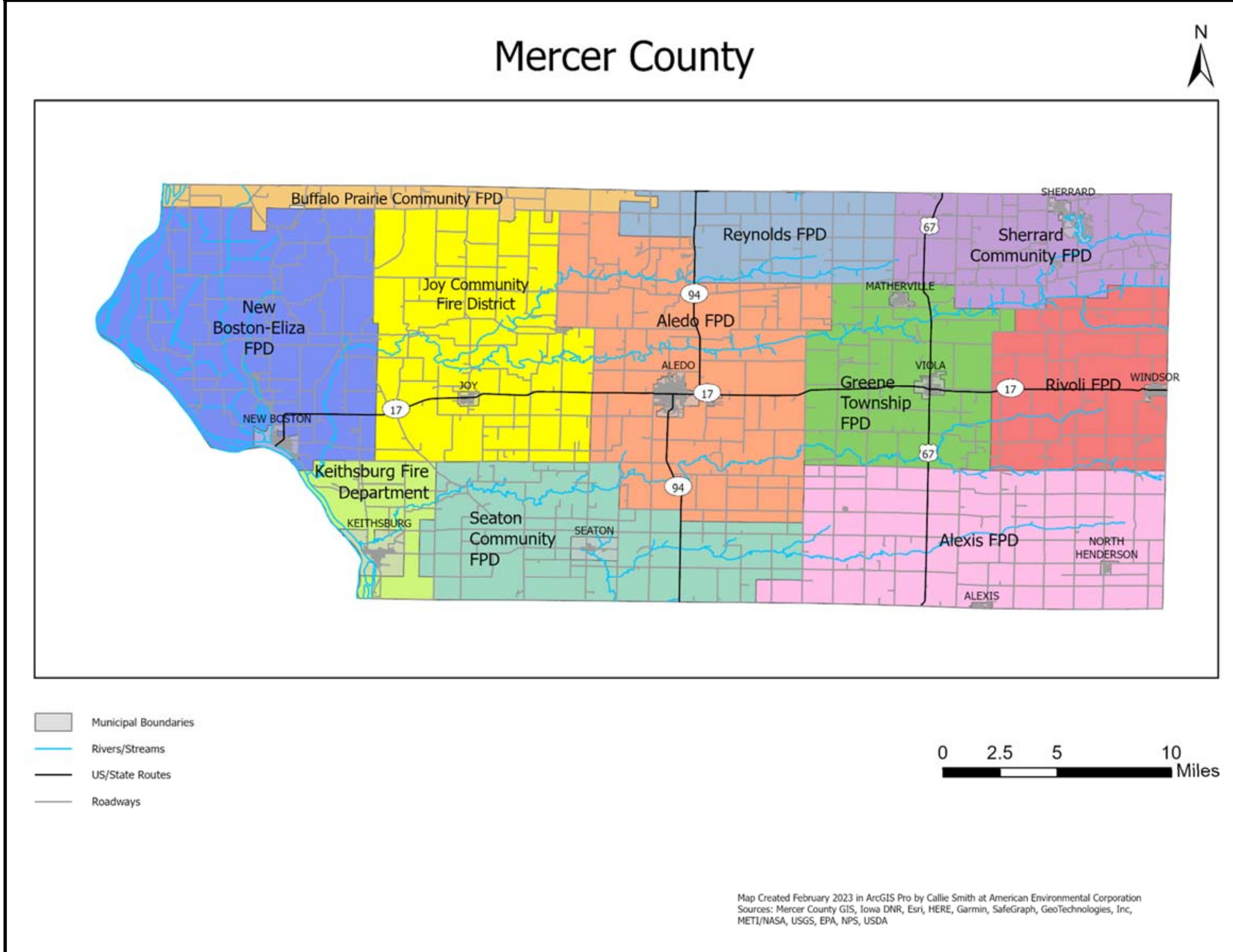


Figure I-9
Drainage & Levee District Boundary Map

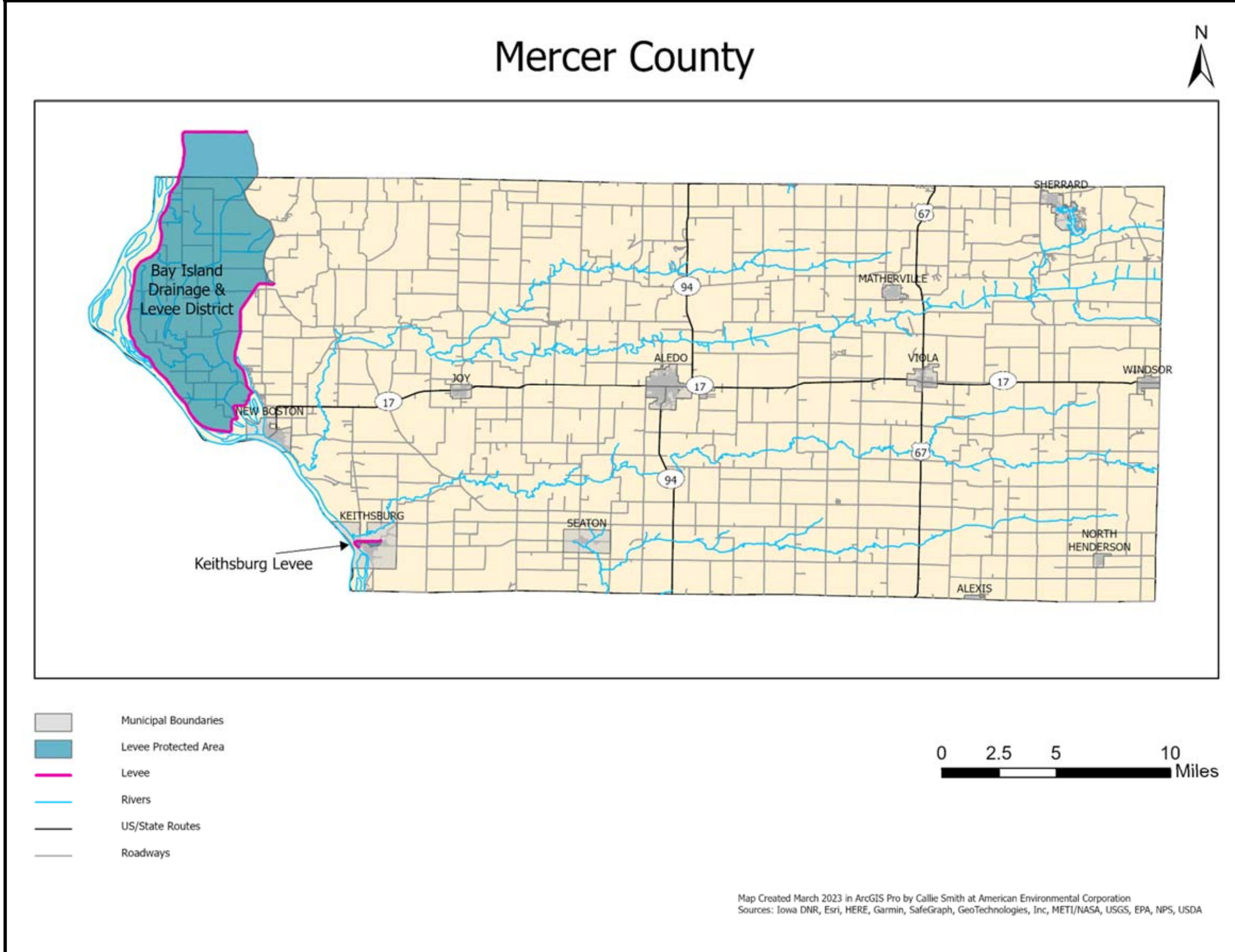


Figure I-11
2017-2021 Demographic Data by Participating Jurisdiction

Participating Jurisdiction	Population	Projected Population (2030)	Total Area (Sq. Miles) (2020)	Number of Housing Units	Percent Race								Income			Total Assessed Value of Housing Units (2022)
					White (alone)	Black or African American (alone)	Asian (alone)	Hispanic or Latino (of any race)	American Indian & Alaska Native (alone)	Native Hawaiian & Other Pacific Islander (alone)	Some other Race (alone)	Two or more Races	% of People whose Income is below the Poverty Line	Per Capita Income	EDRC*	
Mercer County (Total)	15,779	14,548	561.240	7,299	95.6%	0.5%	0.3%	2.7%	0.0%	0.0%	0.8%	2.8%	10.00%	$30,778	---	$168,878,055
Mercer County (Unincorp.)	5,992	5,525	550.337	2,848	96.2%	0.0%	0.1%	1.9%	0.0%	0.0%	0.6%	3.1%	7.50%	---	---	$82,548,803
Aledo	3,860	3,559	2.368	1,815	95.5%	1.8%	0.8%	2.1%	0.0%	0.0%	0.4%	1.5%	9.5%	$29,057	No	$37,511,079
Joy	367	338	0.428	165	97.0%	0.0%	0.0%	0.5%	0.0%	0.0%	2.7%	0.3%	14.7%	$24,219	Yes	$3,023,535
Keithsburg	652	601	2.558	359	98.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	22.4%	$32,840	No	$3,375,673
Matherville	876	808	0.391	342	94.4%	1.0%	0.0%	9.9%	0.0%	0.0%	2.4%	2.2%	12.6%	$25,427	Yes	$7,045,764
Sherrard	690	3636	0.928	267	90.0%	0.0%	0.0%	9.6%	0.0%	0.0%	6.4%	3.6%	1.9%	$32,500	No	$6,826,475
Abington Township	397	365	36.640	176	92.4%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	6.0%	0.80%	$32,771	No	$2,462,989
Preemption Township	2,001	1,845	36.847	854	97.6%	0.4%	0.0%	5.5%	0.0%	0.0%	1.0%	0.9%	9.10%	$29,815	Yes	$22,905,268
Illinois	12,821,813	12,841,250	55,513.18	5,412,995	67.8%	14.1%	5.7%	17.5%	0.3%	0.04%	6.2%	6.2%	11.8%	$39,571	---	---
US	329,725,481	---	3,533,038	139,647,020	68.2%	12.6%	5.7%	18.4%	0.8%	0.2%	5.6%	5.6%	12.6%	$37,638	---	---

* For the purposes of FEMA's Hazard Mitigation Assistance grant programs administered by the Illinois Emergency Management Agency and Office of Homeland Security, an Economically Disadvantaged Rural Community (EDRC) is defined in Illinois as a community of 3,000 or fewer individuals whose residents have an average per capita annual income not exceeding 80 percent of the U.S. per capita income based on best available data.

Sources: Mercer County Clerk.
Illinois Department Public Health, Population Projections – Illinois, Chicago and Illinois Counties by Age and Sex: July 1, 2015 to July 1, 2030 (2019 Edition).
U. S. Census Bureau, American Community Survey, 5-Year Data Profile.

Figure I-12
2017-2021 Demographic Data by Census Tract

Census Tract (2020)	Incorporated Municipalities and Townships that Fall Within Census Tract	Population (2017-2021)	Total Area (Sq. Miles) (2020)	Number of Housing Units (2017-2021)	Percent Race								Income	CEJST	Social Vulnerability Index	
					White (alone)	Black or African American (alone)	Asian (alone)	Hispanic or Latino (of any race)	American Indian & Alaska Native (alone)	Native Hawaiian & Other Pacific Islander (alone)	Some other Race (alone)	Two or more Races	% of People whose Income is below the Poverty Line	Identified as Dis-Advantaged	Nation-wide Overall SVI Ranking (2020)	Level of Vulnerability
401	Matherville, Reynolds, Sherrard, Greene Township, Mercer Township, Preemption Township, Perryton Township, Richland Township	4,511	113.599	1,968	96.6%	0.2%	0.0%	4.8%	0.0%	0.0%	1.6%	1.6%	7.6%	No	0.1121	Low
402	Joy, Keithsburg, New Boston, Seaton, Abington Township, Duncan Township, Eliza Township, Keithsburg Township, Mercer Township, Millersburg Township, New Boston Township, Ohio Township	3,395	240.139	1,641	97.0%	0.0%	0.4%	0.6%	0.0%	0.0%	0.8%	1.9%	14.3%	No	0.5187	Medium to High
403	Aledo, Mercer Township	3,882	15.982	1,868	95.5%	1.8%	0.8%	2.1%	0.0%	0.0%	0.4%	1.5%	9.4%	No	0.2764	Low to Medium
404	Alexis, North Henderson, Viola, Windsor, Greene Township, Mercer Township, North Henderson Township, Ohio Township, Preemption Township, Richland Grove Township, Rivoli Township, Suez Township	3,991	191.521	1,822	93.4%	0.0%	0.2%	2.7%	0.0%	0.0%	0.2%	6.2%	9.7%	No	0.3081	Low to Medium
Mercer County		15,779	561.240	7,299	95.6%	0.5%	0.3%	2.7%	0.0%	0.0%	0.8%	2.8%	10.0%	--	0.0598	Low

Sources: CDC/ATSDR Social Vulnerability Index.
U.S. Census Bureau, American Community Survey, 5-Year Data Profile.

2.0 PLANNING PROCESS

The Mercer Multi-Jurisdictional Natural Hazards Mitigation Plan (the Plan) was updated through the Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. The Plan was prepared to comply with the Disaster Mitigation Act of 2000 and incorporates the nine recommended tasks for developing or updating a local hazard mitigation plan as outlined in Federal Emergency Management Agency's (FEMA) *Local Mitigation Planning Handbook*. **Figure PP-1** provides a brief description of the process utilized to prepare this Plan.

Figure PP-1
Description of Planning Process

Tasks	Description
Task One: Building the Planning Team	The Planning Committee was reformed with broad representation and specific expertise to assist the County, and the Consultant in updating the Plan.
Task Two: Outreach Strategy	Early and ongoing public involvement activities were conducted throughout the Plan's development to ensure the stakeholders and public was given every opportunity to participate and provide input.
Task Three: Risk Assessment	The Consultant identified and profiled the natural hazards that have impacted the County and conducted vulnerability analyses to evaluate the risk to each participating jurisdiction.
Task Four: Capability Assessment	Participating jurisdictions have a unique set of capabilities and resources available to accomplish hazard mitigation. Capabilities that include planning and regulatory, administrative and technical, financial, and education and outreach were identified and cataloged to determine the existing capabilities of each participant related to hazard and loss reduction/prevention.
Task Five: Mitigation Strategy	After reviewing existing plans and completing the risk assessment, the Consultant assisted the Planning Committee in updating the goals and objectives for the Plan. The participating jurisdictions were then asked to identify mitigation actions that had been started and/or completed since the previous Plan was adopted. In addition, they were asked to identify any new mitigation actions based on the results of the risk assessment. The new mitigation actions were then analyzed, categorized, and prioritized.
Task Six: Plan Maintenance and Update	The method and schedule for monitoring, evaluating, and updating the Plan was reviewed and discussed with the participating jurisdictions. The Plan update will be monitored and evaluated by a Plan Maintenance Subcommittee on an annual basis and updated again in five years.
Task Seven: Review and Adopt the Plan	The draft Plan update summarized the results of Tasks Two through Seven. The Plan was reviewed by the participants and a public forum was held to give the public an additional opportunity to provide input. Comments received were incorporated into the draft Plan update and submitted to the Illinois Emergency Management Agency and Office of Homeland Security (IEMA-OHS) and FEMA for review and approval. Comments received from IEMA-OHS and FEMA were incorporated into the final Plan update. The final Plan update was then submitted to the County and participating jurisdictions for adoption.

The Plan update and development was led at the staff level by Angie Litterst, the Mercer County Health Department Administrator and former Mercer County Office of Emergency Management Director. Mercer County contracted with Henry County in January 2023 for emergency management services. American Environmental Corp. (AEC) an environmental consulting firm, with experience in hazard mitigation, risk assessment and public involvement, was employed to guide the County and participating jurisdictions through the planning process.

Participation in the planning process, especially by the County and local government representatives, was crucial to the update of the Plan. To ensure that all participating jurisdictions took part in the planning process, participation requirements were established. Each participating jurisdiction agreed to satisfy the following requirements in order to be included in the Plan update. All of the participating jurisdictions met the participation requirements.

- Attend at least one Committee meeting.
- Complete a capability assessment identifying existing capabilities and resources (i.e., plans, policies, ordinances studies, reports, maps, etc.) available to accomplish hazard mitigation.
- Identify/submit a list of critical infrastructure and facilities.
- Review the risk assessment and provide additional information on events and damages when available.
- Participate in the update of the mitigation goals and project prioritization methodology.
- Provide information on any mitigation actions started and/or completed since the adoption of the previous Plan.
- Identify and submit a list of new mitigation actions.
- Review and comment on the draft Plan update.
- Formally adopt the Plan update.
- Where applicable, incorporate the Plan update into existing planning efforts.
- Participate in the Plan update maintenance.

2.1 MITIGATION ADVISORY COMMITTEE

As previously mentioned, at the start of the planning process, the Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee was formed to update the hazard mitigation plan. The Committee included representatives from each participating jurisdiction, as well as education, emergency services, flood control, and healthcare.

Figure PP-2 details the entities represented on the Committee and the individuals who attended on their behalf. The Planning Committee was chaired by the Mercer County Health Department. Additional technical expertise was provided by the staff at the Illinois Emergency Management Agency and Office of Homeland Security and the Illinois Department of Natural Resources Office of Water Resources.

Mission Statement

Over the course of the first two meetings the Planning Committee developed a mission statement that described their objectives for the Plan update.

The mission of the Mercer County Multi-Jurisdictional Natural Hazards Planning Committee is to prepare a mitigation plan that:

1) documents the risks associated with the natural hazards that impact the County and

2) identifies projects and activities that mitigate risk to people, structures, facilities, and systems that provide support to the County, its residents and economy as well as community lifelines that enable the continuous operation of critical government and business functions."

Figure PP-2
Mercer County Planning Committee Member Attendance Record
(Sheet 1 of 2)

Representing	Name	Title	10/20/2022	3/15/2023	6/21/2023	9/13/2023	12/13/2023
Abingdon Township	DeKeyrel, Harvey	Road Commissioner		X			
Aledo Fire Protection District	Blaser, Justin	Lieutenant	X	X		X	X
Aledo Fire Protection District	Myers, Tony	Fire Chief		X			
Aledo, City of	Blaser, Justin	Public Works Director	X	X		X	X
Aledo, City of	Chausse, Michael	Administrator				X	X
Aledo, City of	Fisk, Trevor	Police Chief			X		
Aledo, City of	Mitchell, Patti	Administrative Assistant Police Department			X		
Aledo, City of	Seefeld, Nick	Lieutenant	X				
American Environmental Corporation	Bostwick-Campbell, Andrea	EMS Manager	X	X	X		X
American Environmental Corporation	Runkle, Ken	Risk Assessor				X	
American Environmental Corporation	Smith, Callie	Environmental Analyst	X	X	X	X	X
Bay Island Drainage & Levee District	Elliott, Jake	Commissioner			X		X
Bay Island Drainage & Levee District	Marston, Dustin	Chairman		X	X	X	X
Bay Island Drainage & Levee District	Smith, Bobby	Commissioner		X	X		
Duncan Township	Newswander, Tiffany	Township Assessor	X				
Eliza Township	Newswander, Tiffany	Township Assessor	X				
Genesis Health System Ambulance	Barnhouse, Jon	Paramedic	X		X		
Genesis Health System Ambulance	Schroth, Renee	Paramedic		X		X	
Genesis Medical Center	Sarabasa, Linda	Emergency Department Nurse Manager	X				
Greene Township (Matherville) Fire Protection District	Flickinger, David	Fire Chief		X	X		
Greene Township (Viola) Fire Protection District	Morrison, Jim	Fire Chief		X	X		
Henderson County - EMA	Brown, Cindy	Coordinator					X
Henry County - Office of Emergency Management	Cameron, Ryan	Chief Deputy Director				X	X
Henry County - Office of Emergency Management	Schnepple, Mat	Director of Emergency Management		X	X		
Joy Community Fire District	Barnhouse, Jon	Captain	X		X		
Joy, Village of	Pritchett, Gwen	Clerk		X	X		
Keithsburg, City of	Reason, Sharon	Mayor	X	X		X	X
Matherville, Village of	Adams, Larry	Mayor			X		
Mercer County - Board	Arbet, Tim	Member	X				
Mercer County - Board	Frieden, Josh	Chairman	X				
Mercer County - Clerk & Recorder	Blaser, Sara	Clerk	X				
Mercer County - Health Department	Ewing, Carla	Administrator	X				
Mercer County - Health Department	Litterst, Angie	Administrator		X	X	X	X
Mercer County - Highway Department	Lower, Matt	Zoning & Highway Administrator		X			
Mercer County - Office of Emergency Management	Litterst, Angie	Director	X				
Mercer County - Sheriff's Office	Terrill, Dusty	Sheriff	X				
Mercer Manor	Holmberg, Janet	Administrator	X				
Mercer Township	Newswander, Tiffany	Township Assessor	X				
Millersburg Township	Dixon, Darla	Township Assessor	X				
Millersburg Township	Retherford, John	Road Commissioner	X				
New Boston Township	Dixon, Darla	Township Assessor	X				
Ohio Grove Township	Simpson, Jeff	Road Commissioner		X			
Perryton Township	Newswander, Tiffany	Township Assessor	X				
Preemption Township	Adams, Larry	Supervisor			X		
Preemption Township	Epperly, Laurie	Assessor		X			
Richland Grove Township	Epperly, Laurie	Assessor		X			
Rivoli Township	Easley, Cathi	Supervisor	X				
Rivoli Township	Epperly, Laurie	Assessor		X			
Seaton Community Fire Protection District	Simpson, Jeff	Trustee		X			
Sherrard Community Fire Protection District	Dobbeleare, Dave	Fire Chief				X	
Sherrard Community Fire Protection District	Dobbeleare, Stephanie	Volunteer			X	X	X
Sherrard Community Fire Protection District	Rath, Paula	Firefighter	X				
Sherrard Community Unit School District #200	Johnson, Carl	Superintendent				X	X

Figure PP-2
Mercer County Planning Committee Member Attendance Record
(Sheet 2 of 2)

Representing	Name	Title	10/20/2022	3/15/2023	6/21/2023	9/13/2023	12/13/2023
Sherrard, Village of	Dobbeleare, Stephanie	Trustee			X	X	X
Sherrard, Village of	Rath, Paula	Mayor Pro Tem	X				
Viola, Village of	Bewley, Jesse	Police Chief				X	X
Viola, Village of	Morrison, Jim	Designated Representative			X		

Planning Committee Meetings

The Planning Committee met five times between October 2022 and December 2023. **Figure PP-2** identifies the representatives by jurisdiction present at each meeting. **Appendices A** and **B** contain copies of the attendance sheets and meeting minutes for each meeting. The purpose of each meeting, including the topics discussed, is provided below.

First Planning Committee Meeting – October 20, 2022

The purpose of this meeting was to explain the planning process to the Planning Committee members and give them a brief overview of the planning process including what mitigation is, what a hazards mitigation plan is and why the Plan needs to be updated. A discussion regarding the hazards to be included in the Plan update was conducted and an electronic survey was sent out following the meeting asking Planning members whether dam failures, mine subsidence, and landslides should be included in the Plan update. Based on the responses received, the Planning Committee chose to include dam failures and mine subsidence. The Committee did not feel landslides posed a significant impact on the County and therefore decided not to include the hazard in the update.

Information needed from each participant was discussed and representatives for the County and the participating jurisdictions were asked to complete the forms entitled "Capability Assessment Worksheet," "Critical Facilities & Infrastructure," "Identification of Severe Weather Shelters" and "Drinking Water Supply Worksheet" and return them at the next meeting.

Committee members were then asked to identify any recent or historic natural hazard events that have impacted the County and participants. A "Hazard Events Questionnaire" was distributed to solicit information on hazard events. Community participation was also discussed. The County and participating jurisdictions were asked to make information available on the planning process at their offices and in the communities. A "Citizen Questionnaire," was also distributed electronically to Committee members prior to the meeting for distribution to their constituents to gauge the public's perception about the hazards that impact the County. Finally, drafts of a mission statement and updated mitigation goals were presented for review.

Second Planning Committee Meeting – March 15, 2023

At the second Committee meeting portions of the updated natural hazard risk assessment sections were presented for review. Following the review of the risk assessment, the Committee members participated in an exercise to calculate the Risk Priority Index (RPI) for the County and participating jurisdictions. The RPI can assist participants in determining which hazards present the highest risks and therefore which ones to focus on when formulating mitigation projects and activities. The Committee then discussed the draft mission statement and updated mitigation goals.

The mission statement and mitigation goals were then reviewed, discussed, and finalized with no changes.

Next, mitigation actions were defined, and examples were discussed. As part of the Plan update, individual mitigation action lists will be created for each participating jurisdiction. Committee members were asked to identify any mitigation projects and activities their jurisdictions had started and/or completed since the previous Plan was completed in 2016. Ideas for new potential mitigation projects and activities were presented. Representatives for the County and the participating jurisdictions were asked to complete the forms entitled "Existing Mitigation Project/Activity Status" and "New Hazard Mitigation Projects" and return them at the next meeting.

Third Planning Committee Meeting – June 21, 2023

The purpose of the third Committee meeting was to discuss the vulnerability analysis for select natural hazards and the preliminary results of the RPI exercise. The Committee members then discussed vulnerable community assets and completed the form entitled "Assets Vulnerability Survey" which will be used in the vulnerability analyses.

The concept of community lifelines was also discussed. Community lifelines enable the continuous operation of critical government and business functions essential to human health and safety or economic security. While the concept was developed to support emergency response and planning, FEMA has begun applying it to all phases of emergency management, including mitigation. Community lifelines will be included in most project descriptions to create a clear connection to the concept.

Next, an explanation of what a mitigation action prioritization methodology is and how it fits into the Mitigation Strategy was provided. The Committee reviewed the updated mitigation project prioritization methodology and approved it with no changes. Finally, a discussion on how the mitigation projects and activities identified by the participating jurisdictions will be presented in the Plan update was provided. Participants were encouraged to provide their mitigation project lists prior to the 4th meeting when draft lists will be distributed for review.

Fourth Planning Committee Meeting – September 13, 2023

At the fourth Committee Meeting, members reviewed the draft jurisdiction-specific mitigation action tables which identified and prioritized the new and existing mitigation projects and activities provided by the participants. Members were given the opportunity to add additional projects and activities to their tables.

The public forum and adoption process were then discussed, and a date for the public forum was set. Finally, the plan maintenance and update requirements were discussed. The Plan update will be monitored and evaluated on an annual basis by a Plan Maintenance Subcommittee which will be made up of the participating jurisdictions, and key members of the Committee. The Plan must be reviewed, revised, and resubmitted to IEMA and FEMA at least once every five years.

Fifth Planning Committee Meeting – December 13, 2023

At this Committee meeting the public was provided an opportunity to ask questions and provide comments on the draft Plan update.

2.2 OUTREACH STRATEGY

To engage the public in the planning process, a comprehensive outreach strategy was developed. The strategy was structured to engage the public, including underserved communities and vulnerable populations, in a two-way dialogue, encouraging the exchange of information throughout the planning process. A mix of public involvement techniques and practices were utilized to:

- ➢ disseminate information;
- ➢ identify additional useful information about natural hazard occurrences and impacts;
- ➢ assure that interested residents would be involved throughout the Plan update's development; and
- ➢ cultivate ownership of the Plan update, thus increasing the likelihood of adoption by the participating jurisdictions.

The dialogue with the public followed proven risk communication principles to help assure clarity and avoid overstating or understating the impacts posed by the natural hazards identified in the Plan update. The following public involvement techniques and practices were applied to give the public an opportunity to access information and participate in the dialogue at their level of interest and availability.

Citizen Questionnaire

A citizen questionnaire was developed to gather facts and gauge public perceptions about natural hazards that affect Mercer County. The questionnaire was distributed electronically to the Committee members who were encouraged to make it available to their residents and the general public. A copy of the questionnaire is contained in **Appendix C**.

A total of 12 questionnaires were completed and returned to the Committee. Questionnaires were completed by residents in each participating municipality with the exception of exception of Matherville and Viola. These responses provide useful information to decision makers as they determine how best to disseminate information on natural hazards and safeguard the public. Additionally, these responses identify the types of projects and activities the public is most likely to support. The following provides a summary of the results.

- ❖ Respondents felt that severe winter storms were the most frequently encountered natural hazard in Mercer County followed by severe summer storms and flooding. However, while complied weather records do indicate that severe winter storms followed by severe summer storms do occur more frequently, extreme cold events, in fact, occur more frequently than flood events.
- ❖ The most effective means of communication identified by respondents to disseminate information about natural hazards were social media and mailings, followed by television and radio. Fact sheets/brochures disseminated via fire departments/law enforcement, as

well as information made available on the internet also received some support among respondents.

- In terms of the most needed mitigation projects and activities, the following categories received the strongest support:
  - maintain power during storms by burying power lines, trimming trees and/or purchasing backup generators (83%);
  - maintain roadway passages during snowstorms and heavy rains (75%);
  - public information fact sheets and brochures describing actions residents can take to protect themselves and their property against natural hazard impacts (58%);
  - building codes and enforcement (58%); and
  - identify residents with special needs in order to provide assistance during a natural hazard event (58%).

FAQ Fact Sheet

A "Frequently Asked Questions" fact sheet was disseminated to help explain what a natural hazards mitigation plan is and briefly describe the planning process. The fact sheet was made available to each participating jurisdiction to provide to their constituents. A copy of the fact sheet is contained in **Appendix D**.

News Releases & Social Media Posts

News releases were prepared and submitted to 102.3 FM WRMJ radio and posted to the Mercer County Facebook page prior to each Committee meeting. The releases announced the purpose of the meetings and how the public could become involved in the Plan update's development. **Appendix E** contains copies of the releases, Facebook posts, and any news articles published.

Planning Committee Meetings

All of the meetings conducted by the Planning Committee were open to the public and publicized in advance to encourage public participation. At the end of each meeting, time was set aside for public comment. In addition, Committee members were available throughout the planning process to talk with residents and local government officials and were responsible for relaying any concerns and questions voiced by the public to the Committee. Interested individuals from the public who attended the Planning Committee meetings were provided handout materials and encouraged though not required to provide their names and/or sign the attendance sheets. Copies of the attendance sheets are included in **Appendix A**.

Public Forum

The final meeting of the Committee, held on December 13, 2023 was conducted as an open-house public forum. The open-house format was chosen for this forum instead of a hearing to provide greater flexibility for residents who wished to participate. Residents were able to come and go at any time during the forum, reducing conflicts with business, family, and social obligations.

In conjunction with the public forum, the draft Plan update was made available for review and comment on the Mercer County Health Department's website. A two-page handout summarizing the planning process and a link to a comment survey that could be used to provide feedback on the draft Plan update were also posted on the website.

At the forum, residents could review a draft of the Plan update; meet with representatives from the County, the participating jurisdictions, and the Consultant; ask any questions; and provide verbal and/or written comments on the draft Plan update. Individuals attending the public forum were provided with a two-page handout summarizing the planning process and a comment sheet that could be used to provide feedback on the draft Plan update. **Appendices F** and **G** contain copies of these materials.

Public Comment Period

After the public forum, the draft Plan update was made available for public review and comment through December 29, 2023 at the Mercer County Health Department's Office and on its website. A two-page handout summarizing the planning process and a link to a comment survey that could be used to provide feedback on the draft Plan update were also posted on the website. **Appendix G** contains a copy of the online comment survey. Residents were encouraged to submit their comments electronically, by mail or through representatives of the Committee.

Results of Outreach Strategy

The public involvement strategy implemented during the planning process created a dialogue among participants and interested residents, which resulted in many benefits, a few of which are highlighted below.

- *Acquired additional information about natural hazards.* Verifiable hazard event and damage information was obtained from participants that presents a clearer assessment of the extent and magnitude of natural hazards that have impacted the County. This information included details about severe winter storms, lightning strikes, flooding, and tornadoes not available from state and federal databases.
- *Obtained critical facilities damage information.* Data collection surveys soliciting information about critical facilities damaged by natural hazards were used to supplement information obtained from government databases. This information was vital to the preparation of the vulnerability analysis.
- *Increased awareness of the impacts associated with natural hazard events within the County.* Understanding how mitigation actions can reduce risk to life and property helped generate ***over** 65 **new mitigation projects and activities*** at the local level that had not been previously identified in any other planning process.

2.3 PARTICIPATION OPPORTUNITIES FOR INTERESTED PARTIES

Businesses, schools, not-for-profit organizations, neighboring counties, and other interested parties were provided multiple opportunities to participate in the planning process. Wide-reaching applications were combined with direct, person-to-person contacts to identify anyone who might have an interest or possess information which could be helpful in updating the Plan.

Education

While the school districts serving Mercer County were invited to serve on the Planning Committee and provide input into the planning process, only Sherrard Community Unit School District #200 participated and chose to be included as participating jurisdiction in the Plan update.

Healthcare & Social Service Agencies

Input was sought from the healthcare community and social service agencies. Representatives from the Aledo Rehabilitation and Aledo Assisted Living, Brookstone of Aledo Assisted Living, Genesis Health System Ambulance, Genesis Medical Center, Mercer County Health Department, Mercer Foundation for Health, and Mercer Manor were invited to serve on the Planning Committee. The Health Department Genesis Medical Center, Genesis Health System Ambulance and Mercer Manor attended the Committee meetings and provided input into the planning process. Genesis Medical Center chose to be included as a participating jurisdiction in the Plan update.

Levee & Drainage Districts

Bay Island Drainage and Levee District was invited to serve on the Planning Committee. The Drainage and Levee District provided input into the planning process and chose to be included as a participating jurisdiction in the Plan update.

Other Government Entities

The fire protection districts and townships in Mercer County were contacted and invited to participate in the Plan update. Representatives from Abington Township, Aledo Fire Protection District (FPD), Duncan Township, Eliza Township, Greene Township (Matherville/Viola) FPD, Joy Community Fire District, Mercer Township, Millersburg Township, New Boston Township, Ohio Grove Township, Perryton Township, Preemption Township, Richland Grove Township, Rivoli Township, Seaton Community FPD, and Sherrard Community FPD served on the Committee and provided input into the planning process. Abington Township, Aledo FPD, Greene Township FPD, Preemption Township, and Sherrard Community FPD chose to be included as participating jurisdictions in the Plan update.

Neighboring Counties

A memo was sent to EMA/ESDA/OEM coordinators in the neighboring counties inviting them to participate in the mitigation planning process. The counties contacted included Rock Island, Henry, Knox, Warren, Henderson in Illinois and Louisa and Muscatine in Iowa. **Appendix H** contains a copy of the invitation memo.

2.4 IDENTIFICATION OF EXISTING CAPABILITIES

Each participating jurisdiction has a unique set of capabilities and resources available to accomplish hazard mitigation and reduce long-term vulnerabilities to hazard events. In order to identify these existing capabilities and resources, a Capability Assessment was conducted. The Capability Assessment helps determine the ability of the participating jurisdictions to implement the Mitigation Strategy and to identify potential opportunities for establishing or enhancing specific mitigation policies, program, or projects. It is important to try and establish which goals and actions are feasible based on an understanding of the organizational capacity of those entities tasked with their implementation. This assessment is designed to provide a general overview of the key capabilities in place for each participating jurisdiction along with their potential effect of loss reduction.

In order to catalog the existing capabilities of each participant, Capability Assessment Worksheets were distributed to each of the participating jurisdictions at the first Committee meeting on October 20, 2022. The worksheets requested information on four primary types of capabilities: planning and regulatory; administrative and technical; financial; and education and outreach. The following provides a brief description of each capability type.

Planning & Regulatory Capabilities: Planning and regulatory capabilities are based on the implementation of existing plans, policies, codes, ordinances, resolutions, local laws, and programs that prevent or reduce the impacts of hazards and guide and manage growth and development.

Administrative & Technical Capabilities: Administrative and technical capabilities are based on the available staff and personnel resources as well as their related skills and tools that can be used to develop and implement mitigation actions, policies, and programs.

Financial Capabilities: Financial capabilities include those resources a jurisdiction has access to or is eligible to use to implement mitigation actions, polices, and programs.

Education & Outreach Capabilities: Education and outreach capabilities include programs and methods already in place that could be used to support implementation of mitigation actions and communicate hazard-related information.

Figures PP-3 through **PP-16** summarize the results of the Capability Assessment by participating jurisdiction type (i.e., county/municipalities, schools, fire protection districts, townships, healthcare facilities, etc.) A capability level of "Limited", "Moderate" or "High" was assigned by capability type to each participating jurisdiction based on the number of available capabilities and resources as well as the jurisdiction's size/area served. **Figure PP-17** summarizes the individual capability levels by capability type and provides an overall capability ranking for each participant.

This assessment provides a consolidated inventory of existing plans, ordinances, programs, and resources in place. Whenever applicable, these existing capabilities were reviewed and incorporated into the Plan.

Highlights from the Capability Assessment include:

- ❖ While two of the municipalities (Aledo and Sherrard) have building codes in place, the County and the remaining three municipalities do not.
- ❖ The County and all of the municipalities have zoning ordinances in place.
- ❖ Only Aledo has a future land use map in place. Neither the County nor any of the municipalities have developed comprehensive plans. While the County indicated in the 2016 Plan it had a comprehensive plan in place, it could not be located during the Plan update.
- ❖ Only the County has a continuity of operations plan in place.

The County, Aledo, Sherrard CUSD #200, Aledo FPD, Greene Township FPD, Sherrard Community FPD, Genesis Medical Center and Bay Island D&LD are fortunate to have the resources and abilities to potentially expand on and improve the existing policies and programs identified. Joy, Keithsburg, Matherville, Sherrard, Abington Township, and Preemption Township have more limited resources and abilities to expand on and improve the existing policies and programs identified. The lack of legal authority and policies/programs currently in place, may hamper these participants' abilities to expand and strengthen existing policies and programs. Their fiscal and staffing situations are also limited.

Overcoming these limitations will require time and a range of actions including, but not limited to improved general awareness of natural hazards and the potential benefits that may come from the development of new standards in terms of hazard loss prevention and the identification of resources available to expand and improve existing policies and programs should the opportunity arise.

Based on conversations with Committee members, none of the jurisdictions that participated in the 2016 Plan update, with the exception of Aledo, have incorporated it into other planning mechanisms within their jurisdictions.

A review of local plans revealed that none of the participating jurisdictions have developed comprehensive plans and only Aledo has a future land use map. Aledo completed an update of its future land use map in 2017. Specific recommendations from the 2016 Plan update were not incorporated into the map revision. The next scheduled update for the future land use map was not identified. While Aledo indicated that their next scheduled building code update would take place in 2023, Sherrard did not indicate when their next scheduled update is anticipated. Aside from Joy and Keithsburg, none of the municipalities have completed updates of their zoning ordinances since the 2016 Plan was completed. Joy updated its zoning ordinance in 2022 and Keithsburg updated its in 2017. It does not appear that specific recommendations from the 2016 Plan update were incorporated into the zoning ordinance updated. Neither Joy nor Keithsburg indicated when the next scheduled zoning ordinance update will take place.

2.5 Review & Incorporation of Existing Plans

The existing plans, studies, reports, technical information, and maps that were reviewed and incorporated into the Plan update, where appropriate, can be found in Section 7.0 References and are cited in each appropriate section.

Figure PP-3
County / Municipalities – Planning & Regulatory Capabilities

Capability Type	Mercer County	Aledo	Joy	Keithsburg	Matherville	Sherrard
Plans, Policies, Codes & Ordinances						
Comprehensive/Master Land Use Plan		X				
Continuity of Operations Plan	X					
Stormwater Management Plan		X				
Transportation Plan						
Economic Development Plan		X				
Emergency Operations Plan	X	X		X		
Disaster Recovery Plan	X				X	
Threat & Hazard Identification Risk Assessment (THIRA) - County Only	X					
Infrastructure Maps		X	X	X	X	
Building Codes		X				X
Floodplain Ordinance	X	X		X		
Stormwater Ordinance			X			
Zoning Ordinance	X	X	X	X	X	X
Subdivision Ordinance	X	X			X	
Historic Preservation Ordinance		X				
Private Sewage Disposal System Ordinance - County Only	X					
Manufactured/Mobile Home Tie Down Ordinance	X			X		
Steep Slope Ordinance						
Mined Areas/Developed Over Mined Areas Ordinance						
National Incident Management System (NIMS) Adoption	X					
National Flood Insurance Program (NFIP) Participation	X	X		X		
Community Rating System (CRS) Participation						
Level of Capability	**M**	**M**	**L**	**L**	**L**	**L**

An "X" indicates that the item is currently in place and being implemented.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-4
County / Municipalities – Administrative & Technical Capabilities

Capability Type	County/Municipality					
	Mercer County	Aledo	Joy	Keithsburg	Matherville	Sherrard
Adminstrative & Technical						
Zoning Board	X	X	X	X		X
Public Utility Board						
Planning Commission		X				
Mutual Aid Agreements	X	X				
Administrator/Manager		X			X	X
Building Inspector/Officer		X		X		X
Community/Economic Development Planner	X					
Emergency Manager	X					
Engineer/Construction Project Manager	X					
GIS Coordinator	X					
Grant Administrator/Writer				X		
Fire Chief - Municipalities Only						
Floodplain Administrator						
Police Chief - Municipalities Only		X				
Public Works/Streets Director - Municipalities Only		X	X	X		X
Water Superintendent - Municipalities Only		X	X	X	X	X
Zoning Officer/Administrator	X	X		X		X
Solid Waste Director - County Only						
Level of Capability	**M**	**M**	**L**	**L**	**L**	**L**

An "X" indicates the presence of staff with specified knowledge or skills.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-5
County / Municipalities – Financial / Education & Outreach Capabilities

Capability Type	County/Municipality					
	Mercer County	Aledo	Joy	Keithsburg	Matherville	Sherrard
Financial						
Roadway/Bridge Improvement Plan - County Only						
Capital Improvements Program						
Tax Levies for Special Purposes	X	X	X	X	X	
Motor Fuel Tax	X	X	X	X	X	X
General Obligation Bonds and/or Special Tax Bonds	X	X			X	
Utility Fees (Stormwater, Sewer, Water, Gas, or Electric Service)		X	X	X		X
Impact Fees - New Development						
Federal Funding Programs (Non-FEMA)	X	X	X		X	
Level of Capability	**L/M**	**M**	**L/M**	**L**	**L/M**	**L**
Education & Outreach						
StormReady Certification	X					
Natural Disaster/Safety-Related School Programs						
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)						
Seasonal Outreach						
Local Citizen Groups/Non-Profit Organizations (Emergency Preparedness, Access & Functional Needs Populations)						
Public-Private Partnership Initiatives Addressing Disaster-Related Issues						
Level of Capability	**L**	**L**	**L**	**L**	**L**	**L**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-6
Townships – Planning & Regulatory /
Administrative & Technical Capabilities

Capability Type	Township	
	Abington Township	Preemption Township
Plans, Policies, Codes & Ordinances		
Comprehensive/Master Land Use Plan		
Stormwater Management Plan		
Open Space/Recreational Area Plan		
Building Codes		
Stormwater Ordinance		
Zoning Ordinance		
Subdivision Ordinance		
Private Sewage Disposal System Ordinance		
Manufactured/Mobile Home Tie Down Ordinance		
Steep Slope Ordinance		
Mined Areas/Developed Over Mined Areas Ordinance		
Road Weight Restriction Ordinance		X
Nuisance Weed, Grass & Tree Ordinance		
National Incident Management System (NIMS) Adoption		
Level of Capability	**L**	**L**
Adminstrative & Technical		
Zoning Board		
Public Utility Board		
Planning Commission		
Mutual Aid Agreements		X
Assessor	X	X
Clerk	X	X
Collector		
Highway/Road District Commissioner	X	X
Supervisor	X	X
Level of Capability	**L/M**	**M**

An "X" indicates that the item is currently in place and being implemented or the presence of staff with specified knowledge or skills

Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-7
Townships – Financial /
Education & Outreach Capabilities

Capability Type	Township	
	Abington Township	Preemption Township
Financial		
Capital Improvements Program		
Roadway/Bridge Improvement Plan		
Tax Levies for Special Purposes		
Motor Fuel Tax	X	X
General Obligation Bonds and/or Special Tax Bonds		
Utility Fees (Stormwater, Sewer, Water, Gas or Electric Service)		
Impact Fees - New Development		
Federal Funding Programs (Non-FEMA)		
Level of Capability	**L**	**L**
Education & Outreach		
StormReady Certification		
Natural Disaster/Safety-Related School Programs		
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)		
Seasonal Outreach		
Local Citizen Groups/Non-Profit Organizations (Emergency Preparedness, Access & Functional Needs Populations)		
Public-Private Partnership Initiatives Addressing Disaster-Related Issues		
Level of Capability	**L**	**L**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-8
Schools – Planning & Regulatory /
Administrative & Technical Capabilities

Capability Type	**School District** Sherrard CUSD #200
Plans & Policies	
Comprehensive/Master Facilities Plan	
Continuity of Operations Plan	X
Strategic Plan	X
Emergency/Crisis Response Plan	X
National Incident Management System (NIMS) Adoption	
Level of Capability	**M**
Adminstrative & Technical	
Board of Education	X
Mutual Aid Agreements	
Superintendent	X
Principal(s)	X
Chief Financial Officer/Finance Director	X
Food Services Supervisor	X
Grant Writer	X
Health Care Supervisor	X
IT Director/Specialist	X
Maintenance Manager	X
Communications Director	X
Operations Manager	X
Safety & Security Director	
Transportation Director	X
Level of Capability	**H**

An "X" indicates that the item is currently in place and being implemented or the presence of staff with specified knowledge or skills.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-9
Schools – Financial / Education & Outreach Capabilities

Capability Type	School District: Sherrard CUSD #200
Financial	
Capital Improvements Program	
Tax Levies for Special Purposes	X
General Obligation Bonds and/or Special Tax Bonds	X
Federal Funding Programs (Non-FEMA)	X
Level of Capability	**M**
Education & Outreach	
StormReady Certification	X
Natural Disaster/Safety-Related School Programs	X
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)	X
Seasonal Outreach	X
Public-Private Partnership Initiatives Addressing Disaster-Related Issues	X
Level of Capability	**H**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-10
Fire Protection Districts – Planning & Regulatory Capabilities

Capability Type	**Fire Protection District**		
	Aledo FPD	Greene Township FPD (Matherville/Viola)	Sherrard Community FPD
Plans, Policies, Codes, Ordinances, Resolutions, & Technical Documents			
Standard Operating Procedures/Guidelines for Structural Fire Fighting (NFPA 1700)	X	X	X
Standard Operating Procedures for Operations at Technical Search & Rescue Incidents (NFPA 1670)		X	
Pre-Incident Planning (NFPA 1620)	X	X	X
Fire Prevention Codes			X
Burn Ordinance			X
National Incident Management System (NIMS) Adoption		X	
Incident Command System (ICS) Adoption		X	X
Building Inspections			
Tier II Reports			
County Emergency Operations Plan		X	X
Safety Data Sheets		X	X
Pipeline Maps		X	X
Hazardous Materials Facilities Maps		X	X
Water Supply Systems Maps		X	X
Impassable Roads & Bridges Maps		X	X
Evacuation Zones Maps		X	X
Community & Special Residential Areas Maps (i.e., manufactured home parks, subdivisions, recreational communities)		X	X
Level of Capability	**L**	**M/H**	**M/H**

An "X" indicates that the item is currently in place and being implemented.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-11
Fire Protection Districts –
Administrative & Technical Capabilities

Capability Type	Fire Protection District		
	Aledo FPD	Greene Township FPD (Matherville/Viola)	Sherrard Community FPD
Adminstrative & Technical			
Board of Trustees	X	X	X
Board of Fire Commissioners			
Mutual Aid Box Alarm System (MABAS)	X	X	X
Mutual Aid Agreements		X	
Hazardous Materials Response Team			
Water Rescue/Dive Team		X	X
Technical Rescue Team			
Fire Chief	X	X	X
Deputy Fire Chief	X		
Administrative Assistant	X		
Financial/Business Manager	X		
Inspector			
Public Education Director/Officer			
Telecom Director			
Training Coordinator	X	X	X
Level of Capability	**M**	**L/M**	**L**

An "X" indicates the presence of staff with specified knowledge or skills.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-12
Fire Protection Districts –
Financial / Education & Outreach Capabilities

Capability Type	Fire Protection District		
	Aledo FPD	Greene Township FPD (Matherville/Viola)	Sherrard Community FPD
Financial			
Capital Improvements Program			X
Tax Levies for Special Purposes	X	X	X
General Obligation Bonds and/or Special Tax Bonds			
Federal Funding Programs (Non-FEMA)	X	X	X
Level of Capability	**L/M**	**L/M**	**M**
Education & Outreach			
Natural Disaster/Safety-Related School Programs	X	X	
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)		X	
Seasonal Outreach		X	
Public-Private Partnership Initiatives Addressing Disaster-Related Issues		X	
Level of Capability	**L**	**H**	**L**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-13
Healthcare Facilities – Planning & Regulatory / Administrative & Technical Capabilities

Capability Type	Healthcare Genesis Medical Center
Plans, Policies, Codes, Ordinances & Resolutions	
Continuity of Operations Plan	X
Strategic Plan	X
Facilities Plan	X
Emergency Preparedness Plan	X
Medical Disaster Preparedness & Response Plan	X
Community Health Needs Assessment (CHNA)	X
Severe Weather Plan	X
National Incident Management System (NIMS) Adoption	X
Level of Capability	**H**
Administrative & Technical	
Board of Directors	X
Patient Advisory Board	
Mutual Aid Agreements	X
Chief Executive Officer	X
Chief Medical Officer	X
Chief Financial Officer	X
Chief Development Officer	
Chief Nursing Officer	X
Communications Director	X
EMS Director	X
ER Director	X
Grant Writer	X
IT Director/GIS Specialist	X
Maintenance Manager	X
Rehab & Long-Term Care Director	X
Safety Officer	
Level of Capability	**H**

An "X" indicates that the item is currently in place and being implemented or the presence of staff with specified knowledge or skills.

Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-14
Healthcare Facilities – Financial / Education & Outreach Capabilities

Capability Type	Healthcare: Genesis Medical Center
Financial	
Capital Improvements Program	X
Tax Levies for Special Purposes	
General Obligation Bonds and/or Special Tax Bonds	X
Federal Funding Programs (Non-FEMA)	
Level of Capability	**M**

Capability Type	Healthcare: Genesis Medical Center
Education & Outreach	
StormReady Certification	
Natural Disaster/Safety-Related School Programs	X
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)	
Seasonal Outreach	X
Local Citizen Groups/Non-Profit Organizations (Emergency Preparedness, Access & Functional Needs Populations)	X
Public-Private Partnership Initiatives Addressing Disaster-Related Issues	
Level of Capability	**M**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-15
Drainage & Levee Districts – Planning & Regulatory / Administrative & Technical Capabilities

Capability Type	Healthcare
	Genesis Medical Center
Plans, Policies, Codes, Ordinances & Resolutions	
Continuity of Operations Plan	X
Strategic Plan	X
Facilities Plan	X
Emergency Preparedness Plan	X
Medical Disaster Preparedness & Response Plan	X
Community Health Needs Assessment (CHNA)	X
Severe Weather Plan	X
National Incident Management System (NIMS) Adoption	X
Level of Capability	**H**

Administrative & Technical	
Board of Directors	X
Patient Advisory Board	
Mutual Aid Agreements	X
Chief Executive Officer	X
Chief Medical Officer	X
Chief Financial Officer	X
Chief Development Officer	
Chief Nursing Officer	X
Communications Director	X
EMS Director	X
ER Director	X
Grant Writer	X
IT Director/GIS Specialist	X
Maintenance Manager	X
Rehab & Long-Term Care Director	X
Safety Officer	
Level of Capability	**H**

An "X" indicates that the item is currently in place and being implemented or the presence of staff with specified knowledge or skills.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-16
Drainage & Levee Districts – Financial / Education & Outreach Capabilities

Capability Type	Healthcare Genesis Medical Center
Financial	
Capital Improvements Program	X
Tax Levies for Special Purposes	
General Obligation Bonds and/or Special Tax Bonds	X
Federal Funding Programs (Non-FEMA)	
Level of Capability	**M**
Education & Outreach	
StormReady Certification	
Natural Disaster/Safety-Related School Programs	X
Ongoing Public Education or Information Programs (Fire Safety, Household Preparedness, Responsible Water Use)	
Seasonal Outreach	X
Local Citizen Groups/Non-Profit Organizations (Emergency Preparedness, Access & Functional Needs Populations)	X
Public-Private Partnership Initiatives Addressing Disaster-Related Issues	
Level of Capability	**M**

An "X" indicates a given resource is locally available for mitigation purposes.
Level of Capacity: "L" = Limited; "M" = Moderate; "H" = High

Figure PP-17
Capability Rankings by Participating Jurisdiction

Capability Type	**County/Municipality**						**Township**		**School District**	**Fire Protection District**			**Healthcare**	**D&LD**
	Mercer County	Aledo	Joy	Keithsburg	Matherville	Sherrard	Abington Township	Preemption Township	Sherrard CUSD #200	Aledo FPD	Greene Township FPD (Matherville/Viola)	Sherrard Community FPD	Genesis Medical Center	Bay Island Drainage & Levee District
Planning & Regulatory	M	M	L	L	L	L	L	L	M	L	M/H	M/H	H	L
Administrative & Technical	M	M	L	L	L	L	L/M	M	H	M	L/M	L	H	M
Financial	L/M	M	L/M	L	L/M	L	L	L	M	L/M	L/M	M	M	H
Education & Outreach	L	L	L	L	L	L	L	L	H	L	H	L	M	L
Overall Capability	**M/L**	**M**	**L**	**L**	**L**	**L**	**L**	**L**	**M/H**	**L/M**	**M**	**M/L**	**M/H**	**M**

Level of Capacity: "L" = Limited; "M" = Moderate; "H" High

3.0 Risk Assessment

Risk assessment is the process of evaluating the vulnerability of assets in order to estimate the potential loss of life, personal injury, economic loss, and property damage resulting from natural hazards. Assets are determined by each participant and can include people; structures (i.e., critical facilities, lifelines, and infrastructure); systems (i.e., networks such as electrical and communications, etc.); and natural, historic, and cultural resources). This section summarizes the results of the risk assessment conducted on the natural hazards in Mercer County. The information contained in this section was gathered by evaluating local, state, and federal records from the last 20 to 70 years.

This risk assessment identifies the natural hazards deemed most important to the Planning Committee and includes a profile of each hazard that identifies past occurrences, the severity or extent of the events, and the likelihood of future occurrences. It also provides a vulnerability analysis that identifies the impacts to public health and property, evaluates the assets of the participating jurisdictions and estimates the potential impacts each natural hazard would have on the evaluated assets. Where applicable, the differences in vulnerability between participating jurisdictions are described.

The subsequent sections provide detailed information on each of the selected natural hazards. The sections are color coded and ordered by the frequency with which the natural hazard has previously occurred within the County. Each natural hazard section contains three subsections: hazard identification, hazard profile, and hazard vulnerability.

Hazard Selection

One of the responsibilities of the Committee was to review the natural hazards detailed in the previous Plan and decide if additional hazards should be included in the Plan update. Over the course of the first two meetings, the Committee members discussed their experiences with natural hazard events and reviewed information on various hazards. After discussing the information provided, the Committee chose to add dam failures and mine subsidence to this Plan update.

The following identifies the hazards included in the Plan update:

- severe winter storms (snow & ice)
- severe storms (thunderstorms, hail, lightning & heavy rain)
- extreme cold
- floods (riverine & flash)
- excessive heat
- tornadoes
- drought
- earthquakes
- levee failures
- mine subsidence
- dam failures

The Planning Committee chose not to include landslides in the Plan update. A review of the USGS Landslide Inventory and NASA's Global Landslide Catalog did not identify any landslide events within the County. The Illinois State Geological Survey's (ISGS) *Landslide Inventory of Illinois* only contains three instances of unclassified landslides in the County. Two of the three events occurred along waterways. Discussions with the Planning Committee did not reveal any recent occurrences of landslides.

Based on the information provided, the Planning Committee did not consider landslides warranted inclusion in the Plan update.

Risk Priority Index

After reviewing the preliminary results of the risk assessment at the second meeting, Committee members and the participating jurisdictions were asked to complete a Risk Priority Index (RPI) exercise for the hazards that have the potential to impact the County and participating jurisdictions. The RPI provides quantitative guidance for ranking the hazards and offers participants with another tool to determine which hazards present the highest risk and therefore which ones to focus on when formulating mitigation actions.

Each hazard was scored on three categories: 1) frequency, 2) impacts on life and health, and 3) impacts on property and infrastructure. A scoring system was developed that assigned specific factors to point values ranging from 1 to 4 for each category. For those hazards that were not applicable to a particular jurisdiction, a value of "NA" was assigned to each category. The higher the point value, the greater the risk associated with that hazard. **Figure R-1**, located at the end of this section, identifies the factors and values/point values associated with each category. Participants were asked to score the selected hazards based on the perspective of the entity they represented on the Committee.

The Consultant took the point values assigned to each category and averaged the remaining results and came up with an overall value for each category. The values for each category were then added together to calculate an RPI score for each hazard. A ranking was then assigned to each hazard based on the RPI score. **Figure R-2**, located at the end of this section, provides the hazard rankings for the participating jurisdictions. Hazard ratings of "1" are highlighted in yellow by jurisdiction.

FEMA's National Risk Index

The National Risk Index (NRI) is an online mapping and data-based interface that helps illustrate a community's risk to 18 identified natural hazards. The natural hazards identified by the NRI and included in this Plan are cold wave, drought, earthquake, hail, heat wave, ice storm, landslides, lightning, riverine flooding, strong wind, tornado, and winter weather. The NRI leverages available source data for natural hazard and community risk factors, such as social vulnerability and community resilience, to develop a baseline relative risk measurement for each county and census tract in the U.S. The goal is to help individuals better understand the natural hazard risk of their communities.

In the NRI, risk is defined as the potential for negative impacts as a result of a natural hazard. The risk equation behind the NRI includes three components: a natural hazards risk component (expected annual loss), a consequence enhancing component (social vulnerability), and a consequence reduction component (community resilience). Social vulnerability represents the susceptibility of social groups to the adverse impacts of natural hazards. Community resilience represents the ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions.

The scores and ratings generated by the NRI describe a county's or census tract's relative position among all other U.S. counties and census tracts for a given component. Dataset Update Version 1.19.0 released March 2023 was used in this analysis. Scores can range from 0 (the lowest possible value) to 100 (the highest possible value). For every score there is assigned one of five qualitative ratings: "Very Low", "Relatively Low", "Relatively Moderate", "Relatively High", and "Very High." Because all ratings are relative, there are no specific numeric values that determine the rating.

In order to provide the participating jurisdictions and public with additional information on the natural hazards included in the Plan, **Figure R-3** located at the end of this section, presents the overall NRI scores and ratings for each census tract as well as for the County. 2020 census tract information was used in this version of the NRI. In 2020, there were four census tracts in Mercer County. Two of the census tracts have a Risk Index rating of "Relatively Moderate" while the remaining two census tracts have a Risk Index rating of "Relatively Low". One of the census tracts has a Social Vulnerability rating of "Relatively Moderate". The remaining three census tracts have a Social Vulnerability rating of "Relatively Low" or "Very Low".

Figure R-4, located at the end of this section, provides the NRI scores and ratings by hazard type for each census tract as well as the County. Hazard ratings of "Relatively High" and "Very High" are highlighted in yellow by census tract. The hazards with the highest relative rating include strong wind (thunderstorms), hail, and extreme cold.

Critical Facilities & Infrastructure

Critical facilities and infrastructure include structures, lifelines, systems, networks, and institutions that are critical for life, safety, and economic viability and necessary for a community's response to and recovery from emergencies. The loss of function of any of these assets can intensify the severity of the impacts and speed of recovery associated a hazard event. Critical facilities and infrastructure may include, but are not limited to, the following:

- **Essential Facilities**: Facilities essential to the health and welfare of the whole population including hospitals and other medical facilities, police and fire stations, emergency operations centers, evacuation shelters, and schools.
- **Government Facilities**: Facilities associated with the continued operations of government services such as courthouses, city/village halls, township buildings, and highway/maintenance centers.
- **Infrastructure Systems**: Infrastructure associated with drinking water, wastewater, transportation (roads, railways, waterways), communication systems, electric power, natural gas and oil.
- **Housing Facilities**: Facilities that serve populations that have access and function needs such as nursing homes, skilled and memory care facilities, residential group homes, and day care centers.
- **High Potential Loss Facilities**: Facilities that would have an impact or high loss associated with them if their functionality is compromised such as nuclear power plants, dams, levees, military installations and facilities housing industrial or hazardous materials.
- **Gathering Places**: Facilities such as parks, libraries, community centers, and churches.

As part of the planning process each participating jurisdiction reviewed and/or completed a questionnaire identifying the critical facilities and infrastructure located within their jurisdiction, both publicly and privately-owned. **Figure R-5**, located at the end of this section, identifies the number of critical facilities and infrastructure located in each participating jurisdiction for select categories. Identifying these assets makes local leaders more aware of the critical facilities and infrastructure located within their jurisdictions and helps them make informed choices on how to better protect these key resources.

While considered a "local government entity" for planning purposes, Abington Township, Aledo FPD, and Bay Island D&LD, Genesis Medical Center, Greene Township FPD, Preemption Township, Sherrard Community FPD, and Sherrard CUSD #200 do not have an extensive inventory of assets to consider when conducting the risk assessment.

Since the assets for these local government entities are located within a participating municipality, with the exception of Abington Township, Bay Island D&LD, Greene Township FPD – Viola Fire Station, Preemption Township, and two schools in the Sherrard CUSD #200 (Winola Elementary School and Sherrard Jr./Sr. High School), and are a subset of these municipalities' critical facilities, their risk is considered to be the same or similar to the risk experienced by the municipalities for those hazards that either impact the entire planning area or can occur at any location within the planning area (i.e., severe storms, severe winter storms, etc.). For those hazards where the risk to Aledo FPD, Genesis Medical Center, Greene Township FPD – Matherville Fire Station, Sherrard Community FPD, and two of the Sherrard CUSD #200 schools (Sherrard Elementary School and Matherville Intermediate School) varies from the risk facing the municipalities, a separate narrative assessment will be provided under the appropriate hazard's vulnerability subsection.

The critical facilities for Abington Township, Bay Island D&LD, and Preemption Township are located in unincorporated Mercer County. Their risk is considered to be the same or similar to the risk experienced by the County for those hazards that either impact the entire planning area or can occur at any location within the planning area (i.e., severe storms, severe winter storms, etc.) For those hazards where the risk to townships and D&LD critical facilities varies from the risk facing the planning area (i.e., the County), a separate narrative assessment will be provided under the appropriate hazard's vulnerability subsection.

Greene Township FPD's Viola Fire Station and Sherrard CUSD #200's Winola Elementary are located in the Village of Viola. Viola's risk is considered to be the same or similar to the risk experienced by the participating municipalities and the County for those hazards that either impact the entire planning area or can occur at any location within the planning area (i.e., severe storms, severe winter storms, etc.). For those hazards where the risk to the Fire Station and Elementary School varies from the risk facing the municipalities, a separate narrative assessment will be provided under the appropriate hazard's vulnerability subsection.

Sherrard CUSD #200's Jr./Sr. High School is located just over a mile north of the Mercer-Rock Island county line in unincorporated Rock Island County. The risk to its critical infrastructure and systems is considered to be the same or similar to the risk experienced by the County for those hazards that either impact the entire planning area or can occur at any location within the planning area (i.e., severe storms, severe winter storms, etc.) For those hazards where the risk to Jr./Sr. High School's critical facilities varies from the risk facing the planning area (i.e., the County), a separate narrative assessment will be provided under the appropriate hazard's vulnerability subsection.

Assets Vulnerability Survey

The participating jurisdictions were also asked to complete an Assets Vulnerability Survey at the third meeting to assist them in creating problem statements summarizing the consequences and/or effects the studied hazards have on their assets. The Survey asked participants to describe their jurisdiction's greatest vulnerabilities to natural hazards and which assets they felt have the greatest vulnerabilities and the hazards they are most vulnerable to. This information is summarized under the appropriate hazard's vulnerability subsection.

Future Conditions

While we cannot predict with certainty what the weather of the future will look like, we can use models to help us make sense of the patterns we have seen in the past and to use that information to predict what events will be more likely to occur going forward.

By looking at data from previous weather conditions and taking into account trends in that data that have emerged over time, we can with some degree of accuracy project what weather may look like in the future. It is important to consider that nearer term predictions have the greatest likelihood of accuracy since they require the least extrapolation and guesswork; however, this does not mean that longer term predictions are not plausible or not useful. Often, having a prediction that is even partly right is preferable to having no guide at all. By coming up with best case and worst case scenarios, even if neither is terribly likely, we can gain a better understanding of the range of potential outcomes and a good idea of what the most probable outcomes might look like.

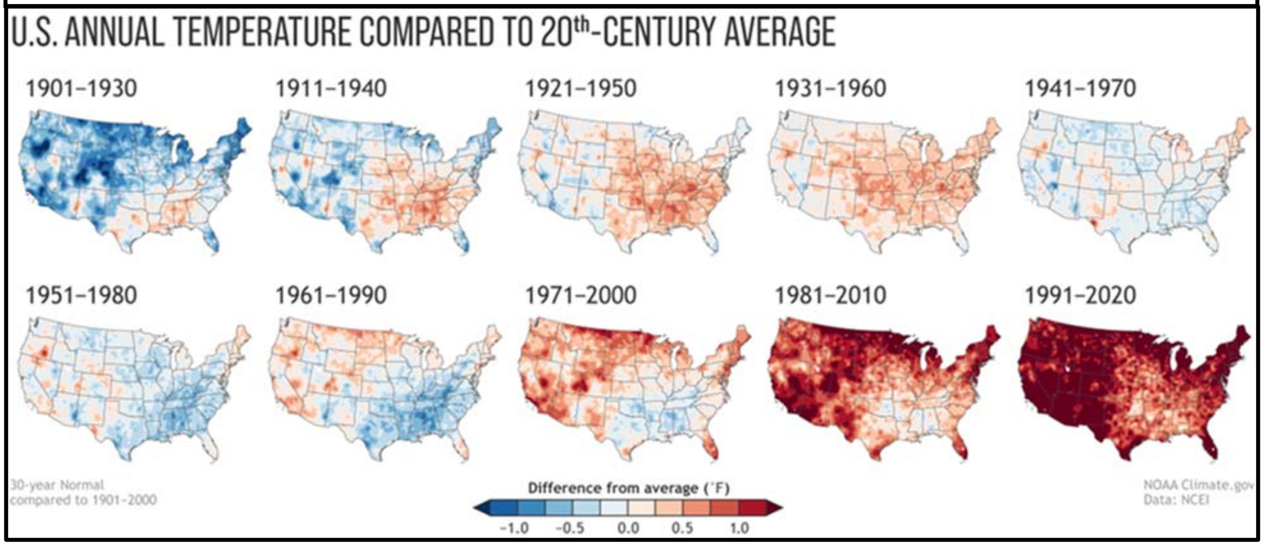
Earth's weather and climate have always been variable. Over time, sea levels have risen and fallen, glaciers have advanced and retreated, and droughts, floods, wildfires, and storms have periodically upended the notion of "normal". In recent years in the U.S., there have been several trends observed in weather patterns that offer us some insight as to what the near future may hold. Broadly, these likely changes can be referred to as "future conditions". They include more general seasonal trends as well as more specific weather pattern trends.

In recent decades we have seen both earlier springs (earlier last frost dates) and later winters (later first frost dates) in the U.S. Taken together, these two changes mean that winters are likely to be shorter and milder, and summers are likely to be longer and hotter across much of the continental U.S. than they were historically. In combination, shorter, milder winters and longer, more intense summers have resulted in an observed increase in average annual temperature.

As with any change that occurs gradually, the difference can be difficult to perceive if the time frame you are looking at is small. Additionally, smaller windows of time are more likely to be skewed by rare occurrences or anomalies. Looking at longer time frames allows us to see the big picture, putting highly unusual years into context by averaging them out with other more typical years. Looking at consecutive 30-year period averages called "Normals" allows us to detect how what is average (or 'normal') has shifted over time.

Figure R-6 shows U.S. annual temperature compared to 20th-century averages. By looking at 30 Year Normals for average annual temperature compared to overall 20th century averages, a trend of increasing annual temperature is particularly apparent in the final three 30 year periods. (1971-2000, 1981-2010, 1991-2020). Since these are average annual temperatures, even a small difference corresponds to larger temperature changes recorded within a year.

Figure R-6
U.S. Annual Temperature Compared to 20th Central Average



Also observed have been changes in when, where, and how much precipitation occurs across the U.S. **Figure R-7** shows U.S. annual precipitation compared to 20th-century averages. For some areas of the Country, this has resulted in increases in overall precipitation. The Midwestern U.S. has been on average getting progressively wetter in 30 year rolling averages from the period of 1951-1980 onwards; elsewhere, it has resulted in decreases, such as in much of the Western and Southwestern US, which has been getting drier since the period of 1971-2000 onwards.

Trends also reveal an uptick in the frequency and severity of hazardous weather events. While this is in part due to better record-keeping and a higher number of people and monitoring devices to witness hazardous events in order to report them, this trend is at least in part due to warmer bodies of air that tend to “supercharge” summer storm systems, making them more likely to produce severe weather events.

Specific information on future conditions is summarized under the appropriate hazard’s probability subsection.

Figure R-7
U.S. Annual Precipitation Compared to 20th Central Average

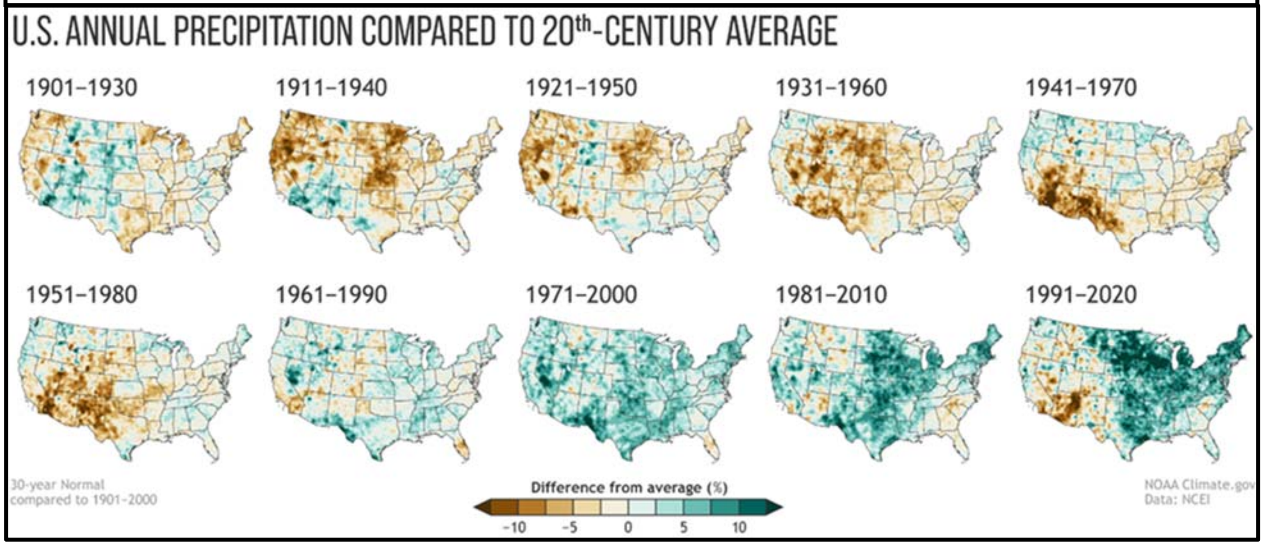


Figure R-1
Risk Priority Index Scoring System

Category	**Factors**	**Point Value**
Hazard Frequency	An event is anticipated to occur within the next year. Based on previous history, at least one event is expected to occur in any given year.	4
	An event is likely to occur in the next 1 to 3 years. Based on previous history, an event has at least a 33% chance of occurring in any given year.	3
	An event is possible in the next 3 to 10 years. Based on previous history, an event has a 10% to 33% chance of occurring in any given year.	2
	An event is unlikely to occur within the next 10 years. These events occur infrequently and based on previous history have a less than 10% chance of occurring in any given year.	1
Impacts on Life & Health	Fatalities are expected to occur during the event.	4
	While fatalities are unlikely, injuries, some requiring hospitalization, may occur during the event.	3
	Minor injuries not requiring hospitalization may occur during the event.	2
	Injuries or fatalities are unlikely to occur during the event.	1
Impacts on Property & Infrastructure	- Substantial property damage is likely to occur including damage to infrastructure and critical facilities. AND/OR - Loss of access/operations at multiple infrastructure and critical facilities (i.e., road & school closures, loss of power to drinking water/wastewater treatment facilities, municipal buildings, etc.) is anticipated for an extended period of time (i.e., a day or more).	4
	- Property damage is expected to occur including superficial damage to infrastructure and critical facilities. AND/OR - Loss of access/operations at multiple infrastructure and critical facilities is anticipated for a period of time (i.e., a day or less).	3
	- Some minor property damage is anticipated (i.e., shingles & siding torn off homes, windows broken, etc.) but no damage to infrastructure or critical facilities is anticipated. AND/OR - Loss of access/operations to infrastructure and critical facilities is anticipated but only for a short period of time (i.e., up to a couple hours).	2
	Property damage is likely to be negligible and no loss of access/operations is anticipated at any infrastructure/critical facilities during the event.	1

Figure R-2
Risk Priority Index Hazard Ranking by Participating Jurisdiction
(Sheet 1 of 2)

Hazard	**Hazard Ranking by Participating Jurisdiction**					
	Mercer County	Aledo	Joy	Keithsburg	Matherville	Sherrard
Dam Failures	**1/2/3/4**	n/a	n/a	n/a	13	12/13
Drought	13	3/4/5/6	8/9/10	7/8/9/10/11/12	11/12	10/11
Earthquakes	14	10/11	11	7/8/9/10/11/12	9/10	10/11
Excessive Heat	5/6/7/8/9/10	8	8/9/10	5	6/7/8	7/8
Extreme Cold	5/6/7/8/9/10	3/4/5/6	2/3/4/5/6/7	7/8/9/10/11/12	2/3/4/5	7/8
Floods	**1/2/3/4**	10/11	8/9/10	**1/2**	2/3/4/5	12/13
Hail	5/6/7/8/9/10	7	2/3/4/5/6/7	6	9/10	9
Heavy Rain	5/6/7/8/9/10	9	2/3/4/5/6/7	7/8/9/10/11/12	6/7/8	**1/2/3/4/5/6**
Levee Failures	5/6/7/8/9/10	n/a	n/a	**1/2**	n/a	n/a
Lightning	11	**1/2**	2/3/4/5/6/7	7/8/9/10/11/12	6/7/8	**1/2/3/4/5/6**
Mine Subsidence	12	n/a	n/a	n/a	11/12	**1/2/3/4/5/6**
Thunderstorms with Damaging Winds	**1/2/3/4**	3/4/5/6	**1**	3/4	2/3/4/5	**1/2/3/4/5/6**
Tornadoes	**1/2/3/4**	3/4/5/6	2/3/4/5/6/7	3/4	**1**	**1/2/3/4/5/6**
Winter Storms	5/6/7/8/9/10	**1/2**	2/3/4/5/6/7	7/8/9/10/11/12	2/3/4/5	**1/2/3/4/5/6**

Figure R-2
Risk Priority Index Hazard Ranking by Participating Jurisdiction
(Sheet 2 of 2)

Hazard	**Hazard Ranking by Participating Jurisdiction**							
	Abington Township	Preemption Township	Sherrard CUSD #200	Aledo FPD	Greene Township FPD	Sherrard Community FPD	Genesis Medical	Bay Island D&LD
Dam Failures	n/a	**1/2/3**	13	n/a	11	10/11/12/13	n/a	n/a
Drought	4/5	10	9/10/11/12	2/3	7/8/9	4	11	11
Earthquakes	11	12/13	9/10/11/12	11	12/13	10/11/12/13	7/8/9/10	12
Excessive Heat	8/9	12/13	2/3/4/5	4/5	3/4	5/6/7/8/9	7/8/9/10	4/5
Extreme Cold	4/5	**1/2/3**	2/3/4/5	**1**	3/4	5/6/7/8/9	2/3/4	6/7/8/9
Floods	8/9	4/5/6/7/8/9	9/10/11/12	10	10	10/11/12/13	5/6	**1**
Hail	6/7	4/5/6/7/8/9	2/3/4/5	6/7	5/6	5/6/7/8/9	7/8/9/10	6/7/8/9
Heavy Rain	**1/2/3**	4/5/6/7/8/9	**1**	6/7	7/8/9	5/6/7/8/9	7/8/9/10	4/5
Levee Failures	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2/3
Lightning	**1/2/3**	4/5/6/7/8/9	8	8/9	7/8/9	5/6/7/8/9	2/3/4	6/7/8/9
Mine Subsidence	n/a	11	9/10/11/12	n/a	12/13	10/11/12/13	n/a	n/a
Thunderstorms with Damaging Winds	10	4/5/6/7/8/9	7	4/5	5/6	2/3	5/6	2/3
Tornadoes	**1/2/3**	4/5/6/7/8/9	2/3/4/5	2/3	**1/2**	**1**	**1**	10
Winter Storms	6/7	**1/2/3**	6	8/9	**1/2**	2/3	2/3/4	6/7/8/9

Figure R-3
National Risk Index Overall Scores/Ratings by Census Tract

Census Tract No.	Participating Jurisdiction Located in Census Tract	Risk Index Score	Risk Index Rating	Social Vulnerability Score	Social Vulnerability Rating	Community Resilience Score	Community Resilience Rating
401	Matherville, Sherrard, Preemption Township, Aledo Fire Protection District, Sherrard Community Fire Protection District, Sherrard CUSD #200	53.13	Relatively Low	12.55	Very Low	*	*
402	Joy, Keithsburg, Abington Township, Aledo Fire Protection District, Bay Island Drainage & Levee District	78.17	Relatively Moderate	51.70	Relatively Moderate	*	*
403	Aledo, Aledo Fire Protection District, Genesis Medical Center	39.14	Relatively Low	28.52	Relatively Low	*	*
404	Alexis, Preemption Township, Aledo Fire Protection District, Greene Township Fire Protection District, Sherrard CUSD #200	63.43	Relatively Moderate	32.43	Relatively Low	*	*
Mercer County		24.44	Very Low	5.98	Very Low	82.81	Very High

* Community Resilience scores are only available at the county level.

Figure R-4
NRI Hazard Scores/Ratings by Hazard by Census Tract
(Sheet 1 of 2)

Census Tract No.	Participating Jurisdiction Located in Census Tract	Severe Storms						Severe Winter Storms				Riverine Floods	
		Hail Score	Hail Rating	Lightning Score	Lightning Rating	Strong Wind Score	Strong Wind Rating	Ice Storm Score	Ice Storm Rating	Winter Weather Score	Winter Weather Rating	Score	Rating
401	Matherville, Sherrard, Preemption Township, Aledo Fire Protection District, Greene Township Fire Protection District, Sherrard Community Fire Protection District, Sherrard CUSD #200	90.96	RH	73.60	RM	95.82	VH	69.60	RM	79.28	RM	82.03	RM
402	Joy, Keithsburg, Abington Township, Aledo Fire Protection District, Bay Island Drainage & Levee District	93.04	RH	78.15	RH	99.00	VH	72.07	RM	81.39	RM	95.97	RH
403	Aledo, Aledo Fire Protection District, Genesis Medical Center	92.53	RH	75.43	RH	92.13	RH	70.42	RM	78.87	RM	29.07	VL
404	Alexis, Preemption Township, Aledo Fire Protection District, Green Township Fire Protection District, Sherrard CUSD #200	91.71	RH	74.90	RM	98.37	VH	71.00	RM	80.57	RM	79.51	RM
Mercer County		74.80	RL	30.86	RL	70.89	RM	33.54	RL	31.72	RL	54.47	RL

Rating Abbreviations: NR = No Rating; VL = Very Low; RL = Relatively Low; RM = Relatively Moderate; RH = Relatively High; VH = Very High

Figure R-4
NRI Hazard Scores/Ratings by Hazard by Census Tract
(Sheet 2 of 2)

Census Tract No.	Participating Jurisdiction Located in Census Tract	Extreme Cold		Excessive Heat		Tornadoes		Drought		Earthquakes	
		Score	Rating	Score	Rating	Score	Rating	Score	Rating	Score	Rating
401	Matherville, Sherrard, Preemption Township, Aledo Fire Protection District, Greene Township Fire Protection District, Sherrard Community Fire Protection District, Sherrard CUSD #200	94.40	RH	76.14	RM	57.95	RM	97.20	RM	29.34	VL
402	Joy, Keithsburg, Abington Township, Aledo Fire Protection District, Bay Island Drainage & Levee District	96.81	RH	80.60	RH	58.88	RM	98.86	RH	37.58	VL
403	Aledo, Aledo Fire Protection District, Genesis Medical Center	92.44	RH	73.95	RM	57.35	RM	92.45	RL	44.02	VL
404	Alexis, Preemption Township, Aledo Fire Protection District, Green Township Fire Protection District, Sherrard CUSD #200	96.24	RH	79.20	RH	59.37	RM	98.49	RM	36.78	VL
Mercer County		71.21	RM	59.82	RL	25.93	VL	87.15	RM	26.95	VL

Rating Abbreviations: NR = No Rating; VL = Very Low; RL = Relatively Low; RM = Relatively Moderate; RH = Relatively High; VH = Very High

Figure R-5
Critical Facilities & Infrastructure by Jurisdiction

Participating Jurisdiction	Critical Facilities				Critical Infrastructure						
	Government[1]	Emergency Protection[2]	Medical & Healthcare[3]	Schools	Drinking Water[4]	Wastewater Treatment[5]	Rail Lines	Bridges	Interstates US/State Routes & Key Roads	Power Plants	Comm. Systems
Mercer County	5	14	3	---	---	---	---	---	15	---	---
Aledo	8	5	2	4	3	3	---	---	6	---	---
Joy	2	1	---	1	1	1	---	---	---	---	---
Keithsburg	4	3	---	---	1	1	---	---	1	---	---
Matherville	1	1	---	1	1	3	---	---	---	---	---
Sherrard	3	1	---	2	1	5	---	---	4	---	---
Abington Township	2	1	---	---	2	---	---	---	4	---	---
Preemption Township	2	1	---	2	1	---	---	---	1	---	---
Sherrard CUSD #200	---	---	---	5	---	---	---	---	---	---	---
Aledo FPD	8	5	2	4	3	3	---	---	6	---	---
Greene Township FPD	2	2	---	1	1	1	---	3	1	---	---
Sherrard Community FPD	3	1	---	3	2	5	---	---	1	---	---
Genesis Medical Center	---	---	2	---	---	---	---	---	---	---	---
Bay Island D&LD	3	---	---	---	---	---	---	---	---	---	---

[1] Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, libraries, pump stations, etc.
[2] Emergency Protection includes: sheriff's department, police, fire, ambulance, emergency operations centers, jail/correctional facilities and evacuation shelters.
[3] Medical & Healthcare includes: public health departments, hospitals, urgent/prompt care and medical clinics, nursing homes, skilled nursing facilities, memory care facilities, residential group homes, etc.
[4] Drinking Water includes: drinking water treatment plants, drinking water wells, and water storage towers/tanks.
[5] Wastewater Treatment includes: wastewater treatment plants and lift stations.
--- Indicates the jurisdiction does not own/maintain any critical facilities within that category.

3.1 SEVERE WINTER STORMS

HAZARD IDENTIFICATION

What is the definition of a severe winter storm?

A severe winter storm can range from moderate snow over a few hours to significant accumulations of sleet and/or ice to blizzard conditions with blinding, wind-driven snow that last several days. The amount of snow or ice, air temperature, wind speed and event duration all influence the severity and type of severe winter storm that results. In general, there are three types of severe winter storms: blizzards, heavy snowstorms and ice storms. The following provides a brief description of each type as defined by the National Weather Service (NWS).

- **Blizzards.** Blizzards are characterized by strong winds of at least 35 miles per hour and are accompanied by considerable falling and/or blowing snow that reduces visibility to ¼ mile or less. Blizzards are the most dangerous of all winter storms.
- **Heavy Snowstorms.** Heavy snowstorms are generally defined as producing snowfall accumulations of four inches or more in 12 hours or less or six inches or more in 24 hours or less.
- **Ice Storms.** An ice storm occurs when substantial accumulations of ice, generally ¼ inch or more, build up on the ground, trees and utility lines as a result of freezing rain.

What is snow?

Snow is precipitation in the form of ice crystals. These ice crystals are formed directly from the freezing of water vapor in wintertime clouds. As the ice crystals fall toward the ground, they cling to each other creating snowflakes. Snow will only fall if the temperature remains at or below 32°F from the cloud base to the ground.

What is sleet?

Sleet is precipitation in the form of ice pellets. These ice pellets are composed of frozen or partially frozen rain drops or refrozen partially melted snowflakes. Sleet typically forms in winter storms when snowflakes partially melt while falling through a thin layer of warm air. The partially melted snowflakes then refreeze and form ice pellets as they fall through the colder air mass closer to the ground. Sleet usually bounces after hitting the ground or other hard surfaces and does not stick to objects.

What is freezing rain?

Freezing rain is precipitation that falls in the form of a liquid (i.e., rain drops), but freezes into a glaze of ice upon contact with the ground or other hard surfaces. This occurs when snowflakes descend into a warmer layer of air and melt completely. When the rain drops that result from this melting fall through another thin layer of freezing air just above the surface they become “supercooled”, but they do not have time to refreeze before reaching the ground. However, because the raindrops are “supercooled”, they instantly refreeze upon contact with anything that is at or below 32°F (i.e., the ground, trees, utility lines, etc.).

Are alerts issued for severe winter storms?

Yes. The NWS Weather Forecast Office in the Quad Cities, Iowa/Illinois is responsible for issuing ***winter storm watches*** and ***warning****s* for Mercer County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Winter Storm Watch.** A winter storm watch is issued for potentially for significant winter weather, including heavy snow, ice, sleet and/or blowing snow within the next day or two.
- **Winter Weather Advisory.** A winter weather advisory is issued for winter weather, including snow, blowing snow, ice and/or sleet, is expected to produce potentially dangerous travel conditions within the next 12 to 36 hours. While these events pose a significant inconvenience, especially to motorist, but should not be life-threatening if caution is exercised.
- **Warnings.** Winter weather warnings are issued for events that can be life threatening. The following warnings will be issued when an event is occurring, is imminent, or has a high probability of occurring.
  - **Blizzard Warning.** A blizzard warning is issued when sustained or frequent winds of 35 mph or greater are accompanied by considerable falling and/or blowing snow that frequently reduces visibility to less than ¼ mile for three hours or more.
  - **Ice Storm Warning. .** An ice storm warning is issued when heavy accumulations of ice (typically ¼ inch or greater) are expected to cause significant impacts to life and property, resulting in hazardous travel conditions, tree damage and extended power outages.
  - **Winter Storm Warning.** A winter storm warning is issued when heavy snow, blowing snow, sleet or a combination of winter weather hazards are expected to cause significant impact to life or property. Individuals are advised to avoid travel and stay indoors.

HAZARD PROFILE

The following identifies past occurrences of severe winter storms; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have severe winter storms occurred previously? What is the extent of these previous severe winter storm?

Table 1, located in **Appendix I**, summarize the previous occurrences as well as the extent or magnitude of severe winter storms (snow & ice) recorded in Mercer County.

<u>Severe Winter Storm Fast Facts – Occurrences</u>

Number of Severe Winter Storm Events Reported (1950 -2022): ***230***

Maximum 24-Hour Snow Accumulation: ***14.0 inches (January 3, 1971)***

Most Likely Month for Severe Winter Storms to Occur: ***December***

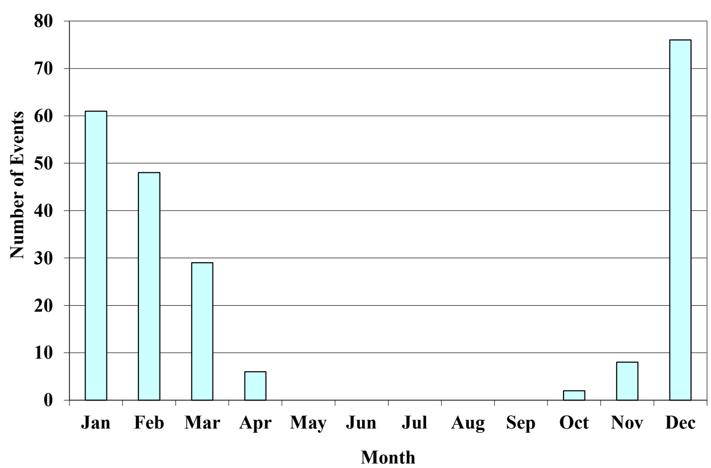
Number of Federal Disaster Declarations Related to Severe Winter Storms: ***1 (2011)***

NOAA's Storm Events Database, Midwestern Regional Climate Center's cli-MATE database, and NWS's COOP data records were used to document 230 reported occurrences of severe winter storms (snow, ice and/or a combination of both) in

Mercer County between 1950 and 2022. Of the 230 recorded occurrences there were 155 heavy snowstorms or blizzards; 67 combination events (freezing rain, sleet, ice and/or snow); and eight ice or sleet storms. Included in the 230 severe winter storms is one event, the 2011 Groundhog's Day blizzard, which contributed to a federal emergency declaration in Mercer County.

Figure SWS-1 charts the reported occurrences of severe winter storms by month. Of the 230 events, 185 (80%) took place in in December, January, and February making this the peak period for severe winter storms. Of these 185 events, 76 (41%) occurred during December, making this the peak month for severe winter storms. There were two events that spanned two months; however, for illustration purposes only the month when the event started is graphed. Of the winter storm events with recorded times, 59% began during the p.m. hours.

Figure SWS-1
Severe Winter Storms by Month
1950 – 2022



According to the NWS's COOP data records, the maximum 24-hour snow accumulation in Mercer County is 14.0 inches, which occurred on January 3, 1971 at the Aledo NWS COOP Observation Station.

What locations are affected by severe winter storms?
Severe winter storms affect the entire County. All communities in Mercer County have been affected by severe winter storms. Severe winter storms generally extend across the entire County and affect multiple locations.

What is the probability of future severe winter storms occurring based on historical data?
Mercer County has had 230 verified occurrences of severe winter storms between 1950 and 2022. With 230 occurrences over the past 73 years, Mercer County should expect at least three severe winter storms in any given year. There were 60 years over the past 73 years where two or more

severe winter storms occurred. This indicates the probability that more than one severe winter storm may occur during any given year within the County is 82%.

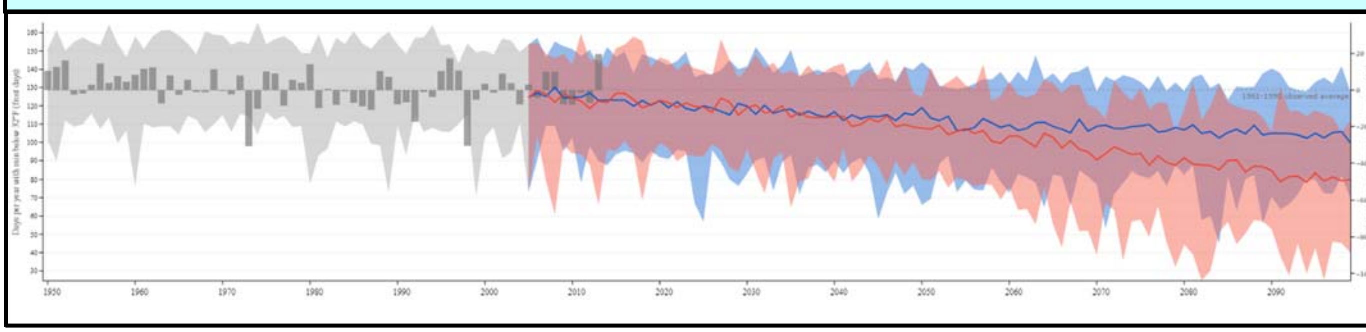
What is the probability of future severe winter storms occurring based on modeled future conditions?

The number of days in a year where the temperature falls below 32°F are gradually decreasing in number, meaning that though there will still be winter weather events, there will be fewer days in a given year that could produce them. **Figure SWS-2 and SWS-3** provide tabular and graphical projections for Mercer County showing estimations for the number of days per year with minimum temperatures below 32°F by decade in the early, mid, and late 21st century with both low and high estimates for each time period.

Figure SWS-2
Number of Days Per Year with Minimum Temperature < 32°F Table – Mercer County

Indicator	**Modeled Time Frame**						
	2030s Min - Max	**2040s** Min - Max	**2050s** Min - Max	**2060s** Min - Max	**2070s** Min - Max	**2080s** Min - Max	**2090s** Min - Max
Days with minimum temperature below 32°F							
Lower Emissions	**117 days** 85 - 129	**114 days** 80 - 138	**112 days** 78 - 134	**109 days** 78 - 138	**108 days** 78 - 133	**106 days** 70 - 132	**104 days** 73 - 134
Higher Emissions	**116 days** 84 - 140	**111 days** 86 - 138	**105 days** 78 - 132	**100 days** 61 - 129	**92 days** 51 - 121	**88 days** 46 - 121	**81 days** 39 - 115

Figure SWS-3
Number of Days Per Year with Minimum Temperature < 32°F Graph – Mercer County



However, while overall trends of rising temperatures will lead to milder winters on average, this does not mean that severe winter storms will become a thing of the past. Heavy snow events could actually become more common due to rising temperatures. Warmer air is more favorable to the formation of high precipitation clouds, which in winter will increase the likelihood of severe winter storm events when it gets cold enough to snow instead of rain. Snow from these events tends to be warm, wet, and heavy, but will melt relatively quickly in comparison to the finer, dustier snow that falls when temperatures are colder.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from severe winter storms.

Are the participating jurisdictions vulnerable to severe winter storms?

Yes. All of Mercer County, including the participating jurisdictions, is vulnerable to the dangers presented by severe winter storms. Severe winter storms are among the more frequently occurring natural hazards in Illinois. Since 2013, Mercer County has experienced 29 severe winter storms.

Severe winter storms have immobilized portions of the County, blocking roads; downing power lines, trees, and branches; causing power outages and property damage; and contributing to vehicle accidents. In addition, the County, township, and municipalities must budget for snow removal and de-icing of roads and bridges as well as for roadway repairs.

Damage to trees and communication/power lines occurred during the January 20, 2010 ice storm.

Photograph courtesy of Angie Litterst, Mercer County Health Department Administrator

The *2023 Illinois Natural Hazard Mitigation Plan* prepared by IEMA-OHS classifies Mercer County's hazard rating for winter storms as "medium" and ice storms as "low". IEMA-OHS's overall hazard rating system has five levels: very low, low, medium, high, and very high.

For winter weather and ice storm FEMA's National Risk Index (NRI) rates the County as a whole as "Relatively Low". None of the four census tracts are rated higher than "Relatively Moderate" for winter weather and ice storm. **Table R-4 presents** the overall NRI scores and ratings for each census tract as well as for the County as a whole.

Have any of the participating jurisdictions identified specific assets vulnerable to the impacts of severe winter storms?

Yes. Based on responses to an Assets Vulnerability Survey distributed to the participating jurisdictions, the following jurisdictions considered specific assets within their jurisdiction vulnerable to severe winter storms.

Mercer County:

Ice storms have the potential to down power and communication lines impacting service to critical county infrastructure as well as residents.

Abington Township:

Ice storms have the potential to down power and communication lines impacting service to residents.

Aledo:

Ice storms have the potential to damage power and communication lines impacting service to critical infrastructure as well as residents.

Aledo Fire Protection District:

- ❖ Ice storms have the potential to down power lines impacting service to the fire station as well as residents.
- ❖ Communication systems have the potential to be damaged ice storms, which would limit the District's ability to quickly respond to emergency calls.

Bay Island Drainage & Levee District:

Severe winter storms have the potential to disrupt power service impacting pumping capacity and levee vulnerability.

Genesis Medical Center:

- ❖ Ice storms have the potential to disrupt power service to the Medical Center impacting patient care.
- ❖ Winter storms have impacted staff's ability to travel to work which limits the resources available to care for patients.

Greene Township Fire Protection District:

- ❖ Ice storms have the potential to down power lines impacting service to both fire stations as well as residents.
- ❖ Communication systems have the potential to be damaged ice storms, which would limit the District's ability to quickly respond to emergency calls.

Joy:

Ice storms have the potential to down power lines impacting service to residents.

Sherrard:

The Village's water treatment plant, water tower, Village Hall, and food pantry do not have emergency backup power supplies so loss of power due to ice storm will affect service to residents.

Sherrard CUSD #200:

- ❖ Severe winter storms have the potential to down power lines causing a loss of power and impacting critical systems, such as refrigerators/freezers, HVAC, computers and communications, necessary to maintain operations at the schools.

Sherrard Community Fire Protection District:

- ❖ Severe winter storms can down trees and power lines blocking roadways, impacting travel and delaying emergency response times.
- ❖ Communication towers have the potential to be damaged by ice storms, which would limit the District's ability to quickly respond to emergency calls.

What impacts resulted from the recorded severe winter storms?

Data obtained from NOAA's Storm Events Database and FEMA Public Assistance figures indicates that between 1950 and 2022, five of the 230 severe winter storms caused $1,098,304 in property damages. Property damage information was either unavailable or none was recorded for the remaining 225 reported occurrences.

Severe Winter Storms & Extreme Cold Events
Fast Facts – Impacts/Risk

Severe Winter Storm (Snow & Ice) Impacts:

- ❖ Total Property Damage (5 events): ***$1,098,304***
- ❖ Injuries (1 event): ***2***
- ❖ Fatalities (2 events): ***2***

Severe Winter Storm Risk/Vulnerability:

- ❖ Public Health & Safety: ***Low to Medium***
- ❖ Buildings/Infrastructure/Critical Facilities: ***Medium***

In comparison, the State of Illinois has averaged $102 million annually in winter storm losses according to the Illinois State Water Survey's Climate Atlas of Illinois, ranking winter storms second only to flooding in terms of economic loss in the State. While behind floods in terms of the amount of property damage caused, severe winter storms have a greater ability to immobilize larger areas, with rural areas being particularly vulnerable.

Two injuries and two fatalities were reported as a result of two separate severe winter storm events. Heavy snow on December 28, 2000 led to a two-vehicle accident that killed one person and injured two others. On February 24, 2007, a 70 year old man struck in the head by a falling ice-covered branch and later died of his injuries.

What other impacts can result from severe winter storms?

In Mercer County, vehicle accidents are the largest risk to health and safety from severe winter storms. Hazardous driving conditions (i.e., reduced visibility, icy road conditions, strong winds, etc.) contribute to the increase in accidents that result in injuries and fatalities. A majority of all severe winter storm injuries result from vehicle accidents.

Traffic accident data assembled by the Illinois Department of Transportation from 2017 through 2021 indicates that treacherous road conditions caused by snow/slush and ice were present for 6.3% to 18.7% of all crashes recorded annually in the County. **Figure SWS-4** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when treacherous road conditions caused by snow and ice were present.

Figure SWS-4
Severe Winter Weather Crash Data for Mercer County

Year	Total # of Crashes	Presence of Treacherous Road Conditions caused by Snow/slush and Ice		
		# of Crashes	# of Injuries	# of Fatalities
2017	254	16	10	0
2018	261	37	8	0
2019	252	47	4	0
2020	209	15	1	0
2021	213	21	3	1
Total:	**1,189**	**136**	**26**	**1**

Source: Illinois Department of Transportation.

Persons who are outdoors during and immediately following severe winter storms can experience other health and safety problems. Frostbite to hands, feet, ears and nose and hypothermia are common injuries. Treacherous walking conditions also lead to falls which can result in serious injuries, including fractures and broken bones, especially in the elderly. Over exertion from shoveling driveways and walks can lead to life-threatening conditions such as heart attacks in middle-aged and older adults who are susceptible.

What is the level of risk/vulnerability to public health and safety from severe winter storms?

While severe winter storms occur regularly in Mercer County, the number of injuries and fatalities is relatively low. Taking into consideration the potential for hazardous driving conditions, snow-removal related injuries, and power outages that could leave individuals vulnerable to hypothermia, the risk to public health and safety of the *general population* from severe winter storms safety is seen as ***low*** to ***medium***.

The level of risk or vulnerability posed by severe winter storms to the public health and safety of *socially vulnerable populations* is considered to be ***medium***. Socially vulnerable populations such as older adults (those 75 years of age and older) are more susceptible to slips and falls caused by treacherous walking conditions and therefore their risk is elevated. **Figure SWS-5** identifies the percent of socially vulnerable populations by participating municipality and the County based on the U.S. Census Bureau's 2017-2021 American Community Survey data.

Figure SWS-5
Socially Vulnerable Populations by Participating Jurisdictions

Participating Jurisdiction	**% of Population 75 year of age & Older**
Aledo[2,5]	9.9%
Joy	9.3%
Keithsburg	10.7%
Matherville[1,3]	9.7%
Sherrard[1,4]	6.2%
Abington Township	7.1%
Preemption Township[1,2,3,4]	7.6%
Unincorp. Mercer County	8.4%
Mercer County	9.3%
State of Illinois	6.4%

[1]Sherrard CUSD #200
[2]Aledo FPD
[3]Greene Township FPD
[4]Sherrard Community FPD
[5]Genesis Medical Center
[6]Bay Island D&LD

Source: U.S. Census Bureau.

Are existing buildings, infrastructure, and critical facilities vulnerable to severe winter storms?

Yes. All existing buildings, infrastructure, and critical facilities located in Mercer County and the participating jurisdictions are vulnerable to damage from severe winter storms.

Structural damage to buildings caused by severe winter storms (snow and ice) is very rare but can occur particularly to flat rooftops. Information gathered from Mercer County residents indicates that snow and ice accumulations on communication and power lines as well as key roads presents the greatest vulnerability to infrastructure and critical facilities within the County. Snow and ice accumulations on lines often lead to disruptions in communications and create power outages. Depending on the damage, it can take anywhere from several hours to several days to restore service.

In addition to affecting communication and power lines, snow and ice accumulations on state and local roads hampers travel and can cause dangerous driving conditions. Blowing and drifting snow can lead to road closures and increases the risk of automobile accidents. Even small accumulations of ice can be extremely dangerous to motorists since bridges and overpasses freeze before other surfaces.

When transportation is disrupted, schools close, emergency, and medical services are delayed, some businesses close and government services can be affected. When a severe winter storm hits there is also an increase in cost to the County, township, and municipalities for snow removal and de-icing. Road resurfacing and pothole repairs are additional costs incurred each year as a result of severe winter storms.

Based on the frequency with which severe winter storms have occurred in Mercer County; the damages described; the amount of property damage previously reported; and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from severe winter storms is ***medium***.

Are future buildings, infrastructure, and critical facilities vulnerable to severe winter storms?

Yes and No. While Aledo and Sherrard have building codes in place that will likely lessen the vulnerability of new buildings and critical facilities to damage from severe winter storms, the County and the three remaining participating municipalities do not. However, infrastructure such as new communication and power lines will continue to be vulnerable to severe winter storms, especially to ice accumulations, as long as they are located above ground. Rural areas of the County have experienced extended periods without power due to severe winter storms. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas. In terms of new roads and bridges, there is very little that can be done to reduce or eliminate their vulnerability to severe winter storms.

What are the potential dollar losses to vulnerable structures from severe winter storms?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe winter storms. Since only five of the 230 recorded events listed property damage numbers for severe winter storms, it is difficult to accurately estimate future potential dollar losses. However, according to the Mercer County Clerk the total equalized assessed values of all residential, commercial, and industrial buildings in the planning area is $267,031,982. Since all of the structures in the planning area are vulnerable to damage, this total represents the countywide property exposure to severe winter storms.

3.2 SEVERE STORMS (THUNDERSTORMS, HAIL, LIGHTNING & HEAVY RAIN)

HAZARD IDENTIFICATION

What is the definition of a severe storm?

The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) defines a "severe storm" as any thunderstorm that produces one or more of the following:

- winds with gust of 50 knots (58 mph) or greater;
- hail that is at least one inch in diameter (quarter size) or larger; and/or
- a tornado.

While severe storms are capable of producing deadly lightning and heavy rain that may lead to flash flooding, the NWS does not use lightning/either to define a severe storm. However, a discussion of both lightning and heavy rain is included in this section because both are capable of causing extensive damage. For the purposes of this report, tornadoes and flooding are categorized as separate hazards and are not discussed under severe storms.

What is a thunderstorm?

A thunderstorm is a rain shower accompanied by lightning and thunder. An average thunderstorm is approximately 15 miles in diameter, affecting a relatively small area when compared to winter storms or hurricanes, and lasts an average of 30 minutes. Thunderstorms can bring heavy rain, damaging winds, hail, lightning and tornadoes.

There are four basic types of thunderstorms: single-cell, multi-cell, squall line, and supercell. The following provides a brief description of each.

<u>Single-cell Thunderstorm</u>

Single cell storms are small, weak storms that only last about ½ hour to an hour and are not usually considered severe. They are typically driven by heating on a summer afternoon. Occasionally a single cell storm will become severe, but only briefly. When this happens, it is called a pulse severe storm.

<u>Multi-cell Thunderstorm</u>

Multi-cell storms are the most common type of thunderstorms. A multi-cell storm is organized in clusters of at least two to four short-lived cells. Each cell usually lasts 30 to 60 minutes while the system as whole may persist for many hours. Multi-cell storms may produce hail, strong winds, brief tornadoes, and/or flooding.

<u>Squall Line</u>

A Squall line is a group of storms arranged in a line, often accompanied by "squalls" of high wind and heavy rain. The line of storms can be continuous or there can be gaps and breaks in the line. Squall lines tend to pass quickly and can be hundreds of miles long but are typically only 10 to 20 miles wide. A "bow echo" is a radar signature of a squall line that "bows out" as winds fall behind the line and circulation develops on either end.

Supercell Thunderstorm

Supercell storms are long-lived (greater than one hour) and highly organized storms that feed off a rising current of air (an updraft). The main characteristic that sets a supercell storm apart from other thunderstorm types is the presence of rotation in the updraft. The rotating updraft of a supercell (called a mesocyclone when visible on radar) helps a supercell storm produce extreme weather events. Supercell storms are potentially the most dangerous storm type and have been observed to generate the vast majority of large and violet tornadoes, as well as downburst winds and large hail.

Despite their size, all thunderstorms are dangerous and capable of threatening life and property. Of the estimated 100,000 thunderstorms that occur each year in the U.S., roughly 10% are classified as severe.

What kinds of damaging winds are produced by a thunderstorm?

Aside from tornadoes, thunderstorms can produce straight-line winds. A straight-line wind is defined as any wind produced by a thunderstorm that is not associated with rotation. There are several types of straight-line winds including downdrafts, downbursts, microbursts, gust fronts and derechos.

Damage from straight-line winds is more common than damage from tornadoes and accounts for most thunderstorm wind damage. Straight-line wind speeds can exceed 87 knots (100 mph), produce a damage pathway extending for hundreds of miles and can cause damage equivalent to a strong tornado.

The NWS measures a storm's wind speed in knots or nautical miles. A wind speed of one knot is equal to approximately 1.15 miles per hour. **Figure SS-1** shows conversions from knots to miles per hour for various wind speeds.

Figure SS-1
Wind Speed Conversions

Knots (kts)	Miles Per Hour (mph)	Knots (kts)	Miles Per Hour (mph)
50 kts	58 mph	60 kts	69 mph
52 kts	60 mph	65 kts	75 mph
55 kts	63 mph	70 kts	81 mph
58 kts	67 mph	80 kts	92 mph

What is hail?

Hail is precipitation in the form of spherical or irregular-shaped pellets of ice that occur within a thunderstorm when strong rising currents of air (updrafts) carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice.

Hailstones grow by colliding with supercooled water drops. The supercooled water drops freeze on contact with ice crystals, frozen rain drops, dust, etc. Thunderstorms with strong updrafts continue lifting the hailstones to the top of the cloud where they encounter more supercooled water and continue to grow. Eventually the updraft can no longer support the weight of the hail, or the updraft weakens, and the hail falls to the ground.

In the U.S., hail causes more than $1 billion in damages to property and crops annually. Hail has been known to cause injuries, although it rarely causes fatalities or serious injury.

How is the severity of a hail event measured?

The severity or magnitude of a hail event is measured in terms of the size (diameter) of the hailstones. The hail size is estimated by comparing it to known objects. **Figure SS-2** provides descriptions for various hail sizes.

Figure SS-2
Hail Size Descriptions

Hail Diameter (inches)	Description	Hail Diameter (inches)	Description
0.25 in.	pea	1.75 in.	golf ball
0.50 in.	marble/mothball	2.50 in.	tennis ball
0.75 in.	penny	2.75 in.	baseball
0.88 in.	nickel	3.00 in.	teacup
1.00 in.	quarter	4.00 in.	grapefruit
1.50 in.	ping pong ball	4.50 in.	softball

Source: NOAA, National Severe Storm Laboratory.

Hail size can vary widely. Hailstones may be as small as 0.25 inches in diameter (pea-sized) or, under extreme circumstances, as large as 4.50 inches in diameter (softball-sized). Typically hail that is one (1) inch in diameter (quarter-sized) or larger is considered severe.

The severity of a hail event can also be measured or rated using the TORRO Hailstorm Intensity Scale. This scale was developed in 1986 by the Tornado and Storm Research Organisation of the United Kingdom. It measures the intensity or damage potential of a hail event based on several factors including: maximum hailstone size, distribution, shape and texture, numbers, fall speed and strength of the accompanying winds.

The Hailstorm Intensity Scale identifies ten different categories of hail intensity, H0 through H10. **Figure SS-3** gives a brief description of each category. This scale is unique because it recognizes that, while the maximum hailstone size is the most important parameter relating to structural damage, size alone is insufficient to accurately categorize the intensity and damage potential of a hail event.

It should be noted that the typical damage impacts associated with each intensity category reflect the building materials predominately used in the United Kingdom. These descriptions may need to be modified for use in other countries to take into account the differences in building materials typically used (i.e., whether roofing materials are predominately shingle, slate or concrete, etc.).

What is lightning?

Lightning, a component of all thunderstorms, is a visible electrical discharge that results from the buildup of charged particles within storm clouds. It can occur from cloud-to-ground, cloud-to-cloud, within a cloud or cloud-to-air. The air near a lightning strike is heated to approximately

50,000°F (hotter than the surface of the sun). The rapid heating and cooling of the air near the lightning strike causes a shock wave that produces thunder.

Figure SS-3
TORRO Hailstorm Intensity Scale

Intensity Category		Typical Hail Diameter millimeters (approx.)*	Typical Hail Diameter inches (approx.)*	Description	Typical Damage Impacts
H0	Hard Hail	5 mm	0.2”	pea	no damage
H1	Potentially Damaging	5-15 mm	0.2” – 0.6”	pea / mothball	slight general damage to plants, crops
H2	Significant	10-20 mm	0.4” – 0.8”	dime / penny	significant damage to fruit, crops, vegetation
H3	Severe	20-30 mm	0.8” – 1.2”	nickel / quarter	severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-40 mm	1.0” – 1.6”	half dollar / ping pong ball	widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50 mm	1.2” – 2.0”	golf ball	wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-60 mm	1.6” – 2.4”	golf ball / egg	bodywork of grounded aircraft dented; brick walls pitted
H7	Destructive	50-75 mm	2.0” – 3.0”	egg / tennis ball	severe roof damage, risk of serious injuries
H8	Destructive	60-90 mm	2.4” – 3.5”	tennis ball / teacup	severe damage to aircraft bodywork
H9	Super Hailstorms	75-100 mm	3.0” – 4.0”	teacup / grapefruit	extensive structural damage, risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	> 100 mm	> 4.0”	softball	extensive structural damage, risk of severe or even fatal injuries to persons caught in the open

* Approximate range since other factors (i.e., number and density of hailstones, hail fall speed and surface wind speed) affect severity.

Source: Tornado and Storm Research Organisation, TORRO Hailstorm Intensity Scale Table.

Lightning on average causes 60 fatalities and 400 injuries annually in the U.S. Most fatalities and injuries occur when people are caught outdoors in the summer months during the afternoons and evenings. In addition, lightning can cause structure and forest fires. Many of the wildfires in the western U.S. and Alaska are started by lightning. According to the NWS lightning strikes cost more than $1 billion in insured losses each year.

Are alerts issued for severe storms?

Yes. The NWS Weather Forecast Office in the Quad Cities, Iowa/Illinois is responsible for issuing ***severe thunderstorm watches*** and ***warning***s for Mercer County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** A severe thunderstorm watch is issued when severe thunderstorms are possible in or near the watch area. Individuals should stay alert for the latest weather information and be prepared to take shelter.
- **Warning.** A severe thunderstorm warning is issued when severe weather has been reported by spotters or indicated by radar. Warnings indicate imminent danger to life and property for those who are in the path of the storm and individuals should seek safe shelter.

HAZARD PROFILE

The following identifies past occurrences of severe storms; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have severe storms occurred previously? What is the extent of these previous severe storms?

Tables 2, 3, 4, and **5** located in **Appendix I,** summarize the previous occurrences as well as the extent or magnitude of severe storm events recorded in Mercer County. Severe storm events are separated into four categories: thunderstorms with damaging winds, hail, lightning, and heavy rain. In Mercer County, severe storms are the most frequently occurring natural hazard.

Severe Storms Fast Facts – Occurrences

Number of recorded Thunderstorms with Damaging Winds (1973 – 2022): ***97***

Number of recorded Severe Hail Events (1971 – 2022): ***44***

Number recorded of Lightning Strike Events (1997 – 2022): ***6***

Number recorded of Heavy Rain Events (2003 – 2022): ***5***

Highest Recorded Wind Speed: ***78 knots (April 13, 2006 & November 10, 2020)***

Largest Hail Recorded: ***2.5 inches (June 14, 1974)***

Most Likely Month for Thunderstorms with Damaging Winds to Occur: ***July***

Most Likely Month for Severe Hail to Occur: ***April***

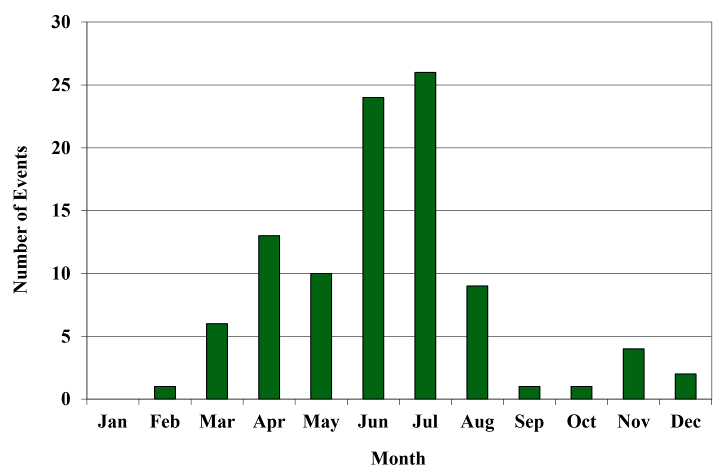
<u>*Thunderstorms with Damaging Winds*</u>

NOAA's Storm Events Database was used to document 97 reported occurrences of thunderstorms with damaging winds in Mercer County between 1973 and 2022. Of the 97 occurrences, 75 had reported wind speeds of 50 knots or greater. There were 22 occurrences, however, where the wind speed was not recorded.

The highest wind speed recorded in Mercer County occurred at Joy on April 13, 2006 and again on November 10, 2020 when winds reached 78 knots (90 mph) during a thunderstorm event. Thunderstorms with damaging winds have been recorded in every participating jurisdiction within the County on multiple occasions.

Figure SS-4 charts the reported occurrences of thunderstorms with damaging winds by month. Of the 97 events, 50 (52%) took place in June, and July making this the peak period for thunderstorms with damaging winds in Mercer County. Of those 50 events, 26 (52%) occurred during July, making this the peak month for thunderstorms with damaging winds. Of the 97 occurrences, 76% of all thunderstorms with damaging winds occurred during the p.m. hours.

Figure SS-4
Thunderstorms with Damaging Winds by Month
1973 – 2022



Hail
NOAA's Storm Events Database was used to document 44 reported occurrences of severe storms with hail one (1) inch in diameter or greater in Mercer County between 1971 and 2022. Of the 44 occurrences, 21 produced hailstones 1.50 inches or larger in diameter.

The largest hail stones documented in Mercer County measured 2.5 inches in diameter (tennis ball sized) and fell on June 14, 1974 near Preemption. Hail one (1) inch in diameter or greater has been recorded in every participating jurisdiction except Matherville on at least one occasion. This does not mean that hail one inch in diameter or greater has not fallen in Matherville, it simply indicates it wasn't recorded.

Figure SS-5 charts the reported occurrences of hail by month. Of the 44 occurrences, 34 (77%) took place in April, May, and June making this the peak period for hail in Mercer County. Of these 34 events, 17 (50%) occurred during April, making this the peak month for hail events. Thirty-nine (89%) of the 44 severe storms with hail occurred during the p.m. hours.

Lightning
While lightning strike events occur regularly across northwestern Illinois, NOAA's Storm Events Database and Committee Member records were only able to identify six occurrences of lightning strikes with verified damages in Mercer County between 1197 and 2022. The data limitations are almost certainly due to the rural nature of the County.

According to data from Vaisala's National Lightning Detection Network, Mercer County averaged from to 6 to 20 cloud-to-ground lightning flashes per square mile annually between 2009 and 2018. **Figure SS-6** illustrates the cloud-to-ground lightning flash density (number of cloud-to-ground flashes per square mile per year) by county for the continental U.S. In comparison, Illinois averaged 12.7 cloud-to-ground lightning flashes per square mile from 2009 to 2018, ranking it eighth in the Country for lightning flash density.

Figure SS-5
Hail Events by Month
1971 – 2022

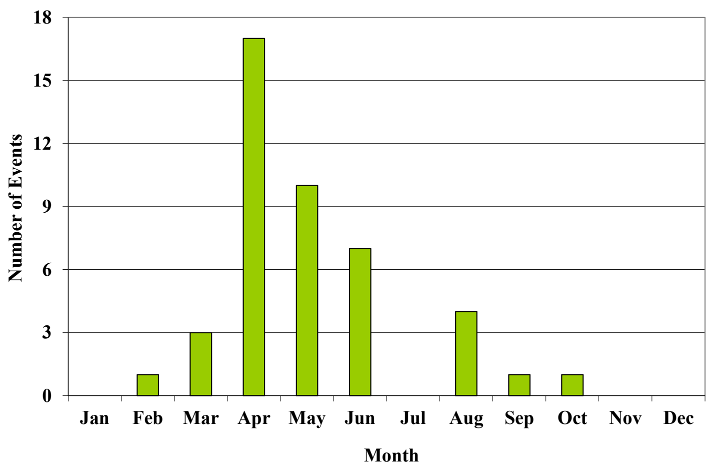
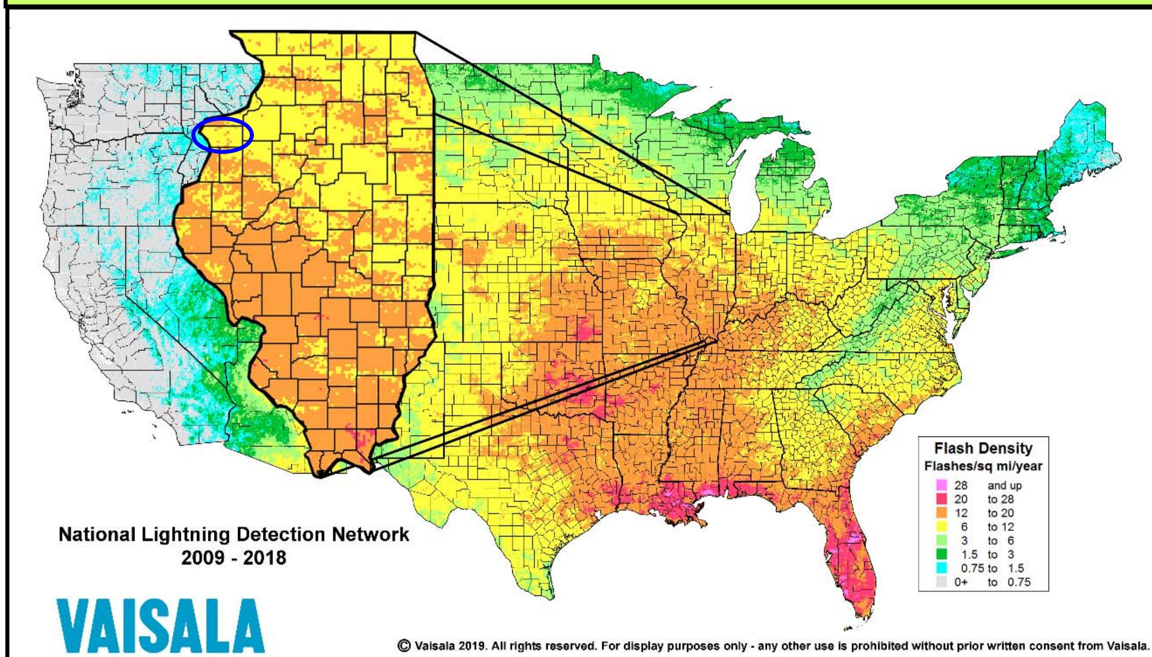


Figure SS-6
Cloud-to-Ground Lightning Flash Density: Continental U.S.



Heavy Rain
While heavy rain events occur on a fairly regular basis across northwestern Illinois, NOAA's Storm Events Database was only able to identify five occurrences of heavy rain in Mercer County. This may be due in part to a lack of uniform reporting guidelines for heavy rain events and the rural nature of most of the County.

What locations are affected by severe storms?

Severe storms affect the entire County. A single severe storm event will generally extend across the entire County and affect multiple locations. Severe storms have been recorded in every participating jurisdiction within the County on multiple occasions.

What is the probability of future severe storm events occurring based on historical data?

Thunderstorms with Damaging Winds
Mercer County has had 97 verified occurrences of thunderstorms with damaging winds between 1973 and 2022. With 97 occurrences over the past 50 years, Mercer County would expect to experience approximately two thunderstorms with damaging winds in any given year. There were 13 years over the last 50 years where multiple (three or more) thunderstorms with damaging winds occurred. This indicates that the probability that multiple thunderstorms with damaging winds may occur during any given year within the County is 26%.

Hail
There have been 44 verified occurrences of hail one (1) inch in diameter or greater between 1971 and 2022. With 44 occurrences over the past 52 years, probability that a severe storm with hail event will occur during any given year within the County is 85%. There were eight years over the last 52 years where two or more hail events occurred. This indicates that the probability that more than one severe storm with hail may occur during any given year within the County is 15%.

What is the probability of future severe storm events occurring based on modeled future conditions?

Severe storms are very difficult to forecast in the near-term future, let alone in the long-term future. This owes to the fact that these events arise due to a combination of multiple factors (including pressure fronts, wind speeds, temperatures, and humidity) working together.

What can be predicted with more certainty looking into the future is the likelihood of supercell formation, which occurs with fewer conditions needing to be met, mainly a temperature differential in fronts and a relatively low moisture content. Supercells are strong, longer-lived storm systems characterized by rotation and updrafts that make them capable of producing hazards such as damaging winds, hail, and even tornadoes. While the formation of a supercell does not ensure that severe storm events will follow, supercells increase the probability of these events significantly, making supercell formation a good predictor for the likelihood of these other weather events.

In addition, in the last 120 years total annual precipitation in Illinois has increased by between 12% to 15% across the State. This trend is likely to continue, and as a result, precipitation in Illinois is forecasted to increase in coming decades. In addition to changes in the overall amount of precipitation, changes in precipitation patterns indicate that future events will likely be less frequent, but larger and more severe. The Illinois State Climatologist indicates that since the beginning of the 20^{th} Century, Illinois has seen a 40% increase in the number of days with extreme precipitation events (rainfall of 2 inches or greater) per year.

Based on existing trends of increasing supercell formation and future projections of precipitation and temperature, supercells are likely to continue to become more common in the future. For a discussion on future projections of temperature, see Section 3.5. Supercell formation today is mostly confined to the Great Plains and the Midwest, but future projections indicate that the geographic range over which supercells may develop is likely to increase as parts of the Country that were previously unfavorable to supercell formation become warmer and dryer. Additionally, if current trends of milder winters persist, supercell season is also likely to lengthen, starting earlier in the year and ending later.

Figure SS-7 contains a series of maps that show how the number of supercell tracks is likely to change in the future. The map at the top labeled a) depicts late 20th Century historical data showing the average number of supercells per year occurring within each grid square on the map. Below, projections for two different late 21^{st} Century future scenarios for supercell frequency are given on the left, a low emission scenario depicted the top left map labeled b) and a high emission scenario depicted in the lower left map labeled d). On the right, the difference between each late 21^{st} Century scenario and the late 20^{th} Century historic baseline is shown, with redder areas showing an increase in supercell tracks per year, and blue areas showing a reduction.

Thunderstorms with Damaging Winds

Damaging winds in severe storms are most often associated with powerful downdrafts, so looking at the changing prevalence of conditions favorable to generating these downdrafts can give us an indicator of how likely damaging thunderstorm winds may be in the future. The formation of powerful storms is typically energized by an influx of warm moist air. As the climate in the Midwest continues to become wetter and warmer, this makes strong thunderstorms with damaging winds a more probable occurrence in the future.

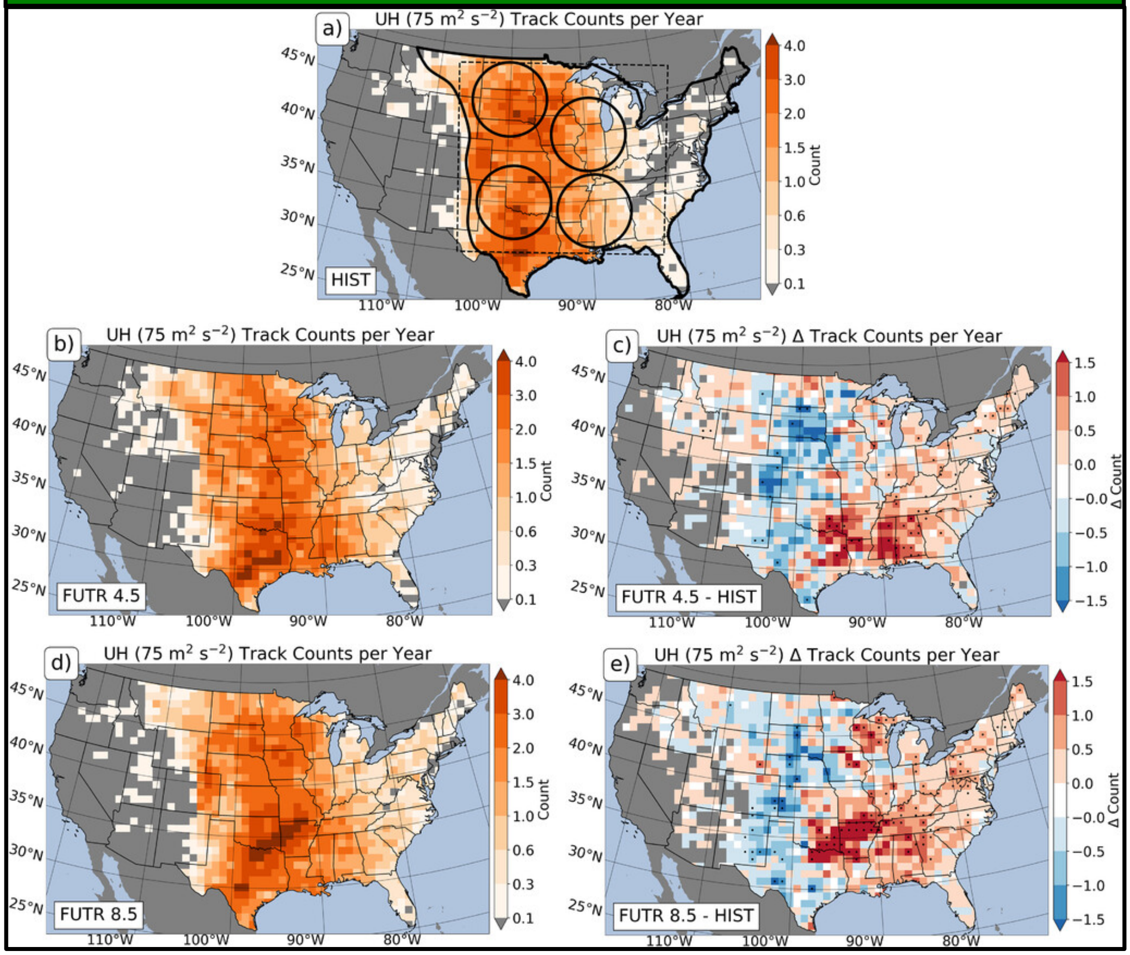
On the other hand, stronger warming occurring at more northerly latitudes is likely to decrease wind shear (a measurement of wind's change in speed and direction along a column of air), which is another important predictor of damaging winds. It is difficult to know which of these trends may be stronger than the other, or whether these two trends may wind up roughly cancelling each other out. The analysis of these trends should be revisited in subsequent planning efforts as more data becomes available.

Hail

Hail forms in storm systems with strong updrafts, so the formation of strong supercell storms is a good predictor of the occurrence of hail. The influx of moist, warm air rising over dryer, cooler air tends to create these updrafts, but for hail to occur, the air above the warm air must be cold enough for hail to form. Hail formation also depends on seasonality since the air above is cooler in spring and warmer in fall.

While a wetter and warmer climate will likely lead to more severe storms with stronger updrafts, it is more difficult to predict whether more hailstorms will result. Less gradual warming in spring may mean there will not be sufficiently cool air aloft for hail to form. When cool enough air is present for hailstones to form, stronger updrafts and more massive storms could be able to generate larger hailstones on average than those seen today. As these trends play out and more data becomes available regarding any shifts in hail frequency or intensity, it will be important to continually reassess the risk posed by hail in future planning efforts.

Figure SS-7
Mean Annual Supercell Track Counts



Citation: Bulletin of the American Meteorological Society 104, 1; 10.1175/BAMS-D-22-0027.1

Heavy Rain
Figures SS-8, SS-9, and **SS-10** provide tabular and graphical projections for Mercer County, showing estimations for average annual precipitation and number of days with total precipitation greater than 2 inches in the early, mid, and late 21st century with both low and high estimates for each time period. Most likely, the true value will fall between these two estimates. By midcentury, the average annual precipitation in Mercer County is projected to increase by 1.5 to 1.7 inches per year, while the average number of days with precipitation per year is projected to decrease by 3 to 4 days according to the Climate Mapping for Resilience and Adaptation's Assessment Tool.

The annual number of days with total precipitation greater than 2 inches is not projected to increase significantly. This is confirmed by the Climate Explorer which indicates that in Mercer County the annual counts of intense rainstorms (rainfall of 2 inches or greater in one day) are not projected to increase. This is based on the findings of the 2018 National Climate Assessment and compares projections for the middle third of the century (2035-2064) with average conditions observed from 1961-1990.

Figure SS-8
Average Annual Precipitation Projections Table – Mercer County

Indicator	Modeled History (1976 - 2005)	Early Century (2015 - 2044)		Mid Century (2035 - 2064)		Late Century (2070 - 2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max
Precipitation:							
Annual average total precipitation	35" 33 - 36	36" 33 - 39	35" 31 - 39	36" 32 - 40	36" 32 - 41	37" 33 - 41	38" 31 - 43
Days per year with precipitation (wet days)	164 days 159 - 168	163 days 152 - 172	161 days 147 - 170	161 days 148 - 174	160 days 138 - 174	161 days 148 - 174	158 days 121 - 181
Maximum period of consecutive wet days	11 days 9 - 12	10 days 9 - 12	10 days 9 - 12	11 days 9 - 13	10 days 9 - 13	10 days 9 - 13	10 days 8 - 13
Annual days with:							
Annual days with total precipitation > 1inch	4 days 3 - 5	5 days 4 - 6	4 days 4 - 5	5 days 4 - 6	5 days 3 - 7	5 days 4 - 8	6 days 4 - 10
Annual days with total precipitation > 2 inches	0 days 0 - 0	0 days 0 - 1	0 days 0 - 1	0 days 0 - 1	1 days 0 - 1	0 days 0 - 1	1 days 0 - 2
Annual days with total precipitation > 3 inches	0 days 0 - 0	0 days 0 - 0	0 days 0 - 0	0 days 0 - 0	0 days 0 - 0	0 days 0 - 0	0 days 0 - 0
Annual days that exceed 99th percentile precipitation	5 days 5 - 6	6 days 6 - 7	6 days 6 - 7	7 days 6 - 7	7 days 6 - 7	7 days 6 - 7	8 days 7 - 9
Days with maximum temperature below 32 °F	41 days 37 - 45	32 days 20 - 42	31 days 23 - 39	28 days 18 - 37	26 days 15 - 36	25 days 13 - 36	16 days 5 - 31

N/A = Data Not Available for the selected area

Figure SS-9
Average Annual Precipitation Projections Graph – Mercer County

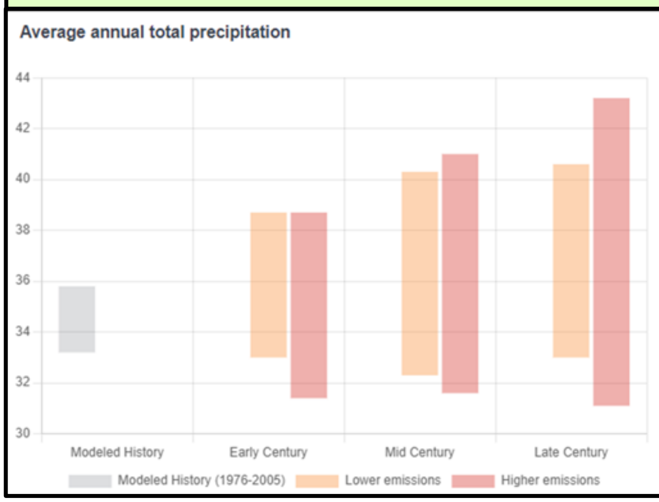
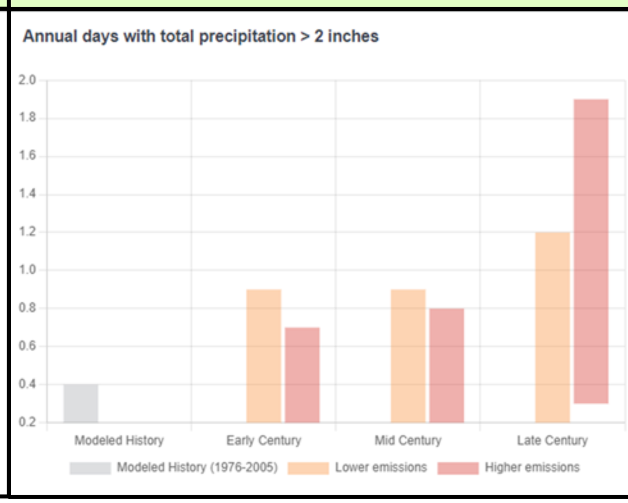


Figure SS-10
Number of Days with Total Precipitation > 2 Inches Graph – Mercer County



HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from severe storms.

Are the participating jurisdictions vulnerable to severe storms?

Yes. All of Mercer County is vulnerable to the dangers presented by severe storms due to the topography of the region and its location in relation to the movement of weather fronts across north-central Illinois. Since 2013, Mercer County has recorded 27 thunderstorms with damaging winds, eight severe storms with hail one (1) inch in diameter or greater, and three lightning strikes with verified damages

Figure SS-11 details the number of thunderstorms with damaging winds and hail events that were recorded in or near each participating municipality while **Figure SS-12** details the number of thunderstorms with damaging winds and hail events that were recorded in or near unincorporated areas of Mercer County.

Figure SS-11
Verified Severe Storm Events by Participating Municipality

Participating Municipality	Number of Events	
	Thunderstorm & High Wind	Severe Hail
Aledo[2,5]	30	8
Joy	5	3
Keithsburg	4	4
Matherville[1,3,8]	3	3
Sherrard[1,4]	6	2

Figure SS-12
Verified Severe Storm Events in Unincorporated Mercer County

Unincorporated Area	Number of Events	
	Thunderstorm & High Wind	Severe Hail
Burgess[1]	1	0
Gilchrist[1,3]	3	0
Hamlet	1	2
Preemption[8]	2	3
Swedona[1,4]	1	0

[1]Sherrard CUSD #200
[2]Aledo FPD
[3]Greene Township FPD
[4]Sherrard Community FPD
[5]Genesis Medical Center
[6]Bay Island D&LD
[7]Abington Township
[8]Preemption Township

Of the participating municipalities, Aledo has had more recorded occurrences of thunderstorms with damaging winds and the greatest number of recorded severe storms with hail events than any of the other municipalities. The differences in the number of recorded events between participating municipalities is likely due to the relative size of the municipalities as well as well as the fact that there has been a long-term NWS COOP Observation Station located in Aledo.

The *2023 Illinois Natural Hazard Mitigation Plan* prepared by the Illinois Emergency Management Agency and Office of Homeland Security (IEMA-OHS) classifies Mercer County's hazard rating for wind (thunderstorms) and hail as "high" and lightning as "very low". IEMA-OHS's overall hazard rating system has five levels: very low, low, medium, high, and very high.

FEMA's National Risk Index (NRI) rates the County as a whole as "Relatively Moderate" for strong wind (thunderstorms), "Relatively Low" for hail, and "Relatively Low" for lightning. For strong wind, three census tracts are rated "Very High", and the remaining census tract is rated "Relatively High". For hail, all the census tracts are rated "Relatively High". For lightning, two tracts are rated "Relatively High" and the remaining two census tracts are rated "Relatively Moderate". **Table R-4 presents** the overall NRI scores and ratings for each census tract as well as for the County as a whole.

Have any of the participating jurisdictions identified specific assets vulnerable to the impacts of severe storms?

Yes. Based on responses to an Assets Vulnerability Survey distributed to the participating jurisdictions, the following jurisdictions considered specific assets within their jurisdiction vulnerable to severe storms.

Mercer County:

- ❖ Severe storms with damaging winds have the potential to down power and communication lines impacting service to critical county infrastructure as well as residents.
- ❖ The dams within the County are vulnerable to the impacts of heavy rain events which could contribute to a breach.
- ❖ Heavy rain events have led to flooding of roadways in the County which impacts travel for both residents and emergency responders.
- ❖ Communication and radio towers within the County are vulnerable to severe storms with damaging winds and lightning strikes. Radio, the County's most used form of public information, is often down due to power outages or lightning strikes to towers.
- ❖ The power grid in the County, especially in the unincorporated areas, is vulnerable to severe storms. The cascading effects from power disruption are a major impact on vulnerable assets including people, critical infrastructure and systems throughout the County.

Abington Township:

Thunderstorms with damaging winds have the potential to down power and communication lines impacting service to residents.

Aledo:

- ❖ The City's water wells, water treatment plant, lift stations, and water storage facilities are vulnerable to lightning strikes. The water well sites have been hit by lightning in the past.
- ❖ Straight-line winds have the potential to damage power and communication lines impacting service to critical infrastructure as well as residents.

Tree damage sustained in Aledo during a July 13, 2016 thunderstorm with damaging winds.

Photograph courtesy of Angie Litterst, Mercer County Health Department Administrator

Aledo Fire Protection District:

- ❖ Severe with damaging winds have the potential to down power lines impacting service to the fire station as well as residents.
- ❖ Communication systems have the potential to be damaged by thunderstorms with damaging winds and lightning strikes, which would limit the District's ability to quickly respond to emergency calls.

Bay Island Drainage & Levee District:
Severe storms with damaging winds have the potential to disrupt power service impacting pumping capacity and levee vulnerability.

Genesis Medical Center:
- ❖ Severe storms with damaging winds have the potential to disrupt power service to the Medical Center impacting patient care.
- ❖ Emergency backup generators are needed to maintain refrigeration and freezers as well as safe temperatures in the school buildings in the event a severe storm causes an extended power outage while students are present.

Greene Township Fire Protection District:
- ❖ Severe with damaging winds have the potential to down power lines impacting service to both fire stations as well as residents.
- ❖ Communication systems have the potential to be damaged by thunderstorms with damaging winds and lightning strikes, which would limit the District's ability to quickly respond to emergency calls.

Joy:
- ❖ The Village does not have stormwater collection system, only ditches and culverts. During heavy rain events the ditches and culverts back up and sometimes flood streets and basements.
- ❖ During power outages caused by severe storms with damaging winds there is no power at Village Hall. As a result, Village operations are shutdown.
- ❖ Severe storms with damaging winds have the potential to down power lines impacting service to residents.

Matherville:
- ❖ The Village's lift stations, and water tower are vulnerable to lightning strikes.

Preemption Township:
Heavy rain events can wash out roadways in the Township causing imminent danger to the traveling public and potential long-term road closures.

Sherrard:
- ❖ The Village's water treatment plant, water tower, Village Hall, and food pantry do not have emergency backup power supplies so loss of power due to a severe storm with damaging winds will affect service to residents.

Sherrard CUSD #200:
- ❖ Thunderstorms with damaging winds have the potential to down power lines causing a loss of power and impacting critical systems, such as refrigerators/freezers, HVAC, computers and communications, necessary to maintain operations at the schools.
- ❖ Lightning strikes have the ability to render communication and computer equipment inoperable impacting critical systems.

Sherrard Community Fire Protection District:
- ❖ Thunderstorms with damaging winds can down trees and power lines blocking roadways, impacting travel and delaying emergency response times.
- ❖ Communication towers have the potential to be damaged by thunderstorms with damaging winds and lightning strikes, which would limit the District's ability to quickly respond to emergency calls.
- ❖ The fire station and its equipment are vulnerable to straight-line wind damage.

What impacts resulted from the recorded severe storms?

Severe storms as a whole have caused an estimated $13.5 million in recorded property damages and $3 million in recorded crop damages. The following provides a breakdown of impacts by category.

Thunderstorms with Damaging Winds

Data obtained from NOAA's Storm Events Database and Committee member records indicates that between 1973 and 2022, 21 of the 97 thunderstorms with damaging winds caused $10,707,600 in property damages and $3,035,000 in crop damages. Damage information was either unavailable or none was recorded for the remaining 75 reported occurrences.

NOAA's Storm Events Database documented four injuries as the result of two separate thunderstorm with damaging wind events. The following provides a brief description of each.

- ❖ On December 27, 1982, a thunderstorm with damaging winds overturned several mobile homes in Aledo, injuring one person inside.
- ❖ A thunderstorm with damaging winds overturned a mobile home in the Gilcrest area, injuring three people on November 29, 1991.

Severe Storms Fast Facts – Impacts/Risk

Thunderstorms with Damaging Winds Impacts:
- ❖ Total Property Damage (21 events): ***$10,707,600***
- ❖ Total Crop Damage (4 events): ***$3,035,000***
- ❖ Injuries (2 events): ***4***
- ❖ Fatalities: ***n/a***

Severe Hail Impacts:
- ❖ Total Property Damage (15 events): ***$2,795,000***
- ❖ Total Crop Damage (2 events) : ***$35,000***
- ❖ Injuries: ***n/a***
- ❖ Fatalities: ***n/a***

Lightning Strike Impacts:
- ❖ Total Property Damage (4 events): ***$70,000***
- ❖ Total Crop Damage: ***n/a***
- ❖ Injuries: ***n/a***
- ❖ Fatalities (1 event): ***1***

Heavy Rain Impacts:
- ❖ Total Property Damage: ***n/a***
- ❖ Total Crop Damage: ***n/a***
- ❖ Injuries: ***n/a***
- ❖ Fatalities: ***n/a***

Severe Storms Risk/Vulnerability:
- ❖ Public Health & Safety: ***Low***
- ❖ Buildings/Infrastructure/Critical Facilities: ***Medium***

Hail

Data obtained from NOAA's Storm Events Database indicates that between 1971 and 2022, 15 of the 44 hail events caused $2,795,000 in property damages and $35,000 in crop damages. Damage information was either unavailable or none was recorded for the remaining 29 events.

No injuries or fatalities were reported as a result of any of the recorded hail events.

Lightning

Data obtained from NOAA's Storm Events Database and Committee member records indicate that that four of the six lightning strike events caused $70,000 in property damages. Damage information was unavailable for the remaining two events. One fatality was reported as the result of a June 5, 2017 lightning strike event in Aledo. A bolt of lightning struck well in advance of an ordinary thunderstorm, killing an eight year old boy who was playing quietly in his backyard.

<u>*Heavy Rain*</u>
Damage information was either unavailable or none was recorded, and no injuries or fatalities were reported as a result of any of the heavy rain events.

What other impacts can result from severe storms?
In Mercer County, the greatest risk to health and safety from severe storms is vehicle accidents. Hazardous driving conditions resulting from severe storms (i.e., wet pavement, poor visibility, high winds, etc.) can contribute to accidents that result in injuries and fatalities. Traffic accident data assembled by the Illinois Department of Transportation from 2017 through 2021 indicates that wet road surface conditions were present for 8.0% to 13.9% of all crashes recorded annually in the County.

While other circumstances cause wet road surface conditions (i.e., melting snow, condensation, light showers, etc.), law enforcement officials agree that hazardous driving conditions caused by severe storms add to the number of crashes. **Figure SS-13** provides a breakdown by year of the number of crashes and corresponding injuries and fatalities that occurred when wet road surface conditions were present.

Figure SS-13
Severe Weather Crash Data for Mercer County

Year	Total # of Crashes	Presence of Wet Road Surface Conditions		
		# of Crashes	# of Injuries	# of Fatalities
2017	254	30	14	0
2018	261	34	19	0
2019	252	35	7	0
2020	209	18	5	0
2021	213	17	9	0
Total:	**1,189**	**134**	**54**	**0**

Source: Illinois Department of Transportation.

What is the level of risk/vulnerability to public health and safety from severe storms?
For Mercer County the level of risk or vulnerability posed by severe storms to public health and safety is considered to be ***low***. This assessment is based on the fact that despite their relative frequency, the number of injuries and fatalities is low. In addition, Genesis Medical Center as well as nearby hospitals in the Quad Cities (Rock Island County), Geneseo (Henry County), Galesburg (Knox County), Monmouth (Warren County), and Muscatine (Muscatine County, Iowa) are equipped to provide care to persons injured during a severe storm.

Are existing buildings, infrastructure, and critical facilities vulnerable to severe storms?
Yes. All existing buildings, infrastructure and critical facilities located in Mercer County and the participating jurisdictions are vulnerable to damage from severe storms. Structural damage to buildings is a relatively common occurrence with severe storms. Damage to roofs, siding, awnings, and windows can occur from hail, flying and falling debris and high winds. Lightning strikes can damage electrical components and equipment (i.e., appliances, computers etc.) and can cause fires that consume buildings. If the roof is compromised or windows are broken, rain can cause additional damage to the structure and contents of a building.

Infrastructure and critical facilities tend to be just as vulnerable to severe storm damage as buildings. The infrastructure and critical facilities that are the most vulnerable to severe storms are related to power distribution and communications. High winds, lightning and flying and falling debris have the potential to cause damage to communication and power lines; power substations; transformers and poles; and communication antennas and towers.

The damage inflicted by severe storms often leads to disruptions in communication and creates power outages. Depending on the damage, it can take anywhere from several hours to several days to restore service. Power outages and disruptions in communications can impair vital services, particularly when backup power generators are not available. **SS-14**, located at the end of this section, identifies by participating jurisdiction critical facilities and infrastructure for select categories that are supported by backup power generators. Nine of the 16 participating jurisdictions acknowledged the need for emergency backup generators to allow continued operation of critical facilities and infrastructure such as county/municipal buildings, communication infrastructure, drinking water wells, water towers, water treatment plants, lift stations, schools, fire stations, food pantries, and pump stations.

In addition to affecting power distribution and communications, debris and flooding from severe storms can block state and local roads hampering travel. When transportation is disrupted, emergency and medical services are delayed, rescue efforts are hindered, and government services can be affected.

Based on the frequency with which severe storms occur in Mercer County, the amount of property damage previously reported and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from severe storms is ***medium***.

Are future buildings, infrastructure, and critical facilities vulnerable to severe storms?

Yes and No. While Aledo and Sherrard have building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from severe storms, the County and the remaining three participating municipalities do not. However, infrastructure such as new communication and power lines will continue to be vulnerable to severe storms as long as they are located above ground. High winds, lightning and flying and falling debris can disrupt power and communication. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from severe storms?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for severe storms. With only 40 of the 152 recorded events listing property damage numbers for all categories of severe storms, there is no way to accurately estimate future potential dollar losses. However, according to the Mercer County Clerk the total equalized assessed values of all residential, commercial, and industrial buildings in the planning area is $267,031,982. Since all of the structures in the planning area are vulnerable to damage, this total represents the countywide property exposure to severe storm events.

Figure SS-14
Critical Facilities & Infrastructure Supported by Backup Generators by Jurisdiction

Participating Jurisdiction	Government/ Administrative[1]	Emergency Protection[2]	Medical & Healthcare[3]	Schools	Warming/ Cooling Centers	Drinking Water[4]	Wastewater Treatment[5]	Flood Control[6]
Mercer County	---	---	---	---	---	---	---	---
Aledo	1	2	---	---	---	1	---	---
Joy	---	1	---	---	---	1	1	---
Keithsburg	---	1	---	---	---	---	---	---
Matherville	1	1	---	---	---	1	---	---
Sherrard	---	1	---	---	---	---	---	---
Abington Township	---	---	---	---	---	---	---	---
Preemption Township	2	1	---	---	---	---	---	---
Sherrard CUSD #200	---	---	---	---	---	---	---	---
Aledo FPD	1	2	---	---	---	1	---	---
Greene Township FPD	1	2	---	---	---	1	1	---
Sherrard Community FPD	---	1	---	---	---	---	---	---
Genesis Medical Center	---	---	1	---	---	---	---	---
Bay Island D&LD	1	---	---	---	---	---	---	---

[1] Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, libraries, etc.
[2] Emergency Protection includes: sheriff's department, police, fire, ambulance, emergency operations centers, jail/correctional facilities and evacuation shelters.
[3] Medical & Healthcare includes: public health departments, hospitals, urgent/prompt care and medical clinics, nursing homes, skilled nursing facilities, memory care facilities, residential group homes, etc.
[4] Drinking Water includes: drinking water treatment plants, drinking water wells, and water storage towers/tanks.
[5] Wastewater Treatment includes: wastewater treatment plants and lift stations.
[6] Flood Control includes: levee pump stations.
--- Indicates the jurisdiction does not own/maintain any critical facilities within that category.

3.3 Extreme Cold

Hazard Identification

What is the definition of extreme cold?

Extreme cold is generally characterized by temperatures well below what is considered normal for an area during the winter months and is often accompanied or is left in the wake of a severe winter storm. Extreme cold criteria vary from region to region. As a result, reliable fixed absolute criteria are not generally specified (i.e., a winter day with a maximum temperature of 0°F).

Whenever the temperature drops below normal and the wind speeds increase, heat can leave the body more rapidly. This can lead to dangerous situations for susceptible individuals, such as those without shelter or who are stranded, or those who live in a home that is poorly insulated or without heat.

Extreme cold is a leading cause of weather-related fatalities in Illinois. According to a 2020 study published by the University of Illinois Chicago, 1,935 individuals died from cold-related illnesses between 2011 and 2018. This is 94% of all temperature-related fatalities recorded in the State during that time period.

Extreme cold can also cause infrastructure damage, especially to residential water pipes and water distribution lines and mains. According to State Farm, in 2020 Illinois was once again the national leader in losses related to frozen pipes.

What is wind chill?

Wind chill, or wind chill factor, is a measure of the rate of heat loss from exposed skin resulting from the combined effects of wind and temperature. As the wind increases, heat is carried away from the body at a faster rate, driving down both the skin temperature and eventually the internal body temperature.

The unit of measurement used to describe the wind chill factor is known as the wind chill temperature. The wind chill temperature is calculated using a formula. **Figure EC-1** identifies the formula and calculates the wind chill temperatures for certain air temperatures and wind speeds.

As an example, if the air temperature is 5°F and the wind speed is 20 miles per hour, then the wind chill temperature would be -15°F. The wind chill temperature is only defined for air temperatures at or below 50°F and wind speeds above three miles per hour. In addition, the wind chill temperature does not take into consideration the effects of bright sunlight which may increase the wind chill temperature by 10°F to 18°F.

Use of the current Wind Chill Temperature (WCT) index was implemented by the NWS on November 1, 2001. The new WCT index was designed to more accurately calculate how cold air feels on human skin. The new index uses advances in science, technology and computer modeling to provide an accurate, understandable and useful formula for calculating the dangers from winter winds and freezing temperatures. The former index was based on research done in 1945 by Antarctic researchers Siple and Passel.

Exposure to extreme wind chills can be life threatening. As wind chills edge toward -19°F and below, there is an increased likelihood that exposure will lead to individuals developing cold-related illnesses.

Figure EC-1
Wind Chill Chart

Temperature (°F)

Wind (mph) \ Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes; 10 minutes; 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T = Air Temperature (°F) V = Wind Speed (mph)

Effective 11/01/01

Source: NOAA, National Weather Service.

What cold-related illnesses are associated with extreme cold?

Frostbite and hypothermia are both cold-related illnesses that can result when individuals are exposed to dangerously low temperatures and wind chills. The following provides a brief description of the symptoms associated with each.

- **Frostbite.** During exposure to extremely cold weather the body reduces circulation to the extremities (i.e., feet, hands, nose, cheeks, ears, etc.) in order to maintain its core temperature. If the extremities are exposed, then this reduction in circulation coupled with the cold temperatures can cause the tissue to freeze.

  Frostbite is characterized by a loss of feeling and a white or pale appearance. At a wind chill of -19°F, exposed skin can freeze in as little as 30 minutes. Seek medical attention immediately if frostbite is suspected. It can permanently damage tissue and in severe cases can lead to amputation.

- **Hypothermia.** Hypothermia occurs when the body's temperature begins to fall because it is losing heat faster than it can produce it. If an individual's body temperature falls below 95°F, then hypothermia has set in, and immediate medical attention should be sought.

  Hypothermia is characterized by uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness and exhaustion. Left untreated, hypothermia will lead to death. Hypothermia occurs most commonly at very cold temperatures but can occur at cool temperatures (above 40°F) if an individual isn't properly clothed or becomes chilled.

What is a wind chill alert?

A wind chill alert is an advisory or warning issued by the NWS when the wind chill is expected to have a significant impact on public safety. The expected severity of cold temperatures and wind speed determines the type of alert issued. There are three types of alerts that can be issued for an extreme cold event. The following provides a brief description of each type of alert based on the ***wind chill criteria*** established by the NWS Weather Forecast Office in Quad Cities, Iowa/Illinois which is responsible for issuing alerts for Mercer County.

- **Wind Chill Watch.** A wind chill watch may be issued if conditions are favorable for wind chill temperatures to meet or exceed warning criteria but are not occurring or imminent.
- **Wind Chill Advisory.** A wind chill advisory is issued when wind chill values are expected to be between -15°F and -24°F.
- **Wind Chill Warning.** A wind chill warning is issued when wind chill values are expected to be -25°F or below.

HAZARD PROFILE

The following identifies past occurrences of extreme cold events; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have extreme cold events occurred previously? What is the extent of these events?

Table 6, located in **Appendix I**, summarize the previous occurrences as well as the extent or magnitude of extreme cold events recorded in Mercer County. NOAA's Storm Events Database, Iowa State University's National Weather Service Watch, Warning, and Advisories database, Midwestern Regional Climate Center's cli-MATE database, and NWS's COOP Data records were used to document 96 occurrences of extreme cold in Mercer County between 1995 and 2022.

Extreme Cold Fast Facts – Occurrences

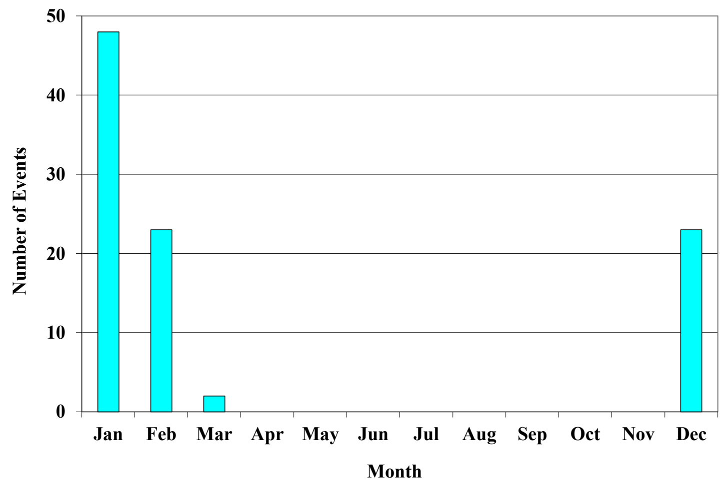
Number of Extreme Cold Events Reported (1995 - 2022): ***96***

Coldest Temperature Recorded in the County: ***-33°F (January 30 & 31, 2019)***

Most Likely Months for Extreme Cold Events to Occur: ***January***

Figure EC-2 charts the reported occurrences of extreme cold by month. Forty-eight of the 96 events (50%) took place in January, making this the peak month for extreme cold events. There were two events that spanned two months; however, for illustration purposes only the month the event started in is graphed.

Figure EC-2
Extreme Cold by Month
1995 - 2022



According to the Midwestern Regional Climate Center, near continuous temperature records for Mercer County have been kept from 1900 to the present at the Aledo NWS COOP Observation Station. **Figures EC-3** lists the coldest days recorded at this Station. Based on the available records, the coldest temperature recorded in Mercer County was -33°F at Aledo on January 30 and 31, 2019.

Figure EC-3
Coldest Days Recorded at the Aledo NWS COOP Observation Station

	Date	Temperature		Date	Temperature
1	01/30/2019	-33°F	6	01/19/1994	-25°F
2	01/31/2019	-33°F	7	02/02/1905	-24°F
3	02/13/1905	-30°F	8	01/05/1924	-24°F
4	02/03/1996	-28°F	9	01/17/2009	-24°F
5	02/04/1996	-26°F			

Source: Midwest Regional Climate Center cli-MATE

What locations are affected by extreme cold?
Extreme cold affects the entire County. Extreme cold, like excessive heat and severe winter storms, generally extends across the entire County and affects multiple locations.

Do any of the participating jurisdictions have designated warming centers?
Yes. Eight of the 12 participating municipalities, townships, schools, fire protection districts, and medical centers have designated warming centers. A "designated" warming center is identified as any facility that has been *formally* identified by the jurisdiction (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents during severe winter storms and extreme cold events.

Figure EC-4 identifies the location of each warming center by jurisdiction. At this time Abington Township, Genesis Medical Center, Sherrard, and Sherrard CUSD #200 do not have any warming centers designated. In addition, there are no State of Illinois-designated warming centers in Mercer County.

Figure EC-4
Designated Warming Centers by Participating Jurisdiction

Name/Address	Name/Address
Aledo	*Keithsburg*
VFW Post 1571, 106 SW 3rd Ave.	Keithsburg Fire Station, 202 S. 6th St.
Aledo FPD	*Matherville*
VFW Post 1571, 106 SW 3rd Ave.	Matherville Fire, 402 2nd St.
Greene Township FPD	*Preemption Township*
Matherville Fire Station, 402 2nd St., Matherville	Matherville Fire, 402 2nd St., Matherville
Viola Fire Station, 1604 13th St., Viola	Township Office, 2582 130th Ave., Aledo
Joy	*Sherrard Community FPD*
Joy Fire Station, 207 West Main Street	Sherrard Fire Dept., 101 E. 1st St., Sherrard

What is the probability of future extreme cold events occurring based on historical data?

Mercer County has experienced 96 verified occurrences of extreme cold between 1995 and 2022. With 96 occurrences over the past 28 years, Mercer County should expect to experience at least three extreme cold events in any given year. It is important to keep in mind that there are almost certainly gaps in the early extreme cold data. More events have almost certainly occurred than are documented in this section, which means that the probability is almost certainly higher than reported.

There were 23 years over the last 28 years where multiple (two or more) extreme cold events occurred. This indicates that the probability that multiple extreme cold events may occur during any given year within the County is 82%.

What is the probability of future extreme cold events occurring based on modeled future conditions?

The warming trend observed in Illinois over the past century hasn't just meant increasingly hotter summers; it has meant milder winters. Over the past 120 years, average temperatures in Illinois have increased by 1°F to 2°F according to the Illinois State Climatologist, with the most prominent changes occurring in overnight temperatures and in increased winter and spring temperatures. As a result, extreme cold events are likely to continue to become less common and less intense than they were in the past. The number of days less than 32°F in Illinois are forecasted to decrease in the coming decades. Reductions in extreme cold events could prevent some of the damages associated with them, both in terms of human health costs and economic costs.

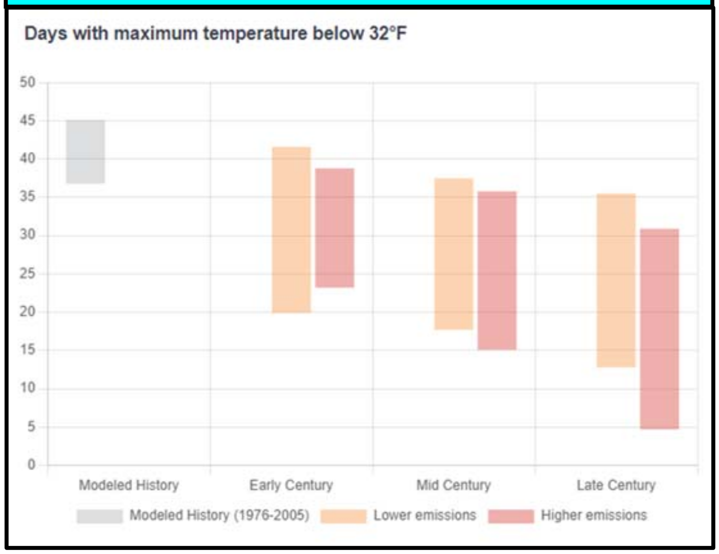
Figures EC-5, EC-6, and **EC-7** provide tabular and graphical projections for Mercer County, showing estimations for number of days where high temperatures will not exceed 32°F in the early, mid, and late 21st century with both low and high estimates for each time period. Most likely, the true value will fall between these two estimates. By midcentury, the average number of days per year not exceeding 32°F in Mercer County is forecasted to decrease from around 41 today to between 28 and 26 according to the Climate Mapping for Resilience and Adaptation's Assessment Tool.

Figure EC-5
Days with Maximum Temperature < 32°F Projection Table – Mercer County

Indicator	Modeled History (1976 - 2005)	Early Century (2015 - 2044)		Mid Century (2035 - 2064)		Late Century (2070 - 2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max
Annual days with:							
Days with maximum temperature below 32 °F	41 days 37 - 45	32 days 20 - 42	31 days 23 - 39	28 days 18 - 37	26 days 15 - 36	25 days 13 - 36	16 days 5 - 31

N/A = Data Not Available for the selected area

Figure EC-6
Number of Days with Maximum Temperature < 32°F Graph – Mercer County

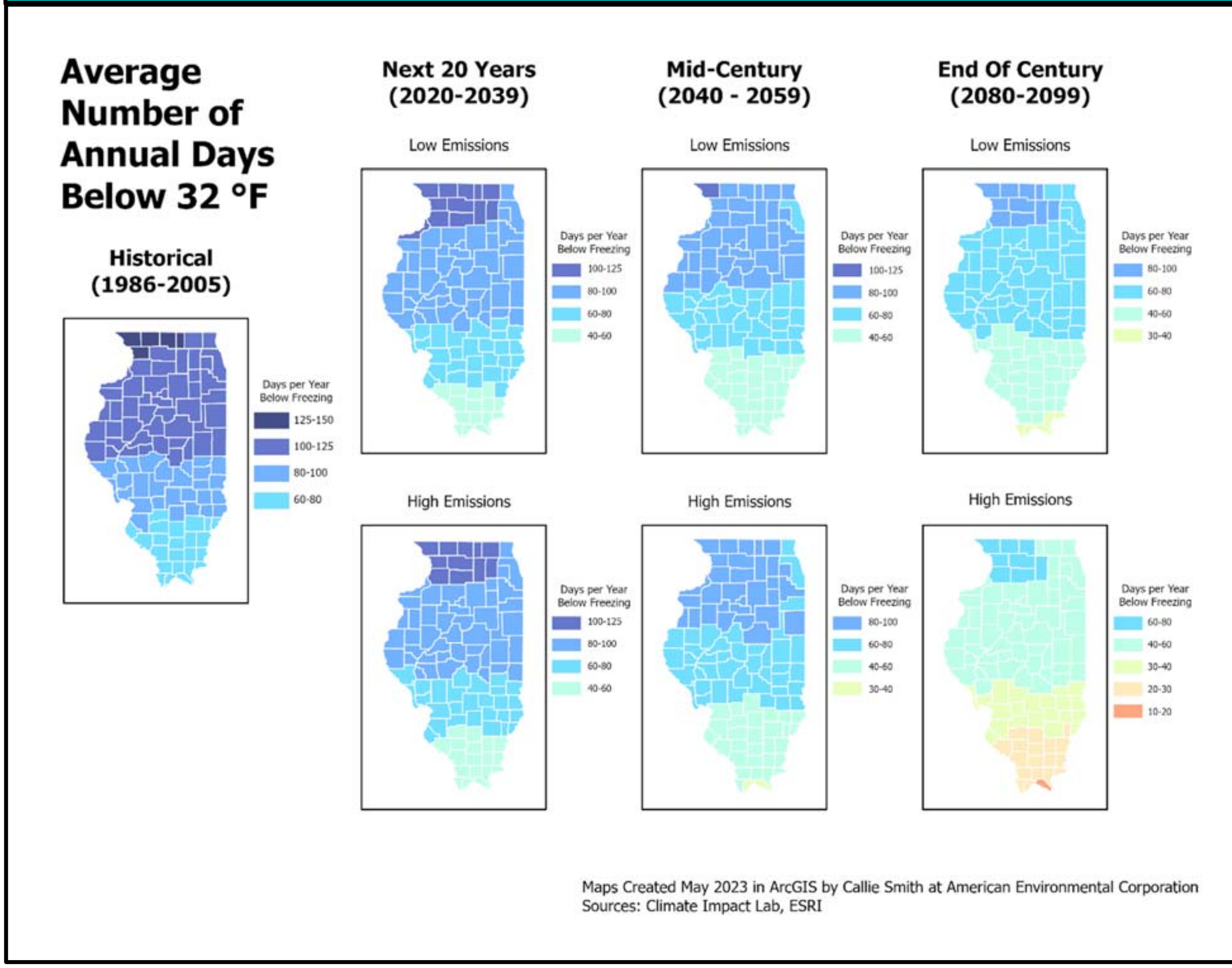


By contrast, projections from Great Lakes Integrated Sciences + Assessments indicate that there is likely to be a change of 2 to 5 days in the number of days per year where temperatures will fall below 20° F by midcentury in Mercer County.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from extreme cold.

Figure EC-7
Average Number of Annual Days Below 32°F



Are the participating jurisdictions vulnerable to extreme cold?

Yes. All of Mercer County, including the participating jurisdictions, is vulnerable to the dangers presented by extreme cold. Since 2013, Mercer County has experienced 41 extreme cold events.

The *2023 Illinois Natural Hazard Mitigation Plan* prepared by IEMA-OHS classifies Mercer County's hazard rating for cold wave as "low". IEMA-OHS's overall hazard rating system has five levels: very low, low, medium, high, and very high.

For extreme cold, FEMA's National Risk Index (NRI) rates the County as a whole as "Relatively Moderate". For extreme cold, all four census tracts are rated "Relatively High". **Table R-4 presents** the overall NRI scores and ratings for each census tract as well as for the County as a whole.

Have any of the participating jurisdictions identified specific assets vulnerable to the impacts of extreme cold?

Yes. Based on responses to an Assets Vulnerability Survey distributed to the participating jurisdictions, Mercer County considered all individuals within the County vulnerable to extreme cold and its impacts even though warming centers are available.

What impacts resulted from the recorded extreme cold events?

Damage information was either unavailable or none was recorded, and no injuries or fatalities were reported as a result of any of the extreme cold events. In comparison, the State of Illinois averages 18 cold-related fatalities annually according to the Illinois State Water Survey's Climate Atlas of Illinois.

Extreme Cold Fast Facts – Impacts/Risk

Extreme Cold Impacts:

- Total Property Damage: ***n/a***
- Injuries: ***n/a***
- Fatalities: ***n/a***

Extreme Cold Risk/Vulnerability:

- Public Health & Safety – General Population: ***Low to Medium***
- Public Health & Safety – Socially Vulnerable Populations: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

What other impacts can result from extreme cold events?

Other impacts of extreme cold include early school dismissals and school closing, power outages and frozen and ruptured water pipes and water mains. Individuals who are outdoors during and immediately following extreme cold events can experience health and safety problems. Frostbite to hands, feet, ears and nose and hypothermia are common injuries.

What is the level of risk/vulnerability to public health and safety from severe winter storms and extreme cold?

For Mercer County the level of risk or vulnerability posed by extreme cold to public health and safety of the *general population* is considered to be ***low to medium.*** This assessment is based on the fact that while extreme cold events occur regularly, the number of injuries and fatalities reported is low and all but one of the participating municipalities have designated warming centers.

The level of risk or vulnerability posed by extreme cold to the public health and safety of *socially vulnerable populations* is considered to be ***medium***. Socially vulnerable populations such as individuals with dementia and access and functional needs populations may be more susceptible to cold-related exposures if they become disoriented outdoors during an event and therefore their risk is elevated. However, demographic information is not available for these segments of the population.

Are existing buildings, infrastructure, and critical facilities vulnerable to extreme cold?

Yes. All existing buildings, infrastructure and critical facilities located in Mercer County and the participating jurisdictions are vulnerable to damage from extreme cold. Individual water pipes and distribution lines and mains are especially susceptible to freezing during extreme cold events. This freezing can lead to cracks or ruptures in the pipes in buildings as well as in buried service lines and mains. As a result, flooding can occur as well as disruptions in service. Since most buried service lines and water mains are located under local streets and roads, fixing a break requires portions of the street or road to be blocked off, excavated, and eventually repaired. These activities can be costly and must be carried out under less than ideal working conditions.

Based on the frequency with which extreme cold events have occurred in Mercer County; the damages described; the amount of property damage previously reported; and the potential for disruptions to power distribution and communication; the risk or vulnerability to buildings, infrastructure and critical facilities from extreme cold events is ***low***.

Are future buildings, infrastructure, and critical facilities vulnerable to extreme cold?

Yes and No. While Aledo and Sherrard have building codes in place that will likely help lessen the vulnerability of new buildings and critical facilities to damage from extreme cold, the County and the remaining three participating municipalities do not. However, infrastructure such as residential water pipes will continue to be vulnerable as long as they are located in areas such as outside walls, attics and crawl spaces that do not contain proper insulation.

What are the potential dollar losses to vulnerable structures from extreme cold?

Unlike other natural hazards, such as tornadoes, there are no standard loss estimation models or methodologies for extreme cold events. With none of the recorded events listing property damage figures, there is no way to accurately estimate future potential dollar losses from extreme cold. However, according to the Mercer County Clerk the total equalized assessed values of all residential, commercial, and industrial buildings in the planning area is $267,031,982. Since all of the structures in the planning area are vulnerable to damage, this total represents the countywide property exposure to extreme cold.

3.4 FLOODS

HAZARD IDENTIFICATION

What is the definition of a flood?

The Federal Emergency Management Agency (FEMA) defines a "flood" as a general or temporary condition where two or more acres of normally dry land or two or more properties are inundated by:

- overflow of inland or tidal waters;
- unusual and rapid accumulation or runoff of surface waters from any source;
- mudflows; or
- a sudden collapse or subsidence of shoreline land.

The severity of a flooding event is determined by a combination of topography and physiography, ground cover, precipitation and weather patterns and recent soil moisture conditions. On average, flooding causes more than $5 billion in damages each year in the U.S. Floods cause utility damage and outages, infrastructure damage (both to transportation and communication systems), structural damage to buildings, crop loss, decreased land values and impede travel.

What types of flooding occur in the County?

There are two main types of flooding that affect Mercer County: general flooding and flash flooding. General flooding can be broken down into two categories: riverine flooding and shallow flooding. The following provides a brief description of each type.

General Flooding – Riverine Flooding

Riverine flooding occurs when the water in a river or stream gradually rises and overflows its banks. This type of flooding affects low lying areas near rivers, streams, lakes, and reservoirs and generally occurs when:

- persistent storm systems enter the area and remain for extended periods of time,
- winter and spring rains combine with melting snow to fill river basins with more water than the river or stream can handle,
- ice jams create natural dams which block normal water flow, and
- torrential rains from tropical systems make landfall.

General Flooding – Shallow Flooding

Shallow flooding occurs in flat areas where there are no clearly defined channels (i.e., rivers and streams) and water cannot easily drain away. There two main types of shallow flooding: sheet flow and ponding. If the surface runoff cannot find a channel, it may flow out over a large area at a somewhat uniform depth in what's called sheet flow. In other cases, the runoff may collect in depressions and low-lying areas where it cannot drain out, creating a ponding effect. Ponding floodwaters do not move or flow away, they remain in the temporary ponds until the water can infiltrate the soil, evaporate, or are pumped out.

<u>*Flash Floods*</u>
Flash flooding occurs when there is a rapid rise of water along a stream or low-lying area. This type of flooding generally occurs within six hours of a significant rain event and is usually produced when heavy localized precipitation falls over an area in a short amount of time. Considered the most dangerous type of flood event, flash floods happen quickly with little or no warning. Typically, there is no time for the excess water to soak into the ground nor are the storm sewers able to handle the sheer volume of water. As a result, streams overflow their banks and low-lying (such as underpasses, basements etc.) areas can rapidly fill with water.

Flash floods are very strong and can tear out trees, destroy buildings and bridges and roll boulders the size of cars. Flash flood-producing rains can also weaken soil and trigger debris flows that damage homes, roads, and property. A vehicle caught in swiftly moving water can be swept away in a matter of seconds. Twelve inches of water can float a car or small SUV and 18 inches of water can carry away large vehicles.

What is a base flood?
A base flood refers to any flood having a 1% chance of occurring in any given year. It is also known as the 100-year flood or the one percent annual chance flood. The base flood is the national standard used by the National Flood Insurance Program (NFIP) and the State of Illinois for the purposes of requiring the purchase of flood insurance and regulating new development.

Many individuals misinterpret the term “100-year flood”. This term is used to describe the risk of future flooding; it does not mean that it will occur once every 100 years. Statistically speaking, a 100-year flood has a 1/100 (1%) chance of occurring in any given year. In reality, a 100-year flood could occur two times in the same year or two years in a row, especially if there are other contributing factors such as unusual changes in weather conditions, stream channelization or changes in land use (i.e., open space land developed for housing or paved parking lots). It is also possible not to have a 100-year flood event over the course of 100 years.

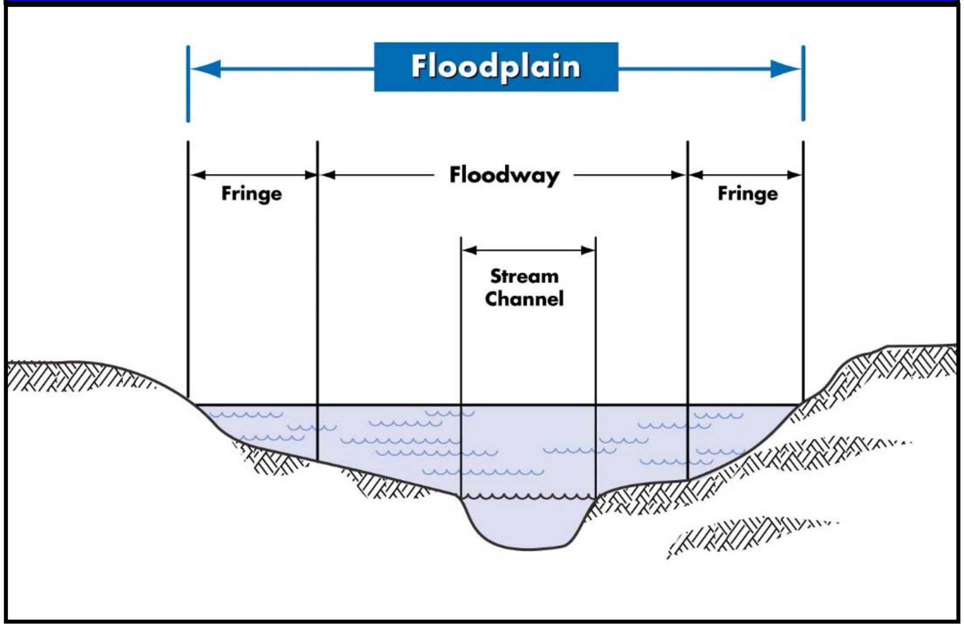
While the base flood is the standard most commonly used for floodplain management and regulatory purposes in the U.S., the 500-year flood is the national standard for protecting critical facilities, such as hospitals and power plants. A 500-year flood has a 1/500 (0.2%) chance of occurring in any given year.

What is a floodplain?
The general definition of a floodplain is any land area susceptible to being inundated or flooded by water from any source (i.e., river, stream, lake, estuary, etc.). This general definition differs slightly from the regulatory definition of a floodplain.

A regulatory or base floodplain is defined as the land area that is covered by the floodwaters of the base flood. This land area is subject to a 1% chance of flooding in any given year. The base floodplain is also known as the 100-year floodplain or a Special Flood Hazard Area (SFHA). It is this second definition that is generally most familiar to people and the one that is used by the NFIP and the State of Illinois.

A base floodplain is divided into two parts: the floodway and the flood fringe. **Figure F-1** illustrates the various components of a base floodplain.

Figure F-1
Floodplain Illustration



Source: Illinois Department of Natural Resources, Quick Guide to Floodplain Management.

The floodway is the channel of a river or stream and the adjacent floodplain that is required to store and convey the base flood without increasing the water surface elevation. Typically, the floodway is the most hazardous portion of the floodplain because it carries the bulk of the base flood downstream and is usually the area where water is deepest and is moving the fastest. Floodplain regulations prohibit construction within the floodway that results in an increase in the floodwater's depth and velocity.

The flood fringe is the remaining area of the base floodplain, outside of the floodway, which is subject to shallow inundation and low velocity flows. In general, the flood fringe plays a relatively insignificant role in storing and discharging floodwaters. The flood fringe can be quite wide on large streams and quite small or nonexistent on small streams. Development within the flood fringe is typically allowed via permit if it will not significantly increase the floodwater's depth or velocity and the development is elevated above or otherwise protected to the base flood elevation.

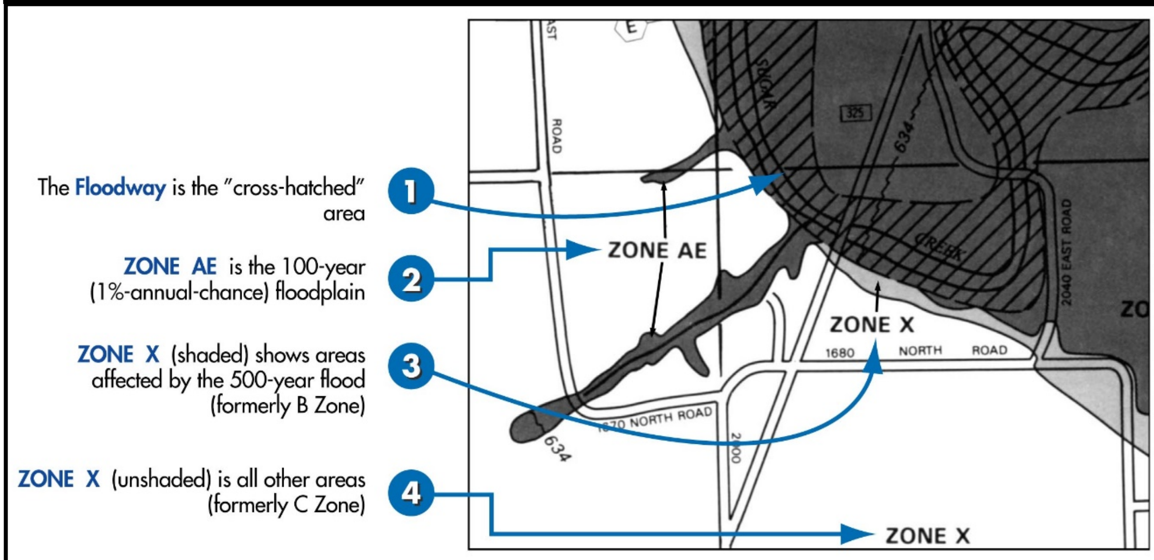
What is a Special Flood Hazard Area?

A Special Flood Hazard Area (SFHA) is the base floodplain. As discussed previously, this is the land area that is covered by the floodwaters of the base flood and has a 1% chance of flooding in any given year. The term SFHA is most commonly used when referring to the based floodplain on the Flood Insurance Rate Maps (FIRM) produced by FEMA. The SFHA is the area where floodplain regulations must be enforced by a community as a condition of participation in the NFIP and the area where mandatory flood insurance purchase requirements apply. SFHA are delineated on the FIRMs and may be designated as Zones A, AE, A1-30, AO, AH, AR, and A99 depending on the amount of flood data available, the severity of the flood hazard or the age of the flood map.

What are Flood Insurance Rate Maps?

Flood Insurance Rate Maps (FIRMs) are maps that identify both the SFHA and the risk premium zones applicable to a community. These maps are produced by FEMA in association with the NFIP for floodplain management and insurance purposes. Digital versions of these maps are referred to as DFIRMs. **Figure F-2** shows an example of a FIRM.

Figure F-2
Example of a Flood Insurance Rate Map (FIRM)



Source: Illinois Department of Natural Resources, Quick Guide to Floodplain Management.

A FIRM will generally show a community's base flood elevations, flood zones and floodplain boundaries. The information presented on a FIRM is based on historic, meteorological, hydrologic, and hydraulic data as well as open-space conditions, flood-control projects, and development. ***These maps only define flooding that occurs when a creek or river becomes overwhelmed. They do not define overland flooding that occurs when an area receives extraordinarily intense rainfall and storm sewers, and roadside ditches are unable to handle the surface runoff.***

What are flood zones?

Flood zones are geographic areas that FEMA has defined according to varying levels of flood risk and type of flooding. These zones are depicted on a community's FIRM. The following provides a brief description of each flood zone.

➢ **Zone A.** Zone A, also known as the Special Flood Hazard Area (SFHA) or base floodplain, is defined as the floodplain area that has a 1% chance of flooding in any given year. There are multiple Zone A designations, including Zones A, AO, AH, A1-30, AE, AR or A99. Land areas located within Zone A are considered high-risk flood areas.

During a 30-year period, the length of many mortgages, there is at least a 1 in 4 chance that flooding will occur in a SFHA. The purchase of flood insurance is mandatory for all buildings in SFHAs receiving federal or federally-related financial assistance.

- **Zone X (shaded).** Zone X (shaded), formerly known as Zone B, is defined as the floodplain area between the limits of the base flood (Zone A) and the 0.2% chance or 500-year flood. Land areas located within Zone X (shaded) are affected by the 500-year flood and are considered at a moderate risk for flooding.

  Zone X (shaded) is also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, shallow flooding areas with average depths of less than one foot or drainage areas less than one square mile. While flood insurance is not federally required in Zone X (shaded), it is recommended for all property owners and renters.
- **Zone X (unshaded).** Zone X (unshaded), formerly known as Zone C, is defined as all other land areas outside of Zone A and Zone X (shaded). Land areas located in Zone X (unshaded) are considered to have a low or minimal risk of flooding. While flood insurance is not federally required in Zone X (unshaded), it is recommended for all property owners and renters.

What is a Repetitive Loss Structure or Property?

FEMA defines a "repetitive loss structure" as a National Flood Insurance Program-insured structure that has received two or more flood insurance claim payments of more than $1,000 each within any 10-year period since 1978. These structures/properties account for approximately one-fourth of all National Flood Insurance Program (NFIP) insurance claim payments since 1978.

Currently, repetitive loss properties make up about 2% of all NFIP policies, and account for approximately $9 billion in claims or approximately 16% of the total claims paid over the history of the Program. These structures not only increase the NFIP's annual losses, but they also drain funds needed to prepare for catastrophic events. As a result, FEMA and the NFIP are working with states and local governments to mitigate these properties.

What is floodplain management?

Floodplain management is the administration of an overall community program of corrective and preventative measures to reduce flood damage. These measures take a variety of forms and generally include zoning, subdivision or building requirements, special-purpose floodplain ordinances, flood control projects, education, and planning. Where floodplain development is permitted, floodplain management provides a framework that minimizes the risk to life and property from floods by maintaining a floodplain's natural function. Floodplain management is a key component of the National Flood Insurance Program.

What is the National Flood Insurance Program?

The National Flood Insurance Program (NFIP) is a federal program, administered by FEMA, that:

- mitigates future flood losses nationwide through community-enforced building and zoning ordinances; and

- provides access to affordable, federally-backed insurance protection against losses from flooding to property owners in participating communities.

It is designed to provide an insurance alternative to disaster assistance to meet escalating costs of repairing damage to buildings and their contents due to flooding. The U.S. Congress established the NFIP on August 1, 1968 with the passage of the National Flood Insurance Act of 1968. This Program has been broadened and modified several times over the years, most recently with the passage of the Flood Insurance Reform Act of 2004.

Prior to the creation of the NFIP, the national response to flood disasters was generally limited to constructing flood-control projects such as dams, levees, sea-walls, etc. and providing disaster relief to flood victims. While flood-control projects were able to initially reduce losses, their gains were offset by unwise and uncontrolled development practices within floodplains. In light of the continued increase in flood losses and the escalating costs of disaster relief to taxpayers, the U.S. Congress created the NFIP. The intent was to reduce future flood damage through community floodplain management ordinances and provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for protection.

Participation in the NFIP is voluntary and based on an agreement between local communities and the federal government. If a community agrees to adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in a SFHA (base floodplain), then the government will make flood insurance available within the community as a financial protection against flood losses.

If a community chooses not to participate in the NFIP or a participating community decides not to adopt new floodplain management regulations or amend its existing regulations to reference new flood hazard data provided by FEMA, then the following sanctions will apply.

- Property owners will not be able to purchase NFIP flood insurance policies and existing policies will not be renewed.
- Federal disaster assistance will not be provided to repair or reconstruct insurable buildings located in identified flood hazard areas for presidentially-declared disasters that occur as a result of flooding.
- Federal mortgage insurance and loan guarantees, such as those written by the Federal Housing Administration and the Department of Veteran Affairs, will not be provided for acquisition or construction purposes within an identified flood hazard area. Federally-insured or regulated lending institutions, such as banks and credit unions, are allowed to make conventional loans for insurable buildings in identified flood hazard areas of non-participating communities. However, the lender must notify applicants that the property is in an identified flood hazard area and that it is not eligible for federal disaster assistance.
- Federal grants or loans for development will not be available in identified flood hazard areas under programs administered by federal agencies such as the Environmental Protection Agency, Small Business Administration and the Department of Housing and Urban Development.

What is the NFIP's Community Rating System?

The NFIP's Community Rating System (CRS) is a voluntary program developed by FEMA to provide incentives (in the form of flood insurance premium discounts) for NFIP participating communities that have gone beyond the minimum NFIP floodplain management requirements to develop extra measures to provide protection from flooding. CRS discounts on flood insurance premiums range from 5% up to 45%. The discounts provide an incentive for communities to implement new flood protection activities that can help save lives and property when a flood occurs.

Are alerts issued for flooding?

Yes. The National Weather Service Weather Forecast Office in Quad Cities, Iowa/Illinois is responsible for issuing ***flood watches*** and ***warnings*** for Mercer County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Flood Watches.** A flood watch is issued when flooding or flash flooding is possible. It does not mean that flooding will occur, just that conditions are favorable. Individuals need to be prepared.
- **Flood Advisories.** A flood advisory is issued when flooding may cause significant inconvenience but is not expected to be to pose an immediate threat to life and/or property. Individuals need to be aware.
- **Warnings.** Warnings indicate a serious threat to life and/or property.
  - **Flood Warning**. A flood warning is issued when flooding is occurring or will occur soon and is expected to last for several days or weeks.
  - **Flash Flood Warning.** A flash flood warning is issued when flash flooding is occurring or is imminent. Flash flooding occurs very quickly so individuals are advised to take action immediately.

HAZARD PROFILE

The following identifies past occurrences of floods; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When has flooding occurred previously? What is the extent of these previous floods?

Tables 7 and **8**, located in **Appendix I**, summarize the previous occurrences as well as the extent or magnitude of flood events recorded in Mercer County. The flood events are separated into two categories: general floods (riverine and shallow/overland) and flash floods.

<u>*General Floods*</u>

NOAA's Storm Events Database, NWS's Advanced Hydrologic Prediction Service, and the U.S. Army Corps of Engineers' river gauge data were used to document 79 occurrences of general flooding in Mercer County

<u>Flood Fast Facts – Occurrences</u>

Number of General Floods Reported (1965 – 2022): ***79***

Number of Flash Floods Reported (1996 – 2022): ***33***

Most Likely Month for General Floods to Occur: ***April***

Most Likely Month for Flash Floods to Occur: ***May***

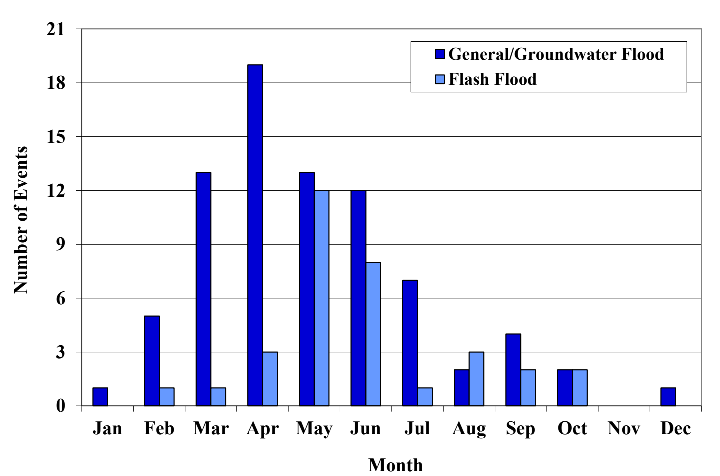
Number of Federal Disaster Declarations Related to General and Flash Flooding: ***9 (1965, 1969, 1973, 1974, 1993, 2001, 2008, 2013, & 2019)*** between 1965 and 2022. Included in the 79 general flood events are 11 events that contributed to nine separate federally-declared disasters in Mercer County.

Based on historical gauge data, the record setting Mississippi River flood at Keithsburg occurred on June 17, 2008 when the River crested at 24.49 feet. The second and third highest crests at this location occurred in 1993 and 2019 respectively.

Flash Floods
NOAA's Storm Events Database and Iowa State University's National Weather Service Watch, Warning, and Advisories database were used to document 33 reported occurrences of flash flooding in Mercer County between 1996 and 2022.

Figure F-3 charts the reported occurrences of flooding by month. Of the 79 general flood events, 45 (57%) began in March, April, and May making this the peak period for general flooding. Of those 45 events, 19 (42%) began during April making this the peak month for general flooding. There were 41 events that spanned two or more months; however, for illustration purposes only the month the event started in is graphed.

Figure F-3
Flood Events by Month



In comparison, 20 of the 33 flash flood events (61%) took place between May and June making this the peak period for flash floods. Of these 20 events, 12 (60%) occurred in May making this the peak month for flash flooding. Of the flash flood events with recorded times, 55% began during the p.m. hours.

What locations are affected by floods?

While specific locations are affected by general flooding, most areas of the County can be impacted by overland and flash flooding because of the topography and seasonally high water table of the area. In Mercer County, approximately 12.7% of the area in the County is designated as being within the base floodplain and susceptible to riverine floods.

Figure F-4 identifies the floodplains in Mercer County as well as the participating jurisdictions. This map is based on the most current Mercer County DFRIMs that became effective April 19, 2010. While a large portion of the area prone to riverine flooding is in unincorporated portions of the County, Keithsburg, New Boston, Seaton and Sherrard are also susceptible to riverine flooding because of its proximity to floodplains. **Appendix J** contains maps identifying the floodplains located in each of the participating municipalities.

Figure F-5 identifies the bodies of water within or immediately adjacent to participating jurisdictions that are known to cause flooding or have the potential to flood. Water bodies with Special Flood Hazard Areas located within a participating jurisdiction (as identified on the DFIRMs) are identified in bold.

Figure F-5
Bodies of Water Subject to Flooding

Participating Jurisdiction	Water Bodies
Aledo	Pike Run
Joy	---
Keithsburg	**Mississippi River, Pope Creek**
Matherville	Lake Matherville, Unnamed Tributary to Edwards River
Sherrard	**Fyre Lake, Karl Lake**
Unincorporated Mercer County	**Big Chief Run, Bogus Chute, Camp Creek,** Cash Creek, **Copperas Creek,** Deerlick Branch, Donohue Run, **Douglas Creek, Duck Creek, Edwards River, Eliza Creek, Fyre Lake, Illinois Slough,** Irwin Branch, Keating Creek, Lake Matherville, Lake Nelson, **Little Camp Creek,** Mad River, Maids Run, Middle Henderson Creek, **Mill Creek, Mississippi River,** McCaw Pond, Mud Creek, **North Camp Creek, North Henderson Creek, North Pope Creek, Parker Run,** Pike Run, **Pope Creek,** Renee Lake, Skunk Creek, **Snake Creek, Swan Lake Ditch,** Toms Creek, **Wildcat Creek,** Winters Creek, Yankee Branch

Source: FEMA's DFIRMs.

Municipal, Township, and County officials have reported overland flood issues outside of the base floodplain in most of the participating municipalities and many unincorporated portions of the County. This overland flooding is known to impair travel.

What jurisdictions within the County take part in the NFIP?

Participating Jurisdictions

Mercer County, Aledo, and Keithsburg participate in the NFIP. **Figure F-6** ***provides information on each NFIP-participating jurisdiction,*** including the date each participant joined, the date of their current effective FIRM and the year of their most recently adopted floodplain zoning ordinance. Joy and Matherville have no identified flood hazard boundaries within their corporate limits and do not wish to participate in the NFIP at this time. While the current effective DFIRM for Sherrard (dated April 19, 2010) does identify SFHAs within its limits, the Village chose not to adopt floodplain regulations and participate in the NFIP. As a result, the Village is listed as a community not in the NFIP with a sanction date of April 19, 2011 in FEMA's Community Status Book Report for Illinois. The current Village administration does not see the need to participate since the area within the SFHA is associated with Karl Lake and Fyre Lake and does not contain any residential structures.

Figure F-4
Floodplain Areas in Mercer County

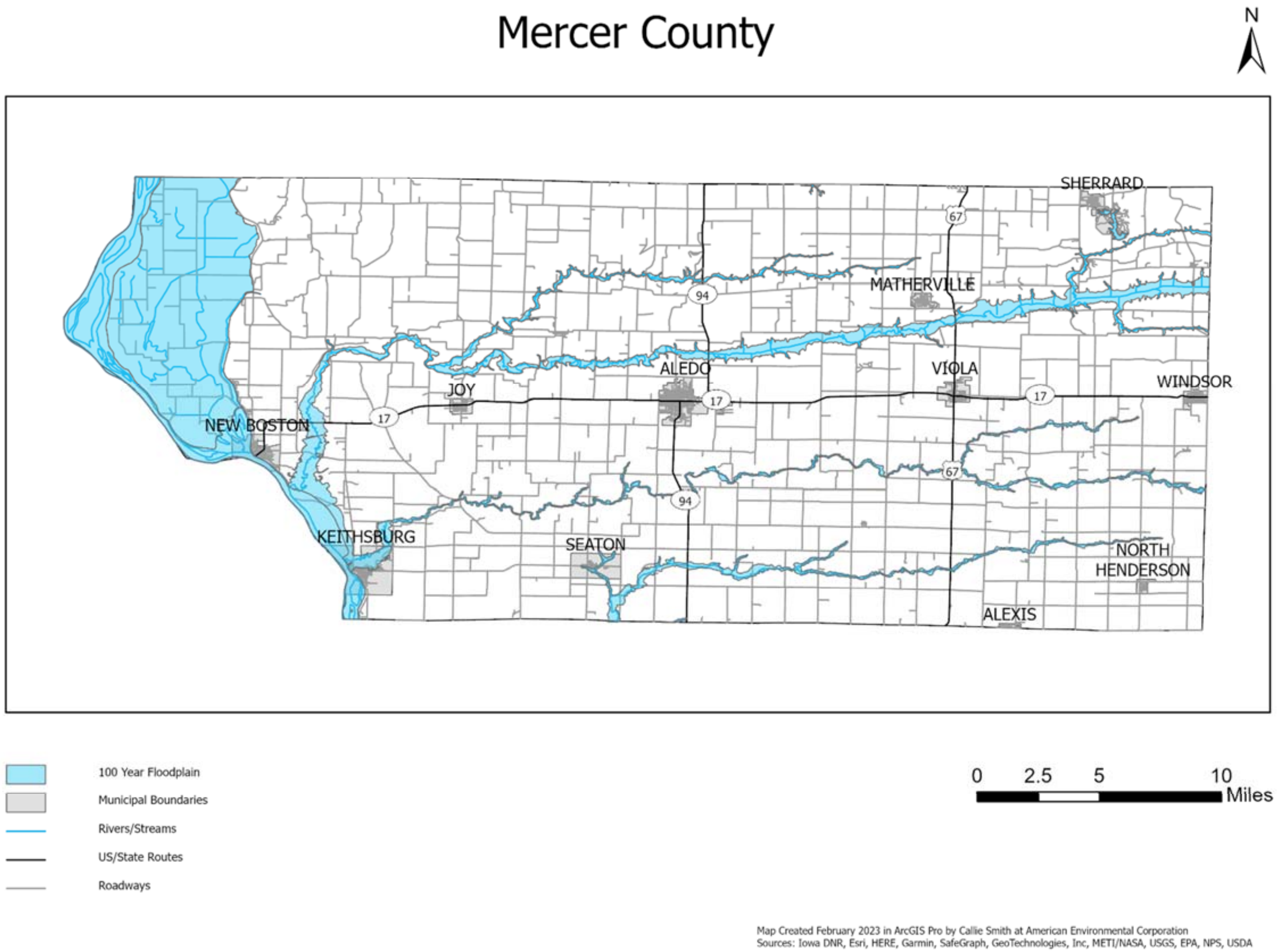


Figure F-6 NFIP Participating Jurisdictions							
Participating Jurisdictions	**Participation (Date)**	**Current Effective FIRM (Date)**	**Floodplain Zoning/FIRM Adoption Ordinance (Year)**	**Adoption of Minimum NFIP Criteria (Yes/No)***	**Local Floodplain Management Regulations Implemented & Enforced (Yes/No)**	**Position Responsible for Implementation of NFIP Commitments/ Requirements**	**CRS Participation**
Mercer County	01/03/1986	04/19/2010	2010	Yes	Yes	County Board Chair	No
Aledo	02/11/1983	04/19/2010 NSFHA	1975	Yes	Yes	Director of Public Works and Utilities	No
Keithsburg	09/15/1983	04/19/2010	2010	Yes	Yes	Zoning Enforcer	No

* In Mercer County, all the NFIP-participating jurisdictions have adopted the State of Illinois model floodplain ordinance. This ordinance goes above and beyond NFIP minimum standards and has much more restrictive floodway regulations. As a result, all of the NFIP-participating jurisdictions are in compliance with NFIP requirements.

Discussions with the individuals responsible for implementation of the NFIP commitments and requirements within their jurisdiction and a review of the participating jurisdictions floodplain ordinances indicates that each monitor flood events and, when applicable, conduct substantial damage determinations for structures within the floodplain using FEMA's Substantial Damage Estimator Tool. For structures that meet the definition of substantial damage (total cost of repairs is 50% or more of the structure's market value before the disaster occurred, regardless of the cause of damage), the owners are notified, and the structure must be brought back into compliance with local floodplain management regulations.

Participating jurisdictions will continue to comply with the NFIP by implementing mitigation projects and activities that enforce this ordinance to reduce future flood risks to new construction within the SFHA. At this time no new construction is planned within the base floodplain. Continued compliance with NFIP requirements is addressed in the Mitigation Action Tables of the participating jurisdictions found in Section 4.7.

Non-Participating Jurisdictions

Figure F-7 provides information on those incorporated municipalities within the County that chose not to participate in the planning process but take part in the NFIP. North Henderson, Viola, and New Windsor have no identified flood hazard boundaries within their corporate limits and have chosen not to participate in the Program. Thile the current effective DFIRM for New Boston (dated April 19, 2010) does identify SFHA within its limits, the Village chose not to adopt floodplain regulations and participate in the NFIP. As a result, the Village is listed as a community not in the NFIP with a sanction date of April 11, 1976 in FEMA's Community Status Book Report for Illinois. The current City administration does not see the need to participate since the area within the SFHA only includes two structures.

Figure F-7 Non-Participating Jurisdiction NFIP Status				
Participating Jurisdictions	**Participation Date**	**Current Effective FIRM Date**	**CRS Participation**	**Most Recently Adopted Floodplain Zoning Ordinance**
Seaton	08/19/1985	04/19/2010	No	2010

Sources: FEMA, Community Status Book Report: Illinois.

What is the probability of future flood events occurring based on historical data?

General Floods

Mercer County has had 79 verified occurrences of general flooding between 1965 and 2022. With 79 occurrences over the past 58 years, the County should expect at least one general flood event in any given year. It is important to keep in mind there are almost certainly gaps in the general flood data. More events have almost certainly occurred than are documented in this section, which means that the probability is almost certainly higher than reported.

Over half of Keithsburg was flooded during the 2008 Mississippi River flood.

Photograph courtesy of Angie Litterst, Mercer County Health Department Administrator

There were 24 years over the past 58 years where two or more general flood events occurred. This indicates that the probability or likelihood that more than one general flood event may occur during any given year within the County is 41%.

Flash Floods

There have been 33 verified flash flood events between 1996 and 2022. With 33 occurrences over the past 27 years, the County should expect at least one flash flood event in any given year. There were 10 years over the past 27 years where two or more flash flood events occurred. This indicates that the probability that more than one flash flood event may occur during any given year within the County is approximately 37%.

What is the probability of future flood events occurring based on modeled future conditions?

In the last 120 years, total annual precipitation in Illinois has increased by between 12% to 15% across the State. This means, according to the Illinois State Climatologist, that we get about an additional 5 inches of yearly rainfall compared to what was expected historically.

This trend is likely to continue, and as a result, precipitation in Illinois is forecasted to increase in coming decades. In addition to changes in the overall amount of precipitation, changes in precipitation patterns indicate that future events will likely be less frequent, but larger and more severe. The Illinois State Climatologist indicates that since the beginning of the 20th Century, Illinois has seen a 40% increase in the number of days with extreme precipitation events (rainfall of 2 inches or greater) per year.

One result of more precipitation overall and an increase in heavy rain events is an increased risk of flooding. In particular, extreme precipitation events are likely to lead to flash floods along rivers and in urban areas, where impermeable surfaces such as buildings, roads, and sidewalks will make drainage systems more likely to be overwhelmed. Rural areas will face different challenges, most notably those close to rivers and in low-lying areas with little or no drainage capability.

Figures SS-8 and **SS-9**, located in Section 3.2, provide tabular and graphical projections for Mercer County, showing estimations for average annual precipitation in the early, mid, and late 21st century with both low and high estimates for each time period. Most likely, the true value will fall between these two estimates. By midcentury, the average annual precipitation in Mercer County is projected to increase by 1.5 to 1.7 inches per year, while the average number of days with precipitation per year is projected to decrease by 3 to 4 days according to the Climate Mapping for Resilience and Adaptation's Assessment Tool.

By midcentury, the annual number of days with total precipitation greater than 1 inch is projected to increase by one day. The annual number of days with total precipitation greater than 2 inches is not projected to increase significantly. This is confirmed by the Climate Explorer, which indicates that in Mercer County the annual counts of intense rainstorms (rainfall of 2 inches or greater in once day) are not projected to increase. This is based on the findings of the 2018 National Climate Assessment and compares projections for the middle third of the century (2035-2064) with average conditions observed from 1961-1990.

Taken together, the projected increase in annual rainfall, the decrease in frequency of rain events, and the negligible threat of intense rain events in Mercer County means that the likelihood of flooding may be slightly higher than it is today.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from floods.

Several factors including topography, precipitation, and an abundance of rivers and streams make Illinois especially vulnerable to flooding. According to the Illinois State Water Survey's Climate Atlas of Illinois, since the 1940s Illinois climate records have shown an increase in heavy precipitation, which has led to increased flood peaks on Illinois rivers.

Are the participating jurisdictions vulnerable to flooding?

Yes. Mercer County and the participating jurisdictions are vulnerable to the dangers presented by flooding. Precipitation levels and topography are factors that cumulatively make virtually the entire County susceptible to some form of flooding. Flooding occurs along the floodplains of all the rivers, streams, and creeks within the County as well as outside of the floodplains in low-lying areas where drainage problems occur. Since 2013, Mercer County has experienced 21 general flood events and 13 flash flood events.

All of the general flood events impacted either a large portion of or the entire County and were not location specific. In terms of flash flood events, all but two impacted either a large portion of or the entire County and were not location specific. Of the remaining two events, one took place in the unincorporated community of Eliza while the other took place in the unincorporated community of Swedona.

The Keithsburg Riverside Campground was flooded during Mississippi River flooding in April 2013.

Photograph courtesy of Angie Litterst, Mercer County Health Department Administrator

The *2023 Illinois Natural Hazard Mitigation Plan* prepared by IEMA-OHS classifies Mercer County's hazard rating for riverine flooding and flash flooding as "medium". IEMA-OHS's overall hazard rating system has five levels: very low, low, medium, high, and very high.

For riverine floods the FEMA's National Risk Index (NRI) rates the County as a whole as "Relatively Low". One of the four census tracts is rated "Relatively High", two are rated "Relatively Moderate", and one is rated "Very Low" for riverine floods. **Table R-4 presents** the overall NRI scores and ratings for each census tract as well as for the County as a whole.

Vulnerability to flooding can change depending on several factors, including land use. As land used primarily for agricultural and open space purposes is converted for residential and commercial/industrial uses, the number of buildings and impervious surfaces (i.e., parking lots, roads, sidewalks, etc.) increases. As the number of buildings and impervious surfaces increases, so too does the potential for flash flooding. Rather than infiltrating the ground slowly, rain and snowmelt that falls on impervious surfaces runs off and fills ditches and storm drains quickly creating drainage problems and flooding. According to the Multi-Resolution Land Characteristics (MRLC) Consortium, approximately 5.2% of the County's land cover is considered developed with 1.4% impervious surfaces. Areas with impervious surface rates approaching or exceeding 12 to 15 percent will likely experience negative impacts to water quality. Between 2016 and 2021 approximately 2.20 square miles of development and 0.08 square miles of impervious surfaces were gained.

As described in Section 1.3 Land Use and Development Trends, substantial changes in land use (from forested, open, and agricultural land to residential, commercial, and industrial) are not anticipated within the County in the immediate future. No substantial increases in residential or commercial/industrial developments are expected within the next five years.

Have any of the participating jurisdictions identified specific assets vulnerable to the impacts of flooding?

Yes. Based on responses to an Assets Vulnerability Survey distributed to the participating jurisdictions, the following jurisdictions considered specific assets within their jurisdiction vulnerable to flooding.

Mercer County:
- ❖ Major flood events can damage the levees within the County adversely impacting their ability to protect the people and infrastructure located behind them.
- ❖ Flood events have caused overtopping and washouts of roadways in the County which impacts travel for both residents and emergency responders.

Abington Township:
Flood events have the potential to cause overtopping and washouts of roadways and culverts in the Township.

Keithsburg:
- ❖ The main road into the City from the north crosses Pope Creek and floods during heaving rain events adversely impacting travel.
- ❖ The wastewater treatment plant is vulnerable to flooding from heavy rain events.

Matherville:
The Village's wastewater treatment lagoon is located in the base floodplain of the Edwards River and vulnerable to flooding.

What impacts resulted from the recorded floods?

Floods as a whole have caused a minimum of $24.2 million in property damages. The following provides a breakdown by category. In comparison, the State of Illinois has averaged an estimated $257 million annually in property damage losses, making flooding the single most financially damaging natural hazard in Illinois.

Flood Fast Facts – Impacts/Risk

General Flood Impacts:
- ❖ Total Property Damage (8 events): ***$9,180,021***
- ❖ Total Crop Damage: ***n/a***
- ❖ Injuries: ***n/a***
- ❖ Fatalities: ***n/a***

Flash Flood Impacts:
- ❖ Total Property Damage (5 events): ***$15,058,000***
- ❖ Total Crop Damage: ***n/a***
- ❖ Injuries: ***n/a***
- ❖ Fatalities: ***n/a***

Flood Risk/Vulnerability to:
- ❖ Public Health & Safety – General Flooding: ***Low***
- ❖ Public Health & Safety – Flash Flooding: ***Medium***
- ❖ Buildings/Infrastructure/Critical Facilities: ***Medium to High***

General Floods
Data obtained from NOAA's Storm Events Database, FEMA Public Assistance figures, and Committee member records indicates that between 1965 and 2022, eight of the 79 general flood events caused $9,180,021 in property damages. Damage information was either unavailable or none was recorded for the remaining 71 reported occurrences. No injuries or fatalities were reported as a result of any of the recorded events.

Flash Floods
Data obtained from NOAA's Storm Events Database indicates that between 1996 and 2022, five of the 33 flash flood events caused $15,058,000 in property damages. Damage information was either unavailable or none was recorded for the remaining 28 reported occurrences. No injuries or fatalities were reported as a result of any of the recorded events.

What other impacts can result from flooding?

One of the primary threats from flooding is drowning. Nearly half of all flash flood fatalities occur in vehicles as they are swept downstream. Most of these fatalities take place when people drive into flooded roadway dips and low drainage areas. It only takes two feet of water to carry away most vehicles.

Floodwaters also pose biological and chemical risks to public health. Flooding can force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto streets and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly, and those with specific allergies.

Flooding can also cause chemical contaminants such as gasoline and oil to enter the floodwaters if underground storage tanks or pipelines crack and begin leaking during a flood event. Depending on the time of year, floodwaters also may carry away agricultural chemicals that have been applied to farm fields.

Homes were flooded in Keithsburg during the July 2014 Mississippi River flood.

Photograph courtesy of Angie Litterst, Mercer County Health Department Administrator

Structural damage, such as cracks forming in a foundation, can also result from flooding. In most cases, however, the structural damage sustained during a flood occurs to the flooring, drywall, and wood framing. In addition to structural damage, a flood can also cause serious damage to a building's content.

Infrastructure and critical facilities are also vulnerable to flooding. Roadways, culverts, and bridges can be weakened by floodwaters and have been known to collapse under the weight of a vehicle. Buried power and communication lines are also vulnerable to flooding. Water can infiltrate lines and cause disruptions in power and communication.

What is the level of vulnerability to public health and safety from floods?

While both general and flash floods occur on a regular basis within the County, the number of injuries and fatalities is low. In terms of the risk or vulnerability to public health and safety from general floods, the risk is seen as ***low***. However, one-third of the recorded flood events were the result of flash flooding. Since there is very little warning associated with flash flooding the risk to public health and safety from flash floods is elevated to ***medium***.

Are there any repetitive loss structures/properties within Mercer County?

Yes. According to information obtained from FEMA, there are three repetitive loss structures located Keithsburg. As described previously, FEMA defines a "repetitive loss structure" as an NFIP-insured structure that has received two or more flood insurance claim payments of more than $1,000 each within any 10-year period since 1978.

Figure F-8 identifies the repetitive flood loss structures by jurisdiction and provides the total flood insurance claim payments. The exact location and/or address of the insured structures are not included in this Plan to protect the owners' privacy. According to FEMA, there have been eight flood insurance claim payments totaling $249,714.24 for the three repetitive flood loss structures.

Figure F-8
Repetitive Flood Loss Structures

Jurisdiction	Structure Type	Number of Structures	Number of Claim Payments	Flood Insurance Claim Payments		Total Flood Insurance Claim Payments
				Structure	Contents	
Keithsburg	Other Residential	1	3	$23,331.99	$0.00	$23,331.99
Keithsburg	Non-Residential	2	5	$206,012.25	$20,370.00	$226,382.25
Total:		**5**	**12**	**$229,344.24**	**$20,370.00**	**$249,714.24**

Source: Federal Emergency Management Agency

Are existing buildings, infrastructure and critical facilities vulnerable to flooding?

Yes. **Figure F-9** identifies the <u>*estimated number*</u> of existing structures by participating jurisdiction located within a base floodplain. These counts were prepared by the Consultant using FEMA's National Flood Hazard Layer and building footprints prepared by the Illinois State Water Survey. **Figure F-10** identifies the <u>*estimated number*</u> of existing structures by township located within the base floodplain. It should be noted that while the identified structures are located in a floodplain, the actual number impacted may differ during a real flood event.

Figure F-9
Existing Buildings, Infrastructure and Critical Facilities Located in a Base Floodplain by Participating Jurisdiction

Participating Jurisdiction	Residential			Residential Garages	Businesses (Commercial/ Industrial)	Miscellaneous (Barns, Sheds, Silos)	Infrastructure/ Critical Facilities
	Houses	Duplexes	Apartment Complexes				
Aledo[2,5]	---	---	---	---	---	---	---
Joy	---	---	---	---	---	---	---
Keithsburg	12	---	---	6	8	11	3
Matherville[1,3]	---	---	---	---	---	---	2
Sherrard[1,4]	---	---	---	---	---	---	---
Unincorp. Mercer County[1,2,3,4,6]	35	---	---	9	1	133	8

[1]Sherrard CUSD #200
[2]Aledo FPD
[3]Greene Township FPD
[4]Sherrard Community FPD
[5]Genesis Medical Center
[6]Bay Island D&LD

Aside from key roads, bridges, electrical substations, and buried power and communication lines, the following provides a description of those participating jurisdictions that have specific infrastructure/critical facilities located within a floodplain:

- <u>*Bay Island Drainage & Levee District:*</u> The District's administrative office, maintenance building, and pump station are located in the base floodplain of the Mississippi River.
- <u>*Keithsburg*</u>: The City's maintenance building is located in the based floodplain of the Mississippi River.

❖ *Matherville:* The Village's wastewater treatment lagoons are located in the base floodplain of the Edwards River.

Figure F-10
Existing Buildings, Infrastructure and Critical Facilities Located in a Floodplain by Township

Township	Residential			Residential Garages	Businesses (Commercial/ Industrial)	Miscellaneous (Barns, Sheds, Silos)	Infrastructure/ Critical Facilities
	Houses	Duplexes	Apartment Complexes				
Abington	11	---	---	2	---	8	---
Duncan[2]	1	---	---	---	---	1	---
Eliza[6]	12	---	---	3	1	61	---
Greene[1,3]	3	---	---	---	---	1	---
Keithsburg	12	---	---	6	8	11	3
Mercer[2,5]	1	---	---	---	---	1	---
Millersburg[2]	1	---	---	1	---	1	---
New Boston[6]	9	---	---	5	1	49	8
North Henderson[1]	---	---	---	---	---	---	---
Ohio Grove[1,2]	---	---	---	---	---	1	---
Perryton[2]	3	---	---	---	---	4	---
Preemption[1,2,3,4]	2	---	---	---	---	1	2
Richland Grove[1,3,4]	6	---	---	---	---	6	---
Rivoli[1]	---	---	---	---	---	---	---
Suez[1]	---	---	---	---	---	---	---

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

While 12.7% of the land area in Mercer County lies within the base floodplain and is susceptible to riverine flooding, ***almost the entire County is vulnerable to flash flooding***. As a result, ***a majority of the buildings, infrastructure and critical facilities that may be impacted by flooding are located outside of the base floodplain and are not easily identifiable.***

The risk or vulnerability of existing buildings, infrastructure and critical facilities to all forms of flooding is considered to be ***medium to high*** based on: (a) the frequency and severity of recorded flood events within the County; (b) the County's proximity to the Mississippi River and its tributaries; (c) the fact that most of the County is vulnerable to flash flooding; and (d) a majority of the buildings, infrastructure and critical facilities that may be impacted are located outside of the base floodplain.

Are future buildings, infrastructure and critical facilities vulnerable to flooding?

The answer to this question depends on the type of flooding being discussed.

Riverine Flooding

In terms of riverine flooding, the vulnerability of future buildings, infrastructure and critical facilities located within NFIP-participating jurisdictions is low as long as the existing floodplain ordinances are enforced. Enforcement of the floodplain ordinance is the mechanism that ensures that new structures either are not built in flood-prone areas or are elevated or protected to the base flood elevation.

Flash Flooding
In terms of flash flooding, all future buildings, infrastructure and critical facilities are still vulnerable depending on the amount of precipitation that is received, the topography and any land use changes undertaken within the participating jurisdictions.

What are the potential dollar losses to vulnerable structures from flooding?
An estimate of the potential dollar losses to vulnerable *residential structures* located within the *participating municipalities and the townships within the County* can be calculated if several assumptions are made. These assumptions represent a probable scenario based on the reported occurrences of flooding in Mercer County.

The purpose of providing an estimate is to help residents and local officials make informed decisions about how they can better protect themselves and their communities. These estimates are meant to provide a ***general idea*** of the magnitude of the potential damage that could occur from a flood event in each of the participating municipalities.

Assumptions
To calculate the overall potential dollar losses to vulnerable residential structures from a flood, a set of decisions/assumptions must be made regarding:

- type of flood event;
- scope of the flood event;
- number of potentially-damaged housing units;
- value of the potentially-damaged housing units; and
- percent damage sustained by the potentially-damaged housing units (i.e., damage scenario.)

The following provides a detailed discussion of each decision/assumption.

Assumption #1

A riverine flood event will impact vulnerable residential structures.

Type of Flood Event. The first step towards calculating the potential dollar losses to vulnerable residential structures is to determine the type of flood event that will be used for this scenario. While the County has experienced all forms of flooding, riverine floods have occurred with greater regularity in the County. In addition, identifying residential structures vulnerable to flash flooding is problematic because most are located outside of the base floodplain and the number of structures impacted can change with each event depending on the amount of precipitation received, the topography and the land use of the area.

Therefore, a riverine flood event will be used since it is (a) relatively easy to identify vulnerable residential structures within each municipality (i.e., those structures located within the base floodplain or Special Flood Hazard Areas of any river, stream or creek); and (b) the number of structures impacted is generally the same from event to event.

Assumption #2

All base floodplains will flood and experience the same degree of flooding.

Scope of the Flood Event. To establish the number of vulnerable residential structures (potentially-damaged housing units), the scope of the riverine flood event must first be determined. In this scenario, the scope refers to the number of rivers, streams and creeks that overflow their banks and the degree of flooding experienced along base floodplains for each river, stream and creek.

Generally speaking, a riverine flood event only affects one or two rivers or streams at a time depending on the cause of the event (i.e., precipitation, snow melt, ice jam, etc.) and usually does not produce the same degree of flooding along the entire length of the river, stream or creek. However, for this scenario, it was decided that:

- ❖ all rivers, streams and creeks with base floodplains would overflow their banks, and
- ❖ the base floodplains of each river, stream and/or creek located within the corporate limits of each municipality would experience the same degree of flooding.

This assumption results in the following conditions for each municipality:

- ➢ Aledo, Joy, and Matherville would not experience any residential flooding since there are no river, stream or creek base floodplains located within their municipal limits;
- ➢ Keithsburg: Pope Creek and the Mississippi River would overflow their banks and flood portions of the Village; and
- ➢ Sherrard: Fyre Lake and Karl Lake would rise out of their banks and flood the southeast portion of the Village.

Assumption #3

The number of existing residential structures located within the base floodplain(s) will be used to determine the number of potentially-damaged housing units.

Number of Potentially-Damaged Housing Units. Since this scenario assumes that all the base floodplains will experience the same degree of flooding, the number of existing residential structures located within the base floodplain(s) can be used to determine the number of potentially-damaged housing units. **Figures F-9** and **F-10** identifies the total number of existing residential structures located within the base floodplains(s) of each participating jurisdiction. These counts were prepared by the Consultant.

While base floodplains are present for Fyre Lake and Karl Lake in Sherrard, there are no residential structures located within their limits.

Assumption #4

The average market value for a residential structure will be used to determine the value of potentially-damaged housing units.

Value of Potentially-Damaged Housing Units. Now that the number of potentially-damaged housing units has been determined, the monetary value of the units must be calculated. Typically, when damage estimates are prepared after a natural disaster such as a flood, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value for a residential structure will be used.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is determined by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the averaged assessed value and multiplying that number by three (the assessed value of a structure in Mercer County is approximately one-third of the market value). **Figure F-11** provides a sample calculation. The total assessed value is based on 2022 tax assessment information provided by the Mercer County Clerk's Office. **Figures F-12** and **Figure F-13** provide the average assessed value and average market value for each participating municipality and the townships.

Figure F-11
Sample Calculation of Average Assessed Value & Average Market Value – Keithsburg

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value

Keithsburg: $3,375,673 ÷ 359 housing units = $9,403

Average Market Value

Average Assessed Value x 3 = Average Market Value (Rounded to the Nearest Dollar)

Keithsburg: $9,403 x 3 = $28,209

Figure F-12
Average Market Value of Housing Units by Participating Municipality

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2022)	Total Housing Units (2017-2021)	Average Assessed Values	Average Market Value (2022)
Aledo[2,5]	$37,511,079	1,815	$20,667	$62,001
Joy	$3,023,535	165	$18,324	$54,972
Keithsburg	$3,375,673	359	$9,403	$28,209
Matherville[1,3]	$7,045,764	342	$20,602	$61,806
Sherrard[1,4]	$6,826,475	267	$25,567	$76,701

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

Source: Mercer County Clerk's Office.

Damage Scenario. The final decision that must be made to calculate potential dollar losses is to determine the percent damage sustained by the structure and the structure's contents during the flood event. In order to determine the percent damage using FEMA's flood loss estimation tables, assumptions must be made regarding (a)

Assumption #5

The potentially-damaged housing units are one or two-story homes with basements and the flood depth is two feet.
Structural Damage = 20%
Content Damage = 30%

the type of residential structure flooded (i.e., manufactured home, one story home without a basement, one- or two-story home with a basement, etc.) and (b) the flood depth. **Figure F-14** calculates the percent loss to a structure and its contents for different scenarios based on flood depth and structure type.

Figure F-13
Average Market Value of Housing Units by Township

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2022)	Total Housing Units (2017-2021)	Average Assessed Values	Average Market Value (2022)
Abington	$2,462,989	176	$13,994	$41,983
Duncan[2]	$1,593,318	121	$13,168	$39,504
Eliza[6]	$3,272,765	106	$30,875	$92,625
Greene[1,3]	$15,257,042	688	$22,176	$66,528
Keithsburg	$4,421,271	410	$10,784	$32,351
Mercer[2,5]	$42,350,992	1,923	$22,023	$66,070
Millersburg[2]	$5,098,054	263	$19,384	$58,153
New Boston[6]	$9,801,861	512	$19,144	$57,433
North Henderson[1]	$2,825,528	153	$18,468	$55,403
Ohio Grove[1,2]	$1,506,196	222	$6,785	$20,354
Perryton[2]	$4,532,107	157	$28,867	$86,601
Preemption[1,2,3,4]	$22,905,268	854	$26,821	$80,463
Richland Grove[1,3,4]	$37,593,092	914	$41,130	$123,391
Rivoli[1]	$10,389,927	549	$18,925	$56,776
Suez[1]	$4,867,645	251	$19,393	$58,179

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

Source: Mercer County Clerk's Office.

Figure F-14
FEMA Flood Loss Estimation Tables

Flood Building Loss Estimation Table

Flood Depth (feet)	One Story No Basement (% Building Damage)	Two Story No Basement (% Building damage)	One or Two Story With Basement (% Building damage)	Manufactured Home (% Building damage)
-2	0	0	4	0
-1	0	0	8	0
0	9	5	11	8
1	14	9	15	44
2	22	13	20	63
3	27	18	23	73
4	29	20	28	78
5	30	22	33	80
6	40	24	38	81
7	43	26	44	82
8	44	29	49	82
>8	45	33	51	82

Flood Content Loss Estimation Table

Flood Depth (feet)	One Story No Basement (% Contents Damage)	Two Story No Basement (% Contents damage)	One or Two Story With Basement (% Contents damage)	Manufactured Home (% Contents damage)
-2	0	0	6	0
-1	0	0	12	0
0	13.5	7.5	16.5	12
1	21	13.5	22.5	66
2	33	19.5	30	90
3	40.5	27	34.5	90
4	43.5	30	42	90
5	45	33	49.5	90
6	60	36	57	90
7	64.5	39	66	90
8	66	43.5	73.5	90
>8	67.5	49.5	76.5	90

Source: FEMA, Understanding Your Risks: Identifying Hazards and Estimating Losses

For this scenario it is assumed that the potentially-damaged housing units are one or two-story homes with basements and the flood depth is two feet. With these assumptions the expected percent damage sustained by the ***structure*** is estimated to be 20% and the expected percent damage sustained by the structure's ***contents*** is estimated to be 30%.

Potential Dollar Losses

Now that all of the decisions/assumptions have been made, the potential dollar losses can be calculated. First the potential dollar losses to the ***structure*** of the potentially-damaged housing units must be determined. This is done by taking the average market value for a residential structure and multiplying that by the percent damage 20% to get the average structural damage per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure F-15** provides a sample calculation.

Figure F-15 ***Structure:*** **Potential Dollar Loss Sample Calculation – Keithsburg**
Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit
Keithsburg: $28,209 x 20% = $5,641.80 per housing unit
Average Structural Damage x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Structure* Potential Dollar Losses (Rounded to the Nearest Dollar)
Keithsburg: $5,641.80 per housing unit x 12 housing units = $67,702

Next the potential dollar losses to the ***content*** of the potentially-damaged housing units must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply that by the percent damage 30% to get the average content damage per unit. Then take the average content damage per unit and multiply that by the number of potentially-damaged housing units. **Figure F-16** provides a sample calculation.

Figure F-16 ***Content:*** **Potential Dollar Loss Sample Calculation – Keithsburg**
½ (Average Market Value of a Housing Unit with the Jurisdiction) x Percent Damage = Average Content Damage per Housing Unit
Keithsburg: ½ ($28,209) x 30% = $4,231.35 per housing unit
Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses (Rounded to the Nearest Dollar)
Keithsburg: $4,231.35 per housing unit x 12 housing unit = $50,776

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and the content. **Figures F-17 and F-18** provide a breakdown of the total potential dollar losses by participating municipality and township.

Figure F-17
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Riverine Flood Event by Participating Municipality

Participating Jurisdiction	Average Market Value (2022)	Potentially-Damaged Housing Units	Potential Dollar Losses		Total Potential Dollar Losses (Rounded to the Nearest Dollar)
			Structure	Content	
Aledo[2,5]	$62,001	0	$ 0	$ 0	$ 0
Joy	$54,972	0	$ 0	$ 0	$ 0
Keithsburg	$28,209	12	$67,702	$50,776	$118,478
Matherville[1,3]	$61,806	0	$ 0	$ 0	$ 0
Sherrard[1,4]	$76,701	0	$ 0	$ 0	$ 0

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

Figure F-18
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Riverine Flood Event by Township

Township	Average Market Value (2022)	Potentially-Damaged Housing Units	Potential Dollar Losses		Total Potential Dollar Losses (Rounded to the Nearest Dollar)
			Structure	Content	
Abington	$41,983	11	$92,363	$69,272	$161,635
Duncan[2]	$39,504	1	$7,901	$5,926	$13,827
Eliza[6]	$92,625	12	$222,300	$166,725	$389,025
Greene[1,3]	$66,528	3	$39,917	$29,938	$69,855
Keithsburg	$32,351	12	$77,642	$58,232	$135,874
Mercer[2,5]	$66,070	1	$13,214	$9,911	$23,125
Millersburg[2]	$58,153	1	$11,631	$8,723	$20,354
New Boston[6]	$57,433	10	$114,866	$86,150	$201,016
North Henderson[1]	$55,403	0	$ 0	$ 0	$ 0
Ohio Grove[1,2]	$20,354	0	$ 0	$ 0	$ 0
Perryton[2]	$86,601	3	$51,961	$38,970	$90,931
Preemption[1,2,3,4]	$80,463	2	$32,185	$24,139	$56,324
Richland Grove[1,3,4]	$123,391	6	$148,069	$111,052	$259,121
Rivoli[1]	$56,776	0	$ 0	$ 0	$ 0
Suez[1]	$58,179	0	$ 0	$ 0	$ 0

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

This assessment illustrates the <u>*potential residential dollar losses*</u> that should be considered when municipalities are deciding which mitigation projects to pursue. Potential dollar losses caused by riverine flooding to vulnerable residences ***in Keithsburg would be expected to be $118,478***. There are four participating municipalities in this scenario who do not have any residences considered vulnerable to riverine flooding. For the townships, potential dollar losses caused by riverine flooding to vulnerable residences would be expected to ***range from $13,827 in Duncan Township to $259,121 in Richland Grove Township***.

Vulnerability of Infrastructure/Critical Facilities

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of a large riverine flood event in dollars. These calculations do not include the physical damages sustained by businesses or other infrastructure and critical facilities.

In terms of businesses, the impacts from a flood event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water and sewer). Depending on the magnitude of the flood event, the damage sustained by infrastructure and critical facilities can be extensive in nature and expensive to repair. As a result, ***the cumulative monetary impacts to businesses and infrastructure can exceed the cumulative monetary impacts to residences.*** While average dollar amounts cannot be supplied for these items at this time, they should be taken into account when discussing the overall impacts that a large-scale riverine flood event could have on the participating jurisdictions.

In terms of specific infrastructure vulnerability, Keithsburg's maintenance garage is located in the floodplain of the Mississippi River while Matherville's wastewater treatment lagoons are located in the base floodplain of the Edwards River. Bay Island D&LD's administrative office, maintenance building, and levee pump station are located in the base floodplain of the Mississippi River. No above-ground infrastructure within the other participating jurisdictions were identified as being vulnerable to riverine flooding.

Considerations

While the potential dollar loss scenario was only for a riverine flood event, the participating jurisdictions have been made aware through the planning process of the impacts that can result from flash flood events. Mercer County has experienced multiple events over the last 25 years as have adjoining and nearby counties. These events illustrate the need for officials to consider the overall monetary impacts of all forms of flooding on their communities. All participants should carefully consider the types of activities and projects that can be taken to minimize their vulnerability.

3.5 Excessive Heat

Hazard Identification

What is the definition of excessive heat?

Excessive heat is generally characterized by a prolonged period of summertime weather that is substantially hotter and more humid than the average for a location at that time of year. Excessive heat criteria typically shift by location and time of year. As a result, reliable fixed absolute criteria are not generally specified (i.e., a summer day with a maximum temperature of at least 90°F).

Excessive heat events are usually a result of both high temperatures and high relative humidity. (Relative humidity refers to the amount of moisture in the air.) The higher the relative humidity or the more moisture in the air, the less likely that evaporation will take place. This becomes significant when high relative humidity is coupled with soaring temperatures.

On hot days the human body relies on the evaporation of perspiration or sweat to cool and regulate the body's internal temperature. Sweating does nothing to cool the body unless the water is removed by evaporation. When the relative humidity is high, then the evaporation process is hindered, robbing the body of its ability to cool itself.

Excessive heat is a leading cause of weather-related fatalities in the U.S. According to the Centers for Disease Control and Prevention, a total of 7,415 people died from heat-related illnesses between 1999 and 2010, an average of 618 fatalities a year.

What is the Heat Index?

In an effort to raise the public's awareness of the hazards of excessive heat, the National Weather Service (NWS) devised the "Heat Index". The Heat Index, sometimes referred to as the "apparent temperature", is a measure of how hot it feels when relative humidity is added to the actual air temperature. **Figure EH-1** shows the Heat Index as it corresponds to various air temperatures and relative humidity.

As an example, if the air temperature is 96°F and the relative humidity is 65%, then the Heat Index would be 121°F. It should be noted that the Heat Index values were devised for shady, light wind conditions. Exposure to full sunshine can increase Heat Index values by up to 15°F. Also, strong winds, particularly with very hot, very dry air, can be extremely hazardous. When the Heat Index reaches 105°F or greater, there is an increased likelihood that continued exposure and/or physical activity will lead to individuals developing severe heat disorders.

What are heat disorders?

Heat disorders are a group of illnesses caused by prolonged exposure to hot temperatures and are characterized by the body's inability to shed excess heat. These disorders develop when the heat gain exceeds the level the body can remove or if the body cannot compensate for fluids and salt lost through perspiration. In either case the body loses its ability to regulate its internal temperature. All heat disorders share one common feature: the individual has been overexposed to heat, or over exercised for their age and physical condition on a hot day. The following describes the symptoms associated with the different heat disorders.

Figure EH-1
Heat Index

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	126	130					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution | Extreme Caution | Danger | Extreme Danger

Source: NOAA, National Weather Service.

- **Heat Rash.** Heat rash is a skin irritation caused by excessive sweating during hot, humid weather and is characterized by red clusters of small blisters on the skin. It usually occurs on the neck, chest, groin or in elbow creases.
- **Sunburn.** Sunburn is characterized by redness and pain of skin exposed too long to the sun without proper protection. In severe cases it can cause swelling, blisters, fever and headaches and can significantly retard the skin's ability to shed excess heat.
- **Heat Cramps.** Heat cramps are characterized by heavy sweating and muscle pains or spasms, usually in the abdomen, arms or legs that during intense exercise. The loss of fluid through perspiration leaves the body dehydrated resulting in muscle cramps. This is usually the first sign that the body is experiencing trouble dealing with heat.
- **Heat Exhaustion.** Heat exhaustion is characterized by heavy sweating, muscle cramps, tiredness, weakness, dizziness, headache, nausea or vomiting and faintness. Breathing may become rapid and shallow and the pulse thready (weak). The skin may appear cool, moist and pale. If not treated, heat exhaustion may progress to heat stroke.
- **Heat Stroke (Sunstroke).** Heat stroke is a life-threatening condition characterized by a high body temperature (106°F or higher). The skin appears to be red, hot and dry with very little perspiration present. Other symptoms include a rapid and strong pulse, throbbing headache, dizziness, nausea and confusion. There is a possibility that the individual will become unconsciousness. If the body is not cooled quickly, then brain damage and death may result.

Studies indicate that, all things being equal, the severity of heat disorders tend to increase with age. Heat cramps in a 17-year-old may be heat exhaustion in someone 40 and heat stroke in a person over 60. Elderly persons, small children, chronic invalids, those on certain medications and persons with weight or alcohol problems are particularly susceptible to heat reactions.

Figure EH-2 below indicates the heat index at which individuals, particularly those in higher risk groups, might experience heat-related disorders. Generally, when the heat index is expected to exceed 105°F, the NWS will initiate excessive heat alert procedures.

Figure EH-2
Relationship between Heat Index and Heat Disorders

Heat Index (°F)	Heat Disorders
80°F – 90°F	Fatigue is possible with prolonged exposure and/or physical activity
90°F – 105°F	Heat cramps, heat exhaustion and heat stroke possible with prolonged exposure and/or physical activity
105°F – 130°F	Heat cramps, heat exhaustion and heat stroke likely; heat stroke possible with prolonged exposure and/or physical activity
130°F or Higher	Heat stroke highly likely with continued exposure

Source: NOAA, Heat Wave: A Major Summer Killer.

What is an excessive heat alert?

An excessive heat alert is an advisory or warning issued by the NWS when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines the type of alert issued. There are four types of alerts that can be issued for an excessive heat event. The following provides a brief description of each type of alert based on the ***excessive heat advisory/warning criteria*** established by NWS Weather Forecast Office in Quad Cities Iowa/Illinois. The Quad Cities Office is responsible for issuing alerts for Mercer County.

- **Outlook.** An excessive heat outlook is issued when the potential exists for an excessive heat event to develop over the next three (3) to seven (7) days.
- **Watch.** An excessive heat watch is issued when conditions are favorable for an excessive heat event to occur within the next 24 to 72 hours.
- **Advisory.** An excessive heat advisory is issued within 12 hours of the onset of extremely dangerous heat conditions when the maximum heat index temperature is expected to be 100°F or higher for at least two (2) days and the nighttime air temperatures will not drop below 75°F.
- **Warning.** An excessive heat warning is issued within 12 hours of the onset of extremely dangerous heat conditions when the maximum heat index temperature is expected to be 105°F or higher for at least two (2) days and the nighttime air temperatures will not drop below 75°F.

HAZARD PROFILE

The following identifies past occurrences of excessive heat, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have excessive heat events occurred previously? What is the extent of these events?

Excessive Heat Fast Facts – Occurrences

Number of Excessive Heat Events Reported (1995 – 2022): ***82***

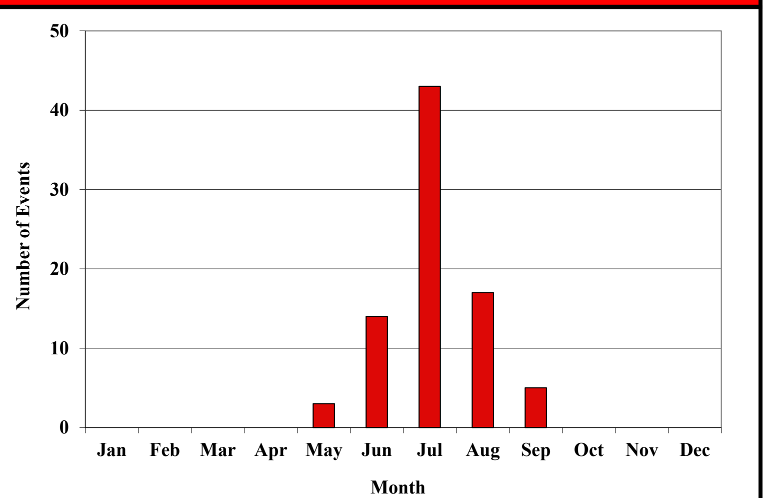
Hottest Temperature Recorded in the County: ***113°F (July 15, 1936)***

Most Likely Month for Excessive Heat Events to Occur: ***July***

Table 9, located in **Appendix I**, summarizes the previous occurrences as well as the extent or magnitude of excessive heat events recorded in Mercer County. NOAA's Storm Events Database, Iowa State University's National Weather Service Watch, Warning, and Advisories database, Midwestern Regional Climate Center's cli-MATE database, and NWS's COOP Data records were used to document 82 occurrences of excessive heat in Mercer County between 1995 and 2022.

Figure EH-3 charts the reported occurrences of excessive heat by month. Forty-three of the 82 events (52%) began in July making this the peak month for excessive heat events in Mercer County. There were four events that spanned two months; however, for illustration purposes only the month the event started is graphed.

Figure EH-3
Excessive Heat by Month
1995 – 2022



According to the Midwestern Regional Climate Center, near continuous temperature records for Mercer County have been kept from 1900 to the present at the Aledo NWS COOP Observation Station. **Figure EH-4** lists the hottest days recorded at this Station. Based on the available records, the hottest temperature recorded in the County was 113°F at the Aledo Observation Station on July 15, 1936.

Figure EH-4
Hottest Days Recorded at the Aledo NWS COOP Observation Station

	Date	Temperature		Date	Temperature
1	07/15/1936	113°F	7	07/22/1901	106°F
2	07/14/1936	111°F	8	07/23/1901	106°F
3	07/12/1936	109°F	9	07/05/1936	106°F
4	07/13/1936	109°F	10	07/11/1936	106°F
5	07/24/1901	108°F	11	07/26/1936	106°F
6	07/21/1901	107°F			

Source: Midwest Regional Climate Center cli-MATE

What locations are affected by excessive heat?

Excessive heat affects the entire County. Excessive heat events, like drought and severe winter storms, generally extend across an entire region and affecting multiple counties.

Do any of the participating jurisdictions have designated cooling centers?

Yes. Nine of the 12 participating municipalities, townships, schools, fire protection districts, and medical centers have designated cooling centers. A "designated" cooling center is identified as any facility that has been *formally* identified by the jurisdiction (through emergency planning, resolution, Memorandum of Agreement, etc.) as a location available for use by residents of the jurisdiction during excessive heat events.

Figure EH-5 identifies the location of each cooling center by jurisdiction. At this time Abington Township, Genesis Medical Center, and Sherrard CUSD #200 do not have any cooling centers designated. In addition, there are no State of Illinois-designated cooling centers in Mercer County.

Figure EH-5
Designated Cooling Centers by Participating Jurisdiction

Name/Address	Name/Address
Aledo	*Keithsburg*
Edwards River Public Library, 412 E Main St.	Keithsburg City Hall, 302 S. 14th St.
Brookstone of Aledo, 405 SE 13th Ave.	Keithsburg Fire Station, 202 6th St.
Mercer County Housing Authority, Vashti Village, 609 NW 4th Ave.	*Matherville* Matherville Fire Station, 402 2nd St.
Mercer County Senior Center, 137 W Main St.	Matherville Village Hall, 500 2nd St.
Aledo VFW Post 1571, 106 SW 3rd Ave.	*Preemption Township*
Aledo FPD	Matherville Fire Station, 402 2nd St., Matherville
Aledo VFW Post 1571, 106 SW 3rd Ave.	Township Office, 2582 130th Ave., Aledo
Greene Township FPD	*Sherrard*
Matherville Fire Station, 402 2nd St., Matherville	Sherrard Public Library, 201 5th Ave.
Joy	*Sherrard Community FPD*
Joy Fire Station, 207 W. Main St.	Sherrard Fire Station, 101 E. 1st St., Sherrard

What is the probability of future excessive heat events occurring based on historical data?

Mercer County has experienced 82 verified occurrences of excessive heat between 1995 and 2022. With 82 occurrences over the past 28 years, Mercer County should expect to experience approximately three excessive heat events a year. It is important to keep in mind that there are almost certainly gaps in the excessive heat data. More events have almost certainly occurred than are documented in this section, which means that the probability is almost certainly higher than reported.

There were 17 years over the last 28 years where multiple (three or more) excessive heat events occurred. This indicates that the probability that multiple excessive heat events may occur during any given year within the County is 61%.

What is the probability of future excessive heat events occurring based on modeled future conditions?

Temperature in Illinois has trended upwards over the last century, with average temperatures in Illinois having increased by 1°F to 2°F in the past 120 years according to the Illinois State Climatologist. This trend is likely to continue, with conservative long-term estimates placing average temperatures by the end of the 21st century between 4° and 9° F warmer than they are today.

With increasing temperatures comes the increasing risk of extreme heat events, which are projected to continue to become more frequent and more severe than they have been historically. This is due to increases in temperatures observed during summer months, where just a few degrees difference can turn a hot day into a dangerously hot day. The number of days greater than 95° F in Illinois are forecasted to increase in the coming decades, with conservative projections predicting that even northern Illinois will see a minimum of 10 extreme heat days per year by the end of the 21st century, compared with one or two extreme heat days per year today. Even just a few additional extreme heat days a year could prove very damaging, both in terms of human health and economic costs.

Figures EH-6, EH-7, and **EH-8** provide tabular and graphical projections for Mercer County, showing estimations for annual high temperature extremes in the early, mid, and late 21st century with both low and high estimates for each time period. Most likely, the true value will fall between these two estimates. By midcentury, the average number of days per year exceeding 90° F in Mercer County is forecasted to increase from around 17 today to between 53 and 63, and the single hottest temperature recorded in a year is predicted to increase by 6°F to 7° F according to the Climate Mapping for Resilience and Adaptation's Assessment Tool.

The Climate Explorer indicates that in Mercer County, extreme temperatures on the hottest days of the year are projected to increase by 7°F. This is based on the findings of the 2018 National Climate Assessment and compares projections for the middle third of the century (2035-2064) with average conditions observed from 1961-1990.

Taken together, an increase in the number of days per year with temperatures greater than 90° F and an increase in extreme temperatures on the hottest days for Mercer County indicates increased risk for extreme heat events.

Figure EH-6
Annual High Temperature Extreme Projections Table – Mercer County

Indicator	Modeled History (1976 - 2005)	Early Century (2015 - 2044)		Mid Century (2035 - 2064)		Late Century (2070 - 2099)	
		Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions	Lower Emissions	Higher Emissions
	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max	Min - Max
Temperature thresholds:							
Annual days with maximum temperature > 90°F	17 days 17 - 25	42 days 27 - 65	45 days 29 - 68	53 days 27 - 92	63 days 38 - 95	64 days 32 - 106	96 days 56 - 126
Annual days with maximum temperature > 95°F	5 days 3 - 6	14 days 6 - 34	17 days 7 - 37	22 days 8 - 63	30 days 12 - 68	31 days 10 - 83	63 days 22 - 105
Annual days with maximum temperature > 100°F	0 days 0 - 1	3 days 0 - 15	4 days 1 - 11	7 days 0 - 35	10 days 1 - 32	11 days 1 - 35	32 days 5 - 81
Annual days with maximum temperature > 105°F	0 days 0 - 0	1 days 0 - 5	1 days 0 - 4	1 days 0 - 15	2 days 0 - 10	3 days 0 - 27	12 days 0 - 47
Annual temperature:							
Annual single highest maximum temperature °F	97 °F 96 - 99	101 °F 97 - 110	102 °F 98 - 106	103 °F 98 - 121	104 °F 100 - 111	105 °F 99 - 124	109 °F 102 - 116
Annual highest maximum temperature averaged over a 5-day period °F	93 °F 92 - 94	96 °F 94 - 102	97 °F 94 - 100	98 °F 94 - 109	100 °F 96 - 105	100 °F 95 - 111	105 °F 98 - 111
Cooling degree days (CDD)	1014 degree-days 947 - 1094	1,400 degree-days 1,170 - 1,741	1,456 degree-days 1,234 - 1,721	1,608 degree-days 1,202 - 2,283	1,788 degree-days 1,420 - 2,274	1,819 degree-days 1,323 - 2,678	2,513 degree-days 1,782 - 3,348

N/A = Data Not Available for the selected area

Figure EH-7
Number of Days with Maximum Temperature > 90°F Graph – Mercer County

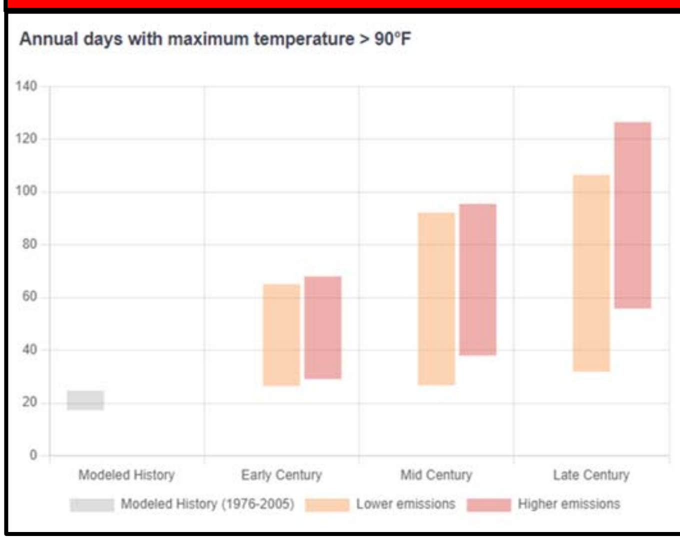
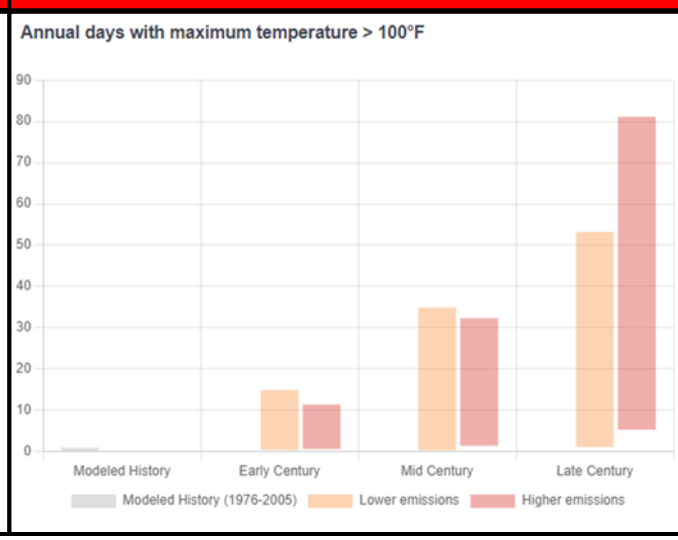


Figure EH-8
Number of Days with Maximum Temperature > 100°F Graph – Mercer County



HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from excessive heat.

Are the participating jurisdictions vulnerable to excessive heat?

Yes. All of Mercer County, including the participating jurisdictions, is vulnerable to the dangers presented by excessive heat. Since 2013, the County has experienced 41 excessive heat events.

The *2023 Illinois Natural Hazard Mitigation Plan* prepared by IEMA-OHS classifies Mercer County's hazard rating for heat wave as "low." IEMA-OHS's overall hazard rating system has five levels: very low, low, medium, high, and very high.

For excessive heat, the FEMA's National Risk Index (NRI) rates the County as a whole as "Relatively Low". Two of the four census tracts are rated "Relatively High", one is rated "Relatively Moderate", and one is rated "Relatively Low" for excessive heat. **Table R-4 presents** the overall NRI scores and ratings for each census tract as well as for the County as a whole.

Have any of the participating jurisdictions identified specific assets vulnerable to the impacts of excessive heat?

Yes. Based on responses to an Assets Vulnerability Survey distributed to the participating jurisdictions, the following jurisdictions considered specific assets within their jurisdiction vulnerable to excessive heat.

Mercer County:
While cooling centers are available in the County, all individuals are vulnerable to excessive heat and its impacts.

Joy:
The elderly and young children are vulnerable to excessive heat and its impacts.

Sherrard:
The elderly are vulnerable to excessive heat and its impacts.

What impacts resulted from the recorded excessive heat events?

Damage information was either unavailable or none was recorded for any of the excessive heat events. No injuries or fatalities were reported as a result of an excessive heat event. This does not mean that injuries or fatalities didn't occur; it simply means that excessive heat was not identified as the primary cause. This is especially true for fatalities. Usually, heat is not listed as the primary cause of death, but rather an underlying cause. The heat indices were sufficiently high for all the excessive heat events to produce heat cramps or heat exhaustion with the possibility of heat stroke in cases of prolonged exposure or physical activity.

Excessive Heat Fast Facts – Impacts/Risk

Excessive Heat Impacts:
- Total Property Damage: ***n/a***
- Total Crop Damage: ***n/a***
- Fatalities : ***n/a***
- Injuries: ***n/a***

Excessive Heat Risk/Vulnerability:
- Public Health & Safety – General Population: ***Low***
- Public Health & Safety – Socially Vulnerable Populations: ***Medium***
- Buildings/Infrastructure/Critical Facilities: ***Low***

In comparison, Illinois averages 74 heat-related fatalities annually according to the Illinois State Water Survey's Climate Atlas of Illinois.

What other impacts can result from excessive heat events?

Other impacts of excessive heat include road buckling, power outages, stress on livestock, early school dismissals and school closings. In addition, excessive heat events can also lead to an increase in water usage and may result in municipalities imposing water use restrictions. In Mercer County, excessive heat should not impact municipal water supplies since none obtain their water from surface water bodies. Excessive heat may impact residents in unincorporated Mercer County who rely on shallow private wells for their drinking water.

What is the level of vulnerability to public health and safety from excessive heat?

Even if injuries and fatalities due to excessive heat were under reported in Mercer County, the level of risk or vulnerability posed by excessive heat to the public health and safety of the *general population* is considered to be ***low***. This assessment is based on the frequency with which excessive heat occurs within the County; the impacts associated with these events; the types of living conditions (such as older, poorly-ventilated high rise buildings and low-income neighborhoods) that tend to contribute to heat-related injuries and fatalities; as well as the fact that injuries and fatalities due to excessive heat may be under reported. For the purposes of this analysis, *general population* includes healthy, able-bodied individuals who should have the ability to physiologically acclimatize to hot conditions over a period of days to weeks. Should that prove difficult, cooling centers are available in each participating municipality to provide relief during peak heat hours.

The level of risk or vulnerability posed by excessive heat to the public health and safety of *socially vulnerable populations* is considered to be ***medium***. Socially vulnerable populations such as older adults (those 75 years of age and older) and small children (those younger than 5 years of age) are more susceptible to heat-related reactions and therefore their risk is elevated. **Figure EH-9** identifies the percent of socially vulnerable populations by participating municipality and the County based on the U.S. Census Bureau's 2017-2021 American Community Survey data. In addition, individuals with chronic conditions, those on certain medications, and persons with weight or alcohol problems are also considered sensitive populations. However, demographic information is not available for these segments of the population.

Are existing buildings, infrastructure, and critical facilities vulnerable to excessive heat?

No. In general, existing buildings, infrastructure and critical facilities located in the County and the participating jurisdictions are not vulnerable to excessive heat. The primary concern is for the health and safety of those living in the County (including all of the municipalities).

While buildings do not typically sustain damage from excessive heat, in rare cases infrastructure and critical facilities may be directly or indirectly damaged. While uncommon, excessive heat has been known to contribute to damage caused to roadways within Mercer County. The combination of excessive heat and vehicle loads has caused pavement cracking and buckling.

Excessive heat has also been known to indirectly contribute to disruptions in the electrical grid. When the temperatures rise, the demand for energy also rises in order to operate air conditioners, fans, and other devices. This increase in demand places stress on the electrical grid components, increasing the likelihood of power outages. While not common in Mercer County, there is the potential for this to occur. The potential may increase over the next two decades if new power sources are not built to replace the state's aging nuclear power facilities that are expected to be decommissioned.

Figure EH-9
Sensitive Populations by Participating Jurisdictions

Participating Jurisdiction	% of Population 75 year of age & Older	% of Population Younger than 5 years of age	Total % of Sensitive Population
Aledo[2,5]	9.9%	5.1%	15.0%
Joy	9.3%	10.6%	19.9%
Keithsburg	10.7%	5.2%	15.9%
Matherville[1,3]	9.7%	11.4%	21.4%
Sherrard[1,4]	6.2%	1.9%	8.1%
Abington Township	7.1%	10.1%	17.2%
Preemption Township[1,2,3,4]	7.6%	7.7%	15.3%
Unincorp. Mercer County	8.4%	3.1%	11.5%
Mercer County	9.3%	5.2%	14.5%
State of Illinois	6.4%	5.8%	12.4%

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

Source: U.S. Census Bureau.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from excessive heat is considered ***low***, even taking into consideration the potential for damage to roadways and disruptions to the electrical grid.

Are future buildings, infrastructure, and critical facilities vulnerable to excessive heat?

No. Future buildings, infrastructure and critical facilities within the County and participating jurisdictions are no more vulnerable to excessive heat events than the existing building, infrastructure, and critical facilities. As discussed above, buildings do not typically sustain damage from excessive heat. Infrastructure and critical facilities may, in rare cases, be damaged by excessive heat, but very little can be done to prevent this.

What are the potential dollar losses to vulnerable structures from excessive heat?

Unlike other natural hazards there are no standard loss estimation models or methodologies for excessive heat. With none of the recorded events listing property damage figures, there is no way to accurately estimate future potential dollar losses from excessive heat. Since excessive heat typically does not cause structure damage, it is unlikely that future dollar losses will be extreme. The primary concern associated with excessive heat is the health and safety of those living in the County and municipalities, especially socially vulnerable populations such as the elderly, infants, young children, and those with medical conditions.

3.6 TORNADOES

HAZARD IDENTIFICATION

What is the definition of a tornado?

A tornado is a narrow violently rotating column of air, often visible as a funnel-shaped cloud that extends from the base of a thunderstorm cloud formation to the ground. The most violent tornadoes can have wind speeds of more than 300 miles per hour and can create damage paths in excess of one mile wide and 50 miles long.

Not all tornadoes have a visible funnel cloud. Some may appear nearly transparent until dust and debris are picked up or a cloud forms within the funnel. Generally, tornadoes move from southwest to northeast, but they have been known to travel in any direction, even backtracking. A typical tornado travels at around 10 to 20 mile per hour, but this may vary from almost stationary to 60 miles per hour. Tornadoes can occur at any time of the year and happen at any time of the day or night, although most occur between 4 p.m. and 9 p.m.

About 1,200 tornadoes hit the U.S. yearly, with an average 52 tornadoes occurring annually in Illinois. The destruction caused by a tornado may range from light to catastrophic depending on the intensity, size and duration of the storm. Tornadoes cause crop and property damage, power outages, environmental degradation, injuries and fatalities. Tornadoes are known to blow roofs off buildings, flip vehicles and demolish homes. Typically, tornadoes cause the greatest damage to structures of light construction, such as residential homes. On average, tornadoes cause 60 to 65 facilities and 1,500 injuries in the U.S. annually.

How are tornadoes rated?

Originally tornadoes were rated using the Fujita Scale (F-Scale), which related the degree of damage caused by a tornado to the intensity of the tornado's wind speed. The Scale identified six categories of damage, F0 through F5. **Figure T-1** gives a brief description of each category.

Use of the original Fujita Scale was discontinued on February 1, 2007 in favor of the Enhanced Fujita Scale. The original scale had several flaws including basing a tornado's intensity and damages on wind speeds that were never scientifically tested and proven. It also did not take into consideration that a multitude of factors (i.e., structure construction, wind direction and duration, flying debris, etc.) affect the damage caused by a tornado. In addition, the process of rating the damage itself was based on the judgment of the damage assessor. In many cases, meteorologists and engineers highly experienced in damage survey techniques often came up with different F-scale ratings for the same damage.

The Enhanced Fujita Scale (EF-Scale) was created to remedy the flaws in the original scale. It continues to use the F0 through F5 categories, but it incorporates 28 different damage indicators (mainly various building types, towers/poles and trees) as calibrated by engineers and meteorologists. For each damage indicator there are eight degrees of damage ranging from barely visible damage to complete destruction of the damage indicator. The wind speeds assigned to each category are estimates, not measurements, based on the damage assessment. **Figure T-1** identifies the Enhanced Fujita Scale.

Figure T-1
Fujita & Enhanced Fujita Tornado Measurement Scales

F-Scale		EF-Scale		Description
Category	**Wind Speed (mph)**	**Category**	**Wind Speed (mph)**	
F0	40 – 72	EF0	65 – 85	Light damage – some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; damage to sign boards
F1	73 – 112	EF1	86 – 110	Moderate damage – peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads
F2	113 – 157	EF2	111 – 135	Considerable damage – roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground
F3	158 – 207	EF3	136 – 165	Severe damage – roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown
F4	208 – 260	EF4	166 – 200	Devastating damage – well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated
F5	261 – 318	EF5	Over 200	Incredible damage – strong frame houses lifted off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 yards; trees debarked; incredible phenomena will occur

Source: NOAA, Storm Prediction Center.

The idea behind the EF-Scale is that a tornado scale needs to take into account the typical strengths and weaknesses of different types of construction, instead of applying a “one size fits all” approach. This is due to the fact that the same wind speed can cause different degrees of damage to different kinds of structures. In a real-life application, the degree of damage to each of the 28 indicators can be mapped together to create a comprehensive damage analysis. As with the original scale, the EF-Scale rates the tornado as a whole based on the most intense damage within the tornado’s path.

While the EF-Scale is currently in use, **the historical data presented in this report is based on the original F-Scale**. None of the tornadoes rated before February 1, 2007 will be re-evaluated using the EF-Scale.

Are alerts issued for tornadoes?

Yes. The National Weather Service Weather Forecast Office in Quad Cities Iowa/Illinois is responsible for issuing ***tornado watches*** and ***warnings*** for Mercer County depending on the weather conditions. The following provides a brief description of each type of alert.

- **Watch.** A tornado watch is issued when tornadoes are possible in the area. Individuals need to be alert and prepared. Watches are typically large, covering numerous counties or even states.

- **Warning.** A tornado warning is issued when a tornado has been sighted or indicated by weather radar. Warnings indicate imminent danger to life and property for those who are in the path of the tornado. Individuals should see shelter immediately. Typically, warnings encompass a much smaller area, such as a city or small county.

HAZARD PROFILE

The following identifies past occurrences of tornadoes; details the severity or extent of each event (if known); identifies the locations potentially affected; and estimates the likelihood of future occurrences.

When have tornadoes occurred previously? What is the extent of these previous tornadoes?

Table 10, located in **Appendix I**, summarizes the previous occurrences as well as the extent or magnitude of tornado events recorded in Mercer County. NOAA's Storm Events Database, Storm Data Publication and Storm Prediction Center have documented 28 occurrences of tornadoes in Mercer County between 1950 and 2022. Included in the 38 tornado events are two events from April 1965 that contributed to a federally-declared disaster in Mercer County. In comparison, there have been 2,745 tornadoes statewide between 1950 and 2021 according to NOAA's Storm Prediction Center.

Tornado Fast Facts – Occurrences

Number of Tornadoes Reported (1950 – 2022): ***38***

Highest F-Scale Rating Recorded: ***F3 (June 14, 1974 & August 15, 1978)***

Most Likely Month for Tornadoes to Occur: ***April***

Average Length of a Tornado: ***3.9 miles***

Average Width of a Tornado: ***107 yards***

Average Damage Pathway of a Tornado: ***0.24 sq. mi.***

Longest Tornado Path in the County: ***26.9 miles (June 14, 1974)***

Widest Tornado Path in the County: ***880 yards (June 18, 1998 & April 13, 2006)***

Number of Federal Disaster Declarations Related to Tornadoes: ***1 (1965)***

Figure T-2 charts the reported occurrences of tornadoes by magnitude. Of the 38 reported occurrences there were: 2 – F3s, 5 – F2s, 11 – F1s, 10 – F0s, 0 – EF3, 1 – EF2, 7 – EF1s, and 2 – EF0s.

Figure T-3 charts the reported tornadoes by month. Of the 38 events, 34 (89%) took place in April, May, June, and July making this the peak period for tornadoes in Mercer County. Of those 34 events, 14 (41%) occurred during April, making this the peak month for tornadoes. In comparison, 1,720 of the 2,745 tornadoes (63%) recorded in Illinois from 1950 through 2021 took place in April, May, and June.

All 38 tornadoes in the County occurred during the p.m. hours, with 27 of the tornado events (71%) taking place between 2 p.m. and 8 p.m. In comparison, more than half of all Illinois tornadoes occur between 2 p.m. and 8 p.m.

The tornadoes that have impacted Mercer County have varied from 0.1 miles (176 yards) to 26.9 miles in length and from 10 yards to 880 yards in width. The average length of a tornado in Mercer County is 3.9 miles and the average width is 107 yards (0.061 miles).

Figure T-2
Tornadoes by Magnitude
1950 – 2022

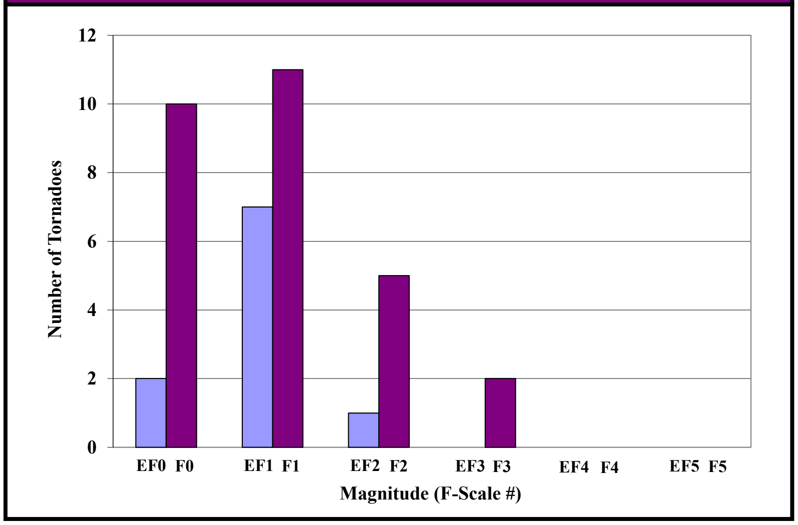


Figure T-3
Tornadoes by Month
1950 – 2022

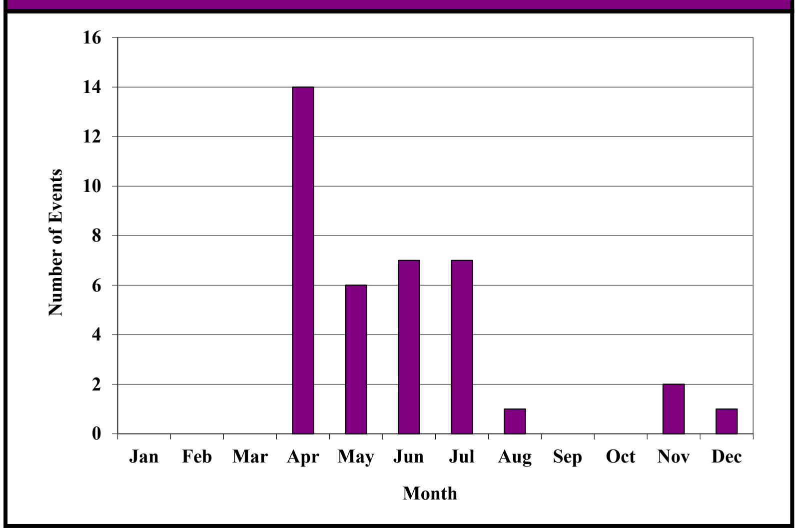
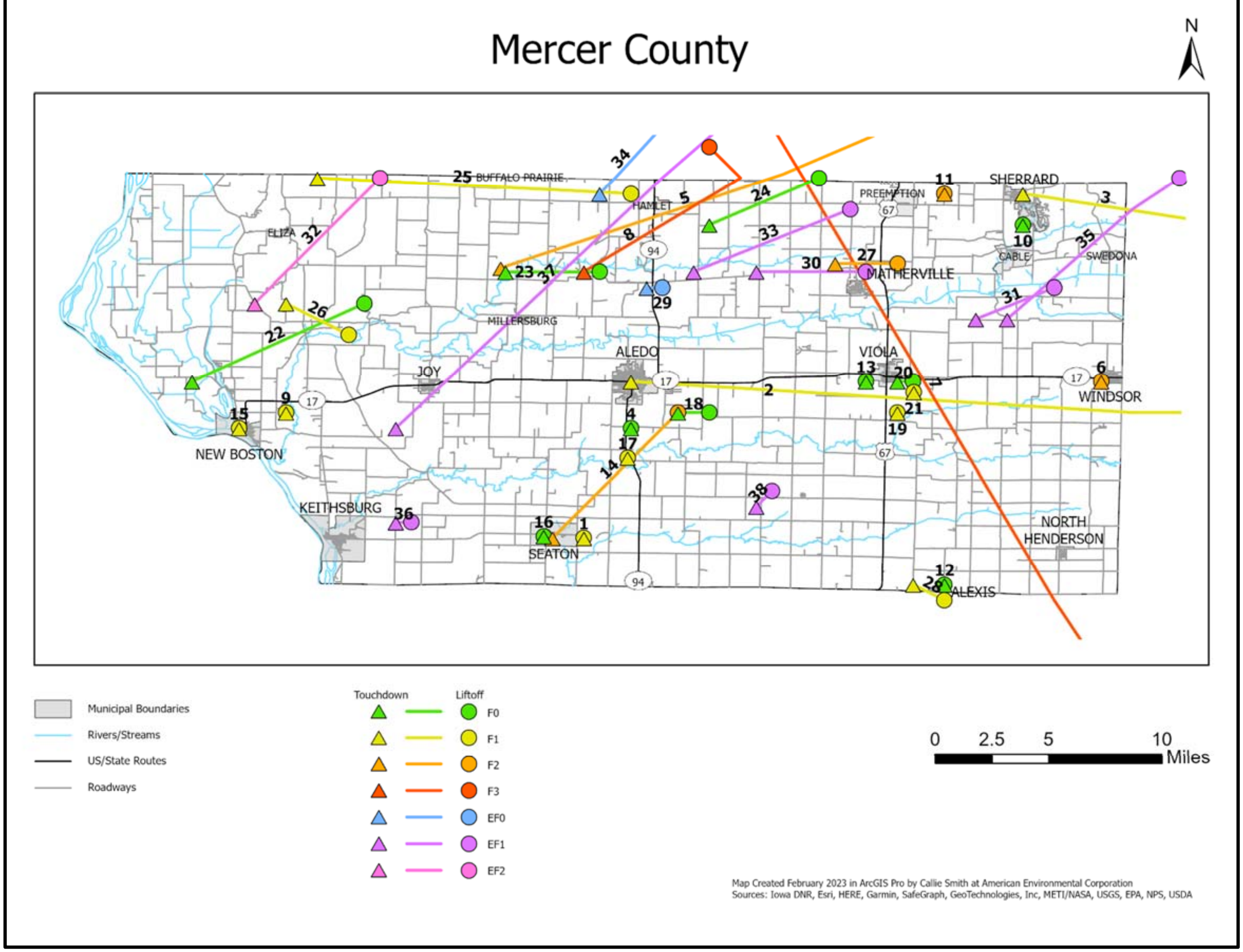
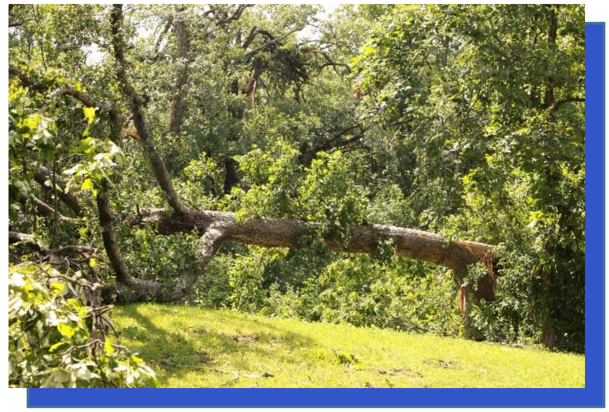


Figure T-4 shows the pathway of each reported tornado. The numbers by each tornado correspond with the tornado description in **Table 10** located in **Appendix I.** Records indicate that most of these tornadoes generally moved from southwest to northeast across the County. Unlike other natural hazards (i.e., severe winter storms, drought, and excessive heat), tornadoes impact a relatively small area. Typically, the area impacted by a tornado is less than four square miles. In Mercer County, the average damage pathway or area impacted by a tornado is 0.24 square miles.

Figure T-4
Tornado Pathways in Mercer County



The longest tornado recorded in Mercer County occurred on June 14, 1974. This F3 tornado, measuring 440 yards in width and 26.9 miles in length, touched down in Rock Island County southeast of Taylor Ridge and traveled southeast through Mercer and Warren Counties to the southwest side of Galesburg where it turned south following Illinois Route 41 through Abingdon before lifting off southeast of Avon in Fulton County. The total length was 48.6 miles, 26.9 in Mercer County. The damage pathway of this tornado covered approximately 12.2 square miles, with 6.7 square miles occurring in Mercer County.



Trees were damaged by three separate tornadoes on July 12, 2014.

Photograph courtesy of Angie Litterst, Mercer County Health Department Administrator

The widest tornado recorded in Mercer County measured 880 yards in width and occurred on two separate occasions. The first tornado occurred on June 18, 1998 when an F2 tornado touched down in Seaton and travelled northeastward before lifting off southwest of Aledo. The second tornado occurred on April 13, 2006 when an F1 touched down along the Mercer-Rock Island county line northeast of Eliza and travelled westward before lifting off northwest of Hamlet.

What locations are affected by tornadoes?

Tornadoes have the potential to affect the entire County. Three of the five participating municipalities have had reported occurrences of tornadoes within their corporate limits.

What is the probability of future tornadoes occurring based on historical data?

Mercer County has had 38 verified occurrences of tornadoes between 1950 and 2022. With 38 tornadoes over the past 73 years, the probability or likelihood that a tornado will touchdown somewhere in the County in any given year is 52%. There were nine years over the last 73 years where more than one tornado occurred. This indicates that the probability that more than one tornado may occur during any given year within the County is 12%.

What is the probability of future tornadoes occurring based on modeled future conditions?

Since tornadoes only occur when several conditions are met, predicting them is extremely difficult, even in the short-term future. Somewhat easier to predict are supercell formations, which are large and longer-lived storm systems that create conditions favorable to producing tornadoes, such as strong rotational winds and updrafts. These systems are fed by warm humid air, which means that a wetter and warmer climate could make them a more likely occurrence. Since future condition forecasts suggest a wetter and warmer Illinois as discussed in Section 3.5, it is likely that the conditions that create tornadoes will become more frequent as well, increasing their likelihood. **Figure SS-7,** located in Section 3.2, contains a series of maps that show how the number of supercell tracks is likely to change in the future. The analysis of this trend should be revisited in subsequent planning efforts as more data becomes available.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from tornadoes.

Are the participating jurisdictions vulnerable to tornadoes?

Yes. All of Mercer County, including the participating jurisdictions, is vulnerable to the dangers presented by tornadoes. Since 2013, 10 tornadoes have been recorded in Mercer County. Three of the five participating municipalities have had a tornado touch down or pass through their municipal boundaries while both of the participating townships have had tornadoes touch down or pass through them. **Figure T-5** lists the verified tornadoes that have touched down in or near or passed through each participating municipality and township. Ten tornadoes have touched down in or passed through the Aledo Fire Protection District (FPD) and seven tornadoes each have touched down in or passed through the Greene Township FPD and Sherrard Community FPD. Sixteen tornadoes have touched down in or passed through Sherrard CUSD #200 while only one tornado has touched down in or passed through the Bay Island D&LD.

Figure T-5
Verified Tornadoes In or Near Participating Municipalities & Townships

Participating Municipality / Township	Number of Verified Tornadoes	Year	
		Touched Down/Passed Through Municipality / Township	Touched Down/Passed Near Municipality
Aledo[2,5]	6	1965	1965, 1972, 1998, 2003, 2003
Joy	1	---	2020
Keithsburg	1	---	2019
Matherville[1,3]	4	2006	1974, 2006, 2014
Sherrard[1,4]	4	1965	1965, 1995, 1995
Abington Township	3	1952, 1998, 1999	---
Preemption Township[1,2,3,4]	7	1973, 1974, 1978, 2003, 2006, 2014, 2015	---

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

Unincorporated areas vulnerable to tornadoes include Hamlet, which has had six tornadoes touch down near its vicinity. **Figure T-6** details the verified tornadoes that have touched down in or near unincorporated areas in Mercer County.

The *2023 Illinois Natural Hazard Mitigation Plan* prepared by IEMA-OHS classifies Mercer County's hazard rating for tornadoes as "medium." IEMA-OHS's overall hazard rating system has five levels: very low, low, medium, high, and very high.

For tornadoes FEMA's National Risk Index (NRI) rates the County as a whole as "Very Low". The four census tracts are rated "Relatively Moderate" for tornadoes. **Table R-4 presents** the overall NRI scores and ratings for each census tract as well as for the County as a whole.

Figure T-6 Verified Tornadoes In or Near Unincorporated Areas of Mercer County			
Unincorporated Area	**Number of Verified Tornadoes**	**Year**	
		Touched Down/Passed *Through* Unincorporated Area	**Touched Down/Passed *Near* Unincorporated Area**
Boden[8]	2	---	2006, 2014
Burgess	1	---	2020
Cable[1,4]	1	---	2014
Eliza	2	---	2006, 2015
Gilchrist[5]	1	---	1974
Gingle Corners[2]	2	---	2014, 2015
Griffin[5]	2	---	2014, 2017
Hamlet	6	---	1973, 1978, 2003, 2006, 2015, 2020
Mannon	4	2003	2003, 2006, 2015
Marston	2	---	2006, 2015
Millersburg[2]	5	2020	1973, 1978, 2003, 2020
Mercer County Airport[2]	1	---	2014
Old Gilchrist[5]	1	---	1974
Petersville	1	---	2015
Preemption[1,4,8]	1	---	2015
Sunbeam[2]	2	2003	1998
Swedona[1,4]	2	---	2014, 2017

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD
[7]Abington Township [8]Preemption Township

Have any of the participating jurisdictions identified specific assets vulnerable to the impacts of tornadoes?

Yes. Based on responses to an Assets Vulnerability Survey distributed to the participating jurisdictions, the following jurisdictions considered specific assets within their jurisdiction vulnerable to tornadoes.

Mercer County:

- ❖ Tornadoes have the potential to down power and communication lines impacting service to critical county infrastructure as well as residents.
- ❖ All individuals are vulnerable to tornadoes since there are only a handful of community safe rooms available for use within the County.

Aledo:

Tornadoes have the potential to damage the City's water wells, water treatment plant, and water storage facilities impacting service to residents.

Genesis Medical Center:

- ❖ A tornado has the potential to disrupt power service to the Medical Center impacting patient care.
- ❖ The Medical Center is physically vulnerable to the impacts of a tornado which could affect our ability to care for those injured during a tornado.

Sherrard:

The Village's water treatment plant, water tower, Village Hall, and food pantry do not have emergency backup power supplies so loss of power due to a tornado will affect service to residents.

Sherrard Community Fire Protection District:

- Communication towers have the potential to be damaged tornadoes, which would limit the District's ability to quickly respond to emergency calls.
- The fire station and its equipment are vulnerable to tornado damage.

What impacts resulted from the recorded tornadoes?

Data obtained from NOAA's Storm Events Database, Storm Data Publications, Storm Prediction Center, and Committee member records indicates that between 1950 and 2022, 23 of the 38 tornadoes caused $3,442,500 in property damage and $20,000 in crop damage. The April 13, 2006 tornado caused $1 million in property damages alone. Property damage information was either unavailable or none was recorded for the remaining 15 reported occurrences.

NOAA's Storm Events Database documented one injury as a result the June 14, 1974 tornado event; however, no detailed information on the injuries sustained was available. In comparison, Illinois averages roughly four tornado fatalities annually; however, this number varies widely from year to year.

Tornado Fast Facts – Impacts/Risk

Tornado Impacts:

- Total Property Damage (21 events): ***$3,442,500***^
- Total Crop Damage (2 events): ***$20,000***
- Injuries (1 event): ***1***
- Fatalities: ***n/a***

Tornado Risk/Vulnerability:

- Public Health & Safety – Rural Areas: ***Low to Medium***
- Public Health & Safety – Municipalities: ***High***
- Buildings/Infrastructure/Critical Facilities – Rural Areas: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities – Municipalities/Populated Unincorp. Areas: ***High***

^ Includes property damages sustained as a result of two separate tornado events that represent losses incurred in two counties. A detailed breakdown by county was not available.

What other impacts can result from tornadoes?

In addition to causing damage to buildings and properties, tornadoes can damage infrastructure and critical facilities such as roads, bridges, railroad tracks, drinking water treatment facilities, water towers, communication towers, antennae, power substations, transformers, and poles. Depending on the damage done to the infrastructure and critical facilities, indirect impacts on individuals could range from inconvenient (i.e., adverse travel) to life-altering (i.e., loss of utilities for extended periods of time).

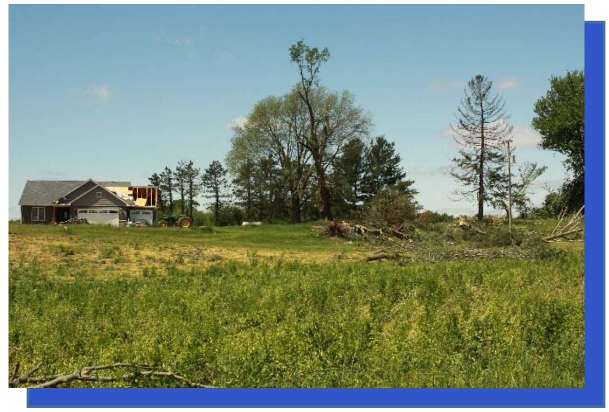
What is the level of risk/vulnerability to public health and safety from tornadoes?

For Mercer County, the level of risk or vulnerability posed by tornadoes to public health and safety depends on not only frequency, but other factors as well including population distribution and density, the ratings and pathways of previously recorded tornadoes, the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.), and adequate access to health care for those injured following a tornado. All these must be examined when assessing vulnerability.

In terms of adequate access to health care, Genesis Medical Center as well as nearby hospitals in the Quad Cities (Rock Island County), Geneseo (Henry County), Galesburg (Knox County), Monmouth (Warren County), and Muscatine (Muscatine County, Iowa) are equipped to provide care and have sufficient capacity for the influx of additional patients from one or more counties.

Mercer County (including townships fire protection districts, & levee districts)

For Mercer County, including the fire protection districts and townships, the level of risk or vulnerability posed by tornadoes to public health and safety is considered to be ***low*** to ***medium***. This assessment is based on the fact that tornadoes do not occur frequently in the County and a large majority of the tornadoes that have impacted the County have touched down in rural areas away from concentrated populations. In addition, the County is not densely populated and there is not a large number of high-risk living accommodations present.



An EF1 tornado ripped part of the roof off a house and damaged dozens of trees on May 17, 2017.

Photograph courtesy of Angie Litterst, Mercer County Health Department Administrator

Participating Municipalities (including schools & healthcare facilities)

In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to the public health and safety would be considered ***high***. This is based on the fact that all of the participating jurisdictions have relatively dense and evenly distributed populations within their municipal boundaries. As a result, if a tornado were to touch down anywhere within the corporate limits of these municipalities it will have a greater likelihood of causing injuries or even fatalities.

Do any participating jurisdictions have community safe rooms?

No. None of the participating jurisdictions have community safe rooms built to standard within their jurisdictions. As a result, if a tornado were to touch down or pass through any of the population centers in the County, then there would be a greater likelihood of injuries and fatalities due to the lack of structures specifically designed and constructed to provide life-safety protection. Each jurisdiction should consider whether the potential impacts to public health and safety from a tornado are considered great enough to warrant the consideration of community safe rooms as a mitigation action.

Are existing buildings, infrastructure, and critical facilities vulnerable to tornadoes?

Yes. All existing buildings, infrastructure, and critical facilities located within the County and participating jurisdictions are vulnerable to tornado damage. Buildings, infrastructure, and critical facilities located in the path of a tornado usually suffer extensive damage, if not complete destruction.

While some buildings adjacent to a tornado's path may remain standing with little or no damage, all are vulnerable to damage from flying debris. It is common for flying debris to cause damage to roofs, siding, and windows. In addition, mobile homes, homes on crawlspaces, and buildings with large spans (i.e., schools, barns, airport hangers, factories, etc.) are more likely to suffer damage. Most workplaces and many residential units do not provide sufficient protection from tornadoes.

The damages sustained by infrastructure and critical facilities during a tornado are similar to those experienced during a severe storm. There is a high probability that power, communication, and transportation will be disrupted in and around the affected area.

Assessing the Vulnerability of Existing Residential Structures

One way to assess the vulnerability of existing residential structures is to estimate the number of housing units that may be potentially damaged if a tornado were to touch down or pass through any of the participating municipalities, townships, or the County. In order to accomplish this, a set of decisions/assumptions must be made regarding:

- the size (area impacted) of the tornado;
- the method used to estimate the area impacted by the tornado within each jurisdiction; and
- the method used to estimate the number of potentially-damaged housing units.

The following provides a brief discussion of each decision/assumption.

Assumption #1

Size of Tornado = 0.24 sq. miles

Assumption #1: Size of Tornado. To calculate the number of existing residential structures vulnerable to a tornado, the size (area impacted) of the tornado must first be determined. There are several scenarios that can be used to calculate the size, including the worst case and the average. For this analysis, the area impacted by an average-sized tornado in Mercer County will be used since it has a higher probability of recurring. In Mercer County, the area impacted by an average-sized tornado is 0.24 square miles. This average is based on more than 70 years of data.

Assumption #2

The entire area impacted by the average-sized tornado falls within the limits of each participating jurisdiction.

Assumption #2: Method for Estimating the Area Impacted. Next, a method for determining the area within each jurisdiction impacted by the average-sized tornado needs to be chosen. There are several methods that can be used including creating an outline of the area impacted by the average-sized tornado and overlaying it on a map of each jurisdiction (most notably the municipalities) to see if any portion of the area falls outside of the corporate limits (which would require additional calculations) or just assume that the entire area of the average-sized tornado falls within the limits of each jurisdiction. For this discussion, it is assumed that the entire area of the average-sized tornado will fall within the limits of the participating jurisdictions.

This method is quicker, easier, and more likely to produce consistent results when the Plan is updated again. There is, however, a greater likelihood that the number of potentially-damaged housing units will be overestimated for those municipalities that have irregular shaped boundaries or occupy less than one square mile.

Assumption #3: Method for Estimating Potentially-Damaged Housing Units. With the size of the tornado selected and a method for estimating the area impacted chosen, a decision must be made on an approach for estimating the number of potentially-damaged housing units. There are several methods that can be used including overlaying the average-sized tornado on a map of each jurisdiction and counting the impacted housing units or calculating the average housing unit density to estimate the number of potentially-damaged housing units.

Assumption #3

The average housing unit density for each jurisdiction will be used to determine the number of potentially-damaged housing units.

For this analysis, the average housing unit density will be used since it provides a realistic perspective on potential residential damages without conducting extensive counts. Using the average housing unit density also allows future updates to the Plan to be easily recalculated and provides an exact comparison to previous estimates.

Calculating Average Housing Unit Density

The average housing unit density can be calculated by taking the number of housing units in a jurisdiction and dividing that by the land area within the jurisdiction. **Figure T-7** provides a sample calculation.

Figure T-7
Calculation of Average Housing Unit Density – Mercer County

Total Housing Units in the Jurisdiction ÷ Land Area within the Jurisdiction =
Average Housing Unit Density
(Rounded Up to the Nearest Whole Number)

Mercer County: 7,299 housing units ÷ 561.24 sq. miles = 13.005 housing units/sq. mile
(14 housing units)

Figure T-8 provides a breakdown of housing unit densities by participating municipality as well as for the unincorporated areas of the County and the County as a whole.

Figure T-8
Average Housing Unit Density by Participating Jurisdiction

Participating Jurisdiction	Township Location	Total Housing Units (2017-2021)	Mobile Homes (2017-2021)	Land Area (Sq. Miles) (2020)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)
Aledo[2,5]	Mercer	1,815	0	2.368	766.470
Joy	Millersburg	165	19	0.428	---
Keithsburg	Keithsburg	359	74	2.558	140.344
Matherville[1,3]	Preemption	342	0	0.391	---
Sherrard[1,4]	Richland Grove	267	0	0.928	---
Unincorp. County		2,382	63	549.702	4.333
County		7,299	257	561.240	13.005

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

Source: U.S. Census Bureau, American Community Survey, 5-Year Data Profile.

While the average housing unit density provides an adequate assessment of the number of housing units in areas where the housing density is fairly constant, such as municipalities, it does not provide a realistic assessment for those counties with large, sparsely populated rural areas such as Mercer County.

In Mercer County, as well as many other northwestern Illinois counties, there are pronounced differences in housing unit densities. A majority of all housing units (75%) are located in six of the County's 15 townships (Mercer, Richland Grove, Preemption, Greene, Rivoli, and New Boston), while approximately 85% of all mobile homes are located in three of the 15 townships (New Boston, Keithsburg, and Greene). **Figure I-5**, located in Section 1.2, identifies the township boundaries. Tornado damage to buildings (especially mobile homes), infrastructure and critical facilities in the more densely populated townships is likely to be greater than in the rest of the County. While the County and Keithsburg, have ordinances that require anchoring systems for mobile home that would help limit the damage from lower rated tornadoes, the remaining four participating municipalities do not.

This substantial difference in density skews the average <u>county</u> housing unit density in Mercer County and is readily apparent when compared to the average housing unit densities for each of the townships within the County. **Figure T-9** provides a breakdown of housing unit densities by township and illustrates the differences between the various townships and the County as a whole.

Figure T-9
Average Housing Unit Density by Township

Township	Incorporated Municipalities Located in Township	Total Housing Units (2017-2021)	Mobile Homes (2017-2021)	Land Area (Sq. Miles) (2020)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)
Abington	Seaton	176	0	36.640	4.803
Duncan[2]		121	0	36.636	3.303
Eliza[6]		106	0	57.372	1.848
Greene[1,3]	Viola	688	60	36.720	18.736
Keithsburg	Keithsburg	410	74	17.976	22.808
Mercer[2,5]	Aledo	1,923	0	35.424	54.285
Millersburg[2]	Joy	263	19	36.317	7.242
New Boston[6]	New Boston	512	85	50.661	10.106
North Henderson[1]	Alexis, North Henderson	153	0	34.996	4.372
Ohio Grove[1,2]		222	0	36.804	6.032
Perryton[2]	Reynolds	157	0	36.361	4.318
Preemption[1,2,3,4]	Matherville, Reynolds	854	0	36.847	23.177
Richland Grove[1,3,4]	Sherrard	914	10	36.379	25.124
Rivoli[1]	Windsor	549	9	35.001	15.685
Suez[1]	Alexis	251	0	37.106	6.764
Townships - 6 most populated		5,440	164	231.032	23.547
Townships - 9 least populated		1,859	93	330.208	5.630

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

Source: U.S. Census Bureau, American Community Survey, 5-Year Data Profile.

For nine of the 15 townships, the *average county* housing unit density is greater (in most cases considerably greater) than the *average township* housing unit densities. However, the *average county* housing unit density is considerably less than the housing unit densities for Mercer, Richland Grove, Preemption, and Keithsburg Townships.

Estimating the Number of Potentially-Damaged Housing Units
Before an estimate of the number of potentially-damaged housing units can be calculated for the participating municipalities, an additional factor needs to be taken into consideration: the presence of commercial/industrial developments and/or large tracts of undeveloped land. Occasionally villages and cities will annex large tracts of undeveloped land or have commercial/industrial parks/developments located within their corporate limits. In many cases these large tracts of land include very few residential structures. Consequently, including these tracts of land in the calculations to determine the number of potentially-damaged housing units skews the results, especially for very small municipalities. Therefore, to provide a more realistic assessment of the number of potentially-damaged housing units, these areas were subtracted from the land area figures obtained from the U.S. Census Bureau for the analysis for this update.

In Mercer County, all of the participating municipalities have large commercial/industrial and/or undeveloped land areas within their municipal boundaries. These areas account for approximately two-fifths to nine-tenths of the land area in these municipalities. If these areas are subtracted from the U.S. Census Bureau land area figures, then the remaining land areas have fairly consistent housing unit densities and contain a majority of the housing units. **Figure T-10** provides a breakdown of the refined land area figures for the municipalities. These refined land area figures will be used to update the average housing unit density calculations for these municipalities.

Figure T-10
Refined Land Area Figures for Participating Municipalities with Large Tracts of Commercial/Industrial and Undeveloped Land Areas

Participating Jurisdiction	Land Area (Sq. Miles) (2020)	Estimated Open Land Area & Commercial/ Industrial Tracts (Sq. Miles)	Refined Land Area (Sq. Miles)
Aledo[2,5]	2.368	1.260	1.108
Joy	0.428	0.320	0.108
Keithsburg	2.558	2.360	0.198
Matherville[1,3]	0.391	0.240	0.151
Sherrard[1,4]	0.928	0.260	0.668

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

With updated average housing unit densities calculated it is relatively simple to provide an estimate of the number of existing potentially-damaged housing units. This can be done by multiplying the average housing unit density by the area impacted by the average-sized Mercer County tornado. **Figure T-11** provides a sample calculation.

Figure T-11 **Sample Calculation of Potentially-Damaged Housing Units – Mercer County**
Average Housing Unit Density x Area Impacted by the Average-Sized Mercer County Tornado = Potentially-Damaged Housing Units (Rounded Up to the Nearest Whole Number) Mercer County: 13.005 housing units/sq. mile x 0.24 sq. miles = 3.12 housing units **(4 housing units)**

For those municipalities that cover less than one square mile, the average housing unit density cannot be used to calculate the number of potentially-damaged housing units. The average housing unit density assumes that the land area within the municipality is at least one square mile and as a result distorts the number of potentially-damaged housing units for very small municipalities.

To calculate the number of potentially-damaged housing units for these municipalities, the area impacted by the averaged-sized Mercer County tornado is divided by the land area within the municipality to get the impacted land area. The impacted land area is then multiplied by the total number of housing units within the municipality to get the number of potentially-damaged housing units. **Figure T-12** provides a sample calculation. Since the refined land areas in Joy, Keithsburg, and Matherville are less than the average area impacted, it is assumed that all of the housing units within these municipalities will be potentially damaged.

Figure T-12 **Sample Calculation of Potentially-Damaged Housing Units** **for Municipalities Covering Less Than One Square Mile – Sherrard**
Area Impacted by the Average-Sized Mercer County Tornado ÷ Land Area within the Jurisdiction x Total Housing Units in the Jurisdiction = Potentially-Damaged Housing Units (Rounded Up to the Nearest Whole Number) Sherrard: 0.24 sq. mile ÷ 0.258 sq. miles x 451 housing units = 419.535 **(420 housing units)**

Figures T-13 and **T-14** provide a breakdown of the number of potentially-damaged housing units by participating municipality, as well as by township and for the unincorporated areas of the County and the County as a whole. It is important to note that for the most densely populated townships, the estimated number of potentially-damaged housing units would only be reached if a tornado's pathway included the major municipality within the township. If the tornado remained in the rural portion of the township, then the number of potentially-damaged housing units would be considerably lower.

Figure T-13
Estimated Number of Housing Units by Participating Jurisdiction Potentially Damaged by a Tornado

Participating Jurisdiction	Total Housing Units (2017-2021)	Land Area/Refined Land Area (Sq. Miles) (2020)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/0.24 Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/0.24 Sq. Mi.) (Rounded Up)
Aledo[2,5]	1,815	1.108	1638.087	393.14	394
Joy	165	0.428	---	165.00	165
Keithsburg	359	0.198	---	359.00	359
Matherville[1,3]	342	0.151	---	342.00	342
Sherrard[1,4]	267	0.668	---	95.93	96
Unincorp. County	2,382	549.702	4.333	0.87	1
County	7,299	561.240	13.005	2.60	3

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

Figure T-14
Estimated Number of Housing Units by Township Potentially Damaged by a Tornado

Township	Total Housing Units (2017-2021)	Land Area (Sq. Miles) (2020)	Average Housing Unit Density (Units/Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/0.24 Sq. Mi.) (Raw)	Potentially-Damaged Housing Units (Units/0.24 Sq. Mi.) (Rounded Up)
Abington	176	36.640	4.803	1.15	2
Duncan[2]	121	36.636	3.303	0.79	1
Eliza[6]	106	57.372	1.848	0.44	1
Greene[1,3]	688	36.720	18.736	4.50	5
Keithsburg	410	17.976	22.808	5.47	6
Mercer[2,5]	1,923	35.424	54.285	13.03	14
Millersburg[2]	263	36.317	7.242	1.74	2
New Boston[6]	512	50.661	10.106	2.43	3
North Henderson[1]	153	34.996	4.372	1.05	2
Ohio Grove[1,2]	222	36.804	6.032	1.45	2
Perryton[2]	157	36.361	4.318	1.04	2
Preemption[1,2,3,4]	854	36.847	23.177	5.56	6
Richland Grove[1,3,4]	914	36.379	25.124	6.03	7
Rivoli[1]	549	35.001	15.685	3.76	4
Suez[1]	251	37.106	6.764	1.62	2
Townships - 6 most populated	5,440	231.032	23.547	5.65	6
Townships - 9 least populated	1,859	330.208	5.630	1.35	2

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

What is the level of risk/vulnerability to existing buildings, infrastructure, and critical facilities vulnerable from tornadoes?

There are several factors that must be examined when assessing the vulnerability of existing buildings, infrastructure, and critical facilities to tornadoes. These factors include tornado frequency, population distribution and density, the ratings and pathways of previously recorded tornadoes, and the presence of high-risk living accommodations (such as high-rise buildings, mobile homes, etc.).

Unincorporated Mercer County (including townships, fire protection districts, & levee districts)

For unincorporated Mercer County, the level of risk or vulnerability posed by tornadoes to existing buildings, infrastructure and critical facilities is considered to be ***low***. This assessment is based on the frequency with which tornadoes have occurred in the County, as well as the amount of damage that has been sustained tempered by the low population density throughout most the County and the relative absence of high risk living accommodations. While previously recorded tornadoes have followed largely rural pathways, they have caused significant damage on several occasions.

Participating Municipalities (including schools & healthcare facilities)

In general, if a tornado were to touch down or pass through any of the participating municipalities the risk to existing buildings, infrastructure, and critical facilities would be considered ***high***. This assessment is based on the population and housing unit distribution within the municipalities where wide expanses of open spaces do not generally exist. As a result, if a tornado were to touch down within any of the municipalities it would have a greater likelihood of causing substantial property damage.

Are future buildings, infrastructure, and critical facilities vulnerable to tornadoes?

Yes and No. While Aledo and Sherrard have building codes in place that will likely lessen the vulnerability of new buildings and critical facilities to damage from tornadoes, the County and three remaining participating municipalities do not. However, even new buildings and critical facilities built to code are vulnerable to the risks posed by a higher rated tornado.

Infrastructure such as new communication and power lines will continue to be vulnerable to tornadoes as long as they are located above ground. Flying debris can disrupt power and communication lines even if they are not directly in the path of the tornado. Steps to bury all new lines would eliminate the vulnerability, but this action would be cost prohibitive in most areas.

What are the potential dollar losses to vulnerable structures from tornadoes?

Unlike other hazards, such as flooding, there are no standard loss estimation models or methodologies for tornadoes. However, a rough estimate of potential dollar losses to the *potentially-damaged housing units* determined previously can be calculated if several additional decisions/assumptions are made regarding:

- ➢ the value of the potentially-damaged housing units; and
- ➢ the percent damage sustained by the potentially-damaged housing units (i.e., damage scenario).

These assumptions represent a ***probable scenario*** based on the reported historical occurrences of tornadoes in Mercer County. The purpose of providing a rough estimate is to help residents and government officials make informed decisions to better protect themselves and their communities. These estimates are meant to provide a ***general idea*** of the magnitude of the potential damage that could occur. The following provides a brief discussion of each decision/assumption.

Assumption #4

The average market value for residential structures in each participating jurisdiction will be used to determine the value of potentially-damaged housing units.

Assumption #4: Value of Potentially-Damaged Housing Units. In order to determine the potential dollar losses to the potentially-damaged housing units, the monetary value of the units must first be calculated. Typically, when damage estimates are prepared after a natural disaster such as a tornado, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value of residential structures in each jurisdiction will be used.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is calculated by taking the total assessed value of residential buildings within a jurisdiction and dividing that number by the total number of housing units within the jurisdiction. The average market value is then determined by taking the average assessed value and multiplying that number by three (the assessed value of a structure in Mercer County is approximately one-third of the market value). **Figure T-15** provides a sample calculation. The total assessed value is based on 2022 tax assessment information obtained from the Mercer County Clerk.

Figure T-15
Sample Calculation of Average Assessed Value & Average Market Value – Sherrard

Average Assessed Value

Total Assessed Value of Residential Buildings in the Jurisdiction÷ Total Housing Units in the Jurisdiction = Average Assessed Value (Rounded to the Nearest Dollar)

Sherrard: $6,826,475 ÷ 267 housing units = $25,567

Average Market Value

Average Assessed Value x 3 = Average Market Value

Sherrard: $25,567 x 3 = $76,701

($76,701)

Figures T-16 and **T-17** provide the average assessed value and average market value for each participating municipality as well as by township and for the unincorporated areas of the County and the County as a whole.

Figure T-16
Average Market Value of Housing Units by Participating Jurisdiction

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2022)	Total Housing Units (2017-2021)	Average Assessed Values	Average Market Value (2022)
Aledo[2,5]	$37,511,079	1,815	$20,667	$62,001
Joy	$3,023,535	165	$18,324	$54,972
Keithsburg	$3,375,673	359	$9,403	$28,209
Matherville[1,3]	$7,045,764	342	$20,602	$61,806
Sherrard[1,4]	$6,826,475	267	$25,567	$76,701
Unincorp. County	$82,548,803	2,382	$34,655	$103,965
County	$168,878,055	7,299	$23,137	$69,411

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD
Source: Mercer County Clerk.

Figure T-17
Average Market Value of Housing Units by Township

Participating Jurisdiction	Total Assessed Value of Residential Buildings (2022)	Total Housing Units (2017-2021)	Average Assessed Values	Average Market Value (2022)
Abington	$2,462,989	176	$13,994	$41,983
Duncan[2]	$1,593,318	121	$13,168	$39,504
Eliza[6]	$3,272,765	106	$30,875	$92,625
Greene[1,3]	$15,257,042	688	$22,176	$66,528
Keithsburg	$4,421,271	410	$10,784	$32,351
Mercer[2,5]	$42,350,992	1,923	$22,023	$66,070
Millersburg[2]	$5,098,054	263	$19,384	$58,153
New Boston[6]	$9,801,861	512	$19,144	$57,433
North Henderson[1]	$2,825,528	153	$18,468	$55,403
Ohio Grove[1,2]	$1,506,196	222	$6,785	$20,354
Perryton[2]	$4,532,107	157	$28,867	$86,601
Preemption[1,2,3,4]	$22,905,268	854	$26,821	$80,463
Richland Grove[1,3,4]	$37,593,092	914	$41,130	$123,391
Rivoli[1]	$10,389,927	549	$18,925	$56,776
Suez[1]	$4,867,645	251	$19,393	$58,179
Townships - 6 most populated	$138,298,182	5,440	$25,422	$76,267
Townships - 9 least populated	$30,579,873	1,859	$16,450	$49,349

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD
Source: Mercer County Clerk.

Assumption #5

The tornado would completely destroy the potentially-damaged housing units.

Structural Damage = 100%
Content Damage = 100%

Assumption #5: Damage Scenario. Finally, a decision must be made regarding the percent damage sustained by the potentially-damaged housing units and their contents. For this scenario, the expected percent damage sustained by the structure and its contents is 100%; in other words, all of the potentially-damaged housing units would be completely destroyed. While it is highly unlikely that each and every housing unit would sustain the maximum percent damage, identifying and calculating different degrees of damage within the average area impacted is complex and provides an additional complication when updating the Plan.

Calculating Potential Dollar Losses

With all the decisions and assumptions made, the potential dollar losses can now be calculated. First, the potential dollar losses to the ***structure*** of a potentially-damaged housing unit must be determined. This is done by taking the average market value for a residential structure and multiplying it by the percent damage (100%) to get the average structural damage per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure T-18** provides a sample calculation.

Figure T-18 ***Structure:*** **Potential Dollar Loss Sample Calculation – Sherrard**
Average Market Value of a Housing Unit with the Jurisdiction x Percent Damage = Average Structural Damage per Housing Unit Sherrard: $76,701 x 100% = $76,701 per housing unit
Average Structural Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Structure* Potential Dollar Losses Sherrard: $76,701 per housing unit x 267 housing units = $20,479,167 **($20,479,167)**

Next, the potential dollar losses to the ***content*** of a potentially-damaged housing unit must be determined. Based on FEMA guidance, the average value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply by the percent damage (100%) to get the average content damage per unit. Next the average content damage per unit is multiplied by the number of potentially-damaged housing units. **Figure T-19** provides a sample calculation.

Finally, the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and content. **Figures T-20** and **T-21** give a breakdown of the total potential dollar losses by municipality and township. For comparison, an estimate of potential dollar losses was calculated for the entire County, the unincorporated portions of the County, the six most populated townships and the nine least populated townships.

Figure T-19 ***Content:*** **Potential Dollar Loss Sample Calculation – Sherrard**
½ (Average Market Value of a Housing Unit) with the Jurisdiction x Percent Damage = Average Content Damage per Housing Unit Sherrard: ½ ($76,701) x 100% = $38,350.50 per housing unit Average Content Damage per Housing Unit x Number of Potentially-Damaged Housing Units within the Jurisdiction = *Content* Potential Dollar Losses Sherrard: $38,350.50 per housing unit x 267 housing units = $10,239,583 **($10,239,583)**

Figure T-20
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Participating Jurisdiction

Participating Jurisdiction	Average Market Value (2022)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
Aledo[2,5]	$62,001	394	$24,428,394	$12,214,197	$36,642,591
Joy	$54,972	165	$9,070,380	$4,535,190	$13,605,570
Keithsburg	$28,209	359	$10,127,031	$5,063,516	$15,190,547
Matherville[1,3]	$61,806	342	$21,137,652	$10,568,826	$31,706,478
Sherrard[1,4]	$76,701	96	$7,363,296	$3,681,648	$11,044,944
Unincorp. County	$103,965	1	$103,965	$51,983	$155,948
County	$69,411	3	$208,233	$104,117	$312,350

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

This assessment illustrates why potential residential dollar losses should be considered when jurisdictions are deciding which mitigation projects to pursue. ***Potential dollar losses caused by an average tornado in Mercer County would be expected to exceed at least $11 million in any of the participating municipalities.***

Potential dollar losses caused by an average tornado in Mercer County townships would be expected to range from $59,256 in Duncan Township to at least $1.3 million in Mercer Township. As discussed previously, the estimate for the entire County is skewed because it does not take into consideration the differences in the housing density.

Vulnerability of Commercial/Industrial Businesses and Infrastructure/Critical Facilities
The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of an average-sized tornado in term of residential dollar losses. These calculations do not include damages sustained by businesses or other infrastructure and critical facilities within the participating jurisdictions.

Figure T-21
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Tornado by Township

Participating Jurisdiction	Average Market Value (2022)	Potentially-Damaged Housing Units (Rounded Up)	Potential Dollar Losses		Total Potential Dollar Losses
			Structure	Content	
Abington	$41,983	2	$83,966	$41,983	$125,949
Duncan[2]	$39,504	1	$39,504	$19,752	$59,256
Eliza[6]	$92,625	1	$92,625	$46,313	$138,938
Greene[1,3]	$66,528	5	$332,640	$166,320	$498,960
Keithsburg	$32,351	6	$194,106	$97,053	$291,159
Mercer[2,5]	$66,070	14	$924,980	$462,490	$1,387,470
Millersburg[2]	$58,153	2	$116,306	$58,153	$174,459
New Boston[6]	$57,433	3	$172,299	$86,150	$258,449
North Henderson[1]	$55,403	2	$110,806	$55,403	$166,209
Ohio Grove[1,2]	$20,354	2	$40,708	$20,354	$61,062
Perryton[2]	$86,601	2	$173,202	$86,601	$259,803
Preemption[1,2,3,4]	$80,463	6	$482,778	$241,389	$724,167
Richland Grove[1,3,4]	$123,391	7	$863,737	$431,869	$1,295,606
Rivoli[1]	$56,776	4	$227,104	$113,552	$340,656
Suez[1]	$58,179	2	$116,358	$58,179	$174,537
Townships - 6 most populated	$76,267	6	$457,602	$228,801	$686,403
Townships - 9 least populated	$49,349	2	$98,698	$49,349	$148,047

[1]Sherrard CUSD #200 [2]Aledo FPD [3]Greene Township FPD
[4]Sherrard Community FPD [5]Genesis Medical Center [6]Bay Island D&LD

In terms of businesses, the impacts from an average-sized tornado event can be physical and/or monetary. Monetary impacts can include loss of sales revenue either through temporary closure or loss of critical services (i.e., power, drinking water, and sewer). Depending on the magnitude of the event, the damage sustained by infrastructure and critical facilities can be extensive in nature and expensive to repair. As a result, the cumulative monetary impacts to businesses and infrastructure can exceed the cumulative monetary impacts to residences. ***While average dollar amounts cannot be supplied for these items at this time, they should be taken into account*** when discussing the impacts that an average-sized tornado could have on the participating jurisdictions.

3.7 DROUGHTS

HAZARD IDENTIFICATION

What is the definition of a drought?

While difficult to define, the National Drought Mitigation Center (NDMC) considers “drought” in its most general sense to be a deficiency of precipitation over an extended period of time, usually a season or more, resulting in a water shortage.

Drought is a normal and recurrent feature of climate and can occur in all climate zones, though its characteristics and impacts vary significantly from one region to another. Unlike other natural hazards, drought does not have a clearly defined beginning or end. Droughts can be short, lasting just a few months, or they can persist for several years. There have been 28 drought events with losses exceeding $1 billion each (CPI-Adjusted) across the U.S. between 1980 and 2022. This is due in part to the sheer size of the areas affected.

What types of drought occur?

There are four main types of drought that occur: meteorological, agricultural, hydrological, and socioeconomic. They are differentiated based on the use and need for water. The following provides a brief description of each type.

- **Meteorological Drought.** Meteorological drought is defined by the degree of dryness or rainfall deficit and the duration of the dry period. Due to climate differences, what might be considered a drought in one location of the country may not be in another location.
- **Agricultural Drought.** An agricultural drought refers to a period when rainfall deficits, soil moisture deficits, reduced ground water or reservoir levels needed for irrigation impact crop development and yields.
- **Hydrological Drought.** Hydrological drought refers to a period when precipitation deficits (including snowfall) impact surface (stream flow, reservoir and lake levels) and subsurface (aquifers) water supply levels.
- **Socioeconomic Drought.** Socioeconomic drought refers to a period when the demand for an economic good (fruit, vegetables, grains, etc.) exceeds the supply as a result of weather-related shortfall in the water supply.

How are droughts measured?

There are numerous quantitative measures (indicators and indices) that have been developed to measure drought. How these indicators and indices measure drought depends on the discipline affected (i.e., agriculture, hydrology, meteorology, etc.) and the region being considered. There is no single index or indicator that can account for and be applied to all types of drought.

Although none of the major indices are inherently superior to the rest, some are better suited than others for certain uses. The first comprehensive drought index developed in the U.S. was the Palmer Drought Severity Index (PDSI). The PDSI is calculated based on precipitation and temperature data, as well as the local Available Water Content of the soil. It is most effective measuring drought impacts on agriculture. For many years it was the only operational drought index, and it is still very popular around the world.

The Standardized Precipitation Index (SPI), developed in 1993, uses precipitation records for any location to develop a probability of precipitation for any time scale in order to reflect the impact of drought on the availability of different water resources (groundwater, reservoir storage, streamflow, snowpack, etc.) In 2009, the World Meteorological Organization recommended SPI as the main meteorological drought index that countries should use to monitor and follow drought conditions.

The first operational 'composite' approach applied in the U.S. was the U.S. Drought Monitor (USDM). The USDM utilizes five key indicators, numerous supplementary indicators, and local reports from expert observers around the country to produce a drought intensity rating that is ideal for monitoring droughts that have many impacts, especially on agriculture and water resources during all seasons over all climate types. NOAA's Storm Events Database records include USDM ratings and utilized them along with additional weather information to describe the severity of the drought conditions impacting affected counties. Therefore, this Plan will utilize USDM ratings to identify and describe previous drought events recorded within the County. The following provides a more detailed discussion of the USDM to aid the Plan's developers and the general public in understanding how droughts are identified and categorized.

U.S. Drought Monitor (USDM)

Established in 1999, the USDM is a relatively new index that combines quantitative measures with input from experts in the field. It is designed to provide the general public, media, government officials and others with an easily understandable "big picture" overview of drought conditions across the U.S. It is unique in that it combines a variety of numeric-based drought indices and indicators with local expert input to create a single composite drought indicator, the results of which are illustrated via a weekly map that depicts the current drought conditions across the U.S. The USDM is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the U.S. Department of Agriculture (USDA), and the National Oceanic and Atmospheric Administration (NOAA).

The USDM has a scale of five intensity categories, D0 through D4, that are utilized to identify areas of drought. **Figure DR-1** provides a brief description of each category.

Because the ranges of the various indicators often don't coincide, the final drought category tends to be based on what a majority of the indictors show and on local observations. The authors also weight the indices according to how well they perform in various parts of the country and at different times of the year. It is the combination of the best available data, location observations and experts' best judgment that make the U.S. Drought Monitor more versatile than other drought indices.

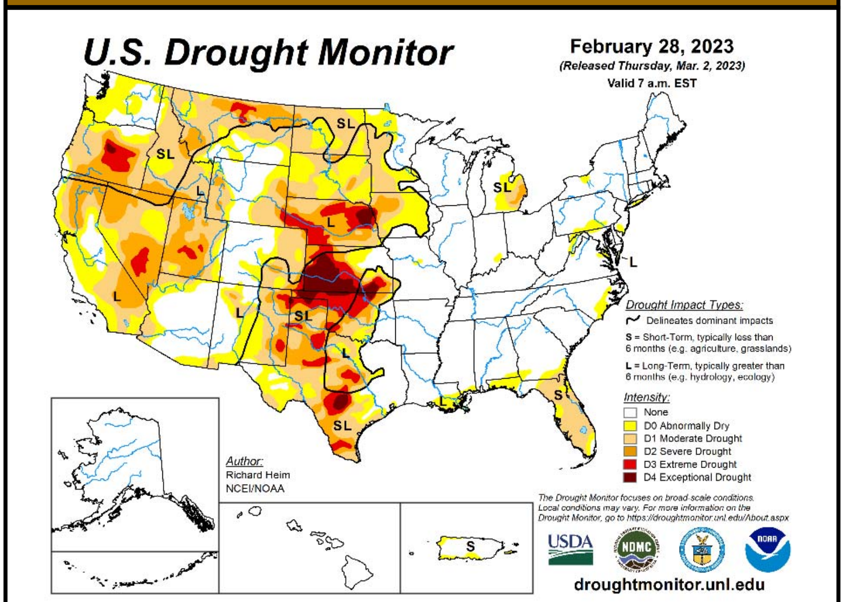
In addition to identifying and categorizing general areas of drought, the USDM also identifies whether a drought's impacts are short-term (typically less than 6 months – agriculture, grasslands) or long-term (typically more than 6 months – hydrology, ecology). **Figure DR-2** shows an example of the USDM weekly map. The USDM is designed to provide a consistent big-picture look at drought conditions in the U.S. It is not designed to infer specifics about local conditions.

Figure DR-1
U.S. Drought Monitor – Drought Intensity Categories

Category	Possible Impacts
D0 (Abnormally Dry)	• Going into drought: - short-term dryness slowing planting, growth of crops or pastures. • Coming out of drought: - some lingering water deficits - pastures or crops not fully recovered
D1 (Moderate Drought)	• Some damage to crops, pastures • Streams, reservoirs, or wells low; some water shortages developing or imminent • Voluntary water-use restrictions requested
D2 (Severe Drought)	• Crop or pasture losses likely • Water shortages common • Water restrictions imposed
D3 (Extreme Drought)	• Major crop/pasture losses • Widespread water shortages or restrictions
D4 (Exceptional Drought)	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies

Source: U.S. Drought Monitor.

Figure DR-2
U. S. Drought Monitor



The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the U.S. Department of Agriculture, and the National Oceanic and Atmospheric Administration. Map Courtesy of NDMC.

HAZARD PROFILE

The following identifies past occurrences of drought, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

When have droughts occurred previously? What is the extent of these previous droughts?

Drought Fast Facts – Occurrences

Number of Drought Events Reported (1980 – 2022): ***5***

Number of Drought Events County was Designated a USDA Primary Natural Disaster Area: ***1 (2005)***

Table 11, located in **Appendix I**, summarizes the previous occurrences as well as the extent or magnitude of the drought events recorded in Mercer County NOAA's Storm Events Database, the Illinois State Water Survey, the Illinois Emergency Management Agency and Office of Homeland Security (IEMA-OHS), the NDMC at the University of Nebraska-Lincoln, and the USDA have documented five official droughts for Mercer County between 1980 and 2022. The County was designated a USDA Primary Natural Disaster area for the 2005 drought.

The recorded drought events ranged in length from 8 to 18 months. Of the four drought events with a recorded starting month, two began in June, one began in May, and one began in July. Three of the drought events were assigned drought intensity category ratings by the USDM, with the 2005 to 2006 drought and the 2012 to 2013 drought reaching D3, extreme drought.

The State of Illinois Drought Preparedness and Response Plan identified seven additional outstanding statewide droughts since 1900 based on statewide summer values of the PDSI provided by NOAA's National Center for Environmental Information. Those seven droughts occurred in 1902, 1915, 1931, 1934, 1936, 1954 and 1964; however, the extent to which Mercer County was impacted was unavailable.

What locations are affected by drought?

Drought events affect the entire County. Droughts, like excessive heat and severe winter storms, tend to impact large areas, extending across an entire region and affecting multiple counties.

What is the probability of future drought events occurring based on historical data?

Mercer County, including the participating jurisdictions, has experienced five droughts between 1980 and 2022. With five occurrences over 43 years, the probability or likelihood that the County may experience a drought in any given year is 11.6%. However, if earlier recorded droughts are factored in, then the probability that Mercer County may experience a drought in any given year decreases to 9.9%.

What is the probability of future drought events occurring based on modeled future conditions?

Despite precipitation trending upwards in Illinois in recent decades, drought conditions are likely to be more problematic in the future than they have been in the recent past, due to a combination of changes in precipitation patterns and an increase in summer temperatures.

In terms of predicting the likelihood of drought conditions, the amount of precipitation received is important, but even more critical is the timing of precipitation events. More frequent precipitation events maintain soil in a spongy, porous state that readily absorbs moisture; alternatively, more infrequent precipitation events tend to lead to dry, hardened earth, which is more effective at repelling water than absorbing it. When a precipitation event does occur over this drought-stricken soil, most of the water runs off and pools in bottomlands, leaving most land 'high and dry' while simultaneously flooding the lowest-lying areas.

Another factor making this outcome more likely is the trend of increasing temperatures in Illinois, particularly during the summer when rain events are already more sporadic. Over the past 120 years, average temperatures in Illinois have increased by 1°F and 2°F according to the Illinois State Climatologist, a trend that is likely to continue. In the future, hotter summer temperatures are likely to lead to more evaporation that will exacerbate dry conditions, causing droughts to intensify more rapidly and become more intense.

Figures SS-8 and **SS-9,** located in Section 3.2, and **Figures EH-7, EH-8,** and **EH-9,** located in Section 3.5, provide tabular and graphical projections for Mercer County showing average annual estimates for temperature and precipitation in the early, mid, and late century, with both low and high estimates for each time period. Most likely, the true values will fall between these two estimates. According to the Climate Mapping for Resilience and Adaptation's Assessment Tool, the number of days exceeding 90°F in Mercer County is projected to go from 17 today to between 53 and 63, while days exceeding 100°F are likely to increase from an average of one a year today to 7 to 10 days by midcentury. It also forecasts that the average annual precipitation in Mercer County is likely to increase by 1.5 to 1.7 inches per year, while the average number of days per year without precipitation is projected to increase by 3 to 4 days.

The Climate Explorer indicates that in Mercer County, the average number of dry spells (a period of consecutive days without precipitation) is projected to increase by one. Extreme temperatures on the hottest days of the year are projected to increase by 7°F. This is based on the findings of the 2018 National Climate Assessment and compares projections for the middle third of the century (2035-2064) with average conditions observed from 1961-1990.

In combination, a decrease in the frequency of precipitation and a significant increase in the number of days with extreme heat in Mercer County would create conditions that will be more likely to produce droughts than today.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from drought.

Are the participating jurisdictions vulnerable to drought?

Yes. All of Mercer County, including the participating jurisdictions, is vulnerable to drought. Neither the amount nor the distribution of precipitation; soil types; topography; or water table conditions provides protection for any area within the County. Since 2013, Mercer county has experienced one drought.

The *2023 Illinois Natural Hazard Mitigation Plan* prepared by IEMA-OHS classifies Mercer County's hazard rating for drought as "low". IEMA-OHS's overall hazard rating system has five levels: very low, low, medium, high, and very high.

For drought, FEMA's National Risk Index (NRI) rates the County as a whole as "Relatively Moderate". One of the four census tracts, one is rated "Relatively High", two are "Relatively Moderate", and one is rated "Relatively Low" for drought. **Table R-4 presents** the overall NRI scores and ratings for each census tract as well as for the County as a whole.

Have any of the participating jurisdictions identified specific assets vulnerable to the impacts of drought?

No. Based on responses to an Assets Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions consider specific assets within their jurisdictions vulnerable to drought.

What impacts resulted from the recorded drought events?

Data obtained from NOAA's Storm Events Database and the USDA Risk Management Agency, indicates that between 1980 and 2022, three of the five droughts (2005, 2012, & 2013) caused an estimated $22,230,793 in damages to crops in Mercer County. Damage information was either unavailable or none was recorded for the remaining two reported occurrences.

<u>Drought Fast Facts – Impacts/Risk</u>

<u>Drought Impacts:</u>
- Total Property Damage: ***n/a***
- Total Crop Damage: ***$22.2 million***

<u>Drought Risk/Vulnerability:</u>
- Public Health & Safety: ***Low***
- Buildings/Infrastructure/Critical Facilities: ***Low***

Of the five drought events, disaster relief payment information was only available for one of the events. In 1988, landowners and farmers in Illinois were paid in excess of $382 million in relief payments; however, a breakdown by county was unavailable.

What other impacts can result from drought events?

Based on statewide drought records available from the Illinois State Water Survey, the most common impacts that result from drought events in Illinois include reductions in crop yields and drinking water shortages.

<u>Crop Yield Reductions</u>

Agriculture is the major enterprise in Mercer County. Farmland accounts for approximately 78.6% of all the land in the County. According to the 2017 Census of Agriculture, there were 748 farms in Mercer County occupying 282,230 acres. Approximately 3.0% of the land in crop production is irrigated. In comparison, there were 713 farms occupying 70.2% (251,200 acres) of the total land area in the County in 2012. Of the land in farms in 2017, 82% or approximately 231,000 acres are in crop production.

According to the 2017 Census of Agriculture, total crop and livestock sales accounted for $217.5 million in revenue. This is a 0.2% increase in revenue from the 2012 Census of Agriculture when total crop and livestock sales accounted for $216.9 million. Mercer County ranks 35th in Illinois in crop cash receipts and 17th in Illinois for livestock cash receipts. A severe drought would have a major financial impact on the large agricultural community, particularly if it occurred during the growing season. Dry weather conditions, particularly when accompanied by excessive heat, can result in diminished crop yields and place stress on livestock.

A reduction in crop yields was seen as a result of the 1983, 1988, 2005, 2012, and 2013 droughts. **Figure DR-3** illustrates the reduction yields seen for corn and soybeans during the recorded drought events. The USDA's National Agricultural Statistics Service records show that yield reductions for corn and soybeans were most severe for the 1988 drought when there was a 46.3% reduction in corn yields and a 17.9% reduction in soybean yields.

Figure DR-3
Crop Yield Reductions Due to Drought –
Mercer County

Year	Corn		Soybeans	
	Yield (bushel)	% Reduction Previous Year	Yield (bushel)	% Reduction Previous Year
1982	124.0	---	39.0	---
1983	**96.0**	**22.6%**	40.0	**---**
1984	118.0	---	37.0	---
1987	121.0	---	42.0	---
1988	**65.0**	**46.3%**	**34.5**	**17.9%**
1989	72.0	---	40.0	---
2004	183.0	---	53.0	---
2005	**155.0**	**15.3%**	**51.0**	**3.8%**
2006	170.0	---	**48.0**	**5.9%**
2007	192.0	---	51.0	---
2011	161.9	---	52.9	---
2012	180.1	---	56.1	---
2013	**177.1**	**1.7%**	**48.3**	**13.9%**
2014	193.5	---	57.0	---

Source: USDA, National Agricultural Statistics Service.

<u>*Drinking Water Shortages*</u>

Municipalities that rely on surface water sources for their drinking water supplies are more vulnerable to shortages as a result of drought. In Mercer County, ***none of the participating municipalities rely exclusively on surface water sources*** for their drinking water supply. According to the Illinois Environmental Protection Agency's Source Water Assessment Program, all of the participating municipalities obtain their water from deep bedrock or sand and gravel aquifers.

While some of the participating municipalities are less vulnerable to drinking water shortages, a prolonged drought or a series of droughts in close succession do have the potential to impact water levels in aquifers used for individual drinking water wells in rural areas. This is because individual (private) water wells tend to be shallower than municipal (public) water wells.

What is the level of vulnerability to public health and safety from drought?

Unlike other natural hazards that affect the County, drought events do not typically cause injuries or fatalities. The primary concern centers on the financial impacts that result from loss of crop yields and livestock and potential drinking water shortages. Even taking into consideration the potential impacts that a water shortage may have on the general public, the risk or vulnerability to public health and safety from drought is ***low***.

Are existing buildings, infrastructure, and critical facilities vulnerable to drought?

No. In general, existing buildings, infrastructure and critical facilities located in Mercer County and the participating jurisdictions are not vulnerable to drought. The primary concern centers on the financial impacts that result from loss of crop yields and livestock.

While buildings do not typically sustain damage from drought events, in rare cases infrastructure and critical facilities may be directly or indirectly impacted. While uncommon, droughts can contribute to roadway damage. Severe soil shrinkage can compromise the foundation of a roadway and lead to cracking and buckling.

Prolonged heat associated with drought can also increase the demand for energy to operate air conditioners, fans, and other devices. This increase in demand places stress on the electrical grid, which increases the likelihood of power outages.

Additionally, droughts have impacted drinking water supplies. Reductions in aquifer water levels can cause water shortages that jeopardize the supply of water needed to provide drinking water and fight fires. While water use restrictions can be enacted in an effort to maintain a sufficient supply of water, they are only temporary and do not address long-term viability issues. Drinking water supplies vulnerable to drought, such as those that rely solely on surface water or shallow wells, need to consider mitigation measures that will provide long-term stability before a severe drought, or a series of droughts occur. Effective mitigation measures include drilling additional wells, preferably deep wells, securing agreements with alternative water sources and constructing water lines to provide a backup water supply.

In general, the risk or vulnerability to buildings, infrastructure and critical facilities from drought is ***low***, even taking into consideration the potential impact a drought may have on drinking water supplies and the stress that prolonged heat may place on the electrical grid.

Are future buildings, infrastructure, and critical facilities vulnerable to drought?

No. Future buildings, infrastructure and critical facilities within the County are no more vulnerable to drought than the existing building, infrastructure, and critical facilities. As discussed above, buildings do not typically sustain damage from drought. Infrastructure and critical facilities may, in rare cases, be damaged by drought, but very little can be done to prevent this damage.

What are the potential dollar losses to vulnerable structures from drought?

Unlike other natural hazards there are no standard loss estimation models or methodologies for drought. Since drought typically does not cause structure damage, it is unlikely that future dollar losses will be excessive. The primary concern associated with drought is the financial impacts that result from loss of crop yields and the potential impacts to drinking water supplies. Since a large part of the County is involved in farming activities, it is likely that there will be future dollar losses to drought. In addition, reduced water levels and the water conservation measures that typically accompany a drought will most likely impact consumers as well as businesses and industries that are water-dependent (i.e., car washes, landscapers, etc.).

3.8 Earthquakes

Hazard Identification

What is the definition of an earthquake?

An earthquake is a sudden shaking of the ground caused when rocks forming the earth's crust slip or move past each other along a fault (a fracture in the rocks). Most earthquakes occur along the boundaries of the earth's tectonic plates. These slow-moving plates are being pulled and dragged in different directions, sliding over, under and past each other. Occasionally, as the plates move past each other, their jagged edges will catch or stick causing a gradual buildup of pressure (energy).

Eventually, the force exerted by the moving plates overcomes the resistance at the edges and the plates snap into a new position. This abrupt shift releases the pent-up energy, producing vibrations or seismic waves that travel outward from the earthquake's point of origin. The location below the earth's surface where the earthquake starts is known as the hypocenter or focus. The point on the earth's surface directly above the focus is the epicenter.

The destruction caused by an earthquake may range from light to catastrophic depending on a number of factors including the magnitude of the earthquake, the distance from the epicenter, the local geologic conditions as well as construction standards and time of day (i.e., rush hour). Earthquake damage may include power outages, general property damage, road, and bridge failure, collapsed buildings and utility damage (ruptured gas lines, broken water mains, etc.).

Most of the damage done by an earthquake is caused by its secondary or indirect effects. These secondary effects result from the seismic waves released by the earthquake and include ground shaking, surface faulting, liquefaction, landslides and, in rare cases, tsunamis.

According to the U.S. Geological Survey, more than 143 million Americans in the contiguous U.S. are exposed to potentially damaging ground shaking from earthquakes. More than 44 million of those Americans, located in 18 states, are exposed to very strong ground shaking from earthquakes. Illinois ranks 10th in terms of the number of individuals exposed to very strong ground shaking. The Federal Emergency Management Agency's Hazus analysis indicates that the annualized earthquake losses to the national building stock is $6.1 billion per year. A majority of the average annual loss is concentrated in California ($3.7 million). The central U.S. (including Illinois) ranks third in annualized earthquake losses at $480 billion, behind the pacific northwest (Washington and Oregon) with annualized earthquake losses at $710 billion.

What is a fault?

A fault is a fracture or zone of fractures in the earth's crust between two blocks of rock. They may range in length from a few millimeters to thousands of kilometers. Many faults form along tectonic plate boundaries. Faults are classified based on the angle of the fault with respect to the surface (known as the dip) and the direction of slip or movement along the fault. There are three main groups of faults: normal, reverse (thrust) and strike-slip (lateral).

Normal faults occur in response to pulling or tension along the two blocks of rock causing the overlying block to move down the dip of the fault plane. Most of the faults in Illinois are normal faults. Reverse or thrust faults occur in response to squeezing or compression of the two blocks of rock causing the overlying block to move up the dip of the fault plane. Strike-slip or lateral faults can occur in response to either pulling/tension or squeezing/compression causing the blocks to move horizontally past each other.

Geologists have found that earthquakes tend to recur along faults, which reflect zones of weakness in the earth's crust. Even if a fault zone has recently experienced an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake could still occur.

What are tectonic plates?

Tectonic plates are large, irregularly-shaped, relatively rigid sections of the earth's crust that float on the top, fluid layer of the earth's mantle. There are about a dozen tectonic plates that make up the surface of the planet. These plates are approximately 50 to 60 miles thick and the largest are millions of square miles in size.

How are earthquakes measured?

The severity of an earthquake is measured in terms of its magnitude and intensity. A brief description of both terms and the scales used to measure each are provided below.

<u>Magnitude</u>

Magnitude refers to the amount of seismic energy released at the hypocenter of an earthquake. The magnitude of an earthquake is determined from measurements of ground vibrations recorded by seismographs. As a result, magnitude is represented as a single, instrumentally determined value. A loose network of seismographs has been installed all over the world to help record and verify earthquake events.

There are several scales that measure the magnitude of an earthquake. The most well-known is the Richter Scale. This logarithmic scale provides a numeric representation of the magnitude of an earthquake through the use of whole numbers and decimal fractions. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in ground vibrations measured. In addition, each whole number increase corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number. It is important to note that the Richter Scale is used only to determine the magnitude of an earthquake, it does not assess the damage that results.

Once an earthquake's magnitude has been confirmed, it can be classified. **Figure EQ-1** categorizes earthquakes by class based on their magnitude (i.e., Richter Scale value). Any earthquake with a magnitude less than 3.0 on the Richter Scale is classified as a micro earthquake while any earthquake with a magnitude of 8.0 or greater on the Richter Scale is considered a "great" earthquake. Earthquakes with a magnitude of 2.0 or less are not commonly felt by individuals. The largest earthquake to occur in the U.S. since 1900 took place off the coast of Alaska in Prince William Sound on March 28, 1964 and registered a 9.2 on the Richter Scale.

Intensity

Intensity refers to the effect an earthquake has on a particular location. The intensity of an earthquake is determined from observations made of the damage inflicted on individuals, structures, and the environment. As a result, intensity does not have a mathematical basis; instead, it is an arbitrary ranking of observed effects. In addition, intensity generally diminishes with distance. There may be multiple intensity recordings for a region depending on a location's distance from the epicenter.

Figure EQ-1
Earthquake Magnitude Classes

Class	Magnitude (Richter Scale)
micro	smaller than 3.0
minor	3.0 – 3.9
light	4.0 – 4.9
moderate	5.0 – 5.9
strong	6.0 – 6.9
major	7.0 – 7.9
great	8.0 or larger

Source: Michigan Technological University, UPSeis

Although numerous intensity scales have been developed over the years, the one currently used in the U.S. is the Modified Mercalli Intensity Scale. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. The lower numbers of the intensity scale are based on human observations (i.e., felt only by a few people at rest, felt quite noticeably by persons indoors, etc.).

The higher numbers of the scale are based on observed structural damage (i.e., broken windows, general damage to foundations etc.). Structural engineers usually contribute information when assigning intensity values of VIII or greater. **Figure EQ-2** provides a description of the damages associated with each level of intensity as well as comparing Richter Scales values to Modified Mercalli Intensity Scale values.

Generally, the Modified Mercalli Intensity value assigned to a specific site after an earthquake is a more meaningful measure of severity to the general public than magnitude because intensity refers to the effects actually experienced at that location.

When and where do earthquakes occur?

Earthquakes can strike any location at any time. However, history has shown that most earthquakes occur in the same general areas year after year, principally in three large zones around the globe. The world's greatest earthquake belt, the circum-Pacific seismic belt (nicknamed the "Ring of Fire"), is found along the rim of the Pacific Ocean, where about 81 percent of the world's largest earthquakes occur.

The second prominent belt is the Alpide, which extends from Java to Sumatra and through the Himalayan Mountains, the Mediterranean Sea and out into the Atlantic Ocean. It accounts for about 17 percent of the world's largest earthquakes, including those in Iran, Turkey, and Pakistan. The third belt follows the submerged mid-Atlantic Ridge, the longest mountain range in the world, nearly splitting the entire Atlantic Ocean north to south.

While most earthquakes occur along plate boundaries some are known to occur within the interior of a plate. (As the plates continue to move and plate boundaries change over time, weakened boundary regions become part of the interiors of the plates.) Earthquakes can occur along zones of weakness within a plate in response to stresses that originate at the edges of the plate or from deep within the earth's crust. The New Madrid earthquakes of 1811 and 1812 occurred within the North American plate.

Figure EQ-2
Comparison of Richter Scale and Modified Mercalli Intensity Scale

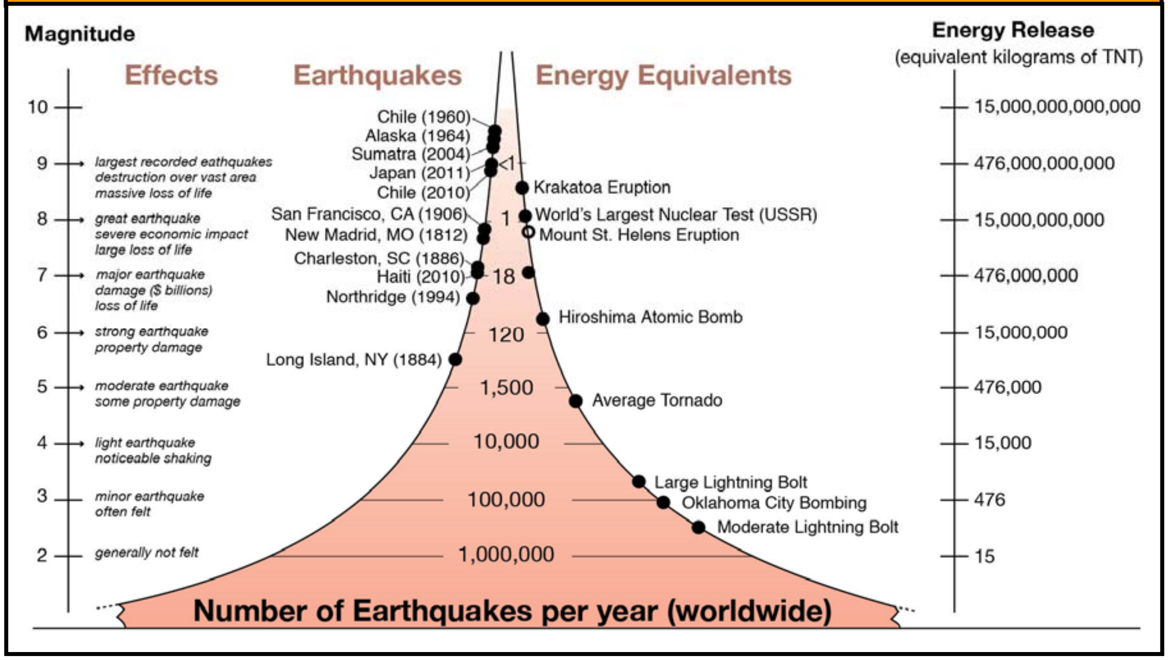
Richter Scale	Modified Mercalli Scale	Observations
1.0 – 1.9	I	Felt by very few people; barely noticeable. No damage.
2.0 – 2.9	II	Felt by a few people, especially on the upper floors of buildings. No damage.
3.0 – 3.9	III	Noticeable indoors, especially on the upper floors of buildings, but may not be recognized as an earthquake. Standing cars may rock slightly; vibrations similar to the passing of a truck. No damage.
4.0	IV	Felt by many indoors and a few outdoors. Dishes, windows, and doors disturbed. Standing cars rocked noticeably. No damage.
4.1 – 4.9	V	Felt by nearly everyone. Small, unstable objects displaced or upset; some dishes and glassware broken. Negligible damage.
5.0 – 5.9	VI	Felt by everyone. Difficult to stand. Some heavy furniture moved. Weak plaster may fall and some masonry, such as chimneys, may be slightly damaged. Slight damage.
6.0	VII	Slight to moderate damage to well-built ordinary structures. Considerable damage to poorly-built structures. Some chimneys may break. Some walls may fall.
6.1 – 6.9	VIII	Considerable damage to ordinary buildings. Severe damage to poorly built buildings. Some walls collapse. Chimneys, monuments, factory stacks, columns fall.
7.0	IX	Severe structural damage in substantial buildings, with partial collapses. Buildings shifted off foundations. Ground cracks noticeable.
7.1 – 7.9	X	Most masonry and frame structures and their foundations destroyed. Some well-built wooden structures destroyed. Train tracks bent. Ground badly cracked. Landslides.
8.0	XI	Few, if any structures remain standing. Bridges destroyed. Wide cracks in ground. Train tracks bent greatly. Wholesale destruction.
> 8.0	XII	Total damage. Lines of sight and level are distorted. Waves seen on the ground. Objects thrown up into the air.

Sources: Michigan Technological University, Department of Geological and Mining Engineering and Sciences, UPSeis.
U.S. Geological Survey.

How often do earthquakes occur?

Earthquakes occur every day. Magnitude 2 and smaller earthquakes occur several hundred times a day worldwide. These earthquakes are known as micro earthquakes and are generally not felt by humans. Major earthquakes, greater than magnitude 7, generally occur at least once a month. **Figure EQ-3** illustrates the approximate number of earthquakes that occur worldwide per year based on magnitude. This figure also identifies manmade and natural events that release approximately the same amount of energy for comparison.

Figure EQ-3
Approximate Number of Earthquakes Recorded Annually



Source: Incorporated Research Institutions for Seismology, Education and Outreach Series, "How Often Do Earthquakes Occur?"

HAZARD PROFILE

The following details the location of known fault zones and geologic structures, identifies past occurrences of earthquakes, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there any faults located within the County?

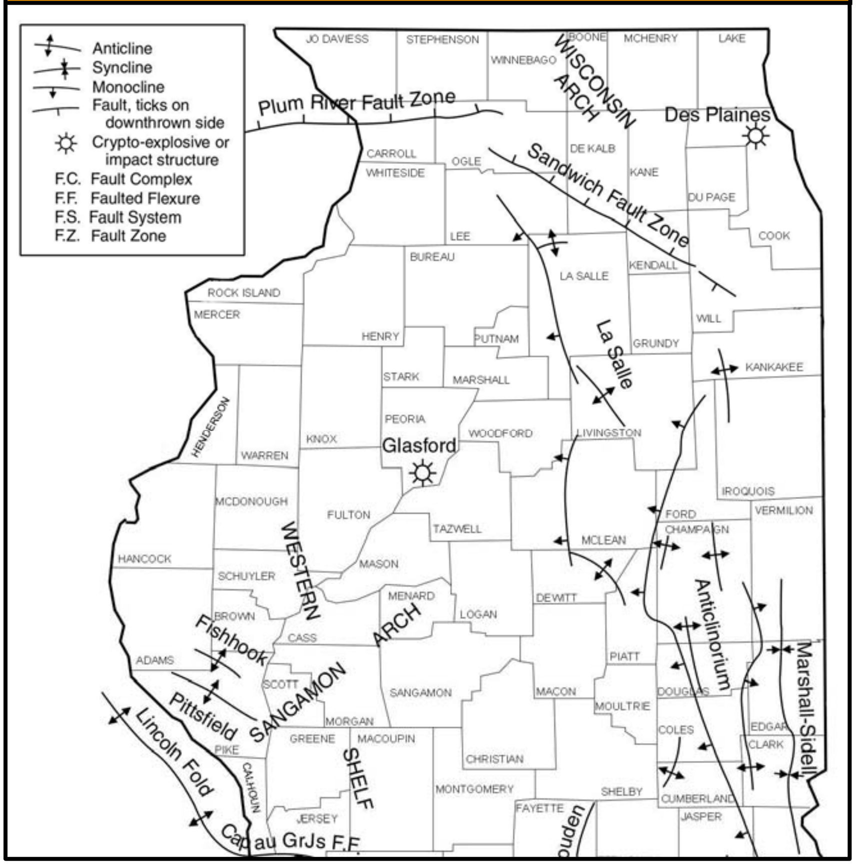
No, there are no known faults or geologic structures located in Mercer County or the immediate region as illustrated by **Figure EQ-4**.

According to the Illinois State Geological Survey, the U.S. Geological Survey and Center for Earthquake Research and Information (CERI) at the University of Memphis, no earthquakes have originated in Mercer County during the last 200 years. While no earthquakes have originated in the County, residents have felt ground shaking caused by earthquakes that have originated outside of the County. The following provides a brief description, by region, of these events. **Figure EQ-5** illustrates the epicenters of the nearby earthquakes.

Earthquake Fast Facts – Occurrences

Earthquakes Originating in the County (1795 – 2022): ***None***
Fault Zones Located within the County: ***None***
Geological Structures Located within the County: ***None***
Earthquakes Originating in Adjacent Counties (1795-2021): ***4***
Fault Zones Located in Nearby Counties: ***None***
Geologic Structures Located in Adjacent Counties: ***None***

Figure EQ-4
Geological Structures in Northwestern Illinois



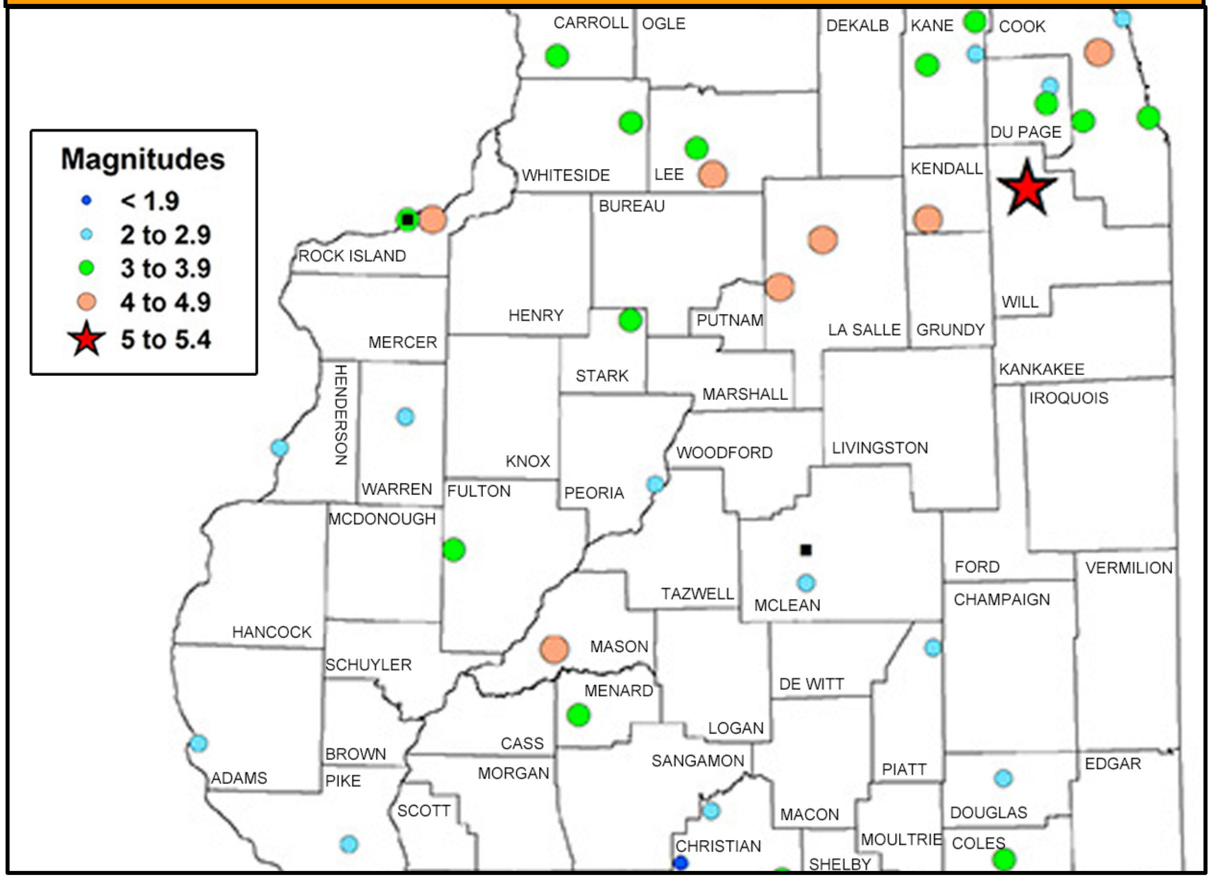
Source: Illinois State Geological Survey.

<u>*Northwestern Illinois*</u>

Four earthquakes have originated in nearby Warren, Henderson, and Rock Island Counties. The following provides a brief description of each.

- On April 11, 1922, an earthquake with an estimated magnitude between 2.0 to 2.9 originated two miles east of Monmouth in Warren County. This earthquake had an intensity of II on the Modified Mercalli Intensity Scale.
- An earthquake with an estimated magnitude between 2.0 to 2.9 originated along the Mississippi River east of Burlington in Henderson County on February 26, 1935. No intensity rating was available from ISGS for this event.
- On November 12, 1934, an earthquake with a magnitude of 3.4 originated in Moline in Rock Island County. This earthquake had an intensity of VI on the Modified Mercalli Intensity Scale.
- An earthquake with a magnitude of 2.8 originated in the City of Rock Island in Rock Island County on January 5, 1935. This earthquake had an intensity of IV on the Modified Mercalli Intensity Scale.

Figure EQ-5
Earthquakes Originating in Mercer Illinois



Source: Illinois State Geological Survey.

Northern Illinois

In addition to the above referenced event, there have been approximately two dozen other earthquakes that have occurred in northern Illinois in the last century, though none of them were greater than a magnitude 5.1. These earthquakes generally caused minor damage within 10 to 20 miles of the epicenter and were felt over several counties. Earthquakes greater than a magnitude 5 are generally not expected in this region. The following highlights a few of the recent earthquakes that have taken place in northern Illinois.

- On March 25, 2015 a magnitude 2.9 earthquake took place at Lake in the Hills in McHenry County. This earthquake was felt over several counties. Damage information was unavailable for this event.
- A magnitude 3.2 earthquake took place on November 4, 2013 on the east side of McCook in Cook County. This earthquake was felt mainly in the Chicago metro area. Damage information was unavailable for this event.
- On February 10, 2010 a magnitude 3.8 earthquake took place approximately two miles northeast of Virgil in Kane County. This earthquake was felt over much of Illinois, Indiana and central and southern Wisconsin. Some minor structural damage was reported.

- ❖ The largest earthquake to take place in northern Illinois in the past several hundred years occurred on May 26, 1909. The exact location of this magnitude 5.1 earthquake isn't known, but the greatest damage occurred in and near Aurora where many chimneys fell, and gas lines were ruptured. Minor structural damage was reported across northern and central Illinois and southern Wisconsin. Ground shaking was felt over seven states.

<u>Southern Illinois</u>

Mercer County residents also felt ground shaking caused by several earthquakes that have originated in southern Illinois. The following provides a brief description of a few of the larger events that have occurred.

- ❖ On April 18, 2008, a magnitude 5.2 earthquake with an estimated intensity of VII for the area surrounding the epicenter was reported in southeastern Illinois near Bellmont in Wabash County. The earthquake was located along the Wabash Valley seismic zone. Minor structural damage was reported in several towns in Illinois and Kentucky. Ground shaking was felt over all or parts of 18 states in the central U.S. and southern Ontario, Canada.
- ❖ A magnitude 5.2 earthquake with an estimated intensity of VII for the area surrounding the epicenter took place on June 10, 1987, in southeastern Illinois near Olney in Richland County. This earthquake was also located along the Wabash Valley seismic zone. Only minor structural damage was reported in several towns in Illinois and Indiana. Ground shaking was felt over all or parts of 17 states in the central and eastern U.S. and southern Ontario, Canada.
- ❖ The strongest earthquake in the central U.S. during the 20th century occurred along the Wabash Valley seismic zone in southeastern Illinois near Dale in Hamilton County. This magnitude 5.4 earthquake occurred on November 9, 1968, with an intensity estimated at VII for the area surrounding the epicenter. Moderate structural damage was reported in several towns in south-central Illinois, southwest Indiana, and northwest Kentucky. Ground shaking was felt over all or parts of 23 states in the central and eastern U.S. and southern Ontario, Canada.

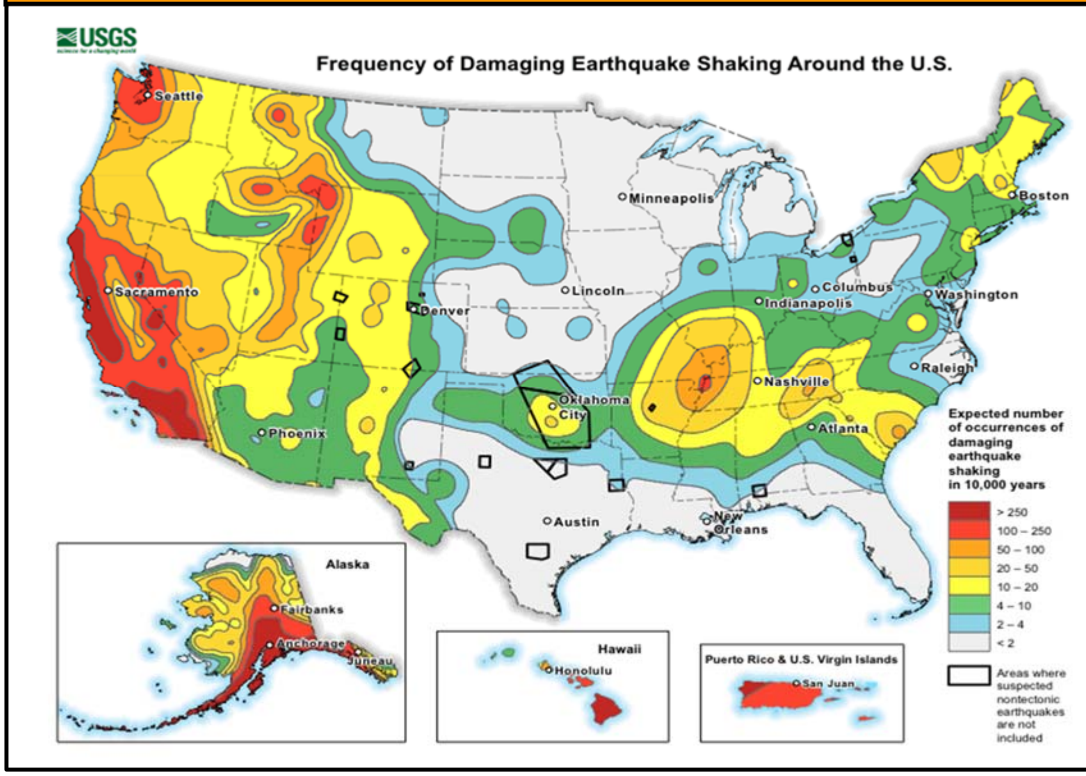
Three of the ten largest earthquakes ever recorded within the continental U.S. took place in 1811 and 1812 along the New Madrid seismic zone. This zone lies within the central Mississippi Valley and extends from northeast Arkansas through southeast Missouri, western Tennessee, western Kentucky, and southern Illinois. These magnitude 7.5 and 7.3 major earthquakes were centered near the town of New Madrid, Missouri and caused widespread devastation to the surrounding region and were felt by people in cities as far away as Pittsburgh, Pennsylvania and Norfolk, Virginia.

The quakes locally changed the course of the Mississippi River creating Reelfoot Lake in northwestern Tennessee. These earthquakes were not an isolated incident. The New Madrid seismic zone is one of the most seismically active areas of the U.S. east of the Rockies. Since 1974 more than 4,000 earthquakes have been recorded within this seismic zone, most of which were too small to be felt.

What locations are affected by earthquakes? What is the extent of future potential earthquakes?

Earthquake events generally affect the entire County. Earthquakes, like drought, impact large areas extending across an entire region and affecting multiple counties. According to the USGS, Mercer County can expect less than 2 occurrences of damaging earthquake shaking over a 10,000-year period. **Figure EQ-6** illustrates the frequency of damaging earthquake shaking around the U.S.

Figure EQ-6
Frequency of Damaging Earthquake Shaking Around the U.S.



Source: U.S. Geological Survey.

What is the probability of future earthquake events occurring based on historical data?

As with flooding, calculating the probability of future earthquakes changes depending on the magnitude of the event. According to the ISGS, Illinois is expected to experience a magnitude 3.0 earthquake every year, a magnitude 4.0 earthquake every four years and a magnitude 5.0 earthquake every 20 years. The likelihood of an earthquake with a magnitude of 6.3 or greater occurring somewhere in the central U.S. within the next 50 years is between 86% and 97%.

While the major earthquakes of 1811 and 1812 do not occur often along the New Madrid fault, they are not isolated events. In recent decades, scientists have collected evidence that earthquakes similar in size and location to those felt in 1811 and 1812 have occurred several times before within the central Mississippi Valley around 1450 A.D., 900 A.D. and 2350 B.C.

The general consensus among scientists is that earthquakes similar to the 1811-1812 earthquakes are expected to recur on average every 500 years. The U.S. Geological Survey and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimates that for a 50-year period the probability of a repeat of the 1811-1812 earthquakes is between 7% and 10% and the probability of an earthquake with a magnitude of 6.0 or larger is between 25% and 40%.

Hazard Vulnerability

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from earthquakes.

Are the participating jurisdictions vulnerable to earthquakes?

Yes. All of Mercer County is vulnerable to earthquakes. The unique geological formations topped with glacial drift soils found in the central U.S. conduct an earthquake's energy farther than in other parts of the Nation. Consequently, earthquakes that originate in the Midwest tend to be felt at greater distances than earthquakes with similar magnitudes that originate on the West Coast.

Earthquake Fast Facts – Risk

Earthquake Risk/Vulnerability:

- Public Health & Safety – Light/Moderate Quake within the County or immediate region: ***Low***
- Public Health & Safety – Strong Quake in the region: ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities – Light/ Moderate Quake within the County or immediate region: ***Low***
- Buildings/Infrastructure/Critical Facilities – Strong Quake in the region: ***Low to Medium***

This vulnerability, found throughout most of Illinois and all of Mercer County, is compounded by relatively high water tables within the region. When earthquake shaking mixes the groundwater and soil, ground support is further weakened thus adding to the potential structural damages experienced by buildings, roads, bridges, electrical lines, and natural gas pipelines.

Extrapolating from the *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency predicts that if a magnitude 6.7 earthquake were to take place anywhere along the New Madrid seismic zone, then the highest projected intensity felt in Mercer County would be a V on the Modified Mercalli Intensity Scale. If a magnitude 8.6 earthquake were to occur, then the highest projected intensity felt would be a VII.

The infrequency of major earthquakes, coupled with relatively low magnitude/intensity of past events, has led the public to perceive that Mercer County is not vulnerable to damaging earthquakes. This perception has allowed the County and participating municipalities to develop largely without regard to earthquake safety.

Have any of the participating jurisdictions identified specific assets vulnerable to the impacts of earthquakes?

No. Based on responses to an Assets Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions consider specific assets within their jurisdictions vulnerable to earthquakes.

What impacts resulted from the recorded earthquake events?

While Mercer County residents felt the earthquakes that have occurred in Illinois, no damages were reported as a result of these events. Given the magnitude of the great earthquakes of 1811 and 1812, it is almost certain that individuals in what is now Mercer County felt those quakes; however, historical records do not indicate the intensity or impacts that these quakes had on the County.

What other impacts can result from earthquakes?

Earthquakes can impact human life, health, and public safety. **Figure EQ-7** details the potential impacts that may be experienced by the County should a magnitude 6.0 or greater earthquake occur in the region.

Figure EQ-7
Potential Earthquake Impacts

Direct	Indirect
Buildings • Temporary displacement of businesses, households, schools, and other critical services where heat, water and power are disrupted • Long-term displacement of businesses, households, schools, and other critical services due to structural damage or fires *Transportation* • Damages to bridges (i.e., cracking of abutments, subsidence of piers/supports, etc.) • Cracks in the pavement of critical roadways • Increased traffic on U.S., and State Routes (especially if the quake originates along the Plum River or Sandwich Fault Zones) as residents move out of the area to seek shelter and medical care and as emergency response, support services and supplies move south to aid in recovery • Misalignment of rail lines due to landslides (most likely near stream crossings), fissures and/or heaving *Utilities* • Downed power and communication lines • Breaks in drinking water and sanitary sewer lines resulting in the temporary loss of service • Disruptions in the supply of natural gas due to cracking and breaking of pipelines *Health* • Injuries/deaths due to falling debris and fires *Other* • Cracks in the earthen dams of the lakes and reservoirs within the County which could lead to dam failures	*Health* • Use of County health facilities (especially if the quake originates along the Plum River or Sandwich Fault Zones) to treat individuals injured closer to the epicenter • Emergency services (ambulance, fire, law enforcement) may be needed to provide aid in areas where damage was greater *Other* • Disruptions in land line telephone service throughout an entire region (i.e., central and southern Illinois) • Depending on the seasonal conditions present, more displacements may be expected as those who may not have enough water and food supplies seek alternate shelter due to temperature extremes that make their current housing uninhabitable

What is the level of vulnerability to public health and safety from earthquakes?

The risk or vulnerability to public health and safety from an earthquake is dependent on the intensity and location of the event. Since there are no known faults in Mercer County, the likelihood that an earthquake will originate in the County is very small, decreasing the changes for catastrophic damages. However, if a light earthquake originates within the County or from the structures in the region, the risk or vulnerability to public health and safety is considered ***low***. This risk is elevated to ***low to medium*** for a strong earthquake originating along seismic zones in the region (i.e., Plum River or Sandwich Fault Zone).

Are existing buildings, infrastructure, and critical facilities vulnerable to earthquakes?

Yes. All existing buildings, infrastructure and critical facilities located in Mercer County and the participating jurisdictions are vulnerable to damage from earthquakes. However, given the County's size (just under 16,000 individuals), its population density, the fact that there are few buildings higher than two stories (with the exception of grain elevators and several multi-story buildings in downtown Aledo) tempered by the low potential for magnitude 5.0 and above earthquakes to occur in the immediate region, the damage is anticipated to be slight with only superficial structure damage such as broken windows and cracks in weak plaster and masonry.

While unlikely, if a strong earthquake (6.0 – 6.9) were to occur in the region, then unreinforced masonry buildings are most at risk during an earthquake because the walls are prone to collapse outward. Steel and wood buildings have more ability to absorb the energy from an earthquake while wood buildings with proper foundation ties have rarely collapsed in earthquakes. In this scenario building damage in Mercer County would range from moderate to considerable for well-built ordinary structures and considerable to severe for poorly-built structures. **Figure EQ-8**, located at the end of this section, identifies the number of unreinforced masonry buildings that serve as critical facilities within the participating jurisdictions.

If the epicenter of a magnitude 7.6 earthquake were to originate anywhere along the New Madrid seismic zone, the highest projected Modified Mercalli intensity felt in Mercer County would be a VI based on extrapolation from the *Projected Earthquake Intensities Map* prepared by the Missouri State Emergency Management Agency. In this scenario building damage in Mercer County would be slight with only superficial structure damage such as broken windows and cracks in weak plaster and masonry.

An earthquake also has the ability to damage infrastructure and critical facilities such as roads and utilities. In the event of a strong earthquake, bridges are expected to experience moderate damage such as cracking in the abutments and subsidence of piers and supports. The structural integrity may be compromised to the degree where safe passage is not possible, resulting in adverse travel times as alternate routes are taken. Some rural families may become isolated where alternate paved routes do not exist. In addition, cracks may form in the pavement of key roadways. **Figure R-5** lists the number of each type of critical infrastructure by jurisdiction.

An earthquake may also down overhead power and communication lines causing power outages and disruptions in communications. Cracks or breaks may form in natural gas pipelines and drinking water and sewage lines resulting in temporary loss of service. In addition, an earthquake could cause cracks to form in the earthen dams located within the County, increasing the likelihood of a dam failure.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on the intensity and location of the event. The risk to buildings, infrastructure and critical facilities is considered to be ***low*** for a light to moderate earthquake that originates within the County or immediate region. This risk is elevated to ***low to medium*** for a strong earthquake originating along seismic zones in the region (i.e., Plum River of Sandwich Fault Zones.)

Are future buildings, infrastructure, and critical facilities vulnerable to earthquakes?

Yes. All future buildings, infrastructure and critical facilities located in Mercer County and the participating jurisdictions are vulnerable to damage from earthquakes. While two of the participating municipalities have building codes in place, these codes do not contain seismic provisions that address structural vulnerability for earthquakes. As a result, there is the potential for future buildings, infrastructure, and critical facilities to face the same vulnerabilities as those of existing buildings, infrastructure, and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from earthquakes?

Since property damage information was either unavailable or none was recorded for the documented earthquakes that impacted Mercer County, there is no way to accurately estimate future potential dollar losses to vulnerable structures. However, according to the Mercer County Clerk the total equalized assessed values of all residential, commercial, and industrial buildings in the planning area is $267,031,982. Since all of the structures in the planning area are susceptible to earthquake impacts to varying degrees, this total represents the countywide property exposure to earthquake events.

Given Mercer County's proximity to geologic structures and fault zones, both large and small, and the fact that all structures within the County are vulnerable to damage, it is likely that there will be future dollar losses from any earthquake ranging from strong to great. As a result, participating jurisdictions were asked to consider mitigation projects that could provide wide ranging benefits for reducing the impacts or damages associated with earthquakes.

Figure EQ-8
Number of Unreinforced Masonry Buildings Serving as Critical Facilities by Jurisdiction

Participating Jurisdiction	Government[1]	Law Enforcement	Fire Stations	Ambulance Service	Schools	Drinking Water	Wastewater Treatment	Medical[2]	Healthcare Facilities[3]
Mercer County	---	---	---	---	---	---	---	1	---
Aledo	1	---	---	---	---	---	---	---	---
Joy	---	---	1	---	---	---	---	---	---
Keithsburg	---	---	---	---	---	---	---	---	---
Matherville	1	---	---	---	---	1	1	---	---
Sherrard	---	---	1	---	2	---	---	---	---
Abington Township	1	---	---	---	---	---	---	---	---
Preemption Township	1	---	---	---	---	---	---	---	---
Sherrard CUSD #200	---	---	---	---	2	---	---	---	---
Aledo FPD	1	---	---	---	---	---	---	---	---
Greene Township FPD	1	---	---	---	---	---	---	---	---
Sherrard Community FPD	---	---	1	---	2	---	---	---	---
Genesis Medical Center	---	---	---	---	---	---	---	---	---
Bay Island D&LD	1	---	---	---	---	---	---	---	---

1 Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, etc.
2 Medical includes: public health departments, hospitals, urgent/prompt care, and medical clinics.
3 Healthcare Facilities include: nursing homes, skilled care facilities, memory care facilities, residential group homes, etc.
--- Indicates jurisdiction does not own/maintain any critical facilities within that category.

3.9 LEVEE FAILURES

HAZARD IDENTIFICATION

What is the definition of a levee?

The U.S. Army Corps of Engineers (USACE or the Corps) defines a "levee" as an earthen embankment, floodwall or structure along a water course whose purpose is flood risk reduction or water conveyance while the National Flood Insurance Program defines a "levee" as a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control or divert the flow of water so as to provide protection from temporary flooding. Levees are typically not designed to hold back water for extended periods of time, rather they are meant to provide temporary flood protection from seasonal high water, precipitation and other weather events. While levees reduce the risk from a flooding event, they do not eliminate it. There is always the chance a flood will exceed the capacity of a levee, no matter how well it is built.

In Illinois, the Mississippi and Illinois River valleys were largely transformed from permanent, seasonal wetlands to highly productive agricultural lands by the construction of levees and the organization of drainage districts between 1879 and 1916.

What is the definition of a levee breach?

A levee breach is a rupture, break or gap in a levee which causes previously contained water to flood the land behind the levee. If the levee breach is identified as a "failure breach" then the cause of the breach is known and occurred without overtopping. In order for a breach to be termed a failure breach, an investigation is usually required to determine the cause.

What is the definition of overtopping?

Overtopping occurs when the water levels contained by the levee exceed the levee's crest elevation and flood the land behind the levee. The flooding occurs from overflow/overwash (waves) and other sources. In most cases overtopping may damage the levee but not compromise it. If the levee is compromised because of overtopping, then it is identified as an "overtopping breach."

What causes a levee breach?

Levee breaches can result from one or more of the following:

- ***erosion of the crown and land-side face of the levee*** caused by overtopping (the higher the velocity of flow over the levee, the more quickly that erosion will occur and cause a failure of the levee);
- ***sand boils and piping*** resulting from the relatively fast passage of flood waters through permeable materials under the base of the levee to the land behind the levee (depending on the amount of sand and soil transported by the waters from the base to the surface, the levee may settle unevenly, crack or even completely fail);
- ***seepage and saturation*** (prolonged exposure to water will cause levee materials to become saturated, leading to seepage and sloughing of the soil on land-side face of the levee and resulting in the loss of slope stability and ultimately failure of the levee);

- ***erosion of the river-side slope of the levee*** as a result of wave action caused by wind and/or commercial or recreational vessels over a long period of time (most Illinois levees are constructed of sand and alluvial materials, both of which are among the easiest materials to erode);
- ***structural failures*** at gates, walls or closure structures;
- ***improper maintenance*** (including failure to maintain gates, walls or closure structures; remove trees; fill in holes created by burrowing animals, etc.); and
- ***earthquakes*** which can cause loss of soil strength and destabilize the levee and foundation materials.

Who is responsible for regulating levees?

This is no single agency with responsibility for levee oversight nationwide. The USACE has specific and limited authorities for approximately 2,000 levees across the country, totaling 14,000 miles. While the Corps serves as one of the nation's largest infrastructure stewards, the misperception exists that the USACE has universal responsibility for the nation's levees. There are three different classifications of levees:

- ***Federally Authorized Levees***. A levee typically designed and built by the Corps in cooperation with a local sponsor, then turned over to the local sponsor (i.e., drainage district) to operate, maintain, repair and replace the levee.
- ***Non-Federally Authorized Levees***. A levee designed and built by a non-federal agency, which is responsible for the operation, maintenance, repair and replacement of the levee.
- ***Private or Corporate-Owned Levees***. A levee designed and built by a private citizen, company or other public entity, which is responsible for the operation, maintenance, repair and replacement of the levee. The Corps has no responsibility for this type of levee.

What is a drainage district?

A drainage district is a local unit of government formed by area landowners to "…construct, maintain or repair drains or levees or to engage in other drainage or levee work for agricultural, sanitary or mining purposes" (70 ILCS 605/3-1). Drainage districts may be organized by petition or referendum and are approved by the circuit court of the county in which the greater part of the district lies.

Each district is usually governed by three drainage commissioners, although there are districts in Illinois that have as many as five drainage commissioners. The drainage commissioners may be any adult who resides in Illinois and owns land within the district's boundaries. Commissioners are either appointed by the county or elected.

Drainage districts are funded through assessments. Each benefited landowner in a district is assessed a fee for the maintenance and upkeep of the district. Under the Illinois Drainage Code, a district which is organized to maintain levees shall include the term "drainage and levee district" in its name.

HAZARD PROFILE

The following details the levee systems located in the County; identifies the location of these levee systems; details past occurrences of levee failures; describes the severity or extent of future potential failures (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Are there levee systems located in the County?

Yes. According to the USACE National Levee Database there are two levee systems located in Mercer County. **Figure LF-1** provides information about each levee system.

Levee Breach Fast Facts – Occurrences

Total Number of Levee Systems Located in the County: ***2***

Number of Levee Breaches Reported: ***2***

When have levee failures occurred previously? What is the extent of these previous failures?

Table 12, located in **Appendix I**, summarize the previous occurrences as well as the extent or magnitude of levee failures recorded in Mercer County. NOAA's Storm Events Database, the National Levee Database, and news media articles were used to document two reported occurrences of levee failures in Mercer County between 1993 and 2022.

Of the two events, one took place in June and one in July making this the peak period for levee failures in Mercer County.

What is the extent of future potential levee failures?

Emergency Action Plans (EAPs)/Emergency Preparedness Plans (EPPs) defining the extent or magnitude of future potential levee breaches (water depth, speed of onset and warning times) have not been developed or were not made available to the Mercer County Office of Emergency Management for any of the levee systems. As a result, a data deficiency exists in terms of defining the extent or magnitude of the inundation areas associated future potential levee breaches.

What locations are potentially affected by levee failures?

Levee failures have the potential to affect Keithsburg and unincorporated areas of Mercer County. **Figures LF-2** and **LF-3** identify the locations potentially impacted by levee failures.

What is the probability of future levee failure occurring based on historical data?

There are several factors that must be considered when calculating the probability of future levee failures including whether a breach has occurred previously, the age and current conditions of the levee, whether proper maintenance is ongoing and the magnitude of the event. It is difficult to specifically establish the probability of future levee breaches associated with the Bay Island Drainage and Levee District (D&LD) No. 1 and Subdistrict No. 1 of Drainage Union No. 1 given it has never experienced a breach; however, based on the data available, the likelihood that it may experience a failure in any given year is estimated to be less than 5%.

Figure LF-1
Levee Systems Located in Mercer County

Levee System Name	Levee Category	Year Organized	# of Levee Segments	Length of Levee (miles)	Total Land Protected (acres)	Approx. Land Protected in Mercer County (acres)	Inspection Rating	PL 84-99 Status
Bay Island Drainage & Levee District (D&LD) No. 1 & Subdistrict No. 1 of Drainage Union No. 1[a]	Federal; portion Non-Federal	1921	2	50.1	24,992	22,035	Minimally Acceptable	Active
Keithsburg Levee	Non-Federal	1966	1	1.15	83	83	Non-Accredited	Non-Accredited

[a] The District extends between Mercer and Rock Island Counties

The Keithsburg Levee has experienced two failures between 1993 and 2022. With two levee failures over the past 30 years, the probability or likelihood it may experience a failure in any given year is estimated to be between 5% and 10%.

According to the USACE National Levee Database, the Subdistrict No. 1 of Drainage Union No. 1 segment has a Levee Safety Action Classification (LSAC) of "Low" (likelihood of inundation due to breach and/or system component malfunction in combination with loss of life, economic, or environmental consequences results in low risk). The Bay Island D&LD No. 1 segment and the Keithsburg Levee have not been screed for a Levee Safety Action Classification.

What is the probability of future levee failure occurring based on modeled future conditions?

Levee failures are caused by a combination of multiple factors, including construction practices, soil permeability and conditions, wave erosion from passing watercrafts, precipitation, and most importantly maintenance. Although there are not yet studies exploring the possible relationship between levee failures and trends in temperature and precipitation changes in the U.S., it can be reasonably inferred that increases in heavy rain events could potentially increase the probability of levee failures.

Since future condition forecasts suggest an increase in total annual precipitation in Illinois as discussed in Section 3.2, it is possible that one of the factors that contributes to levee failures will become more frequent. It is impossible to say how much of an impact, if any, this will have on any given levee, but this increased level of uncertainty should be taken into account in planning for the future. This analysis should be revisited in subsequent planning efforts as more data becomes available.

Figure LF-2
Mercer County Levee Systems Boundary Map

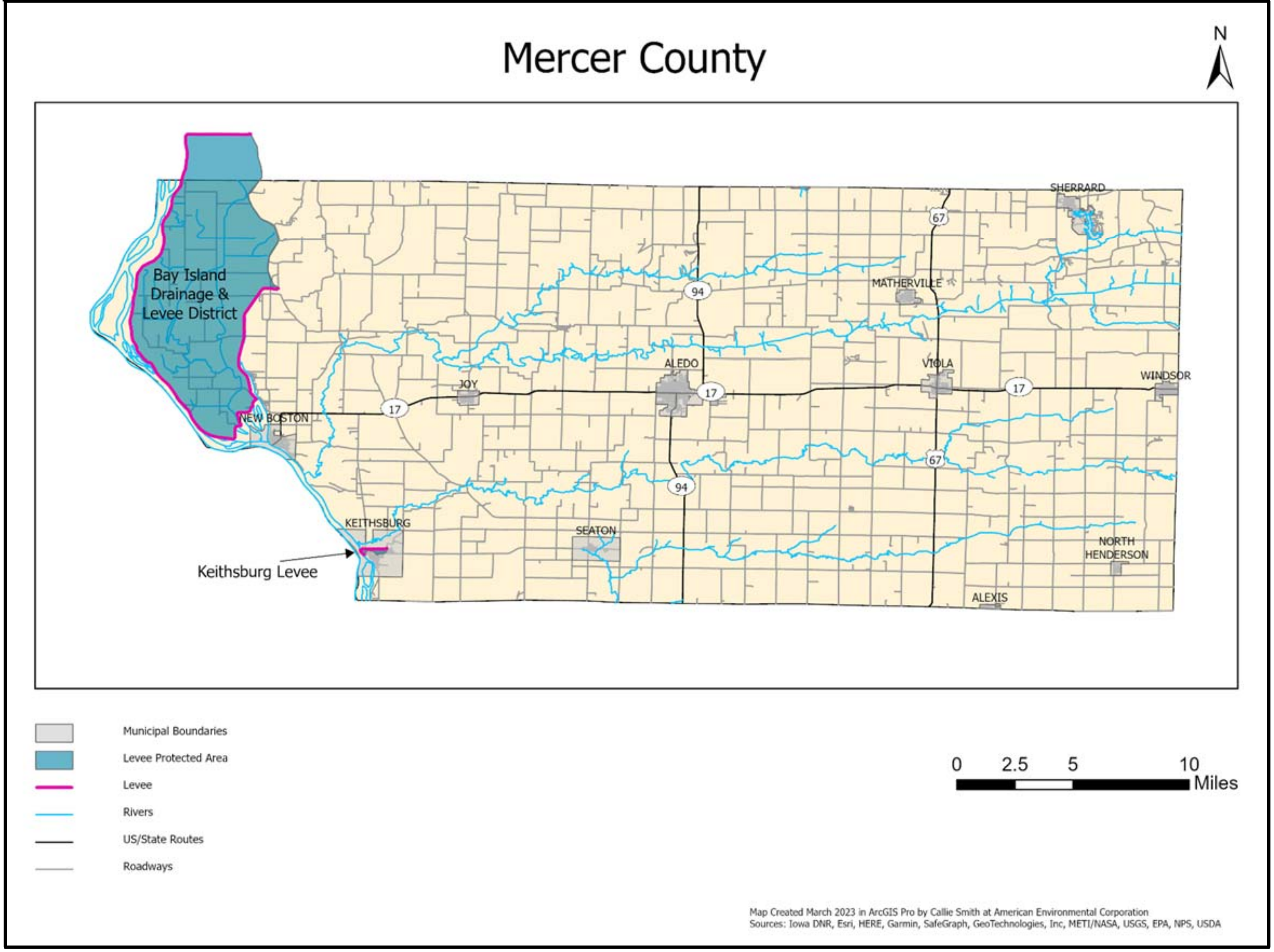
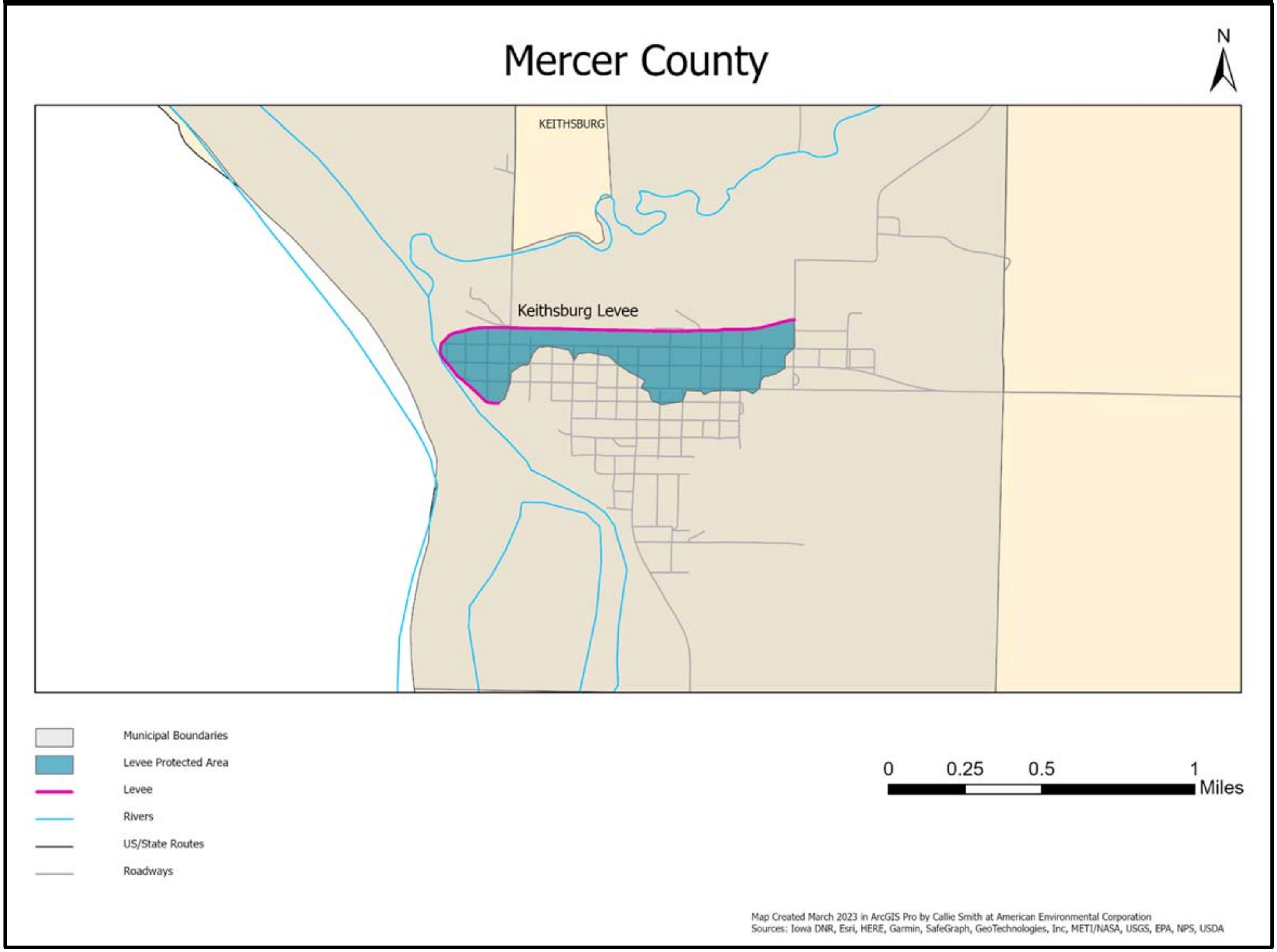


Figure LF-3
Keithsburg Levee System Boundary Map



HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure and critical facilities from levee failures.

Are the participating jurisdictions vulnerable to levee failures?

Yes. Portions of Keithsburg and unincorporated Mercer County are vulnerable to the dangers presented by levee failures. None of the other participating municipalities or the remainder of the County are considered vulnerable.

Levee Failure Fast Facts – Risk

Levee Failure Impacts:
- ❖ Total Property Damage (1 event): ***$250,000***
- ❖ Total Crop Damage: ***n/a***
- ❖ Injuries: ***n/a***
- ❖ Fatalities: ***n/a***

Levee Failure Risk/Vulnerability:
- ❖ Public Health & Safety: ***Low to Medium***
- ❖ Buildings/Infrastructure/Critical Facilities:– ***Low to Medium***

Have any of the participating jurisdictions identified specific assets vulnerable to the impacts of levee failures?

Yes. Based on responses to an Assets Vulnerability Survey distributed to the participating jurisdictions, the following jurisdictions considered specific assets within their jurisdiction vulnerable to levee failures.

Bay Island Drainage & Levee District:
- ❖ A levee breach or overtopping event would affect navigation on the Mississippi River.
- ❖ If an overtopping event were to occur, road closures would occur, including at Copperas Creek bridge (located on 45th St. in Mercer County which turns into 322nd St. in Rock Island County) impacting travel of emergency responders.

Keithsburg:
Flooding of Pope Creek has led to levee failures in the past, impacting homes and businesses. Following the levee failures of 1993 and 2008 the levee has been made more secure.

What impacts resulted from the recorded levee breaches?

Data obtained from NOAA's Storm Events Database indicates that between 1993 and 2022, one of the eight levee failures caused $500,000 in property damages. one of the two levee failures caused $250,000 in property damages. Property damage information was either unavailable or none was recorded for the other reported occurrence. No injuries or fatalities were reported for any of the levee failures.

What other impacts can result from levee breaches?

Aside from causing damage to buildings, infrastructure and critical facilities, floodwaters released due to a levee breach also pose biological and chemical risks to public health. Flooding can force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew which can pose a health hazard, especially for small children, the elderly and those with specific allergies. Flooding also has the potential to contaminate drinking water sources used for both human and livestock consumption.

Flooding resulting from a levee breach can also cause chemical contaminants such as gasoline and oil to enter the floodwaters if underground storage tanks or pipelines crack and begin leaking during an event. Depending on the time of year, floodwaters also may carry away agricultural chemicals that have been applied to farm fields.

What is the level of vulnerability to public health and safety from levee breaches?

In terms of the risk or vulnerability to public health and safety from a levee failure, there are several factors that must be taken into consideration including the magnitude or severity of the precipitating event (whether an earthquake or flooding); the extent and type of development and infrastructure protected by the levee; the amount of time available to enact emergency measures such as evacuations; and USACE's Risk Classification Rating. **Figure LF-4** identifies the number of individuals vulnerable to a levee failure by levee system, the USACE's Levee Safety Action Classification (LSAC) Risk Rating assigned to each levee system and the assessment date, if available. The USACE's Risk Classification Rating has five classes: Very Low, Low, Moderate, High and Very High.

Figure LF-4
Number of Individuals Vulnerable to a Levee Breach

Levee System Name	Total Number of Individuals Protected by Levee	Estimated Number of Individuals Protected by Levee in Mercer County[†]	USACE LSAC Risk Rating	Risk Rating Assessment Date
Bay Island D&LD No. 1 & Subdistrict No. 1 of Drainage Union No. 1[a]	78	50	Not Screened Low	--- 07/15/2016
Keithsburg Levee	93	93	Not Screened	---

[a] District extends between Mercer and Rock Island Counties
[†]A visual inspection was conducted by the Consultant. The estimated number of individuals protected by the levee in Mercer County was extrapolated using the houses identified in the adjoining County multiplied by the U.S. Census Bureau's Persons Per Household 2017-2021 average and subtracted from the total number of individuals protected by the levee.
Source: US Army Corps of Engineers, National Levee Database.

When all these factors are taken into consideration, the overall risk to public health and safety posed by a levee failure from the levees in Mercer County is considered to be ***low*** to ***medium*** for the Keithsburg and ***low*** for the Bay Island Drainage and Levee District (D&LD) No. 1 and Subdistrict No. 1 of Drainage Union No. 1. The Keithsburg Levee protects homes and, businesses as well as their workers.

Are existing buildings, infrastructure and critical facilities vulnerable to levee breaches?

Yes. Buildings, infrastructure and critical facilities located within the leveed areas are vulnerable to levee failures. **Figure LF-5**, located at the end of this section, identifies infrastructure and critical facilities vulnerable to a levee failure by participating jurisdiction while **Figure LF-6** identifies the number of existing structures vulnerable to a levee failure by levee system, the total estimated property value of the vulnerable structures and the participating jurisdiction the structures are located within. These counts were acquired from the USACE's National Levee Database. The estimated property value is a sum of the structure value, structure contents and vehicles in the leveed area. The value does not include economic productivity loss, transportation infrastructure values (i.e., bridges, runways, roads) or land value.

Figure LF-6
Number of Existing Structures Vulnerable to a Levee Failure

Levee System Name	Total Number of Vulnerable Structures	Estimated Number of Vulnerable Structures in Mercer County[†]	Total Estimated Property Value of Vulnerable Structures	Estimated Value of Vulnerable Structures in Mercer County	Structure Locations in Mercer County
Bay Island D&LD No. 1 & Subdistrict No. 1 of Drainage Union No. 1[a]	148	94	$22,100,000	$14,036,500	Unincorp. Mercer County (Eliza and New Boston Townships)
Keithsburg Levee	33	33	$8,400,000	$8,400,000	Keithsburg

[a] District extends between Mercer and Rock Island Counties
[†]A visual inspection was conducted by the Consultant. The estimated number of structures protected by the levee in Mercer County was determined by counting the structures identified in the adjoining County and subtracting this number from the total number of structures protected by the levee.
Source: US Army Corps. of Engineers, National Levee Database.

Depending on the magnitude of the breach, all of the vulnerable buildings, infrastructure and critical facilities may be inundated by water and structural and content damage may result. In addition to impacting structures, a levee failure can damage roads and utilities. Roadways and culverts can be weakened by levee failure floodwaters and may collapse under the weight of a vehicle. Power and communication lines, both above and below ground, are also vulnerable to levee failure flooding. Depending on their location and the velocity of the water as it escapes the levee, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the magnitude or severity of the precipitating event (whether an earthquake, general flood or flash flood), the extent and type of development and infrastructure protected by the levee, the amount of time available to implement emergency measures such as sandbagging, and the USACE's Risk Classification Rating.

When all these factors are taken into consideration, the overall risk to existing buildings, infrastructure and critical facilities posed by a levee failure is considered to be ***medium*** for the Keithsburg Levee and ***low*** for the Bay Island Drainage and Levee District (D&LD) No. 1 and Subdistrict No. 1 of Drainage Union No. 1. The Keithsburg Levee protects critical infrastructure, such as the post office, as well as homes and businesses.

Are future buildings, infrastructure and critical facilities vulnerable to levee breaches?

Yes. Any future buildings, infrastructure and critical facilities located within the studied leveed systems of significance are vulnerable to damage from a levee breach. As a result, future buildings, infrastructure and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from levee breaches?

Unlike other hazards, there are no standard loss estimation models or methodologies for levee failures. With only one recorded event listing property damage numbers for levee failures, there is no way to reasonably estimate future potential dollar losses. However, according to the National Levee Database, the total estimated property value of vulnerable structures in the leveed areas in Mercer County is $22.4 million. Since all of the structures in the leveed areas are susceptible to levee failure impacts to varying degrees, this total represents the maximum property exposure to levee failures.

Figure LF-5
Critical Facilities/Infrastructure Vulnerable to a Levee Breach by Jurisdiction in Mercer County

Participating Jurisdiction	Government[1]	Law Enforcement	Fire Stations	Ambulance Service	Schools	Drinking Water	Wastewater Treatment	Medical[2]	Healthcare Facilities[3]
Mercer County	---	---	---	---	---	---	---	---	---
Keithsburg	1	---	---	---	---	---	---	---	---
Bay Island D&LD	3	---	---	---	---	---	---	---	---

[1] Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, pump stations, etc.
[2] Medical includes: public health departments, hospitals, urgent/prompt care and medical clinics.
[3] Healthcare Facilities include: nursing homes, skilled care facilities, memory care facilities, residential group homes, etc.

3.10 DAM FAILURES

HAZARD IDENTIFICATION

What is the definition of a dam?

A dam is an artificial barrier constructed across a stream channel or a man-made basin for the purpose of storing, controlling or diverting water. Dams typically are constructed of earth, rock, concrete or mine tailings. The area directly behind the dam where water is impounded or stored is referred to as a reservoir.

According to the U.S. Army Corps of Engineers' National Inventory of Dams (NID), there are approximately 91,785 dams in the U.S. and Puerto Rico, with 1,639 dams located in Illinois. (The NID is maintained by the U.S. Army Corps of Engineers and is updated approximately every two years.) Of the 1,639 dams in Illinois, approximately 93.5% are constructed of earth.

What is the definition of a dam failure?

A dam failure is the partial or total collapse, breach or other failure of a dam that causes flooding downstream. In the event of a dam failure, the people, property and infrastructure downstream could be subject to devastating damages. The potential severity of a full or partial dam failure is influenced by two factors:

- the capacity of the reservoir and
- the density, type and value of development/infrastructure located downstream.

There are two categories of dam failures, "flood" or "rainy day" failures and "sunny day" failures. A "flood" or "rainy day" failure usually results when excess precipitation and runoff cause overtopping or a buildup of pressure behind a dam which leads to a breach. Even normal storm events can lead to "flood" failures if debris plugs the water outlets. Given the conditions that lead to a "flood" failure (i.e., rainfall over a period of hours or days), there is usually a sufficient amount of time to warn and evacuate residents downstream.

Unlike a "flood" failure, there is generally no warning associated with a "sunny day" failure. A "sunny day" failure is usually the result of improper or poor dam maintenance, internal erosion, vandalism or an earthquake. This unexpected failure can be catastrophic because it may not allow enough time to warn and evacuate residents downstream.

No one knows precisely how many dam failures have occurred in the U.S.; however, it's estimated that hundreds have taken place over the last century. Some of the worst failures have caused catastrophic property and environmental damage and have taken hundreds of lives. The worst dam failure in the last 50 years occurred on February 26, 1972 in Buffalo Creek, West Virginia. A tailings dam owned by the Buffalo Mining Company failed, taking 125 lives, injuring 1,100 individuals, destroying approximately 550 homes and causing property damage in excess of $50 million (approximately $298.6 million in 2017 based on the Bureau of Labor Statistics Consumer Price Index Inflation Calculator.)

Dam failures have been documented in every state, including Illinois. According to the Dam Incident Database compiled by the National Performance of Dams Program, there have been 10 reported dam failures with uncontrolled releases of the reservoir in Illinois since 1950.

What causes a dam failure?

Dam failures can result from one or more of the following:

- ***prolonged periods of rainfall and flooding*** (the cause of most failures);
- ***inadequate spillway capacity*** resulting in excess flow overtopping the dam;
- ***internal erosion*** caused by embankment or foundation leakage;
- ***improper maintenance*** (including failure to remove trees, repair internal seepage problems, maintain gates, valves and other operational components, etc.);
- ***improper design*** (including use of improper construction materials and practices);
- ***negligent operation*** (including failure to remove or open gates or valves during high flow periods);
- ***failure of an upstream dam on the same waterway***;
- ***landslides into reservoirs*** which cause surges that result in overtopping of the dam;
- ***high winds*** which can cause significant wave action and result in substantial erosion; and
- ***earthquakes*** which can cause longitudinal cracks at the tops of embankments that can weaken entire structures.

How are dams classified?

Each dam listed on the National Inventory of Dams is assigned a hazard potential classification rating per the "Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams." The classification system is based on the potential for loss of life and damage to property in the event of a dam failure. There are three classifications: High, Significant and Low. **Figure DF-1** provides a brief description of each hazard potential classification. It is important to note that the hazard potential classification assigned is not an indicator of the adequacy of the dam or its physical integrity and in no way reflects the current condition of the dam.

Figure DF-1
Dam Hazard Classification System

Hazard Potential Classification	Description
High	Those dams where failure or mis-operation result in probable loss of human life, regardless of the magnitude of other losses. The probable loss of human life is defined to signify one or more lives lost.
Significant	Those dams where failure or mis-operation result in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities or can impact other concerns. Significant hazard potential classification dams are often located in predominately rural or agricultural areas but could be located in areas with population and significant infrastructure.
Low	Those dams where failure or mis-operation results in no probable loss of human life and low economic and/or or environmental losses. Losses are principally limited to the dam owner's property.

Sources: Federal Emergency Management Agency
U.S. Army Corps of Engineers

HAZARD PROFILE

According to the USACE National Inventory of Dams, there are 14 classified dams located in Mercer County. Of those 14 dams, five have a hazard potential classification of "Significant" and the remaining nine dams have a hazard potential classification of "Low". These dams do not have reservoirs with immense storage capacities and are not located in densely populated areas. Due to the limited impacts on the population, land use and infrastructure associated with a majority of the classified dams, only those dams that have a "Significant" hazard potential classification will be analyzed as part of this Plan update.

The following details the location of the "Significant" hazard classified dams, identifies past occurrences of dam failures, details the severity or extent of future potential failures (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

Dam Failure Fast Facts – Occurrences

Number of "Significant" Hazard Classified Dams Located in the County: ***5***

Number of "Significant" Hazard Dams owned by Participating Jurisdictions: ***1***

Number of Dam Failures Reported: ***None***

Probability of Future Dam Failure Events: ***Low***

Do any of the participating jurisdictions own "Significant" hazard classified dams?

Yes. The Village of Matherville owns the Matherville Lagoons Dam. **Figure DF-2** provides a brief description of this dam.

Are there any other publicly or privately-owned "Significant" hazard dams within the County?

Yes. There is one publicly-owned and three privately-owned "Significant" hazard classified dams in Mercer County. **Figure DF-2** provides a brief description of these dams.

When have dam failures occurred previously? What is the extent of these previous dam failures?

According to data from Stanford University's National Performance of Dams Incident Database and discussions with Committee members, there are no known recorded dam failures associated with the classified dam in Mercer County.

What is the extent of future potential dam failures?

An Emergency Action Plan (EAP) defining the extent or magnitude of a potential dam failure (water depth, area of impact) were developed for four of the five "Significant" hazard classified dams in Mercer County. An EAP has not been developed for the Morrison Lake Dam. None of the EAPs were made available to the Mercer County Office of Emergency Management (OEM). As a result, a data deficiency exists in terms of estimating inundation times for various distances downstream.

Figure DF-2
"Significant" Hazard Classified Dams Located in Mercer County

Dam Name	Hazard Classification	Associated Waterway	Owner	Type	Primary Purpose	Completion Year	Height (feet)	Length (feet)	Maximum Storage (acre-feet)	Impoundment Surface Area (acres)	Drainage Area (square miles)	Emergency Action Plan
Publicly-Owned												
Matherville Lagoons Dam	Significant	Edwards River	Village of Matherville	Earth	Other	n/a	9	n/a	120	n/a	n/a	Yes
Mississippi River Lock & Dam 17	Significant	Mississippi River	USACE	Concrete	Navigation	1939	0	3,510	50,000	8,312	99,600	Yes
Privately-Owned												
Fyre Lake Dam	Significant	Tributary of Camp Creek	Fyre Lake Property Owners Assn.	Earth	Recreation	1972	53	1,085	3,950	155	1.7	Yes
Karl Lake Dam	Significant	Tributary of Camp Creek	Fyre Lake Property Owners Assn.	Earth	Recreation	1974	50	800	550	26	0.3	Yes
Morrison Lake Dam	Significant	Tributary of Edwards River	Richard Morrison	Earth	Recreation	1965	33	256	125	n/a	n/a	No

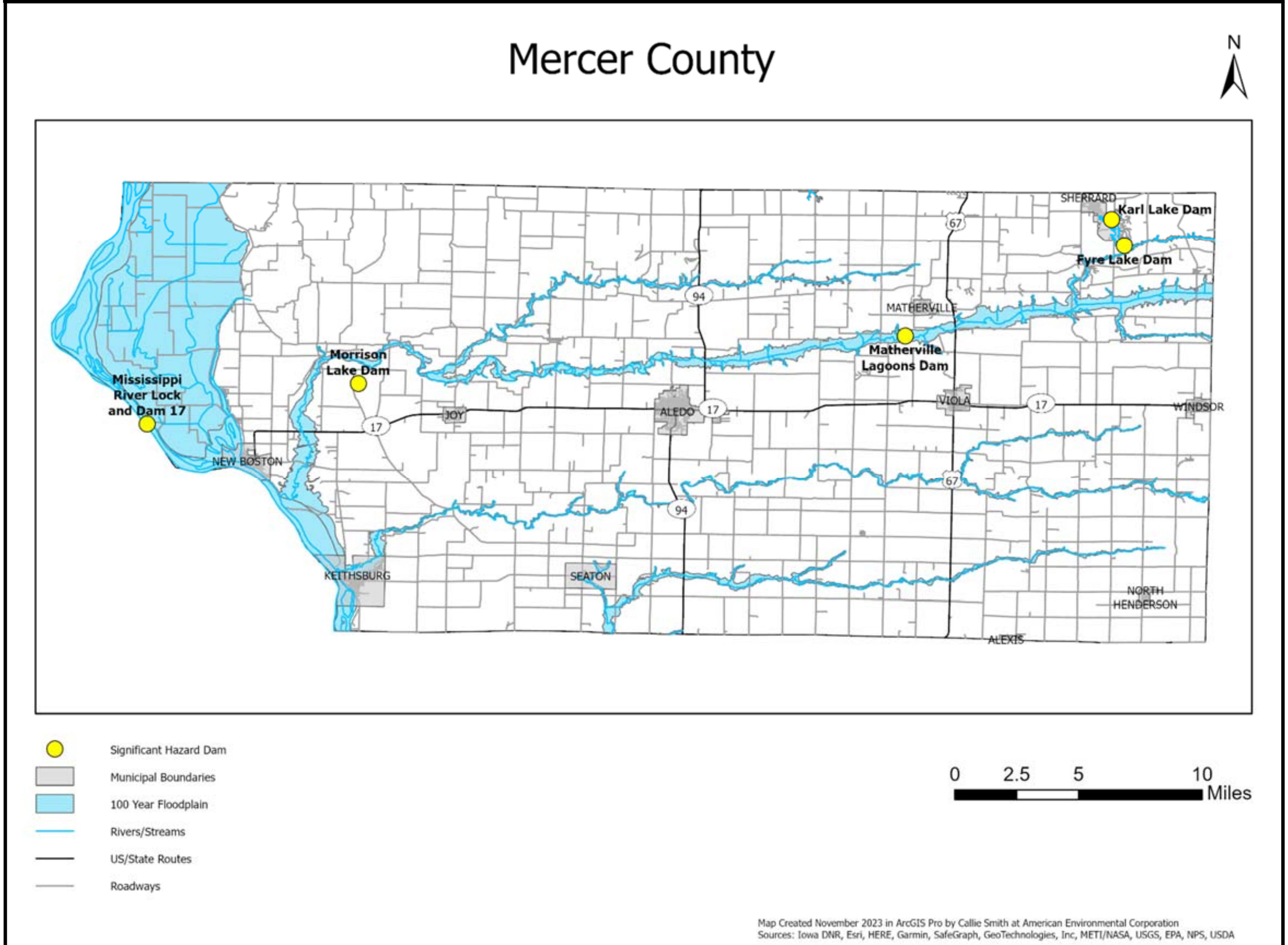
Sources: Stanford University, National Performance of Dams Program, NPDP Dams Database.
U.S. Army Corps of Engineers, National Inventory of Dams Interactive Report.

What locations are affected by dam failure?

Figure DF-3 shows the locations of the "Significant" hazard classified dams in Mercer County. Dam failures have the potential to impact the following areas:

- ❖ open space with some residential land along Fyre Lake in Sherrard;
- ❖ agricultural and wooded land along Camp Creek southeast of Sherrard in unincorporated Mercer County;
- ❖ agricultural and wooded land along Edwards River southwest of Matherville in unincorporated Mercer County;
- ❖ agricultural and wooded land northwest of Joy in unincorporated Mercer County (south of Bluff Road & CR 10);
- ❖ agricultural and wooded land along the Mississippi River north of New Boston in unincorporated Mercer County.

Figure DF-3
Location of "Significant" Hazard Classified Dams in Mercer County



What is the probability of future dam failure events occurring?

Since none of the dams have experienced a dam failure, it is difficult to specifically establish the probability of a future failure. However, based on the capacity of the reservoirs and the scope and type of development and infrastructure located downstream, the probability is estimated to be ***low***. For the purposes of this analysis "low" is defined as having a less than 10% chance of occurring in any given year.

What is the probability of future dam failure events occurring based on modeled future conditions?

Dam failures are caused by a combination of multiple factors, including construction practices, soil permeability and conditions, wave erosion, precipitation, and most importantly maintenance. Although there are not yet sufficient studies exploring the possible relationship between dam failures and trends in temperature and precipitation changes in the U.S., it can be reasonably inferred that increases in heavy rain events could potentially increase the probability of dam failures. Since future condition forecasts suggest an increase in total annual precipitation in Illinois as discussed in Section 3.2, it is possible that one of the factors that contributes to dam failures will become more frequent. It is impossible to say how much of an impact, if any, this will have on any given dam, but this increased level of uncertainty should be taken into account in planning for the future. This analysis should be revisited in subsequent planning efforts as more data becomes available.

HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from dam failures.

Are the participating jurisdictions vulnerable to dam failures?

Yes. Portions of Sherrard around Fyre Lake, Preemption Township, Sherrard Community FPD, Greene Township FPD, and unincorporated areas of Mercer County are vulnerable to the dangers presented by dam failures. While these areas are vulnerable, most residents would not be impacted by a dam failure. None of the rest of the participating jurisdictions or the remainder of the County are considered vulnerable.

Have any of the participating jurisdictions identified specific assets vulnerable to the impacts of dam failures?

Yes. Based on responses to an Assets Vulnerability Survey distributed to the participating jurisdictions, Matherville considers the Matherville Lagoons Dam vulnerable to failure from flooding along the Edwards River.

What impacts resulted from the recorded dam failures?

Since there have been no *recorded* dam failures associated with the classified dams in Mercer County, there are no recorded impacts to report.

What other impacts can result from dam failures?

The impacts from a dam failure are similar to those of a flood. There is the potential for injuries, loss of life, property damage, and crop damage. Depending on the type of dam failure, there may be little, if any warning that an event is about to occur, similar to flash flooding. As a result, one of the primary threats to individuals is from drowning. Motorists who choose to drive over flooded roadways run the risk of having their vehicles swept off the road and downstream. Flooding of roadways is also a major concern for emergency response personnel who would have to find alternative routes around any section of road that becomes flooded due to a dam failure.

Dam Failure Fast Facts – Risk

Dam Failure Risk/Vulnerability:

- Public Health & Safety: "Significant" – ***Low to Medium***
- Public Health & Safety: "Low" Hazard Classification Dams – ***Low***
- Buildings/Infrastructure/Critical Facilities: "Significant" Hazard Classification Dams – ***Low to Medium***
- Buildings/Infrastructure/Critical Facilities: "Low" Hazard Classification Dams – ***Low***

In addition to concerns about injuries and death, the water released by a dam failure poses the same biological and chemical risks to public health as floodwaters. The flooding that results from a dam failure has the potential to force untreated sewage to mix with floodwaters. The polluted floodwaters then transport the biological contaminants into buildings and basements and onto roads and public areas. If left untreated, the floodwaters can serve as breeding grounds for bacteria and other disease-causing agents. Even if floodwaters are not contaminated with biological material, basements and buildings that are not properly cleaned can grow mold and mildew, which can pose a health hazard, especially for small children, the elderly, and those with specific allergies.

Flooding from dam failures also can cause chemical contaminants such as gasoline and oil to enter floodwaters if underground storage tanks or pipelines crack and begin leaking during a dam failure event. Depending on the time of year, the water released by a dam failure also may carry away agricultural chemicals that have been applied to farm fields and cause damage to or loss of crops.

What is the level of vulnerability to public health and safety from dam failures?

In terms of the risk or vulnerability to public health and safety from a dam failure, there are several factors that must be taken into consideration including the severity of the event, the capacity of the reservoir and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk to public health and safety posed by a dam failure at Fyre Lake Dam and Karl Lake Dam is considered to be ***low to medium*** while the overall risk to public health and safety posed by a dam failure at the remaining three "Significant" hazard classified dams is considered to be ***low.***

Are existing buildings, infrastructure, and critical facilities vulnerable to dam failures?

Yes. **Figure DF-4**, located at the end of this section, provides a ***rough estimate*** of the buildings, infrastructure, and critical facilities vulnerable to a dam failure from "Significant" hazard classified dams in Mercer County.

As discussed previously, the EAPs were either not provided to the Mercer County OEM or were not developed for the five "Significant" hazard classified dams in Mercer County. As a result, a data deficiency exists in terms of comprehensively identifying existing buildings, infrastructure, and critical facilities vulnerable to dam failures for these dams. While detailed information was not available, the Consultant conducted a visual inspection of the areas surrounding the "Significant" hazard classified dams in order to provide an estimate of the number of potentially-impacted buildings, infrastructure, and critical facilities that are vulnerable to a dam failure.

Depending on whether there is a full or partial dam failure, all of the vulnerable buildings, infrastructure, and critical facilities may be inundated by water and structural damage may result. Because none of the reservoirs are immense in size, the damage sustained from dam failure flooding may not be to the structure, but to the contents of the buildings or nearby infrastructure and critical facilities.

In addition to impacting structures, a dam failure can damage roads and utilities. Roadways, culverts, and bridges can be weakened by dam failure floodwaters and may collapse under the weight of a vehicle. Power and communication lines, both above and below ground, are also vulnerable to dam failure flooding. Depending on their location and the velocity of the water as it escapes the dam, power poles may be snapped causing disruptions to power and communication. Water may also get into any buried lines causing damage and disruptions.

As with public health and safety, the risk or vulnerability to buildings, infrastructure, and critical facilities is dependent on several factors including the severity of the event, the capacity of the reservoir, and the extent and type of development and infrastructure located downstream. When these factors are taken into consideration, the overall risk to existing buildings, infrastructure, and critical facilities posed by a dam failure in Mercer County is considered to be ***low to medium*** for Karl Lake Dam and ***low*** for the remaining four "Significant" hazard classified dams.

Are future buildings, infrastructure, and critical facilities vulnerable to dam failures?

Yes. Any future buildings, infrastructure, and critical facilities located within the flood path of a classified dam are vulnerable to damage from a dam failure. As a result, future buildings, infrastructure, and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure, and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from dam failures?

Unlike other hazards, there are no standard loss estimation models or methodologies for dam failures. Given that there have been no recorded dam failures in Mercer County, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from a dam failure.

Figure DF-4
Buildings, Infrastructure & Critical Facilities Vulnerable to a Dam Failure from "Significant" Hazard Classified Dams

Dam Name	Locations Affected	Number of Vulnerable Buildings/Infrastructure			
		Residential	Commercial	Infrastructure	Critical Facilities
Publicly-Owned					
Matherville Lagoons Dam	Edwards River Unincorp. Mercer County	---	---	---	Matherville Wastewater Treatment Lagoons
Mississippi River Lock & Dam 17	Mississippi River Unincorp. Mercer County	---	---	---	Mississippi River Lock 17
Privately-Owned					
Fyre Lake Dam	Camp Creek Unincorp. Mercer County	---	---	Township Road	---
Karl Lake Dam	Sherrard	---	---	Lakeview Drive	---
Morrison Lake Dam	Unincorp. Mercer County	---	---	Bluff Road	---

3.11 MINE SUBSIDENCE

HAZARD IDENTIFICATION

What is a mine?

A mine is a pit or excavation made in the earth for the purpose of extracting minerals or ore. Mines were developed in Illinois to extract coal, clay, shale, limestone, dolomite, silica sand, tripoli, peat, ganister, lead, zinc, and fluorite.

What is mining?

Mining is the process of extracting minerals or ore from a mine. There are two common mining methods: surface mining and sub-surface (underground) mining. This section focuses on underground mining practices conducted in Mercer County.

Mining has long figured prominently into Illinois' history. According to the National Mining Association, Illinois has the second largest recoverable reserves of coal in the country, behind only Montana. Coal deposits can be found under 86 of the 102 counties in Illinois and underground mining operations have been conducted in at least 72 counties. **Figure MS-1** shows the extent of coal deposits (Pennsylvanian rocks) present in Illinois and the mined-out areas from surface and underground coal mining. In 2018, Illinois ranked fourth in the U.S. in coal production according to the National Mining Association.

The first commercial coal mine in Illinois is thought have started in Jackson County about 1810. Since that time, there have been more than 3,800 underground coal mines and 363 underground metal and industrial mineral mines operated in Illinois. Almost all of these mines have been abandoned over the years. According to ISGS, there were nine active underground coal mines in Illinois in 2021. The U.S. Geological Survey identified nine active metal and industrial mineral underground mines in Illinois in their most recent Mineral Industry Survey.

What methods are used in underground mining?

Much of Illinois coal lies too deep for surface mining and requires extraction using underground mining methods. There are three main methods of underground mining that have been used in Illinois over the years: room-and-pillar, high-extraction retreat and longwall. The following provides a brief description of each.

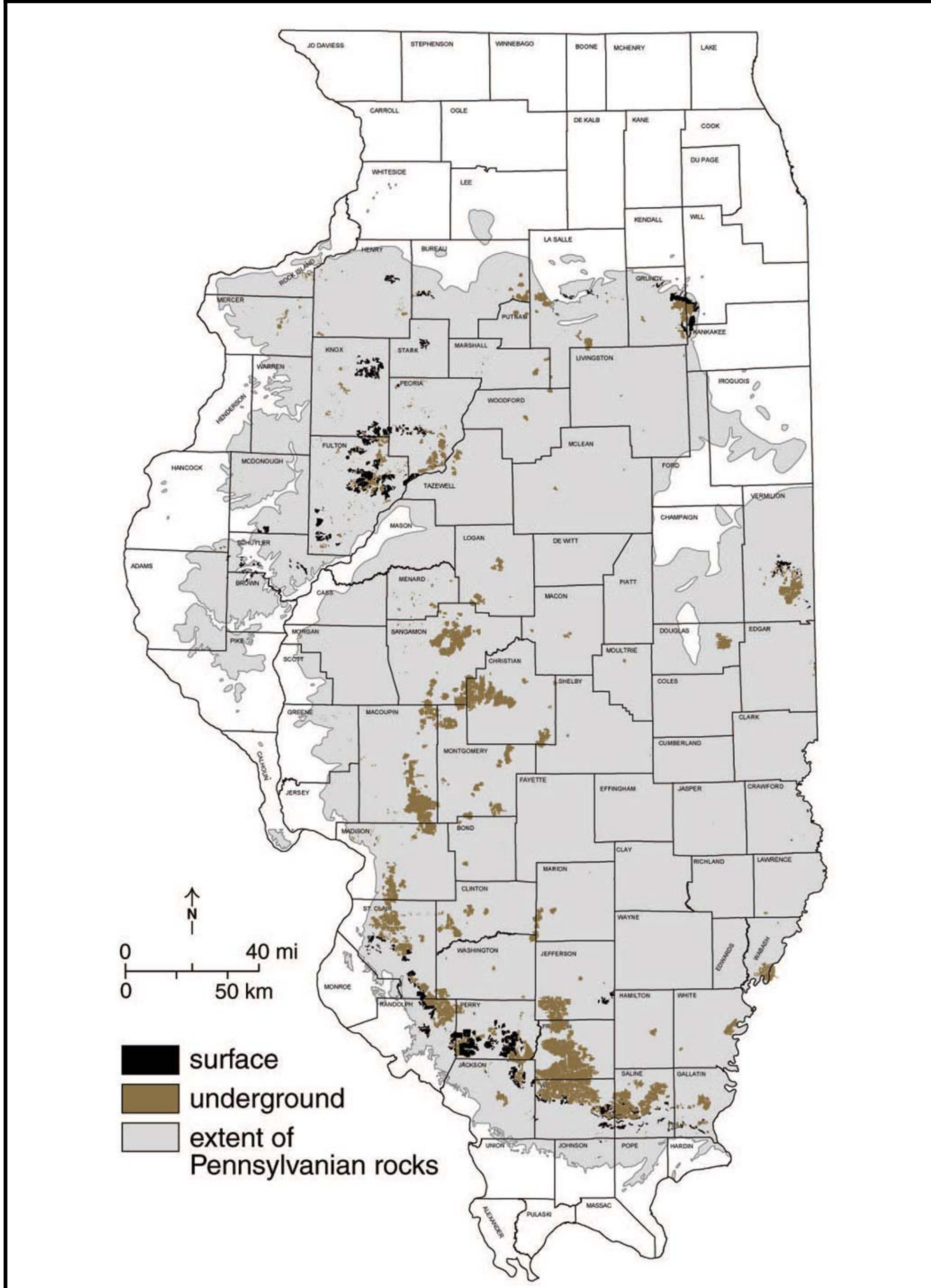
Room-and-Pillar

In the room-and-pillar system, the areas where coal is removed are referred to as "rooms" and the blocks of coal left in place to support the mine's roof and surface are referred to as "pillars". A "panel" refers to a group of rooms isolated from other room groups by surrounding pillars and generally accessed from only one entryway. The room-and-pillar method that was generally used before the early 1900s was characterized by rooms that varied considerably in length, width and sometimes direction, forming irregular mining patterns.

Modern room-and-pillar mines have a regular configuration of production areas (panels) and entryways, and the rooms and entries range from 18 to 24 feet, which is considerably narrower than in older mines. Generally, modern room-and-pillar mining methods recover less than 50% to

60% of the coal in a panel. Most underground mines in Illinois have used a type of room-and-pillar pattern.

Figure MS-1
Coal Mine Deposits & Mined Areas in Illinois



Source: Illinois Department of Natural Resources & Illinois State Geological Survey.

High-Extraction Retreat

High-extraction retreat mining operations first develop a room-and-pillar production area (panel). The miners then systematically begin taking additional coal from the pillars that are left behind. The secondary extraction occurs in a retreating fashion, working from the outer edges of the panel to the main entries. Most of the coal pillars which support the roof are removed shortly after a few rows of rooms and pillars have been formed, leaving only small pillars.

The size and number of pillars left to maintain worker safety varies depending on underground geologic conditions. Roof collapses are controlled by the use of temporary roof supports and planned subsidence of the surface is initiated immediately. Since planned subsidence is part of this operation, this method requires the legal rights to the ground surface. High-extraction retreat methods recover up to 80% to 90% of the coal in a panel. No Illinois mines currently use high-extraction retreat mining, but from the 1940s to 2002, this method was used in the State.

Longwall

Modern longwall mining methods remove coal along a straight working face within defined panels (in this case a solid block of coal), up to 1 to 2 miles long and about 1,000 feet wide. Room-and-pillar methods must be used in conjunction with longwall mining. Like high-extraction retreat, longwall mining begins at the outer edges and works toward the main entries. This fully-mechanized method uses a rotating cutting drum or shearer that works back and forth across the coal face. The coal falls onto a conveyer below the cutting machine and is transported out of the mine.

All of this is performed under a canopy of steel supports that sustains the weight of the roof along the mining surface. As the coal is mined the steel supports advance. The mine roof immediately collapses behind the moving supports, causing 4 to 6 feet of maximum settling of the ground surface over the panel. Since planned subsidence is part of this operation, this method requires the legal rights to the ground surface. Longwall mining methods recover 100% of the coal in a panel.

What is mine subsidence?

Mine subsidence is the sinking or shifting of the ground surface resulting from the collapse of an underground mine. Subsidence is possible in any area where minerals or ore have been undermined. Most of the mine subsidence in Illinois is related to coal mining, which represents the largest volume extracted and area undermined of any solid commodity in the State.

Mine subsidence can be planned, as with modern high-extraction retreat and longwall mining techniques, or it can occur as the result of age and instability. For many years, underground mining was not tightly regulated and not much thought was given to the long-term stability of the mines since most of the land over the mine was sparsely populated. Once mining operations were complete, the mine was abandoned. As cities and towns grew up around the mines, many urban and residential areas were built over or near undermined areas.

ISGS estimates that approximately 333,000 housing units are located in close proximity to underground mines and may potentially be exposed to mine subsidence while approximately 201,000 acres of urban and developed land overlie or are immediately adjacent to underground mines. Most experts agree that room-and-pillar mines will eventually experience some degree of subsidence, but currently there is no way to know when or exactly where it will occur.

What types of mine subsidence can occur in Illinois?

In Illinois mine subsidence typically takes one of two forms: pit subsidence or sag (trough) subsidence. The following provides a brief description of each.

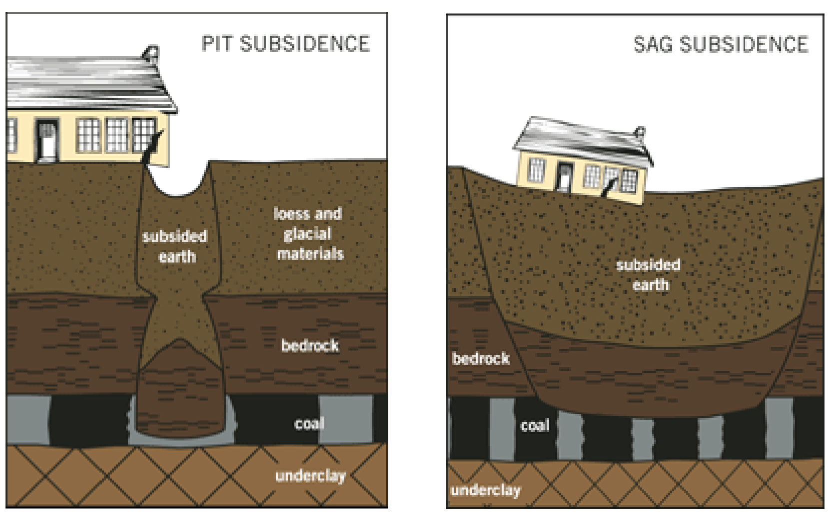
Pit Subsidence

Pit subsidence generally occurs when the roof of a shallow mine (less than 100 feet deep) collapses and forms a bell-shaped hole at the ground's surface, 6 to 8 feet deep and 2 to 40 feet across. **Figure MS-2** provides an illustration of pit subsidence. This type of subsidence forms very quickly causing sudden and swift ground movement. While the probability of a structure being damaged by pit subsidence is generally low since most pits are relatively small, structural damage can occur if pit subsidence develops under the corner of a building, the support posts of a foundation or another critical spot.

Sag (Trough) Subsidence

Sag or trough subsidence generally forms a gentle depression in the ground's surface that can spread over an entire mine panel and affect several acres of land. A major sag can develop suddenly within a few hours or days, or gradually over years. This type of subsidence may originate over places in the mine where pillars have disintegrated and collapsed or where pillars are being pushed into the relatively soft underclay that forms the floor of most mines. **Figure MS-2** illustrates sag subsidence. This is the most common type of mine subsidence and can develop over mines of any depth. Given the relatively large area covered by sag subsidence, buildings, roads, driveways, sidewalks, sewer and water pipes and other utilities may experience damage.

Figure MS-2
Types of Mine Subsidence



Source: Illinois Mine Subsidence Insurance Fund.

What is the Illinois Mine Subsidence Insurance Fund?

Prior to 1979, traditional property owner's insurance did not cover mine subsidence nor was mine subsidence coverage available for purchase in Illinois. Since many mining companies in Illinois ceased operations long before mine subsidence occurred and insurance did not cover such damage, property owner who experienced subsidence damage had no recourse. Several high-profile incidents in the Metro East St. Louis area ultimately led to the passage of the Mine Subsidence Insurance Act in 1979. The Statute required insurers to make mine subsidence insurance available to Illinois homeowners and established the Illinois Mine Subsidence Insurance Fund (IMSIF). Later amendments to the Act gave the Fund the authority, with approval from the Director of Insurance, to set the maximum limits for mine subsidence coverage.

The IMSIF is a taxable enterprise created by Statute to operate as a private solution to a public problem. The purpose of the Fund is to assure financial resources are available to owners of property damaged by mine subsidence. The Fund fills a gap in the insurance market for the benefit of Illinois property owners at risk of experiencing mine subsidence damage.

All insurance companies authorized to write basic property insurance in Illinois are required to enter into a Reinsurance Agreement with the Fund and offer mine subsidence insurance coverage. Mine subsidence insurance covers damage caused by underground mining of any solid mineral resource. In the 34 counties where underground mining has been most prevalent, the Statute requires mine subsidence coverage be automatically included in both residential and commercial property policies. Coverage may be rejected in writing by the insured. **Figure MS-3** identifies the 34 counties where mine subsidence insurance is automatically included in property insurance policies.

In addition to providing reinsurance to insurers, the Fund also is responsible for conducting geotechnical investigations to determine if mine subsidence caused the damage, establishing rates and rating schedules, providing underwriting guidance to insurers, supporting and sponsoring mine subsidence related research and initiatives consistent with the public interest and educating the public about mine subsidence issues.

HAZARD PROFILE

The following details the location of underground mines, identifies past occurrences of mine subsidence, details the severity or extent of each event (if known); identifies the locations potentially affected and estimates the likelihood of future occurrences.

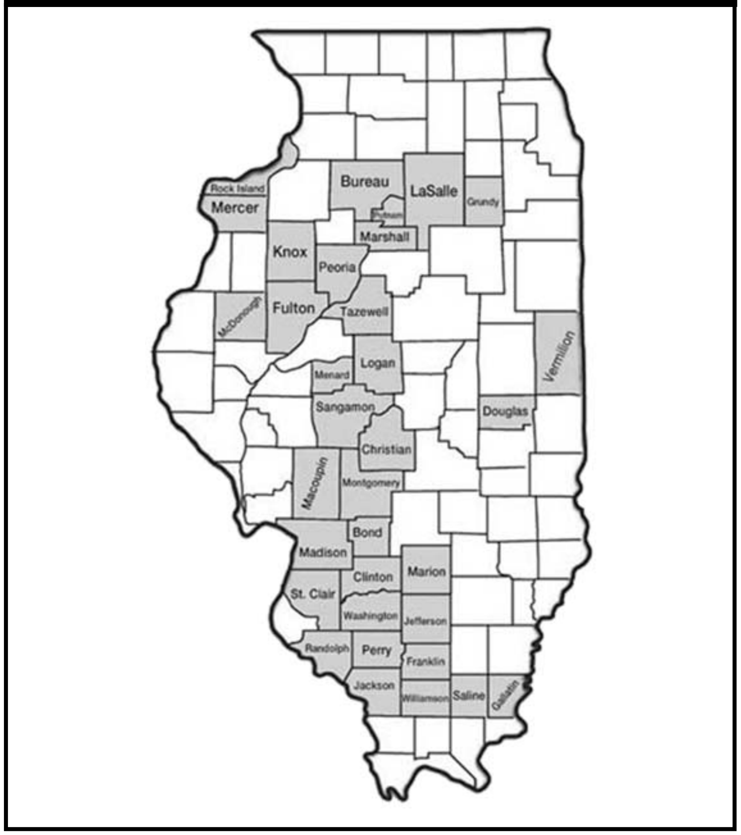
Are there any underground mines located in the County?

Yes. According to the Illinois State Geological Survey's Directory of Coal Mines for Mercer County, there are 129 documented underground mines located in the County. A copy of the Directory for Mercer County is included in **Appendix K. Figure MS-4** illustrates the locations of these mines.

Mine Subsidence Fast Facts – Occurrences

Number of Underground Mines Located within the County: ***129***
Number of Mine Subsidence Events Reported ***None***
Probability of Future Mine Subsidence Events: ***Low to Medium***

Figure MS-3
Counties Required to include Mine Subsidence Coverage in Property Insurance



Source: Illinois Mine Subsidence Insurance Fund.

When has mine subsidence occurred previously? What is the extent of these previous occurrences?

No comprehensive, publicly-accessible database detailing mine subsidence occurrences currently exists in Illinois. A review of local news articles and discussions with Committee members did not identify any known recorded mine subsidence events in Mercer County. According to the Illinois Mine Subsidence Insurance Fund (IMSIF), no claims have been submitted to the IMSIF for Mercer County that proved to be caused by mine subsidence between 1980 and 2022.

What locations are affected by mine subsidence?

According to the Illinois State Geological Survey's (ISGS) *Proximity of Underground Mines to Urban and Developed Lands in Illinois* study published in 2009, there are:

- ❖ Approximately 6,881 acres (1.9% of the land area) and 297 housing units (4.2% of the total housing units) in Mercer County are located in Zone 1, land over or adjacent to mapped mines.
- ❖ An additional 10,057 acres (2.8% of the land area) and 470 housing units (6.7% of the total housing units) in the County are located in Zone 2, land surrounding Zone 1 that could be affected if the mine boundaries are inaccurate or uncertain.

Figure MS-4
Underground Mines Located Mercer County

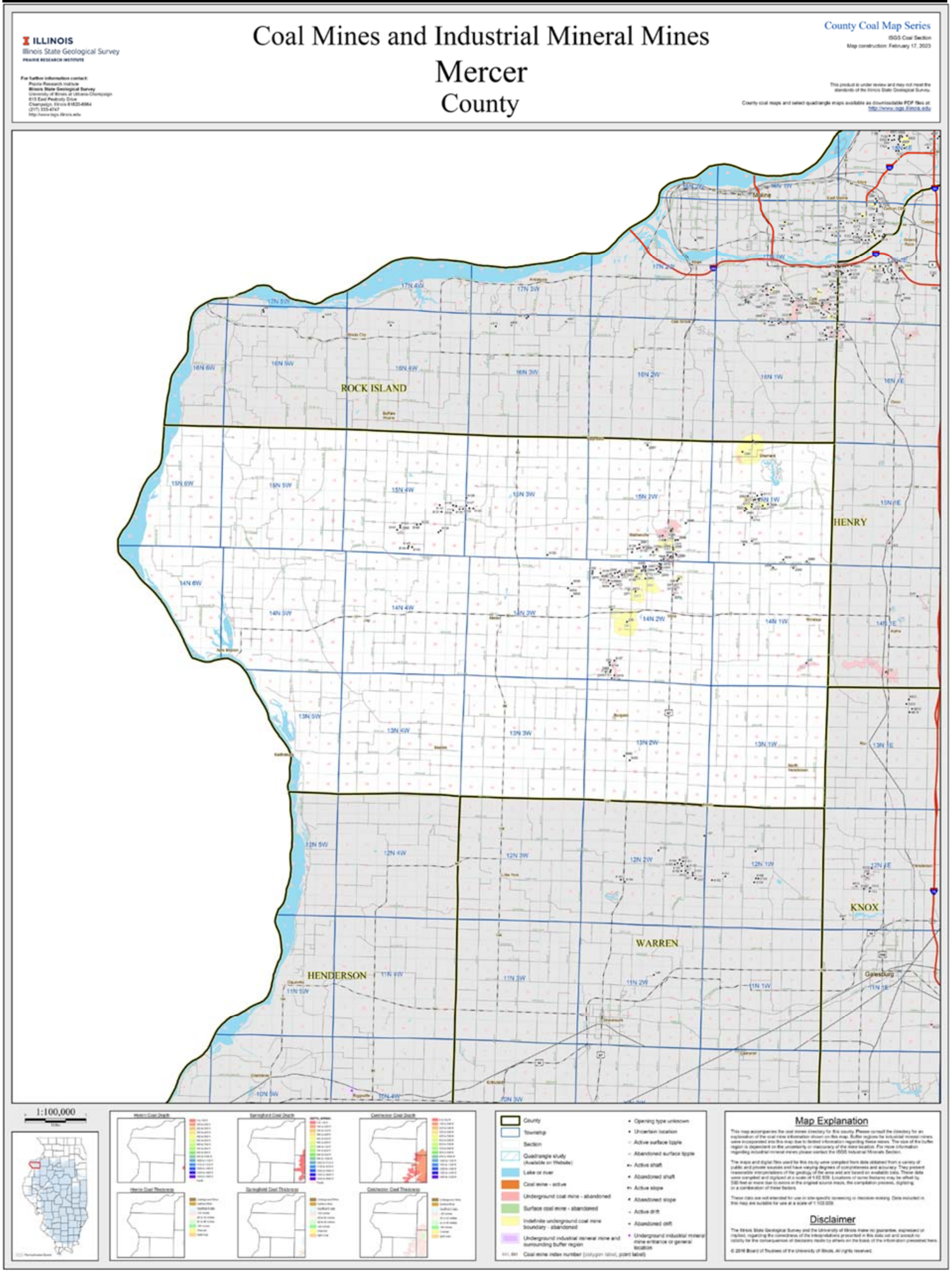


Figure MS-5 identifies the location of the Zone 1 and 2 areas in Mercer County. Based on this mapping, mine subsidence has the potential to impact parts of unincorporated Mercer County as well as Matherville, Sherrard, and Viola.

What is the probability of future mine subsidence events occurring?

There are many variables that must be considered when calculating the probability of future mine subsidence events including whether subsidence has occurred previously in an area, the size, depth and age of the mine, the magnitude or extent of the failure as well as soil and weather conditions. The extent of future potential mine subsidence events is also a function of where current development is located relative to areas of past and present underground mining. According to the IMSIF, most experts agree that room and pillar mines will eventually experience some degree of collapse, but currently there is no way to know when or exactly where mine subsidence will occur.

Given the unpredictability of mine subsidence events, the variables involved and the lack of data available for Mercer County, it is difficult to specifically establish the probability of future mine subsidence events without extensive research.

However, given the mining methods used, the age and location of the mines and the number of housing units located over or adjacent to undermined areas in the County, the probability that unincorporated Mercer County, Matherville, Sherrard, and Viola will experience future mine subsidence events is estimated to be ***low*** to ***medium*** and ***unlikely*** for the remaining participating jurisdictions and most of unincorporated Mercer County. For the purposes of this analysis "unlikely" is defined as having a less than 2% chance of occurring in any given year, "low" is defined as having a less than a 10% chance of occurring in any given year and "medium" is defined as having up to a 50% chance of occurring in any given year.

What is the probability of future mine subsidence events occurring based on modeled future conditions?

No data was available to accurately predict the impacts of future conditions on the frequency and severity of mine subsidence events in this region of the U.S.

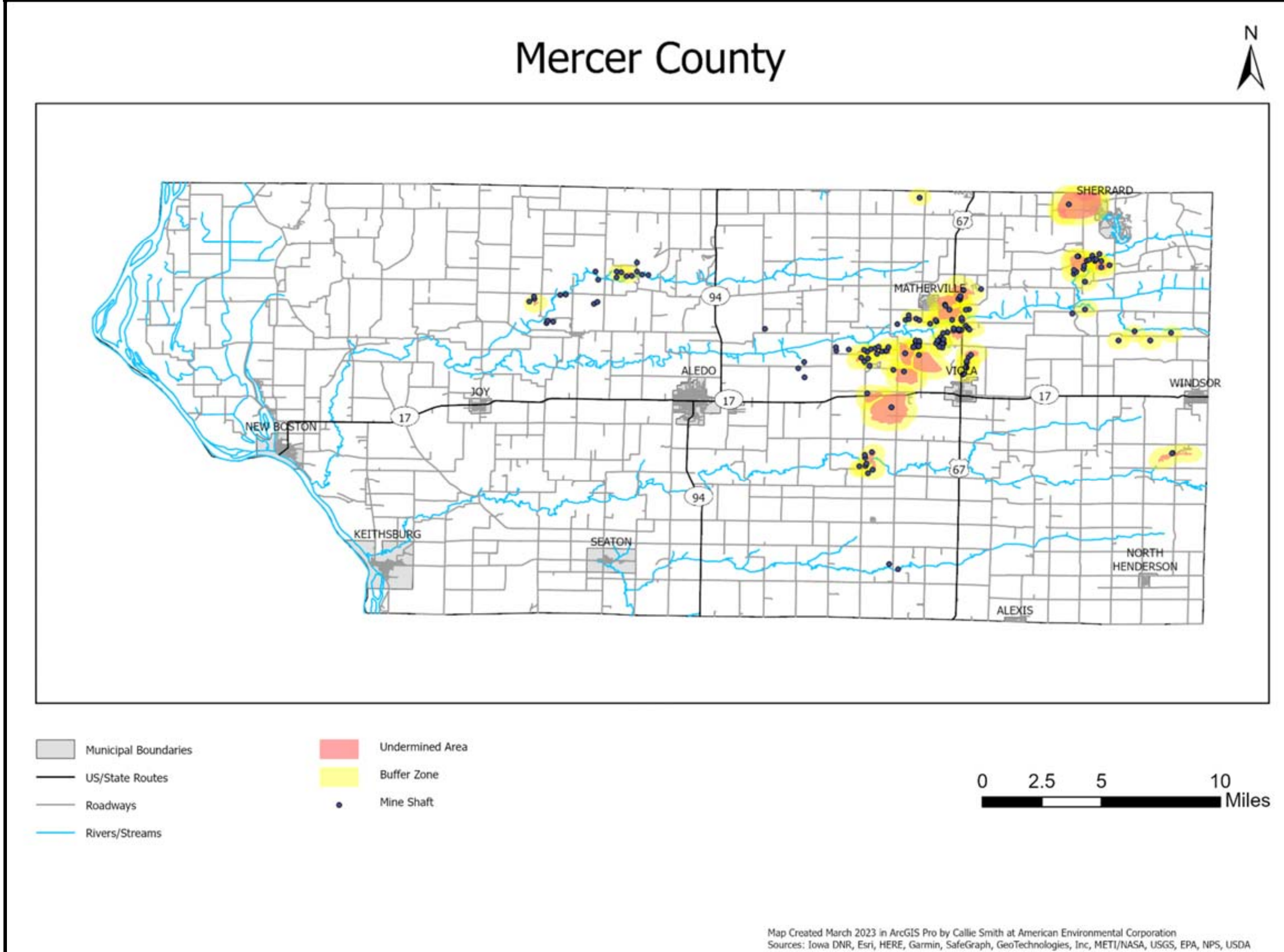
HAZARD VULNERABILITY

The following describes the vulnerability to participating jurisdictions, identifies the impacts on public health and property (if known) and estimates the potential impacts on public health and safety as well as buildings, infrastructure, and critical facilities from mine subsidence.

Are the participating jurisdictions vulnerable to mine subsidence?

Yes. Matherville, Sherrard, Preemption Township, Sherrard CUSD #200, Aledo FPD, Greene Township FPD, Sherrard Community FPD, and parts of unincorporated Mercer County are vulnerable to mine subsidence. None of the other participating jurisdictions or the remainder of the County are considered vulnerable. According to ISGS, approximately 6,881 acres (1.9% of the land area) of Mercer County are over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 10,057 acres (2.8% of the land area) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain.

Figure MS-5
Areas Potentially Impacted by Mine Subsidence in Mercer County



Do any of the participating jurisdictions consider mine subsidence to be among their community's greatest vulnerabilities?

No. Based on responses to an Assets Vulnerability Survey distributed to the participating jurisdictions, none of the participating jurisdictions consider specific assets within their jurisdictions vulnerable to mine subsidence.

What impacts resulted from the recorded mine subsidence events?

Since there have been no *recorded* mine subsidence events in Mercer County, there are no recorded impacts, including injuries or fatalities, to report. According to the IMSIF, no mine subsidence insurance claims were paid between 1980 and 2022 in Mercer County.

Mine Subsidence Fast Facts – Risk

Mine Subsidence Risk/Vulnerability:

- ❖ Public Health & Safety – Zones 1 & 2: ***Low***
- ❖ Public Health & Safety – Areas Outside Zones 1 & 2: ***Low***
- ❖ Buildings/Infrastructure/Critical Facilities – Zones 1 & 2: ***Medium to Low***
- ❖ Buildings/Infrastructure/Critical Facilities – Areas Outside Zones 1 & 2: ***Low***

What other impacts can result from mine subsidence events?

The initial damage to a property from mine subsidence may appear suddenly or occur gradually over many years. Damage to structures can include:

- ❖ cracked, broken or damaged foundations
- ❖ cracks in the basement walls, ceilings, garage floors, driveways, sidewalks, or roadways
- ❖ jammed or broken doors and windows
- ❖ unlevel or tilted walls or floors
- ❖ doors that swing open or closed
- ❖ chimney, porch, or steps that separate from the rest of the structure
- ❖ in extreme cases, ruptured water, sewer, or gas lines

A structure need not lie directly over a mine to be affected by mine subsidence. It is extremely difficult to accurately gauge how far a property must be from a mine to ensure that it will be unaffected by mine subsidence. Each subsidence is unique and influenced by multiple factors.

What is the level of vulnerability to public health and safety from mine subsidence?

In terms of the risk or vulnerability to public health and safety from a mine subsidence event, there are several factors that must be taken into consideration including the age, size, and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When all of the factors are taken into consideration, the overall risk to public health and safety posed by a mine subsidence event in Mercer County is considered to be ***low*** for both Zones 1 and 2 and all other portions of the County.

Are existing buildings, infrastructure, and critical facilities vulnerable to mine subsidence?

Yes. Buildings, infrastructure, and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. According to ISGS, approximately 297 housing units (4.2% of the total housing units in the County) are located over or adjacent to mapped mines and vulnerable to mine subsidence while an additional 470 housing units (6.7% of the total housing units) could be affected by mine subsidence if the mine boundaries are inaccurate or uncertain. **Figure MS-6** identifies the number of critical facilities located within Zones 1 and 2 for the County, Matherville, Sherrard, Preemption Township, Sherrard CUSD #200, Aledo FPD, Greene Township FPD, and Sherrard Community FPD for select categories.

In addition to impacting structures, mine subsidence can damage roads, bridges, and utilities. Roadways, culverts, and bridges can be weakened by mine subsidence and even destroyed if the subsidence occurs directly underneath of them. Water, sewer, power, and communication lines, both above and below ground, are also vulnerable to mine subsidence. Depending on the location of the subsidence, water, sewer, and power lines can experience ruptures causing major disruptions to vital services.

As with public health and safety, the risk or vulnerability to buildings, infrastructure and critical facilities is dependent on several factors including the age, size, and depth of the mine; the mining method employed; the extent of the development and infrastructure in the vicinity of the mine; and soil and weather conditions. When these factors are taken into consideration, the overall risk posed by mine subsidence to vulnerability to buildings, infrastructure and critical facilities in Mercer County is considered to be ***medium to low*** for Zone 1 and ***low*** for Zone 2 and all other portions of the County.

Are future buildings, infrastructure, and critical facilities vulnerable to mine subsidence?

Yes. Any future buildings, infrastructure and critical facilities located within Zones 1 and 2 are vulnerable to mine subsidence. As a result, future buildings, infrastructure, and critical facilities face the same vulnerabilities as those of existing buildings, infrastructure and critical facilities described previously.

What are the potential dollar losses to vulnerable structures from mine subsidence?

Unlike other hazards, there are no standard loss estimation models or methodologies for mine subsidence. Given the lack of recorded events and unpredictability of mine subsidence, sufficient information was not available to prepare a reasonable estimate of future potential dollar losses to vulnerable structure from mine subsidence. Still, those housing units that reside in Zone 1 have the potential to experience future dollar losses from mine subsidence.

Figure MS-6
Critical Facilities Located in Zones 1 and 2 by Jurisdiction

Participating Jurisdiction	Government[1]	Law Enforcement	Fire Stations	Ambulance Service	Schools	Drinking Water	Wastewater Treatment	Medical[2]	Healthcare Facilities[3]
Mercer County	---	---	---	---	---	---	---	---	---
Matherville	1	---	1	---	---	---	---	---	---
Sherrard	3	1	1	1	2	1	2	---	---
Preemption Township	1	---	1	---	---	---	---	---	---
Sherrard CUSD #200	---	---	---	---	2	---	---	---	---
Aledo FPD	---	---	---	---	---	---	---	---	---
Greene Township FPD	1	---	1	---	---	---	---	---	---
Sherrard Community FPD	3	1	1	1	2	1	2	---	---

[1] Government includes: courthouses, city/village halls, township buildings, highway/road maintenance centers, etc.
[2] Medical includes: public health departments, hospitals, urgent/prompt care and medical clinics.
[3] Healthcare Facilities include: nursing homes, skilled care facilities, memory care facilities, residential group homes, etc.
--- Indicates the jurisdiction does not own/maintain any critical facilities within that category.

4.0 MITIGATION STRATEGY

The mitigation strategy identifies how participating jurisdictions are going to reduce or eliminate the potential loss of life and property damage that results from the natural hazards identified in the Risk Assessment section of this Plan. The strategy includes:

- Reviewing, re-evaluating, and updating the mitigation goals. Mitigation goals describe the objective(s) or desired outcome(s) that the participants would like to accomplish in terms of hazard and loss prevention. These goals are intended to reduce or eliminate long-term vulnerabilities to natural hazards.
- Evaluating the status of the existing mitigation actions and identifying a comprehensive range of jurisdiction-specific mitigation actions including those related to continued compliance with the National Flood Insurance Program (NFIP). Mitigation actions are projects, plans, activities, or programs that achieve at least one of the mitigation goals identified.
- Analyzing the existing and new mitigation actions identified for each jurisdiction. This analysis ensures each action will reduce or eliminate future losses associated with the hazards identified in the Risk Assessment section.
- Reviewing, re-evaluating, and updating the mitigation actions prioritization methodology. The prioritization methodology outlines the approach used to prioritize the implementation of each identified mitigation action.
- Identifying the entity(s) responsible for implementation and administration. For each mitigation action, the entity(s) responsible for implementing and administering that action is identified as well as the timeframes for completing the actions and potential funding sources.
- Conducting a preliminary Benefit-Cost analysis of each mitigation action. The qualitative Benefit-Cost analysis provides participants a general idea of which actions are likely to provide the greatest benefit based on the financial cost and staffing efforts needed.

As part of the Plan update, the mitigation strategy was reviewed and revised. A detailed discussion of each aspect of the mitigation strategy and any updates made is provided below.

4.1 MITIGATION GOALS REVIEW

As part of the Plan update process, the mitigation goals from the previous Plan were reviewed and re-evaluated. The previous list of mitigation goals as well as potential updates to the list were distributed to the Committee members at the first meeting on October 20, 2022. Members were asked to review the potential updates before the second meeting and consider whether any changes needed to be made or if additional goals should be included. At the Committee's March 15, 2023 meeting the group discussed the updated goals and approved them with no changes. **Figure MIT-1** lists the approved mitigation goals.

Figure MIT-1 Mitigation Goals	
Goal 1	Protect the lives, health, safety, and welfare of the individuals living in Mercer County from the dangers caused by natural hazards.
Goal 2	Decrease the vulnerability of hazard-prone areas to increase community resilience to future natural hazard events.
Goal 3	Protect existing infrastructure and design new infrastructure (buildings, roads, bridges, utilities, water supplies, sanitary sewer systems, etc.) to be resilient to the impacts of natural hazards.
Goal 4	Maintain and improve communication and coordination between government and private entities and County residents to enhance emergency preparedness, response, recovery and mitigation activities within the County.
Goal 5	Promote hazard resilience – the ability to prepare for, withstand and rapidly recover from the effects of natural hazards – within Mercer County.
Goal 6	Develop long-term strategies to educate residents and businesses about the hazards affecting Mercer County and the actions they can take before a hazard event occurs to protect themselves, their households, homes and businesses in an effort to encourage community resilience.
Goal 7	Incorporate hazard mitigation strategies into existing and new community plans and regulations.
Goal 8	Ensure future development does not increase the vulnerability of hazard-prone areas within Mercer County or create unintended exposures to natural hazards.
Goal 9	Place a priority on protecting community lifelines (i.e., safety and security; food, water, and shelter; health and medical; energy; communication; and transportation), public services, and schools.

4.2 EXISTING MITIGATION ACTIONS REVIEW

The Plan update process included a review and evaluation of the ***existing hazard mitigation actions*** listed in the original Plan. A copy of these previous actions is included in **Appendix L**. A review of the existing hazard mitigation actions revealed the following shortcomings:

- ❖ Detailed descriptions of the actions to be implemented were not provided. Most of the actions identified did not have adequate project/activity descriptions and therefore failed to effectively communicate the solution to the problem of reducing future losses to those tasked with implementing the actions.
- ❖ Actions focused on emergency preparedness, response, recovery, or maintenance and not mitigation. Multiple actions identified were aimed at addressing emergency response or maintenance and not mitigation needs. As a result, actions 15, 16, 18, 24, 25, 26, 32, 33, 35, 36, 37, 38, and 39 were eliminated.

The remaining existing mitigation actions were provided to each of the jurisdictions who participated in the previous Plan update for their review and evaluation at the second meeting held on March 15, 2023. They were asked to identify those actions that were either in progress or that had been completed since the previous Plan was prepared in 2016. They were also given the opportunity to eliminate any action on their specific list that they did not deem viable and/or practical for implementation.

Figures MIT-2 through **MIT-7**, located at the end of this section, summarize the results of this evaluation by jurisdiction. None of the participants identified changes in priorities since the previous Plan was approved. The existing actions identified for Abington Township, Preemption Township, and Sherrard focused on emergency response, recovery, or maintenance and not mitigation and therefore are not included in the summary. Aledo Fire Protection District (FPD), Genesis Medical Center, Green Township FPD, Sherrard CUSD #200, and Sherrard Community FPD are not included in the summary because they did not participate in the previous Plan. While New Boston, North Henderson, Seaton, Viola, Windsor, Rivoli Township, Ohio Grove Township, Millersburg Township, Suez Township, Eliza Township, and Greene Township participated in the previous Plan, they chose not to participate in the Plan update process and are not included in the summary.

4.3 New Mitigation Action Identification

Following the review and evaluation of the existing mitigation actions, the Committee members were asked to consult with their respective jurisdictions to identify ***new, jurisdiction-specific mitigation actions***. Representatives of Mercer County, Aledo, and Keithsburg were also asked to identify mitigation actions that would ensure their continued compliance with the National Flood Insurance Program. The compiled lists of new mitigation actions were then reviewed to assure the appropriateness and suitability of each action. Those actions that were not deemed appropriate and/or suitable were either reworded or eliminated.

4.4 Mitigation Action Analysis

Next, those existing mitigation actions retained, and the new mitigation actions identified were assigned to one of four broad mitigation activity categories that allowed Committee members to compare and consolidate similar actions. **Figure MIT-8** identifies each mitigation activity category and provides a brief description.

Figure MIT-8
Types of Mitigation Activities

Category	Description
Local Plans & Regulations (LP&R)	Local Plans & Regulations include actions that influence the way land and buildings are being developed and built. Examples include stormwater management plans, floodplain regulations, capital improvement projects, participation in the NFIP Community Rating System, comprehensive plans, and local ordinances (i.e., building codes, etc.)
Structure & Infrastructure Projects (S&IP)	Structure & Infrastructure Projects include actions that protect infrastructure and structures from a hazard or remove them from a hazard area. Examples include acquisition and elevation of structures in flood prone areas, burying utility lines to critical facilities, construction of community safe rooms, install "hardening" materials (i.e., impact resistant window film, hail resistant shingles/doors, etc.) and detention/retention structures.
Natural System Protection (NSP)	Natural System Protection includes actions that minimize damage and losses and also preserve or restore natural systems. Examples include sediment and erosion control, stream restoration and watershed management.
Education & Awareness Programs (E&A)	Education & Awareness Programs include actions to inform and educate citizens, elected officials and property owners about hazards and the potential ways to mitigate them. Examples include outreach/school programs, brochures, and handout materials, becoming a StormReady community, evacuation planning and drills, and volunteer activities (i.e., culvert cleanout days, initiatives to check in on the elderly/disabled during hazard events such as storms and extreme heat events, etc.)

Each mitigation action was then analyzed to determine:

- the hazard or hazards being mitigated;
- the general size of the population affected (i.e., small, medium, or large), the participant's Social Vulnerability Index (SVI) ranking, status as a disadvantaged community per the Climate and Economic Justice Screening Tool (CEJST), as well as the participant's status as an Economically Disadvantaged Rural Community (EDRC);
- the goal or goals fulfilled;
- whether the action would reduce the effects on new or existing buildings and infrastructure; and
- whether the action would ensure continued compliance with the National Flood Insurance Program.

Each mitigation action was also evaluated to determine whether it would mitigate risk to one or more of the Federal Emergency Management Agency's (FEMA's) seven Community Lifelines. Community Lifelines are the most fundamental services in the community that, when stabilized, enable all aspects of society to function. These fundamental services enable the continuous operation of critical government and business functions essential to human health and safety or economic security. The Community Lifelines include Safety & Security; Food, Water, Shelter; Health & Medical; Energy (Power & Fuel); Communications; Transportation; and Hazardous Materials. **Figure MIT-9** provides a brief description of each Community Lifeline.

Figure MIT-9
Community Lifelines
(Sheet 1 of 2)

Category	Components/Subcomponents
Safety & Security	- Law Enforcement/Security (police stations, law enforcement, site security, correctional facilities) - Fire Service (fire stations, firefighting resources) - Search & Rescue (local search & rescue) - Government Service (emergency operation centers, essential government functions, government offices, schools, public records, historic/cultural resources) - Community Safety (flood control, other hazards, protective actions)
Food, Water, Shelter	- Food [commercial food distribution, commercial food supply chain, food distribution programs (e.g., food banks)] - Water [drinking water utilities (intake, treatment, storage & distribution), wastewater systems, commercial water supply chain]; - Shelter [housing (e.g., homes, shelters), commercial facilities (e.g., hotels)]; - Agriculture (animals & agriculture)
Health & Medical	- Medical Care (hospitals, dialysis, pharmacies, long-term care facilities, VA health system, veterinary services, home care) - Patient Movement (emergency medical services) - Fatality Management (mortuary and post-mortuary services) - Public Health (epidemiological surveillance, laboratory, clinical guidance, assessment/interventions/treatments, human services, behavioral health) - Medical Supply Chain [blood/blood products, manufacturing (e.g., pharmaceutical, device, medical gases), distribution, critical clinical research, sterilization, raw materials]
Energy	- Power Grid (generation systems, transmission systems, distribution systems) - Fuel [refineries/fuel processing, fuel storage, pipelines, fuel distribution (e.g., gas stations, fuel points), off-shore oil platforms]

Figure MIT-9 Community Lifelines (Sheet 2 of 2)	
Category	**Components/Subcomponents**
Communications	- Infrastructure [wireless, cable systems and wireline, broadcast (e.g., TV and radio), satellite, data centers/internet] - Alerts, Warnings, & Messages (local alert/warning ability, access to IPAWS, NAWAS terminals) - 911 & Dispatch (public safety answering points, dispatch) - Responder Communications (LMR networks) - Finance (banking services, electronic payment processing)
Transportation	- Highway/Roadway/Motor Vehicle (roads, bridges) - Mass Transit (bus, rail, ferry) - Railway (freight, passenger) - Aviation [commercial (e.g., cargo/passenger), general, military] - Maritime (waterways, ports and port facilities)
Hazardous Materials	- Facilities [oil/hazmat facilities (e.g., chemical, nuclear), oil/hazmat/toxic incidents from facilities] - Hazmat, Pollutants, Contaminants (oil/hazmat/toxic incidents from non-fixed facilities, radiological or nuclear incidents)

4.5 Mitigation Action Prioritization Methodology & Benefit-Cost Analysis Review

The methodology applied to prioritize mitigation actions in the previous Plan was reviewed by the Planning Committee as part of the Plan update process. The previous prioritization methodology was based on the key factors of hazard frequency and degree of mitigation and applied a priority rating of A, B, C, or J to each mitigation action. Priority J projects were ones that could "just be done" without outside funding and were able to be implemented within one year of plan adoption.

Taking into account the changes outlined in FEMA's new *Local Mitigation Planning Policy Guide*, the Planning Committee decided to update the previous prioritization methodology to incorporate additional key factors such as benefit-cost utilization and risk reduction to community lifelines in addition to hazard frequency and degree of mitigation. This updated prioritization methodology was presented to the Planning Committee members at the third meeting held on June 21, 2023. The group reviewed and discussed the methodology and chose to approve it with no changes.

Figure MIT-10 identifies and describes the four-tiered prioritization methodology adopted by the Planning Committee. This methodology identifies which projects and activities maximize benefits and have a greater likelihood of reducing the long-term vulnerabilities associated with the most frequently occurring natural hazards.

While prioritizing the actions is useful and provides participants with additional information, it is important to keep in mind that implementing any the mitigation actions is desirable regardless of which prioritization category an action falls under.

Figure MIT-10 Mitigation Action Prioritization Methodology			
P1 High Priority	**P2 Significant Priority**	**P3 Moderate Priority**	**P4 Important**
- Mitigates risk to the most frequently occurring hazards (i.e., severe winter storms, severe storms, extreme cold, floods, excessive heat) - Action has the potential to virtually eliminate or significantly reduce hazard impacts - Mitigates risk to at least one community lifeline - Benefits exceed cost - Action meets multiple plan goals and/or projects life & health	- Mitigates risk to the most frequently occurring hazards (i.e., severe winter storms, severe storms, extreme cold, floods, excessive heat) - Action has the potential to reduce hazard impacts - May mitigate risk to a community lifeline - Benefit is equal to or exceeds cost - Action meets at least one plan goal	- Mitigates risk to the less frequently occurring hazards (i.e., tornadoes, drought, earthquakes, levee failures, dam failures, mine subsidence) - Action has the potential to virtually eliminate or significantly reduce hazard impacts - Mitigates risk to at least one community lifeline - Benefits exceed cost - Action meets multiple plan goals and/or projects life & health	- Mitigates risk to the less frequently occurring hazards (i.e., tornadoes, drought, earthquakes, levee failures, dam failures, mine subsidence) - Action has the potential to reduce hazard impacts - May mitigate risk to a community lifeline - Benefit is equal to or exceeds cost - Action meets at least one plan goal

In addition to weighing the cost of an action versus the benefits the action will produce as part of the prioritization methodology, a preliminary qualitative benefit-cost analysis was conducted on each mitigation action to demonstrate its monetary and non-monetary benefits and provide additional information that can be considered in each participant's decision-making process. The benefits and costs were analyzed in terms of the general overall cost to complete an action as well as the staffing efforted needed and the action's likelihood of virtually eliminating or significantly reducing the risk associated with a specific hazard. The general descriptors of high, medium, and low were used. These terms are not meant to translate into a specific dollar amount, but rather to provide a relative comparison between the actions identified by each jurisdiction.

This analysis is only meant to give the participants a starting point to compare which actions are likely to provide the greatest benefit. It was repeatedly communicated to the Planning Committee members that when a grant application is submitted to the Illinois Emergency Management Agency and Office of Homeland Security (IEM-OHS) and FEMA for a specific action, a detailed benefit-cost analysis will be required to receive funding.

4.6 Mitigation Action Implementation & Administration

Finally, each participating jurisdiction was asked to identify how the mitigation actions will be implemented and administered. This included:

- ➢ identifying the party or parties responsible for oversight and administration;
- ➢ determining what funding source(s) are available or will be pursued; and
- ➢ describing the time frame for completion.

Oversight & Administration

It is important to keep in mind that some of the participating jurisdictions have limited capabilities related to organization and staffing for oversight and administration of the identified mitigation actions. Four of the five participating municipalities are small in size, with populations less than 900 individuals. In most cases these jurisdictions have minimal staff. Their organizational structure is such that most have very few offices and/or departments, generally limited to public works and water/sewer. Those in charge of the offices/departments often lack the technical expertise needed to individually oversee and administer the identified mitigation actions. As a result, most of the participating jurisdictions identified their governing body (i.e., village board, city council or board of trustees) as the entity responsible for oversight and administration simply because it is the only practical option given their organizational constraints. Other participants felt that oversight and administration fell under the purview of the entity's governing body (board/council) and not individual departments.

Funding Sources

While the Bi-State Regional Commission has the ability to provide grant writing services to Mercer County, most of the participants do not have staff with grant writing capabilities. As a result, assistance was needed in identifying possible funding sources for the identified mitigation actions. The consultant provided written information to the participants about FEMA and non-FEMA funding opportunities that have been used previously to finance mitigation actions. In addition, funding information was discussed with participants during Committee meetings and in one-on-one contacts so that an appropriate funding source could be identified for each mitigation action.

A handout was prepared and distributed that provided specific information on the non-FEMA grant sources available including the grant name, the government agency responsible for administering the grant, grant ceiling, contact person, and application period among other key points. Specific grants from the following agencies were identified: U.S. Department of Agricultural – Rural Development (USDA – RD), Illinois Department of Agriculture (IDOA), Illinois Department of Commerce and Economic Opportunity (DCEO), Illinois Environmental Protection Agency (IEPA), Illinois Department of Natural Resources (IDNR) and Illinois Department of Transportation (IDOT).

The funding source identified for each action is the most likely source to be pursued; however, if grant funding is unavailable through the most likely or other suggested sources, then implementation of medium and large-scale projects and activities is unlikely due to the budgetary constraints experienced by most, if not all, of the participants due to their size, projected population growth and limited revenue streams. It is important to remember that the population for the entire County is approximately 15,800 individuals. Four of the five participating municipalities are small in size, with populations less than 900 individuals. Some of the jurisdictions struggle to maintain and provide the most critical of services to their residents. Additional funding is necessary if implementation is to be achieved.

Time Frame for Completion

The time frame for completion identified for each action is the timespan in which participants would like to see the action successfully completed. In most cases, the time frame identified is dependent on obtaining the necessary funding. As a result, a time range has been identified for many of the mitigation actions to allow for unpredictability in securing funds.

4.7 RESULTS OF MITIGATION STRATEGY

Figures MIT-11 through **MIT-24**, located at the end of this section, summarize the results of the mitigation strategy. The mitigation actions are arranged alphabetically by participating jurisdiction following the County and include both existing and new actions.

Figure MIT-2
Mercer County – Status of Existing Mitigation Actions

Mitigation Action Description	Status of Mitigation Action			Year Completed	Summary/Details of Completed Action (i.e., location, scope, etc.)	Status of No/In Progress Actions	
	No Progress (✓)	In Progress (✓)	Completed (✓)			Included in Updated Action Plan (✓)	No Longer Relevant (✓)
Obtain updated aerial photography of Mercer County. (Mitigation Strategy No. 31)			✓	2021			✓

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix L.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the County's vulnerability nor did the County identify any changes in priorities since the previous Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Mercer County completed one administrative activity. This activity however will not significantly change the vulnerability of hazard prone areas in the County.

Figure MIT-3
Aledo – Status of Existing Mitigation Actions
(Sheet 1 of 2)

Mitigation Action Description	Status of Mitigation Action			Year Completed	Summary/Details of Completed Action (i.e., location, scope, etc.)	Status of No/In Progress Actions	
	No Progress (✓)	In Progress (✓)	Completed (✓)			Included in Updated Action Plan (✓)	No Longer Relevant (✓)
Design and construct a community safe room (equipped with an emergency backup generator and HVAC system) at the Mercer County Fair Grounds for use by fair goers and area residents. (Mitigation Strategy No. 1)	✓					✓	
Design and a construct community safe room (retrofit ab existing building and/or construct new multi-function building) equipped with an emergency backup generator and HVAC system in downtown Aledo that can also serve as a warming/cooling center for area residents. (Mitigation Strategy No. 2)	✓					✓	
Purchase and install an emergency backup generator at the WRMJ Station to maintain communications during an extended power outage. (Mitigation Strategy No. 3)		✓				✓	

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix L.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the 2016 Plan was approved. The City did not identify any changes in priorities since the previous Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Aledo three infrastructure improvement projects completed or in progress. These projects have the potential to decrease vulnerability to Communications and Food, Water, Shelter Community Lifelines. These projects however will not significantly change the vulnerability of hazard prone areas within the City.

Figure MIT-3 Aledo – Status of Existing Mitigation Actions (Sheet 2 of 2)							
Mitigation Action Description	**Status of Mitigation Action**			**Year Completed**	**Summary/Details of Completed Action (i.e., location, scope, etc.)**	**Status of No/In Progress Actions**	
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**			**Included in Updated Action Plan (✓)**	**No Longer Relevant (✓)**
Purchase and install an emergency backup generator at the VFW, a designated warming/cooling center & emergency shelter, to establish a resilient and reliable power supply. (Mitigation Strategy No. 4)			✓				✓
Upgrade/retrofit drinking water mains at various locations within the City to increase system resilience and aid in fire suppression during natural hazard events. (Mitigation Strategy No. 5)		✓				✓	

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix L.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the 2016 Plan was approved. The City did not identify any changes in priorities since the previous Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Aledo three infrastructure improvement projects completed or in progress. These projects have the potential to decrease vulnerability to Communications and Food, Water, Shelter Community Lifelines. These projects however will not significantly change the vulnerability of hazard prone areas within the City.

Figure MIT-4
Bay Island Drainage & Levee District – Status of Existing Mitigation Actions

Mitigation Action Description	Status of Mitigation Action			Year Completed	Summary/Details of Completed Action (i.e., location, scope, etc.)	Status of No/In Progress Actions	
	No Progress (✓)	In Progress (✓)	Completed (✓)			Included in Updated Action Plan (✓)	No Longer Relevant (✓)
Utilize the State of Illinois Rapid Electronic Notification (SIREN) system to alert Bay Island residents of natural hazard event information. (Mitigation Strategy No. 7)	✓				Project no longer needed – will utilize the County OEM's alert system		✓
Purchase a portable emergency warning siren to alert residents of impending natural hazard events, establishing a Communications Community Lifeline. (Mitigation Strategy No. 8)	✓				Project no longer needed – will utilize the County OEM's alert system		✓

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix L.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the District's vulnerability since the 2016 Plan was approved. The District did not identify any changes in priorities since the previous Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Bay Island D&LD did not begin or complete any of the identified mitigation actions due to budgetary and personnel constraints experienced by a District of its size. As a result, there has been no change in the vulnerability of hazard prone areas within the District.

Figure MIT-5
Joy – Status of Existing Mitigation Actions

Mitigation Action Description	Status of Mitigation Action			Year Completed	Summary/Details of Completed Action (i.e., location, scope, etc.)	Status of No/In Progress Actions	
	No Progress (✓)	In Progress (✓)	Completed (✓)			Included in Updated Action Plan (✓)	No Longer Relevant (✓)
Upsize/replace culverts/drainage structures to increase carrying capacity and alleviate flooding/drainage problems. (Mitigation Strategy No. 9)		✓				✓	
Clean brush and debris out of drainage ditches in the Village to maximize carrying capacity and alleviate recurring drainage problems. (Mitigation Strategy No. 9)		✓				✓	
Install storm sewer collection system to better manage stormwater runoff and alleviate drainage/flooding problems. (Mitigation Strategy No. 9)	✓					✓	
Purchase and install an emergency backup generator at the Village's drinking water well to increase system resilience and maintain operations during power outages. (Mitigation Strategy No. 10)			✓	2022	New generator installed behind the new treatment plant by the water tower.		✓

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix L.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the 2016 Plan was approved. The Village did not identify any changes in priorities since the previous Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Joy has two infrastructure improvement projects in progress that have the potential to decrease vulnerability of hazard prone areas with the Village. It is still too early to tell the degree of reduction that will be experienced from the implementation of this action. The Village also completed one infrastructure improvement project that has the potential to decrease vulnerability to a Food, Water, Shelter Community Lifeline. This project however will not significantly change the vulnerability of hazard prone areas within the Village.

Figure MIT-6
Keithsburg – Status of Existing Mitigation Actions

Mitigation Action Description	Status of Mitigation Action			Year Completed	Summary/Details of Completed Action (i.e., location, scope, etc.)	Status of No/In Progress Actions	
	No Progress (✓)	In Progress (✓)	Completed (✓)			Included in Updated Action Plan (✓)	No Longer Relevant (✓)
Design and construct an emergency storm shelter for use by area residents. (Mitigation Strategy No. 11)	✓				The City would like a shelter that could serve as a community safe room	✓	
Purchase and install emergency backup generator at City Hall, a designated emergency shelter, to maintain operations during power outages. (Mitigation Strategy No. 12)	✓					✓	
Purchase and install emergency backup generator at the City's drinking water well to increase system resilience and maintain operations during power outages. (Mitigation Strategy No. 12)			✓	2009	Project was completed in 2009 and should have been removed from 2016 Plan update.		✓
Purchase and install emergency backup generators at the City's three lift stations to increase system resilience and maintain operations during power outages. (Mitigation Strategy No. 12)			✓	2009	Project was completed in 2009 and should have been removed from 2016 Plan update.		✓
Upsize/install culverts/drainage structures within a 20-block area to alleviate recurring drainage problems. (Mitigation Strategy No. 13)			✓	2009	Project was completed in 2009 and should have been removed from 2016 Plan update.		✓

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix L.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the City's vulnerability since the 2016 Plan was approved. The City did not identify any changes in priorities since the previous Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Keithsburg did not begin or complete any of the identified mitigation actions for this update period due to budgetary and personnel constraints experienced by a City of its size. As a result, there has been no change in the vulnerability of hazard prone areas within the City.

Figure MIT-7 Matherville – Status of Existing Mitigation Actions							
Mitigation Action Description	**Status of Mitigation Action**			**Year Completed**	**Summary/Details of Completed Action (i.e., location, scope, etc.)**	**Status of No/In Progress Actions**	
	No Progress (✓)	**In Progress (✓)**	**Completed (✓)**			**Included in Updated Action Plan (✓)**	**No Longer Relevant (✓)**
Post signage at fire station identifying it as an emergency shelter. (Mitigation Strategy No. 14)	✓					✓	

(Mitigation Strategy "No.") refers to the original action by number detailed in Appendix L.

No substantial changes in development have occurred in hazard prone areas that would increase or decrease the Village's vulnerability since the 2016 Plan was approved. The Village did not identify any changes in priorities since the previous Plan was approved.

In terms of changes in vulnerability associated with mitigation actions in progress or completed, Matherville did not begin or complete its identified mitigation action due to budgetary and personnel constraints experienced by a Village of its size. As a result, there has been no change in the vulnerability of hazard prone areas within the Village.

Figure MIT-11
Mercer County Hazard Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Purchase and install an emergency backup generator at the County Health Department to establish a resilient and reliable power supply, maintain continuity of government/operations, and mitigate risk to a Community Lifeline. The Health Department serves as an alternate County EOC, a designated shelter, emergency food pantry, sole provider of immunizations for children in the County, as well as maintains a radio system for communications with the County dispatch center.	DF, EC, EH, EQ, F, LF, MS, SS, SWS, T	C FWS H&M S&S	S&IP	Large SVI: 0.0598	---	Yes	1, 3,4, 5, 9	P1	Medium/High	Health Department Administrator / Board of Health	5 years	County / FEMA BRIC HMGP	New
Make public information materials available to residents that detail the risk to life and property associated with the natural hazards that impact the County and the proactive approaches they can take to reduce their risk.	DF, DR, EC, EH, EQ, F, LF, MS, SS, SWS, T	---	E&A	Large SVI: 0.0598	---	---	6	P2/P4	Low/Medium	Health Department Administrator / OEM Director	1-5 years	County	New
Partner with Levee owners to develop Emergency Preparedness Plans/ Inundation Maps that identify the extent of potential failures (water depth, speed of onset, warning times, etc.) for the studied levees to address data deficiencies.	LF	S&S	LP&R	Small SVI: 0.0598	---	---	1	P4	Low/Medium	OEM Director	5 years	County / Levee Owners	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (approximately 6,150 individuals in unincorporated areas), projected population growth, and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

DF	Dam Failure	LF	Levee Failure
DR	Drought	MS	Mine Subsidence
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-11
Mercer County Hazard Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Partner with classified dam owners to develop Emergency Action Plans (EAPs) that identify the extent (water depth, speed of onset, warning times, etc.) and location (inundation areas) of a potential dam failure to address data deficiencies.	DF	S&S	LP&R	Small SVI: 0.0598	---	---	1	P4	Low/Medium	OEM Director	5 years	County / Dam Owners	New
Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to exceed federal standards and reflect the revised FIRMs and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding.*	F	S&S	LP&R	Small SVI: 0.0598	Yes	Yes	1, 2, 6, 7, 8	P1	Low/High	County Board Chair / County Board	1-5 years	County	New
Continue to make the most recent Flood Insurance Rate Maps available at the County Clerk's Office to assist the public in considering where to construct new buildings.*	F	S&S	E&A	Small SVI: 0.0598	Yes	---	1, 2, 6, 7, 8	P2	Low/Medium	County Board Chair / County Clerk	1-5 years	County	New
Continue to make County officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	S&S	E&A	Small SVI: 0.0598	Yes	---	6	P2	Low/Medium	County Board Chair	1-5 years	County	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the County's size (approximately 6,150 individuals in unincorporated areas), projected population growth, and budgetary constraints. The County works hard to maintain critical services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

* Mitigation action to ensure continued compliance with NFIP.

Acronyms

Hazard(s) to be Mitigated:

DF	Dam Failure	LF	Levee Failure
DR	Drought	MS	Mine Subsidence
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-12
Abington Township Hazard Mitigation Actions

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Upsize select roadway culverts to increase carrying capacity, alleviate recurring drainage/ flood problems, and ensure system resilience and functionality.	F, SS	T	S&IP	Medium SVI: 0.5187 CEJST: No EDRC: No	Yes	Yes	2, 3, 5, 9	P1	Medium/High	Road Commissioner	2-5 years	Township / IDOT Local Roads	New
Clean brush and debris out of ditches and waterways within the Township to maximize carrying/storage capacity, alleviate recurring drainage problems, ensure system resilience and functionality, and mitigate risk to a Community Lifeline.	F, SS	T	S&IP	Medium SVI: 0.5187 CEJST: No EDRC: No	Yes	Yes	2, 3, 5, 9	P2	Low/Medium	Road Commissioner	1-5 years	Township	New
Make public information materials available to township residents about the risks to life and property associated with the natural hazards that impact the Township and the proactive actions they can take to reduce their risk.	DR, EC, EH, EQ, F, SS, SWS, T	---	E&A	Large SVI: 0.5187 CEJST: No EDRC: No	---	---	6	P2/P4	Low/Medium	Supervisor	1-5 years	Township	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a small, rural township of this size (approx. 400 individuals). The Township works hard to provide even the most critical of services to its residents, but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

DR	Drought	F	Flood
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-13
Aledo Hazard Mitigation Actions
(Sheet 1 of 4)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Purchase and install stationary automatic emergency backup generators at three existing drinking water wells to establish resilient and reliable power supplies in order to maintain continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	FWS	S&IP	Large SVI: 0.2764 CEJST: No EDRC: No	---	Yes	1, 3, 5, 9	P1	Medium/High	Public Works Director	2-5 years	City / FEMA HMGP BRIC	New
Purchase and install a new stationary automatic emergency backup generator at the Water Treatment Plant to establish resilient and reliable power supply in order to maintain continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	FWS	S&IP	Large SVI: 0.2764 CEJST: No EDRC: No	---	Yes	1, 3, 5, 9	P1	Medium/High	Public Works Director	2-5 years	City / FEMA HMGP BRIC	New
Purchase and install stationary automatic emergency backup generators two existing sanitary lift stations to establish resilient and reliable power supplies in order to maintain continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	FWS	S&IP	Medium SVI: 0.2764 CEJST: No EDRC: No	---	Yes	1, 3, 5, 9	P1	Medium/High	Public Works Director	2-5 years	City / FEMA HMGP BRIC	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 3,860 individuals). The City works hard to maintain critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

DR	Drought	F	Flood
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-13
Aledo Hazard Mitigation Actions
(Sheet 2 of 4)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Purchase and install an automatic emergency backup generator at the Public Works Building to establish resilient and reliable power supply in order to maintain continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	FWS	S&IP	Large SVI: 0.2764 CEJST: No EDRC: No	---	Yes	1, 3, 5, 9	P1	Medium/High	Public Works Director	1 year	City / FEMA HMGP BRIC	New
Establish an emergency drinking water well at the east water tower to provide supplemental capacity to improve drought resilience and ensure continued operations of a Community Lifeline.	DR	FWS	S&IP	Large SVI: 0.2764 CEJST: No EDRC: No	---	Yes	2, 3, 5, 7, 9	P3	High/High	Public Works Director	2-5 years	City / USDA – RD Water & Waste Disposal Program / IEPA SRF – PWSLP / FEMA BRIC	New
Design and construct a community safe room (built to high wind standards and equipped with an emergency backup generator and HVAC system) at the Mercer County Fair Grounds for use by fair goers and area residents to establish a Community Lifeline.	SS, T	---	S&IP	Small SVI: 0.2764 CEJST: No EDRC: No	Yes	---	1	P3	High/High	Public Works Director	3-5 years	City / FEMA HMGP BRIC	Existing (2016) No. 1

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 3,860 individuals). The City works hard to maintain critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

DR	Drought	F	Flood
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-13
Aledo Hazard Mitigation Actions
(Sheet 3 of 4)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Design and a construct community safe room (retrofit an existing building and/or construct a new multi-function building) equipped with an emergency backup generator and HVAC system in downtown Aledo that can also serve as a warming/cooling center for area residents.	EC, EH, SS, T	---	S&IP	Small SVI: 0.2764 CEJST: No EDRC: No	Yes	---	1	P3	High/High	Public Works Director	3-5 years	City / FEMA HMGP BRIC	Existing (2016) No. 2
Secure a Memorandum of Agreement with WRMJ to install an automatic emergency backup generator at the radio station to establish a resilient and reliable power supply in order to maintain continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	---	LP&R	Large SVI: 0.2764 CEJST: No EDRC: No	---	---	1, 3,4, 5, 9	P2	Low/Medium	Public Works Director	1-3 years	City	New
Purchase and install an automatic emergency backup generator at the WRMJ Radio Station to establish a resilient and reliable power supply in order to maintain continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	C	S&IP	Large SVI: 0.2764 CEJST: No EDRC: No	---	Yes	1, 3,4, 5, 9	P1	Medium/High	Public Works Director	1-3 years	City / WRMJ / FEMA HMGP BRIC	Existing (2016) No. 3

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 3,860 individuals). The City works hard to maintain critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

DR	Drought	F	Flood
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-13
Aledo Hazard Mitigation Actions
(Sheet 4 of 4)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)[§]	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)[†]	Status
					New	Existing							
Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to exceed federal standards and reflect the revised FIRMs and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding.*	F	S&S	LP&R	Small SVI: 0.2764 CEJST: No EDRC: No	Yes	Yes	1, 2, 6, 7, 8	P1	Low/Low	Mayor City Council / Building & Zoning Official	1-5 years	City	New
Continue to make the most recent Flood Insurance Rate Maps available at the City's Code Administration Office to assist the public in considering where to construct new buildings.*	F	S&S	E&A	Small SVI: 0.2764 CEJST: No EDRC: No	Yes	---	1, 2, 6, 7, 8	P2	Low/Low	Building & Zoning Official	1-5 years	City	New
Continue to make City officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	S&S	E&A	Small SVI: 0.2764 CEJST: No EDRC: No	Yes	---	6	P2	Low/Low	Building & Zoning Official	1-5 years	City	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 3,860 individuals). The City works hard to maintain critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

* Mitigation action to ensure continued compliance with NFIP.

Acronyms

Hazard(s) to be Mitigated:

DR	Drought	F	Flood
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-14
Aledo Fire Protection District Hazard Mitigation Actions

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Purchase and install an automatic emergency backup generator at the Fire Station to establish a resilient and reliable power supply, ensure sustained functionality during extended power outages, maintain continuity of operations, and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	S&S	S&IP	Large SVI: 0.1121 – 0.5187 CEJST: No	---	Yes	1, 3, 5, 9	P1	Medium/High	Fire Chief / Board of Trustees	1-2 years	FPD / FEMA HMGP BRIC	New
Make public information materials available to District residents that detail the risks to life and property associated with the natural hazards that impact the District and the proactive approaches they can take to reduce their risk.	DR, EC, EH, EQ, F, MS, SS, SWS, T	---	E&A	Large SVI: 0.1121 – 0.5187 CEJST: No	---	---	6	P2/P4	Low/Medium	Fire Chief / Board of Trustees	1-5 years	FPD	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a small rural, all-volunteer fire protection district of this size (serving approx. 4,500 individuals in a service area of 88 square miles). Additional funding is necessary if implementation is to be achieved.

Acronyms

Hazard(s) to be Mitigated:

DR	Drought	MS	Mine Subsidence
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-15
Bay Island Drainage & Levee District Hazard Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Install erosion protection measures along the main stem of the Mississippi River south of Lock 17 to protect the levee from failure due to repeated wave action caused by recurring heavy rain/flood events.	F, SS	S&S	S&IP	Medium SVI: 0.1121 CEJST: No	---	Yes	1, 2, 3, 5, 9	P3	High/High	Commissioners / Board	2-5 years	District / FEMA BRIC	New
Purchase and install an emergency backup generator at the pump station to establish a resilient and reliable power supply, ensure sustained functionality during extended power outages, maintain continuity of operations, and mitigate risk to a Community Lifeline.	F, LF, SS	S&S	S&IP	Large SVI: 0.1121 CEJST: No	---	Yes	1, 2, 3, 5, 9	P1	Medium/High	Commissioners / Board	2-5 years	District / FEMA HMGP BRIC	New
Install an additional pump at pump station to increase pump capacity, improve system resilience, and ensure continued functionality of a Community Lifeline.	F, LF, SS	S&S	S&IP	Large SVI: 0.1121 CEJST: No	---	Yes	1, 2, 3, 5, 9	P1	High/High	Commissioners / Board	2-5 years	District	New
Partner with the County OEM to develop an Emergency Preparedness Plan/Inundation Map for the District that identifies the extent of potential failures (water depth, speed of onset, warning times, etc.) for the levee system to address identified data deficiencies.	LF	S&S	E&A	Large SVI: 0.1121 CEJST: No	---	---	1	LL	Low/Medium	Commissioners / Board	3-5 years	District / County	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural drainage and levee districts. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

DR	Drought	LF	Levee Failure
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-15
Bay Island Drainage & Levee District Hazard Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
Make public information materials available to District residents that detail the risks to life and property associated with the natural hazards that impact the District and the proactive approaches they can take to reduce their risk.	DR, EC, EH, EQ, F, LF, SS, SWS, T	---	E&A	Large SVI: 0.1121 CEJST: No	---	---	6	P2/P4	Low/Medium	Commissioners / Board	1-5 years	District	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural drainage and levee districts. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

DR	Drought	LF	Levee Failure
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-16
Genesis Medical Center Hazard Mitigation Actions

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
Purchase and install an automatic emergency backup generator at the Genesis Health Group Clinic to establish a resilient and reliable power supply in order to maintain continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	H&M	S&IP	Small SVI: 0.0598 CEJST: No	---	Yes	1, 2, 3, 5, 9	P1	Medium/High	Administrator / Board of Directors	2-5 years	Genesis Health System / FEMA HMGP	New
Educate staff about the water conservation measures that can be taken to reduce drought impacts.	DR	---	E&A	Large SVI: 0.0598 CEJST: No	---	---	6	P4	Low/Low	Administrator / Board of Directors	1-5 years	Genesis Health System	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by small, rural hospitals. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

DR	Drought	F	Flood
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-17
Greene Township Fire Protection District Hazard Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Purchase and install additional warning sirens in underserved areas of Viola to maximize the system's effectiveness and establish/ensure continued operation of a Community Lifeline essential to human health and safety.	SS, T	C	S&IP E&A	Medium SVI: 0.1121 – 0.3081 CEJST: No	---	---	6	P3	Medium/High	Viola Station Fire Chief / Board of Trustees	2-5 years	FPD / FEMA BRIC HMGP	New
Design and construct a community safe room (built to high wind standards and equipped with emergency backup generator and HVAC system) at the Viola Fire Station for use by first responders and Village residents to establish a Community Lifeline.	SS, T	---	S&IP	Medium SVI: 0.1121 – 0.3081 CEJST: No	Yes	---	6	P3	High/High	Viola Station Fire Chief / Board of Trustees	2-5 years	FPD / FEMA BRIC HMGP / USDA – RD Critical Facilities Program	New
Purchase and install an automatic emergency backup generator at the Viola Fire Station, a designated warming center, to establish a resilient and reliable power supply, ensure sustained functionality during extended power outages, maintain continuity of operations, and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	S&S	S&IP	Large SVI: 0.1121 – 0.5187 CEJST: No	---	Yes	1, 3, 5, 9	P1	Medium/High	Viola Station Fire Chief / Board of Trustees	2-5 years	FPD / FEMA HMGP BRIC	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a small rural, all-volunteer fire protection district of this size (serving approx. 2,000 individuals in a service area of 25 square miles). Additional funding is necessary if implementation is to be achieved.

Acronyms

Hazard(s) to be Mitigated:

DF	Dam Failure	F	Flood
DR	Drought	MS	Mine Subsidence
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-17
Greene Township Fire Protection District Hazard Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Make public information materials available to District residents that detail the risks to life and property associated with the natural hazards that impact the District and the proactive approaches they can take to reduce their risk.	DF, DR, EC, EH, EQ, F, MS, SS, SWS, T	---	E&A	Large SVI: 0.1121 – 0.3081 CEJST: No	---	---	6	P2/P4	Low/Medium	Fire Chiefs / Board of Trustees	1-5 years	FPD	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a small rural, all-volunteer fire protection district of this size (serving approx. 2,000 individuals in a service area of 25 square miles). Additional funding is necessary if implementation is to be achieved.

Acronyms

Hazard(s) to be Mitigated:

DF	Dam Failure	F	Flood
DR	Drought	MS	Mine Subsidence
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-18
Joy Hazard Mitigation Actions

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Purchase and install an automatic emergency backup generator at Village Hall to establish a resilient and reliable power supply in order to maintain continuity of government/operations during extended power outages and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	C S&S	S&IP	Large SVI: 0.5187 CEJST: No EDRC: Yes	---	Yes	1, 3, 4, 5, 9	P1	High/High	President / Village Board	5 years	Village / FEMA BRIC HMGP	New
Upsize culverts/drainage structures to increase carrying capacity, alleviate flooding/drainage problems, and ensure system resilience and functionality.	F, SS	T	S&IP	Medium SVI: 0.5187 CEJST: No EDRC: Yes	---	Yes	2, 3, 9	P1	High/High	President Village Board / Public Works Department	5 years	Village / IDOT Local Roads	Existing (2016) No. 9
Clean brush and debris out of culverts and drainage ditches in the Village to maximize carrying/storage capacity, alleviate recurring drainage problems, and ensure system resilience and functionality.	F, SS	T	S&IP	Medium SVI: 0.5187 CEJST: No EDRC: Yes	Yes	Yes	2, 3, 9	P2	Low/Medium	President Village Board / Public Works Department	1-5 years	Village	Existing (2016) No. 9
Install storm sewer collection system to better manage stormwater runoff, alleviate drainage/flooding problems, and establish a Community Lifeline.	F, SS	---	S&IP	Large SVI: 0.5187 CEJST: No EDRC: Yes	Yes	Yes	2, 3, 5, 9	P1	High/High	President Village Board / Public Works Department	5 years	Village / USDA – RD Water & Waste Disposal Program / IEPA SRF - WPCLP	Existing (2016) No. 9

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approx. 370 individuals). The Village works hard to provide even the most critical of services to its residents, but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado
F	Flood		

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-19
Keithsburg Hazard Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Design and a construct community safe room (retrofit an existing building and/or construct a new structure) equipped with an emergency backup generator and HVAC system that can also serve as a warming/cooling center and emergency shelter for City residents.	EC, EH, EQ, F, LF, SS, SWS, T	---	S&IP	Medium SVI: 0.5187 CEJST: No EDRC: No	Yes	Yes	1	P1/P3	High/High	Mayor City Council / Maintenance Supervisor	3-5 years	City / FEMA HMGP BRIC	New / Existing (2016) No. 11
Purchase and install emergency backup generator at City Hall, a designated emergency shelter, to establish a resilient and reliable power supply in order to maintain continuity of government/ operations during extended power outages and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	C S&S	S&IP	Large SVI: 0.5187 CEJST: No EDRC: No	---	Yes	1, 3, 4, 5, 9	P1	High/High	Mayor City Council / Maintenance Supervisor	5 years	City / FEMA BRIC HMGP	Existing (2016) No. 12
Review new Flood Insurance Rate Maps (FIRMs) when they become available. Update the flood ordinance to exceed federal standards and reflect the revised FIRMs and present both for adoption. Enforce flood ordinance to ensure new development does not increase flood vulnerability or create unintended exposures to flooding.*	F	S&S	LP&R	Small SVI: 0.5187 CEJST: No EDRC: No	Yes	Yes	1, 2, 6, 7, 8	P1	Low/Medium	Mayor City Council / Zoning Enforcer	1-5 years	City	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 650 individuals). The City works hard to provide even the most critical of services to its residents, but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

* Mitigation action to ensure continued compliance with NFIP.

Acronyms

Hazard(s) to be Mitigated:

EC	Extreme Cold	LF	Levee Failure
EH	Excessive Heat	SS	Severe Storm
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-19
Keithsburg Hazard Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
Continue to make the most recent Flood Insurance Rate Maps available at the City Clerk's Office to assist the public in considering where to construct new buildings.*	F	S&S	E&A	Small SVI: 0.5187 CEJST: No EDRC: No	Yes	---	1, 2, 6, 7, 8	P2	Low/Medium	Zoning Enforcer	1-5 years	City	New
Continue to make City officials aware of the most recent Flood Insurance Rate Maps and issues related to construction in a floodplain.*	F	S&S	E&A	Small SVI: 0.5187 CEJST: No EDRC: No	Yes	---	6	P2	Low/Medium	Zoning Enforcer	1-5 years	City	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 650 individuals). The City works hard to provide even the most critical of services to its residents, but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

* Mitigation action to ensure continued compliance with NFIP.

Acronyms

Hazard(s) to be Mitigated:

EC	Extreme Cold	LF	Levee Failure
EH	Excessive Heat	SS	Severe Storm
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-20
Matherville Hazard Mitigation Actions

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Slip line sanitary sewer lines/mains to eliminate stormwater infiltration, increase system resilience, prevent sewage backups, and mitigate risk to a Community Lifeline.	F, SS	FWS	S&IP	Medium SVI: 0.1121 CEJST: No EDRC: Yes	Yes	Yes	3, 5, 9	P1	High/High	Public Works Director	2-5 years	Village / USDA – RD Water & Waste Program / IEPA SRF – WPCLP	New
Make public information materials available to residents that detail the risks to life and property associated with the natural hazards that impact the Village and the proactive approaches they can take to reduce their risk.	EC, EH, EQ, F, MS, SS, SWS, T	---	E&A	Large SVI: 0.1121 CEJST: No EDRC: Yes	---	---	6	P2/P4	Low/Medium	President / Village Board	1-5 years	Village	New
Post signage at fire station identifying it as an emergency shelter.	EC, EH, EQ, F, SS, SWS, T	---	E&A	Large SVI: 0.1121 CEJST: No EDRC: Yes	---	---	1	P2/P4	Low/Medium	President / Village Board	1-3 years	Village	Existing (2016) No. 14

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a village of this size (approx. 875 individuals). The Village works hard to provide even the most critical of services to its residents, but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

EC	Extreme Cold	MS	Mine Subsidence
EH	Excessive Heat	SS	Severe Storm
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-21
Preemption Township Hazard Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Upsize select drainage structures to increase carrying capacity, alleviate recurring drainage/ flood problems, and ensure system resilience and functionality.	F, SS	T	S&IP	Medium SVI: 0.1121 – 0.3081 CEJST: No EDRC: Yes	Yes	Yes	2, 3, 5, 9	P1	Medium/High	Road Commissioner	2-5 years	Township / IDOT Local Roads	New
Remove trees along critical roads to prevent downed power lines, limbs, and trees blocking roadways during natural hazard events.	SS, T	C E T	S&IP	Medium SVI: 0.1121 – 0.3081 CEJST: No EDRC: Yes	---	Yes	2, 3, 5, 9	P2	Medium/High	Road Commissioner	2-5 years	Township	New
Clean brush and debris out of ditches and waterways within the Township to maximize carrying/storage capacity, alleviate recurring drainage problems, ensure system resilience and functionality, and mitigate risk to a Community Lifeline.	F, SS	T	S&IP	Medium SVI: 0.1121 – 0.3081 CEJST: No EDRC: Yes	Yes	Yes	2, 3, 5, 9	P2	Low/Medium	Road Commissioner	2-5 years	Township	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a small, rural township of this size (approx. 2,000 individuals). The Township works hard to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

DF	Dam Failure	F	Flood
DR	Drought	MS	Mine Subsidence
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-21
Preemption Township Hazard Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Purchase road signage and barricades to alert motorists of hazardous conditions, detours, etc. associated with natural hazard events.	DF, EC, EH, EQ, F, MS, SS, SWS, T	C	LP&R E&A	Medium SVI: 0.1121 – 0.3081 CEJST: No EDRC: Yes	---	---	6	P2/P4	Medium/Medium	Road Commissioner	2-5 years	Township	New
Make public information materials available to township residents about the risks to life and property associated with the natural hazards that impact the Township and the proactive actions they can take to reduce their risk.	DF, DR, EC, EH, EQ, F, MS, SS, SWS, T	---	E&A	Large SVI: 0.1121 – 0.3081 CEJST: No EDRC: Yes	---	---	6	P2/P4	Low/Medium	Supervisor	1-5 years	Township	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a small, rural township of this size (approx. 2,000 individuals). The Township works hard to provide even the most critical of services to its residents. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

DF	Dam Failure	F	Flood
DR	Drought	MS	Mine Subsidence
EC	Extreme Cold	SS	Severe Storm
EH	Excessive Heat	SWS	Severe Winter Storm
EQ	Earthquake	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-22
Sherrard Hazard Mitigation Actions
(Sheet 1 of 5)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Upsize roadway culverts/drainage structures to increase carrying capacity, alleviate drainage problems, and ensure system resilience and functionality.	F, SS	T	S&IP	Medium SVI: 0.1121 CEJST: No EDRC: No	---	Yes	2, 3, 9	P1	Medium/High	President Village Board / Public Works Department	2-5 years	Village / IDOT Local Roads	New
Clean brush and debris out of drainage ditches and waterways within the Village to maximize carrying/storage capacity, alleviate recurring drainage problems, and ensure system resilience and functionality.	F, SS	T	S&IP	Medium SVI: 0.1121 CEJST: No EDRC: No	Yes	Yes	2, 3, 9	P2	Low/Medium	President Village Board / Public Works Department	1-2 years	Village	New
Make public information materials available to residents that detail the risks to life and property associated with the natural hazards that impact the Village and the proactive approaches they can take to reduce their risk.	EC, EH, EQ, F, MS, SS, SWS, T	---	E&A	Large SVI: 0.1121 CEJST: No EDRC: No	---	---	6	P2/P4	Low/Medium	President / Village Board	1-2 years	Village	New
Purchase and install an automatic emergency backup generator at Village Hall to establish a resilient and reliable power supply in order to maintain continuity of government/operations during extended power outages and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	C S&S	S&IP	Large SVI: 0.1121 CEJST: No EDRC: No	---	Yes	1, 3, 4, 5, 9	P1	High/High	President Village Board / Public Works Department	2-5 years	Village / FEMA BRIC HMGP	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 700 individuals). The City works hard to provide even the most critical of services to its residents, but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

EC	Extreme Cold	MS	Mine Subsidence
EH	Excessive Heat	SS	Severe Storm
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-22
Sherrard Hazard Mitigation Actions
(Sheet 2 of 5)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Purchase and install a stationary automatic emergency backup generator at the water tower to establish resilient and reliable power supply in order to maintain continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	FWS	S&IP	Large SVI: 0.1121 CEJST: No EDRC: No	---	Yes	1, 3, 5, 9	P1	Medium/High	President Village Board / Public Works Department	2-5 years	Village / FEMA HMGP BRIC	New
Purchase and install stationary automatic emergency backup generators existing sanitary lift stations to establish resilient and reliable power supplies in order to maintain continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	FWS	S&IP	Medium SVI: 0.1121 CEJST: No EDRC: No	---	Yes	1, 3, 5, 9	P1	Medium/High	President Village Board / Public Works Department	2-5 years	Village / FEMA HMGP BRIC	New
Purchase and install a stationary automatic emergency backup generator at the water treatment plant to establish resilient and reliable power supplies in order to maintain continuity of operations and mitigate risk to a Community Lifeline.	EC, EH, EQ, F, SS, SWS, T	FWS	S&IP	Large SVI: 0.1121 CEJST: No EDRC: No	---	Yes	1, 3, 5, 9	P1	Medium/High	President Village Board / Public Works Department	2-5 years	Village / FEMA HMGP BRIC	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of “Yes”, and/or an Economically Disadvantaged Rural Community (EDRC) designation of “Yes” identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 700 individuals). The City works hard to provide even the most critical of services to its residents, but it’s a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

EC	Extreme Cold	MS	Mine Subsidence
EH	Excessive Heat	SS	Severe Storm
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-22
Sherrard Hazard Mitigation Actions
(Sheet 3 of 5)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Establish an emergency/backup drinking water well south of the current water tower to provide supplemental capacity to improve drought resilience and ensure continued operations of a Community Lifeline.	DR	FWS	S&IP	Large SVI: 0.1121 CEJST: No EDRC: No	---	Yes	2, 3, 5, 7, 9	P3	High/High	President Village Board / Public Works Department	2-5 years	Village / USDA – RD Water & Waste Disposal Program / IEPA SRF – PWSLP / FEMA BRIC	New
Secure a Memorandum of Understanding with the food panty in the Village to install an emergency backup generator to ensure continued operations of a Community Lifeline during prolonged power outages.	EC, EH, EQ, F, SS, SWS, T	FWS	S&IP	Medium SVI: 0.1121 CEJST: No EDRC: No	---	Yes	3, 5, 9	P1/P3	Low/High	President / Village Board	1-3 years	Village	New
Purchase and install an automatic emergency backup generator at the food pantry in the Village to ensure continued operations of a Community Lifeline during prolonged power outages.	EC, EH, EQ, F, SS, SWS, T	FWS	S&IP	Medium SVI: 0.1121 CEJST: No EDRC: No	---	Yes	3, 5, 9	P1/P3	Medium/High	President Village Board / Public Works Department	2-5 years	Village / USDA – RD Critical Facilities Programs	New

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Acronyms

Hazard(s) to be Mitigated:

EC	Extreme Cold	MS	Mine Subsidence
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Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-22
Sherrard Hazard Mitigation Actions
(Sheet 4 of 5)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)[§]	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)[†]	Status
					New	Existing							
Install storm sewer collection system to better manage stormwater runoff, alleviate drainage/flooding problems, and establish a Community Lifeline.	F, SS	---	S&IP	Large SVI: 0.1121 CEJST: No EDRC: No	Yes	Yes	2, 3, 5, 9	P1	High/High	President Village Board / Public Works Department	2-5 years	Village / USDA – RD Water & Waste Disposal Program / IEPA SRF - WPCLP	New
Slip line sanitary sewer lines/mains to eliminate stormwater infiltration, increase system resilience, prevent sewage backups, and mitigate risk to a Community Lifeline.	F, SS	FWS	S&IP	Medium SVI: 0.1121 CEJST: No EDRC: No	Yes	Yes	3, 5, 9	P1	High/High	Public Works Director	2-5 years	Village / USDA – RD Water & Waste Program / IEPA SRF – WPCLP	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 700 individuals). The City works hard to provide even the most critical of services to its residents, but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

EC	Extreme Cold	MS	Mine Subsidence
EH	Excessive Heat	SS	Severe Storm
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Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-22
Sherrard Hazard Mitigation Actions
(Sheet 5 of 5)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Purchase and install grounding systems at Village Hall, water tower, and water treatment plant to protect critical infrastructure (i.e., computers, electrical systems, HVAC, etc.) and improve infrastructure resilience, ensure continuity of operations, and mitigate risk to Community Lifelines.	SS	S&S	S&IP	Large SVI: 0.1121 CEJST: No EDRC: No	---	Yes	1, 3, 5, 9	P1	Medium/High	President / Village Board	2-5 years	Village	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a city of this size (approx. 700 individuals). The City works hard to provide even the most critical of services to its residents, but it's a struggle. Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

EC	Extreme Cold	MS	Mine Subsidence
EH	Excessive Heat	SS	Severe Storm
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-23
Sherrard CUSD #200 Hazard Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Purchase and install automatic emergency backup generators at District schools to establish resilient and reliable power supplies in order to maintain continuity of operations, ensure sustained functionality of all systems (i.e., heating, freezers, etc.) during extended power outage and mitigate risk to Community Lifelines.	EC, EH, EQ, F, MS, SS, SWS, T	S&S	S&IP	Large SVI: 0.1121 – 0.3081 CEJST: No	---	Yes	1, 3, 5, 9	P1	Medium/High	Superintendent School Board / Maintenance Supervisor	5 years	CUSD / USDA – RD Critical Facilities Programs / FEMA HMGP	New
Bury power lines to all District schools to establish a resilient and reliable power supply, limit service disruptions, and mitigate risk to Community Lifelines.	EC, EH, EQ, F, MS, SS, SWS, T	S&S	S&IP	Large SVI: 0.1121 – 0.3081 CEJST: No	---	Yes	1, 3, 5, 9	P1	Medium/High	Superintendent School Board / Maintenance Supervisor	5 years	CUSD / FEMA HMGP BRIC	New
Purchase and install grounding systems at each District building to protect critical infrastructure (i.e., computers, electrical systems, HVAC, etc.) and improve infrastructure resilience, ensure continued operations, and mitigate risk to Community Lifelines.	SS	S&S	S&IP	Large SVI: 0.1121 – 0.3081 CEJST: No	---	Yes	1, 3, 5, 9	P1	Medium/High	Superintendent School Board / Building & Grounds Supervisor	2-5 years	CUSD	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a small, rural school district of this size (serving approx. 9,165 individuals in a 171 square-mile area). Additional funding is necessary if implementation is to be achieved within the time frames specified.

Acronyms

Hazard(s) to be Mitigated:

EC	Extreme Cold	MS	Mine Subsidence
EH	Excessive Heat	SS	Severe Storm
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-23
Sherrard CUSD #200 Hazard Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Educate students and staff about the natural and man-made hazards that have the potential to impact the District and the proactive actions they can take to reduce their risks.	DR, EC, EH, EQ, F, MS, SS, SWS, T	---	E&A	Large SVI: 0.1121 – 0.3081 CEJST: No	---	---	6	P2/P4	Low/Low	Principals / Superintendent School Board	2-5 years	CUSD	New
Perform periodic, district-wide, multi-jurisdiction training on the District's Reunification Plan for police, fire, EMA, and District staff. This Plan outlines how students will be reunified with their parents/guardian in the event of a school crisis or emergency.	EQ, F, MS, SS, T	---	LP&R E&A	Large SVI: 0.1121 – 0.3081 CEJST: No	---	---	1, 4, 5	P2/P4	Low/High	Superintendent / School Board	5 years	CUSD	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

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Acronyms

Hazard(s) to be Mitigated:

EC	Extreme Cold	MS	Mine Subsidence
EH	Excessive Heat	SS	Severe Storm
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Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-24
Sherrard Community Fire Protection District Hazard Mitigation Actions
(Sheet 1 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
					New	Existing							
Identify dry hydrants and water wells within the District that can be used as filling stations to supply an uninterrupted flow of water to aid in fire suppression as necessary during natural hazard events.	DR, EQ, MS, SS, T	S&S	LP&R	Large SVI: 0.1121 – 0.3081 CEJST: No	---	---	1, 5, 7, 9	P2/P4	Low/Medium	Fire Chief	1 year	FPD	New
Identify alternate locations for District trucks, equipment, gear, etc. in the event a natural hazard incident impacts the fire station to ensure continued functionality of a Community Lifeline service.	DF, EC, EH, EQ, F, MS, SS, SWS, T	S&S	LP&R	Large SVI: 0.1121 – 0.3081 CEJST: No	---	---	1, 5, 7, 9	P2/P4	Low/Medium	Fire Chief	1 year	FPD	New
Evaluate the need for additional outdoor warning sirens within the District to maximize the system's effectiveness and establish Community Lifelines in areas without coverage.	SS, T	C	S&IP E&A	Large SVI: 0.1121 – 0.3081 CEJST: No	---	---	1	P1	Medium/High	Fire Chief / Board of Trustees	1-3 years	FPD	New
Make public information materials available to District residents that detail the risks to life and property associated with the natural hazards that impact the District and the proactive approaches they can take to reduce their risk.	DF, DR, EC, EH, EQ, F, MS, SS, SWS, T	---	E&A	Large SVI: 0.1121 – 0.3081 CEJST: No	---	---	6	P2/P4	Low/Medium	Fire Chief / Board of Trustees	2-5 years	FPD	New

§ Size refers to the general size of the population affected (i.e., small, medium, or large, while a Social Vulnerability Index (SVI) ranking of 0.6 or greater, a Climate and Economic Justice Screening Tool (CEJST) designation of "Yes", and/or an Economically Disadvantaged Rural Community (EDRC) designation of "Yes" identifies potentially underserved communities and/or socially vulnerable populations using the SVI, CEJST, and EDRC as described in Section 1.2.

† Identifies the most likely funding source to be pursued for the activity/project described. However, if funding is unavailable through the most likely or other suggested sources, then implementation of medium to large-scale activities/projects is unlikely due to the budgetary constraints experienced by a small rural, all-volunteer fire protection district of this size (serving approx. 3,500 individuals in a service area of 59 square miles). Additional funding is necessary if implementation is to be achieved.

Acronyms

Hazard(s) to be Mitigated:

EC	Extreme Cold	MS	Mine Subsidence
EH	Excessive Heat	SS	Severe Storm
EQ	Earthquake	SWS	Severe Winter Storm
F	Flood	T	Tornado

Community Lifelines to be Mitigated:

C	Communications	H&M	Health & Medical
E	Energy (Power & Fuel)	S&S	Safety & Security
FWS	Food, Water, Shelter	T	Transportation
HM	Hazardous Material		

Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
LP&R	Local Plans & Regulations	S&IP	Structure & Infrastructure Projects

Priority:

P1	High Priority	P3	Moderate Priority
P2	Significant Priority	P4	Important

Figure MIT-24
Sherrard Community Fire Protection District Hazard Mitigation Actions
(Sheet 2 of 2)

Activity/Project Description	Hazard(s) to be Mitigated	Community Lifeline(s) to be Mitigated	Type of Mitigation Activity	Population Affected (Size, SVI, CEJST, and/or EDRC)§	Reduce Effects of Hazard(s) on Buildings & Infrastructure: New	Reduce Effects of Hazard(s) on Buildings & Infrastructure: Existing	Goal(s) Met	Priority	Benefit-Cost Analysis	Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)†	Status
Post signage at fire station identifying it as an emergency shelter.	EC, EH, EQ, F, SS, SWS, T	---	E&A	Large SVI: 0.1121 – 0.3081 CEJST: No	---	---	1	P2/P4	Low/Medium	Fire Chief / Board of Trustees	1-3 years	FPD	New
Install hardening materials (i.e., shatter-proof/ shatter-resistant glass, etc.) at the fire station, a designated emergency shelter, to increase building resilience to natural hazards, maintain continuity of government/operations, protect staff and residents, and mitigate risk to Community Lifelines.	EC, EH, EQ, F, SS, SWS, T	FWS S&S	S&IP	Large SVI: 0.1121 – 0.3081 CEJST: No	---	---	1, 3, 5, 9	P1/P3	Medium/High	Fire Chief / Board of Trustees	2-5 years	FPD / FEMA BRIC HMGP / USDA – RD Critical Facilities Programs	New

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Type of Mitigation Activity:

E&A	Education & Awareness	NSP	Natural Systems Protection
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Priority:

P1	High Priority	P3	Moderate Priority
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5.0 PLAN MAINTENANCE

This section focuses on the Federal Emergency Management Agency (FEMA) requirements for maintaining and updating the Plan once it has been approved by FEMA and adopted by the participating jurisdictions. These requirements include:

- establishing the method and schedule for monitoring, evaluating, and updating the Plan;
- describing how the requirements of the Plan will be incorporated into existing planning mechanisms; and
- detailing how continued public input will be obtained during the plan maintenance process.

These requirements ensure that the Plan remains an effective and relevant document. The following provides a detailed discussion of each requirement.

5.1 MONITORING, EVALUATING & UPDATING THE PLAN

Outlined below is a method and schedule for monitoring, evaluating, and updating the Plan. This method allows the participating jurisdictions to make necessary changes and updates to the Plan and track the implementation and results of the mitigation actions that have been undertaken.

5.1.1 Monitoring and Evaluating the Plan

The Plan update will be monitored and evaluated by a Plan Maintenance Subcommittee on an annual basis. The Subcommittee will be composed of the participating jurisdictions who sought Plan approval and other key members of the Committee. The Mercer County Office of Emergency Management (OEM) via the Henry County OEM will chair the Plan Maintenance Subcommittee.

The Mercer County OEM will assume lead responsibility for monitoring and tracking the implementation status of the mitigation actions identified in the Plan update. It will be the responsibility of each Plan participant to provide the Mercer County OEM with an annual progress report on the status of their existing mitigation actions and identify whether any actions need to be modified. New mitigation actions may be added to the Plan during the annual monitoring and evaluation period or at any time during the plan maintenance cycle by contacting the Mercer County OEM and providing the appropriate information.

Monitoring & Evaluating

- A Plan Maintenance Subcommittee will be formed to monitor and evaluate the Plan update.
- The ***Plan update will be monitored and evaluated*** on an ***annual basis***.
- Each Plan participant will be responsible for providing an annual progress report on the status of their mitigation actions.
- Plan participants can add ***new mitigation actions*** to the Plan ***during the annual monitoring phase or by contacting*** the Mercer County OEM.

The Mercer County OEM together with the Plan Maintenance Subcommittee will also evaluate the Plan update on an annual basis to determine the effectiveness of the Plan at achieving its stated purpose and goals. In order to evaluate the effectiveness of the Plan update, the Subcommittee will review the mitigation actions that have been successfully implemented and determine whether the action achieved the identified goal(s) and had the intended result (i.e., losses were avoided, or the vulnerability of hazard-prone areas were reduced).

The Subcommittee will also ask each Plan participant to identify any significant changes in development or priorities that have occurred within the previous 12 months; whether any new plans, policies, regulations, or reports have been adopted; and if any hazard-related damages to critical facilities and infrastructure have been sustained.

In order to streamline the plan maintenance process, the Mercer County OEM will provide each Plan participant with a Plan Maintenance Checklist along with the necessary forms to complete and return. **Appendix M** contains a copy of the Checklist and associated forms.

The Mercer County OEM will then prepare a progress report detailing the results of the annual Plan monitoring and evaluation period and provide copies to the Subcommittee. The annual progress report will include:

- information on any hazard-related damages sustained by critical facilities and infrastructure within the planning area during the previous year.
- implementation status of the mitigation actions identified in the Mitigation Strategy.
- identification of any new mitigation actions proposed by the Plan participants.
- information on changes in development, priorities, and planning and regulatory capabilities for the Plan participants.
- identification of how information will be disseminated to stakeholders and constituents on the Plan and its progress in effort to seek continued public participation.

If any existing mitigation actions are modified or new mitigation actions are identified for the Plan participants, then Section 4.7 of the Mitigation Strategy will be updated, and the Plan update resubmitted to the Illinois Emergency Management Agency and Office of Homeland Security (IEMA-OHS) and FEMA for reference.

On an as needed basis the Mercer County OEM, in consultation with the Subcommittee, will evaluate requests from non-participating jurisdictions to "join" the Plan before the five-year update. Consideration will be given if certain conditions are met as outlined in Appendix D of *FEMA's Local Mitigation Planning Policy Guide.*

5.1.2 Updating the Plan

The Plan must be updated within five years of the of the Plan approval date indicated on the signed FEMA final approval letter. (This date can be found in Section 6, Plan Adoption.) This ensures that all the participating jurisdictions will remain eligible to receive federal grant funds to implement those mitigation actions identified in this Plan.

The Mercer County OEM via the Henry County OEM, with assistance from the Plan Maintenance Subcommittee, will be responsible for updating the

Updating the Plan

- The Mercer County OEM, with assistance from the Plan Maintenance Subcommittee, will be responsible for updating the Plan.
- The Plan ***must be updated within 5 years*** of the ***date of the final approval letter*** provided by FEMA.
- Once the Plan update has received FEMA/ IEMA-OHS approval, each participating jurisdiction ***must adopt the Plan to remain eligible to receive federal mitigation funds.***

Plan. The update will incorporate all of the information gathered during the monitoring and evaluation phase and will also include:

- a review of the Mitigation Strategy, including potential updates to the mitigation goals and prioritization methodology;
- an evaluation of whether additional natural or man-made hazards need to be addressed or included in the Plan;
- a review of new hazard data that may affect the Risk Assessment Section;
- identification of any changes in priorities within each participating jurisdiction; and
- identification of any changes in development that have occurred in hazard prone areas that would increase or decrease the participating jurisdictions' vulnerability.

A Planning Committee will be reformed to update the Plan and a public involvement strategy similar to the one employed for this Plan update will be implemented to ensure that the public and stakeholders have ample opportunities to become engaged and provide input during the development of the Plan update. In addition, any jurisdictions that did not take part in the previous Plan update may do so at this time. It will be the responsibility of these jurisdictions to provide all of the information needed to be integrated into the Plan update.

A public forum will be held to present the Plan update to the public for review and comment. The comments received at the public forum will be reviewed and incorporated into the Plan update. The Plan update will then be submitted to IEMA-OHS and FEMA for review and approval. ***Once the Plan update has received state and federal approval, FEMA requires that each of the participating jurisdictions adopt the Plan to remain eligible to receive federal funds to implement identified mitigation actions.***

5.2 Incorporating the Mitigation Strategy into Existing Planning Mechanisms

As part of the planning process, the Committee identified each participating jurisdiction's existing capabilities (i.e., existing authorities, policies, programs, technical information, etc.) and resources available to support or accomplish mitigation and reduce long-term vulnerability. **Figures PP-3** through **PP-16** identify the existing authorities, policies, programs, technical information, and resources available by capability type by jurisdiction. ***It will be the responsibility of each participating jurisdiction to incorporate, where applicable, the mitigation strategy and other information contained in the Plan update into the planning mechanisms identified for their jurisdiction.***

Adoption of this Plan update will trigger each participating jurisdiction to review and, where appropriate, integrate the Plan into other available planning mechanisms. The Plan Maintenance Subcommittee's annual review will help maintain awareness of the Plan among the participating jurisdictions and encourage active integration of the Plan into their day-to-day operations and planning mechanisms. Any time a mitigation action is slated for implementation by a participating jurisdiction, it will be integrated into their capital improvement plan/budget.

Based on conversations with the Committee, only Aledo has identified the need to adopt, review, and/or strengthen current policies or programs in the near future. Almost all of the participating jurisdictions (Joy, Keithsburg, Matherville, and Sherrard) have limited capabilities to integrate the mitigation strategy and other information contained in the Plan update into existing planning mechanisms. These jurisdictions are small in size and may not have the financial resources or trained personnel to develop planning mechanisms such as comprehensive plans or building and zoning ordinances.

5.3 CONTINUED PUBLIC INVOLVEMENT

The County and participating jurisdictions understand the importance of continued public involvement and will seek public input on the Plan update throughout the plan maintenance cycle. Any meetings held by the Plan Maintenance Subcommittee will be noticed and open to the public. Stakeholders and public will be encouraged to participate and provide feedback. Following distribution of the annual progress report, each participating jurisdiction will be encouraged to discuss the findings at their monthly board/council meetings to help maintain awareness of the Plan and encourage integration of the Plan in day-to-day operations.

Participating jurisdictions will also be encouraged to make the annual progress report available via social media and on their websites, as available, and at their offices. As the lead organization responsible for maintaining the Plan update, the Mercer County OEM via the Henry County OEM will also periodically post mitigation-related topics to social media including where to access the approved Plan, information on the hazards that have the potential to impact the County, interesting facts about each hazard, and no or low-cost actions that residents can take to reduce their risk from natural hazards.

A copy of the approved Plan will be maintained and available for review at the Mercer County Health Department and on the County's website. Individuals will be encouraged to provide feedback and submit comments for the next Plan update to the Mercer County OEM Office. The comments received will be compiled and included in the annual progress report and considered for incorporation into the next Plan update. Separate Committee meetings and a public forum will be held prior to the next Plan update submittal to ensure that the public and stakeholders have ample opportunity to become engaged, provide input during the development of the Plan update, and comment on the proposed revision to the Plan update.

6.0 Plan Adoption

The final step in the planning process is the adoption of the approved Plan update by each participating jurisdiction. Each jurisdiction must formally adopt the Plan to become or remain eligible for federal grant funds to implement mitigation actions identified in this Plan.

6.1 Plan Adoption Process

Before the Plan update could be adopted by the participating jurisdictions, it was made available for public review and comment through a public forum and comment period. Comments received were incorporated into the Plan update and the Plan was then submitted to the Illinois Emergency Management Agency and Office of Homeland Security and the Federal Emergency Management Agency (FEMA) for their review and approval.

Upon receipt of the Approval Pending Adoption (APA) letter from FEMA, the Plan update was presented to the County and participating jurisdictions for adoption. ***Each participating jurisdiction was required to formally adopt*** the Plan to become or remain eligible to receive federal grant funds to implement the mitigation actions identified in this Plan. Any jurisdiction that chose not to adopt the Plan update did not affect the eligibility of those who did.

Figure PA-1 identifies the participating jurisdictions and the date each formally adopted the Plan update. Signed copies of the adoption resolutions are located in **Appendix N**. FEMA signed the final approval letter on (Date) which began the five-year approval period and set the expiration date of (Date) for the Plan.

Figure PA-1
Plan Adoption Dates

Participating Jurisdiction	Plan Adoption Date

7.0 REFERENCES

Provided below is a listing, by section, of the resources utilized to create this document.

1.0 INTRODUCTION

1. Federal Emergency Management Agency. Data Visualization: Disaster Declarations for States and Counties. Database. <https://www.fema.gov/data-visualization-disaster-declarations-states-and-counties>.
2. Federal Emergency Management Agency. OpenFEMA Dataset: Disaster Declarations Summaries – V2. Excel Dataset. <https://www.fema.gov/openfema-dataset-disaster-declarations-summaries-v1>.
3. Federal Emergency Management Agency. Getting Started: Building Support for Mitigation Planning. FEMA 386-1. September 2002.
4. Illinois Emergency Management Agency and Office of Homeland Security. Mitigation Planning. 2023 Illinois Natural Hazard Mitigation Plan. October 2023. <https://iema.illinois.gov/content/dam/soi/en/web/iema/recovery/documents/plan-illmitigationplan.pdf>.

1.2 County Profile

1. Illinois Department of Commerce and Economic Opportunity. Community Profiles. Database. <https://app.locationone.com/areas/communities?organization=59eaba35bec80e09b4bbf0df&buildings:filters=%5B%5B%22railServed%22%2C%5B%22Y%22%5D%5D%5D&buildings:sort=sqft:high&sites:filters=%5B%5D&sites:sort=acres:high>.
2. Illinois Department of Public Health. IDPH Population Projections, Illinois, Chicago, and Illinois Counties by Age and Sex: July 1, 2015 to July 1, 2030 (2019 Edition). <https://dph.illinois.gov/content/dam/soi/en/web/idph/files/publications/population-projections-report-2010-2030.pdf>.
3. Illinois State Water Survey. Major Watersheds of Illinois. Map. 2011. <https://www.isws.illinois.edu/docs/default-source/maps/major-watersheds-illinois-2000-01.pdf?sfvrsn=b7aba970_2>.
4. Multi-Resolution Land Characteristics Consortium. National Land Cover Database Enhanced Visualization and Analysis Tool. <https://www.mrlc.gov/tools>.
5. United States Census Bureau. 2020 Census – Census Tract Reference Map. <https://www.census.gov/geographies/reference-maps/2020/geo/2020pl-maps/2020-census-tract.html>.
6. United States Census Bureau. Gazetteer Files. <https://www.census.gov/geographies/reference-files/time-series/geo/gazetteer-files.html>.
7. United States Census Bureau. American Community Survey. Data Profiles. <https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/>.

8. United States Department of Agriculture. National Agricultural Statistics Service. Census of Agriculture. 2017 State and County Profiles – Illinois. <https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Illinois/>.
9. United States Department of Agriculture. Census of Agriculture Historical Archive. <https://agcensus.library.cornell.edu/>.
10. United States Department of Agriculture. National Agricultural Statistics Service. Census of Agriculture. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. 2006. Agricultural Handbook 296. <https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051845.pdf>.
11. United States Department of Agriculture. Natural Resources Conservation Service. Soil Surveys by State. <https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/soil/soil-surveys-by-state>.

1.3 Land Use and Development Trends

1. United States Census Bureau. Explore Census Data. <https://data.census.gov/>.
2. United States Census Bureau. Illinois: Population of Counties by Decennial Census: 1900 to 1990. 1995.
3. United States Census Bureau. American Community Survey. Data Profiles. <https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/>.

2.0 PUBLIC INVOLVEMENT

1. Federal Emergency Management Agency. Local Mitigation Planning Policy Guide. FP 206-21-0002. April 19, 2022. <https://www.fema.gov/sites/default/files/documents/fema_local-mitigation-planning-policy-guide_042022.pdf>.

2.4 EXISTING CAPABILITIES

1. Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. Capability Assessment Worksheet. Form.

3.0 RISK ASSESSMENT

1. Changnon, Stanley A., et al. Climate Atlas of Illinois. Champaign, Illinois: Illinois State Water Survey, 2004.
2. Federal Emergency Management Agency. Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA 386-2. August 2001.
3. Illinois Department of Transportation. Illinois Roadway Crash Data. County Crash Statistics. <http://www.idot.illinois.gov/transportation-system/safety/Illinois-Roadway-Crash-Data>.
4. Illinois Emergency Management Agency and Office of Homeland Security. Mitigation Planning. 2023 Illinois Natural Hazard Mitigation Plan. October 2023. <https://iema.illinois.gov/content/dam/soi/en/web/iema/recovery/documents/plan-illmitigationplan.pdf>.

5. Illinois Emergency Management Agency and Office of Homeland Security. Preparedness. Weather. Severe Weather Preparedness Guide. February 2021. <https://www2.illinois.gov/iema/preparedness/documents/severeweatherpreparedness.pdf>

6. Illinois Environmental Protection Agency. Drinking Water Branch. Public Water Supply Systems Search. Database. <http://water.epa.state.il.us/dww/index.jsp>.

7. Illinois Environmental Protection Agency. Source Water Assessment Program Factsheets. Database. <http://dataservices.epa.illinois.gov/swap/factsheet.aspx>.

8. Illinois State Geological Survey. Landslide Inventory of Illinois. By Myrna M. Killey et al. Circular 534. 1985. <https://www.ideals.illinois.edu/items/43502>.

9. Kirschbaum, D.B., Adler, R., Hong, Y., et al. "A Global Landslide Catalog for Hazard Applications: Methods, Results, and Limitations." Natural Hazards 52, 561-575 (2010). <https://doi.org/10.1007/s11069-009-9401-4>.

10. Kirschbaum, D.B., Stanley, T., & Zhou, Y. "Spatial and Temporal Analysis of a Global Landslide Catalog." Geomorphology 249, 4-15 (2015). <https://doi.org/10.1016/j.geomorph.2015.03.016>.

11. Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. Capability Assessment Worksheet. Form.

12. Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. Critical Facilities & Infrastructure. Form.

13. Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. Critical Facilities Vulnerability Survey. Form.

14. Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. Drinking Water Supply Worksheet. Form.

15. Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. Identification of Severe Weather Shelters. Form.

16. Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. Natural Hazard Events Questionnaire. Form.

17. Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. Risk Priority Index Exercise. Form.

18. Midwestern Regional Climate Center. cli-MATE: Online Data Portal. Database. <https://mrcc.purdue.edu/CLIMATE/>.

19. Multi-Resolution Land Characteristics Consortium. National Land Cover Database Enhanced Visualization and Analysis Tool. <https://www.mrlc.gov/tools>.

20. National Aeronautics and Space Administration. Global Landslide Catalog. Cooperative Open Online Landslide Repository. <https://maps.nccs.nasa.gov/arcgis/apps/MapAndAppGallery/index.html?appid=574f26408683485799d02e857e5d9521>.

21. National Oceanic and Atmospheric Administration. National Centers for Environmental Information. COOP Data/Record of Climatological Observations Form. Database. <http://www.ncdc.noaa.gov/IPS/coop/coop.html>.

22. National Oceanic and Atmospheric Administration. National Centers for Environmental Information. Storm Events Database. Database. <https://www.ncdc.noaa.gov/stormevents/>.

23. National Oceanic and Atmospheric Administration. National Weather Service. National Weather Service Glossary. <https://w1.weather.gov/glossary/>.

24. National Oceanic and Atmospheric Administration. National Weather Service. Thunderstorms, Tornadoes, Lightning…Nature's Most Violet Storms. <https://www.weather.gov/media/owlie/ttl6-10.pdf>.

25. U.S. Geological Survey. U.S. Landslide Inventory and Interactive Map. Online Map Viewer. <https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=ae120962f459434b8c904b456c82669d>.

3.1 Severe Winter Storms

1. Illinois Emergency Management Agency and Office of Homeland Security. Mitigation. Winter Storms. <https://iema.illinois.gov/recovery/hazardinfo.html#Winter>.

2. Illinois Emergency Management Agency and Office of Homeland Security. Preparedness. Winter Storm Preparedness Guide. November 2021. <https://www2.illinois.gov/iema/Preparedness/Documents/winter_storm_preparedness_guidebook.pdf>

3. Illinois State Water Survey. Illinois Third Consecutive Severe Winter: 1978-1979. By Stanley A. Changnon, Jr., David Changnon and Phillis Stone. Report of Investigation 94. 1980. <https://www.isws.illinois.edu/pubdoc/RI/ISWSRI-94.pdf>.

4. Illinois State Water Survey. Record Winter Storms in Illinois, 1977-1978. By Stanley A. Changnon, Jr. and David Changnon. Report of Investigation 88. 1978. <https://www.isws.illinois.edu/pubdoc/RI/ISWSRI-88.pdf>.

5. Illinois State Water Survey. The Severe Winter of 1981-1982 in Illinois. By Steven D. Hilberg, Peter G. Vinzani, and Stanley A. Changnon, Jr. Report of Investigation 104. 1983. <https://www.isws.illinois.edu/pubdoc/RI/ISWSRI-104.pdf>.

6. Illinois State Water Survey. State Climatologist Office for Illinois. Glossary of Winter Weather Terms. <https://www.isws.illinois.edu/statecli/Winter/glossary.htm>.

7. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Types of Winter Weather. <https://www.nssl.noaa.gov/education/svrwx101/winter/types/>.

8. Ready.gov. Ready Kids. Winter Weather. <https://www.ready.gov/kids/disaster-facts/winter-weather>.

3.2 Severe Storms (Thunderstorms, Hail, Lightning & Heavy Rain)

1. National Oceanic and Atmospheric Administration. A Hail of a Storm: Hailstones Pack a Perilous (and Costly) Punch. August 2009.

2. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Hail Basics. <https://www.nssl.noaa.gov/education/svrwx101/hail/>.
3. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Hail Types. <https://www.nssl.noaa.gov/education/svrwx101/hail/types/>.
4. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Lightning Basics. <https://www.nssl.noaa.gov/education/svrwx101/lightning/>.
5. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Thunderstorm Basics. <https://www.nssl.noaa.gov/education/svrwx101/thunderstorms/>.
6. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Thunderstorm Types. <https://www.nssl.noaa.gov/education/svrwx101/thunderstorms/types/>.
7. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Damaging Winds Basics. <https://www.nssl.noaa.gov/education/svrwx101/wind/>.
8. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Damaging Winds Types. <https://www.nssl.noaa.gov/education/svrwx101/wind/types/>.
9. National Oceanic and Atmospheric Administration. National Weather Service. Safety. Cloud-to-Ground Lightning Flashes By State: 2009-2018. <https://www.weather.gov/media/safety/09-18Flashes_Flash_Density_State.pdf>.
10. National Oceanic and Atmospheric Administration. National Weather Service. Safety. Severe Thunderstorms. Watch vs. Warning. <https://www.weather.gov/safety/thunderstorm-ww>.
11. National Oceanic and Atmospheric Administration. National Weather Service. Storm Prediction Center. Frequently Asked Questions. How does the NWS define a severe thunderstorm? <https://www.spc.noaa.gov/faq/>.
12. The Tornado and Storm Research Organisation. The TORRO Hailstorm Intensity Scale. <https://www.torro.org.uk/research/hail/hscale>.
13. Vaisala. National Lightning Detection Network. Flash Density Map in Miles: 2009-2018.

3.3 EXTREME COLD

1. Centers for Disease Control and Prevention. Extreme Cold: A Prevention Guide to Promote Your Personal Health and Safety. <https://www.cdc.gov/disasters/winter/pdf/extreme-cold-guide.pdf>.
2. Centers for Disease Control and Prevention. Natural Disasters and Severe Weather. Prevent Hypothermia & Frostbite. <https://www.cdc.gov/disasters/winter/staysafe/hypothermia.html>.

3. Environmental Research. Clinical Outcomes of Temperature Related Injuries Treated in the Hospital Setting, 2011-2018. Lee S. Friedman, et al. 11 July 2020. <https://www.sciencedirect.com/science/article/abs/pii/S0013935120307775?via%3Dihub>.

4. Illinois Emergency Management Agency and Office of Homeland Security. Winter Storm Preparedness Guide. <https://www2.illinois.gov/iema/Preparedness/Documents/winter_storm_preparedness_guidebook.pdf>

5. National Oceanic and Atmospheric Administration. National Weather Service. During Extremely Cold Weather. <https://www.weather.gov/safety/cold-during>.

6. National Oceanic and Atmospheric Administration. National Weather Service. Wind Chill Chart. <https://www.weather.gov/safety/cold-wind-chill-chart>.

7. National Oceanic and Atmospheric Administration. National Weather Service. Wind Chill Questions. <https://www.weather.gov/safety/cold-faqs>.

8. National Oceanic and Atmospheric Administration. National Weather Service. Wind Chill Temperature Index. <https://www.weather.gov/media/safety/wind-chill-brochure.pdf>.

9. National Oceanic and Atmospheric Administration. National Weather Service. Winter Weather Resources and Frequently Asked Questions. <https://www.weather.gov/safety/cold-outreach>.

10. Ready.gov. Ready Kids. Winter Weather. <https://www.ready.gov/kids/disaster-facts/winter-weather>.

11. University of Illinois Chicago. UIC Today. Cold-Weather Accounts for almost all Temperature-Related Deaths. 18 August 2020. <https://today.uic.edu/cold-weather-accounts-for-almost-all-temperature-related-deaths>.

3.4 FLOODS

1. Code of Federal Regulations. Title 44 – Emergency Management and Assistance. Chapter 1 – Federal Emergency Management Agency, Department of Homeland Security. Subchapter B – Insurance and Hazard Mitigation. Part 59 – General Provisions. Subpart A – General. 59.1 – Definitions. <https://www.govinfo.gov/content/pkg/CFR-2017-title44-vol1/pdf/CFR-2017-title44-vol1-part59.pdf>.

2. Federal Emergency Management Agency. Adoption of Flood Insurance Rate Maps by Participating Communities. FEMA 495. September 2019. <https://www.fema.gov/sites/default/files/2020-07/fema_adoption-flood-insurance-rate-maps-participating-communities_bulletin.pdf>.

3. Federal Emergency Management Agency. Answers to Questions About the NFIP. FEMA F-084. March 2022. <https://agents.floodsmart.gov/sites/default/files/fema-answers-to-questions-about-the-NFIP.pdf>.

4. Federal Emergency Management Agency. Community Status Book Report Illinois. <http://www.fema.gov/cis/IL.pdf>.

5. Federal Emergency Management Agency. Design Guide for Improving Critical Facility Safety from Flooding and High Winds: Providing Protection to People and Buildings. FEMA 543. January 2007. <https://www.fema.gov/media-library/assets/documents/8811>.
6. Federal Emergency Management Agency. FEMA Flood Maps and Zones Explained. <https://www.fema.gov/blog/fema-flood-maps-and-zones-explained>.
7. Federal Emergency Management Agency. Flood Insurance Rate Map (FIRM). <https://www.fema.gov/glossary/flood-insurance-rate-map-firm>.
8. Federal Emergency Management Agency. Flood Map Service Center. Map Viewer. <https://msc.fema.gov/portal/home>.
9. Federal Emergency Management Agency. Flood Zones. <https://www.fema.gov/glossary/flood-zones>.
10. Federal Emergency Management Agency. How to Read a Flood Insurance Rate Map Tutorial. Updated June 2003.
11. Federal Emergency Management Agency. How to Read a Flood Map. <https://www.fema.gov/sites/default/files/documents/how-to-read-flood-insurance-rate-map-tutorial.pdf>.
12. Federal Emergency Management Agency. National Flood Insurance Program Community Rating System: A Local Official's Guide to Saving Lives, Preventing Property Damage, Reducing the Cost of Flood Insurance. FEMA B 573. 2018. <https://www.fema.gov/sites/default/files/documents/fema_community-rating-system_local-guide-flood-insurance-2018.pdf>.
13. Federal Emergency Management Agency. National Flood Insurance Program: Frequently Asked Questions Repetitive Loss. October 2005. <https://www.fema.gov/txt/rebuild/repetitive_loss_faqs.txt>.
14. Federal Emergency Management Agency. National Flood Insurance Program Terminology Index. <https://www.fema.gov/flood-insurance/terminology-index>.
15. Federal Emergency Management Agency. Participation in the NFIP. <https://www.fema.gov/glossary/participation-nfip#:~:text=To%20join%2C%20the%20community%20must,exceeds%20the%20minimum%20NFIP%20criteria.>.
16. Federal Emergency Management Agency. What is a flood map? <https://www.floodsmart.gov/all-about-flood-maps>.
17. Federal Emergency Management Agency. Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA 386-2. August 2001.
18. Federal Emergency Management Agency. National Flood Insurance Program. Answers to Tough Questions: Talking Points for Community Officials. September 2013.
19. Illinois Administrative Code. Title 17: Conservation. Chapter I: Department of Natural Resources. Subchapter h: Water Resources. Part 3706: Regulation of

Construction within Flood Plains. <https://www.dnr.illinois.gov/adrules/documents/17-3706.pdf>.

20. Illinois Department of Natural Resources. Office of Water Resources. 100-Year Floodplain in Illinois. Map. August 6 2009. <https://dnr.illinois.gov/waterresources/gismaps.html >.

21. Illinois Department of Natural Resources. Office of Water Resources. Draft River Stages in Illinois: Flood and Damage Data. August 2009. <https://dnr.illinois.gov/content/dam/soi/en/web/dnr/waterresources/documents/floodstagebook-report2009.pdf >.

22. Illinois Department of Natural Resources. Office of Water Resources. Local Floodplain Administrator's Manual. 2006. <https://dnr.illinois.gov/content/dam/soi/en/web/dnr/waterresources/documents/localfloodplainadministratorsmanualbluebook-2006.pdf>.

23. Illinois Department of Natural Resources. Office of Water Resources. Quick Guide to Floodplain Management in Illinois. 2001. <https://dnr.illinois.gov/content/dam/soi/en/web/dnr/waterresources/documents/resman-ilfpmquickguide.pdf>.

24. Illinois State Water Survey. The 1993 Flood on the Mississippi River in Illinois. By Nani G. Bhowmik, et al. Miscellaneous Publication 151. 1994. <https://www.isws.illinois.edu/pubdoc/MP/ISWSMP-151.pdf>.

25. Library of Congress. Congressional Research Service. National Flood Insurance Program: Selected Issues and Legislation in the 115th Congress. R45099. Update July 31, 2018. <https://crsreports.congress.gov/product/pdf/R/R45099>.

26. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Flood Basics. <https://www.nssl.noaa.gov/education/svrwx101/floods/>.

27. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Flood Types. <https://www.nssl.noaa.gov/education/svrwx101/floods/types/>.

28. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Severe Weather 101 – Frequently Asked Questions About Floods. <https://www.nssl.noaa.gov/education/svrwx101/floods/faq>.

29. National Oceanic and Atmospheric Administration. National Weather Service. Advanced Hydrologic Prediction Service. November 2021. <https://water.weather.gov/ahps>.

30. National Oceanic and Atmospheric Administration. National Weather Service. During a Flood. <https://www.weather.gov/safety/flood-during>.

31. National Oceanic and Atmospheric Administration. National Weather Service. Floods the Awesome Power. <https://www.weather.gov/media/jetstream/tstorms/floods_booklet.pdf>.

32. National Oceanic and Atmospheric Administration. National Weather Service. Flood Warning vs. Watch. <https://www.weather.gov/safety/flood-watch-warning>.

33. U.S. Army Corps of Engineers. RiverGages.com <https://rivergages.mvr.usace.army.mil/WaterControl/new/layout.cfm>.

34. U.S. Code. Title 42 – The Public Health and Welfare. Chapter 50 – National Flood Insurance. Subchapter III – Coordination of Flood Insurance with Land-Management Programs in Flood-Prone Areas. Section 4106 – Nonparticipation in Flood Insurance Program. <http://uscode.house.gov/search/criteria.shtml>.

35. U.S. Geological Survey. The 1973 Mississippi River Basin Flood: Compilation and Analyses of Meteorologic, Streamflow, and Sediment Data. By Edwin H. Chin et. al. Geological Survey Professional Paper 937. 1975. 12 March 2019 <https://pubs.usgs.gov/pp/0937/report.pdf>.

36. U.S. Geological Survey. Floods of December 1982 to May 1983 in the Central and Southern Mississippi River and the Gulf of Mexico Basins. By Roy B. Stone and R.H. Bingham. U.S. Geological Survey Water-Supply Paper 2362. 12 March 2019 <https://pubs.usgs.gov/wsp/2362/report.pdf>.

37. U.S. Geological Survey. Floods of March-May 1965 in the Upper Mississippi River Basin. By D. B. Anderson and I. L. Burmeister. Geological Survey Water-Supply Paper 1850-A. 12 March 2019 <https://pubs.usgs.gov/wsp/1850a/report.pdf>.

3.5 EXCESSIVE HEAT

1. Centers for Disease Control and Prevention. National Environmental Public Health Tracking. Extreme Heat. <https://ephtracking.cdc.gov/showClimateChangeExtremeHeat.action>.

2. Centers for Disease Control and Prevention. Natural Disasters and Severe Weather. FAQs. <https://www.cdc.gov/disasters/extremeheat/faq.html>.

3. Centers for Disease Control and Prevention. Natural Disasters and Severe Weather. Warning Signs and Symptoms. <https://www.cdc.gov/disasters/extremeheat/warning.html>.

4. National Oceanic and Atmospheric Administration. National Weather Service. Heat Index. <https://www.weather.gov/safety/heat-index>.

5. National Oceanic and Atmospheric Administration. National Weather Service. Heat Watch vs. Warning. <https://www.weather.gov/safety/heat-ww>.

6. National Oceanic and Atmospheric Administration. National Weather Service. Heat Wave: A Major Summer Killer. Brochure. <https://www.weather.gov/media/owlie/heatwave.pdf>.

7. North Carolina Cooperative Extension Service. Heat Stress Disorders. <https://content.ces.ncsu.edu/heat-stress-disorders>.

8. United States Environmental Protection Agency. Excessive Heat Events Guidebook. June 2006. <https://www.epa.gov/sites/production/files/2016-03/documents/eheguide_final.pdf>.

3.6 Tornadoes

1. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Tornado Basics. <https://www.nssl.noaa.gov/education/svrwx101/tornadoes/>.

2. National Oceanic and Atmospheric Administration. National Severe Storms Laboratory. Frequently Asked Questions about Tornadoes. <https://www.nssl.noaa.gov/education/svrwx101/tornadoes/faq/>.

3. National Oceanic and Atmospheric Administration. National Weather Service. Safety Tornado Watch vs. Warning. <https://www.weather.gov/safety/tornado-ww>.

4. National Oceanic and Atmospheric Administration. Storm Prediction Center. The Online Tornado FAQ: Frequently Asked Questions about Tornadoes. By Roger Edwards. <https://www.spc.noaa.gov/faq/tornado/>.

5. National Oceanic and Atmospheric Administration. Storm Prediction Center. Fujita Tornado Damage Scale. Figure. By Roger Edwards. <https://www.spc.noaa.gov/faq/tornado/f-scale.html>.

6. National Oceanic and Atmospheric Administration. Storm Prediction Center. Enhanced F Scale for Tornado Damage. Figure. By Roger Edwards. <https://www.spc.noaa.gov/faq/tornado/ef-scale.html>.

3.7 Drought

1. Illinois State Water Survey. State of Illinois Drought Preparedness and Response Plan. Adopted by the State Water Plan Committee October 2, 2011. <https://www.isws.illinois.edu/hilites/drought/archive/2011/docs/St_Ill_Drought_Plan_2011.pdf>.

2. Illinois State Water Survey. Department of Energy and Natural Resources. The 1988-1989 Drought in Illinois: Causes, Dimensions, and Impacts. Research Report 121. By Peter J. Lamb, Scientific Editor. 1992. <https://www.isws.illinois.edu/pubdoc/RR/ISWSRR-121.pdf>.

3. Illinois State Water Survey. Illinois State Climatologist. Moderate Drought in Western Illinois. 30 August 2013. <https://climateillinois.wordpress.com/2013/08/>.

4. National Drought Mitigation Center. Drought Basics. <https://drought.unl.edu/Education/DroughtBasics.aspx>.

5. National Drought Mitigation Center. Types of Drought. <https://drought.unl.edu/Education/DroughtIn-depth/TypesofDrought.aspx>.

6. National Integrated Drought Information System. U.S. Drought Portal. U.S. Drought Monitor. <https://www.drought.gov/drought/data-maps-tools/current-conditions>.

7. National Oceanic and Atmospheric Administration. National Centers for Environmental Information. Billion-Dollar Weather and Climate Disasters: Mapping. Database. <https://www.ncdc.noaa.gov/billions/mapping>.

8. National Oceanic and Atmospheric Administration. National Weather Service. Safety. Understand Drought and Know How to Respond. <https://www.weather.gov/safety/drought>.

9. National Oceanic and Atmospheric Administration. National Weather Service. Safety. Drought Safety. Drought Types. <https://www.weather.gov/safety/drought-types>.

10. United State Department of Agriculture. USDA Designates Counties in Illinois as Agricultural Disaster Areas. Release No 0281.05. 27 July 2005.

11. United State Department of Agriculture. Agriculture Secretary Vilsack Announces New Drought Assistance, Designates an Additional 218 Counties as Primary Natural Disaster Areas. Release No. 0260.12. 1 August 2012. <https://www.usda.gov/media/press-releases/2012/08/01/agriculture-secretary-vilsack-announces-new-drought-assistance>.

12. United State Department of Agriculture. Farm Service Agency. USDA Designated 44 Counties in Illinois as Primary Natural Disaster Areas. Release No. 0150.11. 2 November 2011. <https://www.fsa.usda.gov/FSA/printapp?fileName=ed_20111102_rel_0150.html&newsType=ednewsrel>.

13. United State Department of Agriculture. Farm Service Agency. USDA Designated 44 Counties in Iowa as Primary Natural Disaster Areas with Assistance to Farmers and Ranchers in Adjacent States. Release 0201.13. 12 December 2013.

14. United States Department of Agriculture. National Agricultural Statistics Service. Census of Agriculture. 2017 State and County Profiles – Illinois. <https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Illinois/>.

15. United States Department of Agriculture. Census of Agriculture Historical Archive. <https://agcensus.library.cornell.edu/>.

16. United States Department of Agriculture. National Agricultural Statistics Service. 2017 Census of Agriculture. Table 1. County Summary Highlights: 2017. <https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/Illinois/>.

17. United States Department of Agriculture. National Agricultural Statistics Service. 2017 Census of Agriculture. Table 2. Market Value of Agricultural Products Sold Including Direct Sales: 2017 and 2012. <https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_County_Level/Illinois/>.

18. United States Department of Agriculture. Census of Agriculture Historical Archive. Table 1. County Summary Highlights: 2012. 13 March 2019 <https://agcensus.library.cornell.edu/wp-content/uploads/2012-Illinois-st17_2_001_001.pdf>.

19. United States Department of Agriculture. Census of Agriculture Historical Archive. Table 2. Market Value of Agricultural Products Sold Including Direct Sales: 2012 and 2007. <https://agcensus.library.cornell.edu/wp-content/uploads/2012-Illinois-st17_2_002_002.pdf>.

20. United States Department of Agriculture. National Agricultural Statistics Service. Data & Statistics. Quick Stats. Quick Stats Lite. Database. <https://www.nass.usda.gov/Quick_Stats/Lite/>.
21. United States Drought Monitor. U.S. Drought Monitor. Map. <https://droughtmonitor.unl.edu/>.
22. United States Drought Monitor. Drought Classification. <https://droughtmonitor.unl.edu/About/AbouttheData/DroughtClassification.aspx >.
23. United States Drought Monitor. What is the U.S. Drought Monitor? Brochure. < https://droughtmonitor.unl.edu/data/docs/USDM_FSA_fact_sheet.pdf >.
24. World Meteorological Organization. Handbook of Drought Indicators and Indices. <https://library.wmo.int/doc_num.php?explnum_id=3057 .

3.8 Earthquakes

1. Atkinson, William. The Next New Madrid Earthquake: A Survival Guide for the Midwest. Carbondale, Illinois: Southern Illinois University Press, 1989.
2. EPRI, U.S. Department of Energy, and U.S. Nuclear Regulatory Commission. Technical Report: Central and Eastern United States Seismic Source Characterization for Nuclear Facilities. 2012. <http://www.ceus-ssc.com/Report/Downloads.html>.
3. Federal Emergency Management Agency. Hazus Estimated Annualized Earthquake Losses for the United States. FEMA P-366. April 2017. <https://www.fema.gov/sites/default/files/2020-07/fema_earthquakes_hazus-estimated-annualized-earthquake-losses-for-the-united-states_20170401.pdf>.
4. Illinois State Geological Survey. Handbook of Illinois Stratigraphy. By H. B. Willman, et. al. Bulletin 95. 1975. <http://hdl.handle.net/2142/35115>.
5. Illinois State Geological Survey. Seismicity of Illinois. By Paul C. Heigold and Timothy H. Larson. Environmental Geology Notes 133. 1990. 18 March 2019 <http://hdl.handle.net/2142/78950>.
6. Illinois State Geological Survey. Structural Features in Illinois. By W. John Nelson. Bulletin 100. 1995. <https://www.ideals.illinois.edu/items/43593>.
7. Illinois State Geological Survey. Earthquakes In Illinois: 1795 – 2015. Map.
8. Illinois State Geological Survey. Earthquake Occurrence in Illinois: An Earthquake Every Year. Fact Sheet. 1995-3. <https://www.isgs.illinois.edu/sites/isgs/files/files/qk-fct-occur.pdf>.
9. Illinois State Geological Survey. Northern Illinois Earthquakes: Small Quake Shakes the Area. Fact Sheet. 1999-1. <https://www.isgs.illinois.edu/sites/isgs/files/files/eq-fct-nrth.pdf>.
10. Illinois State Geological Survey. Wabash Valley Earthquakes: A Dozen Moderate Quakes in a Century. Fact Sheet. 1996-1. <https://www.isgs.illinois.edu/sites/isgs/files/files/eq-fct-wabash.pdf>.

11. Incorporated Research Institutions for Seismology. How Often Do Earthquakes Occur? Fact Sheet. June 2011. <https://www.iris.edu/hq/inclass/fact-sheet/how_often_do_earthquakes_occur>.
12. Louie, John N. University of Nevada, Reno. Nevada Seismological Lab. Earthquake Effects in Kobe, Japan. <https://sites.google.com/view/louie-class-geol100/earthquake-effects-in-kobe-japan>.
13. Marshak, S., W. J. Nelson and J. H. McBride. “Phanerozoic strike-slip faulting in the continental interior platform of the United States: examples from the Laramide Orogen, Midcontinent, and Ancestral Rocky Mountains.” Geological Society, London, Special Publications 210 (2003): 159-184.
14. Michigan Technological University. UPSeis. Earthquake Magnitude Scale. <http://www.geo.mtu.edu/UPSeis/magnitude.html>.
15. Michigan Technological University. UPSeis. Modified Mercalli Intensity Scale. <http://www.geo.mtu.edu/UPSeis/Mercalli.html>.
16. Missouri State Emergency Management Agency. Earthquake Intensity Map. Map. .
17. University of Alaska Fairbanks. Alaska Earthquake Center. Earthquake Magnitude Classes. <https://earthquake.alaska.edu/earthquake-magnitude-classes>.
18. University of Memphis. Center for Earthquake Research and Information. New Madrid Earthquake Catalog Search. Database. <http://folkworm.ceri.memphis.edu/catalogs/html/cat_nm.html>.
19. U.S. Geological Survey. 1811 – 1812 New Madrid, Missouri Earthquakes. <https://www.usgs.gov/programs/earthquake-hazards/science/1811-1812-new-madrid-missouri-earthquakes>.
20. U.S. Geological Survey. Earthquake Hazards Program. <https://www.usgs.gov/glossary/earthquake-hazards-program>.
21. U S. Geological Survey. Earthquakes. By Kay M. Shedlock and Louis C. Pakiser. 1995. <https://pubs.usgs.gov/gip/earthq1/index.html>.
22. U.S. Geological Survey. Earthquakes in the Central United States – 1699-2002. By Russell L. Wheeler, et. al. U.S. Geological Survey Geologic Investigations Series I-2812. Version 1.0. 24 November 2003. <https://pubs.usgs.gov/imap/i-2812/>.
23. U.S. Geological Survey. Earthquakes in the Central United States – 1699-2002: Earthquake Catalog. By Russell L. Wheeler, et. al. U.S. Geological Survey Geologic Investigations Series I-2812. 24 November 2003. <https://pubs.usgs.gov/imap/i-2812/catalog.txt>.
24. U.S. Geological Survey. Earthquakes in the Central United States – 1699 – 2010. Supersedes Geologic Investigations Series I-2812. By Richard L. Dart and Christina M. Volpi. 2010. <https://pubs.usgs.gov/gip/115/>.
25. U.S. Geological Survey. Earthquakes in the Central United States – 1699 – 2010: Updatecatalog. 2010. <https://pubs.usgs.gov/gip/115/downloads/GIP115_data/Updatecatalog.txt>.

26. U.S. Geological Survey. M 2.9 – 3km WNW of Lake in the Hills, Illinois. <https://earthquake.usgs.gov/earthquakes/eventpage/us10001qrx/executive>.
27. U.S. Geological Survey. M 3.2 – 1km SSW of Lyons, Illinois. <https://earthquake.usgs.gov/earthquakes/eventpage/usb000ksfx/executive>.
28. U.S. Geological Survey. M 3.8 – 2 km NW of Lily Lake, Illinois. <https://earthquake.usgs.gov/earthquakes/eventpage/usp000h751#executive>.
29. U.S. Geological Survey. M 4.2 – 12 km NW of Dayton, Illinois. <https://earthquake.usgs.gov/earthquakes/eventpage/usp000cz1k#executive>.
30. U.S. Geological Survey. M 5.2 – 7km ESE of Claremont, Illinois. <https://earthquake.usgs.gov/earthquakes/eventpage/nm603116#executive>.
31. U.S. Geological Survey. M 5.2 – 7km NNE of Bellmont, Illinois. <https://earthquake.usgs.gov/earthquakes/eventpage/nm606657#executive>.
32. U.S. Geological Survey. Moment magnitude, Richter Scale - what are the different magnitude scales, and why are there so many? <https://www.usgs.gov/faqs/moment-magnitude-richter-scale-what-are-different-magnitude-scales-and-why-are-there-so-many>.
33. U.S. Geological Survey. Nearly Half of Americans Exposed to Potentially Damaging Earthquakes. 10 August 2015. <https://www.usgs.gov/news/nearly-half-americans-exposed-potentially-damaging-earthquakes>.
34. U.S. Geological Survey. Search Earthquake Catalog. Database. <https://earthquake.usgs.gov/earthquakes/search/>.
35. U.S. Geological Survey. Seismicity of the United States, 1568-1989 (Revised). By C.W. Stover and J.L. Coffman. U.S. Geological Survey Professional Paper 1527. 1993. <https://pubs.er.usgs.gov/publication/pp1527>.
36. U.S. Geological Survey. The Modified Mercalli Intensity Scale. <https://www.usgs.gov/programs/earthquake-hazards/modified-mercalli-intensity-scale>.
37. U.S. Geological Survey. The Science of Earthquakes. By Lisa Wald. <https://earthquake.usgs.gov/learn/kids/eqscience.php>.
38. U.S. Geological Survey. The Severity of an Earthquake. <https://pubs.usgs.gov/gip/earthq4/severitygip.html>.
39. U.S. Geological Survey. United States: Magnitude 7+. <https://www.usgs.gov/programs/earthquake-hazards/lists-maps-and-statistics>.
40. U.S. Geological Survey. What is a fault and what are the different types? <https://www.usgs.gov/faqs/what-fault-and-what-are-different-types>.
41. U. S. Geological Survey. Where do earthquakes occur? <https://www.usgs.gov/faqs/where-do-earthquakes-occur?qt-news_science_products=7#qt-news_science_products>.
42. U.S. Nuclear Regulatory Commission. Magnitude/Intensity Comparison. <https://www.nrc.gov/docs/ML1821/ML18214A882.pdf>.

3.9 LEVEE FAILURES

1. Federal Emergency Management Agency. Commonly Used Terms and Acronyms for Levee Systems. <https://www.fema.gov/sites/default/files/2020-08/fema_commonly-used-terms-acronyms-levee-system.pdf>
2. Federal Emergency Management Agency. Factsheet: What is a Levee? <https://www.fema.gov/sites/default/files/2020-08/fema_what-is-a-levee_fact-sheet_0512.pdf>.
3. Federal Emergency Management Agency. Glossary of Frequently Used Terms for Levee Systems. September 2008. <https://www.cityofconcord.org/DocumentCenter/View/473/FEMA---Glossary-Used-with-Levee-Systems-PDF?bidId=>.
4. Illinois Association for Floodplain and Stormwater Management. Why the Concern with Levees? They're Safe, Right? By Bryan Martindale and Paul Osman. 15 September 2007. <https://www.illinoisfloods.org/news-entry/6/why-the-concerns-with-levees-they-re-safe-right>.
5. Illinois Association of Drainage Districts. FAQs. <http://iadd.info/?page_id=47>.
6. Illinois Compiled Statutes. Chapter 70: Special Districts. Act 605: Illinois Drainage Code. <http://www.ilga.gov/legislation/ilcs/ilcs5.asp?ActID=869&ChapterID=15>.
7. Illinois Department of Natural Resources. Office of Water Resources. Draft River Stages in Illinois: Flood and Damage Data. August 2009. <https://dnr.illinois.gov/content/dam/soi/en/web/dnr/waterresources/documents/flood stagebook-report2009.pdf >.
8. Illinois State Water Survey. The 1993 Flood on the Mississippi River in Illinois. By Nani G. Bhowmik, et al. Miscellaneous Publication 151. 1994. <https://www.isws.illinois.edu/pubdoc/MP/ISWSMP-151.pdf>.
9. U.S. Army Corps of Engineers. Rock Island District. Levee Safety Program. Levees. <https://www.mvr.usace.army.mil/Missions/Flood-Risk-Management/Levee-Safety-Program/Levees/>.
10. U.S. Army Corps of Engineers. Rock Island District. Levee Safety Program. Public Law 84-99 Levees in the Rock Island District. <https://www.mvr.usace.army.mil/Missions/Flood-Risk-Management/Levee-Safety-Program/Public-Law-84-99-Program/Public-Law-84-99-Levees/>.
11. U.S. Army Corps of Engineers. Rock Island District. Levee Safety Program. Terms & Definitions. 18 March 2019 <https://www.mvr.usace.army.mil/Missions/Flood-Risk-Management/Levee-Safety-Program/Levees/Terms-Definitions/>.
12. U.S. Army Corps of Engineers. National Levee Database. Database. <https://levees.sec.usace.army.mil/#/>.

3.10 DAM FAILURES

1. Association of State Dam Safety Officials. Failures and Incidents at Dams. <https://damsafety.org/dam-failures>.

2. Federal Emergency Management Agency. Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams. April 2004. <https://www.ferc.gov/sites/default/files/2020-04/fema-333.pdf>.
3. Federal Emergency Management Agency. Multi Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy. 1997.
4. Federal Emergency Management Agency. Risk Prioritization Tools for Dams: Users Manual. By URS Group, Inc. 3 March 2008. <https://damsafety.org/sites/default/files/files/RiskPrioritizationManual2008.pdf>.
5. Illinois Administrative Code. Title 17: Conservation. Chapter I: Department of Natural Resources. Subchapter h: Water Resources. Part 3702: Construction and Maintenance of Dams. Section 3702.30 Applicability. <http://www.ilga.gov/commission/jcar/admincode/017/017037020000300R.html>.
6. National Oceanic and Atmospheric Administration. Report to Administrator, NOAA, on Buffalo Creek (West Virginia) Disaster, 26 February 1972. 17 April 1972. <https://www.weather.gov/media/publications/assessments/Buffalo%20Creek%20WV%20Disaster%20February%201972.pdf>.
7. Stanford University. National Performance of Dams Program. NPDP Dam Incidents Database. Database. <http://npdp.stanford.edu/dam_incidents>.
8. Stanford University. National Performance of Dams Program. NPDP Dams Database. Database. <http://npdp.stanford.edu/dams_database>.
9. U.S. Army Corps of Engineers. Engineering and Design: Safety of Dams – Policy and Procedures. ER 1110-2-1156. 31 March 2014. <https://www.publications.usace.army.mil/USACE-Publications/Engineer-Regulations/>.
10. U.S. Army Corps of Engineers. National Inventory of Dams. Database. < https://nid.usace.army.mil/#/>.
11. U.S. Department of Labor. Mine Safety and Health Administration. Slurry Spill Suffering: The Buffalo Creek Flood. 14 March 2019.
12. U.S. Department of Labor. Mine Safety and Health Administration. Buffalo Creek Mine Disaster 50th Anniversary. 2022. <https://www.msha.gov/buffalo-creek-mine-disaster-50th-anniversary>.
13. West Virginia Archives and History. The Buffalo Creek Flood and Disaster: Official Report from the Governor's Ad Hoc Commission of Inquiry. 1973. <http://129.71.204.160/history/disasters/buffcreekgovreport.html>.

3.11 MINE SUBSIDENCE

1. Illinois Compiled Statutes. Chapter 215: Insurance. Act 5: Illinois Insurance Code. Article XXXVIIIA – Mine Subsidence Insurance. <http://www.ilga.gov/legislation/ilcs/ilcs4.asp?DocName=021500050HArt%2E+XXXVIIIA&ActID=1249&ChapterID=22&SeqStart=155300000&SeqEnd=157000000>.

2. Illinois Department of Natural Resources. Illinois Coal Annual Statistical Report. 2021. <https://www2.illinois.gov/dnr/mines/Documents/Annual%20Statistical%20Reports/asr2021.pdf>.
3. Illinois Mine Subsidence Insurance Fund. Detecting Damage. <https://www.imsif.com/about-mine-subsidence/detecting-damage>.
4. Illinois Mine Subsidence Insurance Fund. History of Mining in Illinois. <https://www.imsif.com/about-mine-subsidence/history-of-mining-in-illinois>.
5. Illinois Mine Subsidence Insurance Fund. How to Obtain Mine Subsidence Insurance. <https://www.imsif.com/about-mine-subsidence-insurance/how-to-obtain-mine-subsidence-insurance>.
6. Illinois Mine Subsidence Insurance Fund. Illinois Mine Subsidence Insurance Fund Historical Record. By Kathleen A. Moran. 2017. <https://www.imsif.com/images/files/HistoricalRecord.pdf>.
7. Illinois Mine Subsidence Insurance Fund. Mission Statement. <https://www.imsif.com/about-imsif/mission-statement>.
8. Illinois Mine Subsidence Insurance Fund. Types of Mine Subsidence. <https://www.imsif.com/about-mine-subsidence/types-of-mine-subsidence>.
9. Illinois State Geological Survey. Coal-Illinois' Black Treasure. 2004. <https://www.ideals.illinois.edu/items/110036>.
10. Illinois State Geological Survey. Coal Mines in Illinois (ILMINES). Online Map Viewer. <https://ilmineswiki.web.illinois.edu/wiki/ILMINES>.
11. Illinois State Geological Survey. County Coal Data and Maps. <https://ilmineswiki.web.illinois.edu/wiki/County_Coal_Data>.
12. Illinois State Geological Survey. Karst Landscapes of Illinois: Dissolving Bedrock and Collapsing Soil. <http://www.isgs.illinois.edu/outreach/geology-resources/karst-landscapes-illinois-dissolving-bedrock-and-collapsing-soil>.
13. Illinois State Geological Survey. Mine Subsidence in Illinois: Facts for Homeowners. By Robert A. Bauer. 2013. 2nd Edition. Circular 569. <http://library.isgs.illinois.edu/Pubs/pdfs/circulars/c569-2013.pdf>.
14. Illinois State Geological Survey. Planned Coal Mine Subsidence in Illinois: A Public Information Booklet. By Robert A. Bauer. 2008. Circular 573. <http://library.isgs.illinois.edu/Pubs/pdfs/circulars/c573.pdf>.
15. Illinois State Geological Survey. The Proximity of Underground Mines to Urban and Developed Lands in Illinois. By Christopher P. Korose, Andrew G. Louchios, and Scott D. Elrick. 2009. Circular 575. <https://www.isgs.illinois.edu/sites/isgs/files/files/c575.pdf>
16. National Mining Association. Facts About Coal and Minerals. 2020. <https://nma.org/wp-content/uploads/2016/11/factbook2020.pdf>.

17. United States Geological Survey. Mineral Industry Surveys: Directory of Active Metal and Industrial Mineral Underground Mines in the United States in 2015. 2015. <file:///C:/Users/abostwick/Downloads/dir-2015-ugmin.pdf>.

4.0 MITIGATION STRATEGY

1. Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. Existing Mitigation Project/Activity Status. Form.

2. Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. Hazard Mitigation Projects. Form.

Appendix A

Attendance Sheet

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

October 20, 2022

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Callie Smith	American Environmental	Environmental Analyst
2.	Andrea Bostwick-Campbell	American environmental	EMS Manager
3.	SHARON REASON	Mayor - City of Keithsburg	Mayor
4.	Cathi Easley	Supervisor Rivoli Township	Supervisor
5.	Janet Holmberg	Mercer Manor	Administrator
6.	Linda Sarabasa	GMC Aledo Emergency Management	ED Manager
7.	JUSTIN BLASER	CITY OF ALEDO / ALEDO FIRE	PUBLIC WORKS
8.	Dusty Terrill	Mercer Co. Sheriff	Sheriff
9.	Tim Arbet	Mercer Co. Board	Board Member
10.	Jon Barnhouse	Genesis Ambulance/Joy Fire	Paramedic
11.	Sara Blaser	Mercer County	County Clerk
12.			
13.			
14.			
15.			
16.			

Attendance Sheet

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

October 20, 2022

	Name (Please Print)	*Representing (Jurisdiction/Organization)*	*Title*
1.	Angie Litterst	Mercer County – Office of EM	Director
2.	Carla Ewing	Mercer County Health Dept.	Administrator
3.	Josh Frieden	Mercer County Board	Chairman
4.	Paula Rath	Sherrard/Sherrard Fire	Mayor Pro Tem
5.	John Retherford	Millersburg Twp	Road Commissioner
6.	Tiffany Newswander	Mercer Twp/Eliza/Duncan/Perryton	Assessor
7.	Doris Dixon	New Boston/Millersburg	Assessor
8.	Nick Seefeld	City of Aledo	Lieutenant
9.			
10.			
11.			
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14.			
15.			
16.			

Attendance Sheet

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

March 15, 2023

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Angie Litterst	Mercer County ~~Health~~ Health Dept	~~Administrator~~ Administrator
2.	Jeff Simpson	Seaton Fire / Ohio Grove Twp	Trustee / Road Commissioner
3.	Laurie Epperly	Richland Grove/Preemption/Rivoli	Township Assessor
4.	JUSTIN BLASER	CITY OF ALEDO	PUBLIC WORKS
5.	Tony Myers	ALEDO FIRE DEPT	FIRE CHIEF
6.	Dustin Marston	Bay Island Drainage	Chairman
7.	Gwen Pritchett	Village of Joy	Village Clerk
8.	Andrea Bostwick-Campbell	American Environmental	EMS Manager
9.			
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16.			

Attendance Sheet

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

March 15, 2023

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	SHARON REASON	CITY of KEITHSBURG	Mayor
2.	Matt Lower	Mercer County Highway	Highway Adm.
3.	Callie Smith	AEC	Environmental Analyst
4.	Mat Schrepple	Henry County OEM	Emergency Mgmt.
5.	[illegible]	[illegible] Fire	Chief
6.	Jim Morrisen	Viola Fire	Chief
7.	Harvey [illegible]	[illegible] Twp	RC
8.	Bobby Smith	Bay Island Drainage	Commisioner
9.	Renee Schroth	Genesis EMS	PARAMEDIC
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Attendance Sheet

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

June 21, 2023

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Jim Morrison	Viola Fire / Viola Village	Fire Chief / Designated for The Village
2.	Callie Smith	AEC	Environmental Analyst
3.	Trevor Fisk	Aledo PD	Chief
4.	Larry Adams	Village of Matherville	Mayor
5.	Larry Adams	Preemption Twp.	Supervisor
6.	Bobby Smith	Bay Island Drainage	Commissioner
7.	Jake Elliott	Bay Island Drainage	Commissioner
8.	Mat Schnepple	Henry/Mercer OEM	Director
9.	Jon Barnhouse	Genesis Ambulance / Joy Fire	Paramedic/Captain
10.	Stephanie Dobbeleare	Village of Sherrard Trustee	Trustee
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Attendance Sheet

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

June 21, 2023

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Angie Litterst	Mercer Co Health Dept	Administrator
2.	David Flickinger	Matherville Fire	Chief
3.	Patti Mitchell	Aledo Police Dept	Admin Assist.
4.	Dustin Martin	Bay Island Drainage	Chairman
5.	Andrea Bostwick-Campbell	AEC	EMS Manager
6.	Gwen Pritchett	Joy IL	Village Clerk
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Attendance Sheet

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

September 13, 2023

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Callie Smith	AEC	Environmental Analyst
2.	JESSE BEWLEY	VIOLA	CHIEF POLICE
3.	Dave Dobbeleare	Sherrard Fire	Chief
4.	Stephanie Dobbeleare	V Sherrard Village	Trustee
5.	Carl Johnson	Sherrard School Dist #200	Superintendent
6.	JUSTIN BLASER	CITY OF ALEDO / ALEDO FIRE	PUBLIC WORKS / LIEUTENANT.
7.	Michael G. Chausse	City of Aledo / Admin	Administrator
8.	Angie Litterst	Mercer County HD	Administrator
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Attendance Sheet

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

September 13, 2023

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	KEN RUNKLE	AEC	RISK ASSESSOR
2.	SHARON REASON	City of Keithsburg	MAYOR
3.	RYAN CAMETON	Henry County OEM	Chief Deputy Director
4.	[illegible] Maslow	Bay Island Drainage	Chairman
5.	Schroth, Renee	Genesis Ems	Paramedic
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Attendance Sheet

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

December 13, 2023

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	Michael G. Chausse	City of Aledo	Administrator
2.	Andrea Campbell	American Environmental	EMS Manager
3.	Justin Baser	City of Aledo / Aledo Fire	Public Works / LT.
4.	[illegible] Marston	Bay Island Drainage	Chairman
5.	[illegible]	Viola	Cheif
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Appendix A

Attendance Sheet

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee Meeting

December 13, 2023

	Name (Please Print)	Representing (Jurisdiction/Organization)	Title
1.	SHARON REASON	CITY of KEITHSBURG	MAYOR
2.	Callie Smith	AEC	Environmental Analyst
3.	Cindy Brown	Henderson Co EMA	EMA
4.	RYAN CAMERON	Henry/Mercer OEM	emergency manager
5.	Stephanie Dobbeleare	Village of Sherrard & Fire Dept	Trustee/Volunteer
6.	Carl Johnson	Sherrard CUSD 200	Supt.
7.	Jake Elliott	Bay Island Drainage	Comm.
8.	Angie Litterst	Mercer County & Mercer County HD	Administrator
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APPENDIX B

Meeting Minutes

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee

October 20, 2022
6:30 p.m.

Committee Members

Aledo, City of
Aledo Fire Protection District
Duncan Township
Eliza Township
Genesis Health System Ambulance
Genesis Medical Center
Joy Community Fire District
Keithsburg, City of
Mercer County Offices:
- County Board
- County Clerk
- Health Department
- OEM
- Sheriff's Office

Mercer Manor
Mercer Township
Millersburg Township
New Boston Township
Perryton Township
Rivoli Township
Sherrard, Village of
Sherrard Community FPD
American Environmental Corp.

<u>Welcome and Introductions</u>

Angie Litterst, Director of the Mercer County Office of Emergency Management, welcomed attendees. She indicated that the purpose of this Committee is to update the Mercer County Natural Hazards Mitigation Plan.

Handout materials were distributed to each member, including a Natural Hazard Events Questionnaire. A link to a citizen questionnaire was provided to potential members via email as well. The questionnaires will help gauge residents and committee member understanding of the natural hazards that impact the County and also identifies communication preferences.

Andrea Bostwick, American Environmental Corporation (AEC), began the meeting by providing background information on the planning grant and the planning process. Mercer County Office of Emergency Management (OEM) applied for and received a planning grant from FEMA to update the County's hazard mitigation plan. This grant is administered through the Illinois Emergency Management Agency (IEMA) and pays for 90% of the planning cost. The remaining 10% will be met through in-kind services. The goal of the grant is to obtain a FEMA-approved hazard mitigation plan. The process generally takes about 16 to 18 months from start to finish.

<u>What is Mitigation?</u>

Andrea explained that for the purpose of this process, mitigation is any sustained action that reduces the long-term risk to people and property from natural hazards and their impacts. Sustained actions can include projects and activities such as building a community safe room or establishing warming and cooling centers. Mitigation is one of the phases of emergency management and is an important component in creating hazard-resistant communities.

What is a Natural Hazards Mitigation Plan?

Andrea then explained that a Natural Hazards Mitigation Plan details the natural hazard events that have previously impacted the County and identifies activities and projects that reduce the risk to people and property from these hazards before an event occurs. A hazard mitigation plan (HMP) is different from the County's Emergency Operations Plan/ Emergency Response Plan (EOP/ERP) because it identifies actions that can be taken before a disaster strikes, whereas the EOP/ERP identifies how the County will respond during and immediately after an event occurs.

The natural hazards that will be included in the Plan update are severe summer storms (including thunderstorms with damaging winds, hail, lightning, and heavy rain events); severe winter storms (including ice and snowstorms); floods (both flash flood and riverine floods); tornadoes; excessive heat; extreme cold; drought; earthquakes; and levee failures.

Andrea indicated that the Committee can also include additional hazards it feels have a significant impact on the County and then discussed dam failures, mine subsidence, and landslides. AEC will send out a survey in the next week to poll the Committee on whether to include any of these hazards in the Plan update.

Why Update a Natural Hazards Mitigation Plan?

Since the early 1990s damages caused by weather extremes have risen substantially. In 2021 the U.S. experienced $141 billion in severe storm damages from twenty (20) severe weather and natural hazard events. The losses experienced in 2022 were the 3rd highest only behind 2017(Harvey, Irma, Maria. and California Wildfires) and 2005 (Katrina, Rita, & Wilma). In the last decade, the U.S. has experienced the top three years with the highest total number of billion-dollar events and two of the top three years with the highest total losses ever recorded. Consequently, the Federal Emergency Management Agency (FEMA) continues to encourage counties throughout the U.S. to prepare and develop hazard mitigation plans because what they've found is that for every dollar spent on mitigation, $6 dollars can be reaped in savings.

Updating this plan provides several major benefits:

1. Access to federal mitigation assistance fund. Specific projects and activities will be developed and updated through the planning process to help each participating jurisdiction reduce damages. By including these actions in this Plan, the participating jurisdictions will become eligible to receive state and federal funds to implement the actions.
2. Increased awareness of the impacts associated with natural hazards. Verifiable information about the natural hazards that occur in Mercer County will be gathered to help participants in municipal and county meetings make decisions about how to better protect citizens and property from storm damages.

The Planning Process

The goal of the Committee meetings is to update the Plan to meet state and federal requirements so that it can be approved by the IEMA and FEMA. The Planning Committee is an integral part of the planning process and ensures that the Plan is tailored to the needs of the County and participating jurisdictions.

A five meeting process has been developed to achieve this goal. Specific activities for the Committee meetings include:

1st Committee meeting	Orientation to the Planning Process Required Information Needed to Participate
2nd Committee meeting	Discuss the Risk Assessment Approve Mission Statement & Goals Participants Return Required Forms Begin discussing Mitigation Projects and Activities
3rd Committee meeting	Discuss and approve Mitigation Strategy Committee returns draft list of Mitigation Projects and Activities
4th Committee meeting	Finish discussing Mitigation Projects and Activities Committee discusses approval/adoption of the Plan
5th Committee meeting (Public Forum)	Present the Plan update for public review Committee helps answer questions from the public

Jurisdictions who wish to be part of the Plan must meet certain participation requirements that include:

- Participating in the planning meetings and public forum
- Completing required forms
- Coordinating with their constituents and the public; and
- Adopting the Plan once it's completed

Information Needed from the Committee

As part of the Plan update, Andrea indicated that there is information that will be needed from each participating jurisdiction. The information provided will be used to meet FEMA plan requirements. She then talked about each of the forms that must be completed at the beginning of the planning process. These Include:

Critical Facilities. Completed lists of Critical Facilities will be used to identify facilities vulnerable to natural hazards and will be provided to IEMA and FEMA as a separate supplement. Copies of the Plan made available to the public will not include these lists for security reasons.

Capability Assessment: Each jurisdiction has a unique set of capabilities and resources available to accomplish hazard mitigation and reduce long-term vulnerabilities to hazard events. As part of the update of the plan, the existing capabilities of each jurisdiction need to be identified and described.

Shelter Surveys. Identifies locations designated as severe weather shelters within each jurisdiction including warming centers, cooling centers and community safe rooms.

Drinking Water Supply Worksheet: Information on the drinking water supplies that serve the participating communities needs to be identified to assist in assessing drought vulnerability.

Callie Smith, also of American Environmental, passed out the forms as Andrea fielded questions. Andrea asked participants to complete the forms and return them by the next meeting if possible and to let her know if they had any questions.

Severe Weather Events

Andrea told the Committee that, while AEC will review multiple data sources, including NOAA, NWS, and state and federal databases, these sources don't always include every event nor do they always include damage information, especially dollar amounts. In many cases, individuals at the local level are her best resource for this kind of information.

She then asked Committee members to share their memories of hazardous events that have occurred in the County including any damages to critical infrastructure and facilities.

Hazard events related include:

- ❖ A heavy rain/flood event brought 4.8 inches of rain in under 24 hours on August 29th, 2018
- ❖ A November 2020 tornado caused minor damage near Joy
- ❖ In 2008 or 2009, Aledo received several inches of ice that downed trees and power lines

She asked participants to identify any hazard events that have impacted their jurisdiction by completing the form titled, "Hazard Event Questionnaire". The information provided will help supplement the information included in the risk assessment.

Andrea also asked Committee members if they had any storm damage photos, they would be willing to share for inclusion in the Plan.

Community Participation

Andrea stressed the importance of attending each committee meeting and indicated that member participation helps the County meet its 10% match for this grant in addition to assuring that member jurisdictions are eligible for IEMA/FEMA funds. She indicated that tag-teaming and designating substitute representatives is permissible when other obligations arise. Andrea pointed out that a designated substitute representative does not have be an official or employee of the jurisdiction.

Andrea requested that each jurisdiction consider sharing meeting information with their boards, councils, etc. at regularly scheduled meetings and consider posting the press release or adding a calendar item to their web pages. She also asked jurisdictions who are on Facebook to consider posting about the Plan on their pages as well.

Andrea indicated that another opportunity to include the public in the process is to post the link to the Citizen Questionnaire on their web pages or Facebook. The more individuals who complete the survey, the better our understanding will be of the public's perception of the hazards that impact the County. Finally, she asked the participants to consider posting or making available at their offices the "Frequently Asked Questions" document in their meeting packet. It provides a quick summary of what the Plan is and why it's important to participate.

Mission Statement & Goals

Copies of a draft mission statement and updated goals were distributed in the meeting packet. Committee Members were asked to review these prior to the next meeting. The mitigation goals describe the objectives or end results the Committee would like to accomplish in terms of hazard and loss reduction/prevention. Every project included in the Plan should be aimed at one or more of the goals identified by this Committee. Specific goals related to each jurisdiction can be added to this list as well.

What Happens Next?

The risk assessment will be the main topic of the next committee meeting.

The second meeting of the Committee was scheduled for:

> **Thursday, February 2, 2023**
> **Mercer County Health Department, 305 NW 7th St., Aledo**
> **6:30 P.M.**

Andrea asked Committee members to please review the "Tasks to be Completed" handout before the next meeting and indicated that AEC's contact information could be found on the last page of the meeting handout if any questions come up. With no further questions the meeting was adjourned, and Angie Litterst closed by thanking attendees for their participation.

Meeting Minutes

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee

March 15, 2023, 6:30 p.m.
Mercer County Health Department
305 NW 7th Street, Aledo, IL

Committee Members

Abingdon Township
Aledo FPD
Aledo, City of
Bay Island Drainage & Levee District
Genesis Health System Ambulance
Greene Township (Matherville) FPD
Greene Township (Viola) FPD
Henry County OEM
Joy, Village of
Keithsburg, City of
Mercer County
    Health Department
    Highway Department
Ohio Grove Township
Preemption Township
Richland Grove Township
Rivoli Township
Seaton Community FPD
American Environmental Corporation

<u>Welcome and Introductions</u>

Angie Litterst, Administrator of the Mercer County Health Department, welcomed attendees. She introduced Matt Schnepple, Director of Emergency Management for Henry County, and indicated the County has contracted with Henry County for emergency management services. She then turned the meeting over to Andrea Campbell, American Environmental Corporation (AEC), who opened the meeting.

Handout materials were distributed to each Committee Member in attendance.

Andrea provided a brief recap to reorient Committee Members as to what has been accomplished at the previous meeting. Before beginning the risk assessment presentation, Andrea asked the participating jurisdictions to submit their completed, "Critical Facilities", "Capability Assessments" and "Shelter Surveys" if they haven't done so already.

<u>Risk Assessment</u>

Andrea began the presentation by noting that there have been 11 major federally-declared disasters in Mercer County since 1965. A total of 718 verified natural hazard events have been documented over the last 20 to 70 years, with 126 events identified since the last plan update in 2016. A minimum of $44.3 million in property damage was recorded for 78 of these events. In addition, $17.9 million in crop damages were recorded for just nine events. Three fatalities and seven injuries were recorded for 6 of the documented natural hazard events.

The damage amounts are actually much higher based on several facts:

1.) damage descriptions for many floods, tornadoes and severe storm events did not include dollar amounts;
2.) damages to roads from heat and freeze/thaws conditions were not included; and
3.) crop damage figures were unavailable for a majority of the events, including drought.

The frequency, magnitude, and property damages for each category of natural hazard were then described.

Severe Storms

There have been at least 146 verified severe storm events (thunderstorms with damaging winds, hail, and lightning) since 1971, 29 of which have occurred since 2016. Two major federal disaster declarations included thunderstorms with damaging winds, one in 1965 and the other in 2008. Approximately $13.4 million in damages have resulted from just 36 events, which is over 30% of all the property damage recorded in the County. Additionally, $3.1 million in crop damages occurred from just 6 thunderstorms with damaging wind/hail events, which is over 15% of all the crop damage recorded in the County. At least 1 fatality and 57 injuries can be attributed to severe storms. Almost all of the injuries are attributed to crashes associated with wet pavement conditions.

The highest recorded wind speed in the County, not associated with a tornado, is 78 knots (90 mph) and occurred at Joy on April 13, 2006 & November 10, 2020. The largest hail recorded in the county is 2.5 inches (tennis ball sized) on June 14, 1974, near Preemption.

Severe Winter Storms

Gaps in historical data were reviewed to document at least 229 verified severe winter storms (snow and/or ice) since 1950 and 103 extreme cold events since 1995. Since 2016, there have been 38 new events, with 15 of these being snow/ice events and 23 being extreme cold events. One major federal disaster declaration for the County included severe winter storms – the 2011 Ground Hog Day Blizzard. Approximately $1.1 million in property damages/emergency protective measures resulted due to 5 of these severe winter storms, the most costly being the 2007 Ice Storm. At least 3 fatalities and 28 injuries can be attributed to severe winter storms, with almost all of the fatalities and injuries attributable to crashes involving ice and snow-covered roadways.

At least 21 severe winter storms have occurred every decade since 1950. In the last decade, 34 severe winter storms took place.

The record maximum 24-hour snowfall in the County since 1950 is 14.0 inches, which occurred at Aledo COOP Station on January 3, 1971. The coldest recorded temperature is -33°F at the Aledo Station on January 30 and 31, 2019.

Floods

Gaps in historical data were reviewed to document at least 113 verified flood events in Mercer County, including 79 verified general flood events since 1965 and 34 flash floods since 1996. Of these, 6 flash floods and 16 riverine flood events have occurred since 2016. At least $24.2 million in damages have resulted from 13 flood events, which is over 50% of all the property damage recorded in the County. Nine of the 11 major federal disaster declarations for Mercer County are related to flooding.

Excessive Heat

Additional resources were reviewed to fill historic gaps which led to the identification of 82 recorded excessive heat events reported in Mercer County since 1995. Since 2016, there have been 33 excessive heat events. No damages were recorded for any of the events, and no fatalities or injuries have occurred as the result of any of the recorded excessive heat events. The highest recorded temperature in the County was 113°F at the Aledo COOP Station on July 15, 1936.

Tornadoes

Since 1950, 38 tornadoes have been verified in Mercer County, with 4 occurring since 2016. Approximately $5.3 million in property damages has resulted from 23 of these tornadoes, which is more than 10% of all the property damage recorded in the County. There have been no recorded fatalities, but two injuries can be attributed to two separate tornado events.

The highest recorded F-Scale rating for a tornado in the County was an F3, which occurred on June 14, 1974. It was also the longest recorded tornado in the County at 26.9 miles. The widest width of a tornado in the County has occurred twice - an F2 occurring on June 18, 1998, and an F1 from April 13, 2006 - both 880 yards (1/2 a mile) wide.

Drought

Six major droughts have occurred during the last four decades – 1983, 1988, 2005, 2011, 2012, and 2013. There has been at least one drought per decade with the exception of the 1990s when no substantial droughts were recorded. The County was designated a Primary Natural Disaster Area by USDA for the 2005 drought.

The 2005 drought caused an estimated $14.86 million in crop damages. Following each declared drought, crop yield reductions were generally experienced, some substantial. Corn and soybean yield reductions were most severe for the 1988 drought, when there was a 46.3% reduction in corn and a 17.9% reduction in soybeans.

Year	Corn	Soybeans
1983	22.6%	-
1988	46.3%	17.9%
2005	15.3%	3.8%
2011	-	-
2012	-	-
2013	1.7%	13.9%

Earthquakes

In the previous 200 years, no earthquakes have originated in Mercer County. However, 4 earthquakes have originated in adjacent counties, including one in Warren, one in Henderson, and two in Rock Island. Rock Island produced the strongest earthquake, one that was recorded to be a 3.4 magnitude in Moline on November 12, 1934. There are no known fault zones or geologic structures located in Mercer County.

Mine Subsidence

There are 129 documented underground coal mines located in Mercer County according to the Illinois State Geological Survey's Directory of Coal Mines. AEC has put in a request with the Illinois Mine Subsidence Insurance Fund (IMSIF) in order to determine how many claims have been submitted for Mercer County between 1980 and 2022, and what dollar amounts were reimbursed by year for those claims.

According to the Illinois State Geological Survey, 16,938 acres (4.8% of the land area) and 767 housing units (10.9% of the total housing units) in Mercer County are located in land over or adjacent to mapped mines and land that could be effected if the mine boundaries are inaccurate or uncertain. Mine subsidence has the potential to impact Matherville and Sherrard, as well as unincorporated areas of the County.

Levees

According to the U.S. Army Corp of Engineer's National Levee Database, there are two levees of significance in Mercer County: Bay Island Drainage & Levee District No. 1 & Subdistrict #1 of Drainage Union No. 1 (federally-constructed, locally-operated and maintained) and Keithsburg Levee (locally-constructed and locally-operated). Records indicate that two levee breaches have occurred in the County, both at the Keithsburg Levee: one on July 7, 1993, and the other on June 14, 2008. The 1993 breach resulted in 2/3 of the city being flooded in less than two hours, and a new drinking water well had to be drilled. The 2008 breach flooded approximately 25 homes, causing $250,000 in property damage.

Dams

There are 14 classified dams in the County according to the US Army Corps of Engineers' National Inventory of Dams. Three dams are publicly-owned: Matherville owns two (Lake Matherville Dam & Matherville Lagoons Dam), and one is owned by the Army Corps of Engineers (Lock & Dam 17). The remaining 11 dams are privately owned. Of the 14 dams, 5 have a hazard classification of "Significant" (Matherville Lagoons Dam, Morrison Lake Dam, Fyre Lake Dam, Karl Lake Dam, & Lock & Dam 17), and 9 have a "low" hazard classification. There are no dams with a "High" hazard classification in Mercer County. No known classified dam failures have been recorded in the County.

Risk Priority Index Exercise

Following the risk assessment, Andrea led the Committee through a Risk Priority Index (RPI) exercise. The RPI is a quantitative means of providing guidance for ranking the hazards that have the potential to impact the County. This ranking can assist participants in determining which hazards present the highest risks and therefore which ones to focus on when formulating mitigation projects and activities. Each hazard is scored on three categories: frequency, impacts on life and health, and impacts on property and infrastructure based on a scoring system provided. Andrea walked the Committee through the scoring system using excessive heat as an example and then provided time for the

Committee to fill out the PRI form during the meeting. The results will be compiled, and the findings will be presented at the next meeting.

Mission Statement & Goals

Andrea asked Committee members to review the updated mission statement and mitigation goals provided in the meeting materials. Both of these are required elements of the Plan. As part of the Plan update process both items need to be reviewed and re-evaluated. The mission statement was reviewed, and no revisions were made to the wording.

Next Andrea discussed the mitigation goals which are intended to reduce long-term vulnerabilities to natural hazards. Each project included in the updated Plan should be aimed at one or more of the goals developed by the Committee. The updated goals were reviewed, and no revisions were made to the wording. The mission statement and goals will be added to the Plan update.

Mitigation

Andrea explained that mitigation actions include activities and projects that reduce the long-term risk to people and property from the natural hazards discussed in the risk assessment.

Status of Existing Projects

Callie Smith, AEC, distributed **"Status of Existing Mitigation Actions"** forms to each of the previously participating jurisdictions detailing the mitigation projects and activities included in the 2016 Plan. Andrea explained that as part of the update process the status of these projects needs to be determined. She described how the form should be completed so that this information can be included in the Plan update.

New Projects

Callie distributed the form titled **"Hazard Mitigation Projects"** and Andrea indicated this form should be used to submit new projects and activities for the Plan update. To help the jurisdictions think about and assemble their lists a 2-page list of potential mitigation projects was included in the handout material along with mitigation project lists from other jurisdictions. These examples can be used to help Committee members when they prepare their lists. Finally, Andrea provided excerpts from a FEMA publication on mitigation ideas as another resource.

She indicated to the Committee that individual mitigation project lists will be developed for each participating jurisdiction and that these are lists of projects each jurisdiction would like to see accomplished if funding becomes available. FEMA is trying to stimulate the implementation of mitigation projects and activities to reduce the extraordinary amount of money being expended on hazard event damages.

The projects and activities included in the Plan should be mitigation-related, not emergency preparedness, response, recovery, or maintenance. Mitigation projects can include studies, regulatory activities, structural and infrastructure projects, and information/education activities. She provided advice for completing the mitigation project list including providing a detailed description of the project, the jurisdiction responsible for the project and the time frame to complete the project.

Committee members were encouraged to contact Andrea or Callie if questions arise before they return to the next Committee meeting.

What Happens Next?

The vulnerability assessment and mitigation project prioritization methodology will be the main topics of the next Committee meeting.

The third meeting of the Committee was scheduled for:

June 21, 2023, 6:30 p.m.
Mercer County Health Department
305 NW 7th Street, Aledo, IL

Public Comment

With no questions or comments, Andrea adjourned the meeting.

Meeting Minutes

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee

March 15, 2023, 6:30 p.m.
Mercer County Health Department
305 NW 7th Street, Aledo, IL

Committee Members

Aledo, City of
Bay Island Drainage & Levee District
Genesis Health System Ambulance
Greene Township (Matherville) FPD
Greene Township (Viola) FPD
Henry/Mercer OEM
Joy, Village of
Joy Community FD
Matherville, Village of
Mercer County
Health Department
Preemption Township
Sherrard, Village of
Viola, Village of
American Environmental Corporation

Welcome

Angie Litterst, Administrator of the Mercer County Health Department, welcomed attendees. She turned the meeting over to Andrea Campbell, American Environmental Corporation (AEC), who opened the meeting.

Handout materials were distributed to each member in attendance. Andrea provided a brief recap to reorient Committee Members as to what has been accomplished at previous meetings. Before beginning the vulnerability analysis presentation, Andrea asked the participating jurisdictions to submit their completed "Critical Facilities", "Capability Assessments", and "Shelter Surveys" if they haven't done so already.

Vulnerability Analysis

Andrea began the vulnerability analysis discussion by noting that the focus of this meeting is the vulnerability posed by tornadoes. The analysis estimates future potential damages in terms of dollar loss to residences, including contents, for each participating jurisdiction based on FEMA acceptable formulas. The potential damages were calculated on the magnitude most likely to be encountered, not on a worst-case event.

Tornadoes

Since 1950, 38 tornadoes have been verified in Mercer County. While occurring less frequently than severe storms and severe winter storms, tornadoes have caused more than $5.3 million in property damages (approximately 10% of all the property damage recorded in the county) and 2 injuries.

Using information from the 38 verified tornadoes, damages were calculated based on an "average" tornado. The average tornado in Mercer County impacts approximately

0.24 square miles. Housing densities were calculated from U.S. Census Bureau information for each of the participating jurisdictions. This information, along with a set of assumptions were used to estimate the number of vulnerable residential structures.

Potential dollar losses were then calculated for these vulnerable residential structures using the provided tax assessment values and an additional assumption about the degree of damage sustained by the structures and their contents.

Potential dollar losses caused by an average-sized tornado to residences and their contents would be expected to exceed at least $11 million in any of the participating municipalities. Losses ranged from $11 million in Sherrard to $42.2 million in Viola. Potential dollar losses by township would be expected to range from $59,256 in Duncan Township to $1.3 million in Mercer Township. Andrea noted that the damage figure for the most populated townships would only be reached if the tornado's path included a portion of a major municipality.

Risk Priority Index Exercise Results

Andrea then presented the results of the Risk Priority Index Exercise that was conducted at the March 15, 2023 meeting. She provided the Committee with a brief recap on what the Risk Priority Index is and how it can help participants determine which hazards present the highest risk and therefore which ones to focus on when formulating mitigation projects and activities.

Based on the Committee's responses, thunderstorms with damaging winds, tornadoes, floods, and dam failures scored the highest. The hazards that scored the lowest included mine subsidence, drought, and earthquakes.

Community Lifelines

Next, Andrea took a few minutes to discuss the concept of community lifelines. FEMA has identified seven community lifelines that are the most fundamental services in the community that, when stabilized, enable all aspects of society to function. The seven community lifelines include: safety & security; food, water, shelter; health & medical; energy (power & fuel); communications; transportation; and hazardous materials.

While the concept of community lifelines was developed to support emergency response and planning, FEMA has begun applying it to all phases of emergency management. Efforts to protect community lifelines and prevent and mitigate potential impacts to them is one of the focuses of the BRIC grant program. A handout with a brief description of the community lifelines was included in the meeting packet. Community lifelines will be included in most project description to create a clear connection to the concept.

Asset Vulnerability Survey

As part of the Plan update, Andrea indicated that vulnerable community assets need to be identified for the participating jurisdictions. FEMA requires that the Plan include a summary, such as a list of key issues or problem statements, which describes the effects the hazards have on each participating jurisdiction and their assets. Assets include people, structures (including critical facilities, infrastructure, and community lifelines), systems (networks and capabilities such as electrical and communications grids), and natural, historic, and cultural resources. Andrea asked Committee members to complete a 2-page survey distributed to help identify each community's vulnerable assets and the hazards they are vulnerable to. This information will be used in the vulnerability analysis.

Mitigation Actions Prioritization Methodology

The Mitigation Actions Prioritization Methodology outlines the approach used to classify each mitigation action identified by the participating jurisdictions and is a FEMA-required element of the Plan.

Mitigation actions can be prioritized in a number of ways. Andrea explained that the updated methodology is based on key factors such as frequency of the hazard, degree of mitigation, and cost/benefit utilization.

This methodology helps objectively identify which projects and activities maximize benefits and have a greater likelihood to significantly reduce the long-term vulnerabilities associated with the most frequently-occurring hazards. After reviewing the updated methodology, the Committee determined that no changes needed to be made.

Andrea acknowledged that while this methodology does not take politics into consideration, this factor may affect the order in which projects are implemented. She also noted that it is important to keep in mind that implementing any of the mitigation projects is desirable regardless of which prioritization category they fall under.

Mitigation Projects

Committee Members were asked to submit their existing and new mitigation projects forms. Andrea then described how the methodology, the existing and new lists of mitigation projects, finalized goals and other information will be presented for Committee review.

Andrea chose a frequently requested mitigation project, a community safe room (tornado shelter), as an example to show how a typical project is prioritized and entered into the Plan on a Mitigation Action Table. She described how each column in the Mitigation Action Table would be completed for this example project.

Andrea explained that the information in the Mitigation Action Tables would be prepared by AEC, but that the Tables cannot be completed until all of the participants submit their draft lists of projects. Committee Members will have the opportunity at the next meeting to review all of the mitigation projects submitted so that they can make adjustments to their lists if they choose.

It was noted that each jurisdiction will have their own list of jurisdiction-specific mitigation projects and they do not need to get approval from the County or any of the other participants for any of their projects. Participants were also reminded that this is a list of projects and activities they would like to see accomplished if funding becomes available. For a jurisdiction to be eligible for a project, it must be on its list.

Andrea also reminded the Committee that this is a mitigation plan, and that there are some projects that IEMA/FEMA do not consider mitigation. Projects associated with emergency preparedness, disaster response & recovery and maintenance will not be included in the Plan. Andrea noted that as the committee members put their lists together, if they are unsure about whether a project would be considered mitigation, go ahead, and include it on their list. AEC will review the lists and help make the appropriate determinations.

Matt Schnepple, Henry/Mercer OEM Director, asked whether projects could still include add-ons as part of the new guidance. Andrea indicated that since the new guidance just went into effect in April, she had not seen how FEMA is going to handle this.

What Happens Next?

Andrea asked that mitigation project forms and all other previously-distributed forms be returned to AEC by July 28th. The Committee agreed to schedule the next meeting on:

September 13th, 2023 6:30 p.m.
Mercer County Health Department
305 NW 7th Street, Aledo, IL

Public Comment

With no additional questions or comments, Andrea adjourned the meeting.

Mercer County Multi-Jurisdictional
Natural Hazards Mitigation Planning Committee

September 13, 2023, 6:30 p.m.
Mercer County Health Department
305 NW 7th Street, Aledo, IL

Committee Members

Aledo, City of
Aledo Fire Protection District
Bay Island Drainage & Levee District
Genesis Health System Ambulance
Henry/Mercer OEM
Keithsburg, City of
Mercer County Health Department
Sherrard, Village of
Sherrard Community Fire Protection District
Sherrard School District #200
Viola, Village of
American Environmental Corporation

<u>Welcome</u>

Angie Litterst, Administrator of the Mercer County Health Department, welcomed attendees. She turned the meeting over to Ken Runkle, American Environmental Corporation (AEC), who opened the meeting.

Handout materials were distributed to each member in attendance. Ken provided a brief recap to reorient Committee members as to what has been accomplished and what will be covered at this meeting.

<u>Mitigation Project Submittal & Action Tables</u>

Ken thanked the Committee Members for assembling their lists of mitigation projects and activities. He explained that the information in the draft Mitigation Action Tables handout was prepared by AEC using the lists of mitigation projects and activities provided by the participation jurisdictions. A draft of the Mitigation Strategy section that details the review and re-evaluation of the goals and prioritization methodology as well as how the mitigation projects were analyzed in the tables was also provided in the meeting handouts for review by the Committee.

Committee members were asked to review the Mitigation Action Tables containing the descriptions of the mitigation projects and activities. Ken and Callie Smith of AEC moved throughout the room to answer any questions. Ken advised Committee Members who wished to add additional projects to provide them to himself or Andrea Bostwick-Campbell as soon as possible, and no later than October 31st.

Participants were reminded that this is a list of projects and activities they would like to see accomplished if the money becomes available. Also, for a jurisdiction to be eligible for a project, it must be on its list.

Since this is a mitigation plan, some projects were either removed or not included if they were not considered mitigation. Projects associated emergency preparedness/response, recovery, and maintenance will not be included in the Plan.

Public Forum and Adoption

Ken laid out the timeline for the remainder of the Plan update process and explained in more detail how the final meeting and adoption process would proceed. The final Committee meeting will be conducted as an open-house style public forum to present the draft Plan for review and comment. A paper copy of the draft Plan will be available for review at the meeting and posted online on the County's website. There will be a two-week public comment period following the public forum.

Unless otherwise specified, Committee members will receive an electronic copy of the draft plan to make available for public comment.

Once the comment period is over, any comments received will be incorporated into the Plan and submitted to IEMA/FEMA. Following IEMA and FEMA review, any edits requested will be made and then FEMA will issue an Approval Pending Adoption letter. At this point an email will be sent to all the participating jurisdictions, along with a copy of a model adoption resolution, asking them to formally adopt the Plan by resolution. A copy of the executed resolution should then be provided to AEC. Once all the adoption resolutions are received, AEC will submit them to IEMA and FEMA. FEMA will then issue the Final Approval letter starting the clock for the five-year update.

Plan Maintenance and Update

Ken described the commitments detailed in a draft of the Plan Maintenance and Update section provided in the meeting handouts for review by the Committee. The Plan will be monitored and evaluated on an annual basis by a Plan Maintenance Subcommittee, which will be made up of the participating jurisdictions and key member of the Planning Committee. The Mercer County Health Department will send out a Plan Maintenance Checklist to each of the participating jurisdictions who will be responsible for providing information to the Subcommittee. This information will include: the status of their mitigation actions; any hazard-related damages to critical facilities and infrastructure; the adoption of any new plans, policies, or regulations; and any significant changes in development. The Subcommittee will also evaluate the Plan to determine its effectiveness at achieving its stated purpose and goals. Participants can also add new mitigation actions during the annual monitoring phase or by contacting the Health Department Administrator.

The Health Department will then prepare an annual progress report detailing the results of the annual monitoring and evaluation period and provide copies to the Subcommittee. Any modifications or additions to the mitigation project list will require an update of the Mitigation Strategy and a resubmittal of the Plan to IEMA and FEMA for reference.

At least once every five years, the Plan must be reviewed, revised, and resubmitted to IEMA/FEMA for the participating jurisdictions to remain eligible for mitigation project funds. At the five-year update, any jurisdiction that is not already part of this Plan and who wants to become part of the updated Plan may do so. New jurisdictions must supply the same information that all the current jurisdictions supplied.

What Happens Next?

Public Forum
The final Committee meeting will be conducted as an open-house style public forum where the draft Plan update will be presented for review and comment.

The public forum will be held:

> **Wednesday, December 13, 2023, 4 p.m. - 6 p.m.**
> **Mercer County Health Department**
> **305 NW 7th Street, Aledo, IL**

Public Comment

With no other questions, the meeting was adjourned.

APPENDIX C

Mercer County Citizen Questionnaire

You can help protect lives and property from natural hazard events in the County by taking a few moments to complete this questionnaire.

Asterisk (*) desonates required questions for form completion.

* 1. **Please indicate where you live in the County (Please check only one.):**

- ☐ Aledo
- ☐ Alexis
- ☐ Joy
- ☐ Keithsburg
- ☐ Matherville
- ☐ New Boston
- ☐ North Henderson
- ☐ Reynolds
- ☐ Seaton
- ☐ Sherrard
- ☐ Viola
- ☐ Windsor
- ☐ Unincorporated County
- ☐ Other (please specify)

* 2. **Please place a checkmark next to each of the natural hazards listed below that you have experienced in the County (please check all that apply).**

- ☐ Severe Summer Storms (thunderstorms, hail, lightning strikes)
- ☐ Floods
- ☐ Severe Winter Storms (snow,sleet, ice)
- ☐ Excessive Heat
- ☐ Extreme Cold
- ☐ Tornadoes
- ☐ Drought
- ☐ Earthquakes
- ☐ Mine/Land Subsidence
- ☐ Landslides
- ☐ Dam Failures
- ☐ Other (please specify)

Appendix C

3. **Which of the natural hazards above have you encountered most frequently?**

4. **Rank the natural hazards listed below in order from 1 to 11 based on which hazard you feel poses the greatest threat. (1 = greatest threat and 11 = least threat)**
Each number should only be used once.

- Severe Summer Storms
- Floods
- Severe Winter Storms
- Excessive Heat
- Extreme Cold
- Tornadoes
- Drought
- Earthquakes
- Mine/Land Subsidence
- Landslides
- Dam Failures

* 5. **What types of mitigation projects or activities are most needed in the County?**
Please check the five you feel are most important

- ☐ Public information fact sheets and brochures describing actions residents can take to protect themselves and their property against natural hazard impacts.
- ☐ Floodplain Ordinances
- ☐ Building Codes and Enforcement
- ☐ Tornado Safe Shelters
- ☐ Maintain roadway passage during snow storms and heavy rains
- ☐ Provide sufficient water supply during drought

- ☐ Sirens or other Alert Systems
- ☐ Flood or Drainage Protection (i.e., culvert and drainage ditch maintenance, retention pond construction, dam or levee conctruction/maintenance and/or hydraulic studies to determine cause of drainage problems.)
- ☐ Maintain power during storms by burying power lines, trimming trees and/or purchasing a back-up generator
- ☐ Identify residents with special needs in order to provide assistance during a ntural hazard event
- ☐ Retrofit critical infrastructure (public water supplies, schools, sewage treatment facilities, bridges, hospitals and other important services) to reduce potential damages
- ☐ Other (please specify)

* 6. **What are the most effective ways *for you* to receive information about how to make your household and property safer from natural hazards (Please check all that apply.)**

- ☐ Newspaper
- ☐ Television
- ☐ Radio
- ☐ Internet
- ☐ Social Media (Facebook, Twitter, etc.)
- ☐ Schools
- ☐ Mailings
- ☐ Extension Service
- ☐ Public Workshops/Meetings
- ☐ Fire Department/Law Enforcement
- ☐ Public Health Department
- ☐ Municipal/County Offices
- ☐ Other (please specify)

Thank you for your time in assisting with the update of the County's Hazard Mitigation Plan.
Mercer County Multi-Jurisdictional Natural Hazard Mitigation Advisory Committee

Done

Appendix C

APPENDIX D

Frequently Asked Questions

Mercer County Multi-Jurisdictional
Hazard Mitigation Plan Update

1) **What is the Mercer County Hazard Mitigation Plan?**
The Mercer County Multi-Jurisdictional Hazard Mitigation Plan evaluates damage to life and property from natural hazards that have impacted the County and identifies projects and activities to reduce these damages. The Plan is considered to be multi-jurisdictional because it includes municipalities and other jurisdictions (townships, fire protection districts, schools, etc.) who want to participate.

2) **What is hazard mitigation?**
Hazard mitigation is any action taken to ***reduce*** the long-term risk to people and property from a natural hazard ***before*** an event occurs.

3) **Why is this Plan being updated?**
The Plan update fulfills federal planning requirements of the Stafford Act as amended by the Disaster Mitigation Act and the Disaster Recovery and Reform Act. While meeting federal requirements, this Plan update also provides these benefits:
   - Funding for mitigation projects and activities ***before*** disasters occur.
   - Funding for projects and activities ***following*** declared disasters.
   - Increased awareness about natural hazards and closer cooperation among the various organizations and political jurisdictions involved in emergency planning and response.

4) **Who is updating this Plan?**
The Mercer County Multi-Jurisdictional Hazards Mitigation Planning Committee is updating the Plan with assistance from technical experts in emergency planning, environmental matters, and infrastructure. The Committee will include members from education, emergency services, municipal, township and county government, health care, and law enforcement.

5) **How can I participate?**
You are invited to attend public meetings of the Mercer County Hazard Mitigation Planning Committee. In addition, you are encouraged to provide photographs, other documentation, and anecdotal information about damages you experienced from natural hazards in Mercer County. Surveys will be available at participating jurisdictions and through Mercer County to help gather specific information from residents. All of this information will be used to update the Plan. The draft Plan update will be presented at a public forum for further public input.

More information can be obtained by contacting:

Angie Litterst, Director
Mercer County Office of Emergency Management
305 NW 7th Street
Aledo, Illinois 61231
(309) 582-3759

APPENDIX E

Mercer County Office of Emergency Management
305 NW 7th Street
Aledo, Illinois 61231
Office (309) 582-3759
Fax (309) 582-3793

Contact: Angie Litterst
309-582-3759

County Prepares for Natural Disasters

Aledo, IL (October 3, 2022) — Mercer County will update its plan to reduce the damages caused by severe weather such as floods, snow and ice storms, thunderstorms, and tornados among other events. The plan is called a Hazard Mitigation Plan and the process to update it will be funded through a grant from the Federal Emergency Management Agency (FEMA).

"The Plan describes the natural hazard events that have impacted the County and identifies activities and projects to reduce the risk to residents, property and infrastructure", said Mercer County Office of Emergency Management Director, Angie Litterst. "By having an updated hazard mitigation plan, the County and participating jurisdictions will become eligible for federal funds to construct these projects." she added.

The Mercer County Hazard Mitigation Planning Committee will hold its first meeting on Thursday, October 20, 2022, at 6:30 P.M. The meeting will be held in the Mercer County Health Department, 305 NW 7th Street in Aledo. The meeting is open to the public.

The Planning Committee includes representatives from the County, townships, municipalities, schools, fire protection districts, and health care services, as well as technical partners and other stakeholders. Meetings of this committee will be conducted over the next year as working sessions so that any interested residents can attend and ask questions. The purpose of these working sessions is to gather and discuss information that will be used to update the plan.

"This mitigation plan is different from our County's emergency response plan because it focuses on ways to reduce and prevent damages before they occur," added Litterst.

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Mercer County Illinois Office of Emergency Management

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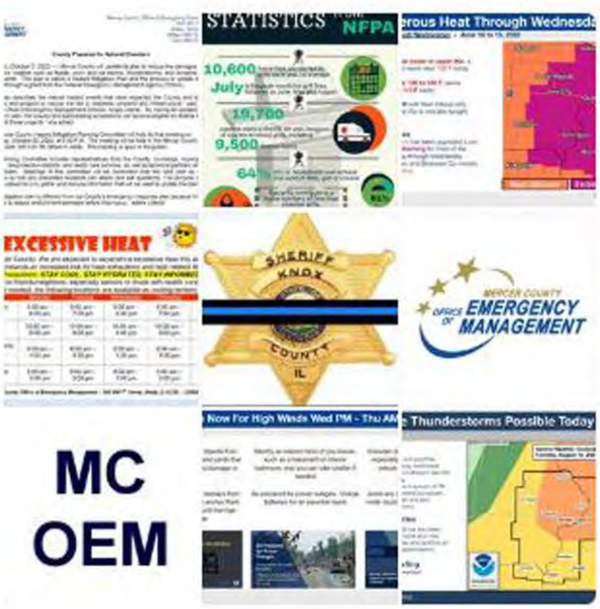

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"This mitigation plan is different from our County's emergency response plan because it focuses on ways to reduce and prevent damages before they occur," added Litterst.

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Aledo, Illinois 61231
Office: (309) 582-3759 Fax: (309) 582-3793

FOR IMMEDIATE RELEASE

Contact: Angie Litterst
309-582-3759

Reducing Damages Caused by Severe Weather

Aledo, IL (January 26, 2023) — The frequency of and damages caused by severe storms and other natural hazards in Mercer County will be discussed when the Mercer County Natural Hazards Mitigation Planning Committee meets at the Mercer County Health Department, 305 NW 7th St. in Aledo, at 6:30 p.m. on Thursday, March 9.

This Committee, comprised of County, township, and municipal representatives as well as technical partners and stakeholders, will meet over the next several months to update the Mercer County Natural Hazards Mitigation Plan. All Committee Meetings are open to the public.

“The goal of this Committee Meeting is to identify how often severe weather events occur within the County and what kinds of damages have resulted. Based on this information we will begin to compile lists of activities and projects to reduce damages caused by these events,” said Mercer County Health Department Administrator, Angie Litterst.

The focus of this effort is on natural hazards — severe thunderstorms with damaging winds or hail, tornadoes, snow and ice storms, floods, drought, and excessive heat.

Interested persons can provide input at these Mercer County Hazards Mitigation Planning Committee meetings or submit their comments and questions to their municipal or county representatives.

Participants to date include the County, Aledo, Aledo Fire Protection District (FPD), Eliza Township, Duncan Township, Genesis Medical Center, Joy Community FPD, Keithsburg, Mercer Manor, Mercer Township, Millersburg Township, New Boston, Perryton Township, Rivoli Township, Sherrard, and Sherrard Community FPD. Jurisdictions who have yet to participate in a committee meeting are encouraged to attend.

“This Plan will be our best resource for determining how to prepare for storms and other natural hazards. After the Plan is updated, comprehensive information will be available in one document to help guide those who are making decisions about how to better protect Mercer County residents,” added Litterst.

MC OEM Mercer County Illinois Office of Emergency Management

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(309) 582-3759

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MC OEM Mercer County Illinois Office of Emergency Management
January 26 at 8:31 AM

Please note the change in date. We are now meeting in March, rather than February. Thank you!

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305 NW 7th Street
Aledo, Illinois 61231
(309) 582-3759
FAX (309) 582-3793
www.mchdil.com

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Contact: Angie Litterst
309-582-3759

Reducing Damages Caused by Severe Weather and Other Hazards

Aledo, IL (June 5, 2023) — Identifying projects and activities that can protect Mercer County residents, property, and critical infrastructure from natural hazards while maintaining vital services when severe weather hits will be discussed at the Mercer County Hazard Mitigation Planning Committee meeting at the Mercer County Health Department, 305 NW 7th St. in Aledo, at 6:30 p.m. on Wednesday, June 21.

"Severe weather frequently damages buildings, crops, roads, and other critical infrastructure in this area. Since 1965, the County has been a part of 11 major federal disaster declarations. In addition, there have been at least three fatalities, seven injuries, and $62.2 million in verified property and crop damages caused by hazard events in the County," said Mercer County Health Department Administrator, Angie Litterst. "Identifying preventative steps that can be taken to reduce the dollar damages as well as protect public health before a natural hazard event occurs is the goal of this planning process."

The Committee began work in October 2022 to update the County's Natural Hazards Mitigation Plan. Committee meetings are open to the public.

"Other emergency plans are directed at responding after a storm or disaster strikes. With this Plan, we will identify actions that can be taken to reduce damage caused by natural hazards for each participating jurisdiction before they occur. This Plan also helps assure each participating jurisdiction is eligible to receive federal grant money for mitigation projects," added Litterst.

Building community safe rooms, retrofitting critical infrastructure to better withstand hazard events, installing back-up power supplies, resolving drainage issues, and developing public information materials are a few of the more frequently encountered mitigation projects in Illinois.

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Attached is information on the upcoming Mercer County Hazard Mitigation Planning Committee's third meeting.

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Mercer County Health Department, Illinois
Published by Angie Arnold Litterst · 5d ·

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FOR IMMEDIATE RELEASE

Contact: Angie Litterst
309-582-3759

Protecting Public Health and Property in Mercer County

Aledo, IL (August 25, 2023) -- Projects and activities to prevent injuries and fatalities while maintaining vital services for Mercer County residents will be the main topic of discussion at the at the Mercer County Health Department, 305 NW 7th St. in Aledo, at 6:30 p.m. on Wednesday, September 13.

The Committee began work in October 2022 to update the County's Natural Hazards Mitigation Plan. This Plan details the past severe weather events that have impacted the County and identifies mitigation projects and activities that can be taken before a severe weather event occurs to protect residents and critical services and infrastructure.

"There has been at least $62.2 million in verified property and crop damages caused by severe weather events in the County," according to Mercer County Health Department Administrator, Angie Litterst. "Obtaining FEMA's approval of our updated Plan will make all of the participants eligible to receive federal grant money for mitigation projects and activities."

Projects identified by Committee members at this meeting will become part of the Mercer County Natural Hazards Mitigation Plan. While the committee has provided input on portions of the Plan, the entire Plan will be presented for public review and comment before it is submitted to the state and federal government for approval.

"A public forum will be conducted later this year for interested persons to review the Plan update and ask questions of Committee Members. A two-week public comment period will be held following the public forum to accommodate interested persons who are unable to attend. We want to make sure that anybody who is interested has an opportunity to review and comment on the draft Plan update," added Litterst.

Interested persons can submit questions and comments to the Committee members or directly to the Mercer County Health Department.

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September 5 at 10:00 AM ·

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The Committee began work in October 2022 to update the County's Natural Hazards Mitigation Plan. This Plan details the past severe weather events that have impacted the County and identifies mitigation projects and activities that can be taken before a severe weather event occurs to protect residents and critical services and infrastructure.

"There has been at least $62.2 million in verified property and crop damages caused by severe weather events in the County," according to Mercer County Health Department Administrator, Angie Litterst. "Obtaining FEMA's approval of our updated Plan will make all of the participants eligible to receive federal grant money for mitigation projects and activities."

Projects identified by Committee members at this meeting will become part of the Mercer County Natural Hazards Mitigation Plan. While the committee has provided input on portions of the Plan, the entire Plan will be presented for public review and comment before it is submitted to the state and federal government for approval.

"A public forum will be conducted later this year for interested persons to review the Plan update and ask questions of Committee Members. A two-week public comment period will be held following the public forum to accommodate interested persons who are unable to attend. We want to make sure that anybody who is interested has an opportunity to review and comment on the draft Plan update," added Litterst.

Interested persons can submit questions and comments to the Committee members or directly to the Mercer County Health Department.

XXXXXXXXXXXXXXXXX

2   1 share

Mercer County Health Department
305 NW 7th Street
Aledo, Illinois 61231
(309) 582-3759
FAX (309) 582-3793
www.mchdil.com

FOR IMMEDIATE RELEASE

Contact: Angie Litterst
309-582-3759

Plan to Protect Public Health and Property in Mercer County
Ready for Public Review

Aledo, IL (November 21, 2023) -- The updated Mercer County Multi-Jurisdictional Natural Hazards Mitigation Plan outlining projects and activities to reduce damages caused by severe weather and other natural hazards will be available for public review and comment starting December 13, 2023. The Plan, along with a summary sheet and a comment survey, will be available for review at the Mercer County Health Department and on the Health Department website.

The comment period will remain open through December 29, 2023. Public comments received will be used to make any revisions needed before the Plan is submitted to the Illinois Emergency Management Agency-Office of Homeland Security and Federal Emergency Management Agencies.

The Mercer County Natural Hazards Mitigation Planning Committee has been conducting working meetings open to the public since October 2022. The Committee prepared the Plan with technical assistance from state and federal agencies as well as a consultant specializing in emergency management planning.

The municipalities of Aledo, Joy, Keithsburg, Matherville, and Sherrard have participated in the planning process. Other participating jurisdictions include Abington Township, Preemption Township, Genesis Medical Center, Sherrard CUSD #200, the Bay Island Drainage and Levee District, Aledo Fire Protection District (FPD), Sherrard Community FPD, and Green Township FPD.

“This Plan describes how the County and the participating jurisdictions have been impacted by severe weather and other hazards and identifies specific mitigation actions that can be taken to reduce damages to people and property before events occur,” explained Mercer County Health Department Administrator, Angie Litterst.

An open-house style public forum will be held at the Mercer County Health Department, 305 NW 7th St. in Aledo, from 4 p.m. to 6 p.m. on Wednesday, December 13. Individuals can come and review the Plan at any time during the forum. Those unable to attend can still review the Plan and provide comments without participating in the public forum.

XXXXXXXXXXXXXXXXX

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Mercer County Health Department, Illinois

Intro

To promote and protect the health and welfare of the Mercer County residents.

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- dph.pmercer@illinois.gov
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Public Health

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Mercer County Health Department, Illinois

Published by Angie Arnold Litterst · 1h ·

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Write a comment...

APPENDIX F

Mercer County Multi-Jurisdictional Natural Hazards Mitigation Plan Public Forum Summary Handout

November 29, 2023
4:00 p.m. – 6:00 p.m.

Each year natural hazards (i.e., severe thunderstorms, tornadoes, severe winter storms, flooding, etc.) cause damage to property and threaten the lives and health of Mercer County residents. Since 1965, Mercer County has been included in 11 major federally-declared disasters and experienced at least $42.6 million in recorded property damages and $25.3 million in recorded crop damages.

In the last 10 years alone (2013 – 2022), there have been 41 extreme cold events, 41 excessive heat events, 29 severe winter storms, 27 thunderstorms with damaging winds, 21 riverine flood events, 13 flash flood events, 10 tornadoes, 8 severe storms with hail one inch in diameter or greater, 3 lightning strike events with verified damages, and one drought in the County. While natural hazards cannot be avoided, their impacts can be reduced through effective hazard mitigation planning and implementation.

What is hazard mitigation planning?
Hazard mitigation planning is the process of determining how to reduce or eliminate property damage and loss of life from natural hazards. This process helps the County and participating jurisdictions reduce their risk by identifying vulnerabilities and developing mitigation actions to lessen and sometimes even eliminate the effects of a hazard. The results of this process are documented in a natural hazards mitigation plan.

Why prepare an updated natural hazards mitigation plan?
By preparing and adopting an updated natural hazards mitigation plan, participating jurisdictions become eligible to apply for and receive federal hazard mitigation funds to implement mitigation actions identified in the plan. These funds, made available through the Disaster Mitigation Act of 2000, can help provide local government entities with the opportunity to complete mitigation projects that would not otherwise be financially possible.

Who participated in the update of the County's Natural Hazards Mitigation Plan?
Recognizing the benefits that could be gained from preparing an updated natural hazards mitigation plan, Mercer County invited all the local government entities within the County to participate. The following jurisdictions chose to participate in the Plan update with the County:

- Abington Township
- Aledo, City of
- Aledo Fire Protection District
- Bay Island Drainage & Levee District
- Genesis Medical Center
- Greene Township Fire Protection District
- Joy, Village of
- Keithsburg, City of
- Matherville, Village of
- Preemption Township
- Sherrard, City of
- Sherrard Community Unit School District #200
- Sherrard Community Fire Protection District

MERCER COUNTY MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN

How was the Plan update developed?
The Mercer County Multi-Jurisdictional Natural Hazards Mitigation Plan update was developed through the Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee. The Committee included representatives from each participating jurisdiction, as well as education, emergency services, flood control, and healthcare. The Planning Committee met five times between October 2022 and December 2023.

Which hazards are included in the Plan update?
After reviewing the risk assessment, the Planning Committee chose to include the following hazards in the Plan:

- severe winter storms (snow & ice)
- severe storms (thunderstorms, hail, lightning & heavy rain)
- extreme cold
- floods (riverine & flash)
- excessive heat
- tornadoes
- drought
- earthquakes
- levee failures
- mine subsidence
- dam failures

What is included in the Plan update?
The Plan update is divided into sections that cover the planning process; the risk assessment; the mitigation strategy, including the jurisdiction-specific mitigation action lists; plan maintenance; and adoption. The majority of the Plan update is devoted to the risk assessment and mitigation strategy.

The risk assessment identifies the natural hazards that pose a threat to the County and includes a profile of each hazard, which describes the location and severity of past occurrences, reported damages to public health and property, and the likelihood of future occurrences. It also provides a vulnerability analysis that estimates the potential impacts each natural hazard would have on the health and safety of the residents of Mercer County, as well as the buildings, critical facilities, and infrastructure in the County.

The key component of the mitigation strategy is a list of the projects and activities developed by each participating jurisdiction to reduce the potential loss of life and property damage that results from the natural hazards identified in the risk assessment. These projects and activities are intended to be implemented *before* a hazard event occurs.

What happens next?
Any comments received at today's public forum and during the public comment period will be reviewed and, where applicable, incorporated into the draft Plan update before it is submitted to the Illinois Emergency Management Agency and Office Homeland Security and Office of Homeland Security (IEMA-OHS) and the Federal Emergency Management Agency (FEMA) for review. Once IEMA-OHS and FEMA have reviewed and approved the Plan, it will be presented to the County and each participating jurisdiction for formal adoption. After adopting the Plan update, each participating jurisdiction will be eligible to apply for federal mitigation funds and can begin implementing the mitigation actions identified in the Plan.

APPENDIX G

Mercer County Multi-Jurisdictional Natural Hazards Mitigation Plan

Comment Sheet

Plan Comment Period
December 13, 2023 thru December 29, 2023

The County's Multi-Jurisdictional Natural Hazard Mitigation Plan evaluates damage to life and property from the natural hazards that occur in the County. This Plan also identifies projects and activities for the County and each participating jurisdiction that will help reduce these damages. This comment sheet should be used to provide feedback on the draft Plan update.

What comments, concerns or questions do you have regarding the draft Plan update? (Use additional sheets if necessary.)

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Please Print Your Name, Address, and Phone Number Below:

Name: ______________________________ Phone: ______________

Address: ____

______________________________ Zip Code: ______________

Comments will be accepted through December 29, 2023.

Place
Stamp
Here

Angie Litterst, Administrator
Mercer County Health Department
305 NW 7th Street
Aledo, IL 61231

Mercer County Multi-Jurisdictional Natural Hazards Mitigation Plan Update Comment Survey

The Mercer County Multi-Jurisdictional Natural Hazards Mitigation Plan evaluates damage to life and property from the natural hazards that occur in the County. This Plan also identifies projects and activities for the County and each participating jurisdiction to help reduce these damages. This comment sheet should be used to provide feedback on the draft Plan.

An asterisk (*) denotes a question that is required for form completion.

* 1. What comments, concerns or questions do you have regarding the draft Plan?

* 2. Name:

3. Address:

4. City/Village/Town:

5. State/Province:

6. Zip Code:

* 7. Email Address:

8. Phone Number:

Comments will be accepted through December 29, 2023.

Done

APPENDIX H

Mercer County Health Department
305 NW 7th Street
Aledo, Illinois 61231
(309) 582-3759
FAX (309) 582-3793
www.mchdil.com

To: Knox County EMA: Chief Randy Hovind (rhovind@ci.galesburg.il.us)
Henderson County EMA: Cindy Brown (EMA.Zoning@hendersoncountyil.gov)
Henry County OEM: Mat Schnepple (Schnepple@ema-hc.com)
Rock Island County EMA: Matt DeSmyter (ema@ricosheriff.org)
Warren County ESDA: Casey Rexroat (casey.rexroat@monmouthfiredepartment.com)
Louisa County, IA EMA: Brian Hall (ema@louisacountyia.gov)
Muscatine County, IA EMA: Chris Jasper (cjasper@muscatineiowa.gov)

From: Angie Litterst, Mercer County Health Department Administrator

Subject: Hazard Mitigation Plan Update

Date: November 21, 2023

The purpose of this memorandum is to inform you that Mercer County is updating its countywide Natural Hazards Mitigation Plan. Since we share common boundaries, you are invited to review our draft Plan and provide comments during the public comment period, which runs from December 13 through 29, 2023. Starting December 13, the Plan, along with a summary sheet and a comment survey, can be viewed on the Mercer County Health Department webpage: https://www.mchdil.com/ .

A public forum is scheduled for:

Wednesday, December 13, 2023
4 p.m. to 6 p.m.
Mercer County Health Department,
305 NW 7th St., Aledo

If you have any questions, please contact me at 309-582-3759 or angie.litterst@mchdept.org

American Environmental Corp., an emergency management and environmental consulting firm experienced in preparing these plans, is leading our planning process. If you have specific questions about the Plan, please contact Ken Runkle, a consultant team member, at 217-585-9517 or krunkle@aecspfld.com

Thank you,

Angie Litterst

Angie Litterst, Administrator
Mercer County Health Department
305 NW 7th Street
Aledo, IL 61231
Office: (309) 582-3759
E-mail: angie.litterst@mchdept.org

Runkle, Ken

From: Angie Litterst <angie.litterst@mchdept.org>
Sent: Tuesday, November 21, 2023 1:49 PM
To: Randy Hovind (rhovind@ci.galesburg.il.us); EMA.Zoning@hendersoncountyil.gov; Mat Schnepple (schnepple@ema-hc.com); ema@ricosheriff.org; Casey Rexroat (casey.rexroat@monmouthfiredepartment.com); ema@louisacountyia.gov; cjasper@muscatineiowa.gov; Runkle, Ken
Subject: Mercer County HMP Required Notification of Adjacent Counties
Attachments: Memo to adjacent counties.pdf

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Angie Litterst

Angie Litterst, Administrator
Mercer County Health Department
305 NW 7th Street
Aledo, IL 61231
Office: (309) 582-3759
E-mail: angie.litterst@mchdept.org

APPENDIX I

Table 1 Severe Winter Storm Events Reported in Mercer County 1950 - 2022												
Date(s)	**Start Time**	**Event Type**	**Magnitude[1]**					**Observed Location(s)[2]**	**Injuries**	**Fatalities**	**Property Damages**	**Impacts/ Event Description**
			Snow (inches)	**Freezing Rain (inches)**	**Ice (inches)**	**Sleet (Inches)**	**Strong Wind (mph)**					
02/24/1950 thru 02/25/1950	n/a	Heavy Snow	10.0 in.					New Boston Keithsburg Aledo	n/a	n/a	n/a	
12/12/1950	n/a	Heavy Snow	5.6 in.					Aledo	n/a	n/a	n/a	
02/08/1951	8:00 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
03/10/1951 thru 03/14/1951	9:30 AM	Heavy Snow	17.0 in.					New Boston Keithsburg	n/a	n/a	n/a	
12/13/1951 thru 12/14/1951	11:30 PM	Heavy Snow	8.8 in.					New Boston Keithsburg	n/a	n/a	n/a	
12/18/1951	n/a	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	n/a	
12/20/1951	7:30 AM	Heavy Snow	5.0 in.					Aledo	n/a	n/a	n/a	
01/04/1952	5:30 AM	Heavy Snow	4.0 in.					New Boston	n/a	n/a	n/a	
03/03/1952 thru 03/04/1952	1:50 PM	Heavy Snow	8.0 in.					Aledo New Boston Keithsburg	n/a	n/a	n/a	
01/17/1953	6:00 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
01/22/1953 thru 01/23/1953	10:30 PM	Heavy Snow	4.0 in.					New Boston	n/a	n/a	n/a	

[1] An "X" in the snow, freezing rain, ice, sleet and/or strong winds columns indicates the presences of that weather condition during the severe winter storm event.

[2] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 1
Severe Winter Storm Events Reported in Mercer County
1950 - 2022

Date(s)	Start Time	Event Type	Magnitude[1] Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)	Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
02/15/1953 thru 02/16/1953	6:30 PM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
12/09/1953	2:00 AM	Heavy Snow	4.5 in.					Aledo New Boston Keithsburg	n/a	n/a	n/a	
12/22/1953	n/a	Heavy Snow	4.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
12/29/1954 thru 12/30/1954	6:00 AM	Heavy Snow	10.0 in.					Aledo New Boston Keithsburg	n/a	n/a	n/a	
02/10/1955	n/a	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
03/21/1955 thru 03/22/1955	3:00 PM	Heavy Snow	6.0 in.					Aledo New Boston Keithsburg	n/a	n/a	n/a	
02/02/1956	n/a	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	n/a	
02/08/1956 thru 02/09/1956	1:00 PM	Heavy Snow	5.7 in.					Aledo	n/a	n/a	n/a	
12/08/1956 thru 12/09/1956	4:30 AM	Heavy Snow	5.0 in.					New Boston	n/a	n/a	n/a	
	2:00 PM	Heavy Snow	4.0 in.					New Boston	n/a	n/a	n/a	

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			Snow (inches)	**Freezing Rain (inches)**	**Ice (inches)**	**Sleet (Inches)**	**Strong Wind (mph)**					
01/09/1957 thru 01/10/1957	3:30 PM	Heavy Snow	9.0 in.					New Boston Keithsburg	n/a	n/a	n/a	
03/24/1957 thru 03/25/1957	9:00 PM	Winter Storm	9.0 in.			X		AledoNew Boston	n/a	n/a	n/a	
12/31/1957	2:00 AM	Heavy Snow	6.8 in.					Aledo	n/a	n/a	n/a	
12/31/1957	7:00 AM	Heavy Snow	6.0 in.					New Boston Keithsburg	n/a	n/a	n/a	
01/19/1958 thru 01/21/1958	8:00 PM	Heavy Snow	9.0 in.					Aledo New Boston	n/a	n/a	n/a	
01/26/1958	n/a	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	n/a	
01/20/1959 thru 01/21/1959	8:00 AM	Heavy Snow	11.0 in.					Aledo New Boston	n/a	n/a	n/a	
03/04/1959 thru 03/06/1959	8:00 PM	Winter Storm	8.0 in.			X		New Boston Keithsburg	n/a	n/a	n/a	
11/12/1959 thru 11/13/1959	5:00 AM	Winter Storm	6.0 in.		X	X		Aledo New Boston	n/a	n/a	n/a	

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01/17/1960 thru 01/18/1960	1:00 PM	Heavy Snow	7.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
02/09/1960 thru 02/10/1960	8:30 AM	Winter Storm	7.0 in.			X		New Boston Keithsburg	n/a	n/a	n/a	
02/20/1960 thru 02/21/1960	4:00 PM	Heavy Snow	7.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
03/09/1960	n/a	Heavy Snow	5.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
03/15/1960 thru 03/16/1960	6:00 PM	Heavy Snow	8.0 in.					Aledo New Boston	n/a	n/a	n/a	
02/03/1961	n/a	Heavy Snow	5.0 in.					Keithsburg	n/a	n/a	n/a	
03/08/1961	n/a	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	n/a	
12/11/1961 thru 12/12/1961	1:00 AM	Heavy Snow	4.0 in.					New Boston Aledo	n/a	n/a	n/a	
12/22/1961 thru 12/23/1961	2:00 PM	Heavy Snow	5.0 in.					Aledo New Boston	n/a	n/a	n/a	

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01/05/1962 thru 01/06/1962	3:30 PM	Heavy Snow	6.0 in.					Aledo New Boston	n/a	n/a	n/a	
01/14/1962 thru 01/15/1962	8:30 AM	Heavy Snow	4.0 in.					New Boston	n/a	n/a	n/a	
02/17/1962 thru 02/19/1962	12:00 PM	Winter Storm	9.0 in.	X	X	X		Aledo New Boston	n/a	n/a	n/a	
02/20/1962 thru 02/21/1962	7:00 PM	Heavy Snow	5.0 in.					Aledo New Boston Keithsburg	n/a	n/a	n/a	
12/24/1962 thru 12/25/1962	9:00 PM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
01/20/1963	n/a	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	n/a	
12/12/1963	n/a	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	n/a	
03/04/1964 thru 03/05/1964	3:00 PM	Winter Storm	5.0 in.				X	Aledo	n/a	n/a	n/a	
03/20/1964	0"30	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
12/04/1964	12:30 AM	Heavy Snow	6.0 in.					Aledo	n/a	n/a	n/a	

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Date(s)	**Start Time**	**Event Type**	**Magnitude[1]**					**Observed Location(s)[2]**	**Injuries**	**Fatalities**	**Property Damages**	**Impacts/ Event Description**
			Snow (inches)	**Freezing Rain (inches)**	**Ice (inches)**	**Sleet (Inches)**	**Strong Wind (mph)**					
02/23/1965 thru 02/24/1965	1:00 PM	Heavy Snow	5.1 in.					Aledo	n/a	n/a	n/a	
03/04/1965 thru 03/05/1965	12:30 AM	Heavy Snow	6.5 in.					Aledo	n/a	n/a	n/a	
03/22/1965 thru 03/23/1965	7:30 PM	Winter Storm	4.0 in.					Aledo	n/a	n/a	n/a	
12/23/1965 thru 12/25/1965	8:00 PM	Heavy Snow	5.0 in.					Aledo	n/a	n/a	n/a	
12/27/1966 thru 12/28/1966	7:00 PM	Heavy Snow	4.5 in.					Aledo New Boston Keithsburg	n/a	n/a	n/a	
01/26/1967 thru 01/27/1967	1:00 AM	Heavy Snow	13.0 in.					Aledo New Boston Keithsburg	n/a	n/a	n/a	
10/26/1967 thru 10/27/1967	4:00 PM	Heavy Snow	5.0 in.					Aledo	n/a	n/a	n/a	
01/13/1968	n/a	Heavy Snow	4.5 in.					Keithsburg	n/a	n/a	n/a	
12/27/1968	12:30 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	

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Date(s)	Start Time	Event Type	Magnitude[1]					Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
02/28/1968	n/a	Heavy Snow	5.0 in.					Keithsburg	n/a	n/a	n/a	
12/06/1969 thru 12/07/1969	2:30 PM	Heavy Snow	6.0 in.					Aledo New Boston Keithsburg	n/a	n/a	n/a	
12/22/1969 thru 12/23/1969	3:00 PM	Heavy Snow	5.0 in.					Aledo New Boston	n/a	n/a	n/a	
01/22/1970 thru 01/23/1970	12:30 PM	Heavy Snow	4.0 in.					New Boston	n/a	n/a	n/a	
	12:30 AM	Heavy Snow	6.7 in.					Aledo	n/a	n/a	n/a	
01/02/1971 thru 01/03/1971	10:30 PM	Heavy Snow	15.0 in.					Aledo New Boston	n/a	n/a	n/a	
03/09/1971	1:00 PM	Heavy Snow	5.5 in.					Aledo Keithsburg	n/a	n/a	n/a	
01/28/1972	9:30 AM	Heavy Snow	4.0 in.					New Boston	n/a	n/a	n/a	
03/12/1972 thru 03/13/1972	4:00 PM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
03/28/1972 thru 03/29/1972	6:30 PM	Heavy Snow	11.0 in.					Aledo Keithsburg	n/a	n/a	n/a	

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Date(s)	Start Time	Event Type	Magnitude[1] Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)	Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
12/09/1972	10:30 AM	Heavy Snow	6.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
12/18/1973 thru 12/19/1973	9:00 PM	Heavy Snow	6.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
01/10/1974	7:00 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
02/21/1974 thru 02/22/1974	1:00 PM	Heavy Snow	5.0 in.					Aledo	n/a	n/a	n/a	
11/13/1974	6:30 AM	Heavy Snow	5.0 in.					Aledo New Boston	n/a	n/a	n/a	
11/28/1974 thru 11/30/1974	7:30 AM	Heavy Snow	8.0 in.					Aledo New Boston Keithsburg	n/a	n/a	n/a	
02/23/1975 thru 02/24/1975	6:30 PM	Heavy Snow	9.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
04/01/1975 thru 04/03/1975	11:00 PM	Winter Storm	6.0 in.	X	X	X		Aledo New Boston Keithsburg	n/a	n/a	n/a	
11/26/1975 thru 11/27/1975	9:30 AM	Heavy Snow	8.0 in.					Aledo New Boston Keithsburg	n/a	n/a	n/a	

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Date(s)	Start Time	Event Type	Magnitude[1]					Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
11/26/1976 thru 11/27/1976	4:30 PM	Heavy Snow	5.0 in.					Aledo	n/a	n/a	n/a	
03/19/1977 thru 03/20/1977	4:30 PM	Heavy Snow	6.2 in.					Aledo Keithsburg	n/a	n/a	n/a	
03/22/1977	n/a	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	n/a	
12/05/1977 thru 12/06/1977	5:30 AM	Heavy Snow	4.5 in.					Aledo New Boston Keithsburg	n/a	n/a	n/a	
12/08/1977	4:00 AM	Heavy Snow	4.0 in.					New Boston	n/a	n/a	n/a	
12/19/1977 thru 12/21/1977	7:00 PM	Heavy Snow	6.0 in.					Aledo	n/a	n/a	n/a	
12/31/1977 thru 01/01/1978	6:00 PM	Heavy Snow	5.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
02/13/1978	6:30 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
12/07/1978	n/a	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	n/a	
12/30/1978 thru 01/01/1979	3:30 PM	Winter Storm	11.0 in.		X			Keithsburg Aledo	n/a	n/a	n/a	

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Date(s)	Start Time	Event Type	Magnitude[1]					Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
01/12/1979 thru 01/14/1979	8:00 PM	Heavy Snow	13.0 in.					Keithsburg Aledo	n/a	n/a	n/a	
02/08/1979	n/a	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	n/a	
02/04/1980 thru 02/05/1980	10:30 PM	Heavy Snow	6.0 in.					Aledo	n/a	n/a	n/a	
03/07/1980 thru 03/08/1980	8:00 AM	Winter Storm	7.0 in.		X	X		Aledo Keithsburg	n/a	n/a	n/a	
04/14/1980	5:00 AM	Heavy Snow	6.0 in.					Aledo	n/a	n/a	n/a	
01/31/1981 thru 02/01/1981	8:00 PM	Heavy Snow	4.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
01/04/1982	n/a	Winter Storm	4.0 in.				X	Keithsburg	n/a	n/a	n/a	
04/05/1982	8:30 AM	Heavy Snow	7.0 in.					Aledo	n/a	n/a	n/a	
03/19/1983 thru 03/21/1983	8:00 PM	Heavy Snow	4.8 in.					Aledo	n/a	n/a	n/a	
12/05/1983 thru 12/06/1983	5:30 PM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	

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Date(s)	**Start Time**	**Event Type**	**Magnitude[1]**					**Observed Location(s)[2]**	**Injuries**	**Fatalities**	**Property Damages**	**Impacts/ Event Description**
			Snow (inches)	**Freezing Rain (inches)**	**Ice (inches)**	**Sleet (Inches)**	**Strong Wind (mph)**					
12/13/1983 thru 12/14/1983	3:30 PM	Heavy Snow	4.2 in.					Aledo	n/a	n/a	n/a	
12/16/1983	2:30 AM	Heavy Snow	5.0 in.					New Boston	n/a	n/a	n/a	
12/20/1983 thru 12/21/1983	10:00 PM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
12/22/1983	1:00 AM	Heavy Snow	4.0 in.					New Boston	n/a	n/a	n/a	
01/29/1984 thru 01/30/1984	2:30 PM	Winter Storm	5.9 in.			X		Aledo	n/a	n/a	n/a	
12/31/1984 thru 01/01/1985	12:30 AM	Winter Storm	8.4 in.		X	X		Aledo Keithsburg	n/a	n/a	n/a	
12/17/1985	n/a	Heavy Snow	4.5 in.					Aledo Keithsburg	n/a	n/a	n/a	
02/05/1986 thru 02/07/1986	8:00 PM	Heavy Snow	6.5 in.					Aledo Keithsburg	n/a	n/a	n/a	
02/24/1986	n/a	Heavy Snow	5.0 in.					Keithsburg	n/a	n/a	n/a	
01/10/1987	n/a	Heavy Snow	4.0 in.					Aledo Keithsburg	n/a	n/a	n/a	

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			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
12/14/1987 thru 12/15/1987	7:30 PM	Heavy Snow	6.5 in.					Aledo	n/a	n/a	n/a	
02/09/1988 thru 02/11/1988	10:00 PM	Heavy Snow	8.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
12/11/1989	n/a	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	n/a	
01/25/1990	1:30 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
02/14/1990 thru 02/15/1990	9:00 AM	Heavy Snow	6.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
12/02/1990 thru 12/03/1990	3:00 PM	Heavy Snow	5.0 in.					Aledo	n/a	n/a	n/a	
01/04/1991 thru 01/05/1991	9:30 PM	Heavy Snow	6.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
03/12/1991	4:00 AM	Heavy Snow	4.1 in.					Aledo	n/a	n/a	n/a	
12/03/1991	n/a	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	n/a	
12/10/1992	n/a	Heavy Snow	6.0 in.					Keithsburg	n/a	n/a	n/a	
01/03/1994	12:30 AM	Heavy Snow	5.0 in.					Aledo	n/a	n/a	n/a	
02/12/1994	6:00 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	

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			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
02/22/1994 thru 02/23/1994	3:00 PM	Heavy Snow	6.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
02/25/1994	4:00 AM	Heavy Snow	7.0 in.						n/a	n/a	n/a	
01/19/1995 thru 01/20/1995	3:00 AM	Heavy Snow	12.0 in.					Aledo New Boston Keithsburg	n/a	n/a	n/a	
01/18/1996	4:30 AM	Winter Storm	in.		X	X		Aledo	n/a	n/a	n/a	
01/26/1996	8:00 AM	Winter Storm	10.0 in.		X	X		Aledo Keithsburg	n/a	n/a	n/a	
11/14/1996	6:00 AM	Winter Storm			X		X	Aledo	n/a	n/a	n/a	
01/09/1997 thru 01/10/1997	4:00 AM	Winter Storm	7.0 in.					Keithsburg Aledo	n/a	n/a	n/a	
01/15/1997 thru 01/17/1997	4:00 AM	Winter Storm	5.0 in.				45 mph	Keithsburg	n/a	n/a	n/a	
01/24/1997	12:07 AM	Winter Storm	4.0 in.	X	X			Aledo	n/a	n/a	n/a	
01/26/1997 thru 01/27/1997	4:30 AM	Heavy Snow	5.0 in.					Aledo	n/a	n/a	n/a	

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02/03/1997 thru 02/04/1997	8:00 PM	Winter Storm	0.5 in.	X	X	X		Aledo	n/a	n/a	n/a	
02/15/1997 thru 02/16/1997	6:30 PM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
04/10/1997 thru 04/12/1997	11:00 AM	Heavy Snow	8.0 in.		X			Aledo Keithsburg	n/a	n/a	n/a	
12/09/1997	n/a	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
12/10/1997	n/a	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
12/24/1997 thru 12/25/1997	9:00 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
03/08/1998 thru 03/09/1998	12:00 PM	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	n/a	
01/01/1999 thru 01/03/1999	5:17 AM	Winter Storm	10.0 in.				X	Aledo Keithsburg	n/a	n/a	n/a	
01/18/1999	4:05 AM	Winter Storm	X				45 mph		n/a	n/a	n/a	

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			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
03/08/1999 thru 03/09/1999	12:00 PM	Winter Storm	6.0 in.				40 mph	Aledo Keithsburg	n/a	n/a	n/a	
12/16/1999 thru 12/17/1999	7:00 PM	Winter Storm	M in.	X				Aledo	n/a	n/a	n/a	
12/19/1999 thru 12/20/1999	4:00 PM	Winter Storm	0.5 in.	X			X	Aledo	n/a	n/a	n/a	
12/23/1999 thru 12/24/1999	2:00 PM	Winter Storm	4.0 in.	X		X		Aledo	n/a	n/a	n/a	
01/03/2000 thru 01/04/2000	12:00 PM	Winter Storm	1.0 in.	X		X		Aledo	n/a	n/a	n/a	
01/17/2000	8:00 AM	Winter Storm		X	X	X		Aledo	n/a	n/a	n/a	
01/19/2000	10:00 AM	Winter Storm	4.5 in.				40 mph	Aledo	n/a	n/a	n/a	
01/29/2000 thru 01/30/2000	12:00 PM	Winter Storm	4.0 in.					Aledo	n/a	n/a	n/a	
02/17/2000 thru 02/19/2000	7:00 PM	Winter Storm	7.0 in.	X		X		Aledo Keithsburg	n/a	n/a	n/a	

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			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
12/10/2000 thru 12/12/2000	10:00 PM	Winter Storm	11.0 in.				40 mph	Keithsburg Aledo	n/a	n/a	n/a	
12/15/2000 thru 12/16/2000	1:00 PM	Ice Storm		X	X	X		Aledo	n/a	n/a	n/a	
12/18/2000 thru 12/19/2000	10:00 AM	Heavy Snow	5.0 in.					Aledo	n/a	n/a	n/a	
12/20/2000 thru 12/21/2000	12:00 PM	Heavy Snow	5.0 in.					Aledo	n/a	n/a	n/a	
12/28/2000 thru 12/29/2000	12:00 PM	Heavy Snow	8.0 in.					Aledo Keithsburg	2	1	n/a	A two-vehicle accident killed one person and injured two others.
01/13/2001 thru 01/14/2001	9:00 PM	Winter Storm		X		X			n/a	n/a	n/a	
01/28/2001 thru 01/29/2001	12:00 PM	Ice Storm		X	0.5 in.	X		Aledo	n/a	n/a	n/a	
02/14/2001	5:00 AM	Winter Storm		X		X			n/a	n/a	n/a	

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			Snow (inches)	**Freezing Rain (inches)**	**Ice (inches)**	**Sleet (Inches)**	**Strong Wind (mph)**					
02/23/2001 thru 02/24/2001	10:30 PM	Winter Storm		X	X	X			n/a	n/a	n/a	
01/30/2002 thru 01/31/2002	12:30 AM	Winter Storm	9.0 in.	X		X		Aledo Keithsburg	n/a	n/a	n/a	
03/02/2002 thru 03/03/2002	12:30 AM	Winter Storm	8.0 in.					Aledo	n/a	n/a	n/a	
02/14/2003 thru 02/15/2003	11:00 AM	Winter Storm	8.0 in.				30 mph	Aledo Keithsburg	n/a	n/a	n/a	
03/04/2003 thru 03/05/2003	5:00 PM	Winter Storm	5.0 in.					Aledo	n/a	n/a	n/a	
12/04/2003 thru 12/05/2003	5:30 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
01/03/2004 thru 01/04/2004	8:00 PM	Heavy Snow	6.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
01/27/2004	n/a	Heavy Snow	5.0 in.					Keithsburg	n/a	n/a	n/a	

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			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
02/02/2004 thru 02/03/2004	4:00 AM	Winter Storm	4.0 in.	X				Aledo	n/a	n/a	n/a	
03/15/2004 thru 03/16/2004	5:30 AM	Heavy Snow	6.0 in.					Aledo Keithsburg	n/a	n/a	n/a	
01/05/2005	12:30 AM	Ice Storm			0.8 in.			Aledo	n/a	n/a	$10,000	
12/08/2005	6:00 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
02/15/2006 thru 02/17/2006	7:00 PM	Winter Storm		X				Aledo	n/a	n/a	$1,000	
03/21/2006	3:00 AM	Heavy Snow	4.0 in.					Keithsburg	n/a	n/a	$2,000	
12/01/2006	12:30 AM	Winter Storm	10.0 in.					New Boston	n/a	n/a	n/a	Most of the County received 6 to 10 inches of snow. The greatest amount was 10 inches near New Windsor.
01/12/2007 thru 01/15/2007	6:30 PM	Winter Storm	3.0 in.	X	0.3 in.	X		Aledo	n/a	n/a	n/a	
02/06/2007	2:00 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
02/12/2007 thru 02/13/2007	11:30 PM	Winter Storm	2.0 in.				40 mph	Aledo	n/a	n/a	n/a	

[1] An "X" in the snow, freezing rain, ice, sleet and/or strong winds columns indicates the presences of that weather condition during the severe winter storm event.

[2] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 1
Severe Winter Storm Events Reported in Mercer County
1950 - 2022

Date(s)	Start Time	Event Type	Magnitude[1]					Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
02/24/2007	1:30 PM	Ice Storm			1.0 in.			Aledo	n/a	1	$965,000	A 70 year old man died after being struck by an ice-covered branch in rural Joy. He was clearing branches from his driveway during the ice storm on February 24 when the branch struck him on the head.
03/01/2007 thru 03/02/2007	6:00 PM	Winter Storm	1.0 in.				50 mph	Aledo	n/a	n/a	n/a	
12/01/2007 thru 12/02/2007	9:00 AM	Ice Storm			X			Aledo	n/a	n/a	n/a	
12/10/2007 thru 12/11/2007	11:30 PM	Ice Storm		X	0.8 in.		40 mph	Aledo	n/a	n/a	n/a	
12/22/2007 thru 12/23/2007	6:00 PM	Winter Storm		X	1.0 in.	X	50 mph		n/a	n/a	n/a	
12/28/2007	5:00 AM	Heavy Snow	5.0 in.					Aledo New Boston	n/a	n/a	n/a	
12/31/2007	7:30 AM	Heavy Snow	6.0 in.					Aledo Keithsburg	n/a	n/a	n/a	

[1] An "X" in the snow, freezing rain, ice, sleet and/or strong winds columns indicates the presences of that weather condition during the severe winter storm event.
[2] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 1
Severe Winter Storm Events Reported in Mercer County
1950 - 2022

Date(s)	Start Time	Event Type	Magnitude[1]					Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
01/21/2008 thru 01/22/2008	11:30 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
01/29/2008	12:30 PM	Winter Storm	X				55 mph		n/a	n/a	n/a	
02/05/2008 thru 02/06/2008	12:00 PM	Heavy Snow	7.0 in.					Aledo	n/a	n/a	n/a	
12/08/2008	8:50 AM	Winter Storm		X	X				n/a	n/a	n/a	
12/16/2008	8:30 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
12/18/2008 thru 12/19/2008	7:00 PM	Ice Storm			1.0 in.			Aledo	n/a	n/a	n/a	*Event Description Provided Below*
According to the Mercer County EMA Director the storm cause major infrastructure damage to both electrical and communication lines.						The Interim Aledo Police Chief indicated trees and power lines were downed leaving the City without power for 3 1/2 days. Police Officers worked 18 hour shitfts during the event. The VFW was setup as a warming center and General Grind and Machine doneated a generator.						
12/21/2008	9:00 AM	Blizzard	2.0 in.				45 mph	Aledo	n/a	n/a	n/a	
01/13/2009 thru 01/14/2009	8:30 PM	Heavy Snow	6.3 in.					Sherrard Aledo	n/a	n/a	n/a	
12/07/2009 thru 12/09/2009	11:00 PM	Winter Storm	2.0 in.		X	X		Aledo	n/a	n/a	n/a	

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Table 1 Severe Winter Storm Events Reported in Mercer County 1950 - 2022													
Date(s)	**Start Time**	**Event Type**	**Magnitude[1]**					**Observed Location(s)[2]**	**Injuries**	**Fatalities**	**Property Damages**	**Impacts/ Event Description**
			Snow (inches)	**Freezing Rain (inches)**	**Ice (inches)**	**Sleet (Inches)**	**Strong Wind (mph)**					
12/25/2009 thru 12/27/2009	12:00 PM	Heavy Snow	5.0 in.					Sherrard	n/a	n/a	n/a	
01/06/2010 thru 01/07/2010	6:00 PM	Heavy Snow	6.9 in.					Sherrard	n/a	n/a	n/a	
01/20/2010	7:00 AM	Ice Storm		X	0.5 in.			Aledo	n/a	n/a	n/a	Mercer County EMA Director indicated the storm damage infrastructure including electrical and communication lines
01/25/2010	7:30 AM	Winter Storm	2.0 in.				50 mph	Aledo	n/a	n/a	n/a	
02/07/2010 thru 02/09/2010	4:00 PM	Heavy Snow	6.0 in.					Aledo	n/a	n/a	n/a	
02/21/2010	1:00 PM	Heavy Snow	5.0 in.					Aledo	n/a	n/a	n/a	
12/11/2010 thru 12/12/2010	9:00 AM	Winter Storm	2.0 in.	X			50 mph	Aledo	n/a	n/a	n/a	
12/23/2010 thru 12/25/2010	8:00 PM	Heavy Snow	7.0 in.					Aledo New Boston	n/a	n/a	n/a	

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Table 1
Severe Winter Storm Events Reported in Mercer County
1950 - 2022

Date(s)	Start Time	Event Type	Magnitude[1]					Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
02/01/2011 thru 02/02/2011	10:30 AM	Blizzard	12.5 in.				60 mph	Aledo	n/a	n/a	$120,304	*Event Description Provided Below*
This event was part of a federally-declared disaster (Declaration #1960) Public Assistance figures for Mercer County totaled $120,304. Totals by Jurisdiction: $3,562 Abington Township; $15,691 Aledo; $937 Joy; $1,839 Keithsburg; $2,682 Keithsburg Township; $3,435 Matherville; $4,571 New Boston; $2,342 North Henderson; $4,669 North Henderson Township; $7,895 Preemption Township Road District; $5,052 Millersburg Township Road District; $4,771 Suez Township Road District; $2,217 Mercer County Hospital; $3,611 Green Road District; $8,153 Mercer Township Road District; $5,610 Richland Grove Township Road District; $5,994 Duncan Township Road District; $4,751 Rivoli Township Road District; $4,428 Ohio Grove Road District; $17,474 Mercer County; $4,985 Eliza Township Road District; $5,635 Perryton Township Road & Bridge District												
02/27/2011 thru 02/28/2011	8:00 PM	Winter Storm		X	X	X		New Boston	n/a	n/a	n/a	
01/12/2012 thru 01/13/2012	9:00 AM	Heavy Snow	5.0 in.					Aledo	n/a	n/a	n/a	
12/20/2012	7:00 AM	Blizzard	4.5 in.				60 mph	Aledo New Windsor	n/a	n/a	n/a	
01/27/2013	11:00 AM	Winter Storm		X	X	X			n/a	n/a	n/a	
02/26/2013 thru 02/27/2013	10:00 AM	Winter Storm	4.0 in.				35 mph	Aledo	n/a	n/a	n/a	
03/24/2013	12:00 AM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	

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Table 1
Severe Winter Storm Events Reported in Mercer County
1950 - 2022

Date(s)	Start Time	Event Type	Magnitude[1] Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)	Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
12/21/2013 thru 12/22/2013	5:00 PM	Heavy Snow	5.0 in.					New Boston	n/a	n/a	n/a	
12/19/2013 thru 12/20/2013	7:00 PM	Winter Storm		X	X				n/a	n/a	n/a	
01/04/2014 thru 01/06/2014	6:00 PM	Heavy Snow	5.4 in.					New Windsor	n/a	n/a	n/a	
02/04/2014 thru 02/05/2014	3:00 PM	Winter Storm	4.0 in.				X	Aledo	n/a	n/a	n/a	
02/17/2014	7:00 AM	Heavy Snow	5.7 in.					Aledo	n/a	n/a	n/a	
01/05/2015 thru 01/06/2014	3:00 PM	Winter Storm	6.0 in.					Aledo	n/a	n/a	n/a	
02/01/2015	12:00 AM	Winter Storm	10.0 in.					Aledo	n/a	n/a	n/a	
02/25/2015 thru 02/26/2015	11:00 AM	Heavy Snow	4.6 in.					Aledo	n/a	n/a	n/a	
11/20/2015 thru 11/21/2015	6:00 PM	Winter Storm	6.8 in.				X	Sherrard	n/a	n/a	n/a	

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Table 1
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1950 - 2022

Date(s)	Start Time	Event Type	Magnitude[1]					Observed Location(s)[2]	Injuries	Fatalities	Property Damages	Impacts/ Event Description
			Snow (inches)	Freezing Rain (inches)	Ice (inches)	Sleet (Inches)	Strong Wind (mph)					
12/28/2015	2:00 AM	Winter Storm		X	1.0 in.		X	Aledo	n/a	n/a	n/a	4 to 6 inche tree limbs were downed.
02/15/2016	n/a	Heavy Snow	4.5 in.					Aledo	n/a	n/a	n/a	
12/04/2016	3:00 AM	Heavy Snow	8.0 in.					Sherrard	n/a	n/a	n/a	
12/29/2017	9:00 AM	Heavy Snow	4.5 in.					Aledo	n/a	n/a	n/a	
02/05/2018	4:00 PM	Heavy Snow	9.0 in.					Aledo	n/a	n/a	n/a	
04/08/2019 thru 04/09/2018	4:00 PM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
11/25/2018 thru 11/26/2018	4:00 PM	Blizzard	12.0 in.				40 mph	Aledo	n/a	n/a	n/a	
01/11/2019 thru 01/13/2019	10:00 PM	Winter Storm	10.0 in.					Aledo	n/a	n/a	n/a	
01/18/2019 thru 01/19/2019	6:00 PM	Winter Storm	4.0 in.				30 mph	Aledo	n/a	n/a	n/a	
01/23/2019	n/a	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	
10/30/2019 thru 10/31/2019	6:00 PM	Heavy Snow	4.0 in.					Aledo	n/a	n/a	n/a	

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Table 1 Severe Winter Storm Events Reported in Mercer County 1950 - 2022													
Date(s)	**Start Time**	**Event Type**	**Magnitude**[1]					**Observed Location(s)**[2]	**Injuries**	**Fatalities**	**Property Damages**	**Impacts/ Event Description**
			Snow (inches)	**Freezing Rain (inches)**	**Ice (inches)**	**Sleet (Inches)**	**Strong Wind (mph)**					
04/16/2020 thru 04/17/2020	6:00 PM	Winter Storm	6.2 in.					Aledo	n/a	n/a	n/a	
12/29/2020 thru 12/30/2020	12:00 PM	Winter Storm	6.0 in.	X				Aledo	n/a	n/a	n/a	
01/01/2021	6:00 AM	Winter Storm	2.0 in.		0.5 in.	X			n/a	n/a	n/a	
01/25/2021 thru 01/26/2021	12:00 PM	Heavy Snow	4.5 in.					New Windsor Aledo	n/a	n/a	n/a	
01/01/2022 thru 01/02/2022	5:00 AM	Winter Storm	5.0 in.				X	Aledo	n/a	n/a	n/a	
12/22/2022 thru 12/24/2022	12:00 AM	Winter Storm	1.8 in.				50 mph	Aledo	n/a	n/a	n/a	
GRAND TOTAL:									**2**	**2**	**$1,098,304**	

Sources: Mercer County Multi-Jurisdictional Natural Hazards Mitigation Planning Committee Member responses to Natural Hazard Events Questionnaire.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

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[2] Observed Location information was obtained from NWS’s COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center’s cli-MATE data system and NOAA’s Storm Events Database.

Table 2 Severe Storms - Thunderstorms with Damaging Winds Reported in Mercer County 1973 - 2022								
Date(s)	**Start Time**	**Location(s)**	**Magnitude Windspeed (knots)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
04/30/1973	5:45 PM	Alexis^	n/a	n/a	n/a	n/a	n/a	
06/20/1974	5:30 PM	Aledo	n/a	n/a	n/a	n/a	n/a	
05/20/1975	5:20 PM	Seaton^	n/a	n/a	n/a	n/a	n/a	
05/20/1975	5:36 PM	Swedona^	52 kts	n/a	n/a	n/a	n/a	
07/23/1975	3:25 PM	Buffalo Prairie^	n/a	n/a	n/a	n/a	n/a	
07/23/1975	3:55 PM	Sherrard	n/a	n/a	n/a	n/a	n/a	
06/17/1978	7:36 PM	Seaton	52 kts	n/a	n/a	n/a	n/a	
07/30/1979	5:31 AM	Aledo^	53 kts	n/a	n/a	n/a	n/a	
07/05/1980	2:00 AM	New Windsor	n/a	n/a	n/a	n/a	n/a	
08/04/1980	5:40 PM	Aledo	50 kts	n/a	n/a	n/a	n/a	
12/27/1982	9:00 PM	Aledo	n/a	1	n/a	n/a	n/a	Several mobile homes were overturned and damaged along with several out-buildings. One person was injured in a mobile home.
04/29/1984	7:15 PM	Viola	n/a	n/a	n/a	$25,000	n/a	Strong winds blew off a roof of a gas station in Viola.
05/06/1986	4:33 PM	Reynolds^	60 kts	n/a	n/a	n/a	n/a	
08/21/1987	3:30 AM	Aledo^	n/a	n/a	n/a	n/a	n/a	
05/08/1988	2:30 PM	Aledo Aledo^	n/a	n/a	n/a	$25,000	n/a	Strong thunderstorm winds damaged two businesses, downed trees and power lines in Aledo. Spotty wind damage was also reported in the northwest half of Mercer County.
08/18/1988	3:00 PM	Aledo^	n/a	n/a	n/a	n/a	n/a	
05/24/1989	5:00 AM	Aledo	71 kts	n/a	n/a	n/a	n/a	
06/27/1990	6:56 PM	Aledo Aledo^	52 kts	n/a	n/a	n/a	n/a	
10/17/1990	4:00 PM	Matherville^	n/a	n/a	n/a	$25,000	n/a	There was damage to a home, trees, and power lines.
06/21/1991	8:00 PM	New Boston	50 kts	n/a	n/a	n/a	n/a	

^ Thunderstorms with damaging winds verified in the vicinity of this location(s).

Table 2
Severe Storms - Thunderstorms with Damaging Winds Reported in Mercer County
1973 - 2022

Date(s)	Start Time	Location(s)	Magnitude Windspeed (knots)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
11/29/1991	10:50 PM	Keithsburg	n/a	n/a	n/a	n/a	n/a	The Mercer County Sheriff's Department reported trees down on cars and homes in Kiethsburg.
11/29/1991	11:19 PM	Gilchrist^ Viola Viola^	n/a	3	n/a	$50,000	n/a	A mobile home was rolled over in the Gilcrest area, near Aledo, injuring three people. The roof was blown off a mobile home 2 miles east and 1 mile north of Viola.
11/29/1991	11:25 PM	Viola^	n/a	n/a	n/a	$25,000	n/a	Six miles northeast of Viola a machine shed, a garage, and a barn were damaged and trees were uprooted.
07/02/1992	11:50 AM	Aledo Keithsburg	n/a	n/a	n/a	$2,500	n/a	As thunderstorms entered Mercer County, trees and power lines were blown down in the communities of Aledo and Keithsburg.
08/15/1993	3:30 AM	Aledo	n/a	n/a	n/a	n/a	n/a	Winds knocked out windows and damaged a gutter at a house. Eight trees were uprooted, farm buildings were damaged.
04/09/1995	12:07 AM	Preemption	n/a	n/a	n/a	n/a	n/a	
04/05/1997	2:35 PM	Joy	52 kts	n/a	n/a	n/a	n/a	Small shed blown over.
04/05/1997	2:50 PM	North Henderson North Henderson^	52 kts	n/a	n/a	n/a	n/a	Power pole downed.
04/05/1997	2:55 PM	Joy^ Aledo	50 kts	n/a	n/a	n/a	n/a	Numerous large tree limbs downed.
04/05/1997	2:55 PM	New Windsor	50 kts	n/a	n/a	n/a	n/a	Trees and power lines downed.
06/21/1997	4:25 AM	Keithsburg	60 kts	n/a	n/a	$15,000	n/a	Tree blown into house.
06/21/1997	4:30 AM	Seaton^	60 kts	n/a	n/a	n/a	n/a	Trees down across route 94.
06/21/1997	4:35 AM	Viola	60 kts	n/a	n/a	n/a	n/a	Trees down across route 67.
07/19/1997	2:45 PM	Viola	60 kts	n/a	n/a	n/a	n/a	Building damaged. Three foot diameter tree downed over highway 67.
07/19/1997	2:57 PM	Aledo	60 kts	n/a	n/a	n/a	n/a	Trees and power lines down.

^ Thunderstorms with damaging winds verified in the vicinity of this location(s).

Table 2 **Severe Storms - Thunderstorms with Damaging Winds Reported in Mercer County** **1973 - 2022**								
Date(s)	**Start Time**	**Location(s)**	**Magnitude Windspeed (knots)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
07/19/1997	3:00 PM	Viola Gilchrist	70 kts	n/a	n/a	n/a	n/a	Shed moved and car lifted off the road. Storage building missing.
07/19/1997	3:05 PM	Matherville^	60 kts	n/a	n/a	n/a	$5,000	Cornfield flattened near highway 17. Large trees downed.
07/19/1997	3:30 PM	countywide	60 kts	n/a	n/a	n/a	n/a	Trees and power lines downed all over the County.
03/27/1998	6:49 PM	Aledo	55 kts	n/a	n/a	n/a	n/a	Numerous trees and power lines were downed.
03/27/1998	7:10 PM	Preemption^	n/a	n/a	n/a	$3,000	n/a	Winds knocked down a barn and numerous power poles.
06/29/1998	2:22 PM	countywide	56 kts	n/a	n/a	n/a	n/a	Damage was heavy to homes, trees and outbuildings in Keithsburg. The Mercer Couty Fairgrounds at Aledo also reported heavy damage.
06/04/1999	1:40 PM	Joy	52 kts	n/a	n/a	n/a	n/a	Power poles and numerous tree limbs were downed.
06/06/1999	3:15 PM	Aledo	55 kts	n/a	n/a	n/a	n/a	Several tree limbs downed. A large tree was blown down onto a baseball field.
07/27/1999	11:30 PM	Viola	n/a	n/a	n/a	$500	n/a	Thunderstorms produced downburst winds which downed power lines in Viola.
04/20/2000	4:05 AM	Alexis^	n/a	n/a	n/a	$500	n/a	Thunderstorm winds blew down a large tree, which blocked U.S. Highway 67.
06/13/2000	3:20 PM	Aledo	n/a	n/a	n/a	$1,000	n/a	Trees were toppled in the County.
05/10/2001	9:40 PM	Alexis^	52 kts	n/a	n/a	n/a	n/a	
06/14/2001	4:50 PM	countywide	61 kts	n/a	n/a	n/a	n/a	Thunderstorms winds damaged outbuildings on a farm southwest of Seaton. Thunderstorm wind downed numerous power lines throughout the County.
06/14/2001	5:05 PM	Seaton	61 kts	n/a	n/a	n/a	n/a	Thunderstorm winds downed trees over a two-block wide area.
08/02/2001	3:10 PM	Seaton	52 kts	n/a	n/a	n/a	n/a	Thunderstorm winds blew down large tree limbs, which blocked the driveways of two homes.

^ Thunderstorms with damaging winds verified in the vicinity of this location(s).

Table 2 Severe Storms - Thunderstorms with Damaging Winds Reported in Mercer County 1973 - 2022								
Date(s)	**Start Time**	**Location(s)**	**Magnitude Windspeed (knots)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
03/09/2002	3:00 AM	Aledo Aledo^ Hamlet^	70 kts	n/a	n/a	n/a	n/a	Garage torn off house, barn destroyed and large trees snapped. A homestead in rural Aledo suffered heavy damage. High winds shattered windows and destroyed a barn, three empty grain storage bins, a fence, several dog houses and a children's swing set.
03/09/2002	3:15 AM	Alexis^	52 kts	n/a	n/a	n/a	n/a	Power lines down.
06/10/2002	3:00 PM	Aledo	57 kts	n/a	n/a	n/a	n/a	A wooden swingset was blown over, and a trampoline was picked up and blown into a field.
06/10/2002	3:40 PM	Sherrard	52 kts	n/a	n/a	n/a	n/a	Trees down.
12/18/2002	12:00 PM	countywide	70 kts	n/a	n/a	n/a	n/a	Severe winds ripped through Mercer County producing scattered reports of damage. One residence in Aledo suffered damage when a metal porch roof struck the home and then an automobile. That same porch roof landed in the power lines in front of another residence a few blocks away. Nearby, a window was blown out of another residence. West of Aledo there was damage to a building at a shooting range. Also, large storage barrels were tossed across a field. Buildings were also damaged near the city of Reynolds.
07/20/2003	11:34 PM	countywide	70 kts	n/a	n/a	$10,000,000	$3,000,000	Also reported by spotters. Considerable damage in Viola, Hamlet, North Henderson, and Aledo with numerous trees and power lines down. Large areas of corn flattened.
05/20/2004	7:44 PM	New Windsor^	61 kts	n/a	n/a	$5,000	$10,000	3 foot diameter trees down on 320th Street near Pope Creek.
06/08/2005	11:53 AM	countywide	57 kts	n/a	n/a	$10,000	$20,000	

^ Thunderstorms with damaging winds verified in the vicinity of this location(s).

Table 2
Severe Storms - Thunderstorms with Damaging Winds Reported in Mercer County
1973 - 2022

Date(s)	Start Time	Location(s)	Magnitude Windspeed (knots)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
04/13/2006	8:50 PM	countywide	78 kts	n/a	n/a	$400,000	n/a	Numerous trees and power lines were downed in Joy. Westmer High School had considerable roof damage done to the gymnasium. The outer roof of the Frontier Communications Building was peeled off. A mobile home just north of Joy was destroyed. Widespread reports of damage to trees and power lines were received throughout the County. Illinois Highway 17 was closed between Aledo and Joy due to the number of power lines, poles, and trees down across the road. The road did not open until the following afternoon. Near Millersburg a roof off a barn with damage to the siding. Paint was stripped from the house with damage done to the garage.
04/13/2006	8:59 PM	Aledo	57 kts	n/a	n/a	$10,000	n/a	Trees/limbs and power lines down across the city.
04/13/2006	9:03 PM	Reynolds^	61 kts	n/a	n/a	$35,000	n/a	Location is about 2.5 miles south of Reynolds on the Berenger farm. Damage to the siding and roof of the house with damage to several outbuildings.
03/31/2007	4:30 PM	Aledo	52 kts	n/a	n/a	n/a	n/a	Sheriffs department reported at least one power pole blown down just north of Aledo, and numerous small branches down around the Aledo area.
06/01/2007	12:40 PM	North Henderson	56 kts	n/a	n/a	n/a	n/a	A dozen 12 inch diameter trees were blown over.
07/21/2008	5:10 AM	New Windsor^	61 kts	n/a	n/a	$25,000	n/a	Wind gusts uprooted three mature trees, snapped 6 to 12 inch diameter tree limbs off of healthy trees, and ripped shingles off of some roofs about 2 miles north of New Windsor. In addition, the outer rows of some area corn fields were leaning over at a 45 degree angle.

^ Thunderstorms with damaging winds verified in the vicinity of this location(s).

Table 2
Severe Storms - Thunderstorms with Damaging Winds Reported in Mercer County
1973 - 2022

Date(s)	Start Time	Location(s)	Magnitude Windspeed (knots)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
07/21/2008	5:13 AM	Sherrard^	61 kts	n/a	n/a	n/a	n/a	Wind gusts blew down some large tree branches 1 mile west southwest of Sherrard.
07/29/2008	4:55 PM	Sherrard^	52 kts	n/a	n/a	n/a	n/a	
06/27/2009	4:48 PM	Reynolds^	52 kts	n/a	n/a	n/a	n/a	
06/27/2009	5:07 PM	Sherrard^	52 kts	n/a	n/a	$25,000	n/a	A power outage was observed.
04/30/2010	4:05 PM	Alexis^	61 kts	n/a	n/a	$25,000	n/a	Wind gusts estimated to be 70 mph destroyed a well-built 60'x60'x35' barn pulling its cement blocks off of the foundation about 3 miles west of Alexis. In addition, some apple trees were damaged as well as the porch of the residence. Wind gusts damage or uprooted several healthy trees including one 40 inches in diameter about 4 miles west of Alexis. In addition, a piece of wood was driven into the front yard.
06/29/2012	8:05 PM	New Windsor^	61 kts	n/a	n/a	$100	n/a	Wind gusts blew down some tree limbs and bent a flagpole.
05/19/2013	5:45 PM	New Windsor	52 kts	n/a	n/a	n/a	n/a	Law enforcement reported trees down near U.S. Highway 67 south of 50th Street.
05/30/2013	3:45 PM	Aledo^	61 kts	n/a	n/a	n/a	n/a	A trained spotter reported large trees down.
06/01/2014	6:45 PM	New Windsor^	52 kts	n/a	n/a	n/a	n/a	A trained spotter reported numerous small limbs down. Two limbs of 8 to 10 inches in diameter and 15 to 20 feet in length were also blown down.
07/12/2014	8:32 PM	Matherville	61 kts	n/a	n/a	n/a	n/a	A large tree was uprooted.
06/22/2016	2:27 AM	Seaton	52 kts	n/a	n/a	n/a	n/a	Mercer county sheriffs office reported a large tree limb down along route 17.

^ Thunderstorms with damaging winds verified in the vicinity of this location(s).

Table 2
Severe Storms - Thunderstorms with Damaging Winds Reported in Mercer County
1973 - 2022

Date(s)	Start Time	Location(s)	Magnitude Windspeed (knots)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
07/13/2016	2:30 PM	Aledo	52 kts	n/a	n/a	n/a	n/a	The emergency manager reported furniture blown around and a semi trailer was blown over at the Mercer County Fair in Aledo. Some trees were also blown down in town.
02/28/2017	8:45 PM	Sherrard^	52 kts	n/a	n/a	n/a	n/a	Several 4 inch diameter tree branches were down along the highway just south of Sherrard.
07/10/2017	3:53 AM	Aledo	61 kts	n/a	n/a	n/a	n/a	The county emergency manager reported a couple of trees were down.
07/11/2017	6:00 AM	New Boston	56 kts	n/a	n/a	n/a	n/a	Local law enforcement reported a tree was down.
07/11/2017	6:15 AM	Aledo	56 kts	n/a	n/a	n/a	n/a	Local law enforcement reported a tree was down.
07/13/2018	6:45 PM	Viola^	55 kts	n/a	n/a	n/a	n/a	The public reported microburst winds damaged a machine shed, topped trees, and flattened corn at a farmstead.
08/28/2018	8:27 PM	Aledo	60 kts	n/a	n/a	n/a	n/a	Law enforcement relayed a report of trees down in Aledo.
09/18/2018	12:00 PM	Aledo	50 kts	n/a	n/a	n/a	n/a	Local law enforcement reported a few trees and power lines down.
05/14/2020	8:45 PM	Burgess^	52 kts	n/a	n/a	n/a	n/a	Several reports of power lines down.
07/09/2020	4:58 PM	Joy^	52 kts	n/a	n/a	n/a	n/a	Reports of flattened corn.
07/09/2020	5:19 PM	Aledo	56 kts	n/a	n/a	n/a	n/a	Downed power pole reported.
07/11/2020	6:27 PM	Aledo	61 kts	n/a	n/a	n/a	n/a	A large pine tree was uprooted along Highway 94 south of Aledo.
07/11/2020	6:32 PM	Viola^	56 kts	n/a	n/a	n/a	n/a	Power lines down due to a tree blown onto them.
07/19/2020	7:51 AM	Keithsburg	61 kts	n/a	n/a	n/a	n/a	Trees were damaged in Keithsburg.

^ Thunderstorms with damaging winds verified in the vicinity of this location(s).

Table 2
Severe Storms - Thunderstorms with Damaging Winds Reported in Mercer County
1973 - 2022

Date(s)	Start Time	Location(s)	Magnitude Windspeed (knots)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
08/10/2020	12:10 PM	countywide	70 kts	n/a	n/a	n/a	n/a	Widespread straight-line winds that produced extensive damage were reported throughout Mercer County, associated with a derecho. These winds lasted around an hour in total, even though the initial line of storms moved out fast. Damaging straight-line winds continued and were associated with the rear inflow jet. Maximum wind speeds were reported up to 80 mph These estimates were determined based off damage surveys and photos submitted through social media. These strong winds damaged many trees, crops, and a few structures in their path.
11/10/2020	1:50 PM	Joy^	78 kts	n/a	n/a	n/a	n/a	Power poles snapped off along highway 17, east of Joy. Large trees with limbs torn off, along with fences blown down in Joy. Also, reports of buildings destroyed south of Joy.
04/07/2021	6:50 PM	Aledo^	65 kts	n/a	n/a	n/a	n/a	A trained spotter reported thunderstorm wind damage to a farm outbuilding south of Aledo. Pictures via social media show part of a wall blown out, but the barn was open to one side and the other wall is partially covered.
06/18/2021	10:04 PM	North Henderson^	56 kts	n/a	n/a	n/a	n/a	A large tree was blown down.
08/10/2021	6:03 PM	Seaton^	65 kts	n/a	n/a	n/a	n/a	Damage reported to power poles, tops of trees, and siding of a farm building. Power outages reported.
08/11/2021	5:44 AM	New Boston	61 kts	n/a	n/a	n/a	n/a	Roof damaged and power is out.

^ Thunderstorms with damaging winds verified in the vicinity of this location(s).

Table 2
Severe Storms - Thunderstorms with Damaging Winds Reported in Mercer County
1973 - 2022

Date(s)	Start Time	Location(s)	Magnitude Windspeed (knots)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
03/05/2022	8:50 PM	Aledo	52 kts	n/a	n/a	n/a	n/a	
06/25/2022	5:26 AM	Gilchrist^	52 kts	n/a	n/a	n/a	n/a	A tree was blown down about 2 miles west of Viola on Highway 17.
GRAND TOTAL:				**4**	**0**	**$10,707,600**	**$3,035,000**	

Source: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

^ Thunderstorms with damaging winds verified in the vicinity of this location(s).

Table 3 Severe Storms - Hail Events Reported in Mercer County 1971 - 2022								
Date(s)	**Start Time**	**Location(s)**	**Magnitude Hail Stone Diameter (inches)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
08/24/1971	5:00 PM	New Windsor^	1.75 in.	n/a	n/a	n/a	n/a	
05/01/1973	3:03 PM	Aledo^	1.50 in.	n/a	n/a	n/a	n/a	
06/14/1974	3:15 PM	Preemption^	2.50 in.	n/a	n/a	n/a	n/a	
06/14/1974	3:40 PM	New Windsor	2.00 in.	n/a	n/a	n/a	n/a	
06/13/1975	6:44 PM	Keithsburg	1.75 in.	n/a	n/a	n/a	n/a	
06/13/1975	6:52 PM	Alexis	1.00 in.	n/a	n/a	n/a	n/a	
09/07/1977	3:10 PM	Aledo^	1.00 in.	n/a	n/a	n/a	n/a	
05/29/1980	12:05 PM	Keithsburg	1.00 in.	n/a	n/a	n/a	n/a	
04/13/1981	6:13 PM	Aledo	1.75 in.	n/a	n/a	n/a	n/a	
04/13/1981	6:35 PM	New Windsor	1.75 in.	n/a	n/a	n/a	n/a	
05/18/1982	3:45 PM	Aledo^	1.00 in.	n/a	n/a	n/a	n/a	
05/18/1982	4:00 PM	Aledo	1.00 in.	n/a	n/a	n/a	n/a	
08/21/1987	1:30 AM	Aledo^	1.75 in.	n/a	n/a	n/a	n/a	
10/23/1991	4:10 PM	New Boston	1.25 in.	n/a	n/a	n/a	n/a	
05/09/1996	8:08 PM	Alexis^	1.75 in.	n/a	n/a	n/a	n/a	
05/10/2001	9:40 PM	Alexis^	1.00 in.	n/a	n/a	n/a	n/a	
06/12/2002	6:55 PM	Matherville^	2.00 in.	n/a	n/a	n/a	n/a	
06/12/2002	7:35 PM	North Henderson^	1.75 in.	n/a	n/a	n/a	n/a	
06/12/2002	8:06 PM	Aledo	1.00 in.	n/a	n/a	n/a	n/a	
04/30/2003	5:25 PM	New Boston	1.25 in.	n/a	n/a	$150,000	n/a	
04/30/2003	5:30 PM	Joy	1.75 in.	n/a	n/a	$350,000	n/a	
04/30/2003	6:01 PM	New Boston	1.75 in.	n/a	n/a	$500,000	n/a	
04/30/2003	6:12 PM	New Boston	1.75 in.	n/a	n/a	$500,000	n/a	
04/30/2003	6:18 PM	New Windsor^	1.75 in.	n/a	n/a	$50,000	n/a	
04/30/2003	7:04 PM	New Windsor	1.75 in.	n/a	n/a	$500,000	n/a	
04/30/2003	7:45 PM	Matherville^	1.75 in.	n/a	n/a	$500,000	n/a	
05/14/2003	2:05 PM	Sherrard	1.00 in.	n/a	n/a	$100,000	n/a	

^ Hail event verified in the vicinity of this location(s).

Table 3 Severe Storms - Hail Events Reported in Mercer County 1971 - 2022								
Date(s)	**Start Time**	**Location(s)**	**Magnitude Hail Stone Diameter (inches)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
08/01/2003	1:38 PM	New Boston^	1.25 in.	n/a	n/a	$3,000	$15,000	
08/01/2003	2:35 PM	Sherrard	1.75 in.	n/a	n/a	$100,000	$20,000	
04/20/2005	5:56 PM	Keithsburg^	1.00 in.	n/a	n/a	$2,000	n/a	
04/20/2005	6:01 PM	Keithsburg	1.00 in.	n/a	n/a	$5,000	n/a	
03/12/2006	7:00 PM	Alexis	1.00 in.	n/a	n/a	n/a	n/a	
03/12/2006	9:17 PM	Matherville^	1.00 in.	n/a	n/a	$5,000	n/a	
04/13/2006	8:55 PM	Aledo Viola	1.25 in.	n/a	n/a	$25,000	n/a	Window cracked with hole the size of a half dollar.
04/13/2006	9:08 PM	New Windsor	1.00 in.	n/a	n/a	$5,000	n/a	
05/02/2012	4:01 AM	Joy^	1.00 in.	n/a	n/a	n/a	n/a	
04/02/2014	11:55 PM	New Boston^	1.75 in.	n/a	n/a	n/a	n/a	
04/03/2014	12:15 AM	Joy^	1.75 in.	n/a	n/a	n/a	n/a	
04/03/2014	12:30 AM	Hamlet^	1.50 in.	n/a	n/a	n/a	n/a	
04/03/2014	12:41 AM	Preemption^	1.00 in.	n/a	n/a	n/a	n/a	
05/11/2014	2:30 PM	New Boston^	1.00 in.	n/a	n/a	n/a	n/a	
03/15/2016	5:38 PM	New Boston^	1.00 in.	n/a	n/a	n/a	n/a	
02/28/2017	8:45 PM	Preemption^	1.00 in.	n/a	n/a	n/a	n/a	Damage to home siding occurred.
05/25/2019	8:53 PM	Hamlet^	1.25 in.	n/a	n/a	n/a	n/a	
GRAND TOTAL:				**0**	**0**	**$2,795,000**	**$35,000**	

Source: NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

^ Hail event verified in the vicinity of this location(s).

Table 4
Severe Storms - Lightning Events Reported in Mercer County
1997 - 2022

Date(s)	Start Time	Location(s)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
06/05/1997	7:19 PM	Aledo^	n/a	1	n/a	n/a	One bolt of lighting touched down well in advance of an ordinary thunderstorm. The bolt struck and killed an eight year old boy who was playing quietly alone in his backyard. The boy was found near a tree and just feet from his home and while medical assistance arrived very quickly, they were unable to revive him.
07/20/2003	11:51 PM	Keithsburg^	n/a	n/a	$20,000	n/a	A house was struck by lightning and caught on fire.
06/06/2006	7:10 AM	Sherrard^	n/a	n/a	$25,000	n/a	Lightning struck a house in the Fyre Lake area causing damage to half the house.
04/19/2017	n/a	Aledo^	n/a	n/a	n/a	n/a	Lightning struck a 30,000 gallon propane tank at the Gold Star FS plant east of the City.
06/25/2022	n/a	New Boston	n/a	n/a	$20,000	n/a	Lightning struck the water well head according to committee member records.
06/25/2022	n/a	Joy^	n/a	n/a	$5,000	n/a	Lightning struck a radio communication antenna.
GRAND TOTAL:			**0**	**1**	**$70,000**	**$0**	

Source: Mercer County Multi-Jurisdictional Natural Hazard Mitigation Planning Committee Member responses to the Natural Hazard Events Questionnaire.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

^ Lightning event verified in the vicinity of this location(s).

Table 5
Severe Storms - Heavy Rain Events Reported in Mercer County
2003 - 2022

Date(s)	Start Time	Magnitude Rainfall (inches)	Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
04/30/2003	6:00 PM	6.00 in.	New Windsor	n/a	n/a	n/a	n/a	IL Route 17 was cloased due to flooding between Aledo and Viola with IL Route 94 closed south of Aledo.
05/30/2004	8:05 AM	3.05 in.	Aledo	n/a	n/a	n/a	n/a	Water ponded at the junction of IL Route 17 and 100th Street west of Joy and on US Route 67 sotuhwest of Preemption.
06/08/2005	12:58 PM	1.80 in.	Keithsburg	n/a	n/a	n/a	n/a	1.80 inches of rain fell in 2 hours.
09/12/2006	6:00 AM	4.50 in.	New Windsor	n/a	n/a	n/a	n/a	
08/23/2011	11:27 AM	n/a	Sherrard	n/a	n/a	n/a	n/a	
GRAND TOTAL:				**0**	**0**	**$0**	**$0**	

Sources: Midwestern Regional Climate Center, cli-MATE.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

[1] Observed Location information was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in the Midwestern Regional Climate Center's cli-MATE data system and NOAA's Storm Events Database.

Table 6
Extreme Cold/Wind Chill Events Reported in Mercer County
1995 - 2022

Date(s)	Start Time	Magnitude - Temperature °F Low (Min)	High (Max)	Wind Chill (Max)	Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
01/04/1995	n/a	-6 °F	4 °F	n/a	Aledo	n/a	n/a	n/a	
02/11/1995	n/a	-4 °F	6 °F	n/a	Aledo	n/a	n/a	n/a	
12/09/1995	n/a	-3 °F	5 °F	n/a	Aledo	n/a	n/a	n/a	
01/19/1996	n/a	-8 °F	8 °F	n/a	Aledo	n/a	n/a	n/a	
01/27/1996	n/a	-3 °F	14 °F	n/a	Aledo	n/a	n/a	n/a	
01/29/1996 thru 02/04/1996	n/a	-28 °F	13 °F	n/a	Aledo	n/a	n/a	n/a	
12/24/1996 thru 12/25/1996	n/a	-1 °F	13 °F	n/a	Aledo	n/a	n/a	n/a	
01/11/1997 thru 01/13/1997	n/a	-10 °F	12 °F	n/a	Aledo	n/a	n/a	n/a	
01/16/1997 thru 01/18/1997	n/a	-12 °F	16 °F	n/a	Aledo	n/a	n/a	n/a	
01/25/1997	n/a	-2 °F	5 °F	n/a	Aledo	n/a	n/a	n/a	
01/28/1997	n/a	-13 °F	6 °F	n/a	Aledo	n/a	n/a	n/a	
01/13/1998	n/a	0 °F	14 °F	n/a	Aledo	n/a	n/a	n/a	
01/07/1999 thru 01/10/1999	n/a	-12 °F	14 °F	n/a	Aledo	n/a	n/a	n/a	
12/21/1999 thru 12/22/1999	n/a	-3 °F	16 °F	n/a	Aledo	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 6
Extreme Cold/Wind Chill Events Reported in Mercer County
1995 - 2022

Date(s)	Start Time	Magnitude - Temperature °F Low (Min)	High (Max)	Wind Chill (Max)	Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
01/20/2000 thru 01/21/2000	n/a	-5 °F	14 °F	n/a	Aledo	n/a	n/a	n/a	
01/23/2000	n/a	-8 °F	14 °F	n/a	Aledo	n/a	n/a	n/a	
12/11/2000 thru 12/13/2000	n/a	-9 °F	13 °F	n/a	Aledo	n/a	n/a	n/a	
12/16/2000 thru 12/17/2000	2:00 PM	-3 °F	5 °F	-50	Aledo	n/a	n/a	n/a	
12/21/2000 thru 12/22/2000	4:00 AM	-9 °F	16 °F	-50	Aledo	n/a	n/a	n/a	
12/24/2000 thru 12/25/2000	n/a	-13 °F	12 °F	n/a	Aledo	n/a	n/a	n/a	
12/27/2000	n/a	-3 °F	11 °F	n/a	Aledo	n/a	n/a	n/a	
12/31/2000 thru 01/01/2001	n/a	-3 °F	13 °F	n/a	Aledo	n/a	n/a	n/a	
01/22/2003 thru 01/23/2003	n/a	-6 °F	12 °F	n/a	Aledo	n/a	n/a	n/a	
01/26/2003	n/a	-8 °F	10 °F	n/a	Aledo	n/a	n/a	n/a	
02/07/2003	n/a	-3 °F	15 °F	n/a	Aledo	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 6 Extreme Cold/Wind Chill Events Reported in Mercer County 1995 - 2022									
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Impacts/Event Description**
		Low (Min)	**High (Max)**	**Wind Chill (Max)**					
02/24/2003 thru 02/25/2003	n/a	-2 °F	13 °F	n/a	Aledo	n/a	n/a	n/a	
01/05/2004 thru 01/06/2004	n/a	-7 °F	14 °F	n/a	Aledo	n/a	n/a	n/a	
01/29/2004 thru 01/31/2004	n/a	-10 °F	3 °F	n/a	Aledo	n/a	n/a	n/a	
12/22/2004 thru 12/23/2004	n/a	-6 °F	13 °F	n/a	Aledo	n/a	n/a	n/a	
01/14/2005 thru 01/17/2005	n/a	-3 °F	13 °F	n/a	Aledo	n/a	n/a	n/a	
12/05/2005 thru 12/07/2005	n/a	-6 °F	14 °F	n/a	Aledo	n/a	n/a	n/a	
12/19/2005	n/a	-2 °F	12 °F	n/a	Aledo	n/a	n/a	n/a	
2/17/2006 thru 02/18/2006	6:00 PM	-8 °F	17 °F	-30 °F	Aledo	n/a	n/a	n/a	
12/07/2006	n/a	-1 °F	14 °F	n/a	Aledo	n/a	n/a	n/a	
01/28/2007	4:00 AM	0 °F	17 °F	-20 °F	Aledo	n/a	n/a	n/a	
01/30/2007	n/a	-1 °F	11 °F	n/a	Aledo	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 6
Extreme Cold/Wind Chill Events Reported in Mercer County
1995 - 2022

Date(s)	Start Time	Magnitude - Temperature °F			Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
		Low (Min)	High (Max)	Wind Chill (Max)					
02/02/2007 thru 02/08/2007	4:00 AM	-9 °F	12 °F	-40 °F	Aledo	n/a	n/a	n/a	
02/14/2007 thru 02/15/2007	n/a	-7 °F	16 °F	n/a	Aledo	n/a	n/a	n/a	
01/01/2008 thru 01/02/2008	11:37 PM	-5 °F	14 °F	-26 °F	Aledo	n/a	n/a	n/a	
01/18/2008 thru 01/19/2008	6:00 PM	-7 °F	4 °F	-30 °F	Aledo	n/a	n/a	n/a	
01/23/2008 thru 01/24/2008	n/a	-11 °F	18 °F	-30 °F	Aledo	n/a	n/a	n/a	
01/30/2008	12:00 AM	-1 °F	15 °F	-30 °F	Aledo	n/a	n/a	n/a	
02/10/2008 thru 02/12/2008	12:00 AM	-1 °F	14 °F	-30 °F	Aledo	n/a	n/a	n/a	
02/18/2008 thru 02/20/2008	n/a	0 °F	18 °F	-25 °F	Aledo	n/a	n/a	n/a	
12/21/2008 thru 12/22/2008	6:00 PM	-6 °F	-1 °F	-35 °F	Aledo	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 6
Extreme Cold/Wind Chill Events Reported in Mercer County
1995 - 2022

Date(s)	Start Time	Magnitude - Temperature °F Low (Min)	High (Max)	Wind Chill (Max)	Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
01/13/2009 thru 01/16/2009	n/a	-24 °F	14 °F	-50 °F	Aledo	n/a	n/a	n/a	
01/24/2009	n/a	-4 °F	6 °F	n/a	Aledo	n/a	n/a	n/a	
02/03/2009 thru 02/04/2009	n/a	0 °F	15 °F	-20 °F	Aledo	n/a	n/a	n/a	
12/10/2009	3:16 AM	0 °F	n/a	-25 °F	Aledo	n/a	n/a	n/a	
01/01/2010 thru 01/06/2010	7:00 PM	-9 °F	14 °F	-30 °F	Aledo	n/a	n/a	n/a	
01/08/2010 thru 01/09/2010	3:44 AM	-12 °F	12 °F	n/a	Aledo	n/a	n/a	n/a	
12/13/2010	n/a	-1 °F	12 °F	-25 °F	Aledo	n/a	n/a	n/a	
01/20/2011 thru 01/21/2011	n/a	-8 °F	18 °F	n/a	Aledo	n/a	n/a	n/a	
02/02/2011 thru 02/03/2011	9:00 PM	-10 °F	15 °F	-25 °F	Aledo	n/a	n/a	n/a	
02/08/2011 thru 02/09/2011	3:47 AM	-11 °F	10 °F	-30 °F	Aledo	n/a	n/a	n/a	
01/21/2013 thru 01/22/2013	7:43 AM	-1 °F	13 °F	-20 °F	Aledo	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 6 Extreme Cold/Wind Chill Events Reported in Mercer County 1995 - 2022									
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Impacts/Event Description**
		Low (Min)	**High (Max)**	**Wind Chill (Max)**					
01/31/2013	n/a	-1 °F	12 °F	-25 °F	Aledo	n/a	n/a	n/a	
12/09/2013 thru 12/10/2013	n/a	-7 °F	17 °F	n/a	Aledo	n/a	n/a	n/a	
12/23/2013	6:00 PM	-10 °F	8 °F	-30 °F	Aledo	n/a	n/a	n/a	
12/30/2013	n/a	-5 °F	11 °F	-25 °F	Aledo	n/a	n/a	n/a	
01/02/2014	n/a	-10 °F	15 °F	-20 °F	Aledo	n/a	n/a	n/a	
01/05/2014 thru 01/08/2014	12:00 PM	-17 °F	12 °F	-50 °F	Aledo	n/a	n/a	n/a	
01/21/2014 thru 01/23/2014	3:00 AM	-8 °F	19 °F	-40 °F	Aledo	n/a	n/a	n/a	
01/27/2014 thru 01/28/2014	12:00 AM	-8 °F	12 °F	-30 °F	Aledo	n/a	n/a	n/a	
02/02/2014 thru 02/03/2014	n/a	-11 °F	10 °F	n/a	Aledo	n/a	n/a	n/a	
02/05/2014 thru 02/07/2014	n/a	-11 °F	15 °F	-29 °F	Aledo	n/a	n/a	n/a	
02/09/2014 thru 02/11/2014	n/a	-14 °F	19 °F	-30 °F	Aledo	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 6 Extreme Cold/Wind Chill Events Reported in Mercer County 1995 - 2022									
Date(s)	Start Time	Magnitude - Temperature °F			Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
		Low (Min)	High (Max)	Wind Chill (Max)					
02/25/2014 thru 02/27/2014	n/a	-5 °F	20 °F	-27 °F	Aledo	n/a	n/a	n/a	
03/02/2014 thru 03/03/2014	6:00 PM	-10 °F	14 °F	-30 °F	Aledo	n/a	n/a	n/a	
01/05/2015 thru 01/07/2015	n/a	-12 °F	10 °F	-35 °F	Aledo	n/a	n/a	n/a	
01/09/2015	6:00 PM	-3 °F	8 °F	-30 °F	Aledo	n/a	n/a	n/a	
02/05/2015	n/a	-4 °F	15 °F	n/a	Aledo	n/a	n/a	n/a	
02/18/2015 thru 02/19/2015	3:00 AM	-5 °F	11 °F	-20 °F	Aledo	n/a	n/a	n/a	
02/22/2015 thru 02/23/2015	n/a	-6 °F	15 °F	-20 °F	Aledo	n/a	n/a	n/a	
02/27/2015	12:00 AM	-12 °F	12 °F	-27 °F	Aledo	n/a	n/a	n/a	
01/10/2016	n/a	-2 °F	n/a	-21 °F	Aledo	n/a	n/a	n/a	
01/17/2106 thru 01/19/2016	3:00 AM	-6 °F	9 °F	-30 °F	Aledo	n/a	n/a	n/a	
12/17/2016 thru 12/18/2016	n/a	-12 °F	20 °F	-30 °F	Aledo	n/a	n/a	n/a	
01/06/2017	n/a	-8 °F	8 °F	n/a	Aledo	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 6
Extreme Cold/Wind Chill Events Reported in Mercer County
1995 - 2022

Date(s)	Start Time	Magnitude - Temperature °F Low (Min)	High (Max)	Wind Chill (Max)	Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
12/26/2017 thru 12/27/2017	6:00 PM	-7 °F	8 °F	-30 °F	Aledo	n/a	n/a	n/a	
12/30/2017 thru 01/06/2018	4:00 AM	-19 °F	18 °F	-35 °F	Aledo	n/a	n/a	n/a	
01/13/2018	n/a	0 °F	13 °F	n/a	Aledo	n/a	n/a	n/a	
01/15/2018 thru 01/16/2018	5:00 PM	-4 °F	12 °F	-20 °F	Aledo	n/a	n/a	n/a	
02/05/2018 thru 02/06/2018	n/a	-5 °F	14 °F	n/a	Aledo	n/a	n/a	n/a	
01/24/2019 thru 01/26/2019	6:00 PM	-14 °F	21 °F	-25 °F	Aledo	n/a	n/a	n/a	
01/29/2019 thru 01/31/2019	6:00 PM	-33 °F	5 °F	-60 °F	Aledo	n/a	n/a	n/a	
02/08/2019	3:13 AM	1 °F	12 °F	-25 °F	Aledo	n/a	n/a	n/a	
03/03/2019 thru 03/04/2019	9:00 PM	-4 °F	14 °F	-30 °F	Aledo	n/a	n/a	n/a	
01/19/2020	n/a	-1 °F	9 °F	-30 °F	Aledo	n/a	n/a	n/a	
02/13/2020	9:00 PM	-10 °F	9 °F	-20 °F	Aledo	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 6
Extreme Cold/Wind Chill Events Reported in Mercer County
1995 - 2022

Date(s)	Start Time	Magnitude - Temperature °F Low (Min)	High (Max)	Wind Chill (Max)	Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Impacts/Event Description
02/06/2021 thru 02/17/2021	6:00 PM	-11 °F	12 °F	-30 °F	Aledo	n/a	n/a	n/a	
01/02/2022	n/a	-6 °F	7 °F	n/a	Aledo	n/a	n/a	n/a	
01/05/2022 thru 01/07/2022	n/a	-7 °F	12 °F	-29 °F	Aledo	n/a	n/a	n/a	
01/19/2022 thru 01/20/2022	6:00 PM	-7 °F	13 °F	-25 °F	Aledo	n/a	n/a	n/a	
01/25/2022	8:00 PM	-7 °F	11 °F	-20 °F	Aledo	n/a	n/a	n/a	
12/22/2022 thru 12/24/2022	n/a	-13 °F	10 °F	-25 °F	Aledo	n/a	n/a	n/a	

GRAND TOTAL:	Injuries	Fatalities	Property Damages
	0	**0**	**$0**

Sources: Iowa State University, Iowa Environmental Mesonet, National Weather Service Data, Search for Warnings.
Midwestern Regional Climate Center, cli-MATE.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2] Home	Business	Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
04/12/1965 thru 05/14/1965	n/a	Mississippi River	western portion of county	20.46 ft. 04/28/1965 8th highest crest on record				n/a	n/a	n/a	n/a	***This event is part of a federally-declared disaster (Declaration #194)***
04/13/1967 thru 04/22/1967	n/a	Mississippi River	western portion of county	15.60 ft. 04/16/1967				n/a	n/a	n/a	n/a	
04/18/1969 thru 05/07/1969	n/a	Mississippi River	western portion of county	17.24 ft. 04/26/1969				n/a	n/a	n/a	n/a	***This event is part of a federally-declared disaster (Declaration #262)***
07/08/1969 thru 07/12/1969	n/a	Mississippi River	western portion of county	14.70 ft. 07/01/2023				n/a	n/a	n/a	n/a	
02/22/1971 thru 02/25/1971	n/a	Mississippi River	western portion of county	15.30 ft. 02/24/1971				n/a	n/a	n/a	n/a	
03/17/1973 thru 03/29/1973	n/a	Mississippi River	western portion of county	17.00 ft. 03/25/1973				n/a	n/a	n/a	n/a	***This event is part of a federally-declared disaster (Declaration #373)***
04/20/1973 thru 05/23/1973	n/a	Mississippi River	western portion of county	19.35 ft. 04/25/1973 10th highest crest on record				n/a	n/a	n/a	n/a	***This event is part of a federally-declared disaster (Declaration #373)***

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7 General Flood Events Reported in Mercer County 1965 - 2022													
Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
					Home	Business	Infra-structure					
05/18/1974 thru 05/26/1974	n/a	Mississippi River	western portion of county	16.50 ft. 05/21/1974				n/a	n/a	n/a	n/a	***This event is part of a federally-declared disaster (Declaration #438)***
06/22/1974 thru 06/30/1974	n/a	Mississippi River	western portion of county	16.90 ft. 06/26/1974				n/a	n/a	n/a	n/a	
05/02/1975 thru 05/19/1975	n/a	Mississippi River	western portion of county	17.35 ft. 05/08/1975				n/a	n/a	n/a	n/a	
03/22/1979 thru 05/16/1979	n/a	Mississippi River	western portion of county	16.90 ft. 04/06/1979				n/a	n/a	n/a	n/a	
04/11/1982 thru 05/04/1982	n/a	Mississippi River	western portion of county	15.20 ft. 04/18/1979				n/a	n/a	n/a	n/a	
03/15/1983 thru 03/23/1983	n/a	Mississippi River	western portion of county	15.80 ft. 03/20/1983				n/a	n/a	n/a	n/a	
03/28/1983 thru 03/31/1983	n/a	Mississippi River	western portion of county	14.50 ft. 03/29/1983				n/a	n/a	n/a	n/a	

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
					Home	Business	Infra-structure					
04/04/1983 thru 05/01/1983	n/a	Mississippi River	western portion of county	15.20 ft. 04/25/1983				n/a	n/a	n/a	n/a	
05/10/1984 thru 05/13/1984	n/a	Mississippi River	western portion of county	14.30 ft. 05/12/1984				n/a	n/a	n/a	n/a	
06/26/1984 thru 07/02/1984	n/a	Mississippi River	western portion of county	14.40 ft. 06/28/1984				n/a	n/a	n/a	n/a	
02/24/1985 thru 02/27/1985	n/a	Mississippi River	western portion of county	14.40 ft. 02/25/1985				n/a	n/a	n/a	n/a	
04/01/1986 thru 04/24/1986	n/a	Mississippi River	western portion of county	16.40 ft. 04/14/1986				n/a	n/a	n/a	n/a	
05/18/1986 thru 06/01/1986	n/a	Mississippi River	western portion of county	16.02 ft. 05/21/1986				n/a	n/a	n/a	n/a	
10/01/1986 thru 10/24/1986	n/a	Mississippi River	western portion of county	17.46 ft. 10/07/1986				n/a	n/a	n/a	n/a	

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
					Home	Business	Infra-structure					
06/18/1990 thru 07/05/1990	n/a	Mississippi River	western portion of county	16.60 ft. 06/21/1990				n/a	n/a	n/a	n/a	
05/26/1991 thru 05/29/1991	n/a	Mississippi River	western portion of county	14.12 ft. 05/27/1991				n/a	n/a	n/a	n/a	
04/29/1992 thru 05/02/1992	n/a	Mississippi River	western portion of county	14.30 ft. 05/01/1992				n/a	n/a	n/a	n/a	
01/04/1993 thru 01/09/1993	n/a	Mississippi River	western portion of county	15.34 ft. 01/06/1993				n/a	n/a	n/a	n/a	
03/28/1993 thru 05/23/1993	n/a	Mississippi River	western portion of county	19.10 ft. 04/25/1993				n/a	n/a	n/a	n/a	***This event is part of a federally-declared disaster (Declaration #997)***
06/09/1993 thru 09/07/1993	n/a	Mississippi River	western portion of county	24.15 ft. 07/09/1993 2nd highest crest on record				n/a	n/a	n/a	n/a	*Event Description Provided Below*
This event is part of a federally-declared disaster (Declaration #997) According to the Mercer County EMA Director, flooding damaged residential, commerical, and infrastructure systems in Keithsburg, New Boston, and the Bay Island D&LD.							The Mayor of Keithsburg indicated the whole City was flooded including 120 homes, of which 93 were acquired and demolished.					

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2] Home	Business	Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
04/15/1995 thru 05/04/1995	n/a	Mississippi River	western portion of county	15.91 ft. 05/01/1995				n/a	n/a	n/a	n/a	
05/12/1995 thru 05/14/1995	n/a	Mississippi River	western portion of county	14.40 ft. 05/13/1995				n/a	n/a	n/a	n/a	
04/30/1996 thru 05/15/1996	n/a	Mississippi River	western portion of county	16.50 ft. 05/13/1996				n/a	n/a	n/a	n/a	
05/28/1996 thru 06/05/1996	n/a	Mississippi River	western portion of county	15.41 ft. 05/30/1996				n/a	n/a	n/a	n/a	
02/23/1997 thru 02/26/1997	n/a	Mississippi River	western portion of county	15.67 ft. 02/24/1997				n/a	n/a	n/a	n/a	
04/12/1997 thru 05/03/1997	n/a	Mississippi River	western portion of county	17.99 ft. 04/20/1997				n/a	n/a	n/a	n/a	
03/26/1998 thru 04/29/1998	n/a	Mississippi River	western portion of county	18.71 ft. 04/14/1998				n/a	n/a	n/a	n/a	

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
					Home	Business	Infra-structure					
07/02/1998 thru 07/12/1998	n/a	Mississippi River	western portion of county	15.62 ft. 07/08/1998				n/a	n/a	n/a	n/a	
07/21/1998 thru 07/22/1998	10:57 PM	area rivers, streams & creeks	countywide	---				n/a	n/a	n/a	n/a	
04/26/1999 thru 05/03/1999	n/a	Mississippi River	western portion of county	14.49 ft. 04/27/1999				n/a	n/a	n/a	n/a	
05/19/1999 thru 06/07/1999	n/a	Mississippi River	western portion of county	15.89 ft. 05/23/1999				n/a	n/a	n/a	n/a	
06/14/2000 thru 06/20/2000	n/a	Mississippi River	western portion of county	15.26 ft. 06/17/2000				n/a	n/a	n/a	n/a	
2/24/2001	9:00 AM	area rivers, streams & creeks	countywide	---				n/a	n/a	n/a	n/a	

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
					Home	Business	Infra-structure					
04/14/2001 thru 06/10/2001	n/a	Mississippi River, Edwards River, Pope Creek	western portion of county	20.72 ft. 05/12/2001 6th highest crest on record				n/a	n/a	$876,479	n/a	*Event Description Provided Below*
This event is part of a federally-declared disaster (Declaration #1368) On May 17th a few gravel road were closed near Keithsburg when Pope Creek came out of its banks. Public Assistance Figures for Mercer County totaled $876,479. Totals by Jurisdiction: $128,465 Keithsburg; $55,275 Keithsburg Township; $111,144 New Boston Township Road District; $91,591 Richland Grove Township Road District; $6,042 Mercer County; $104,378 Millersburg Road District; $50,589 Suez Township Road District; $50,860 Greene Road District; $70,661 Mercer Township Road District; $2,090 Bay Island Drainage District #1, Subdistrict #1, $9,405 Rivoli Township Road District; $8,212 Ohio Grove Road District; $12,452 Mercer County Highway Department; $35,899 Eliza Township Road District; $22,293 Perryton Township Road District; $105,331 Bay Island D&LD; $11,792 Abington Road District.												
04/26/2002 thru 05/01/2002	n/a	Mississippi River	western portion of county	14.58 ft. 04/29/2002				n/a	n/a	n/a	n/a	
5/12/2002	5:00 AM	area rivers, streams & creeks	Aledo^	---				n/a	n/a	n/a	n/a	minor flooding was reported on some secondary roads
06/06/2002 thru 06/10/2002	n/a	Mississippi River	western portion of county	15.63 ft. 06/08/2002				n/a	n/a	n/a	n/a	

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2] Home	Impacts[2] Business	Impacts[2] Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
05/22/2003 thru 05/27/2003	n/a	Mississippi River	western portion of county	14.67 ft. 05/24/2003				n/a	n/a	$1,000,000	n/a	
05/26/2004 thru 06/28/2004	n/a	Mississippi River	western portion of county	16.78 ft. 06/02/2004				n/a	n/a	n/a	n/a	
04/07/2007 thru 04/15/2007	n/a	Mississippi River	western portion of county	14.56 ft. 04/10/2007				n/a	n/a	n/a	n/a	
08/27/2007 thru 08/30/2007	n/a	Mississippi River	western portion of county	14.52 ft. 08/28/2007				n/a	n/a	n/a	n/a	
04/13/2008 thru 05/21/2008	n/a	Mississippi River	western portion of county	20.35 ft. 05/02/2008 9th highest crest on record				n/a	n/a	n/a	n/a	

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2] Home	Business	Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
06/08/2008 thru 07/02/2008	n/a	Mississippi River	western portion of county	24.49 ft. 06/17/2008 flood of record				n/a	n/a	$3,714,060	n/a	*Event Description Provided Below*
This event is part of a federally-declared disaster (Declaration #1771) 122 Individual Assistance applications were approved for Mercer County totalling just over $480,000 according to the 2016 Mercer County Multi-Jurisdictional Hazard Mitigation Plan According to the Mercer County EMA Director, flooding damaged residential, commerical and infrastructure systems in Keithsburg, New Boston and the Bay Island D&LD. The Mayor of Keithburg indicated that some businesses and over half the City was flooded and 28 homes were acquired and demolished following the flooding.							Public Assistance Figures for Mercer County totaled $3,234,060. Totals by Jurisdiction: $5,889 Joy; $149,251 Keithsburg; $3,223 North Henderson Township; $285,085 Richland Grove Township; $14,598 Mercer County; $173,974 Keithsburg Road District; $325,028 Preemption Road District; $48,077 New Boston Road District; $128,203 Millersburg Road District; $312,306 Suez Road District; $291,028 Greene Road District; $216,130 Mercer Road District; $213,855 Duncan Road District, $36,365 Rivoli Township Road District; $101,064 Ohio Grove Road District; $343,212 Mercer County Highway Department; $146,249 Eliza Township Road District; $62,655 Perryton Township Road District; $351,069 Bay Island D&LD; $26,799 Abington Road District.					
03/10/2009 thru 03/14/2009	n/a	Mississippi River	western portion of county	15.19 ft. 03/12/2009				n/a	n/a	n/a	n/a	
03/14/2010 thru 04/13/2010	n/a	Mississippi River	western portion of county	15.32 ft. 03/25/2010				n/a	n/a	n/a	n/a	
06/22/2010 thru 06/28/2010	n/a	Mississippi River	western portion of county	14.73 ft. 06/26/2010				n/a	n/a	n/a	n/a	

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2] Home	Business	Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
07/25/2010 thru 08/03/2010	n/a	Mississippi River	western portion of county	16.86 ft. 07/29/2010				n/a	n/a	$125,000	n/a	
10/03/2010 thru 10/13/2010	n/a	Mississippi River	western portion of county	15.34 ft. 10/08/2010				n/a	n/a	n/a	n/a	
03/28/2011 thru 05/14/2011	n/a	Mississippi River	western portion of county	19.19 ft. 04/24/2011				n/a	n/a	$250,000	n/a	
05/30/2011 thru 06/04/2011	n/a	Mississippi River	western portion of county	14.40 ft. 05/31/2011				n/a	n/a	n/a	n/a	
7/31/2011	n/a	Mississippi River	western portion of county	14.10 ft. 07/31/2011				n/a	n/a	n/a	n/a	

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2] Home	Impacts[2] Business	Impacts[2] Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
04/17/2013 thru 07/11/2013	n/a	Mississippi River	western portion of county	20.60 ft. 04/22/2013 7th highest crest on record				n/a	n/a	$944,672	n/a	*Event Description Provided Below*
This event is part of a federally-declared disaster (Declaration #4116) According to the Mercer County EMA Director, flooding caused road closures. Public Assistance Figures for Mercer County totaled $944,672. Totals by Jurisdiction: $20,638 Abington Township; $12,565 Keithsburg; $13,959 Keithsburg Township; $184,156 Preemption Township Road District; $26,016 New Boston Township Road District; $20,720 Millersburg Township Road District; $71,364 Suez Township Road District;							$44,120 Greene Road District; $72,156 Mercer Township Road District; $59,353 Richland Grove Township Road District; $39,559 Duncan Township Road District, $47,366 Rivoli Township Road District; $23,414 Ohio Grove Road District; $66,187 Mercer County Highway Department; $18,006 Eliza Road District; $76,491 Perryton Township Road District; $148,602 Bay Island D&LD.					
04/23/2014 thru 05/31/2014	n/a	Mississippi River	western portion of county	15.76 ft. 05/15/2014				n/a	n/a	n/a	n/a	
06/21/2014 thru 07/19/2014	n/a	Mississippi River	western portion of county	22.62 ft. 07/05/2014 4th highest crest on record				n/a	n/a	n/a	n/a	According to the Mercer County EMA Director, flooding caused the main wastewater lift station in Keithsburg to fail and the Post Office had to be relocated due to flooding
06/16/2015 thru 06/20/2015	n/a	Mississippi River	western portion of county	14.75 ft. 06/18/2015				n/a	n/a	n/a	n/a	

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
					Home	Business	Infra-structure					
12/19/2015 thru 12/30/2015	n/a	Mississippi River	western portion of county	15.37 ft. 12/26/2015				n/a	n/a	n/a	n/a	
03/27/2016 thru 04/02/2016	n/a	Mississippi River	western portion of county	15.03 ft. 03/30/2016				n/a	n/a	n/a	n/a	
08/31/2016 thru 09/02/2016	n/a	Mississippi River	western portion of county	14.43 ft. 09/01/2016				n/a	n/a	n/a	n/a	
09/27/2016 thru 10/10/2016	n/a	Mississippi River	western portion of county	17.30 ft. 09/30/2016				n/a	n/a	$200,000	n/a	
03/04/2017 thru 03/09/2017	n/a	Mississippi River	western portion of county	14.65 ft. 03/07/2017				n/a	n/a	n/a	n/a	
04/26/2017 thru 06/08/2017	n/a	Mississippi River	western portion of county	16.57 ft. 06/01/2017				n/a	n/a	n/a	n/a	
07/25/2017 thru 07/28/2017	n/a	Mississippi River	western portion of county	14.90 ft. 07/27/2017				n/a	n/a	n/a	n/a	

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
					Home	Business	Infra-structure					
05/05/2018 thru 05/22/2018	n/a	Mississippi River	western portion of county	16.83 ft. 05/13/2018				n/a	n/a	n/a	n/a	
06/25/2018 thru 07/09/2018	n/a	Mississippi River	western portion of county	16.23 ft. 07/02/2018				n/a	n/a	n/a	n/a	
09/05/2018 thru 09/18/2018	n/a	Mississippi River	western portion of county	17.27 ft. 09/09/2018				n/a	n/a	n/a	n/a	
09/28/2018 thru 10/31/2018	n/a	Mississippi River	western portion of county	19.80 ft. 10/14/2018				n/a	n/a	n/a	n/a	
2/8/2019	n/a	Mississippi River	western portion of county	14.24 ft. 02/08/2019				n/a	n/a	n/a	n/a	

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2] Home	Impacts[2] Business	Impacts[2] Infra-structure	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
03/15/2019 thru 06/26/2019	n/a	Mississippi River	western portion of county	22.95 ft. 06/02/2019 3rd highest crest on record				n/a	n/a	$2,069,810	n/a	*Event Description Provided Below*
This event is part of a federally-declared disaster (Declaration #4461) Public Assistance Figures for Mercer County totaled $2,069,810. Totals by Jurisdiction: $15,842 Abington Township; $3,020 Duncan Township; $91,470 Keithsburg; $29,312 Keithsburg Township; $136,333 Millersburg Township; $127,132 Perryton Township; $89,221 Preemption Township; $2,884 Suez Township; $30,105 Viola; $34,516 Greene Road District; $50,459 Mercer Township Road District; $67,184 Richland Grove Township Road District; $43,790 Rivoli Township Road District; $151,872 Mercer County Highway Department; $1,196,670 Bay Island D&LD.												
07/05/2019 thru 07/13/2019	n/a	Mississippi River	western portion of county	14.28 ft. 07/09/2019				n/a	n/a	n/a	n/a	
09/23/2019 thru 11/08/2019	n/a	Mississippi River	western portion of county	17.13 ft. 10/15/2019				n/a	n/a	n/a	n/a	
03/21/2020 thru 04/25/2020	n/a	Mississippi River	western portion of county	16.92 ft. 04/12/2020				n/a	n/a	n/a	n/a	

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 7
General Flood Events Reported in Mercer County
1965 - 2022

Date(s)	Start Time	Water Body	Location(s)	Magnitude Flood Crest Mississippi River Keithsburg[1]	Impacts[2]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
					Home	Business	Infra-structure					
06/05/2020 thru 06/08/2020	n/a	Mississippi River	western portion of county	14.29 ft. 06/07/2020				n/a	n/a	n/a	n/a	
GRAND TOTAL:								**0**	**0**	**$9,180,021**	**$0**	

Sources: Mercer County Multi-Jurisdictional Natural Hazard Mitigation Planning Committee Member responses to the Natural Hazard Events Questionnaire.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
NOAA, National Weather Service, River Observations, North Central River Forecast Center, Mississippi River at Keithsburg.
United States Army Corps of Engineers, RiverGages.com, Data Mining.

^ Flood event verified in the vicinity of this location(s).

1 Flood stage at gauge location is 14.0 feet, moderate flood stage is 15.5 feet and major flood stage is 17.0 feet.

2 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a general flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 8 Flash Flood Events Reported in Mercer County 1996 - 2022										
Date(s)	**Start Time**	**Location(s)**	**Impacts[1]**			**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/ Event Description**
			Home	**Business**	**Infra-structure**					
05/09/1996 thru 05/10/1996	11:38 AM	countywide				n/a	n/a	n/a	n/a	
05/16/1996 thru 05/17/1996	9:42 PM	countywide				n/a	n/a	n/a	n/a	
06/06/1996	4:41 AM	countywide				n/a	n/a	n/a	n/a	
02/20/1997 thru 02/24/1997	4:00 PM	countywide				n/a	n/a	n/a	n/a	
08/17/1997	12:23 AM	countywide				n/a	n/a	n/a	n/a	
10/17/1998 thru 10/18/1998	3:48 PM	countywide				n/a	n/a	n/a	n/a	
05/31/2000	3:30 AM	countywide			X	n/a	n/a	n/a	n/a	Heavy rain of 2 to 3 inches fell in a short period of time, which produced widespread street flooding in Keithsburg. Several county roads were closed due to standing water.
06/04/2002	8:57 AM	countywide			X	n/a	n/a	$10,000,000	n/a	Illinois Route 17 was closed due to flooding between Aledo and Viola with Illinois Route 94 closed south of Aledo.
04/30/2003	8:00 PM	countywide				n/a	n/a	n/a	n/a	
05/30/2004	5:00 AM	Eliza^			X	n/a	n/a	$3,000	n/a	Water was deep and moving fast across 1665 45th Street northwest of Eliza

^ Flash flood event verified in the vicinity of this location(s).

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a flash flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 8
Flash Flood Events Reported in Mercer County
1996 - 2022

Date(s)	Start Time	Location(s)	Impacts[1]			Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
			Home	Business	Infra-structure					
05/30/2004	8:30 AM	Swedona^			X	n/a	n/a	$5,000	n/a	Camp Creek flooded out the bridge on County Line Road with 2 feet of water
06/07/2008	2:28 PM	countywide				n/a	n/a	n/a	n/a	
09/13/2008	4:49 AM	countywide				n/a	n/a	n/a	n/a	
06/19/2009	5:12 PM	countywide				n/a	n/a	n/a	n/a	
08/09/2009	8:54 PM	southeastern portion of county				n/a	n/a	n/a	n/a	
05/13/2010	3:00 AM	countywide			X	n/a	n/a	$5,000,000	n/a	Heavy rains resulted in widespread flash flooding of roads and highways across all of Mercer County, especially the eastern half during the morning of May 13.
06/18/2010	7:49 PM	countywide			X	n/a	n/a	$50,000	n/a	Heavy rains resulted in flash flooding in Aledo, IL during the evening of June 18. Several streets were flooded and Highway 17 had water covering it.
05/25/2011	5:34 PM	countywide				n/a	n/a	n/a	n/a	
05/29/2011	10:12 AM	southeastern portion of county				n/a	n/a	n/a	n/a	
05/03/2012 thru 05/04/2012	10:44 PM	countywide				n/a	n/a	n/a	n/a	
04/18/2013	2:46 AM	countywide				n/a	n/a	n/a	n/a	
05/26/2013	8:15 PM	countywide			X	n/a	n/a	n/a	n/a	Law enforcement reported water over Highway 67 in several locations just south of Preemption.

^ Flash flood event verified in the vicinity of this location(s).

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a flash flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 8 Flash Flood Events Reported in Mercer County 1996 - 2022										
Date(s)	**Start Time**	**Location(s)**	**Impacts[1]**			**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/ Event Description**
			Home	**Business**	**Infra-structure**					
05/28/2013 thru 05/29/2013	7:44 PM	countywide				n/a	n/a	n/a	n/a	
06/24/2013	7:02 AM	northeastern portion of county				n/a	n/a	n/a	n/a	
06/30/2014	1:33 AM	eastern portion of county				n/a	n/a	n/a	n/a	
06/15/2015	3:28 PM	countywide				n/a	n/a	n/a	n/a	
07/06/2015	6:10 PM	countywide			X	n/a	n/a	n/a	n/a	A trained spotter reported water up to 6 inches deep was flowing over roads from several creeks near 120th Avenue and 212 Street north of Aledo. Multiple water rescues were needed from the rising waters over a few hours.
10/10/2018	6:51 AM	western portion of county				n/a	n/a	n/a	n/a	
04/30/2019	12:01 PM	southern portion of county				n/a	n/a	n/a	n/a	
05/29/2019 thru 05/30/2019	10:31 PM	countywide				n/a	n/a	n/a	n/a	
09/15/2019	4:42 AM	countywide				n/a	n/a	n/a	n/a	
03/27/2020 thru 03/28/2020	11:51 PM	north-central portion of county				n/a	n/a	n/a	n/a	

^ Flash flood event verified in the vicinity of this location(s).

1 An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a flash flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 8 Flash Flood Events Reported in Mercer County 1996 - 2022										
Date(s)	**Start Time**	**Location(s)**	**Impacts[1]**			**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/ Event Description**
			Home	**Business**	**Infra-structure**					
08/31/2021	1:30 PM	northeastern portion of county			X	n/a	n/a	n/a	n/a	A few roads were reported impassible due to water over roads.
GRAND TOTAL:						**0**	**0**	**$15,058,000**	**$0**	

Sources: Iowa State University, Iowa Environmental Mesonet, National Weather Service Data, Search for Warnings.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

^ Flash flood event verified in the vicinity of this location(s).

[1] An "X" in the columns of Home, Business and Infrastructure indicates impacts occurred to those structure/infrastructure types during a flash flood event. A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column if available.

Table 9
Excessive Heat Events Reported in Mercer County
1995 - 2022

Date(s)	Start Time	Magnitude - Temperature °F			Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
07/12/1995 thru 07/15/1995	n/a	98 °F	70 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
08/11/1995 thru 08/12/1995	n/a	93 °F	70 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
08/17/1995 thru 08/18/1995	n/a	93 °F	71 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/19/1996	n/a	93 °F	73 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
08/07/1996	n/a	91 °F	74 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/25/1997 thru 07/27/1997	4:00 AM	97 °F	69 °F	110 °F	Aledo	n/a	n/a	n/a	n/a	
08/17/1997	n/a	91 °F	73 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
06/24/1998 thru 06/26/1998	n/a	92 °F	72 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/19/1998 thru 07/20/1998	n/a	94 °F	71 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/04/1999 thru 07/05/1999	n/a	91 °F	73 °F	n/a	Aledo	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 9 Excessive Heat Events Reported in Mercer County 1995 - 2022										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)**[1]	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
07/21/1999 thru 07/25/1999	n/a	95 °F	68 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
07/31/1999	n/a	97 °F	72 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
08/31/2000 thru 09/02/2000	4:21 AM	97 °F	70 °F	115 °F	Aledo	n/a	n/a	n/a	n/a	
07/08/2001	n/a	93 °F	72 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/21/2001 thru 07/23/2001	n/a	93 °F	71 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/31/2001 thru 08/01/2001	n/a	93 °F	72 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/20/2002 thru 07/21/2002	n/a	91 °F	70 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
08/27/2003	n/a	95 °F	69 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/16/2005 thru 07/17/2005	n/a	95 °F	71 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/19/2005 thru 07/21/2005	n/a	92 °F	69 °F	n/a	Aledo	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 9 Excessive Heat Events Reported in Mercer County 1995 - 2022										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)**[1]	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
07/24/2005 thru 07/25/2005	n/a	99 °F	72 °F	115 °F	Aledo	n/a	n/a	n/a	n/a	
08/04/2005	n/a	94 °F	71 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
05/28/2006 thru 05/29/2006	n/a	92 °F	70 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/16/2006 thru 07/17/2006	6:00 AM	96 °F	69 °F	114 °F	Aledo	n/a	n/a	n/a	n/a	
07/28/2006 thru 08/02/2006	n/a	96 °F	69 °F	114 °F	Aledo	n/a	n/a	n/a	n/a	
08/05/2007 thru 08/07/2007	n/a	91 °F	70 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
06/22/2009 thru 06/23/2009	12:07 PM	93 °F	68 °F	110 °F	Aledo	n/a	n/a	n/a	n/a	
06/25/2009	12:00 PM	91 °F	73 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
07/14/2010	12:00 PM	92 °F	71 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
07/17/2010	12:00 PM	90 °F	n/a	105 °F	Aledo	n/a	n/a	n/a	n/a	
07/22/2010 thru 07/23/2010	12:00 PM	90 °F	70 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
08/12/2010	n/a	91 °F	72 °F	115 °F	Aledo	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 9 Excessive Heat Events Reported in Mercer County 1995 - 2022										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
06/06/2011 thru 06/07/2011	1:00 PM	91 °F	68 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
07/17/2011 thru 07/22/2011	12:00 PM	96 °F	71 °F	115 °F	Aledo	n/a	n/a	n/a	n/a	
07/26/2011 thru 07/28/2011	1:00 PM	91 °F	72 °F	110 °F	Aledo	n/a	n/a	n/a	n/a	
07/31/2011 thru 08/02/2011	12:00 PM	95 °F	71 °F	115 °F	Aledo	n/a	n/a	n/a	n/a	
09/01/2011 thru 09/02/2011	12:00 PM	96 °F	71 °F	104 °F	Aledo	n/a	n/a	n/a	n/a	
06/28/2012	10:00 AM	94 °F	71 °F	110 °F	Aledo	n/a	n/a	n/a	n/a	
07/02/2012 thru 07/06/2012	n/a	95 °F	69 °F	110 °F	Aledo	n/a	n/a	n/a	n/a	
07/16/2012 thru 07/18/2012	n/a	97 °F	69 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
07/22/2012 thru 07/25/2012	n/a	101 °F	69 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 9 Excessive Heat Events Reported in Mercer County 1995 - 2022										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
07/15/2013 thru 07/18/2013	n/a	95 °F	72 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
08/27/2013 thru 08/30/2013	n/a	100 °F	69 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
09/09/2013 thru 09/10/2013	n/a	99 °F	70 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
08/24/2014 thru 08/25/2014	n/a	94 °F	69 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
07/13/2015	2:20 PM	93 °F	71 °F	115 °F	Aledo	n/a	n/a	n/a	n/a	
07/17/2015 thru 07/18/2015	1:00 PM	93 °F	71 °F	107 °F	Aledo	n/a	n/a	n/a	n/a	
07/25/2015	12:00 PM	91 °F	72 °F	104 °F	Aledo	n/a	n/a	n/a	n/a	
09/04/2015 thru 09/06/2015	n/a	93 °F	69 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
06/10/2016 thru 06/11/2016	n/a	92 °F	70 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/21/2016 thru 07/24/2016	7:00 AM	94 °F	68 °F	115 °F	Aledo	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 9 Excessive Heat Events Reported in Mercer County 1995 - 2022										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
09/06/2016	n/a	91 °F	73 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
06/13/2017	1:00 PM	94 °F	74 °F	102 °F	Aledo	n/a	n/a	n/a	n/a	
07/12/2017	12:00 PM	90 °F	72 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
07/19/2017 thru 07/20/2017	12:00 PM	94 °F	70 °F	110 °F	Aledo	n/a	n/a	n/a	n/a	
05/28/2018	n/a	96 °F	69 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
06/16/2018 thru 06/19/2018	n/a	93 °F	70 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
06/29/2018 thru 06/30/2018	10:00 AM	92 °F	70 °F	112 °F	Aledo	n/a	n/a	n/a	n/a	
07/04/2018	12:00 PM	91 °F	72 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
07/13/2018	1:00 PM	93 °F	69 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
08/25/2018 thru 08/27/2018	1:41 PM	91 °F	67 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
06/29/2019 thru 07/03/2019	1:18 PM	91 °F	68 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
07/13/2019	n/a	90 °F	73 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/17/2019 thru 07/20/2019	1:00 PM	94 °F	71 °F	115 °F	Aledo	n/a	n/a	n/a	n/a	
06/29/2020	n/a	90 °F	73 °F	n/a	Aledo	n/a	n/a	n/a	n/a	

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Table 9
Excessive Heat Events Reported in Mercer County
1995 - 2022

Date(s)	Start Time	Magnitude - Temperature °F			Observed Location(s)[1]	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
		Day (Max)	Night (Min)	Heat Index (Max)						
07/08/2020	11:00 AM	90 °F	69 °F	103 °F	Aledo	n/a	n/a	n/a	n/a	
07/18/2020	1:00 PM	91 °F	72 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
07/25/2020 thru 07/26/2020	12:00 PM	92 °F	71 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
08/24/2020 thru 08/27/2020	12:18 PM	93 °F	68 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
06/10/2021 thru 06/11/2021	n/a	92 °F	70 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
07/24/2021	12:00 PM	91 °F	71 °F	110 °F	Aledo	n/a	n/a	n/a	n/a	
07/28/2021	11:00 AM	90 °F	71 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
08/10/2021	n/a	92 °F	75 °F	110 °F	Aledo	n/a	n/a	n/a	n/a	
08/24/2021	12:00 PM	94 °F	68 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
08/27/2021 thru 08/28/2021	n/a	93 °F	70 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
05/10/2022 thru 05/12/2022	n/a	95 °F	69 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
06/13/2022 thru 06/15/2022	12:00 PM	96 °F	67 °F	110 °F	Aledo	n/a	n/a	n/a	n/a	
06/21/2022	12:00 PM	96 °F	67 °F	105 °F	Aledo	n/a	n/a	n/a	n/a	
07/05/2022	12:00 PM	98 °F	70 °F	110 °F	Aledo	n/a	n/a	n/a	n/a	

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 9 Excessive Heat Events Reported in Mercer County 1995 - 2022										
Date(s)	**Start Time**	**Magnitude - Temperature °F**			**Observed Location(s)[1]**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
		Day (Max)	**Night (Min)**	**Heat Index (Max)**						
07/23/2022	12:00 PM	95 °F	71 °F	110 °F	Aledo	n/a	n/a	n/a	n/a	
08/06/2022	12:00 PM	93 °F	73 °F	115 °F	Aledo	n/a	n/a	n/a	n/a	
09/20/2022	n/a	94 °F	69 °F	n/a	Aledo	n/a	n/a	n/a	n/a	
GRAND TOTAL:						**0**	**0**	**$0**	**$0**	

Sources: Iowa State University, Iowa Environmental Mesonet, National Weather Service Data, Search for Warnings.
Midwestern Regional Climate Center, cli-MATE.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Cooperative Observation Forms.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

[1] Observed Location information, if available, was obtained from NWS's COOP Observation Station records as well as other officially-designated sources identified in NOAA's Storm Events Database and the Midwestern Regional Climate Center's cli-MATE data system.

Table 10
Tornadoes Reported in Mercer County
1950 - 2022

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
1	7/17/1952	5:00 PM	Seaton^	F 1	0.10 mi.	10 yd.	n/a	n/a	$2,500	n/a	
2	4/23/1965	11:45 PM	Aledo^ Viola^ New Windsor^	F 1	16.20 mi.	100 yd.	n/a	n/a	$250,000 †	n/a	***This event was part of a federally-declared disaster (Declaration #194)*** *Touchdown/Liftoff - Two Counties* Touched down edown north-northeast of Aledo in Mercer County and traveled east-southeast before lifting off east of Woodhull in Henry County - total length: 24.5 miles A tornado touched down north-northeast of Aledo destroying or damaging several hangers and aircraft at the Mercer County Airport.

[1] The length provided is only for the portion(s) of the tornado that occurred in the County.
^ Tornado touchdown verified in the vicinity of this location(s).
† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 10
Tornadoes Reported in Mercer County
1950 - 2022

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
3	4/23/1965	11:50 PM	Sherrard^	F 1	3.50 mi.	100 yd.	n/a	n/a	$25,000 †	n/a	***This event was part of a federally-declared disaster (Declaration #194)*** *Touchdown/Liftoff - Two Counties* Touched down east of Sherrard in Mercer County and traveled southeast before lifting off northwest of Lynn Center in Henry County - total length: 6.6 miles
4	6/3/1972	2:40 PM	Aledo^	F 0	0.10 mi.	10 yd.	n/a	n/a	n/a	n/a	
5	4/21/1973	5:43 PM	Millersburg^ Hamlet^ Reynolds^	F 2	10.20 mi.	10 yd.	n/a	n/a	n/a	n/a	*Touchdown/Liftoff - Multiple Counties* Touched down northweast of Millersburg in Mercer County and traveled northeast through Rock Island County before lifting off east of Colona in Henry County - total length: 30.2 miles Many farm buildings, animals, homes, and trailers were destroyed along the path of this tornado.

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Table 10
Tornadoes Reported in Mercer County
1950 - 2022

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
6	4/13/1974	7:00 PM	New Windsor	F 2	0.10 mi.	20 yd.	n/a	n/a	$25,000	n/a	A tornado touched down briefly in the Village damaging a house.
7	6/14/1974	3:08 PM	Reynolds^ Matherville^ Viola^ North Henderson^	F 3	26.90 mi.	440 yd.	1	n/a	n/a	n/a	*Touchdown/Liftoff - Multiple Counties* Touched down in Rock Island County southeast of Tayor Ridge and traveled southeast through Mercer and Warren Counties to the southwest side of Galesburg where it turned south following IL Route 41 through Abingdon before lifting off southeast of Avon in Fulton County - total length: 48.6 miles

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Table 10
Tornadoes Reported in Mercer County
1950 - 2022

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
8	8/15/1978	7:00 PM	Millersburg^ Hamlet^ Reynolds	F 3	5.10 mi.	77 yd.	n/a	n/a	n/a	n/a	*Touchdown/Liftoff - Two Counties* Touched down southeast of Hamlet in Mercer County and traveled northeast before lifting off northeast of Reynolds in Rock Island County - total length: 6.4 miles Several swaths were cut in cornfields and several property owners reported damage to homes, sheds, and trees.
9	7/30/1987	5:00 PM	New Boston^	F 1	0.20 mi.	10 yd.	n/a	n/a	$25,000	n/a	The tornado destroyed 3 barns and a wash house and damaged a farm house.
10	7/27/1995	5:45 PM	Sherrard^	F 0	0.10 mi.	10 yd.	n/a	n/a	n/a	n/a	
11	7/27/1995	6:00 PM	Sherrard^	F 2	0.10 mi.	10 yd.	n/a	n/a	n/a	n/a	
12	5/9/1996	7:41 PM	Alexis	F 0	0.10 mi.	25 yd.	n/a	n/a	n/a	n/a	A tornado touched down in a vacant lot in the Village.
13	4/15/1998	4:00 PM	Viola^	F 0	0.10 mi.	30 yd.	n/a	n/a	n/a	n/a	

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† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 10 Tornadoes Reported in Mercer County 1950 - 2022											
Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
14	6/18/1998	4:10 PM	Seaton Seaton^ Aledo^	F 2	6.00 mi.	880 yd.	n/a	n/a	$110,000	n/a	The tornado damaged several rural home sites. Northeast of Seaton damage was noted to farm buildings and a silo. South of Aledo seven power lines poles were snapped, and a farmhouse 4 miles west of Aledo was destroyed. The tornado also damaged or destroyed farm buildings, roofs and chimneys south of Aledo.
15	6/29/1998	2:40 PM	New Boston New Boston^	F 1	1.00 mi.	30 yd.	n/a	n/a	$5,000	n/a	
16	6/6/1999	3:00 PM	Seaton	F 0	0.10 mi.	10 yd.	n/a	n/a	n/a	n/a	A tornado touched down briefly causing no injuries or damage.
17	4/30/2003	5:42 PM	Aledo^	F 1	0.10 mi.	75 yd.	n/a	n/a	$500,000	n/a	A tornado damaged farm buildings.
18	4/30/2003	5:57 PM	Aledo^	F 0	0.80 mi.	20 yd.	n/a	n/a	$50,000	n/a	
19	4/30/2003	6:08 PM	Viola^	F 1	0.10 mi.	50 yd.	n/a	n/a	$500,000	n/a	A tornado damaged a farm house.
20	4/30/2003	6:11 PM	Viola Viola^	F 0	0.50 mi.	25 yd.	n/a	n/a	$250,000	n/a	A tornado damaged a house.

[1] The length provided is only for the portion(s) of the tornado that occurred in the County.

^ Tornado touchdown verified in the vicinity of this location(s).

† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 10 Tornadoes Reported in Mercer County 1950 - 2022											
Map No.	**Date(s)**	**Start Time**	**Location(s)**	**Magnitude Fujita Scale**	**Length (Miles)[1]**	**Width (Yards)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
21	4/30/2003	6:12 PM	Viola^	F 1	0.50 mi.	75 yd.	n/a	n/a	$300,000	n/a	A house was pushed 6 feet off its foundation by a tornado.
22	5/10/2003	7:30 PM	New Boston^	F 0	8.30 mi.	100 yd.	n/a	n/a	$100,000	n/a	
23	5/10/2003	7:45 PM	Millersburg^	F 0	2.10 mi.	50 yd.	n/a	n/a	$100,000	n/a	
24	5/10/2003	7:55 PM	Hamlet^ Reynolds^	F 0	3.50 mi.	50 yd.	n/a	n/a	$50,000	n/a	*Touchdown/Liftoff - Two Counties* Touched down southeast of Hamlet in Mercer County and traveled northeast before lifting off east of Reynolds in Rock Island County - total length: 3.8 miles
25	4/13/2006	8:33 PM	Eliza^ Hamlet^	F 1	11.10 mi.	880 yd.	n/a	n/a	$15,000	n/a	Intermittent damage was noted to trees and outbuildings along the tornado's path.
26	4/13/2006	8:57 PM	Eliza^	F 1	1.50 mi.	100 yd.	n/a	n/a	$50,000	n/a	A mobile home was destroyed south of Eliza.
27	4/13/2006	9:07 PM	Matherville^	F 2	2.00 mi.	50 yd.	n/a	n/a	$30,000	n/a	Two homes had roof damage done to them by the tornado with one house completed unroofed.

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† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 10
Tornadoes Reported in Mercer County
1950 - 2022

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
28	4/13/2006	9:12 PM	Alexis Alexis^	F 1	0.80 mi.	200 yd.	n/a	n/a	$1,000,000	n/a	The steeple of the Village Baptist Church was damaged. An air conditioning unit was blown off the roof of United North Elementary School. The Presbyterian Church parsonage had 75% of its roof torn off and blown onto the house next door. Across the north side of the Village, several sheds were heavily damaged or destroyed in addition to considerable tree damage. One house along the north side had its roof completely blown off and numerous other houses sustained varying degrees of roof damage. Several utility poles were snapped in half and utility lines were downed. Much of the Village was without power and water for over 36 hours.

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† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
Table 10 Tornadoes Reported in Mercer County 1950 - 2022											
29	7/12/2014	8:20 PM	Aledo^	EF 0	0.38 mi.	50 yd.	n/a	n/a	n/a	n/a	Damage from the tornado was primarily to corn crops.
30	7/12/2014	8:30 PM	Matherville^	EF 1	3.70 mi.	100 yd.	n/a	n/a	n/a	$10,000	This tornado caused damage to crops, power poles and lines as well as to trees. Some branches were 1 to 3 inches in diameter and some tree trunks snapped off.
31	7/12/2014	8:46 PM	Viola^ Swedona^	EF 1	2.78 mi.	50 yd.	n/a	n/a	n/a	n/a	This tornado produced mainly crop and tree damage with numerous 1 to 3 inch tree limbs down as well as several large tree trunks snapped off. An outbuilding was also destroyed.

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† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 10 Tornadoes Reported in Mercer County 1950 - 2022											
Map No.	**Date(s)**	**Start Time**	**Location(s)**	**Magnitude Fujita Scale**	**Length (Miles)[1]**	**Width (Yards)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
32	5/24/2015	5:50 PM	Eliza^	EF 2	6.75 mi.	50 yd.	n/a	n/a	$30,000	n/a	This tornado damaged mainly trees and outbuildings along its path. The worst damage was near the beginning of the path, where a large machine shed was completely destroyed, 2 garages were destroyed, and a house partially un-roofed. Witnesses described a blinding rain accompanied the tornado.
33	6/11/2015	4:25 PM	Aledo^ Preemption^	EF 1	5.94 mi.	50 yd.	n/a	n/a	n/a	$10,000	This tornado damaged mainly trees and some crops.

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† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 10
Tornadoes Reported in Mercer County
1950 - 2022

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
34	12/23/2015	4:33 PM	Hamlet^	EF 0	1.20 mi.	50 yd.	n/a	n/a	n/a	n/a	*Touchdown/Liftoff - Two Counties* Touched down west of Hamlet in Mercer County and traveled northeast before lifting off west of Rock Island in Rock Island County - total length: 10.8 miles The tornado snapped 6 to 10 inch tree branches along its path. There was no structural damage visible along the tornado track.

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Table 10
Tornadoes Reported in Mercer County
1950 - 2022

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
35	5/17/2017	7:00 PM	New Windsor Swedona^	EF 1	5.73 mi.	150 yd.	n/a	n/a	$25,000	n/a	*Touchdown/Liftoff - Two Counties* Touched down northwest of New Windsor in Mercer County and traveled northeast before lifting off southwest of Orion in Henry County - total length: 8.11 miles This tornado caused damage to numerous farm outbuildings, a few homes and trees across Mercer and Henry counties. One house partially lost a roof while another was impelled by flying debris. Approximately 30 to 40 trees were snapped at the trunks, a couple of dozen were uprooted, with about 50 trees experiencing limb damage.
36	6/15/2019	7:38 PM	Keithsburg^	EF 1	0.68 mi.	40 yd.	n/a	n/a	n/a	n/a	A brief tornado damaged trees at and just east of a farmstead. Some trunks were snapped off near the base.

[1] The length provided is only for the portion(s) of the tornado that occurred in the County.
^ Tornado touchdown verified in the vicinity of this location(s).
† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 10
Tornadoes Reported in Mercer County
1950 - 2022

Map No.	Date(s)	Start Time	Location(s)	Magnitude Fujita Scale	Length (Miles)[1]	Width (Yards)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/Event Description
37	11/10/2020	1:45 PM	Joy^ Millersburg Hamlet^	EF 1	14.03 mi.	50 yd.	n/a	n/a	n/a	n/a	*Touchdown/Liftoff - Two Counties* Touched down southwest of Joy in Mercer County and traveled northeast before lifting off east-northeast of Taylor Ridge in Rock Island County - total length: 20.34 miles A tornado touched down southwest of Joy, destroying an outbuilding. This tornado followed an intermittent path hrough Mercer County. Occasional tree damage was observed between Joy and Hamlet.

[1] The length provided is only for the portion(s) of the tornado that occurred in the County.
^ Tornado touchdown verified in the vicinity of this location(s).
† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 10 Tornadoes Reported in Mercer County 1950 - 2022											
Map No.	**Date(s)**	**Start Time**	**Location(s)**	**Magnitude Fujita Scale**	**Length (Miles)[1]**	**Width (Yards)**	**Injuries**	**Fatalities**	**Property Damages**	**Crop Damages**	**Impacts/Event Description**
38	11/10/2020	2:02 PM	Burgess^	EF 1	0.54 mi.	30 yd.	n/a	n/a	n/a	n/a	This tornado destroyed a large grain bin about 1.4 miles west of Burgess
GRAND TOTAL:							**1**	**0**	**$3,442,500**	**$20,000**	

Sources: Mercer County Multi-Jurisdictional Natural Hazard Mitigation Planning Committee Member responses to the Natural Hazard Events Questionnaire.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Data.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
NOAA, National Weather Service, Storm Prediction Center, SVRGIS, Tornadoes (1950-2021) Database.

[1] The length provided is only for the portion(s) of the tornado that occurred in the County.
^ Tornado touchdown verified in the vicinity of this location(s).
† Property damages sustained as a result of this tornado represent losses sustained in two or more counties. A detailed breakdown by county was not available.

Table 11
Drought Events Reported in Mercer County
1980 - 2022

Year(s)	Start Month	Duration (Months)	Magnitude Drought Intensity Category[1] D0	D1	D2	D3	D4	Percent Crop Yield Reduction from Previous Year Corn	Soybeans	Designated USDA Primary Natural Disaster Area	Crop Damages	Impacts/Event Description
1983	n/a	n/a						22.6 %	---	n/a	n/a	All 102 counties in Illinois were proclaimed state disaster areas because of high temperatures and insufficient precipitation beginning in mid-June
1988	June	16						46.3 %	17.9 %	n/a	n/a	Approximately half of all Illinois counties were impacted by drought conditions
2005 - 2006	May	18	X	X	X	X		15.3 %	9.7 %	Yes	$14,860,000	
2012 - 2013	June	9.5	X	X	X	X		---	---	No	$2,910,789 *	
2013 - 2014	July	8	X	X	X			1.7 %	13.9 %	No	$4,460,004 *	
GRAND TOTAL:											**$22,230,793 ***	

* Crop Damage figures for drought/heat were obtained from USDA Risk Management Agency and only represent losses sustained by insured crops.

Sources: Illinois State Water Survey, Illinois State Climatologist.
National Drought Mitigation Center, United States Drought Monitor.
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.
United States Department of Agriculture, National Agricultural Statistics Service, Quik Stats Lite.

[1] An "X" identifies the level of drought intensity reached by at least a portion of the County during the event, if available.

US Drought Monitor – Drought Intensity Category Descriptions

D0	abnormally dry	D3	extreme drought
D1	moderate drought	D4	exceptional drought
D2	severe drought		

Table 12
Levee Failures Reported in Mercer County
1993 - 2022

Date(s)	Start Time	Levee System	Magnitude Area Flooded (acres)	Injuries	Fatalities	Property Damages	Crop Damages	Impacts/ Event Description
07/07/1993	n/a	Keithsburg Levee	*	n/a	n/a	n/a	n/a	Keithsburg was evacuated on July 7th when the levee gave way. Two-thirds of the Village was inundated in less than 2 hours. The drinking wate wells and water plant were under 13 feet of water or more. A new well was drilled and started operating on July 19th. A new pump house and water treatment plant wer completed on August 4th.
06/14/2008	8:43 AM	Keithsburg Levee	*	n/a	n/a	$250,000	n/a	The levee broke flooding approximately 25 homes.
GRAND TOTAL:				**0**	**0**	**$250,000**	**$0**	

* A detailed description of the type and magnitude of the impacts are included in the Impacts/Event Description column.

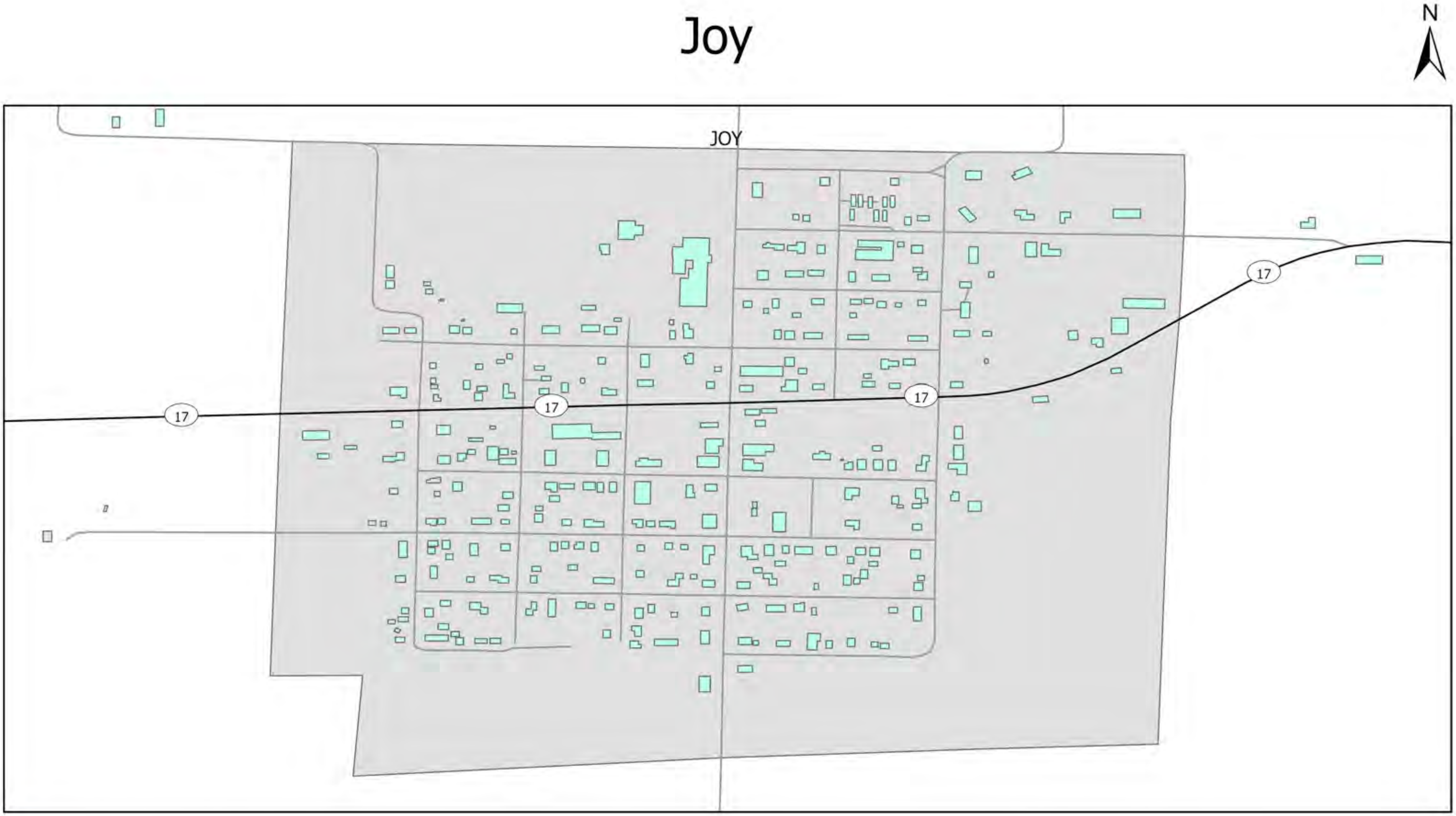
Sources: Illinois State Water Survey, *The 1993 Flood on the Mississippi River in Illinois* .
NOAA, National Environmental Satellite, Data & Information Service, National Centers for Environmental Information, Storm Events Database.

APPENDIX J

Aledo

Map Created December 2023 in ArcGIS Pro by Callie Smith at American Environmental Corporation
Sources: Iowa DNR, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

Joy

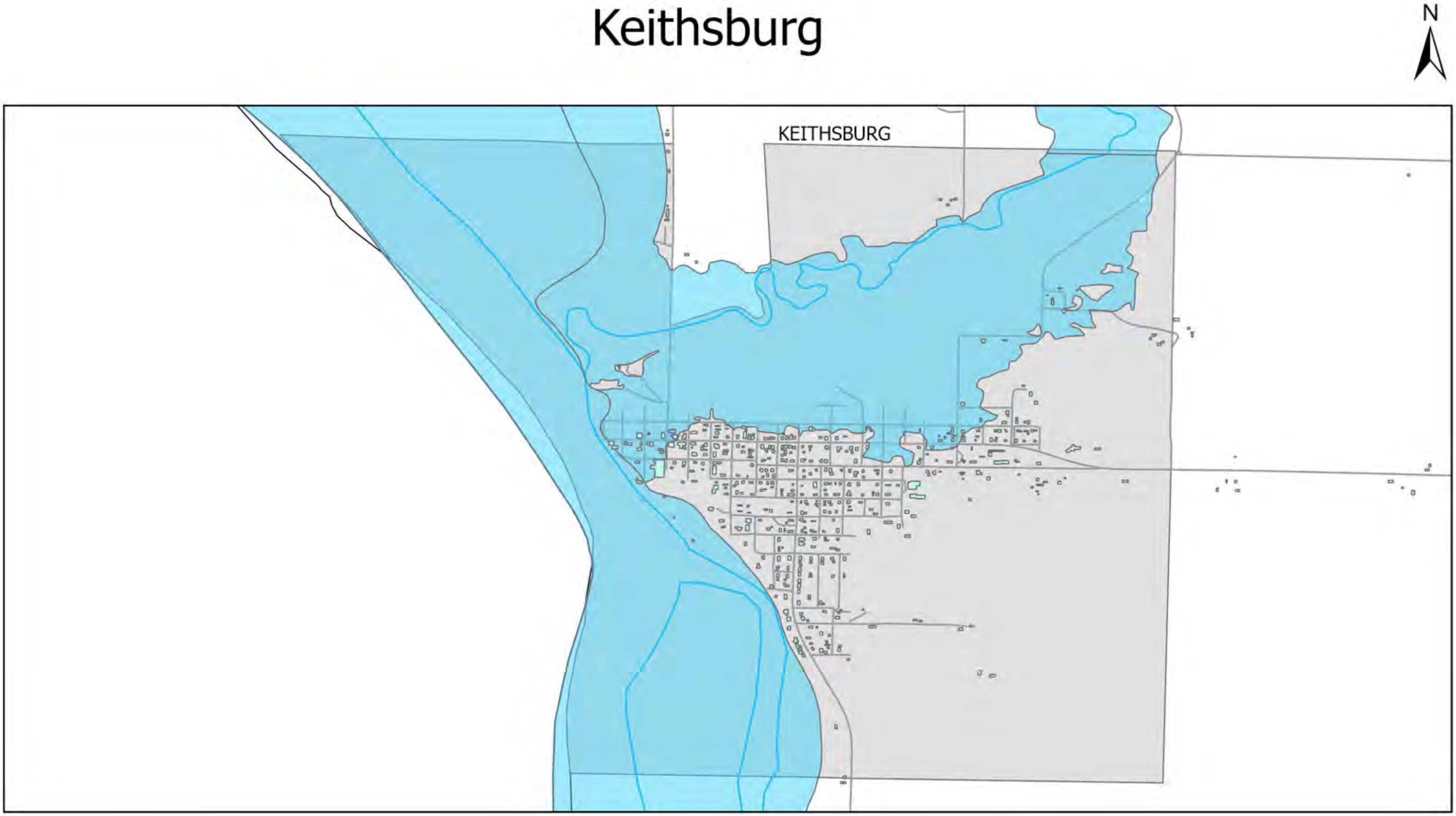


100 Year Floodplain
Municipal Boundaries
Building Footprints
Rivers/Streams
US/State Routes
Roadways

0 0.13 0.25 0.5 Miles

Map Created December 2023 in ArcGIS Pro by Callie Smith at American Environmental Corporation
Sources: Iowa DNR, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

Keithsburg



100 Year Floodplain

Municipal Boundaries

Building Footprints

Rivers/Streams

US/State Routes

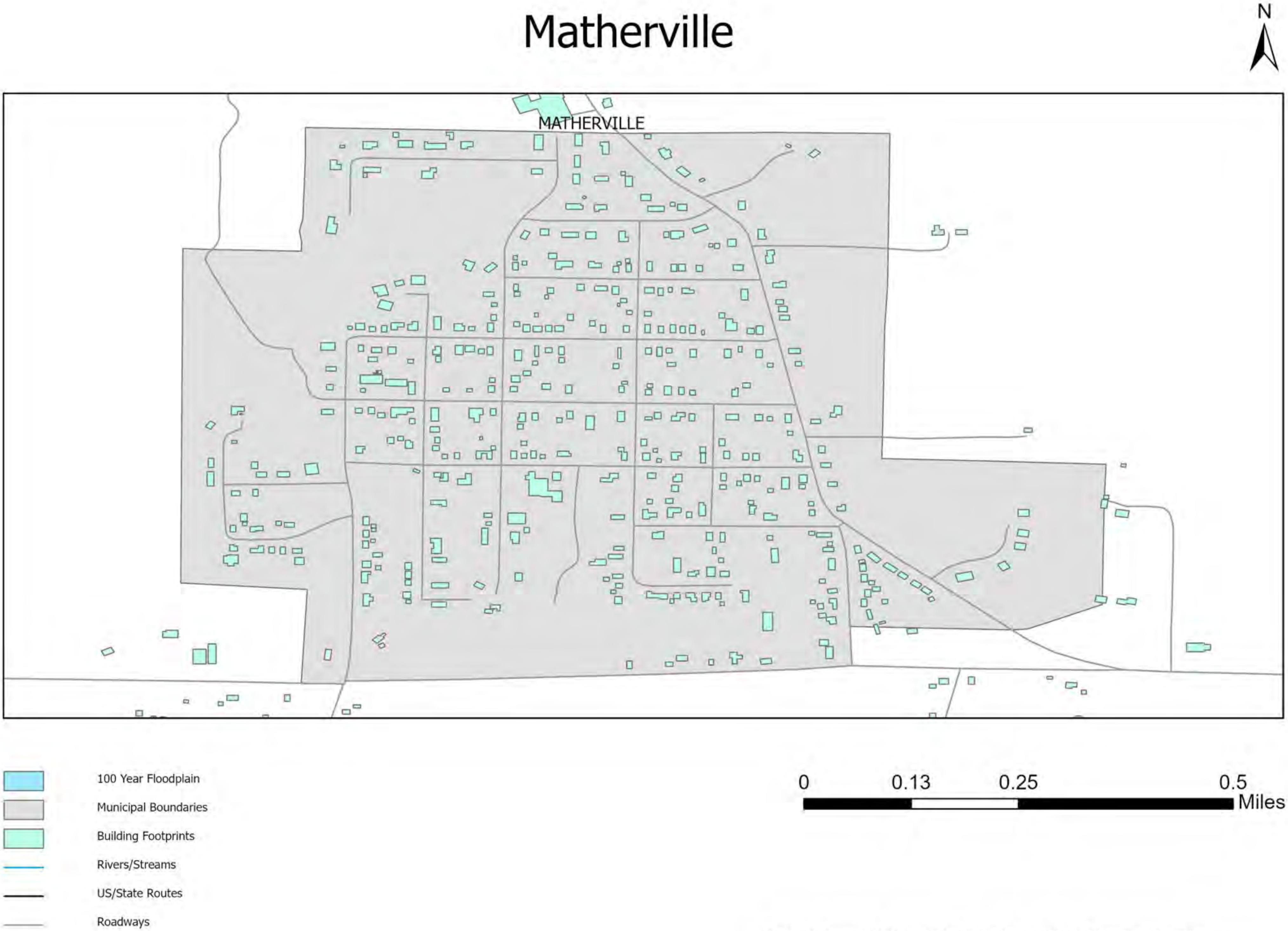
Roadways

0 0.5 1 2 Miles

Map Created December 2023 in ArcGIS Pro by Callie Smith at American Environmental Corporation
Sources: Iowa DNR, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

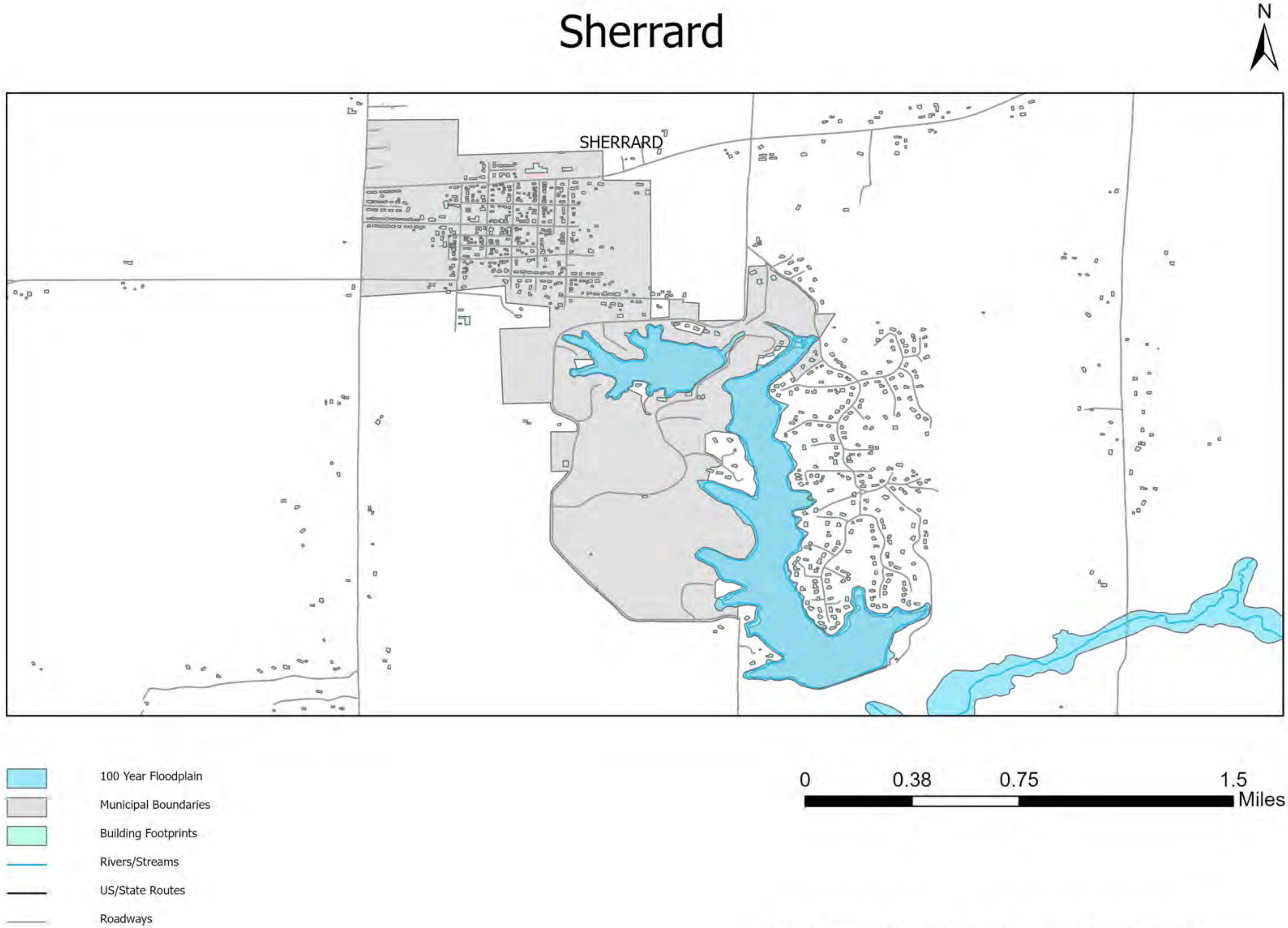
Appendix J

Matherville



Map Created December 2023 in ArcGIS Pro by Callie Smith at American Environmental Corporation
Sources: Iowa DNR, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

Sherrard



Map Created December 2023 in ArcGIS Pro by Callie Smith at American Environmental Corporation
Sources: Iowa DNR, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

APPENDIX K

DIRECTORY OF COAL MINES IN ILLINOIS

Mercer
County

This directory accompanies the Illinois Coal
Mines map or maps for this County.

August 2019

ILLINOIS
Illinois State Geological Survey
PRAIRIE RESEARCH INSTITUTE

Prairie Research Institute
Illinois State Geological Survey
615 East Peabody Drive
Champaign, Illinois 61820
(217) 333-4747
http//:www.isgs.illinois.edu

INTRODUCTION

Coal has been mined in 76 counties. More than 7,400 coal mines have operated since commercial mining began in Illinois circa 1810. Our maps of known mines for each county may help the public to identify mined areas. This accompanying coal mine directory provides basic information about the coal mines. Please note, however, that the accuracy and completeness of the maps and directories vary depending on the availability and quality of source material. Little or no information is available for many mines, especially the older ones, because mining activity was not regulated or documented until the late 1800's. Even then, reporting requirements were minimal.

The coal mine maps are maps compiled by the Illinois State Geological Survey (ISGS) of known mines: underground and surface coal mines as well as underground industrial mineral mines. Buffer regions for industrial mineral underground mines were incorporated into the maps due to limited information regarding these mines. The size of the buffer region is dependent on the uncertainty or inaccuracy of the mine location based on the quality of the source material. For more information regarding industrial mineral mines please contact the ISGS Industrial Minerals Section.

In cooperation with the Illinois State Geological Survey, the Office of Mines and Minerals (a division of the Department of Natural Resources) is in search of old underground mine maps of Illinois. Many of the undocumented maps are believed to be in libraries, historical societies and personal files of old mine employees. The Department asks that anyone who knows of one of these maps, please contact the Department at (618) 650-3197 or by emailing rgibson@siue.edu. A map specialist will come to your location, if you wish. Otherwise maps can be mailed, or you may stop by one of our offices in Edwardsville, Springfield, Ottawa, or Benton. These maps will be checked against existing inventory. If they are found to be a new discovery, they will be electronically imaged and returned to the owner (if requested).

MINE MAPS

The mined areas are shown on county base maps at a scale of 1:100,000.

Three types of mine information are shown on the maps: an index number that identifies the mine in the directory, a symbol that marks the 'location' of the mine, and an outline of the mined area if that is known. The location is almost always the site of the main mine opening or, in the case of surface mines, the location of the tipple (coal washing and storage facility). The type of symbol indicates whether the opening is a shaft, drift, or slope and whether the mine is active or abandoned. Another symbol represents a mine with an uncertain type of portal and/or uncertain location. When the exact location is unknown, the symbol is placed in the center of the section or quarter section in which the mine was reported to exist. If a mine cannot be located within a section, it is not shown on the map, but is listed in the directory.

The boundaries of the mined areas are also shown for most of the mines; however, for some mines the only information available is the location of the main opening. There are three types of coal-mined areas: underground, surface, and indefinite--which are shaded with different patterns. The underground mines also show large blocks of unmined coal within the mine, when that information is available. The indefinite areas, which have been plotted from sketchy or incomplete information, usually are underground workings, although the directory should be consulted to determine the specific mine type.

For most counties, one map shows all known mines. However, in Gallatin, Saline, Vermilion, and Williamson Counties, several seams have been extensively mined. For the sake of readability, separate maps have been produced for the mines in each seam. Mines in the Herrin Coal are shown on one map, those in the Springfield Coal are shown on another, and the mines in all other coals are shown on a third map. In Vermilion County, the mines that operated in the Herrin and the Danville Coals are presented on separate maps.

Quadrangle maps at 1:24,000 scale have been completed for select areas and contain more detailed outlines with directories that contain more detailed coal mine information. The maps and directories are available as downloadable PDF files or can be purchased. Please visit the ISGS web site for more information.

MINE DIRECTORIES

Each county directory is keyed to the mine map by the mine index number; the directory provides basic information about the coal mines shown on the map. The data have been compiled from a variety of sources such as the annual Coal Report of the Illinois Office of Mines and Minerals and field notes taken by ISGS geologists. The information presented in the table is described below. A blank in any column indicates that information is not available for that item. Again, we welcome any additional information that you may have.

<u>ISGS Index</u> Each mine in the state is identified with a unique number; this number is shown on the map and is the link between the map and the directory. The number is permanently assigned to a mine regardless of changes in the mine name, ownership, or operator.

<u>Company Name</u> A mine may have been operated by more than one company or the operating company may have changed its name. Separate entries in the directory show each name and the years of operation under the name. In many instances, names have been abbreviated to fit within the space available.

<u>Mine Name and Mine Number</u> An entry is included for each name and/or number the mine operated under, even if the company name remained the same. Many companies use the same name for all their mines, but differentiate them by number. Again, abbreviations have been used where necessary.

Mine Type   Underground mines are either "shaft," "slope," or "drift" which refers to the type of opening used to remove the coal from the mine. In shaft mines the coal is removed through a vertical shaft. Slope designates mines in which the coal is removed via a sloping incline from the ground surface to the mining level. In slope mines, miners and equipment may use either the slope or a vertical shaft to get into the mine. A drift mine is an underground mine that is excavated where the coal outcrops in the side of a bluff or the highwall of a surface mine. The mine type for surface mines is "strip" because these mines are more commonly called "strip mines."

Method   This refers to the pattern by which the coal was removed. Most underground mines in Illinois have used a type of room and pillar pattern, the areas where the coal is removed are the 'rooms' with 'pillars' of coal left in place to support the roof. In some mines, the pillars were later pulled to extract additional coal. The abbreviations are listed below and most are illustrated in Figure 1.

RP	Room & Pillar; specific type unknown
RPB	Room & Pillar Basic; irregular panels, typical of old mines
MRP	Modified Room & Pillar; a somewhat more regular pattern than Room & Pillar Basic
RPP	Room and Pillar Panel; similar to Modified Room & Pillar
BRP	Blind Room and Pillar; every 6th or 7th room is left unmined to provide additional support
CRP	Checkerboard Room and Pillar; evenly spaced large pillars
LW	Longwall; all coal is removed
	Old longwall mines were backfilled with rock to provide support
	Modern longwall mines allow roof to collapse behind as mining progresses
HER	High Extraction Retreat; a form of Room & Pillar mining that extracts most of the coal

Years Operated   Years that the mine operated; these dates may include periods when the mine was idle or not in full operation. Dates of mining from different sources are sometimes contradictory. The conventions that we have used to indicate where we were uncertain of dates are as follows. If we know the full range of dates that a mine operated under a specific name, those are given (1928-1934). If we know when a mine last operated, but not when it began, we use a dash and end date (-1934). If we know that a mine operated in a particular year, but not when it opened or closed, we just give the year we know (1920). To avoid confusion with the previous case, if a mine opened and closed in the same year, the year is repeated (1926-1926). In cases where a mine operated under different names, but we don't know when the name change occurred, the full range of dates is given for all names (John Smith Sr. Mine 1913-1944, Bill Smith Mine 1913-1944). A blank indicates that we have no information on the dates that the mine operated.

Coal Seam Mined The seam name is that used by the Illinois State Geological Survey. Figure 2 shows these coal seams in a stratigraphic column and provides a cross-reference to other names commonly used for these coals. If a mine has operated in more than one seam, there are separate entries in the table for each seam mined.

Location The location given is the site of the main portal or, for surface mines, the tipple. For small surface mines, the pit and the tipple are assumed to be the same. The location is based on the Public Land Survey System of townships and sections. Townships are identified by a township (north-south) and range (east-west) designation such as T14N-R6E. Townships are subdivided into approximately 36 one-square-mile sections, which are numbered from 1 to 36.

ORDERING INFORMATION

A 1:100,000 scale color plot with the directory is available at a cost of $12.50. This can be ordered by contacting the Information Office at (217) 244-2414 or sales@prairie.illinois.edu.

ACCURACY OF MAP

The maps and digital files used for this study were compiled from data obtained from a variety of sources and have varying degrees of completeness and accuracy. They present reasonable interpretations of the geology of the area and are based on available data. These data were compiled and digitized at a scale of 1:62,500, except for areas where quadrangle studies have been completed and the data was compiled at 1:24,000 or better. Locations of some features may be offset by 500 feet or more due to errors in the original source maps, the compilation process, digitizing, or a combination of these factors. These data are not intended for use in site-specific screening or decision-making. Data included in this map are suitable for use at a scale of 1:100,000.

DISCLAIMER

The Illinois State Geological Survey and the University of Illinois make no guarantee, expressed or implied, regarding the correctness of the interpretations presented in this data set and accept no liability for the consequences of decisions made by others on the basis of the information presented here.

DIRECTORY OF COAL MINES FOR MERCER COUNTY, ILLINOIS (August 2019)

ISGS INDEX	COMPANY NAME	MINE NAME	MINE NO.	MINE TYPE	METHOD	YEARS OPERATED	SEAM MINED	COUNTY	LOCATION TWP	RGE	SEC
17	COAL VALLEY MNG. CO.	COAL VALLEY	2	SHAFT	MRP	1895-1918	ROCK ISLAND	MERCER	16N	1W	33
18	COAL VALLEY MNG. CO.	COAL VALLEY	3	SHAFT	MRP	1909-1921	ROCK ISLAND	MERCER	15N	2W	27
19	ALDEN COAL CO.	ALDEN	7	SHAFT	MRP	1909-1927	ROCK ISLAND	MERCER	15N	2W	27
233	WILLIAMS,WM	WILLIAMS		SHAFT		1894-1930	ROCK ISLAND	MERCER	14N	2W	32
290	EMPIRE C C	EMPIRE	3	SHAFT	RP	1900-1911	ROCK ISLAND	MERCER	14N	2W	20
356	BRASMER,G.P. & SONS	BLACK DIAMOND	1	SHAFT		1922-1927	ROCK ISLAND	MERCER	14N	2W	2
356	ESSLEY C C	ESSLEY	1	SHAFT		1928-1933	ROCK ISLAND	MERCER	14N	2W	2
831	HAZEL DELL COAL CORP	HAZEL DELL	1	SHAFT	RP	1958-1973	ROCK ISLAND	MERCER	14N	1W	26
2666	ENGLE,LEONARD	ENGLE		SLOPE		1936-1937	ROCK ISLAND	MERCER	15N	4W	28
2666	LITTLE STAR C C	LITTLE STAR		SLOPE		1936-1941	ROCK ISLAND	MERCER	15N	4W	28
2666	LITTLE STAR COAL MINE	LITTLE STAR		SLOPE		1936-1941	ROCK ISLAND	MERCER	15N	4W	28
2666	THREE IN ONE C C	3 IN 1		SLOPE		1936-1941	ROCK ISLAND	MERCER	15N	4W	28
2955	YOUNG,SWAN J	YOUNG		SHAFT	RP	1900-1918	ROCK ISLAND	MERCER	14N	1W	2
2955	PETERSON,R.W.	PETERSON				1921-	ROCK ISLAND	MERCER	14N	1W	
2956	NORTHWESTERN COAL MFG CO	NORTHWESTERN		STRIP		1908-1909	ROCK ISLAND	MERCER	14N	1W	3
2957	PETERSON,R.W.			SLOPE		1913-1917		MERCER	14N	2W	
2957	PETERSON,C.E.			SHAFT		1923-1930		MERCER	14N	2W	
2958	EDDINGTON,WM J C C		2	STRIP		1957-1959	ROCK ISLAND	MERCER	14N	2W	3
2958	VIOLA MATERIALS CORP	VIOLA	1	STRIP		1959-1973	ROCK ISLAND	MERCER	14N	2W	3
2959	GOODEN,GEORGE, UNDERGROUND	GOODEN		UG	RP	1919-1924	ROCK ISLAND	MERCER	14N	2W	3
2960	ROCK QUARRY C C	ROCK QUARRY		SHAFT		1935-1938	ROCK ISLAND	MERCER	14N	2W	3
2960	HAYBURN,EUGENE	HAYBURN		SHAFT		1937-1938	ROCK ISLAND	MERCER	14N	2W	3
2961	LITTLE STAR MNG CO	LITTLE STAR		SHAFT		1918-1919		MERCER	14N	2W	3
2962	SHAXTER BROS,OPER ABT 1922	SHAXTER		DRIFT			ROCK ISLAND	MERCER	14N	2W	4
2962	GUTHRIE,J M C C	GUTHRIE		SLOPE		1936-1941	ROCK ISLAND	MERCER	14N	2W	4
2963	EMPIRE C C	EMPIRE	1	SHAFT		1886-1902	ROCK ISLAND	MERCER	14N	2W	4

DIRECTORY OF COAL MINES FOR MERCER COUNTY, ILLINOIS (August 2019)

ISGS INDEX	COMPANY NAME	MINE NAME	MINE NO.	MINE TYPE	METHOD	YEARS OPERATED	SEAM MINED	COUNTY	LOCATION TWP	RGE	SEC
2964	JONES & BODEN	JONES & BODEN		SHAFT		1901-1902	ROCK ISLAND	MERCER	14N	2W	4
2964	JONES,ARTHUR	JONES		SHAFT		1902-1912	ROCK ISLAND	MERCER	14N	2W	4
2964	BLAINE,JAMES	PLEASANT VALLEY		SHAFT		1912-1917	ROCK ISLAND	MERCER	14N	2W	4
2964	BLAINE,W.E.	PLEASANT VALLEY		SHAFT		1918-1921	ROCK ISLAND	MERCER	14N	2W	4
2964	BLAINE BROTHERS	BLAINE		SHAFT		1921-1923	ROCK ISLAND	MERCER	14N	2W	4
2964	BLAINE & JONES	BLAINE & JONES		SHAFT		1923-1923	ROCK ISLAND	MERCER	14N	2W	4
2965	LEE BROS C C	LEE		SLOPE		1923-1942	ROCK ISLAND	MERCER	14N	2W	4
2965	B & H C C	B & H	1	SLOPE		1950-1953	ROCK ISLAND	MERCER	14N	2W	4
2966	TAYLOR,JOHN	TAYLOR		SLOPE		-1933	ROCK ISLAND	MERCER	14N	2W	4
2966	MYERS,MAX	MYERS		SLOPE		1933-1937	ROCK ISLAND	MERCER	14N	2W	4
2966	RICHARDSON C C(MAX MYERS)	MYERS		SLOPE		1937-1938	ROCK ISLAND	MERCER	14N	2W	4
2966	RICHARDSON,ETHEL	RICHARDSON		SLOPE		1938-1938	ROCK ISLAND	MERCER	14N	2W	4
2966	SKINNER,ETHEL	SKINNER		SLOPE		1938-1938	ROCK ISLAND	MERCER	14N	2W	4
2966	AVON C C	AVON		SLOPE		1939-1942	ROCK ISLAND	MERCER	14N	2W	4
2966	FAULCONER,WM.H	FAULCONER		SLOPE		1939-1939	ROCK ISLAND	MERCER	14N	2W	4
2967	DORMAN C C	DORMAN	2	SLOPE		1936-1939	ROCK ISLAND	MERCER	14N	2W	5
2967	GOBEN & PETERSON	GOBEN		SLOPE		1939-1940	ROCK ISLAND	MERCER	14N	2W	5
2967	GOBEN,ELMER	GOBEN		SLOPE		1940-1941	ROCK ISLAND	MERCER	14N	2W	5
2967	GOBEN & SMITH	GOBEN		SLOPE		1941-1942	ROCK ISLAND	MERCER	14N	2W	5
2968	MILLER & GOBEN	MILLER & GOBEN				1934-1936		MERCER	14N	2W	5
2969	NEEDHAM & SMITH	N & S				1934-1936	ROCK ISLAND	MERCER	14N	2W	5
2970	SNELL,JOHN	SNELL		SLOPE		1917-1930	ROCK ISLAND	MERCER	14N	2W	6
2970	TAYLOR,JOHN	TAYLOR		SLOPE		1917-1930	ROCK ISLAND	MERCER	14N	2W	6
2970	HARTMAN & TAYLOR	H & T		SLOPE		1918-1919	ROCK ISLAND	MERCER	14N	2W	6
2970	HARTMAN,S C	HARTMAN		SLOPE		1919-1923	ROCK ISLAND	MERCER	14N	2W	6
2971	PETERSON,C A	PETERSON		SLOPE	RP	1916-1924		MERCER	14N	2W	8
2972	HYDRAULIC PRESS BRICK	HYDRAULIC PRESS BRICK		SLOPE		1916-1926	ROCK ISLAND	MERCER	14N	2W	8
2973	ALDEN C C	ALDEN	2	SHAFT	RPB	1895-1906	ROCK ISLAND	MERCER	14N	2W	9

DIRECTORY OF COAL MINES FOR MERCER COUNTY, ILLINOIS (August 2019)

ISGS INDEX	COMPANY NAME	MINE NAME	MINE NO.	MINE TYPE	METHOD	YEARS OPERATED	SEAM MINED	COUNTY	LOCATION TWP	RGE	SEC
2974	PEASE C C	PEASE		SHAFT	RPB	1934-1944	ROCK ISLAND	MERCER	14N	2W	11
2975	ESSLEY C C	ESSLEY	2	SHAFT	MRP	1930-1940	ROCK ISLAND	MERCER	14N	2W	11
2976	KNESS C C	KNESS	1	SHAFT	RP*	1934-1937	ROCK ISLAND	MERCER	14N	2W	14
2976	FOUR IN ONE C C	4 IN 1		SHAFT		1938-1941	ROCK ISLAND	MERCER	14N	2W	14
2977	ALDEN C C	ALDEN	4	SHAFT	RPB	1904-1908	ROCK ISLAND	MERCER	14N	2W	17
2978	SMITH & SON	SMITH	1	SLOPE	RP	1932-1942	ROCK ISLAND	MERCER	14N	2W	31
2978	SMITH,CHARLES	SMITH		SLOPE		1932-1942	ROCK ISLAND	MERCER	14N	2W	31
2979	NESBIT & SMITH	N & S		SHAFT		1883-1930	ROCK ISLAND	MERCER	14N	2W	32
2979	SMITH & HARRISON	S & H		SHAFT		1883-1930	ROCK ISLAND	MERCER	14N	2W	32
2979	MARTIN BROS	MARTIN		SHAFT	RP	1883-1930	ROCK ISLAND	MERCER	14N	2W	32
2979	MARTIN,F M	MARTIN		SHAFT		1883-1930	ROCK ISLAND	MERCER	14N	2W	32
2980	SMITH,T H	SMITH				1934-1937	ROCK ISLAND	MERCER	14N	2W	32
2981	CABLE (P. L.)	CABLE SLOPE		SLOPE	RP	1878-1879	ROCK ISLAND	MERCER	15N	1W	5
2981	COAL VALLEY MNG. CO.	COAL VALLEY		SLOPE	RP	1879-1896	ROCK ISLAND	MERCER	15N	1W	5
2982	COAL VALLEY MNG. CO.	COAL VALLEY	1	SHAFT	MRP	1881-1909	ROCK ISLAND	MERCER	15N	1W	17
2983	LILLIMAN BROTHERS	LILLIMAN		SHAFT	RPB	1893-1901	ROCK ISLAND	MERCER	15N	1W	20
2983	LILLIMAN & CO.	LILLIMAN		SHAFT	RPB	1901-1903	ROCK ISLAND	MERCER	15N	1W	20
2983	LILLIMAN (ALFRED)	LILLIMAN		SHAFT	RPB	1903-1905	ROCK ISLAND	MERCER	15N	1W	20
2984	PETERSON (CHARLES)	PETERSON		SHAFT	RPB	1878-1895	ROCK ISLAND	MERCER	15N	1W	21
2984	PETERSON (BRYAN B.)	PETERSON		SHAFT	RPB	1895-1918	ROCK ISLAND	MERCER	15N	1W	21
2984	SWANSON & NIMRICK	SWANSON & NIMRICK		SHAFT	RPB	1918-1920	ROCK ISLAND	MERCER	15N	1W	21
2984	SWANSON (AXEL)	SWANSON		SHAFT	RPB	1920-1923	ROCK ISLAND	MERCER	15N	1W	21
2984	PETERSON COAL CO.	PETERSON		SHAFT	RPB	1923-1924	ROCK ISLAND	MERCER	15N	1W	21
2984	PETERSON (BRYAN B.)	PETERSON		SHAFT	RPB	1924-1925	ROCK ISLAND	MERCER	15N	1W	21
2985	SPAHNIR (A. J.)	SPAHNIR		DRIFT		1936-1936	ROCK ISLAND	MERCER	15N	1W	28
2986	YOUNG,SWAN J	YOUNG		UG	RP	1934-1936	ROCK ISLAND	MERCER	15N	1W	35
2987	SCHAECHTER BROTHERS	SCHAECHTER		DRIFT		1922-1925	ROCK ISLAND	MERCER	15N	2W	4

DIRECTORY OF COAL MINES FOR MERCER COUNTY, ILLINOIS (August 2019)

ISGS INDEX	COMPANY NAME	MINE NAME	MINE NO.	MINE TYPE	METHOD	YEARS OPERATED	SEAM MINED	COUNTY	LOCATION TWP	RGE	SEC
2987	SCHRAECHTER (LOUIS)	SCHRAECHTER		DRIFT		1926-1929	ROCK ISLAND	MERCER	15N	2W	4
2988	BODEN (JOHN)	BODEN		DRIFT		1933-1934	ROCK ISLAND	MERCER	15N	2W	26
2989	DOCHERTY (JAMES)	DOG TOWN		SLOPE		1938-1939	ROCK ISLAND	MERCER	15N	2W	26
2989	BLUE FLAME COAL CO.	DOG TOWN		SLOPE		1939-1940	ROCK ISLAND	MERCER	15N	2W	26
2990	RIDDELL (WILLIAM H.)	RIDDELL		SHAFT	MRP	1906-1912	ROCK ISLAND	MERCER	15N	2W	33
2990	LINK (AXEL E.)	LINK		SHAFT	MRP	1912-1915	ROCK ISLAND	MERCER	15N	2W	33
2990	LEE & HAGMAN	LEE & HAGMAN		SHAFT	MRP	1915-1916	ROCK ISLAND	MERCER	15N	2W	33
2990	MCCRAME & LEE	MCCRAME & LEE		SHAFT	MRP	1916-1917	ROCK ISLAND	MERCER	15N	2W	33
2990	MCCRANEY SAND & GRAVEL	MCCRANEY		SHAFT	MRP	1917-1919	ROCK ISLAND	MERCER	15N	2W	33
2991	FULTON COUNTY COAL CO.	FULTON	2	SHAFT	RP	1913-1914	ROCK ISLAND	MERCER	15N	2W	33
2992	KORESKO C C	KORESKO		UG		1933-1938	ROCK ISLAND	MERCER	15N	2W	34
2993	O'ROURKE & BUGAS	O'ROURKE & BUGAS		SLOPE	MRP	1929-1932	ROCK ISLAND	MERCER	15N	2W	34
2993	NEVER SEEN COAL CO.	NEVER SEEN		SLOPE	MRP	1933-1937	ROCK ISLAND	MERCER	15N	2W	34
2993	O'ROURKE & BUGAS	O'ROURKE & BUGAS		SLOPE	MRP	1938-1938	ROCK ISLAND	MERCER	15N	2W	34
2993	NEVER SEEN COAL CO.	NEVER SEEN		SLOPE	MRP	1939-1943	ROCK ISLAND	MERCER	15N	2W	34
2994	FRYE & BOLLMAN	FRYE & BOLLMAN	1	SLOPE		1933-1942	ROCK ISLAND	MERCER	15N	2W	35
2995	BARR & DOCHERTY	BARR		SHAFT		1890-1892	ROCK ISLAND	MERCER	15N	2W	35
2995	DOCHERTY,THOMAS & SONS	DOCHERTY		SHAFT		1892-1899	ROCK ISLAND	MERCER	15N	2W	35
2995	DOCHERTY,PETER	DOCHERTY		SHAFT		1899-1902	ROCK ISLAND	MERCER	15N	2W	35
2995	DOCHERTY BROS	DOCHERTY		SHAFT		1902-1920	ROCK ISLAND	MERCER	15N	2W	35
2996	HUFFMAN & JOHNSON	HUFFMAN & JOHNSON		SLOPE		1926-1927	ROCK ISLAND	MERCER	15N	2W	35
2996	CRESCENT COAL CO.	CRESCENT		SLOPE		1927-1928	ROCK ISLAND	MERCER	15N	2W	35
2996	HOFFMAN & JOHNSON	HOFFMAN & JOHNSON		SLOPE		1929-1929	ROCK ISLAND	MERCER	15N	2W	35
2996	HUFFMAN & JOHNSON	HUFFMAN & JOHNSON		SLOPE		1930-1934	ROCK ISLAND	MERCER	15N	2W	35
2997	MORRIS COOP C C	MORRIS		UG	RP	1939-1942	ROCK ISLAND	MERCER	15N	4W	24
2998	DEWROCK C C	DEWROCK				1936-	ROCK ISLAND	MERCER	15N	4W	28
4966	BUGAS (GEORGE) & BROTHERS	BUGAS		SLOPE	MRP	1920-1922	ROCK ISLAND	MERCER	14N	2W	3
4966	BUGAS (GEORGE) COAL CO.	BUGAS		SLOPE	MRP	1922-1923	ROCK ISLAND	MERCER	14N	2W	3

DIRECTORY OF COAL MINES FOR MERCER COUNTY, ILLINOIS (August 2019)

ISGS INDEX	COMPANY NAME	MINE NAME	MINE NO.	MINE TYPE	METHOD	YEARS OPERATED	SEAM MINED	COUNTY	LOCATION TWP	RGE	SEC
4966	NEVER SEEN COAL CO.	NEVER SEEN		SLOPE	MRP	1923-1924	ROCK ISLAND	MERCER	14N	2W	3
4966	BUGAS (MRS. ANNA)	BUGAS		SLOPE	MRP	1924-1925	ROCK ISLAND	MERCER	14N	2W	3
4966	NEVER SEEN COAL CO.	NEVER SEEN		SLOPE	MRP	1925-1926	ROCK ISLAND	MERCER	14N	2W	3
5280				SHAFT			ROCK ISLAND	MERCER	15N	2W	26
6082								MERCER	13N	2W	20
6083								MERCER	13N	2W	21
6086								MERCER	14N	2W	4
6088								MERCER	14N	2W	4
6089								MERCER	14N	2W	4
6090								MERCER	14N	2W	4
6092	HYDRAULIC PRESS BRICK	HYDRAULIC PRESS BRICK		UG	RPB			MERCER	14N	2W	5
6093				UG	RP			MERCER	14N	2W	5
6094				UG	RP			MERCER	14N	2W	5
6095				UG	RP			MERCER	14N	2W	5
6096				UG	RP			MERCER	14N	2W	5
6097								MERCER	14N	2W	5
6098								MERCER	14N	2W	5
6099								MERCER	14N	2W	6
6100								MERCER	14N	2W	6
6101				UG	RP			MERCER	14N	2W	7
6102							ROCK ISLAND	MERCER	15N	2W	34
6104				UG	RP			MERCER	14N	2W	32
6105								MERCER	14N	2W	32

DIRECTORY OF COAL MINES FOR MERCER COUNTY, ILLINOIS (August 2019)

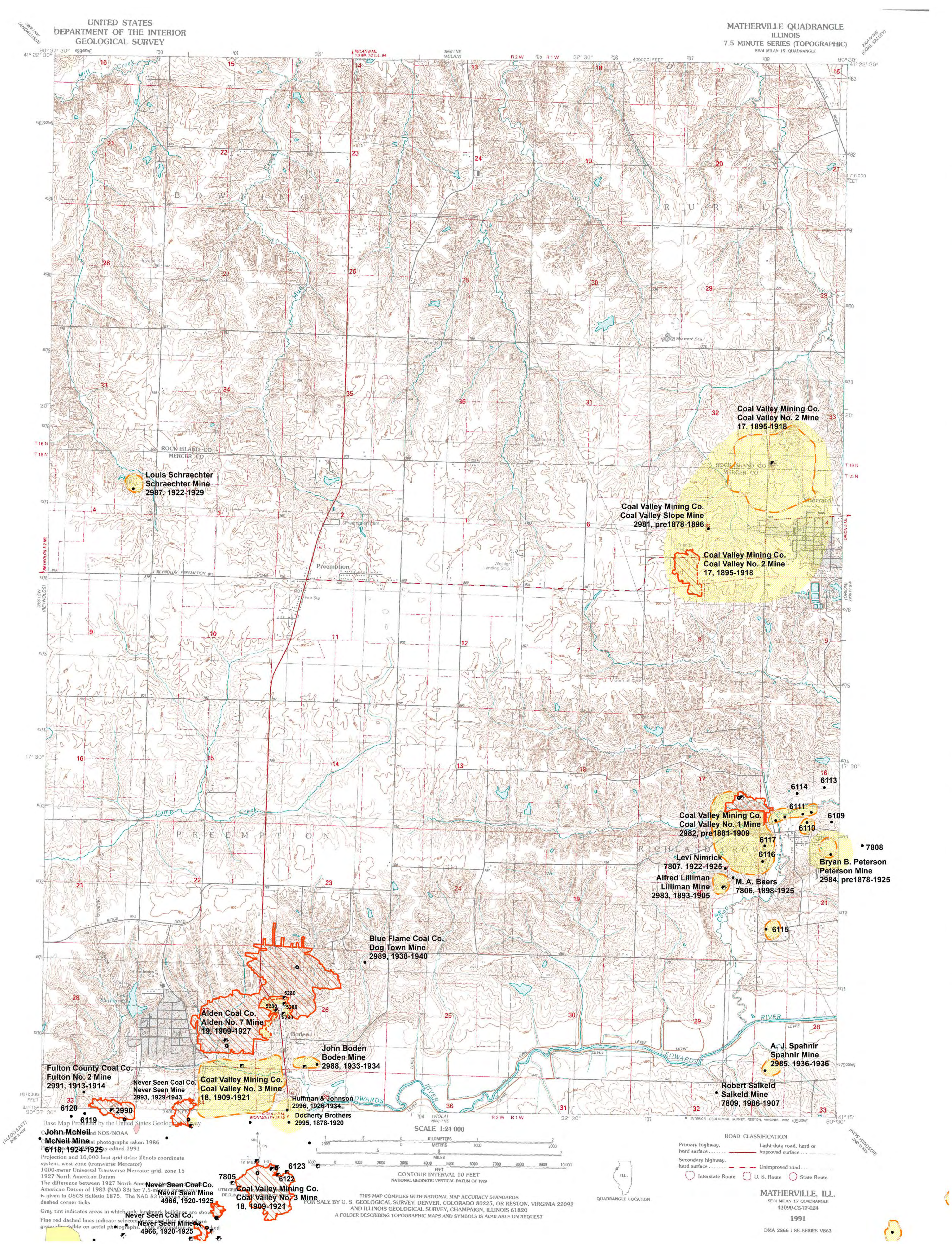
ISGS INDEX	COMPANY NAME	MINE NAME	MINE NO.	MINE TYPE	METHOD	YEARS OPERATED	SEAM MINED	COUNTY	LOCATION TWP	RGE	SEC
6106								MERCER	14N	2W	32
6107								MERCER	14N	2W	32
6109							ROCK ISLAND	MERCER	15N	1W	16
6110				DRIFT			ROCK ISLAND	MERCER	15N	1W	16
6111				DRIFT			ROCK ISLAND	MERCER	15N	1W	16
6112				UG			ROCK ISLAND	MERCER	14N	2W	4
6113							ROCK ISLAND	MERCER	15N	1W	16
6114							ROCK ISLAND	MERCER	15N	1W	16
6115				UG	RPB		ROCK ISLAND	MERCER	15N	1W	21
6116							ROCK ISLAND	MERCER	15N	1W	21
6117							ROCK ISLAND	MERCER	15N	1W	21
6118								MERCER	15N	2W	33
6119								MERCER	15N	2W	33
6120								MERCER	15N	2W	33
6121								MERCER	15N	2W	34
6122								MERCER	15N	2W	35
6123								MERCER	15N	2W	35
6124								MERCER	15N	2W	35
6125								MERCER	15N	3W	19
6126								MERCER	15N	3W	19
6127								MERCER	15N	3W	19
6128	THOMPSON,ED	THOMPSON						MERCER	15N	3W	19
6129								MERCER	15N	3W	35

DIRECTORY OF COAL MINES FOR MERCER COUNTY, ILLINOIS (August 2019)

ISGS INDEX	COMPANY NAME	MINE NAME	MINE NO.	MINE TYPE	METHOD	YEARS OPERATED	SEAM MINED	COUNTY	LOCATION TWP	RGE	SEC
6131								MERCER	15N	4W	23
6132								MERCER	15N	4W	23
6133				UG	RP			MERCER	15N	4W	24
6134								MERCER	15N	4W	24
6135								MERCER	15N	4W	24
6136								MERCER	15N	4W	24
6137								MERCER	15N	4W	26
6138								MERCER	15N	4W	26
6139								MERCER	15N	4W	27
6140								MERCER	15N	4W	27
6141								MERCER	15N	4W	28
6142								MERCER	15N	4W	28
6143								MERCER	15N	4W	34
6144								MERCER	15N	4W	34
6145								MERCER	15N	4W	34
6653								MERCER	14N	2W	4
6654								MERCER	14N	3W	11
6655								MERCER	14N	3W	12
6656								MERCER	14N	3W	12
6658				UG	RP			MERCER	15N	1W	34
6659								MERCER	14N	2W	8
6660				UG	RP			MERCER	14N	2W	8

DIRECTORY OF COAL MINES FOR MERCER COUNTY, ILLINOIS (August 2019)

ISGS INDEX	COMPANY NAME	MINE NAME	MINE NO.	MINE TYPE	METHOD	YEARS OPERATED	SEAM MINED	COUNTY	LOCATION TWP	RGE	SEC
7805				SHAFT			ROCK ISLAND	MERCER	15N	2W	34
7806	BEERS (MILTON A.)	BEERS		SLOPE	RP	1898-1910	ROCK ISLAND	MERCER	15N	1W	20
7806	WAHLBERG (ANDREW W.)	WAHLBERG		SLOPE	RP	1910-1913	ROCK ISLAND	MERCER	15N	1W	20
7806	BEERS (M. A.)	BEERS		SLOPE	RP	1913-1925	ROCK ISLAND	MERCER	15N	1W	20
7807	NIMRICK BROTHERS	NIMRICK		SHAFT		1922-1923	ROCK ISLAND	MERCER	15N	1W	20
7807	NIMRICK (LEVI)	NIMRICK		SHAFT		1923-1924	ROCK ISLAND	MERCER	15N	1W	20
7807	NIMRICK BROTHERS	NIMRICK		SHAFT		1924-1925	ROCK ISLAND	MERCER	15N	1W	20
7807	NIMRICK (LEVI)	NIMRICK		SHAFT		1925-1925	ROCK ISLAND	MERCER	15N	1W	20
7808				SHAFT			ROCK ISLAND	MERCER	15N	1W	21
7809	SALKELD (ROBERT)	SALKELD		SLOPE	RP	1906-1907	ROCK ISLAND	MERCER	15N	1W	32



Coal Mines in Illinois
Matherville Quadrangle

Mercer & Rock Island Counties, Illinois

Rock Island Coal

This map accompanies the Coal Mines Directory for the Matherville Quadrangle. Consult the directory for a complete explanation of the information shown on this map.

Mining Method

- Room & Pillar (RP)
- Room & Pillar Basic (RPB)
- Modified Room & Pillar (MRP)
- Room & Pillar Panel (RPP)
- Blind Room & Pillar (BRP)
- Checkerboard Room & Pillar (CRP)
- High Extraction Retreat (HER)
- Longwall (LW)
- Underground, Method Unknown
- Strip Mine
- Auger Mine
- General Area of Mining

Other Areas Depicted

- Non-Coal Mines

Source of Mine Outline

- Final Mine Map
- Not Final Mine Map
- Undated Mine Map
- Incomplete Mine Map
- Secondary Source Map

Tipple, Shaft, Slope, Drift Locations

- Strip Mine Tipple - Active
- Strip Mine Tipple - Abandoned
- Mine Shaft - Active
- Mine Shaft - Abandoned
- Mine Slope - Active
- Mine Slope - Abandoned
- Mine Drift - Active
- Mine Drift - Abandoned
- Air Shaft
- Uncertain Location
- Uncertain Type of Opening

Other Points Depicted

- Non-Coal Mines

Location

Mine Annotation

(space permiting)
Company
Mine Name
ISGS Index No., Years of Operation

Disclaimer

Please check the Coal Section at the Illinois State Geological Survey's web site at http://www.isgs.illinois.edu for the most up-to-date version of these products.

Note that each quadrangle scale mined-out area map requires the use of the associated text directory for full explanation of map features and mine attributes. Also note that some quadrangles have multiple seams of mining and therefore more than one map may be available for a particular quadrangle. Please take care to check for multiple maps, as extensive mining may exist in the other seams.

The maps and digital files used for these studies were compiled from data obtained from a variety of public and private sources and have varying degrees of completeness and accuracy. This compilation map presents reasonable interpretation of the geology of the area and is based on available data. Locations of some mine features may be offset by 500 feet or more due to errors in the original source maps, the compilation process, digitizing, or a combination of these factors. These data are not intended for use in site-specific screening or decision-making. Use of these documents does not eliminate the need for detailed studies to fully understand the geology of a specific site. The Illinois State Geological Survey, Prairie Research Institute, or the University of Illinois make no guarantee, expressed or implied, regarding the correctness of the interpretations presented in this data set and accept no liability for the consequences of decisions made by others on the basis of the information presented here.

These maps were designed for use at 1:24,000. Enlarging the map may reduce accuracy, as the original scale of the source maps used to compile the outlines shown varies from 1:400 to 1:150,000, and some mine locations are known only from text descriptions. See the accompanying mine directory for the original scale of the source map used for a specific mine to check accuracy of a given portion of the map. Areas with no mines shown may still be undermined; see the unlocated mines list at the back of each mine directory.

The image of the U.S.G.S. topographic base map was projected from the original UTM to Lambert Conformal Conic.

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Mine Outlines Compiled by
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June 2018

DIRECTORY OF COAL MINES IN ILLINOIS
7.5-MINUTE QUADRANGLE SERIES
MATHERVILLE QUADRANGLE
MERCER & ROCK ISLAND COUNTIES

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2018

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Cover photo Track-mounted duckbill loading machine at a Peabody Coal Company mine, ca. 1915.

DISCLAIMER: The accuracy and completeness of mine maps and directories vary with the availability of reliable information. Maps and other information used to compile this mine map and directory were obtained from a variety of sources and the accuracy of some of the original information cannot be verified. Consequently, the Illinois State Geological Survey (ISGS) cannot guarantee the mine maps are free of errors and disclaims any responsibility for damages that may result from actions or decisions based on them.

The ISGS updates the maps and directories periodically, and welcomes any new information or corrections. Please contact the Coal Section of the ISGS at the address shown on the title page of this directory, or telephone (217) 244-4610.

CONTENTS

INTRODUCTION

Coal has been mined in 76 counties of Illinois. More than 7,400 coal mines have operated since commercial mining began in Illinois about 1810; fewer than 30 are currently active. To detail the extent and location of coal mining in Illinois, the Illinois State Geological Survey (ISGS) has compiled maps and directories of known coal mines. The ISGS offers maps at a scale of 1:100,000 and accompanying directories for each county in which coal mining is known to have occurred. Maps at a scale of 1:24,000 and accompanying directories, such as this, are available for selected quadrangles. Contact the ISGS for a list of these quadrangles.

These larger scale maps show the approximate positions of mines in relation to surface features such as roads and water bodies, and indicate the mining method used and the accuracy of the mine boundaries. The maps are useful for locating mine boundaries relative to specific properties and for assessing the potential for subsidence in an area. Mine boundaries compiled from final mine surveys are generally shown within 200 feet of their true position. As a result of poor cartographic quality and inaccuracies in the original mine surveys, boundaries of some older mines may be mislocated on the map by 500 feet or more. Original mine maps should be consulted in situations that require precise delineation of mine boundaries or internal workings of mined areas.

This directory serves as a key to the accompanying mine map and provides basic information on the coal mines in the quadrangle. The directory is composed of two parts. Part I explains the symbols and patterns used on the accompanying map and the summary data presented for each mine. Part II numerically lists the mines in the quadrangle and summarizes the geology and production history of each mine. Total production for the mine, not the portion in the quadrangle, is given.

MINING IN THE MATHERVILLE QUADRANGLE

According to A. H. Worthen, mines were active in sections 16, 20, and 21 of T15N-R1W near the town of Cable. The locations were not specific and may be represented on the accompanying map by mines on the slopes adjacent to Camp Creek and its tributaries. Mining continued in this area until 1925.

According to the 1910 Coal Report (p. 238), the town of Matherville was established as a mining town for the Coal Valley Mining Company (mine index 18) and Alden No. 7 Mine (mine index 19). Mining ceased in this vicinity in 1943.

PART I EXPLANATION OF MAP AND MINE SUMMARY SHEET

INTERPRETING THE MAP

The map accompanying this directory shows the location of coal mines known to be present in the quadrangle. The map, corresponding to a U.S. Geological Survey (USGS) 7.5-minute quadrangle, covers an area bounded by lines of latitude and longitude 7.5-minutes apart. In Illinois, a quadrangle is approximately 6.5 miles east to west and 8.5 miles north to south, an area of about 56 square miles. The ISGS generally offers one map of mines per quadrangle. In some areas where extensive mining occurred in two or more overlapping seams, separate maps are compiled for mines in each seam to maintain readability of the map.

Mine Type and Mining Method
The mine type is indicated on the map by pattern color: green represents surface mines; red and yellow represent underground mines. The red patterns are used for areas of underground mining that are documented by a primary or secondary source map. A yellow pattern is used for cases where no map of the mine workings is available, but a general area of mining can be inferred from property maps or production figures. The patterns indicate the main mining methods used in underground mines. The methods are (1) room and pillar and (2) high extraction. The method used gives some indication of the amount and pattern of coal extraction within each mined area, and has some influence on the timing and type of subsidence that can occur over a mine.

The following discussion and illustrations of mining methods are based on Guither et al. (1984).

In room-and-pillar mines, coal is removed from haulage-ways (entries) and selected areas called rooms. Pillars of unmined coal are left between the rooms to support the roof. Depending on the size of rooms and pillars, the amount of coal removed from the production areas will range from 40% to 70%.

Room and Pillar - mining is divided into six categories:
- room-and-pillar basic (RPB, fig. 1A), an early method that did not follow a preset mining plan and therefore resulted in very irregular designs;
- modified room and pillar (MRP, fig. 1B);
- room-and-pillar panel (RPP, fig. 1C);
- blind room and pillar (BRP, fig. 1D);
- checkerboard room and pillar (CRP, fig. 1E);
- room and pillar (RP), a classification used when the specific type of room-and-pillar mining is unknown.

Blind and checkerboard are the most common types of room-and-pillar mining used in Illinois today. The knowledge of room-and-pillar mining methods gives a trained engineer information on the nature of subsidence that may occur. A more extensive discussion of subsidence can be found in Bauer et al. (1993).

High-extraction   These mining methods are subdivided into high-extraction retreat (HER, Fig 1F) and longwall (LW, Fig 1G, 1H). In these methods, much of the coal is removed within well defined areas of the mine. Subsidence of the surface above these areas occurs within weeks. Once the subsidence activity ceases, the potential for further movement over these areas is low; however, subsidence may continue for several years after mining.

High-extraction retreat mining is a form of room-and-pillar mining that extracts most of the coal. Rooms and pillars are developed in the panels, and the pillars are then systematically removed (fig. 1F).

In early (pre-1960) longwall mines, mining advanced in multiple directions from a central shaft (fig. 1G). Large pillars of coal were left around the shaft, but all coal was removed beyond these pillars. Miners placed rock and wooden props and cribs in the mined-out areas to support the mine roof. The overlying rock gradually settled onto these supports, thus producing subsidence at the surface. In post-1959 longwall mines, room-and-pillar methods have been used to develop the main entries of the mine and panel areas. Modern longwall methods extract 100 percent of the coal in the panel areas (fig. 1H).

SOURCE MAPS

Mine outlines depicted on the map are, whenever possible, based on maps made from original mine surveys. The process of compiling and digitizing the quadrangle map may produce errors of less than 200 feet in the location of mine boundaries. Larger errors of 500 feet or more are possible for mines that have incomplete or inaccurate source maps.

Because of the extreme complexity of some mine maps, detailed features of mined areas have been omitted. The digitized mine boundary includes the exterior boundary of all rooms or entries that were at least 80 feet wide or protruded 500 feet from the main mining area. Unmined areas between mines are shown if they are at least 80 feet wide; unmined blocks of coal within mines are shown if they are at least 400 feet on each side. Original source maps should be consulted when precise information on mine boundaries or interior features is needed.

The mine summary sheet lists the source maps used to determine each mine outline. The completeness of map sources is indicated on the map by a line symbol at the mine boundary. Source maps are organized in five categories.

Final mine map The mine outline was digitized from an original map made from mine surveys conducted within a few months after production ceased. The date of the map and the last reported production are listed on the summary sheet.

Not a final map The mine is currently active or the mine outline was made from a map based on mine surveys conducted more than few months before production ceased. This implies the actual mined-out area is probably larger than the outline on the map. The mine summary sheet indicated the dates of source maps and the last reported production, as well as the approximate tonnage mined between these two dates (if the mine is abandoned). The summary sheet also lists the approximate acreage mined since the date of the map and, in some cases, indicates the area where additional mining may have taken place. This latter information is determined by locating on the map the active faces relative to probable boundaries of the mine property.

Undated map The source map was undated, so it may or may not be based on a final mine survey. When sufficient data are available, the probable acreage of the mined area is estimated from reported production, average seam thickness and a recovery rate comparable to other mines in the area. This information is listed in the summary sheet for the mine.

Incomplete map The source map did not show the entire mine. The summary sheet indicates the missing part of the mine map and the acreage of the unmapped area, which is estimated from the amount of coal known to have been produced from the mine.

Secondary source map The original mine map was not found so the outline shown was determined from secondary sources (e.g., outlines from small-scale regional maps published in other reports). The summary sheet describes the secondary sources.

POINTS AND LABELS

The locations of all known mine openings (shafts, slopes, and drifts) and surface mine tipples are plotted on the map. Tipples are areas where coal was cleaned, stockpiled, and loaded for shipping.

Only openings or tipples are plotted for mines without source maps. If the precise locations of these features are unknown, a special symbol is used to indicate the approximate location of the mine.

Each mine on the map is labeled with the names of the mine and operating company, ISGS mine index number, and years of operation (if known) if space permits. A seam designation is given on maps where more than one seam was mined. For a mine that operated under more than one name, only the most recent name is generally given. When a mine changed names or ownership shortly before closing, an earlier name is listed. All company and mine names are listed on the mine summary sheet in the directory, under the production history segment.

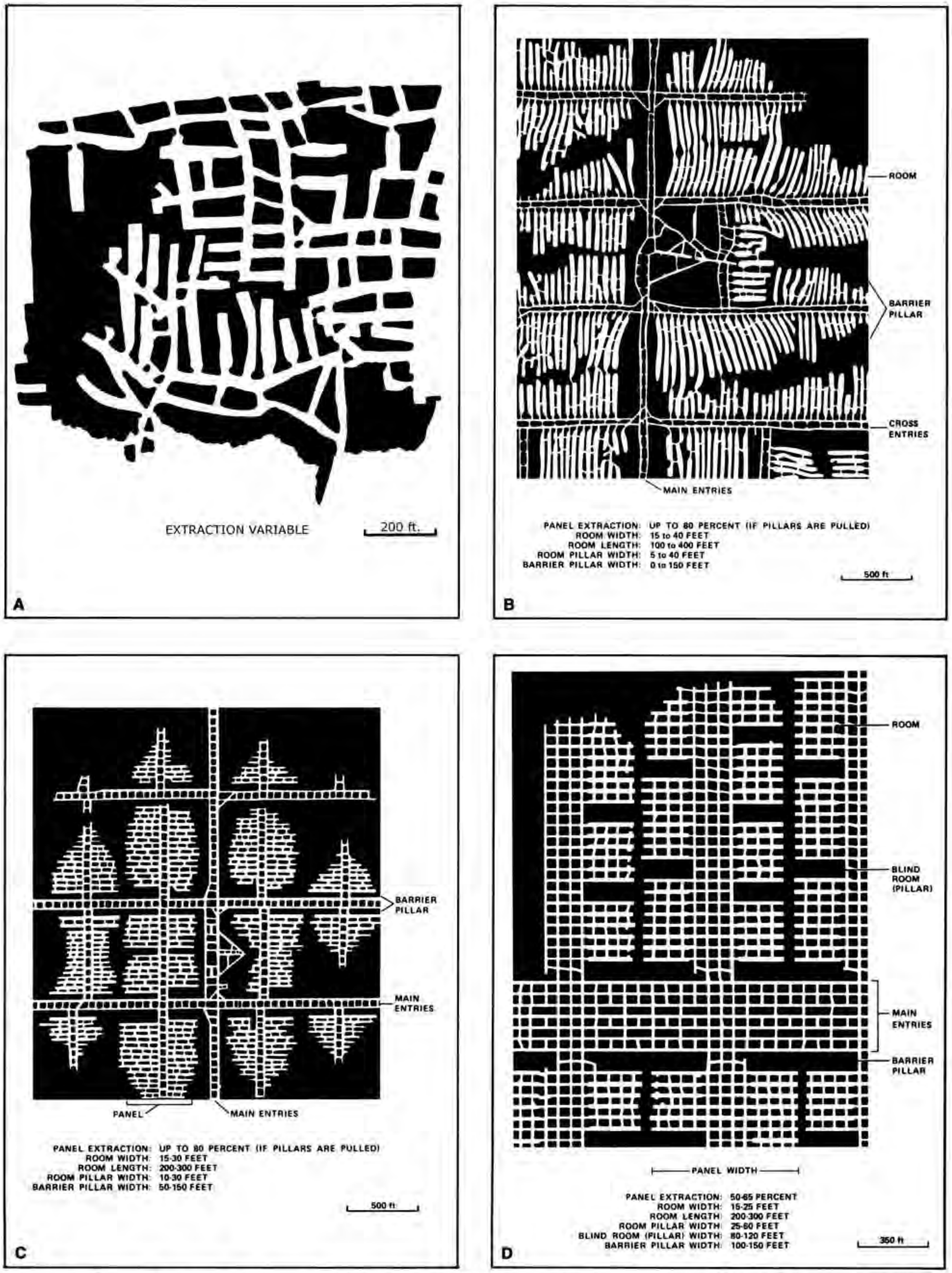


Figure 1 Mining methods: (A) room-and-pillar basic (RPB), (B) modified room and pillar (MRP), (C) room-and-pillar panel (RPP), (D) blind room and pillar (BRP).

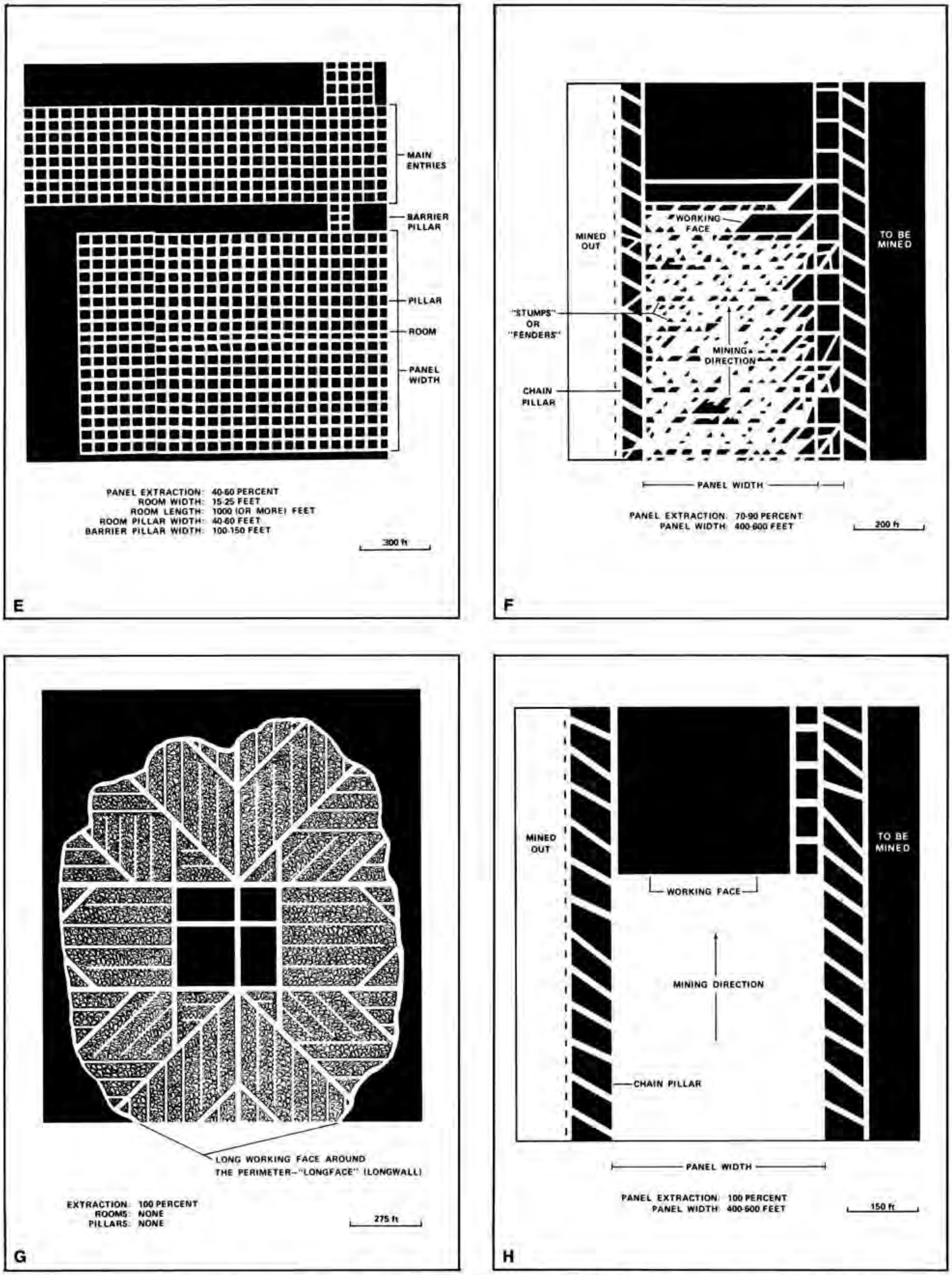


Figure 1 *(cont.)* Mining methods: (E) checkerboard room and pillar (CRP), (F) high extraction retreat (HER), (G) early (pre-1960) longwall, (H) post-1959 longwall

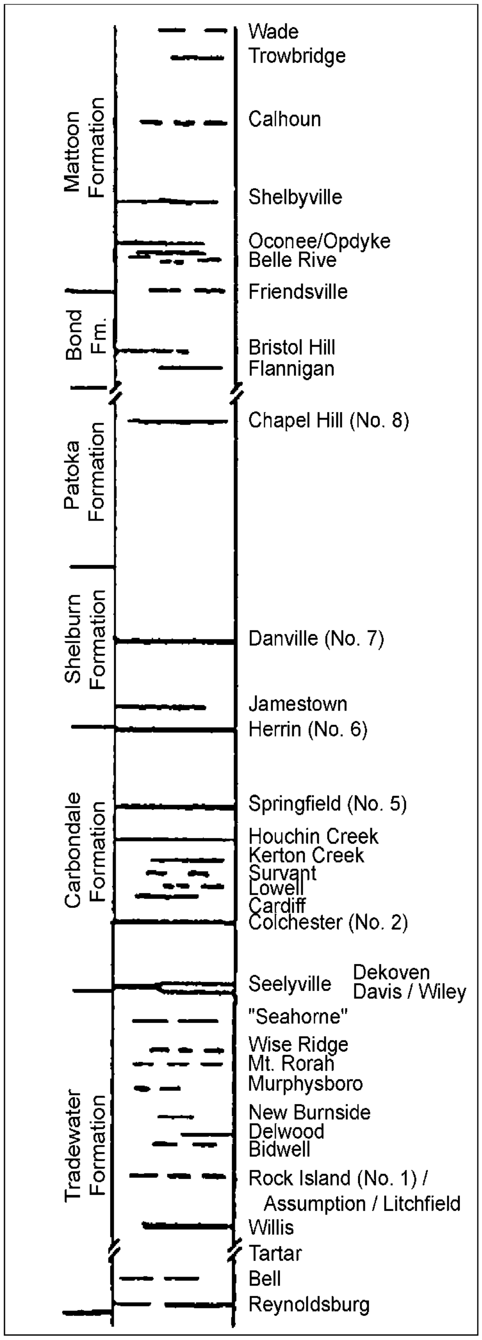


Figure 2 Generalized stratigraphic section, showing approximate vertical relations of coals in Illinois.

INTERPRETING A MINE SUMMARY SHEET

The mine summary sheet is arranged numerically by mine index number. Index numbers are shown on the map and in the mine listing. The mine summary sheet provides the following information (if available).

Company and mine name The last company or owner of the mine is used, unless no production was recorded for the last owner. In that case, the penultimate owner is listed. Mines often have no specific name; in these cases, the company name is also used as the mine name.

Type *Underground* denotes a subsurface mine in which the coal was reached through a shaft, slope, or a drift entry. *Surface* denotes a surface, open pit or strip mine.

Total mined-out acreage shown The total acreage of the mined area mapped, including any acreage mined on adjacent quadrangles, is calculated from the digitized outline of the mine. The acreage of large barrier pillars depicted on the map is excluded from the mined-out acreage. Small pillars not digitized are included in the acreage calculation. If the mine outline is not based on a final mine map, the acreage is followed by an estimate of additional acres that may have been mined. The estimate is determined from reported mine production, approximate thickness of the coal, and recovery rates calculated from nearby mines that used similar mining methods.

SHAFT, SLOPE, DRIFT OR TIPPLE LOCATIONS

Shaft, slope, drift, or tipple locations Locations of all known former entry points to underground mines or the location of coal cleaning, tipple, and shipping equipment used by the mine's facility are listed. The location is described in terms of county, township and range (Twp-Rge), section, and location within the section by quarters. NE SW NW, for instance, would describe the location in the northeast quarter of the southwest quarter of the northwest quarter. When sections are irregular in size, the quarters remain the same size and are oriented (or "registered") from the southeast corner of the section. Approximate footage from the section lines (FEL = from east line, FNL = from north line, for example) is given when that information is known; this indicates a surveyed location and is not derived from maps. Entry points are also plotted on the map and coded for the type of entry or tipple. A mine opening may have had many purposes during the life of the mine. Old hoist shafts are often later used for air and escape shafts; this information is included in the directory when known. The tipple for underground mines was generally located near the main shaft or slope. At surface mines, coal was sometimes hauled to a central tipple several miles from the mine pit.

GEOLOGY

Seam(s) mined The name of the coal seam(s) mined is listed, if known. If multiple seams were mined, they are all listed, although the mined-out area for each seam may be shown on separate maps. Figure 2 shows the stratigraphic section of the coal-bearing interval in Illinois, and the vertical relations among the coals.

Depth The depth to the top of the seam in the vicinity of the shaft is listed, if known. The depth is determined from notes made by geologists who visited the mine during its operation or from drill hole data in ISGS files. Depth generally varies little over the extent of a mine; however, reported depths for an individual mine may vary. Depth for surface-mined coals varies, and is usually represented as a range.

Thickness The approximate thickness of the mined seam is shown, if known. Thickness also comes from notes of geologists who visited the mine during its operation or from borehole data in ISGS files. Minimum, maximum, and average thicknesses are given when this information is available.

Mining method The principal mining method used at the mine (figs. 1A-H) is listed. See the mining methods section at the beginning of this directory for a discussion of this parameter.

Geologic problems reported Any known geologic problems, such as faults, water seepage, floor heaving, and unstable roof, encountered in the mine are reported. This information is from notes made by ISGS geologists who visited the mine, or from reports by mine inspectors published by the Illinois Department of Mines and Minerals, or from the source map(s). Geologic problems are not reported for active mines.

PRODUCTION HISTORY

Production history Tons of coal produced from the mine by each mine owner are totaled. When the source map used for the mine outline is not a final mine map, the tonnage produced since the date of the map is identified. For mines that extend into adjacent quadrangles, the tonnage reported includes areas mined in adjacent quadrangles.

SOURCE OF DATA

Source map This section lists information about the map(s) used to compile the mine outline and the locations of tipples and mine openings. In some cases more than one source map was used. For example, a map drawn before the mine closed may provide better information on original areas of the mine than a later map. When more than one map was used, the bibliography section explains what information was taken from each source.

Date The date of the most recent mine survey listed on the source map is reported.

Original scale The original scale of the source map is listed. Many maps are photo-reductions and are no longer at their original scale. The original scale gives some indication of the level of detail of the mine outline and the accuracy of the mine boundary relative to surface features. Generally, the larger the scale, the greater the accuracy and detail of the mine map. Mine outlines taken from source maps at scales smaller than 1:24,000 may be highly generalized and may well be inaccurately located with respect to surface features.

Digitized scale The scale of the digitized map is reported. The scale may be different from that of the original source map. In many cases the digitized map was made from a photo-reduction of the original source map, or the source map was not in a condition suitable for digitizing and the mine boundaries were transferred to another base map.

Map type Source maps are classified into five categories to indicate the probable completeness of the map. See discussion of source maps in the previous section.

Annotated bibliography Sources that provide information about the mine are listed, with the data taken from each source. Some commonly used sources are described below. Full bibliographic references are given for all other sources. Unless otherwise noted, all sources are available for public inspection at the ISGS.

Coal Reports Published since 1881, these reports contain tabular data on mine ownership, production, employment, and accidents. Some volumes include short descriptions made by mine inspectors of physical features and conditions in selected mines.

Directory of Illinois Coal Mines This source is a compilation of basic data about Illinois coal mines, originally gathered by ISGS staff in the early 1950s. Sources used for this directory are undocumented, but they are primarily Illinois Department of Mines and Minerals annual reports, ISGS mine notes, and coal company officials.

ENR Document 85/01, Guither, H. D., J. K. Hines, and R. A. Bauer, 1985 The Economic Effect of Underground Mining Upon Land Used for Illinois Agriculture: Illinois Department of Energy and Natural Resources Document 85/01, 185 p.

Microfilm map The U.S. Bureau of Mines maintains a microfilm archive of mine maps. A microfilm file for Illinois is available for public viewing at the ISGS.

Mine notes ISGS geologists have visited mines or contacted mine officials throughout the state since the early 1900s. Notes made during these visits range from brief descriptions of the mine location to long narratives (including sketches) of mining conditions and geology.

Federal Land Bank of St. Louis, Preliminary Reports on Subsidence Investigations Mining engineers working for the Federal Land Bank of St. Louis mapped areas of subsidence due to coal mining in the early 1930s. These reports often include county maps of mine properties with mined-out areas including shaft locations, as well as subsidence areas.

REFERENCES

Bauer, R. A., B. A. Trent, and P. B. Dumontelle, 1993, Mine Subsidence in Illinois: Facts for the Homeowner Considering Insurance, Illinois State Geological Survey, Environmental Geology Note 144, 16p.

Guither, H. D., J. K. Hines, and R. A. Bauer, 1985, The Economic Effects of Underground Mining Upon Land Used for Illinois Agriculture, Illinois Department of Energy and Natural Resources Document 85/01, 185p.

Worthen, A. H, H. M. Bannister, F. H. Bradley, & H. A. Green, 1870, Geology and Paleontology of Illinois, Volume IV, State Journal Steam Press, Springfield, Illinois, 508p.

PART II DIRECTORY OF MINES IN THE MATHERVILLE QUADRANGLE

MINE SUMMARY SHEETS

A summary sheet on the geology and production history of each mine in the Matherville Quadrangle is provided. These summary sheets are arranged numerically by mine index number. Consult Part I for a complete explanation of the data listed in the summary sheet.

Mine Index 17
Coal Valley Mining Company, Coal Valley No. 2 Mine

Type: Underground Total mined-out acreage shown: 282; production indicates approximately 910 acres were mined. A general area of mining has been added to the accompanying map to indicate the approximate size of the mine.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	16N 1W	33	SW SW SW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Thickness (ft) Max	Thickness (ft) Avg	Mining Method
Rock Island	206	2.5	5.0	3.67	MRP

Geologic Problems Reported: An erosion channel approximately 75 feet wide ran E-W, crossing an entry about 2000 feet from the shaft. Some small faults with 3 to 4 feet of displacement were present, as well as slips and rolls. The roof was 0 to 10 feet of black shale overlain by bluish gray limestone. The coal sometimes had a 1.83 foot thick dirty layer just beneath the roof, underlain by a 0.25-inch layer with streaks of coal and pyrite, but usually the upper 10 inches was harder and brighter than the lower 38 inches. Roof falls caused 8 fatalities between 1899 and 1909. The seam locally had considerable dip while the general dip was 12 feet in 3 miles to the south. In 1909, Udden reported many pillars were pulled. Where bony coal was present, such as 500 to 600 feet from the shaft, heaving took place that no amount of timbering could halt. In some cases, heaving filled the entry. In some places, the floor was sandstone.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Coal Valley Mining Company	Coal Valley No. 2	1895-1918	3,011,897
			3,011,897

Last reported production: May 1918

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352451	5-4-1914	Unknown	1:24000	Not final *
Matherville Quadrangle	1953	1:24000	1:24000	Secondary source
Coal Section files (Milan Quadrangle)	1910	1:62500	1:62500	Secondary source

* Incomplete on the eastern side.

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, shaft location, seam, depth, thickness, geologic problems.
Microfilm map, document 352451, reel 03139, frame 127 - Mine outline (western), mining method.
Matherville Quadrangle, 7.5 USGS topographic map - Shaft location.
Coal Section files, undated work map on USGS topographic map, 15' Milan Quadrangle - Mine outline (northern).

Mine Index 18
Coal Valley Mining Company, Coal Valley No. 3 Mine

Type: Underground   Total mined-out acreage shown: 271 in two polygons (one north and one south of the Edwards River)

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	15N 2W	27	SE SE SE
Main slope	Mercer	15N 2W	34	SE NE SE
Air shaft	Mercer	15N 2W	34	NE SE SE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Thickness (ft) Max	Thickness (ft) Avg	Mining Method
Rock Island	61	3.67	5.0	4.0	MRP

Geologic Problems Reported: The mine was abandoned because of poor roof conditions. The roof was generally up to 8 feet of black shale under 1 to 3 feet of limestone. Clay veins, slips and rolls were noted in the seam. Swags were common in the coal.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Coal Valley Mining Company	Coal Valley No. 3	1909-1921	1,280,003
			1,280,003

Last reported production: August 1921

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352246	9-15-1921	1:1200	1:2069	Final
Coal Section files (Milan Quadrangle)	undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, shaft location, depth, thickness, geologic problems.
Microfilm map, document 352246, reel 03138, frames 310 & 311 - Shaft & slope locations, mine outline (southern), mining method.
Coal Section files, undated work map on USGS topographic map, 15-minute Milan Quadrangle - Mine outline (northern), shaft location.

Mine Index 19
Alden Coal Company, Alden No. 7 Mine

Type: Underground Total mined-out acreage shown: 320 Production indicates approximately 26 acres were mined after the map date.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	15N 2W	27	NE SW SE
Air shaft	Mercer	15N 2W	27	NW SE SE
Air shaft	Mercer	15N 2W	26	SW NE NW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	70-95			4.0-5.0	MRP

Geologic Problems Reported: In 1916, a great deal of water entered the mine from an abandoned adjacent mine, whose workings were not mapped (abandoned workings of "many, many years standing"). The influx of water idled Alden No. 7 Mine for 2 months. A lenticular black shale of variable thickness was present between the coal the limestone roof. A roof fall caused a fatality in 1915. The coal was irregular in thickness and had a high pyrite content as well as a considerable amount of calcite. There was more calcite in the bottom of the seam while the pyrite was throughout the bed. If the pyrite was gobbed so that air did not circulate freely over the pyrite masses, they began to burn. Horsebacks, faults, clay veins and rolls were present in the mine. One swag was noted where the coal thickness increased to 5 feet. Mine notes indicate pillars were pulled. The source map shows many areas of squeeze, especially in the eastern portion.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Alden Coal Company	Alden No. 7	1909-1925	1,564,229
Alden Coal Company	Alden No. 7	1925-1927	127,658 *
			1,691,887

* Production after map date

Last reported production: March 1927

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
State archive, IL_2355	6-1-1925	1:2400	1:2400	Not final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, seam, depth, thickness, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, shaft location, geologic problems.
State Archive, IL_2355, courtesy of Robert Gibson, IDNR - Shaft locations, mine outline, mining method, geologic problems.

Mine Index 2981
Coal Valley Mining Company, Coal Valley Slope Mine

Type: Underground Total mined-out acreage shown: None; included in the general area of mining for Coal Valley No. 2 Mine (mine index 17). Production indicates approximately 105 acres were mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main slope	Mercer	15N 1W	5	

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	40-100			3.5-4.0	RP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
P. L. Cable	Cable Slope	pre1878-1879	12,521
Coal Valley Mining Company	Coal Valley Slope	1879-1896	338,669
			351,190

Last reported production: 1896

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Mine notes	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, depth, thickness, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes - Slope location.

Mine Index 2982
Coal Valley Mining Company, Coal Valley No. 1 Mine

Type: Underground   Total mined-out acreage shown: 180 (including general area of mining)
Production indicates approximately 700 acres were mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	15N 1W	17	SW NE SE
Air shaft	Mercer	15N 1W	17	SW NE SE

Note: In 1884, the mine dimensions were 2,278 ft north of the shaft and 1,820 ft south of the shaft. It is likely there are more shafts than shown on the accompanying map.

GEOLOGY

		Thickness (ft)			Mining
Seam(s) Mined	Depth (ft)	Min	Max	Avg	Method
Rock Island	56			3.9-4.5	MRP

Geologic Problems Reported: The workings were connected underground to the Ellis Slope Mine (unlocated mine at the back of this report), which caused flooding in January 1907, when Camp Creek overflowed its banks. A roof fall during pillar removal resulted in a fatality.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Coal Valley Mining Company	Coal Valley No. 1	pre1881-1909 *	2,473,563
			2,473,563

* Production, ownership, and years of operation prior to 1881 are unknown. The 1882 Coal Report indicated 10 acres were mined.

Last reported production: 1909

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352250	6-1-1908	1:1200	1:1986	Not final
Coal Section files, Milan Quadrangle	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, thickness, geologic problems.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Shaft location, depth, thickness.
Microfilm map, document 352250, reel 03138, frame 316 - Shaft locations, mine outline, mining method.
Coal Section files, undated work map on USGS topographic map, 15-minute Milan Quadrangle - Mine outline.

Mine Index 2983
Alfred Lilliman, Lilliman Mine

Type: Underground Total mined-out acreage shown: 11

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	15N 1W	20	SE SW NE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	37-50			3.0-4.0	RPB

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Lilliman Brothers	Lilliman	1893-1901	12,560
Lilliman & Company	Lilliman	1901-1903	10,400
Alfred Lilliman	Lilliman	1903-1905	9,754
			32,714

Last reported production: 1905

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Coal Section files, Milan Quadrangle	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, depth, thickness.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Shaft location.
Coal Section files, undated work map on USGS topographic map, 15-minute Milan Quadrangle - Mine outline.

Mine Index 2984
Bryan B. Peterson, Peterson Mine

Type: Underground Total mined-out acreage shown: 12 Production indicates over 30 acres were mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	15N 1W	21	SW NW NE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Thickness (ft) Max	Thickness (ft) Avg	Mining Method
Rock Island	21-65			2.5-4.0	RPB

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Charles Peterson	Peterson	pre1878-1895 *	40,297
Bryan B. Peterson	Peterson	1895-1918	46,798
Axel Swanson & Nimrick	Swanson & Nimrick	1918-1920	5,606
Axel Swanson	Swanson	1920-1923	3,626 **
Peterson Coal Company	Peterson	1923-1924	360
Bryan B. Peterson	Peterson	1924-1925	2,059
			98,746

* Production, ownership, and years of operation before 1878 are unknown. The 1882 Coal Report indicated 4 acres were mined.
** The 1922 Coal Report did not list mines producing less than 10,000 tons.

Last reported production: 1925

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Coal Section files, Milan Quadrangle	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, depth, thickness.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine location, depth.
Coal Section files, undated work map on USGS topographic map, 15-minute Milan Quadrangle - Mine outline.

Mine Index 2985
A. J. Spahnir, Spahnir Mine

Type: Underground Total mined-out acreage shown: 10 as a general area of mining; production indicates less than 1 acre was mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Drift	Mercer	15N 1W	28	SW SW SW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Thickness (ft) Max	Thickness (ft) Avg	Mining Method
Rock Island	25				Underground

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
A. J. Spahnir	Spahnir	1936-1936	179
			179

Last reported production: 1936

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Coal Section files, Milan Quadrangle	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine location, seam, depth.
Coal Section files, undated work map on USGS topographic map, 15-minute Milan Quadrangle - Mine outline.
ISGS mined-out area map, Area 4, 1950 - Mine type, mine identification.

Mine Index 2987
Louis Schraechter, Schraechter Mine

Type: Underground Total mined-out acreage shown: 11; production indicates less than 2 acres were mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Drift	Mercer	15N 2W	4	NW SE NE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island					Underground

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Schaechter Brothers	Schaechter	1922-1925	1,600
Louis Schraechter	Schraechter	1926-1929	3,375
			4,975

Last reported production: 1929

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Coal Section files, Milan Quadrangle	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine location.
Coal Section files, undated work map on USGS topographic map, 15-minute Milan Quadrangle - Mine outline.
Mined-out area map, O'Neill plan map No. 4, 1950 - Mine type, mine identification.

Mine Index 2988
John Boden, Boden Mine

Type: Underground   Total mined-out acreage shown: 11, as a general area of mining. Production indicates the Boden Mine worked less than 1 acre. However, the 1910 (15-minute) quadrangle map depicts a shaft within the general area of mining, and other mines may have operated within the general area of mining.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main drift	Mercer	15N 2W	26	SE SE SW
Old shaft	Mercer	15N 2W	26	SW SE SW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	35			3.6-4.0	Underground

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
John Boden *	Boden	1933-1934	2,535
			2,535

* ISGS field notes written by J. A. Udden indicate that the Dog Town Mine operated by Docherty Brothers (mine index 2995) on 7-24-1911 worked at the shaft location shown for Boden Mine (SW SE SW 26-T15N-R2W). It is likely that the 35-T15N-R2W location was not the site for all of the production from 1878 to 1920.

Last reported production: 1934

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Coal Section files, Milan Quadrangle	Undated	1:62500	1:62500	Secondary source
ISGS field notes (J. A. Udden)	7-24-1911	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, drift location, seam, depth, thickness.
ISGS field notes (Mercer County) - Shaft location, thickness.
Coal Section files, undated work map on USGS topographic map, 15-minute Milan Quadrangle - Mine outline, drift location, shaft location (printed on 1910 topographic map).
Mined-out area map, O'Neill plan map No. 4, 1950 - Mine type, mine identification.

Mine Index 2989
Blue Flame Coal Company, Dog Town Mine

Type: Underground Total mined-out acreage shown: None; production indicates less than 1 acre was mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main slope	Mercer	15N 2W	26	NW NE NE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	50-100			3.0	Underground

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
James Docherty *	Dog Town	1938-1939	630
Blue Flame Coal Company	Dog Town	1939-1940	253
			883

* The mine notes indicate the mine owned by Docherty was opened by Harris & Brown in 1937. The Coal Reports did not list production under that name.

Last reported production: 1940

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Mine notes	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, slope location, seam, depth, thickness, mine name.

Mine Index 2990
McCraney Sand & Gravel, McCraney Mine

Type: Underground   Total mined-out acreage shown: 25   Production indicates approximately 5 acres were mined after the map date.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	15N 2W	33	NW SE NE
Air / escape slope	Mercer	15N 2W	33	SE SE NE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	40			3.0-4.0	MRP

Geologic Problems Reported: The source map showed areas of thin coal in limited areas on the southern and northern sides of the mine.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
William H. Riddell	Riddell	1906-1912	32,700
Axel E. Link	Link	1912-1915	15,884
Lee & Hagman	Lee & Hagman	1915-1916	375
McCrame & Lee	McCrame & Lee	1916-1917	3,700
McCraney Sand & Gravel	McCraney	1917-1918	30,147
McCraney Sand & Gravel	McCraney	1918-1919	17,871 *
			100,677

* Production after map date

Last reported production: 1919

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352248	9-12-1918	1:1200	1:1655	Not final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, thickness, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine location, seam, depth.
Microfilm map, document 352248, reel 03138, frame 314 - Shaft & slope locations, mine outline, mining method, geologic problems.

Mine Index 2991
Fulton County Coal Company, Fulton No. 2 Mine

Type: Underground Total mined-out acreage shown: None; production indicates approximately 7 acres were mined

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft or slope	Mercer	15N 2W	33	SW NW NE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Thickness (ft) Max	Thickness (ft) Avg	Mining Method
Rock Island	shaft, 50; slope, 10			3.5-3.67	RP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Fulton County Coal Company	Fulton No. 2	1913-1914	22,760
			22,760

Last reported production: 1914

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Coal Section files, Milan Quadrangle	Undated	1:62500	1:62500	Secondary source
ISGS field notes (D. M. Moody)	summer 1958	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, depth, thickness, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
ISGS field notes (Mercer County) - Mine location.
Coal Section files, undated work map on USGS topographic map, 15-minute Milan Quadrangle - Mine location.

Mine Index 2993
Never Seen Coal Company, Never Seen Mine

Type: Underground Total mined-out acreage shown: 21 Production indicates less than 1 acre was mined after the map date.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main slope	Mercer	15N 2W	34	SE SE NW
Air shaft	Mercer	15N 2W	34	SE SE NW

GEOLOGY

		Thickness (ft)			Mining
Seam(s) Mined	Depth (ft)	Min	Max	Avg	Method
Rock Island	30				MRP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
James O'Rourke & Mike Bugas	O'Rourke & Bugas	1929-1932	7,237
Never Seen Coal Company	Never Seen	1933-1937	22,720
O'Rourke & Bugas	O'Rourke & Bugas	1938-1938	3,174
Never Seen Coal Company	Never Seen	1939-1943	32,418
Never Seen Coal Company	Never Seen	1943-1943	273 *
			65,822

* Production after map date

Last reported production: July 5, 1943

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352245	6-20-1943	1:600	1:993	Not final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, slope location, seam, depth.
Microfilm map, document 352245, reel 03138, frame 309 - Slope & shaft locations, mine outline, mining method.

Mine Index 2996
Huffman & Johnson, Huffman & Johnson Mine

Type: Underground Total mined-out acreage shown: None; production indicates approximately 10 acres were mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main slope	Mercer	15N 2W	35	NE SW NW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Thickness (ft) Max	Thickness (ft) Avg	Mining Method
Rock Island	40				Underground

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Huffman & Johnson	Huffman & Johnson	1926-1927	5,100
Crescent Coal Company	Crescent	1927-1928	5,421
Hoffman & Johnson	Hoffman & Johnson	1929-1929	3,241
Huffman & Johnson	Huffman & Johnson	1930-1934	21,280
			35,042

Last reported production: 1934

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Mine notes	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Slope location, seam, depth.

Mine Index 7806
M. A. Beers, Beers Mine

Type: Underground   Total mined-out acreage shown: None; production indicates approximately 16 acres were mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main slope	Mercer	15N 1W	20	NW SE NE

GEOLOGY

		Thickness (ft)			Mining
Seam(s) Mined	Depth (ft)	Min	Max	Avg	Method
Rock Island	7-20		3.5	2.0	RP

Geologic Problems Reported: The roof was a good limestone cap rock with no clod, but the top coal stuck to the roof and was difficult to get down. A few rolls were present in the coal.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Milton A. Beers	Beers	1898-1910	8,810
Andrew W. Wahlberg	Wahlberg	1910-1913	1,440
M. A. Beers	Beers	1913-1925 *	18,137
			28,387

* Idle 1916-1920, 1922, 1923

Last reported production: 1925

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
ISGS field notes (H. E. Culver)	9-15-1923	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, depth, thickness, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
ISGS field notes (Mercer County) - Slope location, thickness, geologic problems.

Mine Index 7807
Levi Nimrick, Nimrick Mine

Type: Underground   Total mined-out acreage shown: None; production indicates approximately 2 acres were mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	15N 1W	20	CENTER NE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	35			3.0	Underground

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Nimrick Brothers	Nimrick	1922-1923	2,227
Levi Nimrick	Nimrick	1923-1924	1,035
Nimrick Brothers	Nimrick	1924-1925	703
Levi Nimrick	Nimrick	1925-1925	223
			4,188

Last reported production: 1925

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
ISGS field notes (H. E. Culver)	9-15-1923	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
ISGS field notes (Mercer County) - Shaft location, depth, thickness.

Mine Index 7809
Robert Salkeld, Salkeld Mine

Type: Underground   Total mined-out acreage shown: None; production indicates less than 1 acre was mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main slope	Mercer	15N 1W	32	NE NW NE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	10			3.5-4.0	RP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Robert Salkeld	Salkeld	1906-1907	600
			600

Last reported production: 1907

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Coal Section files, Milan Quadrangle	9-15-1923	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, depth, thickness, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Coal Section files, undated work map on USGS topographic map, 15-minute Milan Quadrangle - Slope location, thickness.

OTHER MINES SHOWN ON MATHERVILLE QUADRANGLE

Mine Index 5280 NE NW SW, NW NW SW, SE SW NW & SE SW NW 26-T15N-R2W, four shafts (northernmost is a water shaft), Rock Island Coal source: State Archive, IL_2355, map of Alden No. 7 Mine (mine index 19, 6-1-1925)
Mine Index 6109 SW SW SE 16-T15N-R1W source: Coal Section files, Milan (15-minute) Quadrangle work map
Mine Index 6110 SE SE SW 16-T15N-R1W, drift or slope source: Coal Section files, Milan (15-minute) Quadrangle work map
Mine Index 6111 SW 16-T15N-R1W, 4 drifts or slopes source: Coal Section files, Milan (15-minute) Quadrangle work map
Mine Index 6113 SW NW SE 16-T15N-R1W source: Coal Section files, Milan (15-minute) Quadrangle work map
Mine Index 6114 SW NE SW 16-T15N-R1W source: Coal Section files, Milan (15-minute) Quadrangle work map
Mine Index 6115 SW NW SW 21-T15N-R1W source: Coal Section files, Milan (15-minute) Quadrangle work map
Mine Index 6116 SW NW NW 21-T15N-R1W source: Coal Section files, Milan (15-minute) Quadrangle work map
Mine Index 6117 NW NW NW 21-T15N-R1W source: Coal Section files, Milan (15-minute) Quadrangle work map

MINES WHOSE LOCATIONS ARE NOT KNOWN, MATHERVILLE QUADRANGLE

The locations of the following mines are unknown, but the production tonnage, operating names, and nearest town were reported in the Annual Coal Reports. The operators listed below mined in or near the Matherville Quadrangle. The information shown is similar to that presented on the summary sheets in the previous pages of this directory. The first item is the name the mine operated under as listed in the Coal Report, then the years the mine reported. If no physical data are available, the next item listed is the total tons produced by the mine. If physical data are available, the order of presentation is as follows: type of opening for the mine (drift, slope or shaft), depth of coal in feet, and thickness of coal in feet.

The total tons mined by these unlocated mines is 305,933 (301,523 underground and 4,410 mined by uncertain method), which would represent approximately 80 to 200 acres, depending on the recovery factor, mining method, and numerous other factors. (Note: 1 square mile = 640 acres)

CABLE

Ellis (Richard B.), pre1878-1886, slope, Rock Island, 20-95, 2.5-4.0, RP	45,372 tons
Co-operative Tile Works, 1886-1890	16,079 tons
Swanson (Axel), 1890-1897	14,020 tons
	75,471 tons
Ellis (Thomas B.), 1890-1893, slope, Rock Island, 15, 3.5-4.0, RP	660 tons
Hill Brothers & Waters Coal Company, 1893-1895	33,000 tons
Camp Creek Coal Company, 1895-1898, shaft, Rock Island, 62-70, 3.5-4.25	45,047 tons
	78,047 tons
Posten (Mack), 1909-1911, slope, Rock Island, 12, 3.5, RP	2,090 tons

GRIFFIN

Griffin Brothers, pre1878-1895, shaft, Rock Island, 22-35, 2.5, RP	12,060 tons
Griffin (Frank A.) & Company, 1895-1897	4,600 tons
Griffin Clay Manufacturing Company, 1897-1900	7,595 tons
U. S. Clay Manufacturing Company, 1900-1903	7,640 tons
	31,895 tons

MATHERVILLE

Taylor (John A.), 1919-1920	1,100 tons
Taylor & Bradford, 1920-1921	2,150 tons
	3,250 tons

Thomas (Oscar), 1916-1919, slope, Rock Island, 100, –, RP — 2,195 tons

Davis & Hagman, 1924-1925 — 200 tons

Davis (Grover), 1926-1928, underground — 1,836 tons

Matazel Brothers, 1928-1928, underground	18 tons
Matazel (Martin & Samuel), 1929-1929	131 tons
	149 tons

Hartman (S. C.), 1933-1934, underground — 10,115 tons

McCloskey (W. E.), 1933-1935, underground — 4,097 tons

Cable Coal Company, 1939-1940, underground — 298 tons

Cable Coal Company, 1941-1942, underground — 293 tons

PREEMPTION

Boden (E.) & Penman (William), 1878-1879, shaft, Rock Island, 38, 4.5, RP — 811 tons

Ashby (Thomas), pre1878-1879, shaft, Rock Island, 33, 4.0 — 509 tons

Jones (Owen), 1882-1883, shaft, Rock Island, 61, 4.0 — 135 tons

Boden (Edward), No. 1 Mine, 1882-1895, slope, Rock Island, 20-35, 4.0-4.5 — 27,140 tons

Gettice & Taylor, 1883-1884, shaft, Rock Island, 61, 4.0, RP — 600 tons

Clark (Edward), 1886-1887, shaft, Rock Island, 61, 4.0, RP — 380 tons

Boden (Edward), No. 2 Mine, 1895-1902, shaft, Rock Island, 58-60, 4.0-4.5 — 17,722 tons

Penman, Boden & Company, No. 2 Mine, 1895-1896	1,500 tons
Penman (William), 1896-1905, shaft, Rock Island, 48, 4.0-4.5, RP	19,220 tons
	20,720 tons

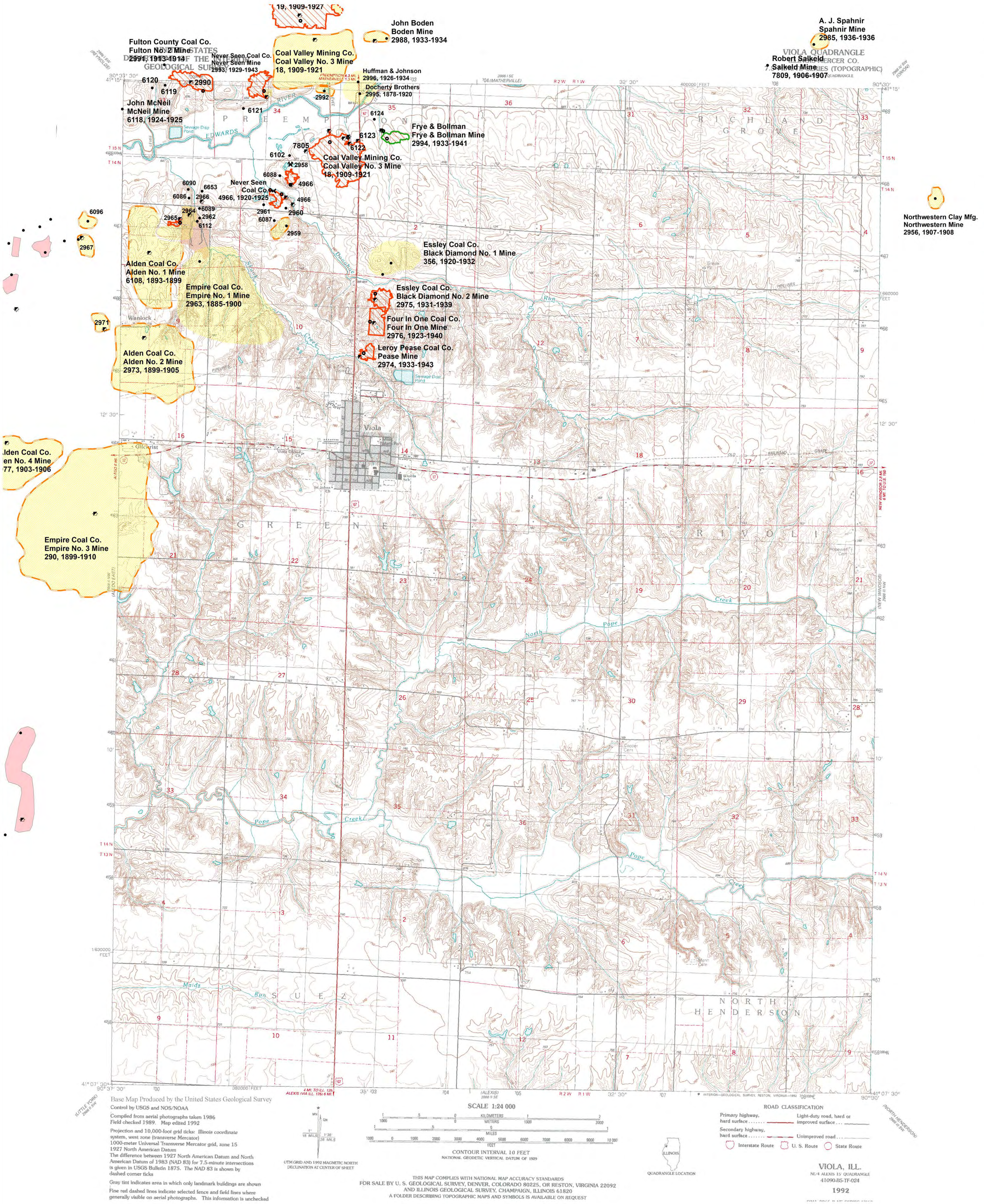
Williams (Joseph), 1899-1903, shaft, Rock Island, 35-42, 4.0-4.5, RP	5,280 tons
Williams (Alfred), 1903-1906	4,188 tons
	9,468 tons

Liefendorfer (C. W.), 1904-1906, shaft, Rock Island, 30-40, 4.0, RP	5,200 tons
Liefendorfer & Kasenburg, 1906-1907	3,935 tons
Huffman & Hayburn, 1907-1909	8,050 tons
	17,185 tons

SHERRARD

Bell & Lillinean, 1925-1926	460 tons
Bell (Henry M.), 1927-1927	500 tons
	960 tons

INDEX OF MINES IN THE MATHERVILLE QUADRANGLE



Coal Mines in Illinois
Viola Quadrangle

Mercer County, Illinois

Rock Island Coal

This map accompanies the Coal Mines Directory for the Viola Quadrangle. Consult the directory for a complete explanation of the information shown on this map.

Mining Method

- Room & Pillar (RP)
- Room & Pillar Basic (RPB)
- Modified Room & Pillar (MRP)
- Room & Pillar Panel (RPP)
- Blind Room & Pillar (BRP)
- Checkerboard Room & Pillar (CRP)
- High Extraction Retreat (HER)
- Longwall (LW)
- Underground, Method Unknown
- Strip Mine
- Auger Mine
- General Area of Mining

Other Areas Depicted

- Non-Coal Mines

Source of Mine Outline

- Final Mine Map
- Not Final Mine Map
- Undated Mine Map
- Incomplete Mine Map
- Secondary Source Map

Tipple, Shaft, Slope, Drift Locations

- Strip Mine Tipple - Active
- Strip Mine Tipple - Abandoned
- Mine Shaft - Active
- Mine Shaft - Abandoned
- Mine Slope - Active
- Mine Slope - Abandoned
- Mine Drift - Active
- Mine Drift - Abandoned
- Air Shaft
- Uncertain Location
- Uncertain Type of Opening

Other Points Depicted

- Non-Coal Mines

Location

Mine Annotation
(space permiting)
Company
Mine Name
ISGS Index No., Years of Operation

Disclaimer
Please check the Coal Section at the Illinois State Geological Survey's web site at http://www.isgs.illinois.edu for the most up-to-date version of these products.

Note that each quadrangle scale mined-out area map requires the use of the associated text directory for full explanation of map features and mine attributes. Also note that some quadrangles have multiple seams of mining and therefore more than one map may be available for a particular quadrangle. Please take care to check for multiple maps, as extensive mining may exist in the other seams.

The maps and digital files used for these studies were compiled from data obtained from a variety of public and private sources and have varying degrees of completeness and accuracy. This compilation map presents reasonable interpretation of the geology of the area and is based on available data. Locations of some mine features may be offset by 500 feet or more due to errors in the original source maps, the compilation process, digitizing, or a combination of these factors. These data are not intended for use in site-specific screening or decision-making. Use of these documents does not eliminate the need for detailed studies to fully understand the geology of a specific site. The Illinois State Geological Survey, Prairie Research Institute, or the University of Illinois make no guarantee, expressed or implied, regarding the correctness of the interpretations presented in this data set and accept no liability for the consequences of decisions made by others on the basis of the information presented here.

These maps were designed for use at 1:24,000. Enlarging the map may reduce accuracy, as the original scale of the source maps used to compile the outlines shown varies from 1:400 to 1:150,000, and some mine locations are known only from text descriptions. See the accompanying mine directory for the original scale of the source map used for a specific mine to check accuracy of a given portion of the map. Areas with no mines shown may still be undermined; see the unlocated mines list at the back of each mine directory.

The image of the U.S.G.S. topographic base map was projected from the original UTM to Lambert Conformal Conic.

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Mine Outlines Compiled by
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June 2018

DIRECTORY OF COAL MINES IN ILLINOIS
7.5-MINUTE QUADRANGLE SERIES
VIOLA QUADRANGLE
MERCER COUNTY

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2018

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Cover photo Track-mounted duckbill loading machine at a Peabody Coal Company mine, ca. 1915.

DISCLAIMER: The accuracy and completeness of mine maps and directories vary with the availability of reliable information. Maps and other information used to compile this mine map and directory were obtained from a variety of sources and the accuracy of some of the original information cannot be verified. Consequently, the Illinois State Geological Survey (ISGS) cannot guarantee the mine maps are free of errors and disclaims any responsibility for damages that may result from actions or decisions based on them.

The ISGS updates the maps and directories periodically, and welcomes any new information or corrections. Please contact the Coal Section of the ISGS at the address shown on the title page of this directory, or telephone (217) 244-4610.

CONTENTS

INTRODUCTION

Coal has been mined in 76 counties of Illinois. More than 7,400 coal mines have operated since commercial mining began in Illinois about 1810; fewer than 30 are currently active. To detail the extent and location of coal mining in Illinois, the Illinois State Geological Survey (ISGS) has compiled maps and directories of known coal mines. The ISGS offers maps at a scale of 1:100,000 and accompanying directories for each county in which coal mining is known to have occurred. Maps at a scale of 1:24,000 and accompanying directories, such as this, are available for selected quadrangles. Contact the ISGS for a list of these quadrangles.

These larger scale maps show the approximate positions of mines in relation to surface features such as roads and water bodies, and indicate the mining method used and the accuracy of the mine boundaries. The maps are useful for locating mine boundaries relative to specific properties and for assessing the potential for subsidence in an area. Mine boundaries compiled from final mine surveys are generally shown within 200 feet of their true position. As a result of poor cartographic quality and inaccuracies in the original mine surveys, boundaries of some older mines may be mislocated on the map by 500 feet or more. Original mine maps should be consulted in situations that require precise delineation of mine boundaries or internal workings of mined areas.

This directory serves as a key to the accompanying mine map and provides basic information on the coal mines in the quadrangle. The directory is composed of two parts. Part I explains the symbols and patterns used on the accompanying map and the summary data presented for each mine. Part II numerically lists the mines in the quadrangle and summarizes the geology and production history of each mine. Total production for the mine, not the portion in the quadrangle, is given.

MINING IN THE VIOLA QUADRANGLE

Mining in the Viola Quadrangle was generally in the Rock Island Coal, a lenticular coal that ranged from less than 1 ft thick up to 4 to 5 ft thick within a short distance. The coal was generally present as an upper bench of hard, bright coal 1 to 1.7 ft thick with a lower thicker bench duller coal, separated by a carbonaceous shale 10 to 18 inches thick.

The largest mines were along the western quadrangle boundary and all closed in 1910 or before. There are no known maps of these four mines: Alden No. 1 Mine (mine index 6108), Alden No. 2 Mine (mine index 2973), Empire No. 1 Mine (mine index 2963), and Empire No. 3 Mine (mine index 290). Their outlines are from a secondary source drawn in the 1930s or estimated by production and shaded as a general area of mining.

PART I EXPLANATION OF MAP AND MINE SUMMARY SHEET

INTERPRETING THE MAP

The map accompanying this directory shows the location of coal mines known to be present in the quadrangle. The map, corresponding to a U.S. Geological Survey (USGS) 7.5-minute quadrangle, covers an area bounded by lines of latitude and longitude 7.5-minutes apart. In Illinois, a quadrangle is approximately 6.5 miles east to west and 8.5 miles north to south, an area of about 56 square miles. The ISGS generally offers one map of mines per quadrangle. In some areas where extensive mining occurred in two or more overlapping seams, separate maps are compiled for mines in each seam to maintain readability of the map.

Mine Type and Mining Method

The mine type is indicated on the map by pattern color: green represents surface mines; red and yellow represent underground mines. The red patterns are used for areas of underground mining that are documented by a primary or secondary source map. A yellow pattern is used for cases where no map of the mine workings is available, but a general area of mining can be inferred from property maps or production figures. The patterns indicate the main mining methods used in underground mines. The methods are (1) room and pillar and (2) high extraction. The method used gives some indication of the amount and pattern of coal extraction within each mined area, and has some influence on the timing and type of subsidence that can occur over a mine.

The following discussion and illustrations of mining methods are based on Guither et al. (1984).

In room-and-pillar mines, coal is removed from haulage-ways (entries) and selected areas called rooms. Pillars of unmined coal are left between the rooms to support the roof. Depending on the size of rooms and pillars, the amount of coal removed from the production areas will range from 40% to 70%.

Room and Pillar - mining is divided into six categories:

- room-and-pillar basic (RPB, fig. 1A), an early method that did not follow a preset mining plan and therefore resulted in very irregular designs;
- modified room and pillar (MRP, fig. 1B);
- room-and-pillar panel (RPP, fig. 1C);
- blind room and pillar (BRP, fig. 1D);
- checkerboard room and pillar (CRP, fig. 1E);
- room and pillar (RP), a classification used when the specific type of room-and-pillar mining is unknown.

Blind and checkerboard are the most common types of room-and-pillar mining used in Illinois today. The knowledge of room-and-pillar mining methods gives a trained engineer information on the nature of subsidence that may occur. A more extensive discussion of subsidence can be found in Bauer et al. (1993).

High-extraction   These mining methods are subdivided into high-extraction retreat (HER, Fig 1F) and longwall (LW, Fig 1G, 1H). In these methods, much of the coal is removed within well defined areas of the mine. Subsidence of the surface above these areas occurs within weeks. Once the subsidence activity ceases, the potential for further movement over these areas is low; however, subsidence may continue for several years after mining.

High-extraction retreat mining is a form of room-and-pillar mining that extracts most of the coal. Rooms and pillars are developed in the panels, and the pillars are then systematically removed (fig. 1F).

In early (pre-1960) longwall mines, mining advanced in multiple directions from a central shaft (fig. 1G). Large pillars of coal were left around the shaft, but all coal was removed beyond these pillars. Miners placed rock and wooden props and cribs in the mined-out areas to support the mine roof. The overlying rock gradually settled onto these supports, thus producing subsidence at the surface. In post-1959 longwall mines, room-and-pillar methods have been used to develop the main entries of the mine and panel areas. Modern longwall methods extract 100 percent of the coal in the panel areas (fig. 1H).

SOURCE MAPS

Mine outlines depicted on the map are, whenever possible, based on maps made from original mine surveys. The process of compiling and digitizing the quadrangle map may produce errors of less than 200 feet in the location of mine boundaries. Larger errors of 500 feet or more are possible for mines that have incomplete or inaccurate source maps.

Because of the extreme complexity of some mine maps, detailed features of mined areas have been omitted. The digitized mine boundary includes the exterior boundary of all rooms or entries that were at least 80 feet wide or protruded 500 feet from the main mining area. Unmined areas between mines are shown if they are at least 80 feet wide; unmined blocks of coal within mines are shown if they are at least 400 feet on each side. Original source maps should be consulted when precise information on mine boundaries or interior features is needed.

The mine summary sheet lists the source maps used to determine each mine outline. The completeness of map sources is indicated on the map by a line symbol at the mine boundary. Source maps are organized in five categories.

Final mine map The mine outline was digitized from an original map made from mine surveys conducted within a few months after production ceased. The date of the map and the last reported production are listed on the summary sheet.

Not a final map The mine is currently active or the mine outline was made from a map based on mine surveys conducted more than few months before production ceased. This implies the actual mined-out area is probably larger than the outline on the map. The mine summary sheet indicated the dates of source maps and the last reported production, as well as the approximate tonnage mined between these two dates (if the mine is abandoned). The summary sheet also lists the approximate acreage mined since the date of the map and, in some cases, indicates the area where additional mining may have taken place. This latter information is determined by locating on the map the active faces relative to probable boundaries of the mine property.

Undated map The source map was undated, so it may or may not be based on a final mine survey. When sufficient data are available, the probable acreage of the mined area is estimated from reported production, average seam thickness and a recovery rate comparable to other mines in the area. This information is listed in the summary sheet for the mine.

Incomplete map The source map did not show the entire mine. The summary sheet indicates the missing part of the mine map and the acreage of the unmapped area, which is estimated from the amount of coal known to have been produced from the mine.

Secondary source map The original mine map was not found so the outline shown was determined from secondary sources (e.g., outlines from small-scale regional maps published in other reports). The summary sheet describes the secondary sources.

POINTS AND LABELS

The locations of all known mine openings (shafts, slopes, and drifts) and surface mine tipples are plotted on the map. Tipples are areas where coal was cleaned, stockpiled, and loaded for shipping.

Only openings or tipples are plotted for mines without source maps. If the precise locations of these features are unknown, a special symbol is used to indicate the approximate location of the mine.

Each mine on the map is labeled with the names of the mine and operating company, ISGS mine index number, and years of operation (if known) if space permits. A seam designation is given on maps where more than one seam was mined. For a mine that operated under more than one name, only the most recent name is generally given. When a mine changed names or ownership shortly before closing, an earlier name is listed. All company and mine names are listed on the mine summary sheet in the directory, under the production history segment.

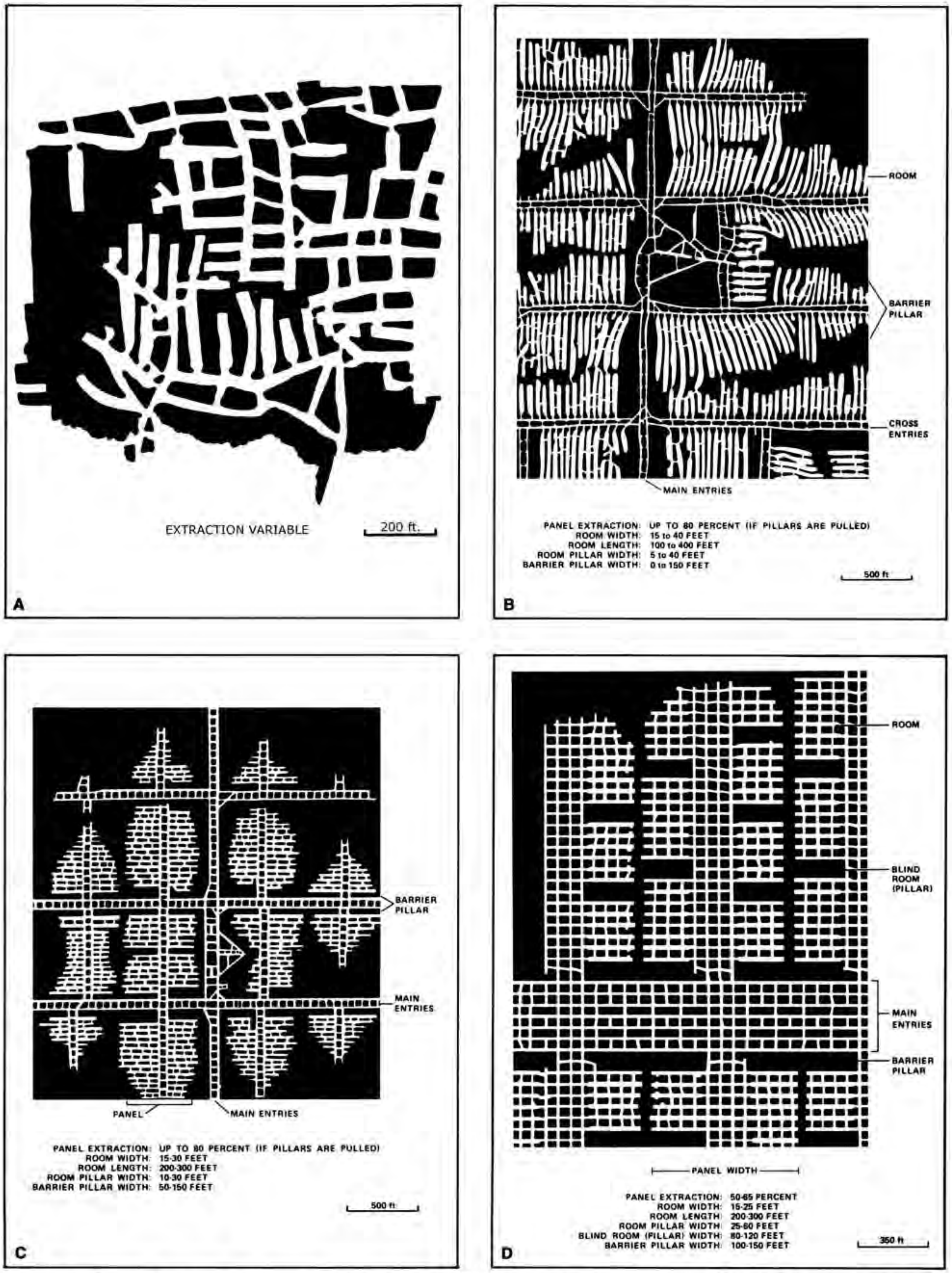

Figure 1 Mining methods: (A) room-and-pillar basic (RPB), (B) modified room and pillar (MRP), (C) room-and-pillar panel (RPP), (D) blind room and pillar (BRP).

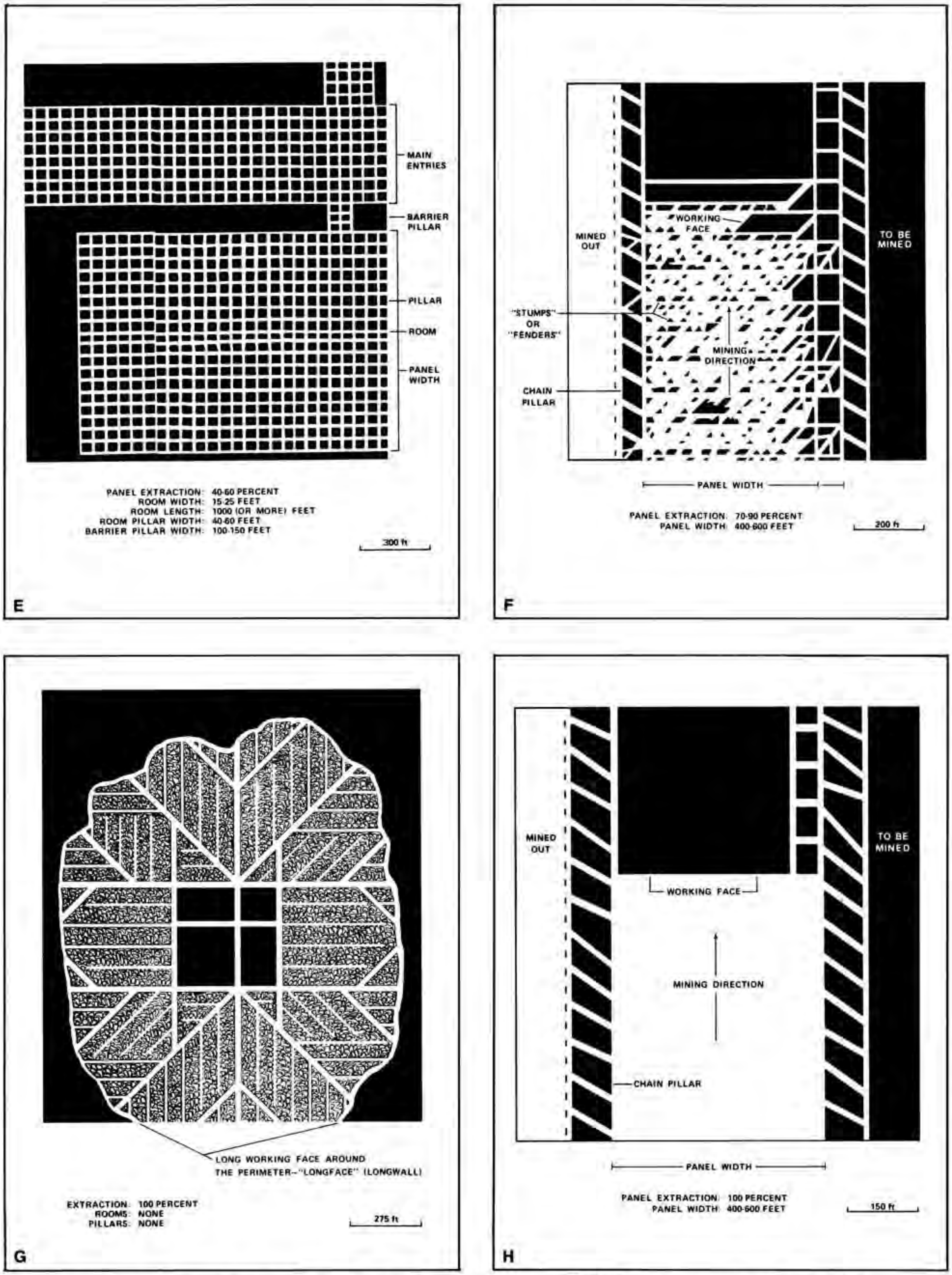

Figure 1 *(cont.)* Mining methods: (E) checkerboard room and pillar (CRP), (F) high extraction retreat (HER), (G) early (pre-1960) longwall, (H) post-1959 longwall

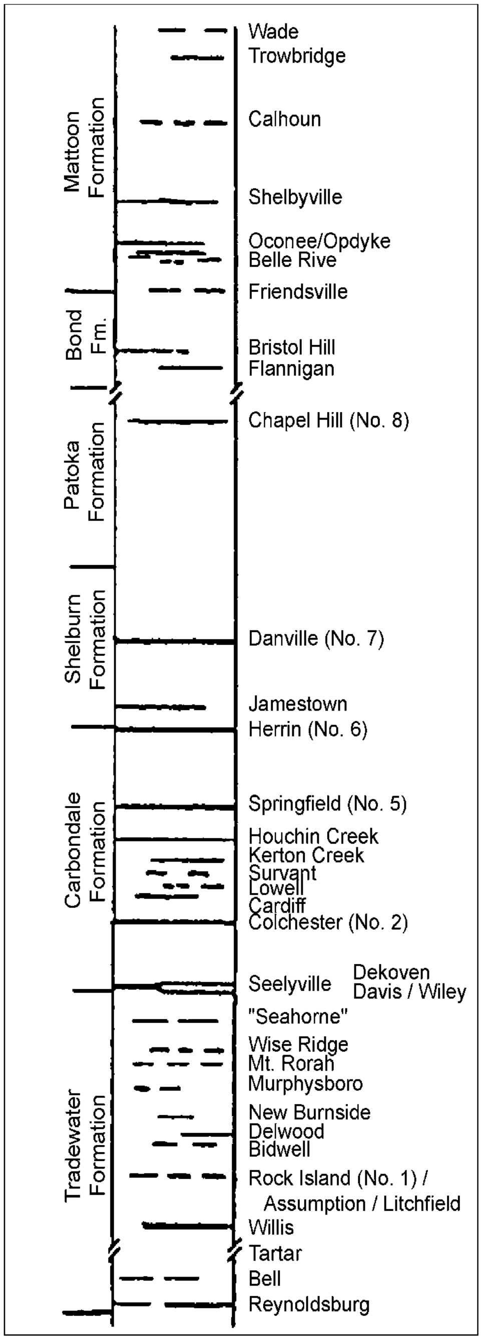

Figure 2 Generalized stratigraphic section, showing approximate vertical relations of coals in Illinois.

INTERPRETING A MINE SUMMARY SHEET

The mine summary sheet is arranged numerically by mine index number. Index numbers are shown on the map and in the mine listing. The mine summary sheet provides the following information (if available).

Company and mine name The last company or owner of the mine is used, unless no production was recorded for the last owner. In that case, the penultimate owner is listed. Mines often have no specific name; in these cases, the company name is also used as the mine name.

Type *Underground* denotes a subsurface mine in which the coal was reached through a shaft, slope, or a drift entry. *Surface* denotes a surface, open pit or strip mine.

Total mined-out acreage shown The total acreage of the mined area mapped, including any acreage mined on adjacent quadrangles, is calculated from the digitized outline of the mine. The acreage of large barrier pillars depicted on the map is excluded from the mined-out acreage. Small pillars not digitized are included in the acreage calculation. If the mine outline is not based on a final mine map, the acreage is followed by an estimate of additional acres that may have been mined. The estimate is determined from reported mine production, approximate thickness of the coal, and recovery rates calculated from nearby mines that used similar mining methods.

SHAFT, SLOPE, DRIFT OR TIPPLE LOCATIONS

Shaft, slope, drift, or tipple locations Locations of all known former entry points to underground mines or the location of coal cleaning, tipple, and shipping equipment used by the mine's facility are listed. The location is described in terms of county, township and range (Twp-Rge), section, and location within the section by quarters. NE SW NW, for instance, would describe the location in the northeast quarter of the southwest quarter of the northwest quarter. When sections are irregular in size, the quarters remain the same size and are oriented (or "registered") from the southeast corner of the section. Approximate footage from the section lines (FEL = from east line, FNL = from north line, for example) is given when that information is known; this indicates a surveyed location and is not derived from maps. Entry points are also plotted on the map and coded for the type of entry or tipple. A mine opening may have had many purposes during the life of the mine. Old hoist shafts are often later used for air and escape shafts; this information is included in the directory when known. The tipple for underground mines was generally located near the main shaft or slope. At surface mines, coal was sometimes hauled to a central tipple several miles from the mine pit.

GEOLOGY

Seam(s) mined The name of the coal seam(s) mined is listed, if known. If multiple seams were mined, they are all listed, although the mined-out area for each seam may be shown on separate maps. Figure 2 shows the stratigraphic section of the coal-bearing interval in Illinois, and the vertical relations among the coals.

Depth The depth to the top of the seam in the vicinity of the shaft is listed, if known. The depth is determined from notes made by geologists who visited the mine during its operation or from drill hole data in ISGS files. Depth generally varies little over the extent of a mine; however, reported depths for an individual mine may vary. Depth for surface-mined coals varies, and is usually represented as a range.

Thickness The approximate thickness of the mined seam is shown, if known. Thickness also comes from notes of geologists who visited the mine during its operation or from borehole data in ISGS files. Minimum, maximum, and average thicknesses are given when this information is available.

Mining method The principal mining method used at the mine (figs. 1A-H) is listed. See the mining methods section at the beginning of this directory for a discussion of this parameter.

Geologic problems reported Any known geologic problems, such as faults, water seepage, floor heaving, and unstable roof, encountered in the mine are reported. This information is from notes made by ISGS geologists who visited the mine, or from reports by mine inspectors published by the Illinois Department of Mines and Minerals, or from the source map(s). Geologic problems are not reported for active mines.

PRODUCTION HISTORY

Production history Tons of coal produced from the mine by each mine owner are totaled. When the source map used for the mine outline is not a final mine map, the tonnage produced since the date of the map is identified. For mines that extend into adjacent quadrangles, the tonnage reported includes areas mined in adjacent quadrangles.

SOURCE OF DATA

Source map This section lists information about the map(s) used to compile the mine outline and the locations of tipples and mine openings. In some cases more than one source map was used. For example, a map drawn before the mine closed may provide better information on original areas of the mine than a later map. When more than one map was used, the bibliography section explains what information was taken from each source.

Date The date of the most recent mine survey listed on the source map is reported.

Original scale The original scale of the source map is listed. Many maps are photo-reductions and are no longer at their original scale. The original scale gives some indication of the level of detail of the mine outline and the accuracy of the mine boundary relative to surface features. Generally, the larger the scale, the greater the accuracy and detail of the mine map. Mine outlines taken from source maps at scales smaller than 1:24,000 may be highly generalized and may well be inaccurately located with respect to surface features.

Digitized scale The scale of the digitized map is reported. The scale may be different from that of the original source map. In many cases the digitized map was made from a photo-reduction of the original source map, or the source map was not in a condition suitable for digitizing and the mine boundaries were transferred to another base map.

Map type Source maps are classified into five categories to indicate the probable completeness of the map. See discussion of source maps in the previous section.

Annotated bibliography Sources that provide information about the mine are listed, with the data taken from each source. Some commonly used sources are described below. Full bibliographic references are given for all other sources. Unless otherwise noted, all sources are available for public inspection at the ISGS.

Coal Reports Published since 1881, these reports contain tabular data on mine ownership, production, employment, and accidents. Some volumes include short descriptions made by mine inspectors of physical features and conditions in selected mines.

Directory of Illinois Coal Mines This source is a compilation of basic data about Illinois coal mines, originally gathered by ISGS staff in the early 1950s. Sources used for this directory are undocumented, but they are primarily Illinois Department of Mines and Minerals annual reports, ISGS mine notes, and coal company officials.

ENR Document 85/01, Guither, H. D., J. K. Hines, and R. A. Bauer, 1985 The Economic Effect of Underground Mining Upon Land Used for Illinois Agriculture: Illinois Department of Energy and Natural Resources Document 85/01, 185 p.

Microfilm map The U.S. Bureau of Mines maintains a microfilm archive of mine maps. A microfilm file for Illinois is available for public viewing at the ISGS.

Mine notes   ISGS geologists have visited mines or contacted mine officials throughout the state since the early 1900s. Notes made during these visits range from brief descriptions of the mine location to long narratives (including sketches) of mining conditions and geology.

Federal Land Bank of St. Louis, Preliminary Reports on Subsidence Investigations Mining engineers working for the Federal Land Bank of St. Louis mapped areas of subsidence due to coal mining in the early 1930s. These reports often include county maps of mine properties with mined-out areas including shaft locations, as well as subsidence areas.

REFERENCES

Bauer, R. A., B. A. Trent, and P. B. Dumontelle, 1993, Mine Subsidence in Illinois: Facts for the Homeowner Considering Insurance, Illinois State Geological Survey, Environmental Geology Note 144, 16p.

Guither, H. D., J. K. Hines, and R. A. Bauer, 1985, The Economic Effects of Underground Mining Upon Land Used for Illinois Agriculture, Illinois Department of Energy and Natural Resources Document 85/01, 185p.

Wanless, H. R., 1929, Geology and Mineral Resources of the Alexis Quadrangle, Illinois State Geological Survey, Bulletin 57, 217p.

PART II DIRECTORY OF MINES IN THE VIOLA QUADRANGLE

MINE SUMMARY SHEETS

A summary sheet on the geology and production history of each mine in the Viola Quadrangle is provided. These summary sheets are arranged numerically by mine index number. Consult Part I for a complete explanation of the data listed in the summary sheet.

Mine Index 18
Coal Valley Mining Company, Coal Valley No. 3 Mine

Type: Underground   Total mined-out acreage shown: 271 (85 in southern outline, 270 in northern outline)

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft *	Mercer	15N 2W	27	SE SE SE
Main slope *	Mercer	15N 2W	34	SE NE SE
Air shaft	Mercer	15N 2W	34	NE SE SE

* The shaft in the southern outline is the older mine. The new slope, north of the Edwards River, was opened in 1917, but it appears (from the map date) that the southern portion continued operation.

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Thickness (ft) Max	Thickness (ft) Avg	Mining Method
Rock Island	61	3.67	5.0	4.0	MRP

Geologic Problems Reported: The mine was abandoned because of poor roof conditions. The roof was generally up to 8 feet of black shale under 1 to 3 feet of limestone. Clay veins, slips and rolls were noted in the seam. Swags were common in the coal.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Coal Valley Mining Company	Coal Valley No. 3	1909-1921	1,280,003
			1,280,003

Last reported production: August 1921

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352246	9-15-1921	1:1200	1:2069	Final
Coal Section files (Milan Quadrangle)	undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, shaft location, depth, thickness, geologic problems.
Microfilm map, document 352246, reel 03138, frames 310 & 311 - Shaft & slope locations, mine outline (southern), mining method.
Coal Section files, undated work map on USGS topographic map, 15-minute Milan Quadrangle - Mine outline (northern), shaft location.

Mine Index 290
Empire Coal Company, Empire No. 3 Mine

Type: Underground Total mined-out acreage shown: 766

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	14N 2W	20	SW NE NE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	130-135	3.0	6.5	4.0	RP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Empire Coal Company *	Empire No. 3	1899-1910	1,653,646
			1,653,646

* According to the mine notes, Empire Coal Company was owned or operated by Shuler Mining Company.

Last reported production: March 31, 1910

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Coal Section files (Alexis Quadrangle)	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, abandonment date.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, shaft location, seam, depth, thickness, mining method.
Coal Section files, undated work map on USGS topographic map, 15-minute Alexis Quadrangle - Mine outline, shaft location.

Mine Index 356
Essley Coal Company, Black Diamond No. 1 Mine

Type: Underground   Total mined-out acreage shown: 66   Production indicates approximately 15 acres were mined. However, various maps showed vaguely where the shaft and slope were located, and the mine location is not precisely known.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	14N 2W	2	NW SE SW
Slope	Mercer	14N 2W	2	SE SW SW

GEOLOGY

		Thickness (ft)			Mining
Seam(s) Mined	Depth (ft)	Min	Max	Avg	Method
Rock Island	38-60	4.0	4.5	4.2	RP

Geologic Problems Reported: The immediate roof was black shale that ranged from 24 to 36 inches thick. The caprock above the shale was 18 inches of black rock. Water came into the mine through cracks in the shale roof and via sandstone under the coal. The mine notes state that the pillars were largely pulled and subsidence had taken place before 1964. The coal had a pyrite and pyrite concretion layer about 18 inches below the roof.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
G. P. Brasmer	Black Diamond	1920-1927	15,683 *
Essley Coal Company	Black Diamond No. 1	1926-1932 **	39,236
			54,919

* Production was not listed in the 1922 Coal Report for mines producing less than 10,000 tons.
** The slope was constructed in 1926, and apparently listed simultaneously with active production from the original shaft.

Last reported production: 1932

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Map library, 4103.M42 d5.1-3	1922	1:62500	1:62500	Secondary source
Coal Section files (Alexis Quadrangle)	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, shaft & slope locations, seam, depth, thickness, mining method, geologic problems.
ISGS map library, 4103.M42 d5.1-3 (H. E. Culver) - Shaft location.
Coal Section files, undated work maps on USGS topographic map, 15-minute Alexis Quadrangle - Shaft & slope locations.

Mine Index 2958
Viola Materials, Incorporated, Viola Mine

Type: Surface   Total mined-out acreage shown: None; production indicates approximately 11 acres were mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Pit	Mercer	14N 2W	3	NE NW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island					Surface

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Eddington Coal Company	Eddington	1957-1959	4,362
Viola Coal Company	Viola	1959-1961	6,892
Viola Materials, Incorporated	Viola	1962-1973	52,972
			64,226

Last reported production: May 1973

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Mine notes	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, pit location, seam.

Mine Index 2959
George Gooden, Gooden Mine

Type: Underground Total mined-out acreage shown: 11

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Drift	Mercer	14N 2W	3	NE NE SW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island				3.0	Underground

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
George Gooden	Gooden	1918-1919	1,938
Gooden & Jones	Gooden & Jones	1919-1920	2,819
George Gooden	Gooden	1920-1923	9,040 *
			13,797

* Production was not reported in 1922 for mines producing less than 10,000 tons.

Last reported production: 1923

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
ISGS field notes (H. R. Wanless)	7-11-1925	1:62500	1:62500	Secondary source
Coal Section files (Alexis Quadrangle)	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine location, seam, thickness.
ISGS field notes (H. R. Wanless, 7-11-1925) - Mine type, mine location.
Coal Section files, undated work map on USGS topographic map, 15-minute Alexis Quadrangle - Mine outline, drift or slope location.

Mine Index 2960
Eugene Hayburn, Hayburn Mine

Type: Underground   Total mined-out acreage shown: None; production indicates less than 1 acre was mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Mine	Mercer	14N 2W	3	SE SE NW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island					Underground

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Rock Quarry Coal Company	Rock Quarry	1935-1936	298
Eugene Hayburn	Hayburn	1937-1937	492
			790

Last reported production: 1937

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Mine notes	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine location.

Mine Index 2961
Little Star Mining Company, Little Star Mine

Type: Underground Total mined-out acreage shown: None; production indicates less than 1 acre was mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Mine	Mercer	14N 2W	3	SE SW NW

GEOLOGY

		Thickness (ft)			Mining
Seam(s) Mined	Depth (ft)	Min	Max	Avg	Method
Rock Island	35	2.67	3.33	3.0	Underground

Geologic Problems Reported: The layer above the coal was 24 feet of compact massive shale that made a poor roof. In some places, up to 1 foot of limestone was directly above the coal, which made a better roof. Slips and rolls were present in the coal. A 1-inch band and lenses of pyrite were present about 12 inches below the top of the coal.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Little Star Mining Company	Little Star	1917-1918	949
			949

Last reported production: 1918

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Mine notes	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine location, seam, depth, thickness, mining method, geologic problems.

Mine Index 2962
Martin Coal Company, Martin Mine

Type: Underground   Total mined-out acreage shown: None; production indicates 3 acres were mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main slope	Mercer	14N 2W	4	NW SE

GEOLOGY

		Thickness (ft)			Mining
Seam(s) Mined	Depth (ft)	Min	Max	Avg	Method
Rock Island	20			3.17	MRP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
J. M. Guthrie Coal Company	Guthrie	1936-1939	5,995
Martin Coal Company	Martin	1940-1940	2,668 *
			8,663

* Production after map date

Last reported production: 1940

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352240	1939	1:600	1:745	Not final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, slope & drift locations, seam, depth, thickness.
Microfilm map, document 352240, reel 03138, frame 304 - Shaft locations, mine outline, mining method.

Mine Index 2963
Empire Coal Company, Empire No. 1 Mine

Type: Underground   Total mined-out acreage shown: 344

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	14N 2W	4	SE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	100			3.5-4.33	LW, RP *

* The Coal Reports indicated that longwall mining was practiced in the first year, after which room and pillar mining took place.

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Empire Coal Company	Empire No. 1	1885-1900	1,137,541
			1,137,541

Last reported production: October 1900

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Mine notes	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, depth, thickness.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine location.

Mine Index 2964
Blaine & Jones, Pleasant Valley Mine

Type: Underground Total mined-out acreage shown: None; production indicates 11 acres were mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main slope	Mercer	14N 2W	4	NW NW SE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	15-18	3.75	5.0	4.0	RP

Geologic Problems Reported: The shallow depth of the mine meant that the roof rocks were weathered and allowed water into the mine, which caused some difficulties. Slips of 1 foot or more and filled with clay were abundant. The coal seam had 6 inches of "false bottom" that did not separate easily from the good coal for loading. Pyrite was present in vertical veins and horizontal seams.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Jones & Boden	Pleasant Valley	1900-1901	1,828
Arthur Jones	Pleasant Valley	1901-1904	10,684
Jones & Hayburn	Pleasant Valley	1904-1905	3,840
Arthur Jones	Pleasant Valley	1905-1911	16,926
James Blaine	Pleasant Valley	1911-1917	4,713
W. E. Blaine	Pleasant Valley	1917-1918	833
James Blaine	Pleasant Valley	1918-1920	455
Blaine Brothers	Pleasant Valley	1920-1922	672 *
Blaine & Jones	Pleasant Valley	1922-1923	3,904
			39,951

* Production was not listed in the 1922 Coal Report for mines producing less than 10,000 tons.

Last reported production: 1923

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Mine notes	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, slope location, seam, depth, thickness, geologic problems, mine name.
ISGS field notes (H. R. Wanless, 7-13-1925) - Geologic problems.

Mine Index 2965
B. & H. Coal Company, B. & H. Mine

Type: Underground Total mined-out acreage shown: 2 Production indicates less than 1 acre was mined after the map date. Production indicates 26 acres were mined. A general area of mining has been added to the accompanying map. B. & H. Mine was connected underground to Blaine Mine (mine index 2964).

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main slope	Mercer	14N 2W	4	NE NE SW
Air shaft	Mercer	14N 2W	4	NE NE SW

GEOLOGY

		Thickness (ft)			Mining
Seam(s) Mined	Depth (ft)	Min	Max	Avg	Method
Rock Island	10-40			3.0	MRP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
W. T. Lee	Lee	1917-1922 *	4,840
Lee & Hagman	Lee & Hagman	1922-1925	10,452
William T. Lee	Lee	1925-1925	650
Lee Brothers	Lee	1926-1949 **	53,160
B. & H. Coal Company	B. & H.	1950-1952	1,880 ***
			70,982

* Idle 1921 & 1922
** Idle 1942-1949
*** Production after map date

Last reported production: 1952

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352237	9-20-1950	1:1200	1:1241	Not final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, slope location, seam, depth, thickness.
Microfilm map, document 352237, reel 03138, frame 301 - Slope & shaft locations, mine outline, mining method.

Mine Index 2966
Avon Coal Company, Avon Mine

Type: Underground Total mined-out acreage shown: None; production indicates approximately 3 acres were mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main slope	Mercer	14N 2W	4	SE SW NE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	18-35			3.5-4.0	RP

Geologic Problems Reported: The immediate roof consisted of shale and rock, which came down easily. Pillars were not pulled.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
John Turner	Turner	1934-1934	500
Max Myers	Myers	1935-1937	3,130
Richardson Coal Company	Richardson	1935-1937	1,414
Eithel Richardson	Richardson	1938-1938	48
Ethell Skinner	Skinner	1938-1939	1,251
William H. Faulconer	Faulconer	1939-1939	81
Avon Coal Company	Avon	1939-1941	6,214
			12,638

Last reported production: 1941

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Mine notes	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, slope location, seam, depth, thickness, mining method, geologic problems.

Mine Index 2973
Alden Coal Company, Alden No. 2 Mine

Type: Underground Total mined-out acreage shown: 249

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	14N 2W	9	NE NW SW
Air shaft *	Mercer	14N 2W	9	

* According to the 1901 Coal Report, an auxiliary air shaft was sunk at the active face, about one mile south and one-quarter of a mile west of the main shaft. The air shaft is not shown on the accompanying map as the distances are vague and the shaft location is not from an accurate mine map.

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	135			4.5	RP

Geologic Problems Reported: One fatality was caused by a roof fall while top coal was being recovered.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Alden Coal Company	Alden No. 2	1899-1905	749,927
			749,927

Last reported production: June 30, 1905

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Coal Section files (Alexis Quadrangle)	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, seam, depth, thickness, geologic problems.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Shaft location.
Coal Section files, undated work map on USGS topographic map, 15-minute Alexis Quadrangle - Shaft location, mine outline.

Mine Index 2974
Leroy Pease Coal Company, Pease Mine

Type: Underground   Total mined-out acreage shown: 7   Production indicates approximately 5 acres were mined after the map date.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	14N 2W	11	SW NW SW
Air shaft	Mercer	14N 2W	11	SW NW SW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	58-65			3.5	RP

Geologic Problems Reported: Two roof falls were noted in the northern portion of the mine. The immediate roof above the coal was black limestone cap rock over most of the mine.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Leroy Pease	Pease	1933-1934	5,650
Pease Coal Company	Pease	1934-1935	500
Harris Brothers	Harris	1935-1935	696
Leroy Pease Coal Company	Pease	1936-1938	13,600
Leroy Pease Coal Company	Pease	1939-1943 *	16,014 **
			36,460

* Idle 1940
** Production after map date

Last reported production: 1943

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352235	12-15-1938	1:600	1:993	Not final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, shaft location, seam, depth, thickness, mining method, geologic problems.
Microfilm map, document 352235, reel 03138, frame 299 - Shaft locations, mine outline, mining method, geologic problems.

Mine Index 2975
Essley Coal Company, Black Diamond No. 2 Mine

Type: Underground   Total mined-out acreage shown: 14   Production indicates approximately 1 acre was mined after the map date.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	14N 2W	11	SE NW NW
Air shaft	Mercer	14N 2W	11	SE NW NW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	39-50			3.5-3.83	MRP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Essley Coal Company	Black Diamond No. 2	1931-1938	34,039
Essley Coal Company	Black Diamond No. 2	1938-1939	3,183 *
			37,222

* Production after map date

Last reported production: 1939

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352244	3-24-1938	1:600	1:1034	Not final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, shaft location, seam, depth, thickness, mine name.
Microfilm map, document 352244, reel 03138, frame 308 - Shaft locations, mine outline, mining method.

Mine Index 2976
Four In One Coal Company, Four In One Mine

Type: Underground   Total mined-out acreage shown: 18   Production indicates approximately 1 acre was mined after the map date.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	14N 2W	11	NE SW NW
Air shaft	Mercer	14N 2W	11	NW SW NW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	33-50	3.0	4.0	3.5-3.83	RP

Geologic Problems Reported: The pillars were pulled, and subsidence was noted. The immediate roof was 1 to 2 inches of clod, with 18 to 20 inches of limestone above that. A layer of pyrite concretions up to 2 inches thick was usually present in the lower bench of coal. Another visit to the mine indicated that the pyrite nuggets were rare and scattered, and were easily separated from the coal.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Kness Coal Company	Kness	1923-1937	48,760
Four In One Coal Company	Four In One	1937-1938	3,085
Kness Coal Company	Kness	1939-1939	1,915 *
Four In One Coal Company	Four In One	1940-1940	1,072 *
			54,832

* Production after map date

Last reported production: 1940

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352241	1-2-1939	1:600	1:1035	Not final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, shaft location, seam, depth, thickness, mining method, geologic problems.
Microfilm map, document 352241, reel 03138, frame 305 - Shaft locations, mine outline, mining method.

Mine Index 2990
McCraney Sand & Gravel, McCraney Mine

Type: Underground   Total mined-out acreage shown: 25   Production indicates approximately 5 acres were mined after the map date.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	15N 2W	33	NW SE NE
Air / escape slope	Mercer	15N 2W	33	SE SE NE

GEOLOGY

		Thickness (ft)			Mining
Seam(s) Mined	Depth (ft)	Min	Max	Avg	Method
Rock Island	40			3.0-4.0	MRP

Geologic Problems Reported: The source map showed areas of thin coal in limited areas on the southern and northern sides of the mine.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
William H. Riddell	Riddell	1906-1912	32,700
Axel E. Link	Link	1912-1915	15,884
Lee & Hagman	Lee & Hagman	1915-1916	375
McCrame & Lee	McCrame & Lee	1916-1917	3,700
McCraney Sand & Gravel	McCraney	1917-1918	30,147
McCraney Sand & Gravel	McCraney	1918-1919	17,871 *
			100,677

* Production after map date

Last reported production: 1919

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352248	9-12-1918	1:1200	1:1655	Not final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, thickness, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine location, seam, depth.
Microfilm map, document 352248, reel 03138, frame 314 - Shaft & slope locations, mine outline, mining method, geologic problems.

Mine Index 2992
Koresco Coal Company, Koresco Mine

Type: Underground   Total mined-out acreage shown: 5

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Mine	Mercer	15N 2W	34	SE SE NE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	40				Underground

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Koresco Coal Company	Koresco	1933-1937	12,662
			12,662

Last reported production: 1937

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Coal Section files (Alexis Quadrangle)	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine location, seam, depth.
Coal Section files, undated work map on USGS topographic map, 15-minute Alexis Quadrangle - Mine outline.

Mine Index 2993
Never Seen Coal Company, Never Seen Mine

Type: Underground Total mined-out acreage shown: 21 Production indicates less than 1 acre was mined after the map date.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main slope	Mercer	15N 2W	34	SE SE NW
Air shaft	Mercer	15N 2W	34	SE SE NW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	30				MRP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
James O'Rourke & Mike Bugas	O'Rourke & Bugas	1929-1932	7,237
Never Seen Coal Company	Never Seen	1933-1937	22,720
O'Rourke & Bugas	O'Rourke & Bugas	1938-1938	3,174
Never Seen Coal Company	Never Seen	1939-1943	32,418
Never Seen Coal Company	Never Seen	1943-1943	273 *
			65,822

* Production after map date

Last reported production: July 5, 1943

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352245	6-20-1943	1:600	1:993	Not final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, slope location, seam, depth.
Microfilm map, document 352245, reel 03138, frame 309 - Slope & shaft locations, mine outline, mining method.

Mine Index 2994
Frye & Bollman, Frye & Bollman Mine

Type: Underground Total mined-out acreage shown: 10

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main slope	Mercer	15N 2W	35	SE NE SW
Air shaft	Mercer	15N 2W	35	NE SE SW
Old air shaft	Mercer	15N 2W	35	SE NE SW

GEOLOGY

		Thickness (ft)			Mining
Seam(s) Mined	Depth (ft)	Min	Max	Avg	Method
Rock Island	40-50			3.67	MRP

Geologic Problems Reported: The source map showed bad top in the north, northeast, south, and southwest.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Frye & Bollman	Frye & Bollman	1933-1941	40,440

Last reported production: 1941

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 352234	4-1-1941	1:1200	1:1241	Final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, slope location, seam, depth, thickness.
Microfilm map, document 352234, reel 03138, frame 298 - Shaft locations, mine outline, depth, mining method, geologic problems.

Mine Index 2995
Docherty Brothers, Docherty Mine

Type: Underground   Total mined-out acreage shown: None; production indicates approximately 30 acres were mined. A general area of mining has been added to the accompanying map to show the approximate area undermined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	15N 2W	35	SE SW NW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	30-160			4.0-4.5	RP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Robert Taylor	Taylor	1878-1889	19,309
Docherty & Barr	Docherty & Barr	1889-1891	3,472
Thomas Docherty & Sons	Docherty	1891-1898	17,440
Peter Docherty	Docherty	1898-1901	7,450
Docherty Brothers	Docherty	1901-1902	3,800
Peter Docherty	Docherty	1902-1903	4,100
Docherty Brothers *	Docherty	1903-1920	65,850
			121,421

* ISGS field notes written by J. A. Udden indicate that the Dog Town Mine operated by Docherty Brothers (mine index 2995) on 7-24-1911 worked at the shaft location shown for Boden Mine (SW SE SW 26-T15N-R2W). It is likely that the 35-T15N-R2W location was not the site for all of the production from 1878 to 1920.

Last reported production:

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Mine notes	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, depth, thickness, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Shaft location.

Mine Index 4966
Never Seen Coal Company, Never Seen Mine

Type: Underground Total mined-out acreage shown: 11 Production indicates approximately 1 acre was mined after the map date.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Slope	Mercer	14N 2W	3	NW SE NW
Air slope	Mercer	14N 2W	3	NW SE NW
New Slope	Mercer	14N 2W	3	SE SE NW
Old Portal (drift)	Mercer	14N 2W	3	NE SE NW
Old air drift	Mercer	14N 2W	3	NE SE NW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	57-60	3.5	5.2	4.0	MRP

Geologic Problems Reported: The roof over much of the mine was poor, the exceptions being areas where the caprock was present. The caprock was 2 to 3 feet of limestone, underlain by 2 feet of clod. The clod's thickness varied, being thick in sloughs and depressions (up to 7 feet) where it made a very bad roof, and thin on rolls. The clod contains concretions (up to 2-3 ft diameter) in some places. Slips and faults were common in some parts of the mine, and clay seams were present along fault planes. The faults showed displacement of 4 to 10 inches. The roof was bad in areas with slips. A gray band of pyrite was present in the lower half of the coal, and pyrite concretions were seen at various places in the seam. The concretions were easily separated from the coal. The floor was sandstone.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
George Bugas & Brothers	Bugas	1920-1922 *	612
George Bugas Coal Company	Bugas	1922-1923	337
Never Seen Coal Company	Never Seen	1923-1924	11,776
Mrs. Anna Bugas	Bugas	1924-1925	10,796
Never Seen Coal Company	Never Seen	1925-1925	4,973
Never Seen Coal Company	Never Seen	1925-1925	3,800 **
			32,294

* Production was not listed in the 1922 Coal Report for mines producing less than 10,000 tons.
** Production after map date

Last reported production: 1926

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Map library, 4103.M42 i5.1-1	11-20-1925	1:1200	1:1200	Not final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, slope location, seam, depth, thickness, geologic problems.
Map library, 4103.M42 i5.1-1 - Mine outline, slope & drift locations, mining method.

Mine Index 6108
Alden Coal Company, Alden No. 1 Mine

Type: Underground   Total mined-out acreage shown: 178

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	14N 2W	4	SE SW SW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	135-140			4.0-4.5	RP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Alden Coal Company	Alden No. 1	1893-1899	598,195
			598,195

Last reported production: 1899

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Coal Section files (Alexis Quadrangle)	Undated	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, depth, thickness, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Coal Section files, undated work map on USGS topographic map, 15-minute Alexis Quadrangle - Shaft location, mine outline.

Mine Index 6118
John McNeil, McNeil Mine

Type: Underground   Total mined-out acreage shown: None; production indicates less than 1 acre was mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main drift	Mercer	15N 2W	33	NE NW SW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island				2.25	Underground

Geologic Problems Reported: The mine rapidly filled with water and required a great deal of pumping. The coal was thinner than expected, as a well 300 feet east of the mine showed coal between 3 and 3.5 feet thick.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
John McNeil	McNeil	1924-1925	114
			114

Last reported production: 1925

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
ISGS field notes (H. R. Wanless)	7-6-1925	1:62500	1:62500	Secondary source

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
ISGS field notes (Mercer County) - Mine type, drift location, seam, thickness, geologic problems.

OTHER MINES SHOWN ON VIOLA QUADRANGLE

Mine Index 6086 SW SW NE 4-T14N-R2W, drift source: ISGS field notes (H. R. Wanless, 7-13-1925)
Mine Index 6087 NW NE SW 3-T14N-R2W, drift source: ISGS field notes (H. R. Wanless, 7-11-1925)
Mine Index 6088 SW NE NW 3-T14N-R2W source: ISGS field notes (D. M. Moody, summer 1958)
Mine Index 6089 NE NW SE 4-T14N-R2W, drift source: ISGS field notes (H. R. Wanless, 7-13-1925)
Mine Index 6090 NW SW NE 4-T14N-R2W, drift source: ISGS field notes (H. R. Wanless, 7-13-1925)
Mine Index 6102 SE SW SE 34-T15N-R2W source: Coal Section files, Alexis (15-minute) Quadrangle work map (data posted 1962)
Mine Index 6112 NW SE 4-T14N-R2W, "previous old workings" source: Microfilm, document 352240 (map of Guthrie Mine, mine index 2962, 1939)
Mine Index 6119 SW SW NE 33-T15N-R2W, drift source: ISGS field notes (H. R. Wanless, 7-1925)
Mine Index 6120 SE SE NW 33-T15N-R2W, drift source: ISGS field notes (H. R. Wanless, 7-6-1925)
Mine Index 6121 NW NE SW 34-T15N-R2W, drift source: ISGS field notes (H. R. Wanless, 7-6-1925)
Mine Index 6122 NE SW SW 35-T15N-R2W, shaft used for windmill source: Microfilm, document 352246, map of Coal Valley No. 3 Mine (mine index 18, 9-15-1921)
Mine Index 6123 NE SW SW 35-T15N-R2W, shaft source: Microfilm, document 352246, map of Coal Valley No. 3 Mine (mine index 18, 9-15-1921)
Mine Index 6124 NW NE SW 35-T15N-R2W source: Coal Section files, Alexis (15-minute) Quadrangle work map
Mine Index 6653 NE SW NE 4-T14N-R2W, drift source: ISGS field notes (H. R. Wanless, 7-13-1925)
Mine Index 7805 SW SE SE 34-T15N-R2W, shaft source: Microfilm, document 352246, map of Coal Valley No. 3 Mine (mine index 18, 9-15-1921)

MINES WHOSE LOCATIONS ARE NOT KNOWN, VIOLA QUADRANGLE

The locations of the following mines are unknown, but the production tonnage, operating names, and nearest town were reported in the Annual Coal Reports. The operators listed below mined in or near the Viola Quadrangle. The information shown is similar to that presented on the summary sheets in the previous pages of this directory. The first item is the name the mine operated under as listed in the Coal Report, then the years the mine reported. If no physical data are available, the next item listed is the total tons produced by the mine. If physical data are available, the order of presentation is as follows: type of opening for the mine (drift, slope or shaft), depth of coal in feet, and thickness of coal in feet.

The total tons mined by these unlocated mines is 123,877 (118,907 underground and 4,970 mined by uncertain method), which would represent approximately 25 to 50 acres, depending on the recovery factor, mining method, and numerous other factors. (Note: 1 square mile = 640 acres)

GILCHRIST

Russell (Edward), 1888-1889, shaft, Rock Island, 40, 4.0, RP	160 tons
Ayers (Richard), 1889-1890	230 tons
Ayers (Martin), 1890-1891	260 tons
	650 tons
Frost (Luke), 1889-1892, slope, Rock Island, 12, 4.0, RP	1,360 tons
Frost Brothers, 1892-1893, shaft, Rock Island, 20, 4.0, RP	280 tons
Green (Milton M.), 1890-1892, drift, Rock Island, –, 3.5, RP	600 tons
Golden & Jones, 1891-1892, shaft, Rock Island, 20, 3.5, RP	220 tons
Gardener (William), 1892-1893, drift, Rock Island, –, 4.0, RP	340 tons
Gardner (William), 1896-1898, shaft, –, 32, 3.5, RP	820 tons
Maynard (Harry) & Company, 1905-1906, shaft, Rock Island, 42, 4.0, RP	138 tons

MATHERVILLE

Taylor (John A.), 1919-1920	1,100 tons
Taylor & Bradford, 1920-1921	2,150 tons
	3,250 tons
Thomas (Oscar), 1916-1919, slope, Rock Island, 100, –, RP	2,195 tons
Davis & Hagman, 1924-1925	200 tons
Davis (Grover), 1926-1928, underground	1,836 tons
Matazel Brothers, 1928-1928, underground	18 tons
Matazel (Martin & Samuel), 1929-1929	131 tons
	149 tons
Hartman (S. C.), 1933-1934, underground	10,115 tons
McCloskey (W. E.), 1933-1935, underground	4,097 tons
Cable Coal Company, 1939-1940, underground	298 tons
Cable Coal Company, 1941-1942, underground	293 tons

VIOLA

Tidball (J.), 1878-1879, slope, Rock Island, 24, 4.0	1,213 tons
Parks (Russell), pre1879-1888, shaft, Rock Island, 30-35, 4.0, RP	8,260 tons
Blaine (William), pre1879-1888, shaft, Rock Island, 20-32, 3.0-4.0, RP	11,902 tons
Guthrie (Samuel), 1878-1879, drit, Rock Island, 25, 4.0	80 tons
Guthrie (Samuel), 1883-1888, shaft, Rock Island, 41, 4.0, RP	2,675 tons
Guthrie (John), 1888-1889	240 tons
Guthrie (William), 1889-1889	224 tons
Guthrie (Andrew), 1889-1890	480 tons
	3,619 tons
Hunter (Walter), 1878-1879, drift, Rock Island, 50, 4.0	40 tons
Tarr (Henry), pre1878-1879, shaft, Rock Island, 42, 4.5	200 tons
Morrow (John), pre1879-1883, shaft, Rock Island, 48-58, 4.0-4.25	2,890 tons
Martin (Tim) & Drum (John), pre1878-1879, shaft, Rock Island, 44-65, 4.0	924 tons
Martin (Francis M.), 1879-1889	17,104 tons
Martin (Orrick), 1889-1891	4,100 tons
Martin (G. W.), 1891-1893	3,170 tons
Dunn (John), 1893-1898	6,233 tons
	31,531 tons
Pinkerton (William), pre1879-1883, shaft, Rock Island, 24-30, 2.0-4.0	1,080 tons
Pinkerton (George), pre1881-1883, drift, Rock Island, 31, 4.0	550 tons
Parks (Rufus), pre1881-1882, drift, Rock Island, 15, 4.0	260 tons
Boon (Hopkins), 1881-1882, shaft, Rock Island, 20, 4.0	140 tons
Boon (Hopkins), pre1881-1882, shaft, Rock Island, 61, 4.0	500 tons

Frazier (Hugh B.), pre1881-1883, shaft, Rock Island, 22, 4.0	idle
Collins (W. P.), 1881-1882, shaft, Rock Island, 26, 4.0	300 tons
Guthrie (William), 1882-1885, shaft, Rock Island, 30-32, 3.5-4.0, RP	2,030 tons
Slocum (Clarence), 1883-1884, shaft, Rock Island, 20, 4.0, RP	900 tons
Smith (John), 1883-1884, drift, Rock Island, 20, 4.0, RP	210 tons
Thompson (John), 1883-1884, slope, Rock Island, 30, 3.0, RP	500 tons
Jones (Alvin T.), 1884-1885, shaft, Rock Island, 20, 4.0, RP	420 tons
Campbell (William), 1885-1886	440 tons
	860 tons
Foster (John W.), 1887-1888	216 tons
McFate (James), 1888-1889	216 tons
	432 tons
Parks (James R.), 1890-1891, drift, Rock Island, –, 4.0, RP	512 tons
Barr (William), 1897-1898, slope, Rock Island, 30, 4.0	2,700 tons
Cameron (Henry), 1898-1899	1,000 tons
	3,700 tons
Campbell (Frank), 1901-1902	1,520 tons
Miller (Ben), 1906-1909, shaft, Rock Island, 20-29, 2.5-3.0, RP	1,760 tons
Grady (Edward), 1906-1907, drift, Rock Island, –, 3.5, RP	80 tons
Mills (T. J.) & Company, 1908-1909, slope or drift, Rock Island, 18, 4.0, RP	500 tons
Gustafson (L.), 1909-1910	300 tons
	800 tons
Langston (George), 1909-1911, drift, Rock Island, –, 3.5, RP	75 tons
Bolt (E. E.), 1910-1911, drift, Rock Island, –, 4.0, RP	302 tons
Dodd (Thomas), 1911-1915, slope or drift, Rock Island, 8-40, 4.0, RP	3,720 tons
Brown (J. M.), 1915-1917, drift, Rock Island, 30, 2.83-3.5, RP	125 tons
Rodansky (William), 1916-1917, slope, Rock Island, 15, 5.33, RP	1,263 tons
Rodamsky (Charles) & Brothers, 1917-1918	2,176 tons
	3,439 tons
Snell & McGimpsey, 1927-1927	400 tons
New Diamond Coal Company, 1940-1943, underground operated by K. Crummy through 1941, then G. Rodamsky	2,142 tons
Martin (Harvey L.), 1941-1942, underground	1,980 tons
Martin (Harvey L.), No. 3 Mine, 1942-1943, underground	633 tons
Black Diamond Coal Company, No. 3 Mine, 1942-1943, underground	4,027 tons
Essley (F. H. & W. F.), 1944-1944	1,022 tons
Miller (Rudy) & Harris (G.), 1944-1946	3,050 tons
M. & H. Coal Company, 1947-1947	445 tons
	8,099 tons

INDEX OF MINES IN THE VIOLA QUADRANGLE

ILLINOIS STATE GEOLOGICAL SURVEY
PRAIRIE RESEARCH INSTITUTE

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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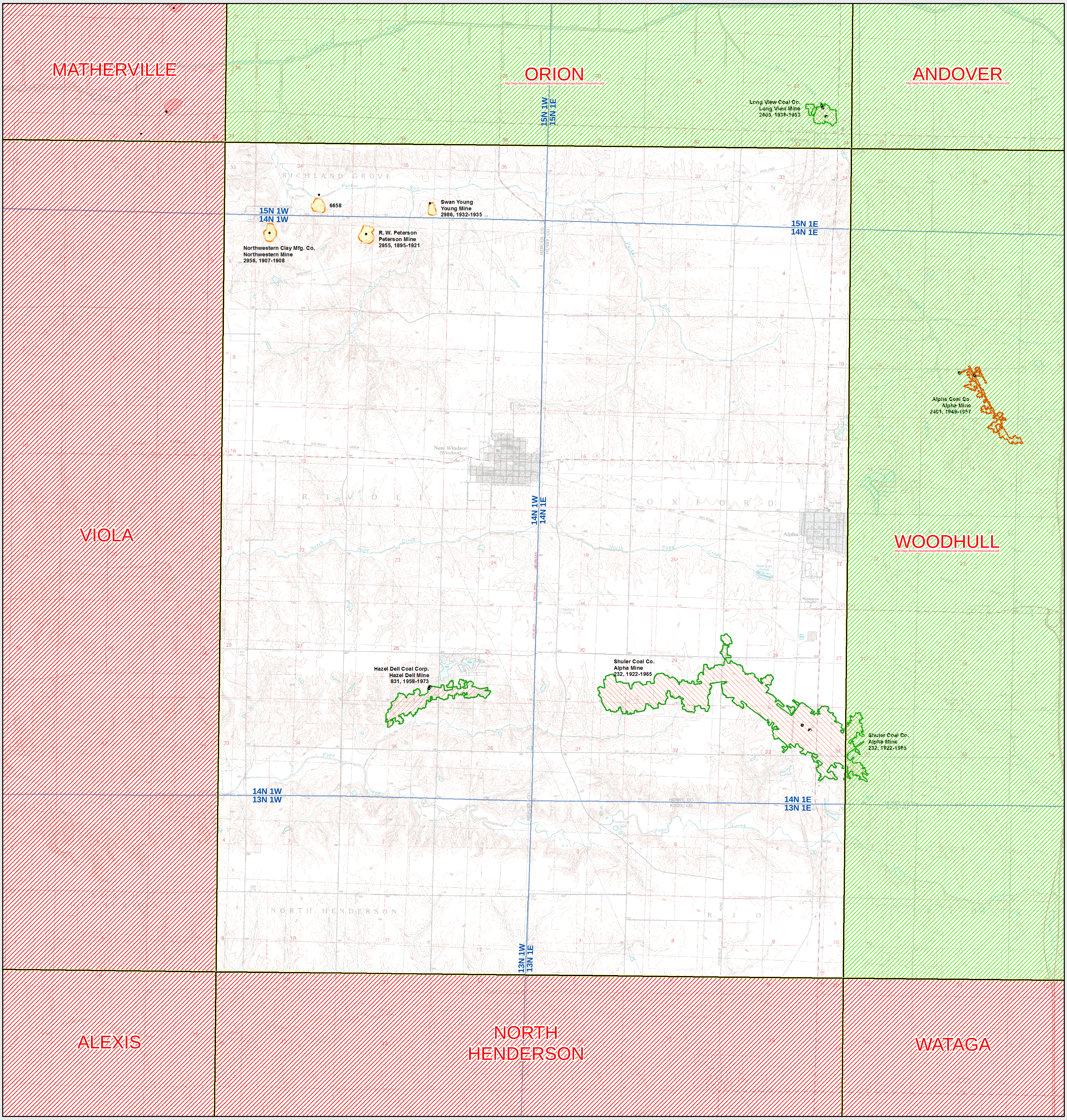
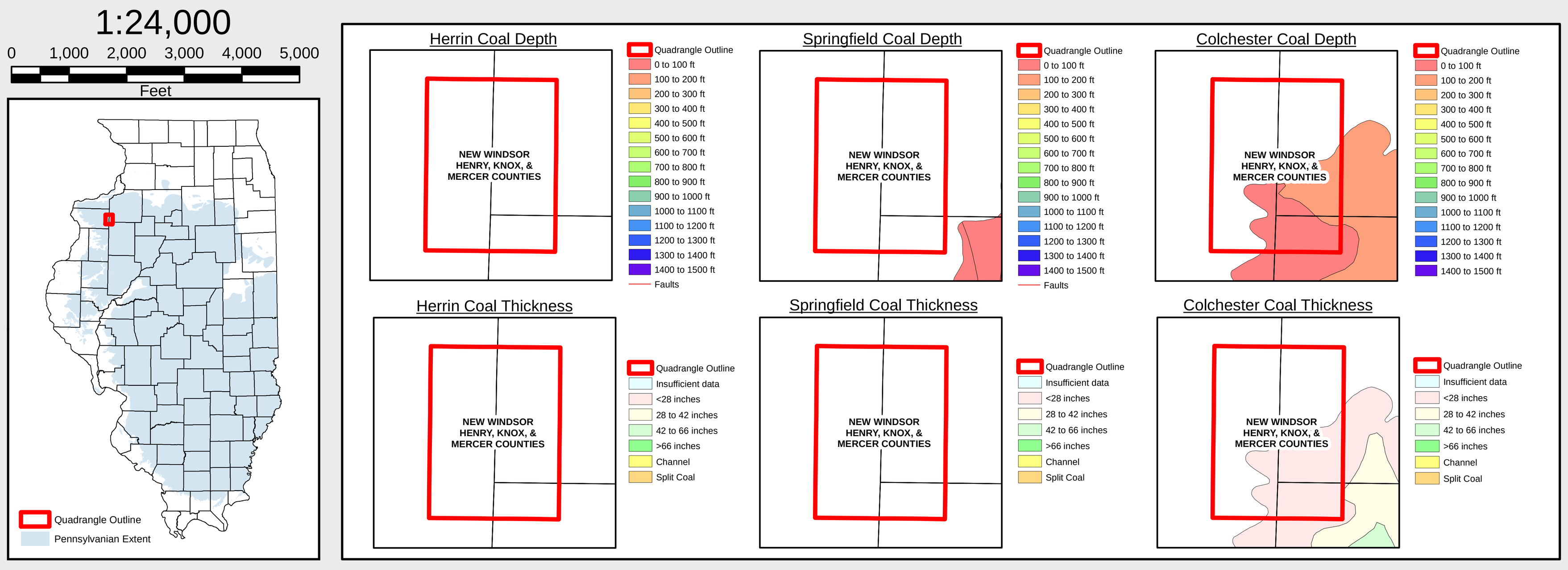
Coal Mines in Illinois
NEW WINDSOR QUADRANGLE
HENRY, KNOX, & MERCER COUNTIES

THIS MAP ACCOMPANIES THE COAL MINES DIRECTORY FOR THE NEW WINDSOR QUADRANGLE. CONSULT THE DIRECTORY FOR A COMPLETE EXPLANATION OF THE INFORMATION SHOWN ON THIS MAP.

Mine Outlines Compiled by
C. Chenoweth & Jennifer M. Obrad
June 2014

Maps Avalable for this Quadrangle: 1 (This map)





Completed Quadrangles Mining Method
- Room & Pillar (RP)
- Room & Pillar Basic (RPB)
- Modified Room & Pillar (MRP)
- Room & Pillar Panel (RPP)
- Blind Room & Pillar (BRP)
- Checkerboard Room & Pillar (CRP)
- High Extraction Retreat (HER)
- Longwall (LW)
- Underground, Method Unknown
- Strip Mine
- Auger Mine
- General Area of Mining

Other Areas Depicted
- Non-Coal Mines

Point Locations
- Strip Mine Tipple - Active
- Strip Mine Tipple - Abandoned
- Mine Shaft - Active
- Mine Shaft - Abandoned
- Mine Slope - Active
- Mine Slope - Abandoned
- Mine Drift - Active
- Mine Drift - Abandoned
- Air Shaft
- Uncertain Location
- Uncertain Type of Opening
- Non-Coal Mines

Source of Mine Outline
- Final Mine Map
- Not Final Mine Map
- Undated Mine Map
- Incomplete Mine Map
- Secondary Source Map

Mine Annotation
(space permiting)
Company
Mine Name
ISGS Index No., Years of Operation

Status of Neighboring Mined Out Area Quadrangle
- Completed
- Not Completed
- No Known Mining

Not Completed Quadrangle Mining Type
- Underground
- Surface
- General Area of Mining

Map Explanation

Note that each quadrangle scale mined-out area map requires the use of the associated text directory for full explanation of map features and mine attributes. Also note that some quadrangles have multiple seams of mining and therefore more than one map may be available for a particular quadrangle. Please take care to check for multiple maps, as extensive mining may exist in the other seams.

The maps and digital files used for these studies were compiled from data obtained from a variety of public and private sources and have varying degrees of completeness and accuracy. This compilation map presents reasonable interpretation of the geology of the area and is based on available data. Locations of some mine features may be offset by 500 feet or more due to errors in the original source maps, the compilation process, digitizing, or a combination of these factors. These data are not intended for use in site-specific screening or decision-making.

These maps were designed for use at 1:24,000. Enlarging the map may reduce accuracy, as the original scale of the source maps used to compile the outlines shown varies from 1:400 to 1:150,000, and some mine locations are known only from text descriptions. See the accompanying mine directory for the original scale of the source map used for a specific mine to check accuracy of a given portion of the map. Areas with no mines shown may still be undermined; see the unlocated mines list at the back of each mine directory.

The image of the U.S.G.S. topographic base map was projected from the original UTM to Lambert Conformal Conic.

Disclaimer

The Illinois State Geological Survey and the University of Illinois make no guarantee, expressed or implied, regarding the correctness of the interpretations presented in this data set and accept no liability for the consequences of decisions made by others on the basis of the information presented here.

DIRECTORY OF COAL MINES IN ILLINOIS
7.5-MINUTE QUADRANGLE SERIES
NEW WINDSOR QUADRANGLE
MERCER, HENRY & KNOX COUNTIES

C. Chenoweth & Jennifer M. Obrad

2014

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This material is based upon work supported by the Illinois Department of Transportation. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of the Illinois Department of Transportation.

Cover photo Track-mounted duckbill loading machine at a Peabody Coal Company mine, ca. 1915.

DISCLAIMER: The accuracy and completeness of mine maps and directories vary with the availability of reliable information. Maps and other information used to compile this mine map and directory were obtained from a variety of sources and the accuracy of some of the original information cannot be verified. Consequently, the Illinois State Geological Survey (ISGS) cannot guarantee the mine maps are free of errors and disclaims any responsibility for damages that may result from actions or decisions based on them.

The ISGS updates the maps and directories periodically, and welcomes any new information or corrections. Please contact the Coal Section of the ISGS at the address shown on the title page of this directory, or telephone (217) 244-4610.

CONTENTS

INTRODUCTION

Coal has been mined in 76 counties of Illinois. More than 7,400 coal mines have operated since commercial mining began in Illinois about 1810; fewer than 30 are currently active. To detail the extent and location of coal mining in Illinois, the Illinois State Geological Survey (ISGS) has compiled maps and directories of known coal mines. The ISGS offers maps at a scale of 1:100,000 and accompanying directories for each county in which coal mining is known to have occurred. Maps at a scale of 1:24,000 and accompanying directories, such as this, are available for selected quadrangles. Contact the ISGS for a list of these quadrangles.

These larger scale maps show the approximate positions of mines in relation to surface features such as roads and water bodies, and indicate the mining method used and the accuracy of the mine boundaries. The maps are useful for locating mine boundaries relative to specific properties and for assessing the potential for subsidence in an area. Mine boundaries compiled from final mine surveys are generally shown within 200 feet of their true position. As a result of poor cartographic quality and inaccuracies in the original mine surveys, boundaries of some older mines may be mislocated on the map by 500 feet or more. Original mine maps should be consulted in situations that require precise delineation of mine boundaries or internal workings of mined areas.

This directory serves as a key to the accompanying mine map and provides basic information on the coal mines in the quadrangle. The directory is composed of two parts. Part I explains the symbols and patterns used on the accompanying map and the summary data presented for each mine. Part II numerically lists the mines in the quadrangle and summarizes the geology and production history of each mine. Total production for the mine, not the portion in the quadrangle, is given.

MINING IN THE NEW WINDSOR QUADRANGLE

Mining took place in the New Windsor Quadrangle between 1895 and 1973, all working in the Rock Island Coal. The earlier part of Shuler Coal Company's mine (mine index 232) was the eastern portion of that mine, which extends into the Woodhull Quadrangle. The most recent mine (mine index 831, Hazel Dell Mine) closed in 1973, and used drilling to avoid the thinning parts of the podlike deposits of Rock Island Coal.

PART I EXPLANATION OF MAP AND MINE SUMMARY SHEET

INTERPRETING THE MAP

The map accompanying this directory shows the location of coal mines known to be present in the quadrangle. The map, corresponding to a U.S. Geological Survey (USGS) 7.5-minute quadrangle, covers an area bounded by lines of latitude and longitude 7.5-minutes apart. In Illinois, a quadrangle is approximately 6.5 miles east to west and 8.5 miles north to south, an area of about 56 square miles. The ISGS generally offers one map of mines per quadrangle. In some areas where extensive mining occurred in two or more overlapping seams, separate maps are compiled for mines in each seam to maintain readability of the map.

Mine Type and Mining Method
The mine type is indicated on the map by pattern color: green represents surface mines; red and yellow represent underground mines. The red patterns are used for areas of underground mining that are documented by a primary or secondary source map. A yellow pattern is used for cases where no map of the mine workings is available, but a general area of mining can be inferred from property maps or production figures. The patterns indicate the main mining methods used in underground mines. The methods are (1) room and pillar and (2) high extraction. The method used gives some indication of the amount and pattern of coal extraction within each mined area, and has some influence on the timing and type of subsidence that can occur over a mine.

The following discussion and illustrations of mining methods are based on Guither et al. (1984).

In room-and-pillar mines, coal is removed from haulage-ways (entries) and selected areas called rooms. Pillars of unmined coal are left between the rooms to support the roof. Depending on the size of rooms and pillars, the amount of coal removed from the production areas will range from 40% to 70%.

Room and Pillar - mining is divided into six categories:
- room-and-pillar basic (RPB, fig. 1A), an early method that did not follow a preset mining plan and therefore resulted in very irregular designs;
- modified room and pillar (MRP, fig. 1B);
- room-and-pillar panel (RPP, fig. 1C);
- blind room and pillar (BRP, fig. 1D);
- checkerboard room and pillar (CRP, fig. 1E);
- room and pillar (RP), a classification used when the specific type of room-and-pillar mining is unknown.

Blind and checkerboard are the most common types of room-and-pillar mining used in Illinois today. The knowledge of room-and-pillar mining methods gives a trained engineer information on the nature of subsidence that may occur. A more extensive discussion of subsidence can be found in Bauer et al. (1993).

High-extraction   These mining methods are subdivided into high-extraction retreat (HER, Fig 1F) and longwall (LW, Fig 1G, 1H). In these methods, much of the coal is removed within well defined areas of the mine. Subsidence of the surface above these areas occurs within weeks. Once the subsidence activity ceases, the potential for further movement over these areas is low; however, subsidence may continue for several years after mining.

High-extraction retreat mining is a form of room-and-pillar mining that extracts most of the coal. Rooms and pillars are developed in the panels, and the pillars are then systematically removed (fig. 1F).

In early (pre-1960) longwall mines, mining advanced in multiple directions from a central shaft (fig. 1G). Large pillars of coal were left around the shaft, but all coal was removed beyond these pillars. Miners placed rock and wooden props and cribs in the mined-out areas to support the mine roof. The overlying rock gradually settled onto these supports, thus producing subsidence at the surface. In post-1959 longwall mines, room-and-pillar methods have been used to develop the main entries of the mine and panel areas. Modern longwall methods extract 100 percent of the coal in the panel areas (fig. 1H).

SOURCE MAPS

Mine outlines depicted on the map are, whenever possible, based on maps made from original mine surveys. The process of compiling and digitizing the quadrangle map may produce errors of less than 200 feet in the location of mine boundaries. Larger errors of 500 feet or more are possible for mines that have incomplete or inaccurate source maps.

Because of the extreme complexity of some mine maps, detailed features of mined areas have been omitted. The digitized mine boundary includes the exterior boundary of all rooms or entries that were at least 80 feet wide or protruded 500 feet from the main mining area. Unmined areas between mines are shown if they are at least 80 feet wide; unmined blocks of coal within mines are shown if they are at least 400 feet on each side. Original source maps should be consulted when precise information on mine boundaries or interior features is needed.

The mine summary sheet lists the source maps used to determine each mine outline. The completeness of map sources is indicated on the map by a line symbol at the mine boundary. Source maps are organized in five categories.

Final mine map The mine outline was digitized from an original map made from mine surveys conducted within a few months after production ceased. The date of the map and the last reported production are listed on the summary sheet.

Not a final map The mine is currently active or the mine outline was made from a map based on mine surveys conducted more than few months before production ceased. This implies the actual mined-out area is probably larger than the outline on the map. The mine summary sheet indicated the dates of source maps and the last reported production, as well as the approximate tonnage mined between these two dates (if the mine is abandoned). The summary sheet also lists the approximate acreage mined since the date of the map and, in some cases, indicates the area where additional mining may have taken place. This latter information is determined by locating on the map the active faces relative to probable boundaries of the mine property.

Undated map The source map was undated, so it may or may not be based on a final mine survey. When sufficient data are available, the probable acreage of the mined area is estimated from reported production, average seam thickness and a recovery rate comparable to other mines in the area. This information is listed in the summary sheet for the mine.

Incomplete map The source map did not show the entire mine. The summary sheet indicates the missing part of the mine map and the acreage of the unmapped area, which is estimated from the amount of coal known to have been produced from the mine.

Secondary source map The original mine map was not found so the outline shown was determined from secondary sources (e.g., outlines from small-scale regional maps published in other reports). The summary sheet describes the secondary sources.

POINTS AND LABELS

The locations of all known mine openings (shafts, slopes, and drifts) and surface mine tipples are plotted on the map. Tipples are areas where coal was cleaned, stockpiled, and loaded for shipping.

Only openings or tipples are plotted for mines without source maps. If the precise locations of these features are unknown, a special symbol is used to indicate the approximate location of the mine.

Each mine on the map is labeled with the names of the mine and operating company, ISGS mine index number, and years of operation (if known) if space permits. A seam designation is given on maps where more than one seam was mined. For a mine that operated under more than one name, only the most recent name is generally given. When a mine changed names or ownership shortly before closing, an earlier name is listed. All company and mine names are listed on the mine summary sheet in the directory, under the production history segment.

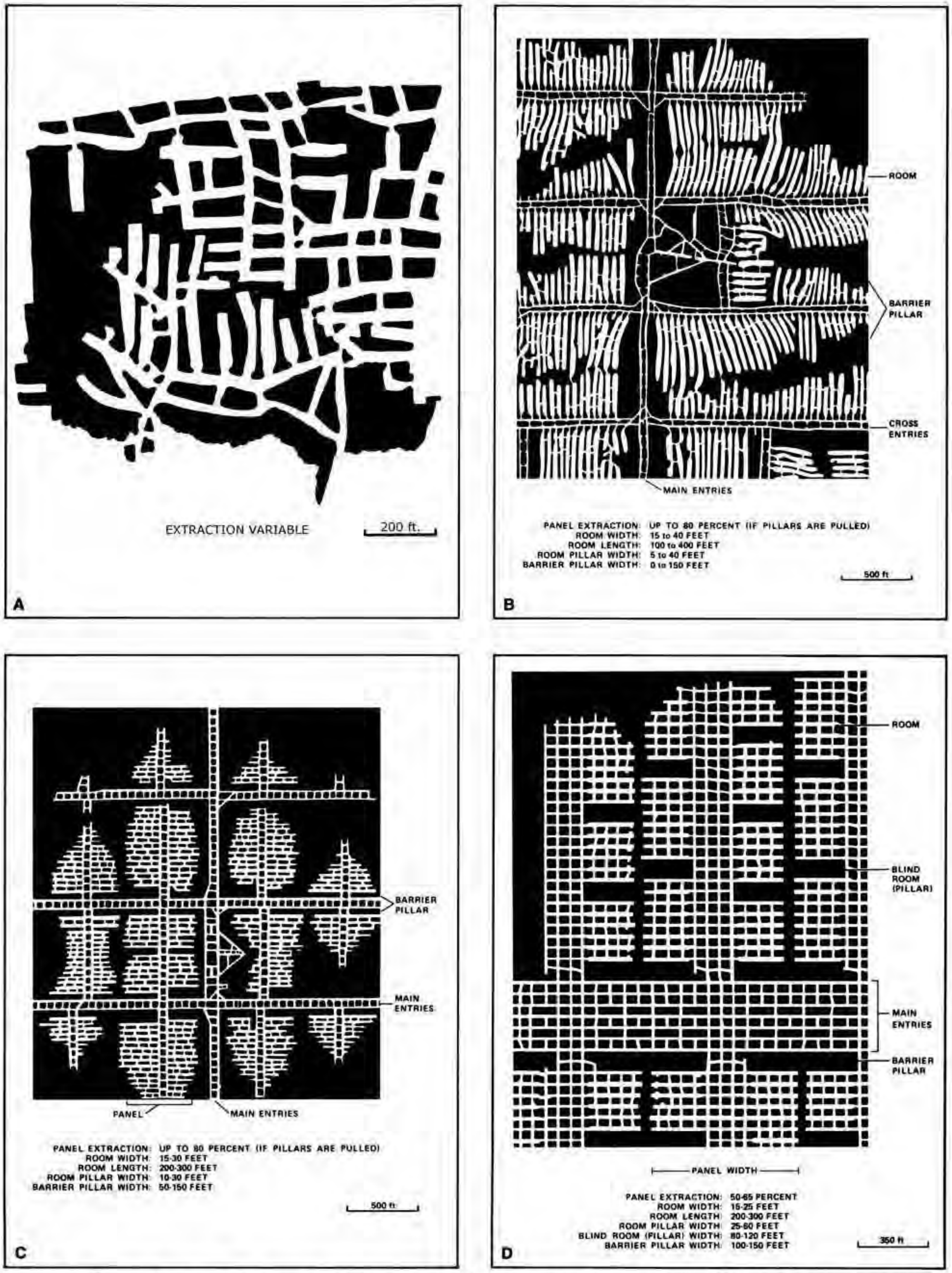

Figure 1 Mining methods: (A) room-and-pillar basic (RPB), (B) modified room and pillar (MRP), (C) room-and-pillar panel (RPP), (D) blind room and pillar (BRP).

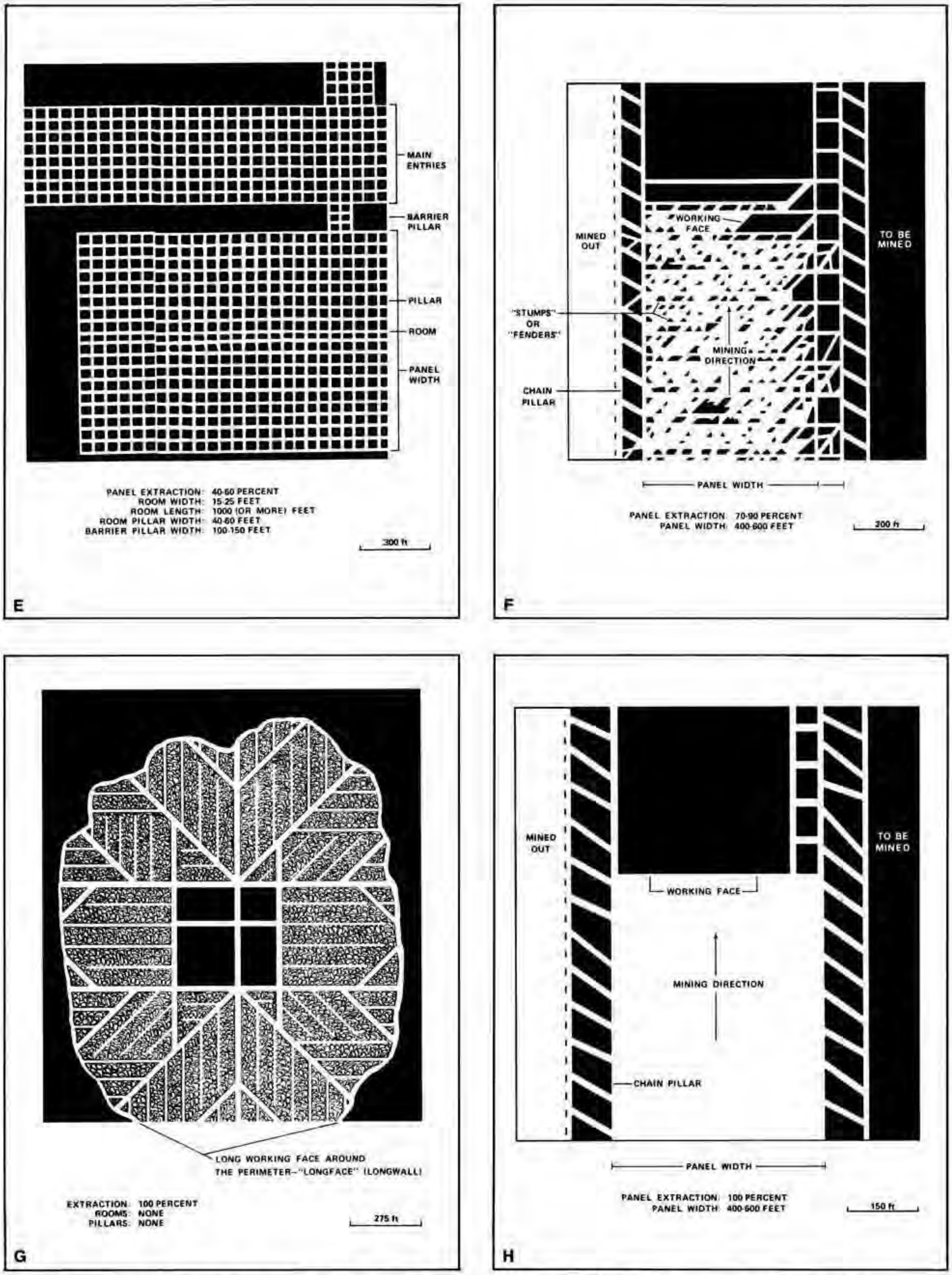

Figure 1 *(cont.)* Mining methods: (E) checkerboard room and pillar (CRP), (F) high extraction retreat (HER), (G) early (pre-1960) longwall, (H) post-1959 longwall

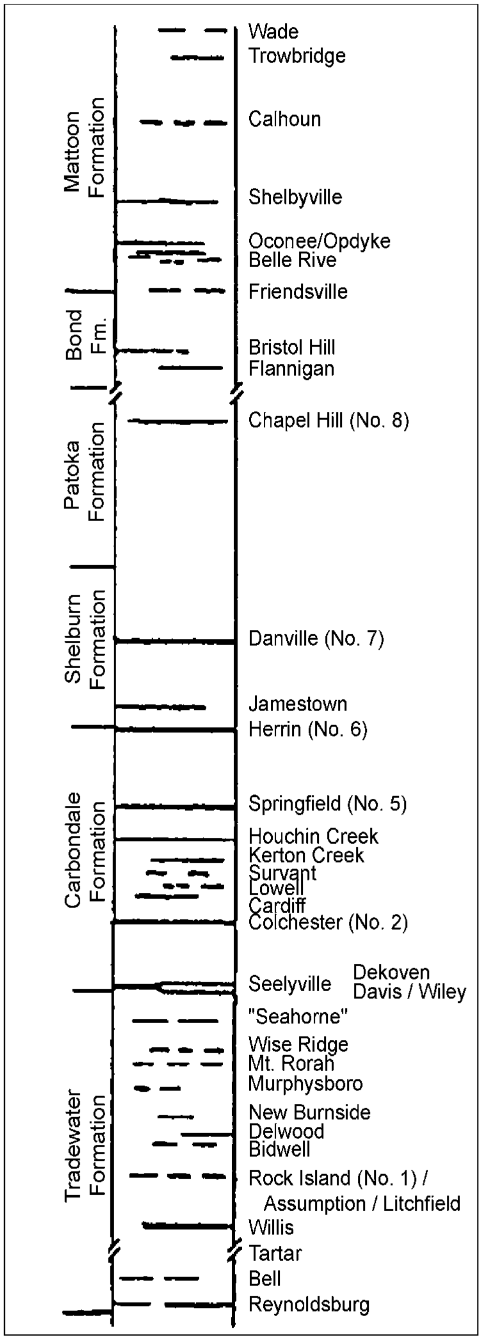

Figure 2 Generalized stratigraphic section, showing approximate vertical relations of coals in Illinois.

INTERPRETING A MINE SUMMARY SHEET

The mine summary sheet is arranged numerically by mine index number. Index numbers are shown on the map and in the mine listing. The mine summary sheet provides the following information (if available).

Company and mine name The last company or owner of the mine is used, unless no production was recorded for the last owner. In that case, the penultimate owner is listed. Mines often have no specific name; in these cases, the company name is also used as the mine name.

Type *Underground* denotes a subsurface mine in which the coal was reached through a shaft, slope, or a drift entry. *Surface* denotes a surface, open pit or strip mine.

Total mined-out acreage shown The total acreage of the mined area mapped, including any acreage mined on adjacent quadrangles, is calculated from the digitized outline of the mine. The acreage of large barrier pillars depicted on the map is excluded from the mined-out acreage. Small pillars not digitized are included in the acreage calculation. If the mine outline is not based on a final mine map, the acreage is followed by an estimate of additional acres that may have been mined. The estimate is determined from reported mine production, approximate thickness of the coal, and recovery rates calculated from nearby mines that used similar mining methods.

SHAFT, SLOPE, DRIFT OR TIPPLE LOCATIONS

Shaft, slope, drift, or tipple locations Locations of all known former entry points to underground mines or the location of coal cleaning, tipple, and shipping equipment used by the mine's facility are listed. The location is described in terms of county, township and range (Twp-Rge), section, and location within the section by quarters. NE SW NW, for instance, would describe the location in the northeast quarter of the southwest quarter of the northwest quarter. When sections are irregular in size, the quarters remain the same size and are oriented (or "registered") from the southeast corner of the section. Approximate footage from the section lines (FEL = from east line, FNL = from north line, for example) is given when that information is known; this indicates a surveyed location and is not derived from maps. Entry points are also plotted on the map and coded for the type of entry or tipple. A mine opening may have had many purposes during the life of the mine. Old hoist shafts are often later used for air and escape shafts; this information is included in the directory when known. The tipple for underground mines was generally located near the main shaft or slope. At surface mines, coal was sometimes hauled to a central tipple several miles from the mine pit.

GEOLOGY

Seam(s) mined The name of the coal seam(s) mined is listed, if known. If multiple seams were mined, they are all listed, although the mined-out area for each seam may be shown on separate maps. Figure 2 shows the stratigraphic section of the coal-bearing interval in Illinois, and the vertical relations among the coals.

Depth The depth to the top of the seam in the vicinity of the shaft is listed, if known. The depth is determined from notes made by geologists who visited the mine during its operation or from drill hole data in ISGS files. Depth generally varies little over the extent of a mine; however, reported depths for an individual mine may vary. Depth for surface-mined coals varies, and is usually represented as a range.

Thickness The approximate thickness of the mined seam is shown, if known. Thickness also comes from notes of geologists who visited the mine during its operation or from borehole data in ISGS files. Minimum, maximum, and average thicknesses are given when this information is available.

Mining method The principal mining method used at the mine (figs. 1A-H) is listed. See the mining methods section at the beginning of this directory for a discussion of this parameter.

Geologic problems reported Any known geologic problems, such as faults, water seepage, floor heaving, and unstable roof, encountered in the mine are reported. This information is from notes made by ISGS geologists who visited the mine, or from reports by mine inspectors published by the Illinois Department of Mines and Minerals, or from the source map(s). Geologic problems are not reported for active mines.

PRODUCTION HISTORY

Production history Tons of coal produced from the mine by each mine owner are totaled. When the source map used for the mine outline is not a final mine map, the tonnage produced since the date of the map is identified. For mines that extend into adjacent quadrangles, the tonnage reported includes areas mined in adjacent quadrangles.

SOURCE OF DATA

Source map This section lists information about the map(s) used to compile the mine outline and the locations of tipples and mine openings. In some cases more than one source map was used. For example, a map drawn before the mine closed may provide better information on original areas of the mine than a later map. When more than one map was used, the bibliography section explains what information was taken from each source.

Date The date of the most recent mine survey listed on the source map is reported.

Original scale The original scale of the source map is listed. Many maps are photo-reductions and are no longer at their original scale. The original scale gives some indication of the level of detail of the mine outline and the accuracy of the mine boundary relative to surface features. Generally, the larger the scale, the greater the accuracy and detail of the mine map. Mine outlines taken from source maps at scales smaller than 1:24,000 may be highly generalized and may well be inaccurately located with respect to surface features.

Digitized scale The scale of the digitized map is reported. The scale may be different from that of the original source map. In many cases the digitized map was made from a photo-reduction of the original source map, or the source map was not in a condition suitable for digitizing and the mine boundaries were transferred to another base map.

Map type Source maps are classified into five categories to indicate the probable completeness of the map. See discussion of source maps in the previous section.

Annotated bibliography Sources that provide information about the mine are listed, with the data taken from each source. Some commonly used sources are described below. Full bibliographic references are given for all other sources. Unless otherwise noted, all sources are available for public inspection at the ISGS.

Coal Reports Published since 1881, these reports contain tabular data on mine ownership, production, employment, and accidents. Some volumes include short descriptions made by mine inspectors of physical features and conditions in selected mines.

Directory of Illinois Coal Mines This source is a compilation of basic data about Illinois coal mines, originally gathered by ISGS staff in the early 1950s. Sources used for this directory are undocumented, but they are primarily Illinois Department of Mines and Minerals annual reports, ISGS mine notes, and coal company officials.

ENR Document 85/01, Guither, H. D., J. K. Hines, and R. A. Bauer, 1985 The Economic Effect of Underground Mining Upon Land Used for Illinois Agriculture: Illinois Department of Energy and Natural Resources Document 85/01, 185 p.

Microfilm map The U.S. Bureau of Mines maintains a microfilm archive of mine maps. A microfilm file for Illinois is available for public viewing at the ISGS.

Mine notes ISGS geologists have visited mines or contacted mine officials throughout the state since the early 1900s. Notes made during these visits range from brief descriptions of the mine location to long narratives (including sketches) of mining conditions and geology.

Federal Land Bank of St. Louis, Preliminary Reports on Subsidence Investigations Mining engineers working for the Federal Land Bank of St. Louis mapped areas of subsidence due to coal mining in the early 1930s. These reports often include county maps of mine properties with mined-out areas including shaft locations, as well as subsidence areas.

REFERENCES

Bauer, R. A., B. A. Trent, and P. B. Dumontelle, 1993, Mine Subsidence in Illinois: Facts for the Homeowner Considering Insurance, Illinois State Geological Survey, Environmental Geology Note 144, 16p.

Guither, H. D., J. K. Hines, and R. A. Bauer, 1985, The Economic Effects of Underground Mining Upon Land Used for Illinois Agriculture, Illinois Department of Energy and Natural Resources Document 85/01, 185p.

PART II DIRECTORY OF MINES IN THE NEW WINDSOR QUADRANGLE

MINE SUMMARY SHEETS

A summary sheet on the geology and production history of each mine in the New Windsor Quadrangle is provided. These summary sheets are arranged numerically by mine index number. Consult Part I for a complete explanation of the data listed in the summary sheet.

Mine Index 232
Shuler Coal Company, Alpha Mine

Type: Underground Total mined-out acreage shown: 638

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Henry	14N 1E	33	SE NE NE
Air shaft	Henry	14N 1E	33	SW NE NE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	265-267	4.0	4.67	4.5	MRP, with RPP

Geologic Problems Reported: A water-bearing portion of the glacial drift caused problems while sinking the shaft. Driving pilings prevented caving while shaft construction was in progress, and the remainder of the shaft construction encountered no difficulties. The roof rock was 0.5 to 2.0 feet of limestone that was locally present from 5 to 8 feet above the coal. The interval between the cap rock and coal consisted of black shale. Shale and pyrite bands were present and difficult to separate from the coal. Pyrite was also seen as nodules and lenses. Some small inclined faults were noted, but these presented little effect on mining.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Shuler Coal Company	Alpha	1922-1939	987,280
Alpha Coal Company	Alpha	1939-1940	17,675
Bugos-White Coal Company	Alpha	1940-1957	1,324,386
Shuler Coal Company	Alpha	1957-1965	651,584
			2,980,925

Last reported production: March 1965

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 351524	3-30-1965	1:2400	1:4303	Final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Henry County) - Mine names, mine index, ownership, years of operation.
Mine notes (Henry County) - Mine type, shaft location, seam, depth, thickness, geologic problems.
Microfilm map, document 351524, reel 03136, frames 278-283 - Shaft locations, mine outline, mining method.

Mine Index 831
Hazel Dell Coal Corporation, Hazel Dell Mine

Type: Underground Total mined-out acreage shown: 100

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	14N 1W	26	NE SE SE
Air shaft	Mercer	14N 1W	26	NE SE SE

GEOLOGY

		Thickness (ft)			Mining
Seam(s) Mined	Depth (ft)	Min	Max	Avg	Method
Rock Island	145	0 *	5.4	4.6	RPP

* The coal was a lenticular deposit. Drilling was done to plan the mine extension, avoiding the thinning coal.

Geologic Problems Reported: The rooms were wide (30 to 50 feet across), but the roof was extremely good and did not require roof bolting. In some rare cases, the roof rock extended downward up to 1 foot into the coal. The seam had a 1 to 3 inch bony coal layer. The sulphur content was about 6% after preparation. The floor was a dark gray siltstone. The floor heaved somewhat at the shaft bottom and toward the western portion of the workings, but not elsewhere.

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Hazel Dell Coal Corporation	Hazel Dell	1958-1973	456,714
			456,714

Last reported production: September 1973

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
Microfilm, document 318790	1-1974	1:2400	1:5296	Final

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, shaft location, seam, thickness, geologic problems.
Microfilm map, document 351418, reel 03136, frame 53 - Shaft locations, mine outline, depth, mining method.

Mine Index 2955
R. W. Peterson, Peterson Mine

Type: Underground   Total mined-out acreage shown: 14   Production indicates approximately 8 acres were mined. The source map merely indicates a general area of mining.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	14N 1W	2	NW NW

GEOLOGY

		Thickness (ft)			Mining
Seam(s) Mined	Depth (ft)	Min	Max	Avg	Method
Rock Island	10-50			2.5-5.5	RP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Andrew Peterson	Peterson	1895-1898 *	1,400
Peterson & Young	Peterson & Young	1898-1899	630
S. J. Young	Young	1899-1908	10,612
F. E. Peterson	Peterson	1908-1909	2,203
J. A. Peterson	Peterson	1909-1911	4,262
R. W. Peterson	Peterson	1911-1921 **	7,646
			26,753

* Idle 1897
** Idle 1917-1920

Last reported production: 1921

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
ISGS Mined Out Area Map, Area 6	1950	approx. 1:130000	1:62500 ***	Secondary source

*** The outline and shaft location drawn on the 1950 Mined Out Area map were designated as "Quade", after John C. Quade who made maps and reports in the mid-1930s for the Federal Land Bank of St. Louis. The scale of the maps included with the Federal Land Bank reports was generally approximately 1:130000, while the 1950 Mined Out Area maps were drawn at 1:62500.

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, seam, depth, thickness, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine type, mine location.
ISGS Mined Out Area Map, Area 6 - Shaft location, mine outline.

Mine Index 2956
Northwestern Clay Manufacturing Company, Northwestern Mine

Type: Underground   Total mined-out acreage shown: 11   Production indicates less than 1 acre was mined. The source map merely indicates a general area of mining.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Main shaft	Mercer	14N 1W	3	SE NW NW

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	40			2.83	RP

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Northwestern Clay Manufacturing Company	Northwestern	1907-1908	75
			75

Last reported production: 1908

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
ISGS Mined Out Area Map, Area 6	1950	approx. 1:130000	1:62500 *	Secondary source

* The outline and shaft location drawn on the 1950 Mined Out Area map were designated as "Quade", after John C. Quade who made maps and reports in the mid-1930s for the Federal Land Bank of St. Louis. The scale of the maps included with the Federal Land Bank reports was generally approximately 1:130000, while the 1950 Mined Out Area maps were drawn at 1:62500.

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation, mine type, seam, depth, thickness, mining method.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine location.
ISGS 1950 Mined Out Area Map, Area 6 - Shaft location, mine outline, mining method.

Mine Index 2986
Swan Young, Young Mine

Type: Underground   Total mined-out acreage shown: 5   Production indicates less than 1 acre was mined.

SHAFT, SLOPE, DRIFT or TIPPLE LOCATIONS

Type	County	Township-Range	Section	Quarters-Footage
Mine	Mercer	15N 1W	35	S ½ SE SE

GEOLOGY

Seam(s) Mined	Depth (ft)	Thickness (ft) Min	Max	Avg	Mining Method
Rock Island	30				Underground

Geologic Problems Reported:

PRODUCTION HISTORY

Company	Mine Name	Years	Production (tons)
Swan Young	Young	1932-1935	467 *
			467

* Production from 1932 and 1933 is not known. Mines producing less than 1,000 tons per year were not listed in the Coal Reports.

Last reported production: 1935

SOURCES OF DATA

Source Map	Date	Original Scale	Digitized Scale	Map Type
ISGS Mined Out Area Map, Area 6	1950	approx. 1:130000	1:62500 **	Secondary source

** The outline and shaft location drawn on the 1950 Mined Out Area map were designated as "Quade", after John C. Quade who made maps and reports in the mid-1930s for the Federal Land Bank of St. Louis. The scale of the maps included with the Federal Land Bank reports was generally approximately 1:130000, while the 1950 Mined Out Area maps were drawn at 1:62500.

Annotated Bibliography (data source, brief description of information)

Coal Reports - Production, ownership, years of operation.
Directory of Illinois Coal Mines (Mercer County) - Mine names, mine index, ownership, years of operation.
Mine notes (Mercer County) - Mine location, seam, depth, years of operation.
ISGS 1950 Mined Out Area map, Area 6 - Mine location, mine outline.

OTHER MINES SHOWN ON NEW WINDSOR QUADRANGLE

Mine Index 6658 NE SW SE 34-T15N-R1W, shaft, Rock Island Coal source: ISGS mined out area, area 6 (1950)

MINES WHOSE LOCATIONS ARE NOT KNOWN, NEW WINDSOR QUADRANGLE

The locations of the following mines are unknown, but the production tonnage, operating names, and nearest town were reported in the Annual Coal Reports. The operators listed below mined in or near the New Windsor Quadrangle. The information shown is similar to that presented on the summary sheets in the previous pages of this directory. The first item is the name the mine operated under as listed in the Coal Report, then the years the mine reported. If no physical data are available, the next item listed is the total tons produced by the mine. If physical data are available, the order of presentation is as follows: type of opening for the mine (drift, slope or shaft), depth of coal in feet, and thickness of coal in feet.

The total tons mined by these unlocated mines is 156,049 (with 154,529 mined underground and 1,520 mined by uncertain method), which would represent between 32 and 65 acres, depending on the recovery factor, mining method, and numerous other factors. (Note: 1 square mile = 640 acres)

ALPHA

Bland (John), 1890-1892, slope, Colchester, 20, 2.5, RP	642 tons

GRIFFIN

Griffin Brothers, pre1878-1895, shaft, Rock Island, 22-35, 2.5, RP	12,060 tons
Griffin (Frank A.) & Company, 1895-1897	4,600 tons
Griffin Clay Manufacturing Company, 1897-1900	7,595 tons
U. S. Clay Manufacturing Company, 1900-1903	7,640 tons
	31,895 tons

NEW WINDSOR

Anderson (John), pre1878-1879, shaft, Rock Island, 12, 2.5 150 tons

McMullen (Horace), pre1878-1879, shaft, Rock Island, 20, 2.25	250 tons
Isaacson (J. M.), pre1878-1879, shaft, Rock Island, 22, 2.25	200 tons
Simelson (Jonas), pre1882-1887, shaft, Rock Island, 25-30, 2.25-2.5, RP	9,840 tons
Birgrin (Charles), 1884-1885, shaft, Rock Island, 35, 2.25, RP	784 tons

Peterson (Charles), 1886-1887, drift, Rock Island, –, 2.5, RP	400 tons
Olson (Andrew), 1887-1888	200 tons
Peterson (P. C.), 1888-1893	3,850 tons
	4,450 tons

Swanson (John), 1886-1888, shaft, Rock Island, 30, 2.5, RP	2,320 tons
Young (Olaf), 1888-1889	700 tons
Brooks (John), 1889-1890	240 tons
	3,260 tons

Young (Olaf), 1892-1893, drift, Rock Island, –, 2.5, RP	100 tons

Carlson (John P.), 1887-1891, drift, Rock Island, –, 2.5, RP	2,172 tons
Johnson (Charles), 1891-1892	640 tons

	2,812 tons
Peterson (John A.), 1892-1893, drift, Rock Island, –, 2.5, RP	440 tons
Young (Swan J.), 1912-1918, slope, Rock Island, 90-91, 2.0, RP	3,417 tons
Knuteson (Charles), 1897-1898, drift, Rock Island, –, 2.5	480 tons

VIOLA

Tidball (J.), 1878-1879, slope, Rock Island, 24, 4.0	1,213 tons
Parks (Russell), pre1879-1888, shaft, Rock Island, 30-35, 4.0, RP	8,260 tons
Blaine (William), pre1879-1888, shaft, Rock Island, 20-32, 3.0-4.0, RP	11,902 tons
Guthrie (Samuel), 1878-1879, drit, Rock Island, 25, 4.0	80 tons
Guthrie (Samuel), 1883-1888, shaft, Rock Island, 41, 4.0, RP	2,675 tons
Guthrie (John), 1888-1889	240 tons
Guthrie (William), 1889-1889	224 tons
Guthrie (Andrew), 1889-1890	480 tons
	3,619 tons
Hunter (Walter), 1878-1879, drift, Rock Island, 50, 4.0	40 tons
Tarr (Henry), pre1878-1879, shaft, Rock Island, 42, 4.5	200 tons
Morrow (John), pre1879-1883, shaft, Rock Island, 48-58, 4.0-4.25	2,890 tons
Martin (Tim) & Drum (John), pre1878-1879, shaft, Rock Island, 44-65, 4.0	924 tons
Martin (Francis M.), 1879-1889	17,104 tons
Martin (Orrick), 1889-1891	4,100 tons
Martin (G. W.), 1891-1893	3,170 tons
Dunn (John), 1893-1898	6,233 tons
	31,531 tons
Pinkerton (William W.), pre1879-1883, shaft, Rock Island, 24-30, 3.0-4.0	1,080 tons
Pinkerton (George W.), pre1881-1883, drift, Rock Island, 31, 4.0	550 tons
Parks (Rufus), pre1881-1882, drift, Rock Island, 15, 4.0	360 tons
Boon (Hopkins), 1881-1882, shaft, Rock Island, 20, 4.0	140 tons
Boon (Hopkins), pre1881-1882, shaft, Rock Island, 61, 4.0	500 tons
Frazier (Hugh B.), pre1881-1883, shaft, Rock Island, 22, 4.0	idle
Collins (W. P.), 1881-1882, shaft, Rock Island, 26, 4.0	300 tons
Guthrie (William), 1882-1885, shaft, Rock Island, 30-32, 3.5-4.0, RP	2,030 tons
Slocum (Clarence), 1883-1884, shaft, Rock Island, 20, 4.0, RP	900 tons
Smith (John), 1883-1884, drift, Rock Island, 20, 4.0, RP	210 tons
Thompson (John), 1883-1884, slope, Rock Island, 30, 3.0, RP	500 tons
Jones (Alvin T.), 1884-1885, shaft, Rock Island, 20, 4.0, RP 420 tons	mrcr 051
Campbell (William), 1885-1886	440 tons
	860 tons

Foster (John W.), 1887-1888	216 tons
McFate (James), 1888-1889	216 tons
	432 tons
Parks (James R.), 1890-1891, drift, Rock Island, –, 4.0, RP	512 tons
Barr (William), 1897-1898, slope, Rock Island, 30, 4.0	2,700 tons
Cameron (Henry), 1898-1899	1,000 tons
	3,700 tons
Campbell (Frank), 1901-1902	1,520 tons
Miller (Ben), 1906-1909, shaft, Rock Island, 20-29, 2.5-3.0, RP	1,760 tons
Grady (Edward), 1906-1907, drift, Rock Island, –, 3.5, RP	80 tons
Mills (T. J.) & Company, 1908-1909, slope or drift, Rock Island, 18, 4.0, RP	500 tons
Gustafson (L.), 1909-1910	300 tons
	800 tons
Langston (George), 1909-1911, drift, Rock Island, –, 3.5, RP	75 tons
Bolt (E. E.), 1910-1911, drift, Rock Island, –, 4.0, RP	302 tons
Dodd (Thomas), 1911-1915, slope or drift, Rock Island, 8-40, 4.0, RP	3,720 tons
Brown (J. M.), 1915-1917, drift, Rock Island, 30, 2.83-3.5, RP	125 tons
Rodansky (William), 1916-1917, slope, Rock Island, 15, 5.33, RP	1,263 tons
Rodamsky (Charles) & Brothers, 1917-1918	2,176 tons
	3,439 tons
Snell & McGimpsey, 1927-1927	400 tons
New Diamond Coal Company, 1940-1943, underground operated by K. Crummy through 1941, then G. Rodamsky	2,142 tons
Martin (Harvey L.), 1941-1942, underground	1,980 tons
Martin (Harvey L.), No. 3 Mine, 1942-1943, underground	633 tons
Black Diamond Coal Company, No. 3 Mine, 1942-1943, underground	4,027 tons
Essley (F. H. & W. F.), 1944-1944	1,022 tons
Miller (Rudy) & Harris (G.), 1944-1946	3,050 tons
M. & H. Coal Company, 1947-1947	445 tons
	8,544 tons

INDEX OF MINES IN THE NEW WINDSOR QUADRANGLE

Appendix L

Jurisdictional Project Grid

Mitigation Strategy No.	Goal	Community	Project Type	Hazard Type	Possible Funding	Project Description	Priority	Lead Contact	Proposed Schedule	Benefit/Cost
1	1	Aledo	Shelter at Mercer County Fairgrounds	Severe Weather	County/ Ag Society	Construct multi-purpose storm shelter in a highly populated area	A	Mayor	2017	High/ High
2	1	Aledo	Shelter for downtown Aledo	Severe Weather	Local/ County	Construct and/or provide adequate renovations to existing buildings downtown	A	Mayor	2017	High/ Low
3	4	Aledo	Generator for WRMJ station & tower	All hazards	WRMJ/ local TIF	Maintain a centralized communication center	A	John Hoscheidt	2016-2017	High/ High
4	1	Aledo	Generator for VFW	Severe Weather	Local/TIF	Provide an adequate building in the event of an emergency	A	Mayor	2016/2017	High/ High
5	3	Alexis	Water main upgrade	Fire protection	FEMA DECO	Install new and upgrade main for ISO	B	Jim Olson	2018-2020	High/ High

Mitigation Strategy No.	Goal	Community	Project Type	Hazard Type	Possible Funding	Project Description	Priority	Lead Contact	Proposed Schedule	Benefit/Cost
6	3	Alexis	Generator for water and for sewer plant	No water and sewer backup	FEMA DECO	Install generator at main well & at sewer plant	B	Jim Olson	2015-2017	High/Medium
7	1	Bay Island	Emergency Evacuation	Flooding	Mercer County EMA, MCHD	Enter contact numbers of residents into a State of Illinois Rapid Electronic Notification (SIREN) "alert by list" template for quick sharing of emergency information with Bay Island residents	J	Brian Mills, Commissioner	For Spring flooding season	High/Low
8	2	Bay Island	Emergency Evacuation	Flooding	PDM Grants	Obtain a portable emergency warning siren for evacuation purposes	B	Brian Mills, Commissioner	For Spring flooding season	High/Low
9	3	Joy	Storm water drainage	Basement flooding/road flooding	FEMA Local CDAP	Replace culverts, clean ditches, install storm water system	B	Mayor, Todd Heath	2017-2025	Medium/High
10	1 & 5	Joy	Generator for well	Water for village and fire department	FEMA DECO	Back-up generator	B	Mayor, Todd Heath	2016-2017	High/Medium

Mitigation Strategy No.	Goal	Community	Project Type	Hazard Type	Possible Funding	Project Description	Priority	Lead Contact	Proposed Schedule	Benefit/Cost
11	1	Keithsburg	Public storm shelter	Safety of residents and visitors	$75,000	24x24 building	A	Mayor, Allen Henshaw	2016-2018	High/Low
12	1 & 5	Keithsburg	Generators	Severe storms	FEMA	Install stand by generators at 5 locations Well-shelter 3 lift stations	A	Mayor, Allen Henshaw	2016-2017	High/Low
13	3	Keithsburg	Culvert replacement App-18 blocks	Draining to prevent flooding	$40,000	Install culvert onto App 20 blocks for storm drainage	A	Mayor, Allen Henshaw	2016-2018	High/Low
14	4	Matherville	Emergency response	All hazards	Local	Education/ Notification Signs at fire station Listing as a shelter	J	Mayor, Steph McMeekan	2016	High/Low
15	1	Matherville	Emergency Response	Tornado Severe Weather	FEMA Local	Provide helmets at school for kids in case of debris (building collapse)	A	Mayor, Steph McMeekan	2016-2018	High/Low
16	3	Matherville	Infrastructure Emergency Response	Dam failure	FEMA Local	Dam upgrades at the lake to bring into compliance	C	Mayor, Steph McMeekan	2017-2019	Moderate/High

Mitigation Strategy No.	Goal	Community	Project Type	Hazard Type	Possible Funding	Project Description	Priority	Lead Contact	Proposed Schedule	Benefit/Cost
17	1	New Boston	Public storm shelter	Tornado Severe weather	FEMA Local	Would like to install an underground shelter for the public	A	Mayor	2018-2019	High/High
18	1,3,5,6	New Boston	Redo Roads	All Hazards	Local	Resurface rough and deteriorating roads	A	Mayor	2016	High/High
19	1	New Boston	2- new storm sirens	Tornado Severe weather	FEMA Local	Add siren pointing in opposite direction at fire department Also a siren by the river. Currently have 1 storm siren, but it is not enough	A	Mayor	2016-2017	High/High
20	1	New Windsor	Generator for water tower pumping station	Tornado Severe Weather Extreme Temp.	FEMA	Install generator	A	Mayor, Mike Peterson	2016-2019	High/Medium
21	3	North Henderson	Water main upgrade	Water flow for fire protection	DECO CDAP	New mains to support fire fighting	B	Mayor, Ron Brown	2017-2020	High

Mitigation Strategy No.	Goal	Community	Project Type	Hazard Type	Possible Funding	Project Description	Priority	Lead Contact	Proposed Schedule	Benefit/Cost
22	1	Seaton	Generators for warming centers	Tornado Severe Weather Ext. Temp.	FEMA	Install generator	A	Fire Chief, Frank Wheeler	2016-2017	High/Mediu m
23	1	Seaton	Storm Siren	Tornado Severe Weather	FEMA	Install updated warning system	A	Mayor, Bob Springer	2018-2019	High/Mediu m
24	1	Sherrard	Infrastructure	All Hazard		Connect water tower in Sherrard to water tower at Fyre Lake	A	Delbert Henry	2016-2019	High/High
25	2	Sherrard	Emergency Response and Infrastructure	All Hazard		Extend existing road, 1st ave, to 310th str to give access to Fyre Lake	A	Delbert Henry	2016-2019	High/High
26	3	Sherrard	Infrastructure Emergency Response	All Hazard		Complete 310th street	A	Delbert Henry	2016-2019	High/High

Mitigation Strategy No.	Goal	Community	Project Type	Hazard Type	Possible Funding	Project Description	Priority	Lead Contact	Proposed Schedule	Benefit/Cost
27	5	Viola	Emergency Response	Tornado Severe Storm Extreme Temp.	FEMA	Ensure each shelter location & emergency response center has generator	B	EMA, Shelter site manager	2016-2021	High/Mediu m
28	1	Viola	Infrastructure	Severe Storm Tornado Wind	FEMA	Damage to existing building that needs demolition-causes life safety issues	B	Village Board	2016-2021	High/High
29	3	Viola	Infrastructure	Flooding Flash Flooding	IDOT USDA FEMA	Determine ways to improve culverts, drainage systems for better water run off	B	Village Board	2016-2021	High/High
30	3	Viola	Emergency Response	All Hazard	IDOT IEMA FEMA	Obtain and have ready all equipment necessary to transportation routes & disaster cleanup	B	Village Board	2016-2021	High/High
31	5	Mercer County	Emergency Response	All Hazard	County State	Assessment office aerial photography update. Last county flight 2003	B	Mary McClellan	2017	Medium/Hig h

Mitigation Strategy No.	Goal	Community	Project Type	Hazard Type	Possible Funding	Project Description	Priority	Lead Contact	Proposed Schedule	Benefit/Cost
32	3	Preemption township	Infrastructure	2 bridges unsafe, roads created with heavy rain and river flooding, low lying roads	IDOT FEMA	Build 2 narrow bridges Rebuild roads	A	Township board	2016	High/High
33	3	Rivoli Township	Infrastructure	Unsafe roads created with heavy rain/ flooding	IDOT FEMA	Rebuild roads	A	Township board	2016	High/High
34	3	Ohio Grove Township	Flood containment system	Flood	FEMA	Install flood control system	A	Road commissioner, Jeff Simpson	2016-2017	Medium/ Medium

Mitigation Strategy No.	Goal	Community	Project Type	Hazard Type	Possible Funding	Project Description	Priority	Lead Contact	Proposed Schedule	Benefit/Cost
35	3	Millersburg Township	More gravel Inject oil	Hazard from Poor roads	State Federal	Upgrade drainage subgrade	A	Township board	2016	High/High
36	3	Abington Township Mercer County	Infrastructure	All hazard	FEMA Local	Replace pilings	A	Township board	Summer 2016	High/High
37	3	Suez Township	More gravel oil	Poor roads	FEMA	Replace pilings	A	Township board	2016	High
38	3	Eliza Township	More gravel	Poor roads	FEMA	rock	A	Township board	2016	High
39	3	Greene Township	More money	Weight lime	IDOT IEMA	Replace bridge	A	Township board	2016	High

APPENDIX M

Plan Maintenance Checklist

We are in the process of conducting our annual evaluation/status update for our Multi-Jurisdictional Hazard Mitigation Plan. Please review the following tasks and complete and return this checklist along with the necessary forms. If you have any questions, please let us know.

Jurisdiction: ______________________________

Prepared By: ______________________________

Title: ______________________ Date: ______________

TASK 1: DAMAGE INFORMATION

Has your jurisdiction sustained any natural hazard-related damages to critical facilities and infrastructure within the last year?

☐ Yes ☐ No ☐ Don't Know

If Yes, please complete and return the attached critical facilities damages questionnaire.

TASK 2: STATUS OF EXISTING PROJECTS/ACTIVITIES

Please look over the attached Mitigation Action Tables for your jurisdiction and determine whether any of the mitigation projects/activities listed have been completed or are in progress (in the planning stages.)

Does your jurisdiction have any mitigation projects/activities in progress (in the planning stages) or completed?

☐ Yes ☐ No

If Yes, please fill out and return the attached Mitigation Action Progress Report for each project/activity that has been completed or is in progress.

Has your jurisdiction undergone any changes in priorities within the last 12 months that would impact the implementation of the listed mitigation projects/activities?

☐ Yes ☐ No

If yes, please detail the changes in priorities.

____

____

____

Plan Maintenance Checklist

TASK 3: IDENTIFICATION OF NEW PROJECTS/ACTIVITIES

Are there any new mitigation projects/activities your jurisdiction would like to see add to the Plan? (Remember, only projects included in the Plan are potentially eligible for federal mitigation projects funding.)

☐ Yes ☐ No

If yes, please complete and return the attached New Mitigation Project Form.

TASK 4: JURISDICTION EVALUATION

Have there been any significant changes in development in your jurisdiction within the last 12 months (i.e. expansion of existing businesses, siting of new businesses, new subdivision development, or expansion of existing subdivisions, demolition of businesses/residents to create green spaces, etc.)

☐ Yes ☐ No

If yes, please specify the type of development changes.

Has your jurisdiction adopted any new/updated policies, plans, regulations, or reports (i.e., comprehensive plans, building codes, zoning ordinance, etc.) that could be incorporated into this Plan?

☐ Yes ☐ No

If yes, please provide the name of the policy, plan, regulation, or report and its purpose.

Were any components of the Hazard Mitigation Plan (i.e., mitigation actions, vulnerability analyses, etc.) integrated into any new/updated policies, plans, regulations, or reports (i.e., comprehensive plans, building codes, zoning ordinance, etc.)?

☐ Yes ☐ No

If yes, please provide the name of the policy, plan, regulation, or report and what component(s) of the hazard mitigation plan were integrated.

Plan Maintenance Checklist

TASK 4: JURISDICTION EVALUATION CONTINUED…

Do any new critical facilities or infrastructure need to be added to your jurisdiction's Critical Facilities Survey?

☐ Yes ☐ No

If yes, please provide the name and address of the facility.

____

____

What are your plans for sharing information on the Plan and its annual progress with your jurisdiction and constituents (i.e., informal presentation at board/council meeting, posting update to social media or website, etc.)?

____

____

Critical Facilities Damage Questionnaire

Supplemental information about ***damages to critical infrastructure/facilities*** (i.e., government buildings, schools, communication towers and radio equipment, water & sewer treatment facilities, hospitals, medical centers, etc.) that have ***taken place*** in the participating jurisdictions and County is needed for the risk assessment/vulnerability analysis portion of the Plan. If you could take a moment and think about the critical infrastructure damages caused by past natural hazard occurrences and provide any available information in the form below, it would be greatly appreciated.

Please complete <u>one record</u> for <u>each natural hazard event that damaged a critical facility</u>. Do not combine multiple events on one record. Additional forms are located on the back of this page. Please return the completed form(s) to Andrea or Zak. Thank you!

Jurisdiction: ______________________________

Prepared By: ______________________ Date: __________

1.) Date of Event (month/day/year if possible)**:** ______________

2.) Critical Facility Damaged: ______________________________

3.) Type of Hazard:

- ☐ thunderstorm (straight-line winds)
- ☐ hail
- ☐ lightning strike
- ☐ heavy rain
- ☐ flood
- ☐ tornado
- ☐ snow storm
- ☐ ice storm
- ☐ extreme cold
- ☐ drought
- ☐ excessive heat
- ☐ landslide
- ☐ sinkhole
- ☐ mine subsidence
- ☐ earthquake
- ☐ levee failure
- ☐ dam failure

4.) Types of Damages: ______________________________

____

5.) Estimate of Damages: $ ______________________________

Mitigation Action Progress Report

As part of the Plan Maintenance "monitoring" phase, the implementation status of each project and activity listed in the Plan for the participating jurisdictions needs to be identified.

1) Please review the Mitigation Action Tables provided for your jurisdiction to determine whether any of the projects/activities listed have been ***"Completed"*** or are ***"In Progress"*** (in the planning stages.)
2) For each project or activity that is ***"Completed"*** or "***In Progress"***, please fill out the following Progress Report.

Jurisdiction: ______________________________

Prepared By: ______________________________

Title: ____________________ Date: ____________________

Progress Report Period	From Date: To Date:
Project/Activity Description	
Responsible Agency	
Project Status	☐ In Progress ☐ Approved by Council/Board ☐ Included in Capital Improvement Plan/Slated for Construction & Implementation ☐ Grant Completed & Submitted ☐ Letting/Contractor Selected ☐ Notice to Proceed Issued ☐ Construction Underway ☐ Anticipated Completion Date: ____________ ☐ Other (please specify): ____________ ☐ Completed ☐ Project Delayed ☐ Project Cancelled

SUMMARY OF PROJECT PROGRESS FOR THIS REPORT PERIOD

What was accomplished during this reporting period for this project?

Were any obstacles, problems or delays encountered?	☐ Yes ☐ No ☐ Don't Know
If Yes, please describe:	

If the project was delayed, is it still relevant?	☐ Yes ☐ No ☐ Don't Know
If Yes, should the project be changed/revised?	

Other comments:

New Hazard Mitigation Projects Form
Multi-Jurisdictional Hazard Mitigation Plan

Participating Jurisdiction ______________________________

Prepared by: ______________________________

Title ______________________________ Date: ______________

	Project Description	Position/Organization Responsible for Implementation & Administration of the Project *(i.e. Mayor / City Council; Public Works Director; Fire Chief / Board of Trustees)*	Time Frame to Complete the Project *(i.e. 1 year; 5 years; 2-5 years)*
1.			
2.			
3.			
4.			

APPENDIX N