

ANNEX A

CLARKE COUNTY

This annex includes jurisdiction-specific information for Clarke County and its participating municipalities. It consists of the following five subsections:

- ❖ A.1 Clarke County Community Profile
 - ❖ A.2 Clarke County Risk Assessment
 - ❖ A.3 Clarke County Vulnerability Assessment
 - ❖ A.4 Clarke County Capability Assessment
 - ❖ A.5 Clarke County Mitigation Strategy
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A.1 CLARKE COUNTY COMMUNITY PROFILE

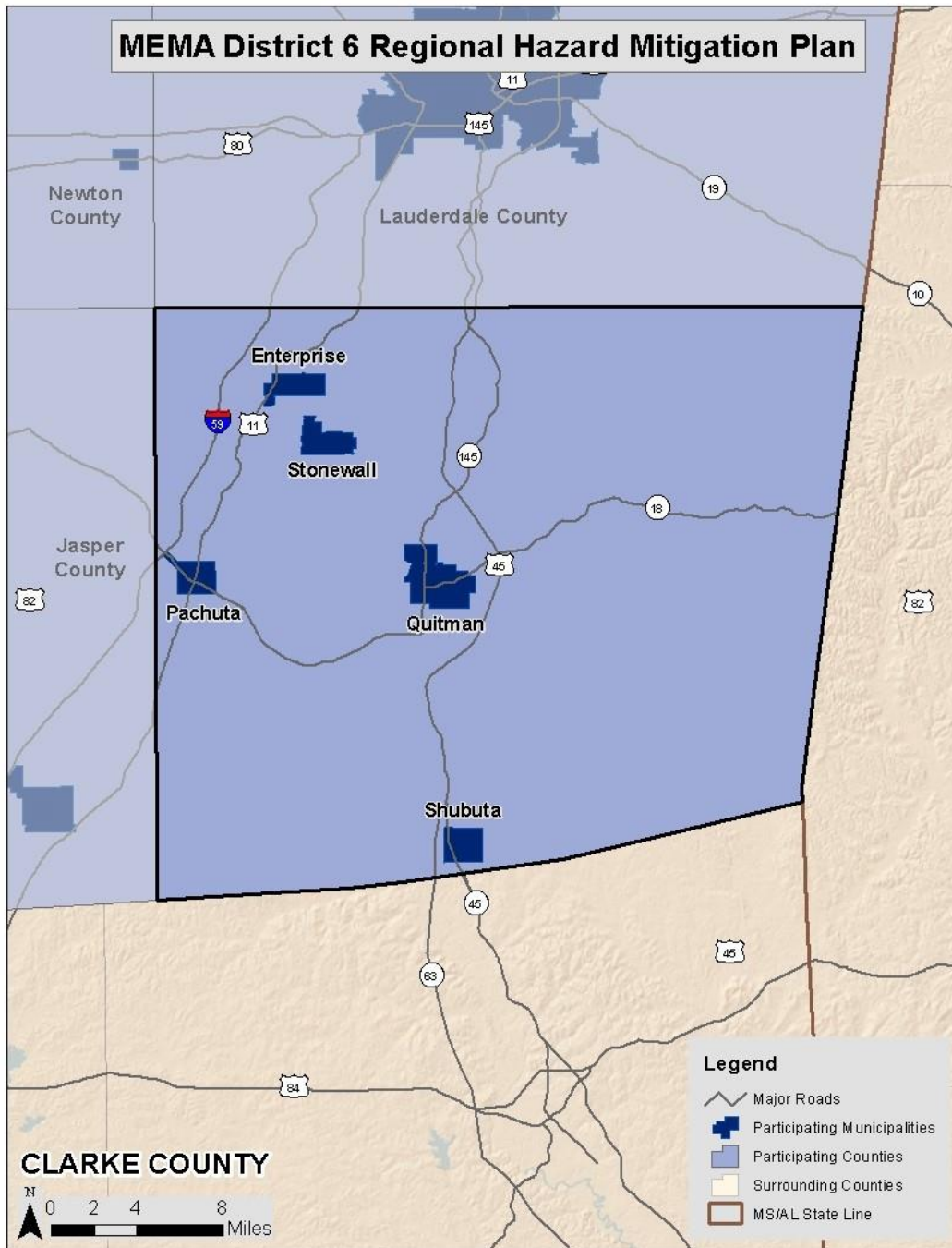
A.1.1 Geography and the Environment

Clarke County is located in eastern Mississippi. It comprises four towns and one city, Town of Enterprise, Town of Pachuta, City of Quitman, Town of Shubuta, and Town of Stonewall, as well as many small unincorporated communities. An orientation map is provided as **Figure A.1**.

The county provides many outdoor recreational activities due to its close proximity to the Chickasawhay River along with cultural opportunities at the historic Mississippi State University Riley Center for Education and Performing Arts. The total area of the county is 694 square miles, 2 square miles of which is water area.

Summer temperatures in the county range from highs of about 90 degrees Fahrenheit (°F) to lows in the upper 60s. Winter temperatures range from highs in the mid-50s to lows around 30°F. Average annual rainfall is approximately 56 inches, with the wettest months being November, December, and May.

Figure A.1: CLARKE COUNTY ORIENTATION MAP



A.1.2 Population and Demographics

According to the 2019 American Community Survey data provided by U.S. Census, Clarke County has a population of 15,770 people. The county has seen a decrease in population between 2010 and 2020, however two municipalities have experienced growth. The population density is 24 people per square mile. Population counts from the US Census Bureau for 2000, 2010, and 2019 for the county and participating jurisdictions are presented in **Table A.1**.

Table A.1: POPULATION COUNTS FOR CLARKE COUNTY

| Jurisdiction | 2000 Census Population | 2010 Census Population | 2019 Census Population | % Change 2010-2019 |
|----------------------|------------------------|------------------------|------------------------|--------------------|
| Clarke County | 17,955 | 16,732 | 15,770 | -5.74% |
| Enterprise | 474 | 526 | 615 | 16.92% |
| Pachuta | 245 | 261 | 143 | -45.21% |
| Quitman | 2,463 | 2,323 | 1,974 | -15% |
| Shubuta | 651 | 441 | 337 | -23% |
| Stonewall | 1,149 | 1,088 | 933 | -14.24% |

Source: United States Census Bureau

Based on the 2019 American Community Survey, the median age of residents of Clarke County is 42.2 years. The racial characteristics of the county are presented in **Table A.2**. Whites make up the majority of the population in the county, accounting for 63.6 percent of the population.

Table A.2: DEMOGRAPHICS OF CLARKE COUNTY

| Jurisdiction | White, Percent (2019) | Black or African American, Percent (2019) | American Indian or Alaska Native, Percent (2019) | Asian, Percent (2019) | Native Hawaiian or Other Pacific Islander, Percent (2019) | Other Race, Percent (2019) | Two or More Races, percent (2019) | Persons of Hispanic Origin, Percent (2019)* |
|----------------------|-----------------------|---|--|-----------------------|---|----------------------------|-----------------------------------|---|
| Clarke County | 63.6% | 35.5% | 0.1% | 0.0% | 0.0% | 0.3% | 0.6% | 0.68% |
| Enterprise | 86.7% | 13.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Pachuta | 62.2% | 37.8% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Quitman | 54.4% | 42.3% | 0.5% | 0.0% | 0.0% | 0.95% | 0.3% | 1.5% |
| Shubuta | 19.3% | 80.7% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0% |
| Stonewall | 80.0% | 20.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.9% |

*Hispanics may be of any race, so also are included in applicable race categories

Source: United States Census Bureau, American Community Survey

A.1.3 Housing

According to the 2019 American Community Survey, there are 8,000 housing units in Clarke County, the majority of which are single family homes or mobile homes. Housing information for the county and five municipalities is presented in **Table A.3**.

Table A.3: HOUSING CHARACTERISTICS OF CLARKE COUNTY

| Jurisdiction | Housing Units (2010) | Housing Units (2019) | Median Home Value (2019) |
|----------------------|----------------------|----------------------|--------------------------|
| Clarke County | 7,876 | 8000 | \$84,900 |
| Enterprise | 250 | 276 | \$110,600 |
| Pachuta | 134 | 134 | \$86,900 |
| Quitman | 1,065 | 1,065 | \$94,000 |
| Shubuta | 217 | 217 | \$54,100 |
| Stonewall | 559 | 559 | \$55,200 |

Source: United States Census Bureau, American Community Survey

A.1.4 Infrastructure

TRANSPORTATION

In Clarke County, Interstate 59 runs north to south allowing transportation in the north western part of the county. U.S. Highway 11 runs roughly north-south through Clarke County. U.S. Highway 45 is a north-south highway from the Gulf of Mexico through Clarke County.

The Clarke County Airport provides limited local service within the county. The closest international airport is Jackson-Evers International Airport, which offers international and domestic flights to a number of locations around the world.

UTILITIES

Electrical power in Clarke County is provided by East Mississippi Electric Power Association and Mississippi Power Company and several local distributors, including Dixie EPA and Southern Pine EPA.

Water and sewer service is provided to residents by the Towns of Enterprise, Pachuta, Shubuta, Stonewall, as well as the City of Quitman. Wautubee Water Association also serves some of the county residents.

COMMUNITY FACILITIES

There are a number of buildings and community facilities located throughout Clarke County. According to the data collected for the vulnerability assessment (Section 6.4.1), there are 7 fire stations, 6 police stations, and 10 public schools located within the county.

There is one hospital located in Clarke County. H.C. Watkins Memorial Hospital is a 25-bed acute medical-surgical hospital located in the City of Quitman.

Recreational opportunities in Clarke County include great hunting, fishing, and golfing as well as local entertainment. Clarko State Park offers camping, cabin rentals and water sports and contains a Lake that allows boat launch, fishing, and water skiing. Archusa Creek Water Park provides fishing opportunities along with camping, boating, swimming, water skiing, and picnicking.

A.1.5 Land Use

Many areas of Clarke County are undeveloped or sparsely developed. There are several small incorporated municipalities located throughout the county, with a few larger hubs interspersed. These areas are where the county's population is generally concentrated. The incorporated areas are also where many of the businesses, commercial uses, and institutional uses are located. Land uses in the balance of the study area generally consist of rural residential development, agricultural uses, and recreational areas,

although there are some notable exceptions in the larger municipalities. Local land use and associated regulations are further discussed in *Section 7: Capability Assessment*.

East Central Planning and Development District assists with Clarke County with planning and development to promote economic growth and job opportunities.

A.1.6 Employment and Industry

According to the 2019 American Community Survey (ACS), in In Clarke County, 50.6 percent of the population 16 and over were employed; 45.6 percent were not currently in the labor force. An estimated 77.4 percent of the people employed were private wage and salary workers; 17.0 percent were federal, state, or local government workers; and 5.1 percent were self-employed in their own (not incorporated) business with 31.8% employed in educational services, and health care and social assistance. The median household income for Clarke County in 2019 was \$43,207, while the state’s median household income for the same period was \$45,081

A.2 CLARKE COUNTY RISK ASSESSMENT

This subsection includes hazard profiles for each of the significant hazards identified in Section 4: *Hazard Identification* as they pertain to Clarke County. Each hazard profile includes a description of the hazard’s location and extent, notable historical occurrences, and the probability of future occurrences. Additional information can be found in Section 5: *Hazard Profiles*.

A.2.1 Flood

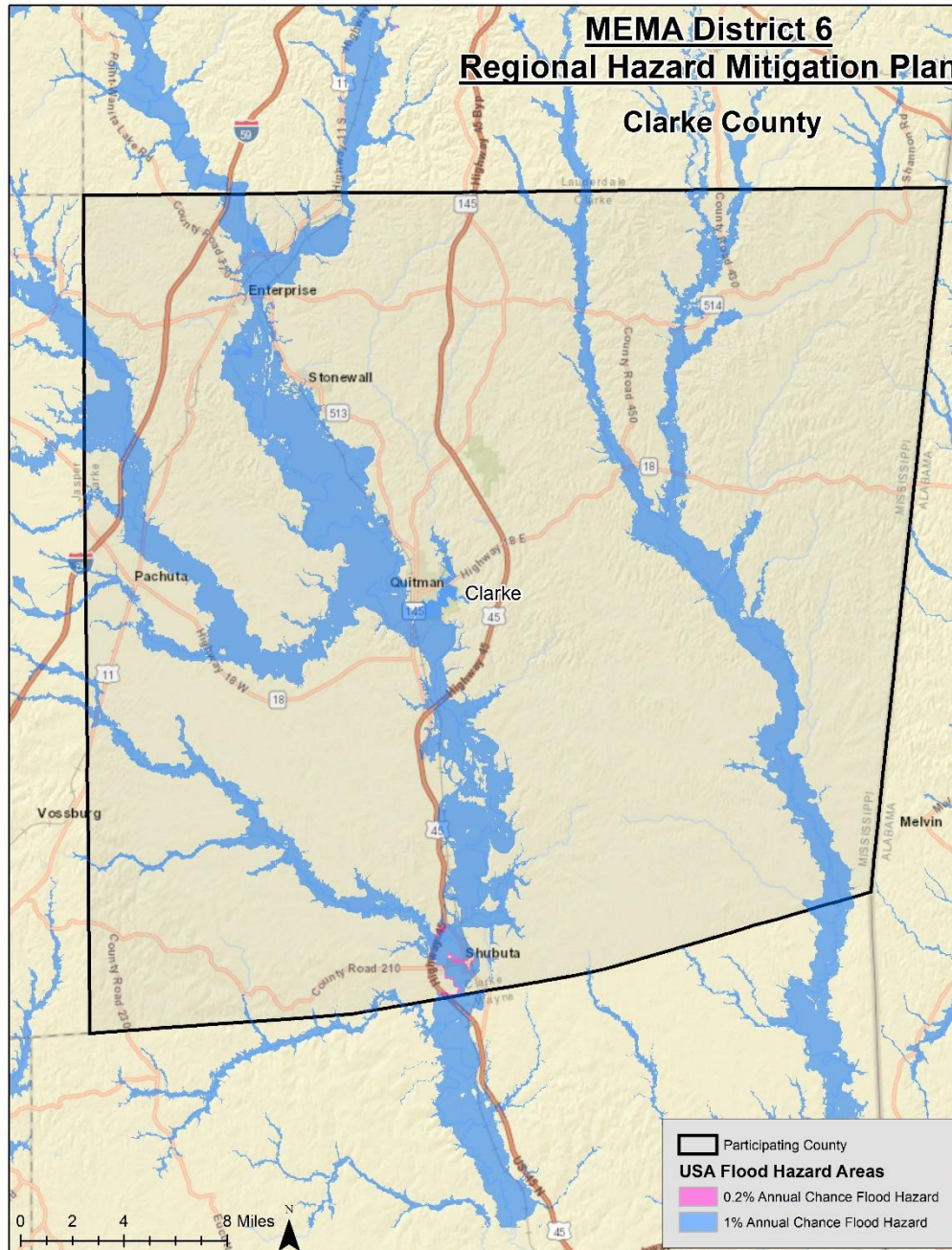
LOCATION AND SPATIAL EXTENT

According to GIS analysis, of the 697 square miles that make up Clarke County, there are 113.2 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 0.3 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain).

These flood zone values account for 16.3 percent of the total land area in Clarke County. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas. **Figure A.2** illustrates the location and extent of currently mapped special flood hazard areas for Clarke County based on best available FEMA Digital Flood Insurance Rate Map (DFIRM) data. Flooding problems in Clarke County are due primarily to overflow of the Chickasawhay River and its major tributaries.¹

¹ FEMA. Flood Insurance Study. September 2011

Figure A.2: SPECIAL FLOOD HAZARD AREAS IN CLARKE COUNTY



Source: Federal Emergency Management Agency

Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 15.8 percent of the total land area in the MEMA District 6 Region.

Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the region was near Lena in Leake County in 1979. Water reached a discharge of 122,000 cubic feet per second and the stream gage height was recorded at 32.2 feet. Additional peak discharge readings and gage heights are in the table below.

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| County | Location/Jurisdiction | Date | Peak Discharge (cfs) | Gage Height (ft) |
|-------------------|---|------------|----------------------|------------------|
| Clarke County | Chickasawhay River at Enterprise | 02/23/1961 | 61,700 | 37.94 |
| | Chickasawhay River near Quitman | April 1900 | 66,000 | 50.91 |
| | Souinlovie Creek near Pachuta | April 1900 | 27,000 | 59.00 |
| | Chickasawhay River at Shubuta | April 1900 | 90,000 | 47.90 |
| Jasper County | Tallahala Creek at Waldrup | 02/06/2004 | 18,900 | 23.17 |
| Kemper County | Hamilton Branch near DeKalb | 04/13/1974 | 662 | 7.58 |
| | Flat Scooba Creek Tributary near Scooba | 04/12/1979 | 427 | 8.87 |
| Lauderdale County | Okatibbee Creek near Meridian | 02/22/1961 | 27,000 | 26.14 |
| Leake County | Pearl River near Carthage | 04/14/1979 | 102,000 | 28.74 |
| | Pearl River near Lena | 04/17/1979 | 122,000 | 32.20 |
| | Tuscolameta Creek at Walnut Grove | 04/08/2003 | 45,800 | 32.08 |
| | Town Creek near Verona | 03/21/1955 | 70,000 | 29.40 |
| Neshoba County | Pearl River at Burnside (unincorporated area) | 04/13/1979 | 76,600 | 23.60 |
| Newton County | Potterchitto Creek at Newton | 04/07/2003 | 8,520 | 18.64 |
| Scott County | Strong River near Morton | 12/24/1974 | 5,600 | 22.00 |
| Smith County | Oakohay Creek at Mize | 04/13/1974 | 28,900 | 17.26 |
| | Leaf River near Raleigh | 04/13/1974 | 17,000 | 28.17 |
| | Leaf River near Taylorsville | 04/14/1974 | 37,600 | 57.44 |

HISTORICAL OCCURRENCES

Floods were at least partially responsible for six disaster declarations in Clarke County in 1973, 1974, 1979, 1990, 2003, and 2011, 2016, 2019, and 2020.² Information from the National Centers for Environmental Information was used to ascertain additional historical flood events. The National Centers for Environmental Information reported a total of 18 events in Clarke.

County since 1998. A summary of these events is presented in **Table A.4**. These events accounted for almost \$4.7 million in property damage in the county. Specific information on flood events, including date, type of flooding, and deaths and injuries, can be found in **Table A.5**.

Table A.4: SUMMARY OF FLOOD OCCURRENCES IN CLARKE COUNTY

| Location | Number of Occurrences | Deaths / Injuries | Property Damage |
|------------|-----------------------|-------------------|-----------------|
| Enterprise | 2 | 0/0 | \$3,002,000 |
| Pachuta | 1 | 0/0 | \$5,000 |
| Quitman | 8 | 0/0 | \$648,000 |
| Shubuta | 1 | 0/0 | \$5,000 |

² A complete listing of historical disaster declarations can be found in Section 4: *Hazard Identification*.

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| | | | |
|----------------------------|-----------|------------|--------------------|
| Stonewall | 5 | 0/0 | \$362,000 |
| Unincorporated Area | 19 | 0/0 | \$653,000 |
| CLARKE COUNTY TOTAL | 18 | 0/0 | \$4,675,000 |

Source: National Centers for Environmental Information

Table A.5: HISTORICAL FLOOD EVENTS IN CLARKE COUNTY

According to the National Centers for Environmental Information, there have been a total of 18 reported flood events in Clarke County with over \$4.675 Million in property damage. These are the most significant flood events reported:

January 8th, 1998 - An emergency spillway on a small dam at the Archusa Water Park failed and sent flood waters down the Chickasawhay river resulting in over \$500,000 in property damage. Water got up around fifty homes, but only twenty five homes were flooded.

March 31st, 2005 - Heavy rains, between 4 and 6 inches, fell across portions of Clarke county during the early morning hours of March 31st. Nearly a dozen county roads were flooded with several being washed out. Reported property damage was \$170,000.

March 9th, 2011 - Significant and widespread heavy rainfall occurred across nearly all of Clarke County. Rainfall totals ranged from 6 to 8 inches. Dozens of roads were flooded with many washed out. Extensive flooding occurred around Quitman with 15 homes and businesses flooded. Water rescues occurred at nearly a dozen homes with people trapped by the flood waters. Across the county, 10 additional homes were flooded. The resulting property damage was in excess of \$3 Million.

March 22nd, 2012 - Shubuta Creek was well out of its banks. Numerous county roads were washed out. Water was over County Road 270. A culvert was washed out and County Road 120 was closed. Property damage was reported to be \$300,000.

March 10th, 2016 - Numerous roads were flooded across Clarke County. Water entered three homes and three inches of water entered the Clarke County EOC. Several roads washed out with other roads impassable between Quitman and Enterprise. Multiple roads were flooded in Quitman. Flooding occurred on County Road 320 and 120 resulting in over \$200,000 in property damage.

HISTORICAL SUMMARY OF INSURED FLOOD LOSSES

According to FEMA flood insurance policy records as of June 2015, there have been 41 flood losses reported in Clarke County through the National Flood Insurance Program (NFIP) since 1978, totaling over \$682,000 in claims payments. A summary of these figures for the county is provided in **Table A.6**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in Clarke County were either uninsured, denied claims payment, or not reported. Available data from the Natural Resources Defense Council (NRDC) reveal that as of September 30, 2019 there were 78 reported NFIP claims totaling \$1,218,834 in Clarke County.

Table A.6: SUMMARY OF INSURED FLOOD LOSSES IN CLARKE COUNTY (2015)

| Location | Flood Losses | Claims Payments |
|----------------------------|--------------|------------------|
| Enterprise | 6 | \$293,457 |
| Pachuta | 0 | \$0 |
| Quitman | 2 | \$18,401 |
| Shubuta | 3 | \$7,781 |
| Stonewall | 7 | \$30,121 |
| Unincorporated Area | 23 | \$332,258 |
| CLARKE COUNTY TOTAL | 41 | \$682,018 |

Source: Federal Emergency Management Agency, National Flood Insurance Program (2015). As of this update, access to more current NFIP data isn't available. The data from 2019 was obtained through a FOIA request by the Natural Resources Defense Council.

REPETITIVE LOSS PROPERTIES

According to the Mississippi Emergency Management Agency, there are four non-mitigated repetitive loss properties located in Clarke County, which accounted for nine losses and almost \$233,000 in claims payments under the NFIP. The average claim amount for these properties is \$25,845. Of the four properties, three are single family and one is non-residential. Without mitigation, these properties will likely continue to experience flood losses. **Table A.7** presents detailed information on repetitive loss properties and NFIP claims and policies for Clarke County.

Table A.7: REPETITIVE LOSS PROPERTIES IN CLARKE COUNTY (2015)

| Location | Number of Properties | Types of Properties | Number of Losses | Building Payments | Content Payments | Total Payments | Average Payment |
|------------|----------------------|------------------------------------|------------------|-------------------|------------------|----------------|-----------------|
| Enterprise | 2 | 1 single family; 1 non-residential | 5 | \$188,107 | \$33,376 | \$221,482 | \$44,296 |
| Pachuta | 0 | -- | 0 | \$0 | \$0 | \$0 | \$0 |
| Quitman | 0 | -- | 0 | \$0 | \$0 | \$0 | \$0 |
| Shubuta | 0 | -- | 0 | \$0 | \$0 | \$0 | \$0 |

| Location | Number of Properties | Types of Properties | Number of Losses | Building Payments | Content Payments | Total Payments | Average Payment |
|----------------------------|----------------------|---------------------|------------------|-------------------|------------------|------------------|-----------------|
| Stonewall | 0 | -- | 0 | \$0 | \$0 | \$0 | \$0 |
| Unincorporated Area | 2 | 2 single family | 4 | \$11,125 | \$0 | \$11,125 | \$2,781 |
| CLARKE COUNTY TOTAL | 4 | | 9 | \$199,232 | \$33,376 | \$232,608 | \$25,845 |

Source: National Flood Insurance Program

PROBABILITY OF FUTURE OCCURRENCES

Flood events will remain a threat in Clarke County, and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The participating jurisdictions and unincorporated areas have risk to flooding, though not all areas will experience flood. The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above, which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain).

It can be inferred from the floodplain location maps, previous occurrences, and repetitive loss properties that risk varies throughout the county. For example, the Town of Shubuta has more floodplain and thus a higher risk of flood than the other municipalities. Flood is not the greatest hazard of concern but will continue to occur and cause damage. Therefore, mitigation actions may be warranted, particularly for repetitive loss properties.

A.2.2 Erosion

LOCATION AND SPATIAL EXTENT

Erosion in Clarke County is typically caused by flash flooding events. Unlike coastal areas, areas of concern for erosion in Clarke County are primarily rivers and streams. Generally, vegetation helps to prevent erosion in the area, and it is not an extreme threat to the county. No areas of concern were reported by the hazard mitigation council.

HISTORICAL OCCURRENCES

Several sources were vetted to identify areas of erosion in Clarke County. This includes searching local newspapers, interviewing local officials, and reviewing previous hazard mitigation plans. No historical erosion occurrences were found in these sources.

PROBABILITY OF FUTURE OCCURRENCES

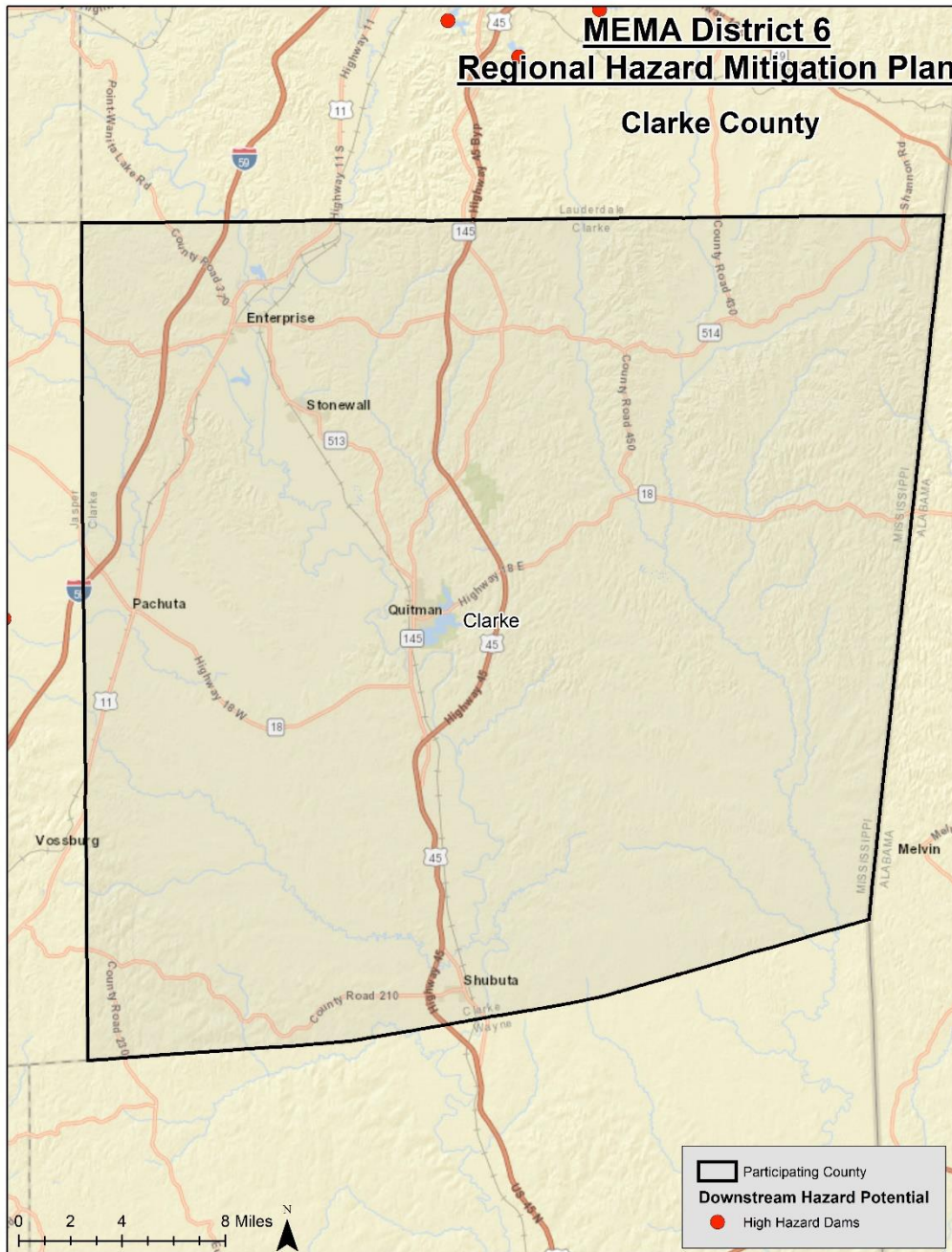
Erosion remains a natural, dynamic, and continuous process for Clarke County, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annually).

A.2.3 Dam and Levee Failure

LOCATION AND SPATIAL EXTENT

According to the U.S. Army Corps of Engineers' National Inventory of Dams, there are no high hazard dams in Clarke County (**Table A.8**). **Figure A.3** shows the location of other nearby high hazard dams.

Figure A.3: CLARKE COUNTY HIGH HAZARD DAM LOCATIONS



Source: U.S. Army Corps of Engineers – National Inventory of Dams (NID)

Table A.8: CLARKE COUNTY HIGH HAZARD DAMS

| Dam Name | Hazard Potential |
|----------------------|------------------|
| Clarke County | |
| NONE | N/A |

HISTORICAL OCCURRENCES

There is no record of dam breaches in Clarke County.

PROBABILITY OF FUTURE OCCURRENCES

Given the current dam inventory and historic data, a dam breach is possible (between 1 and 10 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events.

A.2.4 Winter Storm and Freeze

LOCATION AND SPATIAL EXTENT

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. Clarke County is not accustomed to severe winter weather conditions and rarely receives severe winter weather, even during the winter months. Events tend to be mild in nature; however, even relatively small accumulations of snow, ice, or other wintry precipitation can lead to losses and damage due to the fact that these events are not commonplace. Given the atmospheric nature of the hazard, the entire county has uniform exposure to a winter storm.

The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in the MEMA District 6 Region. However, the greatest snowfall reported in Meridian (north of the region) was 14.0 inches in 1963. In February 2021, the region experienced winter weather with heavy snow up to three inches. Transportation was greatly impacted.

HISTORICAL OCCURRENCES

According to the National Centers for Environmental Information, there have been a total of six recorded winter storm events in Clarke County since 1996 (**Table A.9**). These events resulted in over \$727,000 in damages. Detailed information on the recorded winter storm events can be found in **Table A.10**.

Table A.9: SUMMARY OF WINTER STORM EVENTS IN CLARKE COUNTY

| Location | Number of Occurrences | Deaths / Injuries | Property Damage |
|---------------|-----------------------|-------------------|-----------------|
| Clarke County | 10 | 0/0 | \$885,000 |

Source: National Centers for Environmental Information

Table A.10: HISTORICAL WINTER STORM IMPACTS IN CLARKE COUNTY

| Location | Date | Type | Deaths / Injuries | Property Damage* |
|-------------------|------|------|-------------------|------------------|
| Enterprise | | | | |
| None Reported | -- | -- | -- | -- |

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| Pachuta | | | | |
|----------------------|----|----|----|----|
| <i>None Reported</i> | -- | -- | -- | -- |

| Location | Date | Type | Deaths / | Property Damage* |
|----------------------------|-----------|-------------------|----------|------------------|
| Quitman | | | | |
| None Reported | -- | -- | -- | -- |
| Shubuta | | | | |
| None Reported | -- | -- | -- | -- |
| Stonewall | | | | |
| None Reported | -- | -- | -- | -- |
| Unincorporated Area | | | | |
| CLARKE (ZONE) | 2/1/1996 | Ice Storm | 0/0 | \$152,096 |
| CLARKE (ZONE) | 1/1/2002 | Heavy Snow | 0/0 | \$6,633 |
| CLARKE (ZONE) | 1/19/2008 | Heavy Snow | 0/0 | \$0 |
| CLARKE (ZONE) | 1/1/2010 | Cold / Wind Chill | 0/0 | \$200,000 |
| CLARKE (ZONE) | 2/11/2010 | Heavy Snow | 0/0 | \$547,194 |
| CLARKE (ZONE) | 1/9/2011 | Ice Storm | 0/0 | \$21,218 |
| CLARKE (ZONE) | 1/28/2014 | Heavv Snow | 0/0 | \$0 |
| CLARKE (ZONE) | 1/6/2017 | Winter Weather | 0/0 | \$10,000 |
| CLARKE (ZONE) | 12/7/2017 | Heavv Snow | 0/0 | \$50,000 |
| CLARKE (ZONE) | 1/16/2018 | Winter Weather | 0/0 | \$0 |

*All damage may not have been reported.

Source: National Centers for Environmental Information

There have been several severe winter weather events in Clarke County. The text below describes one of the major events and associated impacts on the county. Similar impacts can be expected with severe winter weather.

January 2008 Winter Storm -

This storm produced heavy snow across the region, with an average of three to four inches of snow. Some heavier amounts, between four to five inches, also fell in isolated areas. At the height of the snow, temperatures fell to near freezing, and accumulations occurred on roadways resulting in a number of traffic accidents. Additionally, some power outages occurred in the heaviest snow band due to the weight of wet snow on limbs and lines.

Winter storms throughout the planning area have several negative externalities including hypothermia, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could to fire or an accumulation of toxic fumes.

February 2010 Heavy Snow –

At the National Weather Service office, a total of 4.7 inches of snow fell during the event. This is the 2nd largest February snowfall event and the 10th overall largest snowfall event on record. This heavy snow event was not just a local event. Heavy snow spanned a large portion of the South with a substantial swath of 3 to 6 inches which fell from north-central Texas through north and central Louisiana, central and southern Mississippi, Alabama and Georgia.

February 2021 Ice Storm

As an arctic air mass continued to build southward across the South on February 17th, another wave of precipitation overspread this cold air mass across much of Mississippi. The main impacts across central and southern portions of the state were from freezing rain and resulting heavy icing, but some significant

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accumulations of sleet and snow also occurred in areas mainly north and west of the Natchez Trace. Freezing rain continued through the evening hours, ending from west to east by the early morning of February 18th. Ice accumulated quickly in many locations and downed numerous trees, large limbs, and power lines across the affected areas. Several trees and limbs fell onto power lines, resulting in more widespread power outages as well. Some trees fell onto homes or cars, and significant amounts of ice, sleet, and snow collapsed a few gas station awnings and roofs where accumulations were greatest. In the hardest hit areas, extensive damage to trees and power lines took several months and cost several hundred thousands of dollars to clean up.

PROBABILITY OF FUTURE OCCURRENCES

Winter storm events will continue to occur in Clarke County. According to historical information, the annual probability is likely (between 10 and 100 percent).

FIRE-RELATED HAZARDS

A.2.5 Drought / Heat Wave

Drought

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. Furthermore, it is assumed that Clarke County would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment but may exacerbate wildfire conditions.

Heat Wave

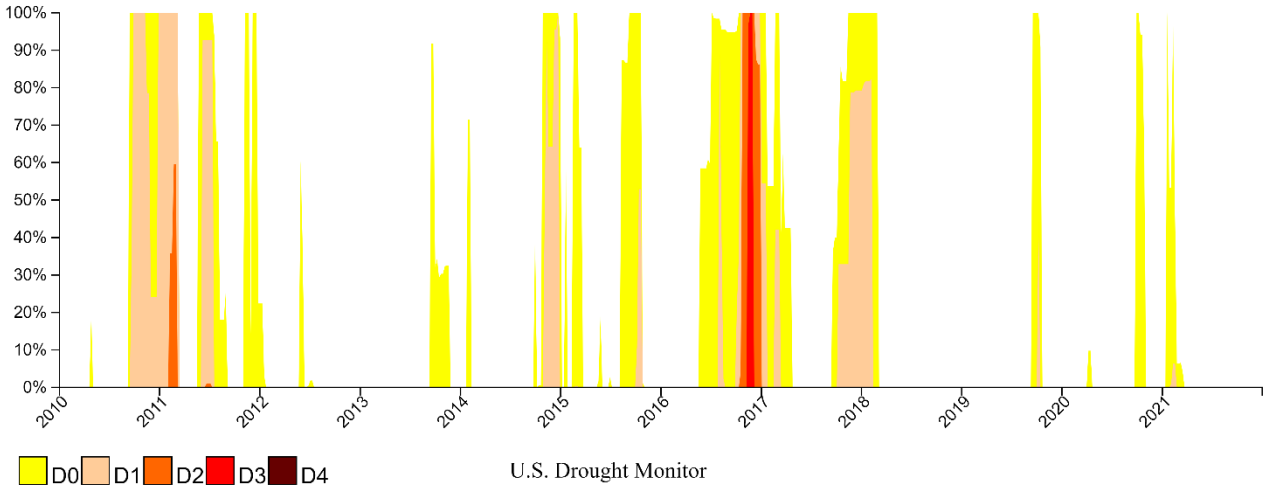
Heat waves typically impact a large area and cannot be confined to any geographic or political boundaries.

HISTORICAL OCCURRENCES

Drought

Table A.11 shows the most severe drought classification for each year, according to U.S. Drought Monitor classifications. It should be noted that the U.S. Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional but a majority of the county may actually be in a less severe condition.

Table A.11: HISTORICAL DROUGHT OCCURRENCES IN CLARKE COUNTY



Source: United States Drought Monitor

Some additional anecdotal information was provided from the National Centers for Environmental Information on droughts in Clarke County.

Summer 2006 – During a four-and-a-half-month period, from June to the middle of October, abnormally dry conditions prevailed across most of Jackson, MS County Warning Area (CWA). The drought had a significant impact on the agricultural industry. Non-irrigated crops were destroyed and all other sustainable crops produced a below normal yield. Catfish ponds were drawn down to severe levels and required water to be pumped back into the fish ponds. The cattle industry suffered due to low watering ponds and lack of sufficient grasslands for grazing and hay production. Water supply problems were encountered by those cities who obtained water from local rivers for drinking purposes due to the low river flows. Fire threat was significant causing the issuance of burn bans across the CWA.

Summer 2007 – By the middle of April, drought conditions were being experienced across a large portion of Eastern and some of Central Mississippi. During the month of May, the drought worsened and expanded. In June, the drought peaked across the region. Although drought conditions continued throughout July and August, conditions were less severe than earlier in the summer. As a result of these conditions, area farmers and crop yields were affected.

October 2010 – Very dry conditions continued across central Mississippi during most of October. Crops were put under stress under the warm and dry conditions. The likely impact was less crop yields for harvest time.

Heat Wave

The National Centers for Environmental Information was used to determine historical heat wave occurrences in the county.

July 2005 – A five-day heat wave occurred across the region. Heat index values reached near 110 degrees each day. Each day had high temperatures ranging from 95 to 99 degrees. This was the warmest stretch of weather the area experienced since July 2001.

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August 2005 –A heat wave covering the south began in mid-August and lasted about 10 days. High temperatures were consistently over 95 degrees and surpassed 100 degrees or more on some days. It was the first time since August 2000 that 100-degree temperatures reached the area.

July 2006 – A short heat wave impacted most of the area temperatures in the 90s to around 100 for five straight days.

August 2007 – A heat wave gripped most of the area with the warmest temperatures since 2000. It lasted from August 5th to the 16th.

August 2010 – The combination of high humidity and above normal temperatures produced heat index readings ranged between 105 and 109 degrees during the afternoon hours in the middle part of August.

PROBABILITY OF FUTURE OCCURRENCES

Drought

Based on historical occurrence information, it is assumed that Clarke County has a probability level of likely (between 10 and 100 percent annual probability) for future drought events. However, the extent (or magnitude) of drought and the amount of geographic area covered by drought, varies with each year. Historic information indicates that there is a much lower probability for extreme, long-lasting drought conditions.

Heat Wave

Based on historical occurrence information, it is assumed that all of Clarke County has a probability level of likely (between 10 and 100 percent annual probability) for future heat wave events.

A.2.6 Wildfire

LOCATION AND SPATIAL EXTENT

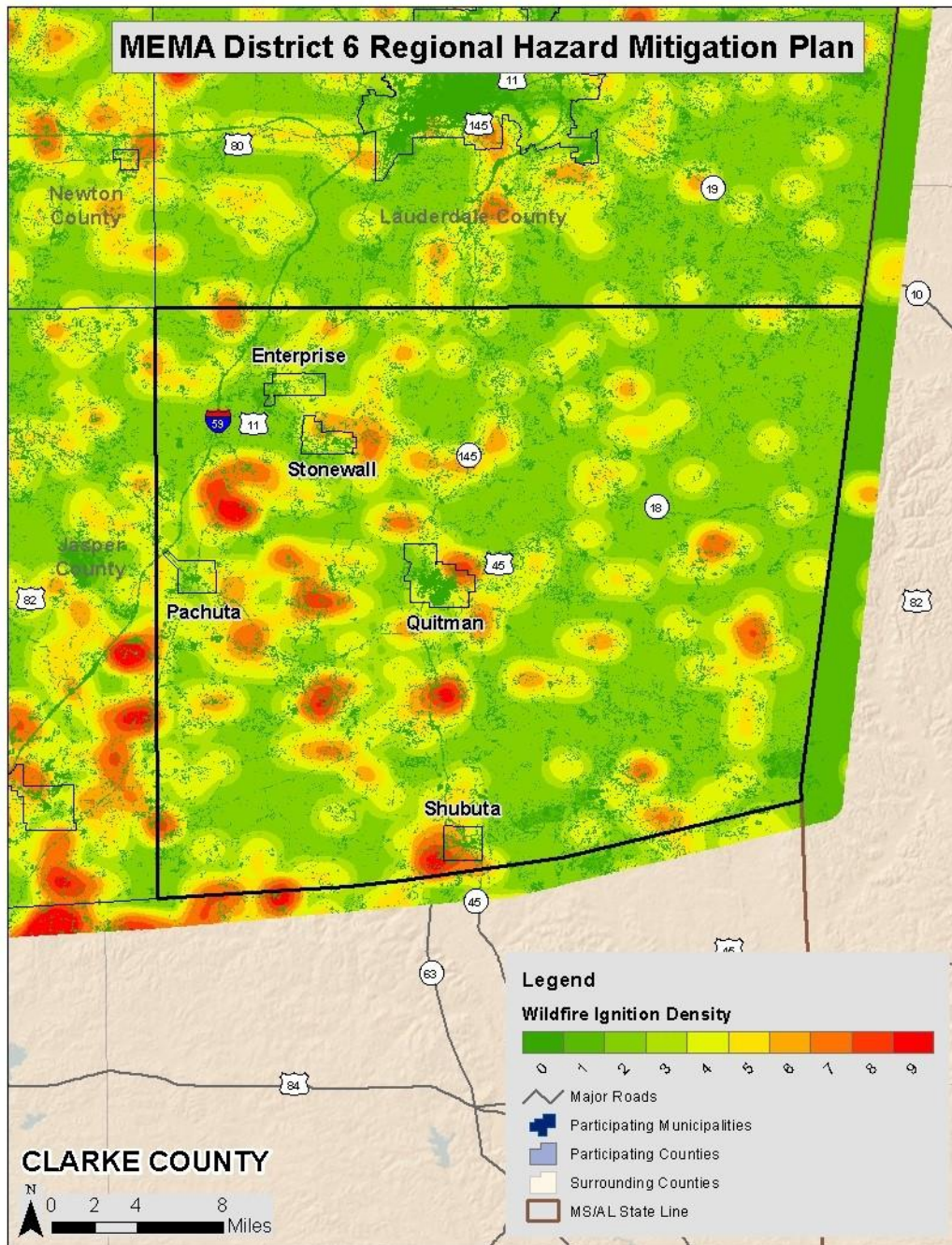
The entire county is at risk to a wildfire occurrence. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the urban-wildland interface are particularly susceptible to fire hazard as populations abut formerly undeveloped areas. The Wildfire Ignition Density data shown in the figure below give an indication of historic location.

HISTORICAL OCCURRENCES

Figure A.4 shows the Wildfire Ignition Density in Clarke County based on data from the Southern Wildfire Risk Assessment. This data is based on historical fire ignitions and the likelihood of a wildfire igniting in an area. Occurrence is derived by modeling historic wildfire ignition locations to create an average ignition rate map. This is measured in the number of fires per year per 1,000 acres.³

³ Southern Wildfire Risk Assessment, 2021.

Figure A.4: WILDFIRE IGNITION DENSITY IN CLARKE COUNTY



Source: Southern Wildfire Risk Assessment

Based on data from the Mississippi Forestry Commission from 2005 to 2014, Clarke County experiences an average of 36 wildfires annually which burn an average of 394 acres per year. The data indicates that most of these fires are small, averaging 11 acres per fire. **Table A.12** provides a summary of wildfire occurrences in Clarke County and **Table A.13** lists the number of reported wildfire occurrences in the county between the years 2011 and 2020. Jurisdiction specific information is not available due to Mississippi Forestry Commission providing only county level data.

Table A.12: SUMMARY TABLE OF ANNUAL WILDFIRE OCCURRENCES (2015-2021)*

| | Clarke County |
|---|---------------|
| Average Number of Fires per year | 15 |
| Average Number of Acres Burned per year | 194 |
| Average Number of Acres Burned per fire | 12.9 |

*These values reflect averages over a 5-year period.

Source: Mississippi Forestry Commission

Table A.13: HISTORICAL WILDFIRE OCCURRENCES IN CLARKE COUNTY

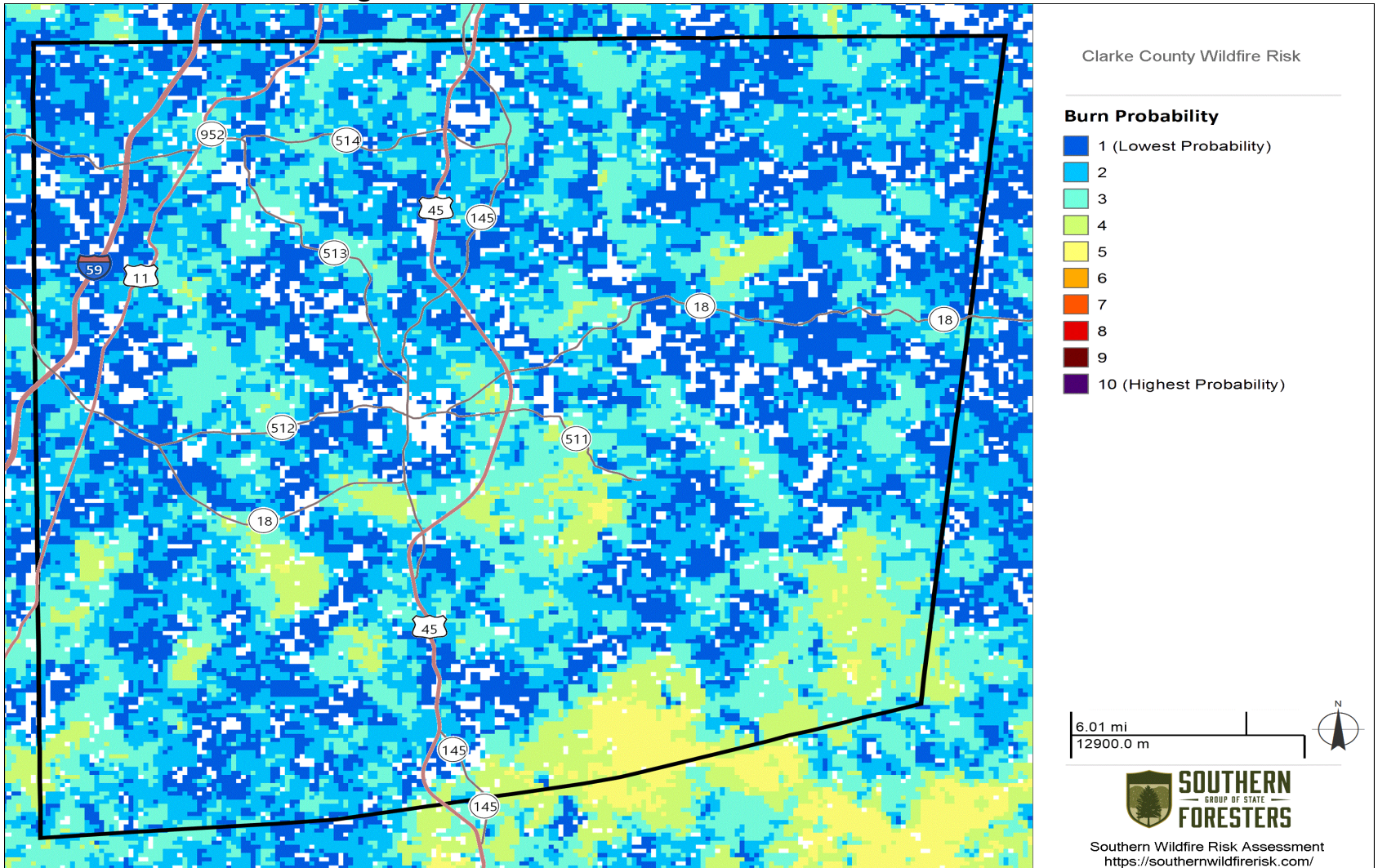
| Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|------------------------|------|------|------|------|------|------|------|------|------|------|
| CLARK | | | | | | | | | | |
| Number of Fires | 42 | 10 | 12 | 20 | 24 | 29 | 9 | 5 | 19 | 8 |
| Number of Acres Burned | 368 | 77 | 172 | 193 | 249 | 268 | 163 | 64 | 332 | 49 |

Source: Mississippi Forestry Commission

PROBABILITY OF FUTURE OCCURRENCES

Wildfire events will be an ongoing occurrence in Clarke County. **Figure A.5** shows that there is some probability a wildfire will occur throughout the county. However, the likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to Clarke County for future wildfire events is highly likely (100 percent annual probability).

Figure A.5: BURN PROBABILITY IN CLARKE COUNTY



Source: Southern Wildfire Risk Assessment

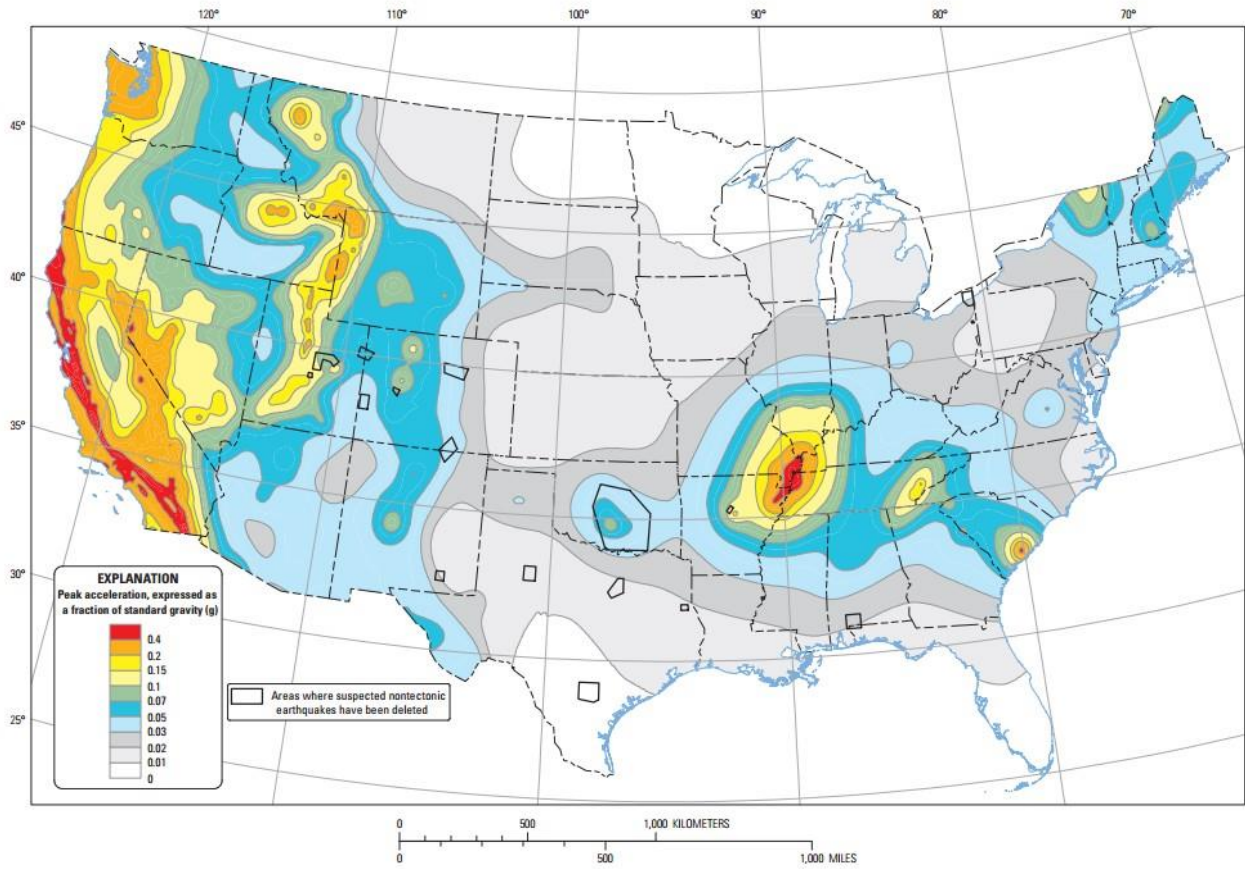
GEOLOGIC HAZARDS

A.2.7 Earthquake

LOCATION AND SPATIAL EXTENT

Figure A.6 shows the intensity level associated with Clarke County, based on the national USGS map of peak acceleration with 10 percent probability of exceedance in 50 years. It is the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 10 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards. According to this map, Clarke County lies within an approximate zone of level “2” to “3” ground acceleration. This indicates that the county exists within an area of moderate seismic risk.

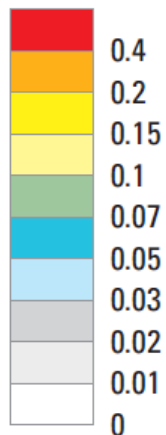
Figure A.6: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Ten-percent probability of exceedance in 50 years map of peak ground acceleration

EXPLANATION

Peak acceleration, expressed as a fraction of standard gravity (g)



Areas where suspected nontectonic earthquakes have been deleted

Source: United States Geological Survey, 2014

HISTORICAL OCCURRENCES

At least one earthquake is known to have affected Clarke County since 1886. This measured a II on the Modified Mercalli Intensity (MMI) scale. **Table A.14** provides a summary of earthquake events reported by the National Geophysical Data Center between 1638 and 1985. **Table A.15** presents a detailed occurrence of each event including the date, distance for the epicenter, magnitude and Modified Mercalli Intensity (if known).⁴

No earthquakes have occurred in the planning area since the last plan update. This was also confirmed during planning meetings with participants.

Table A.14: SUMMARY OF SEISMIC ACTIVITY IN CLARKE COUNTY

| Location | Number of Occurrences | Greatest MMI Reported | Richter Scale Equivalent |
|----------------------------|-----------------------|-----------------------|--------------------------|
| Enterprise | 1 | II | < 4.2 |
| Pachuta | 0 | -- | -- |
| Quitman | 0 | -- | -- |
| Shubuta | 0 | -- | -- |
| Stonewall | 0 | -- | -- |
| Unincorporated Area | 0 | -- | -- |
| CLARKE COUNTY TOTAL | 1 | II (feeble) | < 4.2 |

Source: National Geophysical Data Center

Table A.15: SIGNIFICANT SEISMIC EVENTS IN CLARKE COUNTY (1638 -1985)

| Location | Date | Epicentral Distance | Magnitude | MMI |
|----------------------------|----------|---------------------|-----------|-----|
| Enterprise | | | | |
| Enterprise | 9/1/1886 | 829.0 km | Unknown | II |
| Pachuta | | | | |
| None Reported | -- | -- | -- | -- |
| Quitman | | | | |
| None Reported | -- | -- | -- | -- |
| Shubuta | | | | |
| None Reported | -- | -- | -- | -- |
| Stonewall | | | | |
| None Reported | -- | -- | -- | -- |
| Unincorporated Area | | | | |
| None Reported | -- | -- | -- | -- |

Source: National Geophysical Data Center

PROBABILITY OF FUTURE OCCURRENCES

⁴ Due to reporting mechanisms, not all earthquake events were recorded during this time. Furthermore, some are missing data, such as the epicenter location, due to a lack of widely used technology. In these instances, a value of “unknown” is reported.

ANNEX A: CLARKE COUNTY

The probability of significant, damaging earthquake events affecting Clarke County is unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the county. The annual probability level for the county is estimated to be between 1 and 10 percent (possible).

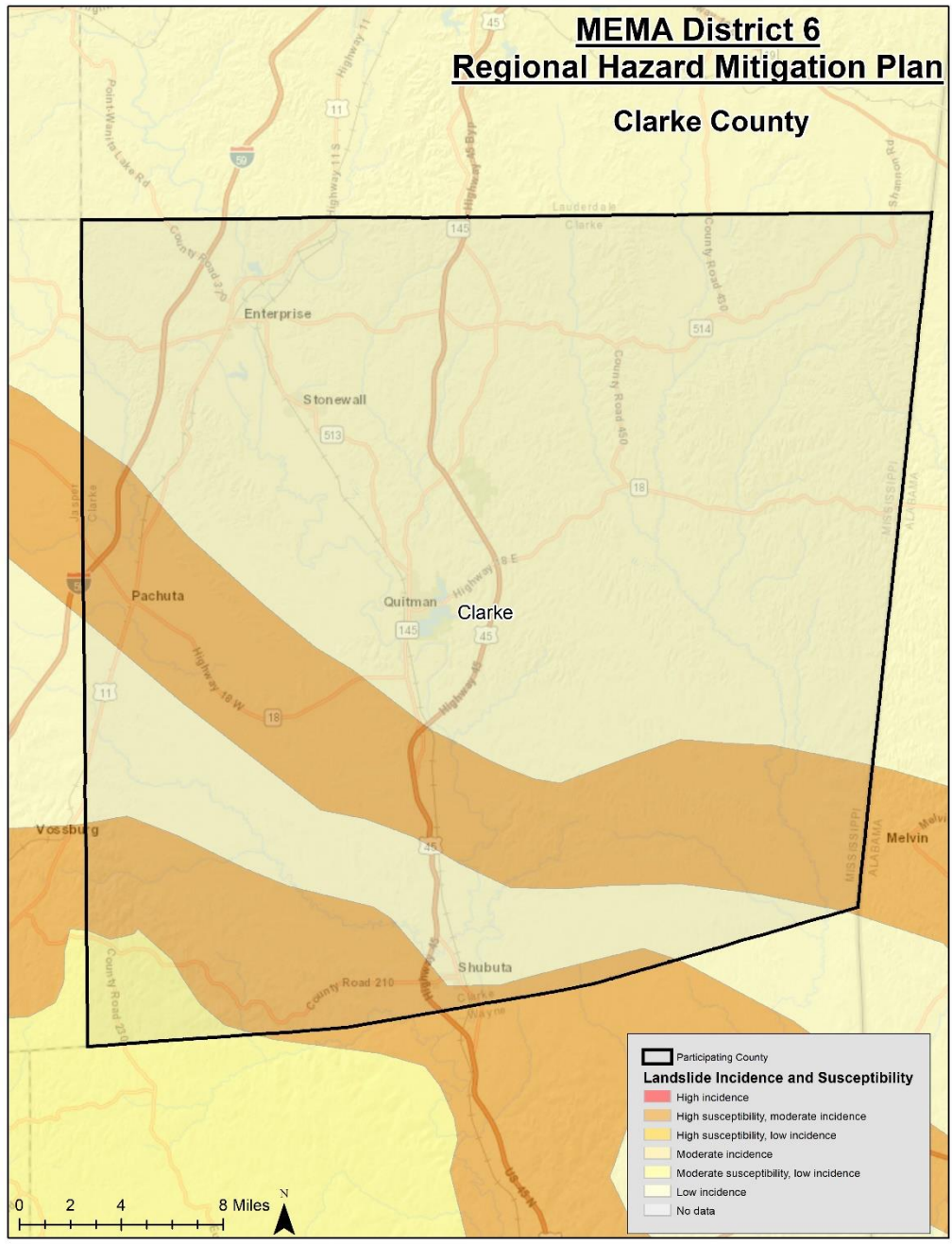
A.2.8 Landslide

LOCATION AND SPATIAL EXTENT

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain). Human development can also exacerbate risk by building on previously undevelopable steep slopes. Landslides are possible throughout Clarke County, though the risk is relatively low.

According to **Figure A.7** below, the majority of the county falls under a low incidence area. This indicates that less than 1.5 percent of the area is involved in landsliding. There are also some areas in the southwestern half of the county that are moderate incidence areas. This indicates that between 1.5 and 10 percent of the area is involved in landsliding.

Figure A.7: LANDSLIDE SUSCEPTIBILITY AND INCIDENCE MAP OF CLARKE COUNTY



Source: United States Geological Survey

HISTORICAL OCCURRENCES

There is no extensive history of landslides in Clarke County. Landslide events typically occur in isolated areas. Reviews of the USGS Landslide Inventory show no historical occurrences of landslides.

PROBABILITY OF FUTURE OCCURRENCES

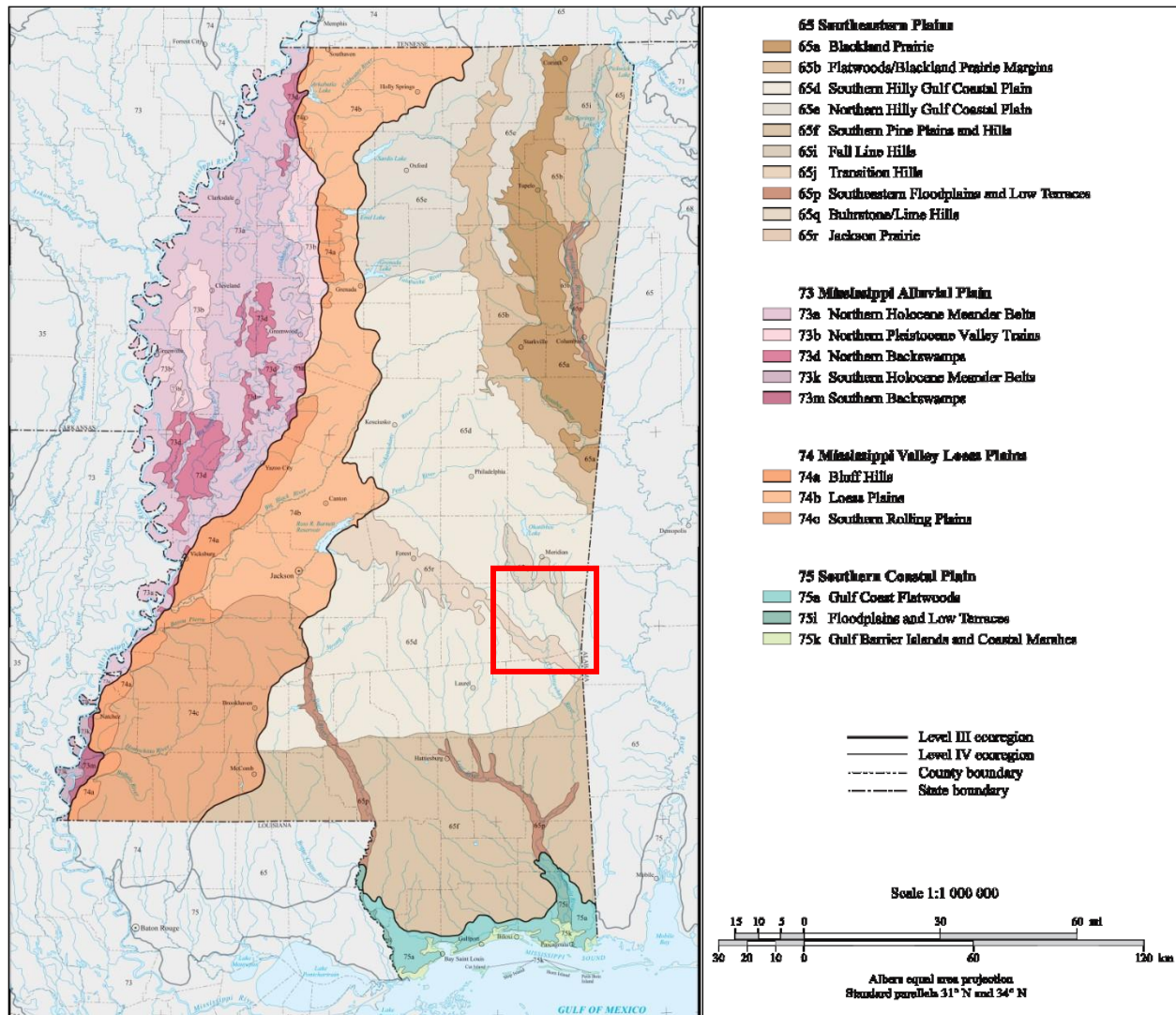
Based on historical information and the USGS susceptibility index, the probability of future landslide events is unlikely (less than 1 percent probability). The USGS data indicates that most areas in Clarke County have a low incidence rate and low susceptibility to landsliding activity. There are also some areas in the southwestern half of the county with moderate susceptibility to landsliding as well as additional areas with moderate incidence and high susceptibility. Local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in Clarke County have greater risk than others given factors such as steepness on slope and modification of slopes.

A.2.9 Land Subsidence

LOCATION AND SPATIAL EXTENT

Much of Clarke County is located in an area where the soil is substantially clay, causing a shrink and swell effect depending on the current conditions. Indeed, much of the area underlain by the calcareous Yazoo clay which, when combined with sand and marl, is highly susceptible to expansion when wet and shrinking when dry. These areas are denoted below in **Figure A.8**.

Figure A.8: MAP OF MISSISSIPPI SOILS



Source: <http://www.eoearth.org/view/article/152119/>

HISTORICAL OCCURRENCES

There is no significant historical record of land subsidence in Clarke County. However, local county officials have noted the impacts from these swings and changes in soil as roads and other infrastructure have experienced large cracks and breaks, causing stops in daily operations and significant costs to local, state, and federal budgets. Often the cost to repair this infrastructure can be in the range of millions of dollars depending on the degree of damage and necessity for quick repairs.

PROBABILITY OF FUTURE OCCURRENCES

The probability of future land subsidence events in the county is unlikely (less than 1 percent annual probability).

WIND-RELATED HAZARDS

A.2.10 Hurricane and Tropical Storm

LOCATION AND SPATIAL EXTENT

Hurricanes and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect Clarke County. All areas in Clarke County are equally susceptible to hurricane and tropical storms.

HISTORICAL OCCURRENCES

According to the National Hurricane Center's historical storm track records, 57 hurricane or tropical storm/depression tracks have passed within 75 miles of the MEMA District 6 Region since 1855.¹⁰ This includes: 1 Category 3 hurricane, 2 Category 2 hurricanes, 5 Category 1 hurricanes, 33 tropical storms, and 16 tropical depressions.

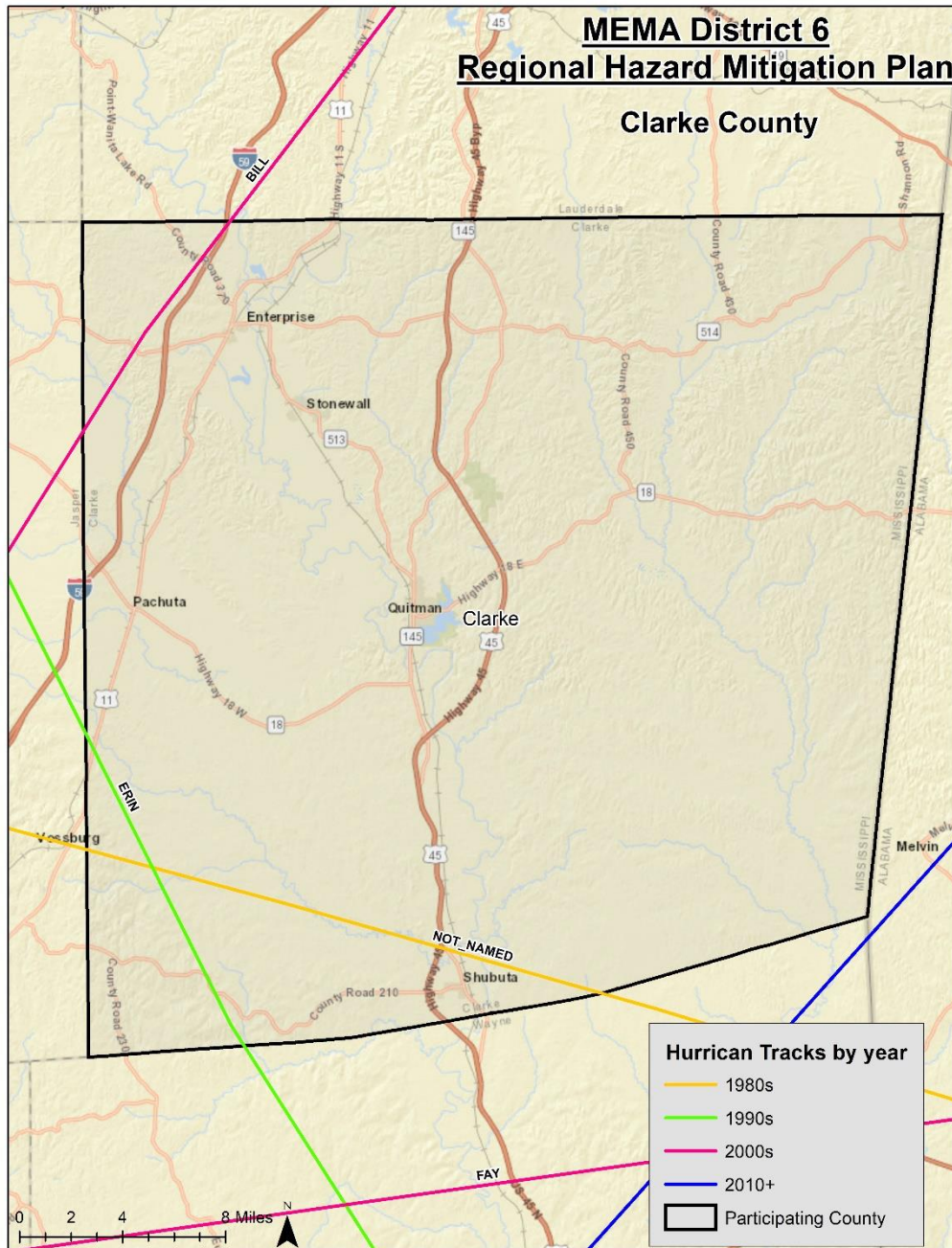
Of the recorded storm events, 35 hurricane or tropical storm/depression events traversed directly through the region as shown in **Figure A.9**. Notable storms include Hurricane Frederic (1979) and Hurricane Katrina (2005). **Table A.16** provides for each event the date of occurrence, name (if applicable), maximum wind speed (as recorded within 75 miles of the MEMA District 6 Region) and category of the storm based on the Saffir-Simpson Scale.

¹⁰These storm track statistics include tropical depressions, tropical storms, and hurricanes. Lesser events may still cause

ANNEX A: CLARKE COUNTY

significant local impact in terms of rainfall and high winds.

Figure A.9: HISTORICAL HURRICANE STORM TRACKS 1980 - 2021



Source: National Oceanic and Atmospheric Administration, National Hurricane Center

Table A.16: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE MEMA 6 DISTRICT REGION (1850–2020)

| Date of Occurrence | Storm Name | Maximum Wind Speed (knots) | Storm Category |
|--------------------|------------|----------------------------|---------------------|
| 9/16/1855 | UNNAMED | 70 | Category 1 |
| 9/15/1860 | UNNAMED | 70 | Category 1 |
| 7/12/1872 | UNNAMED | 40 | Tropical Storm |
| 9/2/1879 | UNNAMED | 60 | Tropical Storm |
| 10/7/1879 | UNNAMED | 40 | Tropical Storm |
| 10/16/1879 | UNNAMED | 40 | Tropical Storm |
| 9/1/1880 | UNNAMED | 50 | Tropical Storm |
| 8/3/1881 | UNNAMED | 40 | Tropical Storm |
| 6/14/1887 | UNNAMED | 30 | Tropical Depression |
| 8/28/1890 | UNNAMED | 35 | Tropical Storm |
| 9/12/1892 | UNNAMED | 40 | Tropical Storm |
| 9/8/1893 | UNNAMED | 55 | Tropical Storm |
| 8/17/1895 | UNNAMED | 35 | Tropical Storm |
| 8/3/1898 | UNNAMED | 35 | Tropical Storm |
| 8/16/1901 | UNNAMED | 45 | Tropical Storm |
| 10/10/1905 | UNNAMED | 35 | Tropical Storm |
| 9/27/1906 | UNNAMED | 95 | Category 2 |
| 9/22/1907 | UNNAMED | 35 | Tropical Storm |
| 6/13/1912 | UNNAMED | 50 | Tropical Storm |
| 7/17/1912 | UNNAMED | 25 | Tropical Depression |
| 9/14/1912 | UNNAMED | 50 | Tropical Storm |
| 9/30/1915 | UNNAMED | 60 | Tropical Storm |
| 7/6/1916 | UNNAMED | 80 | Category 1 |
| 7/5/1919 | UNNAMED | 30 | Tropical Depression |
| 10/18/1923 | UNNAMED | 50 | Tropical Storm |
| 7/30/1926 | UNNAMED | 25 | Tropical Depression |
| 9/1/1932 | UNNAMED | 60 | Tropical Storm |
| 10/16/1932 | UNNAMED | 45 | Tropical Storm |
| 8/1/1936 | UNNAMED | 40 | Tropical Storm |
| 9/1/1937 | UNNAMED | 30 | Tropical Depression |
| 6/16/1939 | UNNAMED | 35 | Tropical Storm |
| 8/14/1939 | UNNAMED | 35 | Tropical Storm |
| 9/26/1939 | UNNAMED | 40 | Tropical Storm |
| 9/25/1940 | UNNAMED | 20 | Tropical Depression |
| 9/4/1948 | UNNAMED | 50 | Tropical Storm |
| 9/5/1949 | UNNAMED | 40 | Tropical Storm |
| 8/31/1950 | BAKER | 65 | Category 1 |
| 6/1/1959 | ARLENE | 25 | Tropical Depression |
| 9/16/1960 | ETHEL | 35 | Tropical Storm |
| 9/26/1960 | FLORENCE | 15 | Tropical Depression |

| Date of Occurrence | Storm Name | Maximum Wind Speed (knots) | Storm Category |
|--------------------|------------|----------------------------|---------------------|
| 8/18/1969 | CAMILLE | 100 | Category 3 |
| 9/16/1971 | EDITH | 60 | Tropical Storm |
| 7/19/1977 | UNNAMED | 25 | Tropical Depression |
| 9/6/1977 | BABE | 30 | Tropical Depression |
| 7/11/1979 | BOB | 40 | Tropical Storm |
| 9/13/1979 | FREDERIC | 95 | Category 2 |
| 8/12/1987 | UNNAMED | 25 | Tropical Depression |
| 8/27/1992 | ANDREW | 30 | Tropical Depression |
| 8/4/1995 | ERIN | 45 | Tropical Storm |
| 8/6/2001 | BARRY | 20 | Tropical Depression |
| 9/26/2002 | ISIDORE | 55 | Tropical Storm |
| 7/1/2003 | BILL | 45 | Tropical Storm |
| 7/11/2005 | DENNIS | 45 | Tropical Storm |
| 8/29/2005 | KATRINA | 80 | Category 1 |
| 9/14/2007 | HUMBERTO | 20 | Tropical Depression |
| 8/24/2008 | FAY | 30 | Tropical Depression |
| 8/17/2009 | CLAUDETTE | 25 | Tropical Depression |
| 10/28/2020 | Zeta | 33 | Tropical Depression |

*It should be noted that the track of several major hurricanes that impacted the region fell outside of the 75-mile buffer. These storms were included in the table due to their significant impact. (Georges, 1988; Ivan, 2004; Issac, 2012)

Source: National Hurricane Center

Federal records indicate that disaster declarations were made in 1979 (Hurricane Frederic), 2004 (Hurricane Ivan), 2005 (Hurricane Dennis and Hurricane Katrina), and 2012 (Hurricane Issac). Hurricane and tropical storm events can cause substantial damage in the area due to high winds and flooding.

Flooding and high winds from hurricanes and tropical storms can cause damage throughout the county. Anecdotes are available from NCEI for the major storms that have impacted the county as found below:

Tropical Storm Isidore – September 26, 2002

The heavy rainfall associated with Tropical Storm Isidore resulted in significant river and flash flooding across much of Mississippi. Twenty-four-hour rainfall totals between 5 and 10 inches were common over much of Mississippi, especially in the southern part of the state, where 24-hour amounts exceeded 9 inches near Hattiesburg. Gradient wind gusts between 35 and 45 miles per hour combined with the saturated ground to lead to numerous downed trees and powerlines over the state. Most of the damage was seen along and east of the Natchez Trace, near the path of the storm's diffuse center. One indirect fatality was reported just east of the Kalem community in Scott County. Here, a falling tree struck a truck driven by a 31-year-old male. Damage from Isidore was an estimated \$500,000.

Tropical Storm Bill – June 30 and July 1, 2003

Heavy rainfall with Tropical Storm Bill resulted in several reports of flash flooding. Forty-eight-hour rainfall totals ranged between 3 and 7 inches, mainly across SE portions of Mississippi. Gradient wind gusts between 30 and 40 mph combined with saturated soils to down numerous trees very close to center's track. Damage from Bill was an estimated \$100,000.

Hurricane Ivan – September 16, 2004

Thousands of trees were blown down across Eastern Mississippi during Hurricane Ivan as well as hundreds of power lines. The strong wind itself did not cause much structural damage, however the fallen trees did. These downed trees accounted for several hundred homes, mobile homes and businesses to be damaged or destroyed. Most locations across Eastern Mississippi reported sustained winds between 30 and 40 mph with Tropical Storm force gusts between 48 and 54 mph. The strongest reported winds occurred in Newton, Lauderdale and Oktibbeha Counties.

Overall, rainfall totals were held in check as Ivan steadily moved north. The heaviest rains were confined to far Eastern Mississippi where 3 to 4 inches fell over a 15-hour period. Due to the duration of the rain no flooding was reported. Across Eastern Mississippi, Hurricane Ivan was responsible for one fatality. This fatality occurred in Brooksville (Noxubee County) when a tree fell on a man. Damage from Ivan was estimated at \$200 million.

Tropical Storm Arlene – June 11, 2005

The western periphery of Tropical Storm Arlene affected far Eastern Mississippi during the evening and brought gusty winds and locally heavy rains to that portion of the state. Peak wind gusts were reported up to 40 mph and the combination of wet soils allowed for a few hundred trees to get blown down or uprooted. Several of the downed trees took down power lines and a small few landed on homes causing damage. Additionally, the counties across Eastern Mississippi received 3 to 5 inches of rain as Arlene lifted north.

Hurricane Dennis – July 10, 2005

Hurricane Dennis moved north-northwest across Southwest Alabama and then into East-Central Mississippi and finally across Northeast Mississippi. Wind gusts over tropical storm force were common across areas east of a line from Starkville to Newton to Hattiesburg. These winds caused several hundred trees to uproot or snap and took down numerous power lines. Additionally, a total of 21 homes or businesses sustained minor to major damage from fallen trees or gusty winds.

Heavy rainfall was not a major issue as Dennis steadily moved across the region. Rainfall totals between 2 and 5 inches fell across Eastern Mississippi over a 12-hour period. One indirect fatality occurred in Jasper County from an automobile accident due to wet roads.

Hurricane Katrina – August 29, 2005

Hurricane Katrina will likely go down as the worst and costliest natural disaster in United States history. The amount of destruction, the cost of damaged property/agriculture and the large loss of life across the affected region has been overwhelming. Catastrophic damage was widespread across a large portion of the Gulf Coast region. The devastation was not only confined to the coastal region, widespread and significant damage occurred well inland up to the Hattiesburg area and northward past Interstate 20.

Hurricane force winds were common across Central Mississippi. The region received sustained winds of 60-80 mph with gusts ranging from 80-120 mph. Wind damage to structures was widespread, with roofs blown off or partially peeled. Hundreds of signs were shredded or blown down. Many businesses sustained structural damage as windows were broken, roofs were blown off, and walls were collapsed. Millions of trees were uprooted and snapped. Power poles and lines were snapped and taken down from wind and trees. It was thousands of downed trees which caused the most significant structural damage as

ANNEX A: CLARKE COUNTY

these trees fell onto homes and businesses. Power outages lasted from a few days to as long as four weeks. Agriculture and timber industries were severely impacted. Row crops, including cotton, rice, corn, and soybeans, took a hard hit. Other impacted industries were the catfish industry, dairy and cattle industry, and nursery businesses.

PROBABILITY OF FUTURE OCCURRENCES

Given the inland location of the county, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. The probability of being impacted is less than coastal areas, but still remains a real threat to Clarke County due to induced events like flooding. Based on historical evidence, the probability level of future occurrence is likely (annual probability between 10 and 100 percent). Given the regional nature of the hazard, all areas in the county are equally exposed to this hazard. However, when the county is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area.

A.2.11 Thunderstorm (wind, hail, lightning)

LOCATION AND SPATIAL EXTENT

Thunderstorm / High Wind

A thunderstorm event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. It is assumed that Clarke County has uniform exposure to an event and the spatial extent of an impact could be large.

The following Beaufort scale is an empirical measure for the intensity of the wind associated with windstorms.

Table A17A: Beaufort Wind Scale

| Beaufort Scale | | | | | |
|----------------|------------------|-----------------|------------------|-------------------------|--|
| NUMBER | WIND SPEED (MPH) | DESCRIPTION | WAVE HEIGHT (FT) | SEA CONDITIONS | LAND CONDITIONS |
| 0 | <1 | Calm | 0 | Flat. | Calm. Smoke rises vertically. |
| 1 | 1-3 | Light air | 0.33 | Ripples without crests. | Wind motion visible in smoke. |
| 2 | 3-7 | Light breeze | 0.66 | Small wavelets. | Wind felt on exposed skin. Leaves rustle. |
| 3 | 8-12 | Gentle breeze | 2 | Large wavelets. | Leaves and smaller twigs in constant motion. |
| 4 | 13-17 | Moderate breeze | 3.3 | Small waves. | Dust and loose paper rise. Small branches begin to move. |

ANNEX A: CLARKE COUNTY

| Beaufort Scale | | | | | |
|----------------|------------------|-------------------------------------|------------------|--|--|
| NUMBER | WIND SPEED (MPH) | DESCRIPTION | WAVE HEIGHT (FT) | SEA CONDITIONS | LAND CONDITIONS |
| 5 | 18-24 | Fresh breeze | 6.6 | Moderate (1.2 m) longer waves. Some foam and spray. | Small trees sway. |
| 6 | 25-30 | Strong breeze | 9.9 | Large waves with foam crests and some spray. | Large branches in motion. Whistling heard in overhead wires. Umbrella use difficult. |
| 7 | 31-38 | High wind, Moderate Gale, Near Gale | 13.1 | Sea heaps up and foam begins to streak. | Whole trees in motion. Effort needed to walk against the wind. |
| 8 | 39-46 | Fresh Gale | 18 | Moderately high waves with breaking crests forming spindrift. Streaks of foam. | Twigs broken from trees. Cars veer on road. |
| 9 | 47-54 | Strong Gale | 23 | High waves (6-7 m) with dense foam. Wave crests start to roll over. Considerable spray. | Larger branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over. Damage to circus tents and canopies. |
| 10 | 55-63 | Whole Gale/Storm | 29.5 | Very high waves. The sea surface is white and there is considerable tumbling. | Trees uprooted. Considerable structural damage. |
| 11 | 64-72 | Violent storm | 37.7 | Exceptionally high waves. | Widespread vegetation and structural damage. |
| 12 | ≥73 | Hurricane-force | ≥46 | Huge waves. Sea is completely white with foam and spray. Air is filled with driving spray, reduced visibility. | Massive and widespread damage to structures. |

Source: www.spc.noaa.gov

Although wind damage associated with thunderstorms is normally minor, the extent to which MEMA District 6 could be affected by high winds is not insignificant. As an example of the intensity of winds that MEMA District 6 may experience, a thunderstorm on record in Lauderdale County indicated damage

ANNEX A: CLARKE COUNTY

associated with 68 kts, which equates to 78 mile per hour straight line winds and a Number 12 on the Beaufort Scale. In this scenario, building damage would be significant, power lines downed, trees uprooted, and loss of life possible. This same category of thunderstorm wind could also happen elsewhere in the planning area. Historically, windstorms in the region fall within the 50-60kts, which equates to 57-69 miles per hour and a Number 10-11 on the Beaufort Scale.

Hailstorm

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that Clarke County is uniformly exposed to severe thunderstorms; therefore, all areas of the county are equally exposed to hail which may be produced by such storms.

Lightning

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of Clarke County is uniformly exposed to lightning.

HISTORICAL OCCURRENCES

Thunderstorm / High Wind

Severe storms were at least partially responsible for eight disaster declarations in Clarke County in 1979, 1990, 2003, 2011, 2016, 2019, and 2020. According to NCEI, there have been 289 reported thunderstorm and high wind events since 1971 in Clarke County. These events caused over \$3.82 million in damages.

Table A.17B summarizes this information. **A.18** presents top thunderstorm and high wind event reports including date, magnitude, and associated damages for each event.

Table A.17B: SUMMARY OF THUNDERSTORM / HIGH WIND OCCURRENCES IN CLARKE COUNTY

| Location | Number of Occurrences | Deaths / Injuries | Property Damage |
|----------------------------|-----------------------|-------------------|--------------------|
| CLARKE COUNTY TOTAL | 289 | 0/0 | \$3,823,000 |

Source: National Centers for Environmental Information

Table A.18: HISTORICAL THUNDERSTORM / HIGH WIND OCCURRENCES IN CLARKE COUNTY

The following thunderstorm and high wind occurrences represent the top events in terms of property damage:

May 29th, 2005 –

A swath of wind damage occurred across portions of Clarke County from Pachuta to Quitman to Stonewall. Within this area several dozen trees were blown down with many blocking area roads. In Pachuta 1 tree damaged a vehicle and in Quitman one tree caused major damage to a house. Property damage was reported to be in excess of \$400,000.

May 9th, 2006 –

A supercell thunderstorm developed just northwest of Newton, in Newton County, and tracked east and then east-southeast across southern Lauderdale and northern Clarke Counties. This long-lived supercell storm produced a swath of quarter to golf ball sized hail all along its path. Additionally, in northern Clarke County, near Highway 45, the rear flank downdraft of this storm downed several trees and blew a carport off a house. A few of the downed trees fell on a home causing significant damage. The storm held its intensity as it moved into Choctaw County Alabama with a reported \$150,000 in property damage occurring in Clarke County.

May 3rd, 2009 –

Early on the 3rd, clusters of severe storms evolved into a line which produced scattered wind damage as it pushed east along and just north of I-20. An outflow boundary pushed out of this line and provided the focus for the second powerful and significant severe event.

Between 8 am and 1 pm, a Derecho evolved and raced east across the southern half of the forecast area at 60 to 70 mph. A Derecho is defined as a long-lived windstorm, usually a large bow echo, which has a width of 40 to 250 miles and covers a long distance, typically one to three states. This large bowing squall line brought intense straight-line winds and widespread damage across its swath. Some of the wind speeds within this Derecho ranged between 80 and 95 mph. There were numerous reports of trees down as well as downed power lines, which caused widespread power outages in many locations. Many structures were damaged by either fallen trees or just the wind itself. Scattered reports of hail and a few tornadoes also occurred. Property damage in Clarke County was in excess of \$640,000.

April 4th, 2011 –

A powerful storm system took shape across the central United States and clashed with a warm and unstable airmass. An extensive and intense squall line resulted which quickly pushed eastward across the eastern half of the country. Overall, this system produced a large severe weather outbreak and brought widespread wind damage to multiple states across the south, mid-south, and southeast United States. Nearly 1500 reports of severe weather were reported, across 15 states, with the vast majority being damaging winds. Wind damage was not the only severe weather event type, large hail and tornadoes were also part of the

ANNEX A: CLARKE COUNTY

mix. In terms of total events (severe weather reports), this outbreak is one of the largest in the United States.

Across the National Weather Service Jackson forecast area, numerous reports of down trees and power lines were reported along with multiple reports of damaged structures. These structures were damaged by either fallen trees or intense winds. Survey teams found 5 tornadoes across the area, two of which were rated EF2. The first strong tornado moved into northwest Catahoula Parish from LaSalle Parish. The other strong tornado occurred across Tensas Parish and tracked to the MS River, crossed the river and dissipated in far northwest Claiborne County. The other three tornadoes were rated EF1. One of these occurred just north of Utica, in Hinds County, another tracked across northern Simpson County near Braxton, and the other across southeast Lincoln and southern Lawrence Counties. Property damage in Clarke County was reported to be over \$200,000.

Hailstorm

According to the National Centers for Environmental Information, 108 recorded hailstorm events have affected Clarke County since 1966. **Table A.19** is a summary of the hail events in Clarke County. **A.20** provides detailed information about top events that occurred in the county. In all, hail occurrences resulted in approximately \$450,000 in property damages. Hail ranged in diameter from 0.75 inches to 4.25 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Therefore, it is likely that damages are greater than the reported value.

Table A.19: SUMMARY OF HAIL OCCURRENCES IN CLARKE COUNTY

| Location | Number of Occurrences | Deaths / Injuries | Property Damage |
|----------------------------|-----------------------|-------------------|------------------|
| CLARKE COUNTY TOTAL | 108 | 0/0 | \$398,000 |

Source: National Centers for Environmental Information

Table A.20: HISTORICAL HAIL OCCURRENCES IN CLARKE COUNTY

March 5th, 1998 –

The largest diameter hail reported for this event was 1.75 in. and caused a reported \$100,000 in damages to roofs and automobiles.

May 9th, 2006 –

A supercell thunderstorm developed just northwest of Newton, in Newton County, and tracked east and then east-southeast across southern Lauderdale and northern Clarke Counties. This long-lived supercell storm produced a swath of quarter to golf ball sized hail all along its path. Additionally, in northern Clarke County, near Highway 45, the rear flank downdraft of this storm downed several trees and blew a carport off a house. A few of the downed trees fell on a home causing significant damage. The storm held its intensity as it moved into Choctaw County Alabama. Property damage was reported to be \$50,000.

April 15th, 2011 –

A significant severe weather event and tornado outbreak affected portions of central Mississippi, southeastern Arkansas, and northeastern Louisiana on April 15th. This event evolved slowly and brought multiple rounds of severe storms to the region between 3 am and 9 pm. A total of 15 tornadoes occurred during this event with 3 being of the strong variety (EF2 or EF3). In addition, numerous reports of damaging straight-line winds occurred as well as instances of large hail. Some of the strongest storms produced hail from golf ball to baseball size. There were two reports of softball sized hail as well, one in Clarke County and the other in Kemper County. In addition to the severe storms, significant flash flooding occurred over northern portions of central Mississippi. A swath of golf ball to softball sized hail fell across west central Clarke County causing \$125,000 in property damage. The largest diameter hail was reported to be 4.25 in.

Lightning

According to the National Centers for Environmental Information, there has been seven recorded lightning events in Clarke County since 2014. This event did not result in any reported damages, as listed in summary **Table A.21**. However, lightning has caused one fatality in the county. Detailed information on historical lightning events can be found in **Table A.22**.

It is certain that more than one event has impacted the county. Many of the reported events are those that cause damage, and it should be expected that damages are likely much higher for this hazard than what is reported.

Table A.21: SUMMARY OF LIGHTNING OCCURRENCES IN CLARKE COUNTY

| Location | Number of Occurrences | Deaths / Injuries | Property Damage |
|----------------------------|-----------------------|-------------------|------------------|
| Enterprise | 0 | 0/0 | \$0 |
| Pachuta | 0 | 0/0 | \$0 |
| Quitman | 0 | 0/0 | \$0 |
| Shubuta | 0 | 0/0 | \$0 |
| Stonewall | 0 | 0/0 | \$0 |
| Unincorporated Area | 7 | 1/0 | \$237,000 |
| CLARKE COUNTY TOTAL | 7 | 1/1 | \$237,000 |

Source: National Centers for Environmental Information

Table A.22: HISTORICAL LIGHTNING OCCURRENCES IN CLARKE COUNTY

| Location | Date | Deaths / Injuries | Property Damage | Details |
|----------------------------|------------|-------------------|-----------------|--|
| Enterprise | | | | |
| None Reported | -- | -- | -- | -- |
| Pachuta | | | | |
| None Reported | -- | -- | -- | -- |
| Quitman | | | | |
| None Reported | -- | -- | -- | -- |
| Shubuta | | | | |
| None Reported | -- | -- | -- | -- |
| Stonewall | | | | |
| None Reported | -- | -- | -- | -- |
| Unincorporated Area | | | | |
| DE SOTO | 7/11/2014 | 1/0 | \$0 | A 23-year-old female was struck and killed by a lightning strike while riding a horse. |
| QUITMAN CLARK | 8/8/2015 | 0/0 | \$100,000 | |
| SABLE | 8/10/2018 | 0/1 | \$0 | An adult male was struck by lightning while driving south on Highway 45. |
| DE SOTO | 8/18/2018 | 0/0 | \$2,000 | |
| SYKES | 12/27/2018 | 0/0 | \$100,000 | |
| PINE RIDGE | 8/14/2019 | 0/0 | \$15,000 | |
| SABLE | 8/11/2020 | 0/0 | \$20,000 | |

PROBABILITY OF FUTURE OCCURRENCES

Thunderstorm / High Wind

Given the high number of previous events, it is certain that thunderstorm events, including straight-line wind events, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for the entire county.

Hailstorm

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is highly likely (100 percent annual probability). Since hail is an atmospheric hazard, it is assumed that Clarke County has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the county.

Lightning

Although there was not a high number of historical lightning events reported in Clarke County via NCEI data, it is a regular occurrence accompanied by thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN), Clarke County is located in an area of the country that experienced an average of 4 to 6 cloud-to-ground lightning flashes per square kilometer per year between 2015 and 2019.⁵ Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the county.

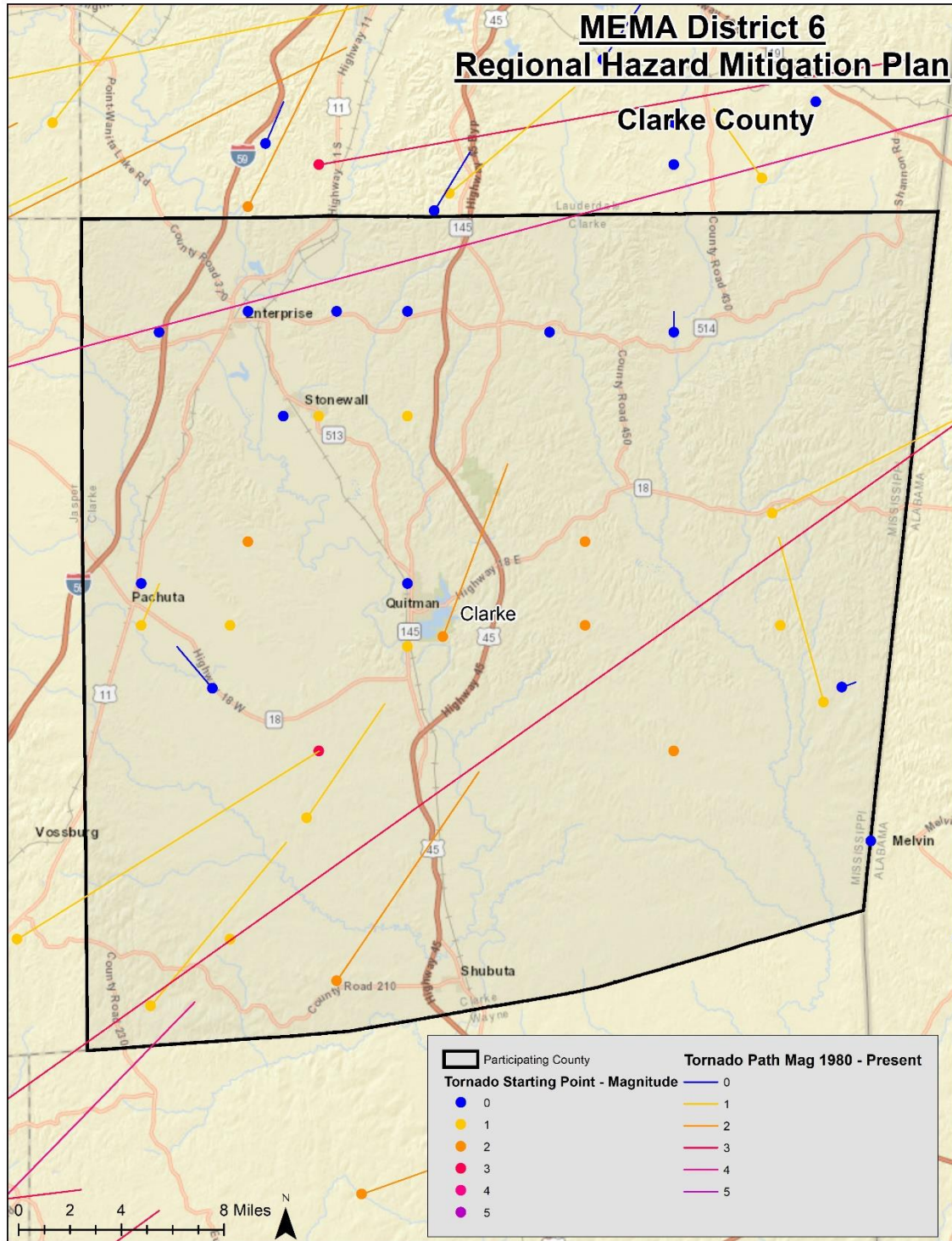
A.2.12 Tornado

LOCATION AND SPATIAL EXTENT

Tornadoes occur throughout the state of Mississippi, and thus in Clarke County. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that Clarke County is uniformly exposed to this hazard. With that in mind, **Figure A.10** shows tornado track data for many of the major tornado events that have impacted the county. While no definitive pattern emerges from this data, some areas that have been impacted in the past may be potentially more susceptible in the future.

⁵ Vaisala's Annual Lightning Report – 2020. Retrieved on 9.8.2021 from:
<https://www.vaisala.com/sites/default/files/documents/WEA-MET-Annual-Lightning-Report-2020-B212260EN-A.pdf>

Figure A.10: HISTORICAL TORNADO TRACKS IN CLARKE COUNTY



Source: National Weather Service Storm Prediction Center

HISTORICAL OCCURRENCES

Tornadoes were at least partially responsible for five disaster declarations in Clarke County in 1973, 1979, 1990, 2003, 2011, 2019, and 2020. According to the National Centers for Environmental Information, there have been a total of 39 recorded tornado events in Clarke County since 1957 (Table A.23), resulting in over \$28.524 million in property damages. In addition, 4 fatalities and 26 injuries were reported. The magnitude of these tornadoes ranges from F0 to F4 and EF0 to EF4 in intensity, although an EF5 event is possible. Detailed information on historic tornado events can be found in Table A.24.

Table A.23: SUMMARY OF TORNADO OCCURRENCES IN CLARKE COUNTY

| Location | Number of Occurrences | Deaths / Injuries | Property Damage |
|----------------------------|-----------------------|-------------------|---------------------|
| CLARKE COUNTY TOTAL | 39 | 4/26 | \$28,524,000 |

Source: National Centers for Environmental Information

Table A.24: HISTORICAL TORNADO IMPACTS IN CLARKE COUNTY

February 28th, 1987 –

An F4 tornado touched down near Moselle, Mississippi and grew to a width of 2 miles as it passed near Laurel. The tornado traveled a distance of 40 miles killing six people, injuring 350 others, and causing \$25 million in damages. The tornado ended in Clarke County.

April 27th, 2011 –

A historic outbreak of tornadoes across the Ark-La-Miss began late on Tuesday, April 26th continuing into the early morning hours of Wednesday, April 27th. The event ramped up again during the early afternoon of April 27th continuing into the early evening. The activity on April 26th began as supercell thunderstorms producing large hail and tornadoes across northeast Texas and portions of Arkansas before evolving into a squall line as it moved east. Through the rest of the afternoon multiple tornadoes developed, stemming from multiple supercell storms. Nearly all of the storms produced tornadoes, with many of them long track and significant. The other violent tornado to impact the Jackson, MS forecast area occurred across Smith, Jasper, and Clarke Counties. This tornado continued into Alabama and had a total path length of 124 miles across both states. Loss of life during this historic event was staggering. Unfortunately, 321 people lost their lives making this the second deadliest tornado outbreak in U.S. history. Over \$900,000 in property damage occurred in Clarke County.

February 5th, 2020 –

This long track tornado affected the counties of Jasper, Clarke and Lauderdale. This tornado began in Jasper County south of Bay Springs along County Road 9, where it snapped several softwood trees and some minor peeling of the tin roof of a home also occurred. It progressed northeast and crossed MS Highway 15 where it snapped a few softwood trees. The snapping and uprooting of softwood trees continued as it crossed US Highway 18, and then moved into Clarke County resulting in multiple snapped and uprooted trees, severely damaging a carport and causing damage to portions of a one-story home along US Highway 513. As the tornado neared Enterprise, it continued to snap and uproot numerous softwood trees thus causing them to fall onto cars and take down several power poles along County Road 360 and US Highway 11. Along US Highway 11 North, as the tornado neared Lauderdale County, it took off a large section of a one-story home. This tornado caused \$500,000 in damages.

PROBABILITY OF FUTURE OCCURRENCES

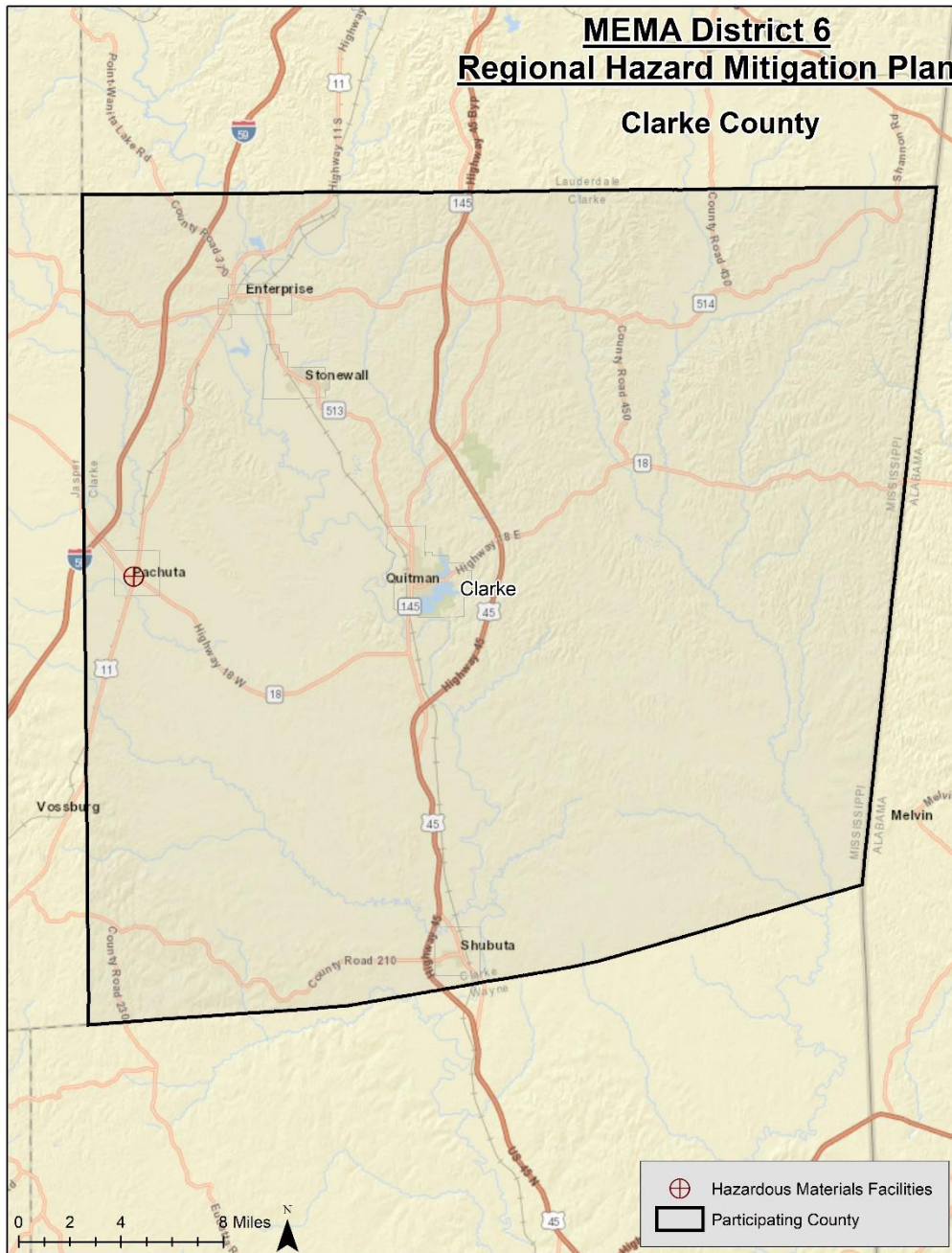
According to historical information, tornado events pose a significant threat to Clarke County. The probability of future tornado occurrences affecting Clarke County is likely (between 10 and 100 percent annual probability).

A.2.13 Hazardous Materials Incidents

LOCATION AND SPATIAL EXTENT

Clarke County has one TRI site. This site is shown in **Figure A.11**.

Figure A.11: TOXIC RELEASE INVENTORY (TRI) SITES IN CLARKE COUNTY



Source: Environmental Protection Agency

In addition to “fixed” hazardous materials locations, hazardous materials may also impact the county via roadways and rail. Many roads in the county are subject to hazardous materials transport and all roads that permit hazardous material transport are considered potentially at risk to an incident.

HISTORICAL OCCURRENCES

There has been a total of eight recorded HAZMAT incidents in Clarke County since 1977 (Table A.25). These events resulted in more than \$404,000 in property damage. Table A.26 presents detailed information on historic HAZMAT incidents in Clarke County as reported by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA).

Table A.25: SUMMARY OF HAZMAT INCIDENTS IN CLARKE COUNTY

| Location | Number of Occurrences | Deaths / Injuries | Property Damage |
|----------------------------|-----------------------|-------------------|------------------|
| Enterprise | 1 | 0/0 | \$70,353 |
| Pachuta | 5 | 0/0 | \$333,836 |
| Quitman | 2 | 0/0 | \$73 |
| Shubuta | 0 | 0/0 | \$0 |
| Stonewall | 0 | 0/0 | \$0 |
| Unincorporated Area | 0 | 0/0 | \$0 |
| CLARKE COUNTY TOTAL | 8 | 0/0 | \$404,262 |

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

Table A.26: HAZMAT INCIDENTS IN CLARKE COUNTY

| Report Number | Date | City | Mode | Serious Incident? | Fatalities/ Injuries | Damages (\$)* | Quantity Released |
|----------------------------|-----------|------------|---------|-------------------|----------------------|---------------|-------------------|
| Enterprise | | | | | | | |
| I-1993060965 | 6/3/1993 | ENTERPRISE | Highway | No | 0/0 | \$70,353 | 100 LGA |
| Pachuta | | | | | | | |
| I-1980090269 | 8/18/1980 | PACHUTA | Highway | No | 0/0 | \$0 | 1 LGA |
| I-1987050207 | 4/28/1987 | PACHUTA | Highway | No | 0/0 | \$0 | 3 LGA |
| I-1988070398 | 7/4/1988 | PACHUTA | Highway | No | 0/0 | \$0 | 65 LGA |
| E-2013120282 | 12/2/2013 | PACHUTA | Highway | No | 0/0 | \$0 | 2 LGA |
| E-2014100659 | 9/17/2014 | PACHUTA | Highway | Yes | 0/0 | \$333,836 | 2,730 LGA |
| Quitman | | | | | | | |
| I-1977081726 | 8/10/1977 | QUITMAN | Highway | No | 0/0 | \$0 | 15 LGA |
| I-1998061053 | 4/7/1998 | QUITMAN | Highway | No | 0/0 | \$73 | 2 LGA |
| Shubuta | | | | | | | |
| None Reported | -- | -- | -- | -- | -- | -- | -- |
| Stonewall | | | | | | | |
| None Reported | -- | -- | -- | -- | -- | -- | -- |
| Unincorporated Area | | | | | | | |
| None Reported | -- | -- | -- | -- | -- | -- | -- |

Source: United States Department of Transportation Pipeline and Hazardous Materials Safety Administration

PROBABILITY OF FUTURE OCCURRENCES

Given the location of one toxic release inventory site in Clarke County and prior roadway incidents, it is likely (between 10 and 100 percent annual probability) that a hazardous material incident may occur in the county. County and town officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

A.2.14 Pandemic

LOCATION AND SPATIAL EXTENT

Pandemics are global in nature. However, they may start anywhere. Clarke County chose to analyze this hazard given the agriculture in the area and potential for this kind of event to occur in any location at any time.

All populations should be considered at risk to pandemic. Buildings and infrastructure are not directly impacted by the virus/pathogen but could be indirectly impacted if people are not able to operate and maintain them due to illness. Many buildings may be shutdown, at least temporarily, as a result. Employers may initiate work from home procedures for non-essential workers in order to help stop infection. Commerce activities, and thus the economy, may suffer greatly during this time.

HISTORICAL OCCURRENCES

Several pandemics have been reported throughout history. A short history of the flu/Spanish Flu was collected from The Historical Text Archive and is described below.

The first known pandemic dates back to 430 B.C. with the Plague of Athens. It reportedly killed a quarter of the population over four years due to typhoid fever. In 165-180 A.D., the Antonine Plague killed nearly 5 million people. Next, the Plague of Justinian (the first bubonic plague pandemic) occurred from 541 to 566. It killed 10,000 people a day at its peak and resulted in a 50 percent drop in Europe's population. Since the 1500s, influenza pandemics have occurred about three times every century or roughly every 10 to 50 years. The Black Death devastated European populations in the 14th century. Nearly a third of the population (20-30 million) was killed over six years. From 1817 to present, seven Cholera Pandemics have impacted to the world and killed millions. Perhaps most severe, was the Third Cholera Pandemic (1852-1959) which started in China. Isolated cases can still be found in the Western U.S. today. There were three major pandemics in the 20th century (1918-1919, 1957-1958, and 1968-1969). The most infamous pandemic flu of the 20th century, however, was that of 1918-1919. Since the 1960s, there has only been one pandemic, the 2009 H1N1 influenza. The pandemics of the 20th and 21st centuries that impacted the United States are detailed below.

1918 Spanish Flu: This was the most devastating flu of the 20th century. This pandemic spread across the world in three waves between 1918 and 1919. It typically impacted areas for around twelve weeks and then would largely disappear. However, it would frequently reemerge several months later. Worldwide, approximately 50 million persons died and over a quarter of the population was infected. Nearly 675,000 people died in the United States. The illness came on suddenly and could cause death within a few hours. The virus impacted those aged 15 to 35 especially hard. The movement of troops during World War I is thought to have facilitated the spread of the virus.

ANNEX A: CLARKE COUNTY

In Mississippi, state officials noted that "epidemics have been reported from a number of places in the State," on October 4th, 1918. By the 18th, twenty-six localities reported 1,934 cases (the real number of cases was likely much higher). West Point, Mississippi was hit especially hard and quarantine was established. Throughout the state, African Americans were impacted at a greater rate than white populations. This is thought to be partly caused from a shortage of caretakers. It is estimated that over 6,000 people died in Mississippi, though that number may be much higher as death records were not widely recorded.

1957 Asian Flu: It is estimated that the Asian Flu caused 2 million deaths worldwide. Approximately 70,000 deaths were in the U.S. However, the proportion of people impacted was substantially higher than that of the Spanish Flu. This flu was characterized as having much milder effects than the Spanish Flu and greater survivability. Similar to other pandemics, this pandemic has two waves. Elderly and infant populations were more likely to succumb to death. This flu is thought to have originated from a genetic mutation of a bird virus.

1968 Hong Kong Flu: The Hong Kong Flu is thought to have caused one million deaths worldwide. It was milder than both the Asian and Spanish influenza viruses. It was similar to the Asian Flu, which may have provided some immunity to the virus. It had the most severe impact on elderly populations.

2009 H1N1 Influenza: This flu was derived from human, swine, and avian virus strains. It was initially reported in Mexico in April 2009. On April 26, the U.S. government declared H1N1 a public health emergency. A vaccine was developed and over 80 million were vaccinated which helped minimize the impacts. The virus had mild impacts on most of the population but did cause death (usually from viral pneumonia) in high-risk populations such as pregnant women, obese persons, indigenous people, and those with chronic respiratory, cardiac, neurological, or immunity conditions. Worldwide, it is estimated that 43 million to 89 million people contracted H1N1 between April 2009 and April 2010, and between 8,870 and 18,300 H1N1 cases resulted in death.

2020 SARS-CoV-2 (COVID-19): Coronavirus Disease 2019 (COVID-19) was declared as pandemic by the World Health Organization on March 11th, 2020 mainly due to the speed and scale of the transmission of the disease. Prior to that, it started as an epidemic in mainland China with the focus being firstly reported in the city of Wuhan, Hubei province on February 26th, 2020. The etiologic agent of COVID-19 was isolated and identified as a novel coronavirus, initially designated as 2019-nCoV. Later, the virus genome was sequenced and because it was genetically related to the coronavirus outbreak responsible for the SARS outbreak of 2003, the virus was named as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by the International Committee for Taxonomy of Viruses.

There is a considerable amount of data on the extent of COVID-19 throughout the State of Mississippi and Clarke County. The number of reported cases and deaths across the State of Mississippi and Clarke County are shown in the figure below.

Figure 12: COVID-19 Cases as of 08/01/2021⁶

| | Cases | Deaths |
|---------------|---------|--------|
| Mississippi | 348,496 | 7,556 |
| Clarke County | 1,881 | 80 |

⁶ Mississippi State Department of Health. *COVID-19 Dashboard*. Retrieved from: https://msdh.ms.gov/msdhsite/_static/14,0,420.html

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

In addition to the pandemics above, there have been several cases of pandemic threats, some of which reached epidemic levels. They were contained before spreading globally. Examples include Smallpox, Polio, Tuberculosis, Malaria, AIDS, SARS and Yellow Fever. Advances in medicine and technology have been instrumental in containing the spread of viruses in recent history.

It is notable that no birds have been infected with Avian Flu in North and South America.

PROBABILITY OF FUTURE OCCURRENCES

Based on historical occurrence information, it is assumed that all of Clarke County has a probability level of unlikely (less than 1 percent annual probability) for future pandemics events. While pandemic can have devastating impacts, they are relatively rare.

The Mississippi State Department of Health maintains a state pandemic plan which can be found here: <http://www.msdh.state.ms.us/msdhsite/index.cfm/44,1136,122,154,pdf/SNSPlan.pdf>

A.2.15 Conclusions on Hazard Risk

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its “How-to” guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports.

HAZARD EXTENT

Table A.27 describes the extent of each natural hazard identified for Clarke County. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

Table A.27: EXTENT OF CLARKE COUNTY HAZARDS

| Flood-related Hazards | |
|-------------------------|--|
| Flood | Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for 16.3 percent of the total land area in Clarke County. Flood depth and velocity are recorded via United States Geological Survey stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the county was at the Chickasawhay River at Shubuta in April 1900. Water reached a discharge of 90,000 cubic feet per second and the stream gage height was recorded at 47.90 feet. |
| Erosion | The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records located in Clarke County. |
| Dam Failure | Dam Failure extent is defined using the Mississippi Department of Environmental Quality criteria (Table 5.7). No dams are classified as high-hazard in Clarke County. |
| Winter Storm and Freeze | The extent of winter storms can be measured by the amount of snowfall received (in inches). Official long term snow records are not kept for any areas in Clarke County. However, the greatest snowfall reported in Meridian (north of the county) was 14.0 inches in 1963. |

| Fire-related Hazards | |
|------------------------------|---|
| Drought / Heat Wave | <p>Drought extent is defined by the U.S. Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. According to the U.S. Drought Monitor Classifications, the most severe drought condition is Exceptional. Clarke County has received this ranking twice over the 15-year reporting period.</p> <p>The extent of extreme heat can be measured by the record high temperature recorded. Official long term temperature records are not kept for any areas in Clarke County. However, the highest recorded temperature in Meridian (north of the county) was 107°F in 1980.</p> |
| Wildfire | <p>Wildfire data was provided by the Mississippi Forestry Commission and is reported annually by county from 2011-2020. The greatest number of fires to occur in Clarke County in any year 75 in 2006. The greatest number of acres to burn in the county in a single year occurred in 2006 when 1,057 acres were burned. Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the county.</p> |
| Geologic Hazards | |
| Earthquake | <p>Earthquake extent can be measured by the Richter Scale (Table 5.16), the Modified Mercalli Intensity (MMI) scale (Table 5.17), and the distance of the epicenter from Clarke County. According to data provided by the National Geophysical Data Center, the greatest earthquake to impact the county was reported in Enterprise with a MMI of II (feeble), an unknown magnitude, and 829 km away from the epicenter.</p> |
| Landslide | <p>As noted above in the landslide profile, there is no extensive history of landslides in Clarke County and landslide events typically occur in isolated areas. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is low throughout the majority of the county, except for some areas of moderate incidence in the southwestern half. There is also low susceptibility throughout most of the county, except for some areas in the southwestern portion which have moderate and high susceptibility.</p> |
| Land Subsidence | <p>The extent of land subsidence can be defined by the measurable rate of subsidence that occurs. There are no subsidence rate records located in Clarke County nor is there any significant historical record of events.</p> |
| Wind-related Hazards | |
| Hurricane and Tropical Storm | <p>Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5 (Table 5.20). The greatest classification of hurricane to traverse directly through Clarke County was Hurricane Frederic, a Category 2 storm which carried tropical force winds of 95 knots upon arrival in the county.</p> |

| | |
|---------------------------------|--|
| Thunderstorm / Hail / Lightning | <p>Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 65-year history from the National Centers for Environmental Information, the strongest recorded wind event in Clarke County was last reported on May 3, 2009 at 72 knots (approximately 83 mph). It should be noted that future events may exceed these historical occurrences.</p> <p>Hail extent can be defined by the size of the hail stone. The largest hail stone reported in Clarke County was 4.25 inches (reported on April 15, 2011). It should be noted that future events may exceed this.</p> <p>According to the Vaisala’s flash density map (Figure 5.17), Clarke County is located in an area that experiences 6 to 8 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures.</p> |
| Tornado | Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA (Figure 5.18) as well as the Fujita/Enhanced Fujita Scale (Tables 5.27 and 5.28). The greatest magnitude reported in Clarke County was an F4 (reported on February 28, 1987). |
| Other Hazards | |
| Hazardous Materials Incident | According to USDOT PHMSA, the largest hazardous materials incident reported in Clarke County was 2,730 LGA released on the highway (reported on September 17, 2014). It should be noted that larger events are possible. |
| Pandemic | While pandemics remain to be rare occurrences overall, it cannot be ignored that as of the drafting of this plan the world continues to be engulfed by the COVID-19 Pandemic. |

PRIORITY RISK INDEX RESULTS

In order to draw some meaningful planning conclusions on hazard risk for Clarke County, the results of the hazard profiling process were used to generate countywide hazard classifications according to a “Priority Risk Index” (PRI). More information on the PRI and how it was calculated can be found in Section 5.16.2.

Table A.28 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Council. The results were then used in calculating PRI values and making final determinations for the risk assessment.

Table A.28: SUMMARY OF PRI RESULTS FOR CLARKE COUNTY

| Hazard | Category/Degree of Risk | | | | | |
|-------------------------------|-------------------------|--------------|----------------|--------------------|--------------------|------------|
| | Probability | Impact | Spatial Extent | Warning Time | Duration | PRI Score |
| Flood-related Hazards | | | | | | |
| Flood | Likely | Critical | Moderate | 6 to 12 hours | Less than 24 hours | 2.9 |
| Erosion | Possible | Minor | Small | More than 24 hours | More than 1 week | 1.8 |
| Dam Failure | Possible | Critical | Small | Less than 6 hours | Less than 6 hours | 2.4 |
| Winter Storm and Freeze | Likely | Limited | Moderate | More than 24 hours | Less than 24 hours | 2.4 |
| Fire-related Hazards | | | | | | |
| Drought / Heat Wave | Likely | Minor | Large | More than 24 hours | More than 1 week | 2.5 |
| Wildfire | Highly Likely | Minor | Small | Less than 6 hours | Less than 1 week | 2.6 |
| Geologic Hazards | | | | | | |
| Earthquake | Possible | Minor | Moderate | Less than 6 hours | Less than 6 hours | 2.0 |
| Landslide | Unlikely | Minor | Small | Less than 6 hours | Less than 6 hours | 1.5 |
| Land Subsidence | Unlikely | Minor | Small | Less than 6 hours | Less than 6 hours | 1.5 |
| Wind-related Hazards | | | | | | |
| Hurricane and Tropical Storm | Likely | Critical | Large | More than 24 hours | Less than 24 hours | 2.9 |
| Thunderstorm Wind / High Wind | Highly Likely | Critical | Moderate | 6 to 12 hours | Less than 6 hours | 3.1 |
| Hailstorm | Highly Likely | Limited | Moderate | 6 to 12 hours | Less than 6 hours | 2.8 |
| Lightning | Highly Likely | Limited | Negligible | 6 to 12 hours | Less than 6 hours | 2.4 |
| Tornado | Likely | Catastrophic | Small | Less than 6 hours | Less than 6 hours | 3.0 |
| Other Hazards | | | | | | |
| Hazardous Materials Incident | Likely | Limited | Small | Less than 6 hours | Less than 24 hours | 2.5 |
| Pandemic | Unlikely | Catastrophic | Large | More than 24 hours | More than 24hrs | 2.8 |

A.2.16 Final Determinations on Hazard Risk

The conclusions drawn from the hazard profiling process for Clarke County, including the PRI results and input from the Regional Hazard Mitigation Council, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk (**Table A.29**). For purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of Clarke County. A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately, and is described in Section 6: *Vulnerability Assessment* and below in Section A.3. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

Table 29: CONCLUSIONS ON HAZARD RISK FOR CLARKE COUNTY

| | |
|----------------------|--|
| HIGH RISK | Thunderstorm Wind / High Wind Tornado Flood Hurricane and Tropical Storm Hailstorm Pandemic |
| MODERATE RISK | Wildfire Drought / Heat Wave Hazardous Materials Incident Dam and Levee Failure Winter Storm and Freeze Lightning |
| LOW RISK | Earthquake Erosion Landslide Land Subsidence |

A.3 CLARKE COUNTY VULNERABILITY ASSESSMENT

This subsection identifies and quantifies the vulnerability of Clarke County to the significant hazards previously identified. This includes identifying and characterizing an inventory of assets in the county and assessing the potential impact and expected amount of damages caused to these assets by each identified hazard event. More information on the methodology and data sources used to conduct this assessment can be found in Section 6: *Vulnerability Assessment*.

A.3.1 Asset Inventory

The following table lists the fire stations, police stations, emergency operations centers (EOCs), medical care facilities, and schools located in Clarke County according to Hazus-MH Version 2.2.

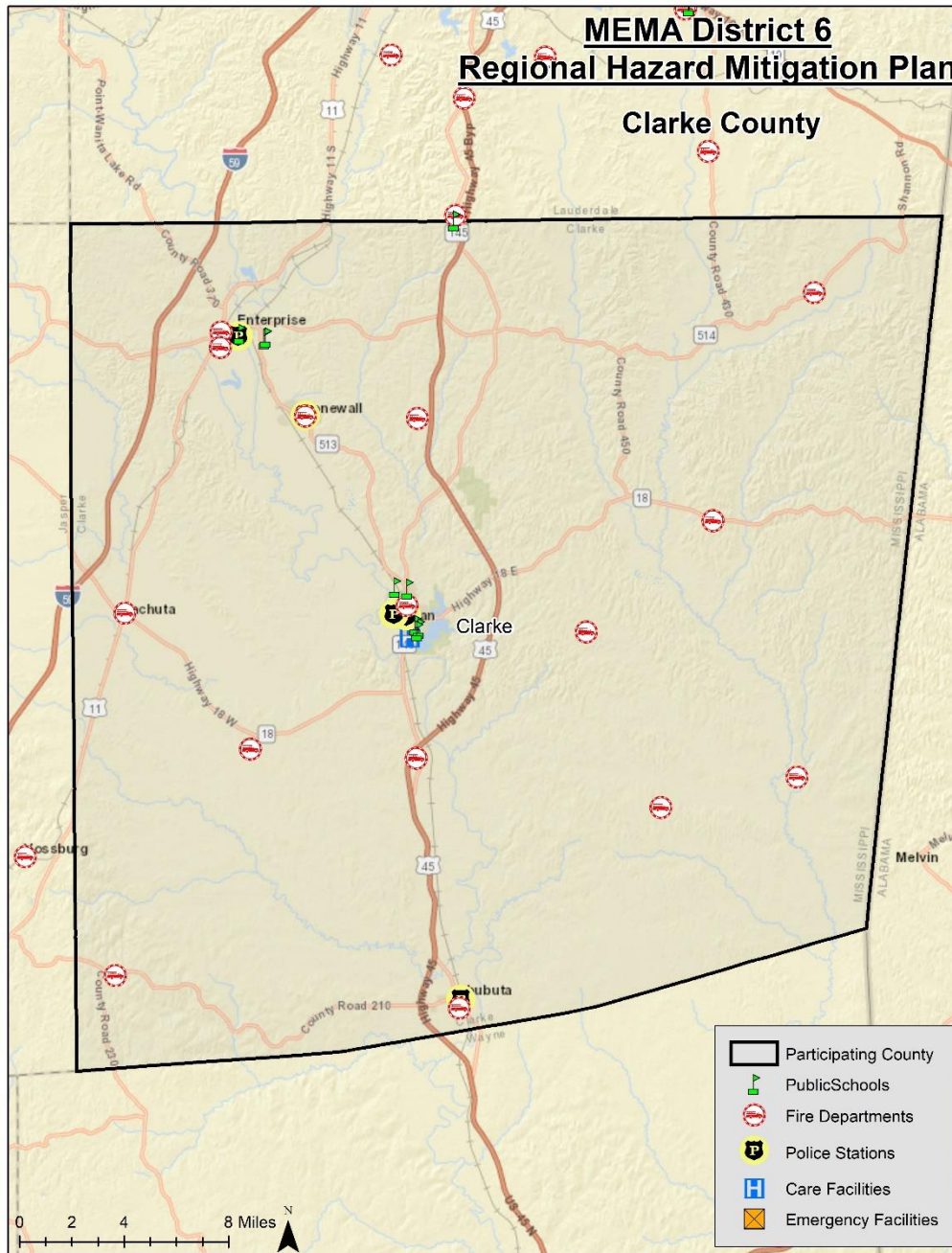
In addition, the figure below shows the locations of critical facilities in Clarke County. At the end of this subsection, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all-inclusive and only includes information provided through Hazus.

Table A.30: CRITICAL FACILITY INVENTORY IN CLARKE COUNTY

| Location | Fire Stations | Police Stations | Medical Care Facilities | EOC | Schools |
|----------------------------|---------------------|---------------------|-------------------------|--------------------|---------------------|
| Enterprise | 2 | 1 | 1 | 0 | 3 |
| Pachuta | 2 | 0 | 0 | 0 | 0 |
| Quitman | 7 | 2 | 1 | 1 | 6 |
| Shubuta | 2 | 1 | 1 | 0 | 0 |
| Stonewall | 1 | 1 | 0 | 0 | 0 |
| Unincorporated Area | 0 | 0 | 0 | 0 | 0 |
| ASSET VALUATION | \$32,048,232 | \$11,465,772 | N/A | \$2,293,154 | \$58,718,113 |
| CLARKE COUNTY TOTAL | 14 | 5 | 3 | 1 | 9 |

Source: Hazus-MH 2.2

Figure A.13: CRITICAL FACILITY LOCATIONS IN CLARKE COUNTY



Source: Hazus-MH 2.2

A.3.2 Social Vulnerability

In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess those particular segments of the resident population in Clarke County that are potentially at risk to these hazards.

Table A.32 lists the population by jurisdiction according to U.S. Census 2010 population estimates. The total population in Clarke County according to Census data is 16,732 persons. Additional population estimates are presented above in Section A.1.

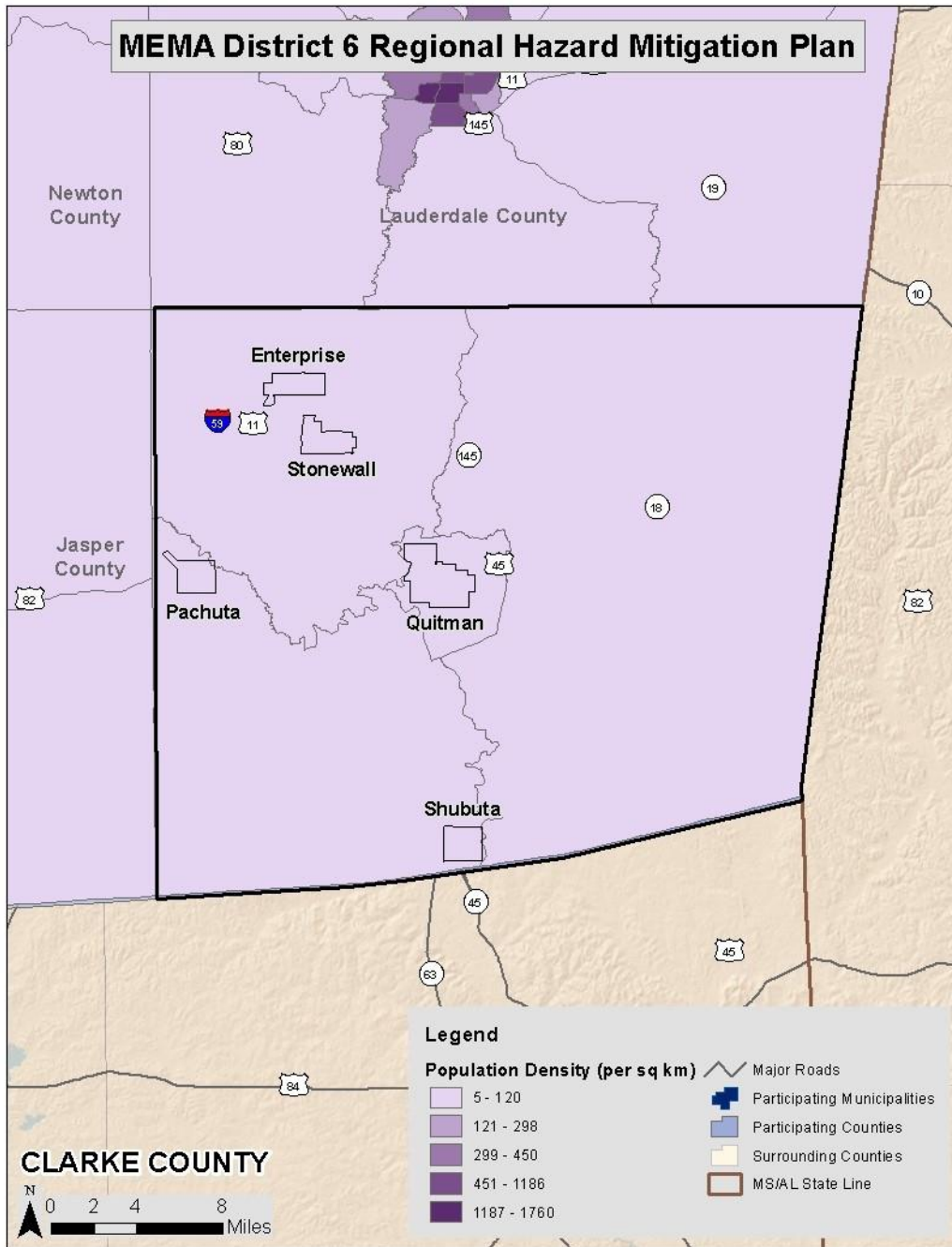
Table A.31: TOTAL POPULATION IN CLARKE COUNTY

| Location | Total 2019 Population |
|----------------------------|-----------------------|
| Enterprise | 615 |
| Pachuta | 143 |
| Quitman | 1,974 |
| Shubuta | 337 |
| Stonewall | 933 |
| Unincorporated Area | 11,768 |
| CLARKE COUNTY TOTAL | 15,770 |

Source: United States Census – American Community Survey 2019

In addition, the following figure illustrates the population density per square kilometer by census tract as it was reported by the U.S. Census Bureau American Community Survey 2019.

Figure A.14: POPULATION DENSITY IN CLARKE COUNTY



Source: United States Census – American Community Survey 2019

A.3.3 Development Trends and Changes in Vulnerability

Since the previous county hazard mitigation plan was approved (in 2015), Clarke County has experienced limited growth and development. **Table A.33** shows the number of building units constructed since 2010 according to the U.S. Census American Community Survey.

Table A.32: BUILDING COUNTS FOR CLARKE COUNTY

| Jurisdiction | Total Housing Units (2019) | Units Built 2014 or later | % Building Stock Built Post-2014 |
|----------------------------|----------------------------|---------------------------|----------------------------------|
| Enterprise | 276 | 0 | 0.0% |
| Pachuta | 119 | 0 | 0.0% |
| Quitman | 3,581 | 2 | 0.1% |
| Shubuta | 205 | 0 | 0.0% |
| Stonewall | 546 | 0 | 0.0% |
| Unincorporated Area | 3,478 | 75 | 2.1% |
| CLARKE COUNTY TOTAL | 8,000 | 77 | 1.0% |

Source: United States Census Bureau

Table A.34 shows population growth estimates for the county from 2010 to 2014 based on the U.S. Census Annual Estimates of Resident Population.

Table A.33: POPULATION GROWTH FOR CLARKE COUNTY

| Jurisdiction | Population Estimates (as of July 1) | | | | | % Change 2015-2019 |
|----------------------------|-------------------------------------|---------------|---------------|---------------|---------------|--------------------|
| | 2015 | 2016 | 2017 | 2018 | 2019 | |
| Enterprise | 716 | 586 | 796 | 650 | 615 | -14.10% |
| Pachuta | 286 | 256 | 219 | 185 | 143 | -50% |
| Quitman | 2,147 | 1,914 | 1,811 | 2,001 | 1,974 | -8.05% |
| Shubuta | 342 | 335 | 397 | 386 | 337 | -1.46% |
| Stonewall | 1,315 | 1,250 | 1,014 | 961 | 933 | -29% |
| Unincorporated Area | 11,556 | 12,062 | 11,852 | 11,745 | 11,768 | 1.83% |
| CLARKE COUNTY TOTAL | 16,362 | 16,203 | 16,089 | 15,928 | 15,770 | -3.61% |

Source: United States Census Bureau – American Community Survey

Based on the data above, there has been a low rate of residential development and population growth in the county since 2015, and the county has actually experienced a slight population decline. However, the unincorporated areas of the county have experienced a slightly higher rate of development compared to the rest of the county, resulting in an increased number of structures that are vulnerable to the potential impacts of the identified hazards. Conversely, since the population has decreased throughout the county, there are now fewer numbers of people exposed to the identified hazards. Therefore, development and population growth have impacted the county's vulnerability since the previous local hazard mitigation plan was approved but there has been no change in the overall vulnerability since the changes offset one another.

It is also important to note that as development increases in the future, greater populations and more structures and infrastructure will be exposed to potential hazards if development occurs in the floodplains, moderate and high landside susceptibility areas, high wildfire risk areas, or primary and secondary TRI site buffers.

A.3.4 Vulnerability Assessment Results

As noted in Section 6: *Vulnerability Assessment*, only hazards with a specific geographic boundary, available modeling tool, or sufficient historical data allow for further analysis. Those results, specific to

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Clarke County, are presented here. All other hazards are assumed to impact the entire planning region (drought / heat wave; thunderstorm—wind, hail, lightning; tornado; and winter storm and freeze) or, due to lack of data, analysis would not lead to credible results (dam and levee failure, erosion, and land subsidence). In the case of landslide, local officials determined that the USGS data may be somewhat amiss and that even the areas identified as moderate risks probably entailed an overall low risk.

The hazards to be further analyzed in this subsection include: flood, wildfire, earthquake, hurricane and tropical storm winds, and hazardous materials incident.

The annualized loss estimate for all hazards is presented near the end of this subsection.

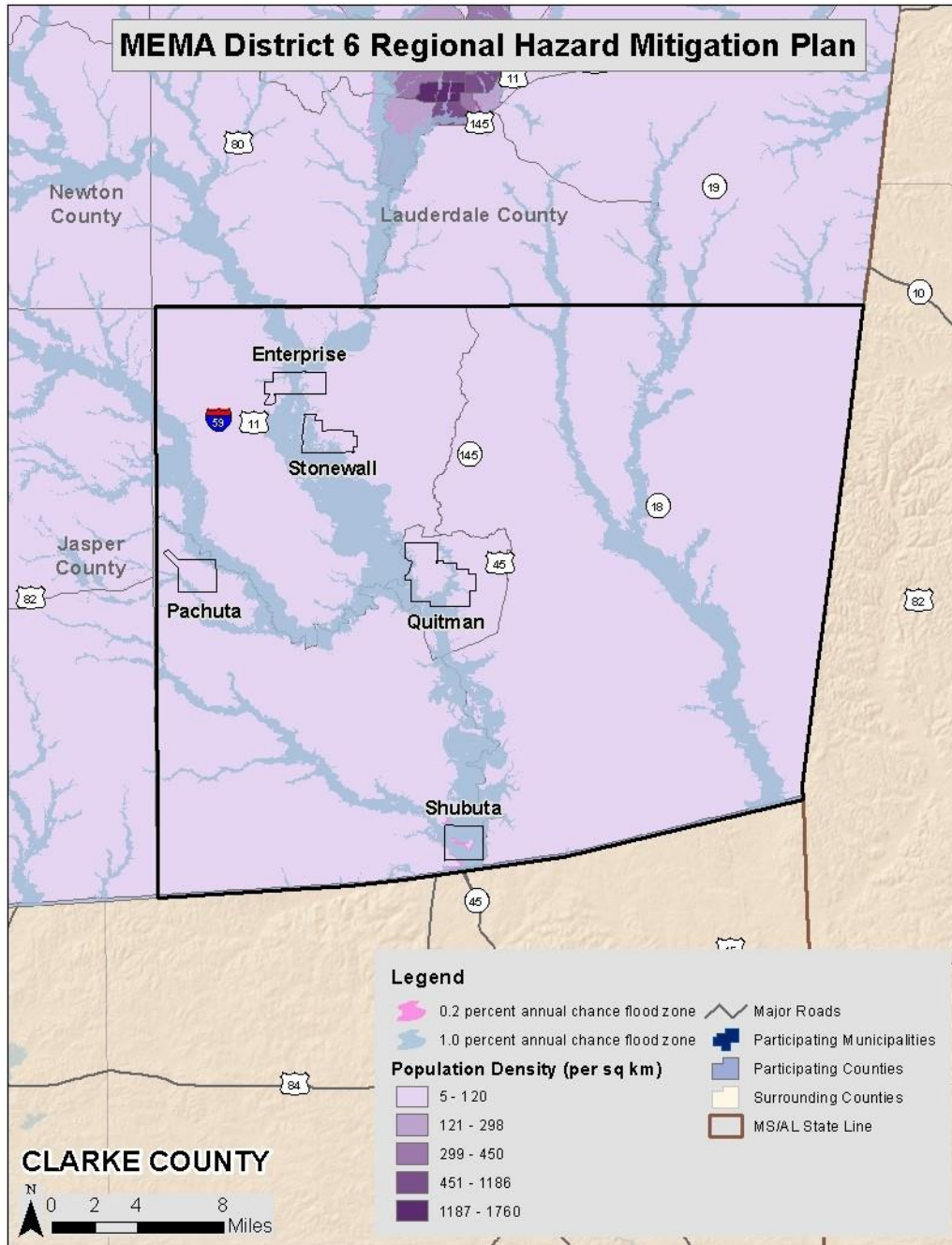
FLOOD

Historical evidence indicates that Clarke County is susceptible to flood events. A total of 18 flood events have been reported by the National Centers for Environmental Information resulting in \$4.7 million in property damage. On an annualized level, these damages amounted to \$341,967 for Clarke County.

Social Vulnerability

The figure below is presented to gain a better understanding of at-risk population by evaluating census tract level population data against mapped floodplains. There are areas of concern in several areas of the county. Indeed, nearly every incorporated municipality is potentially at risk of being impacted by flooding in some areas of its jurisdiction. Therefore, further investigation in these areas may be warranted. Population density data remains unchanged since last update.

Figure A.15: POPULATION DENSITY NEAR FLOODPLAINS

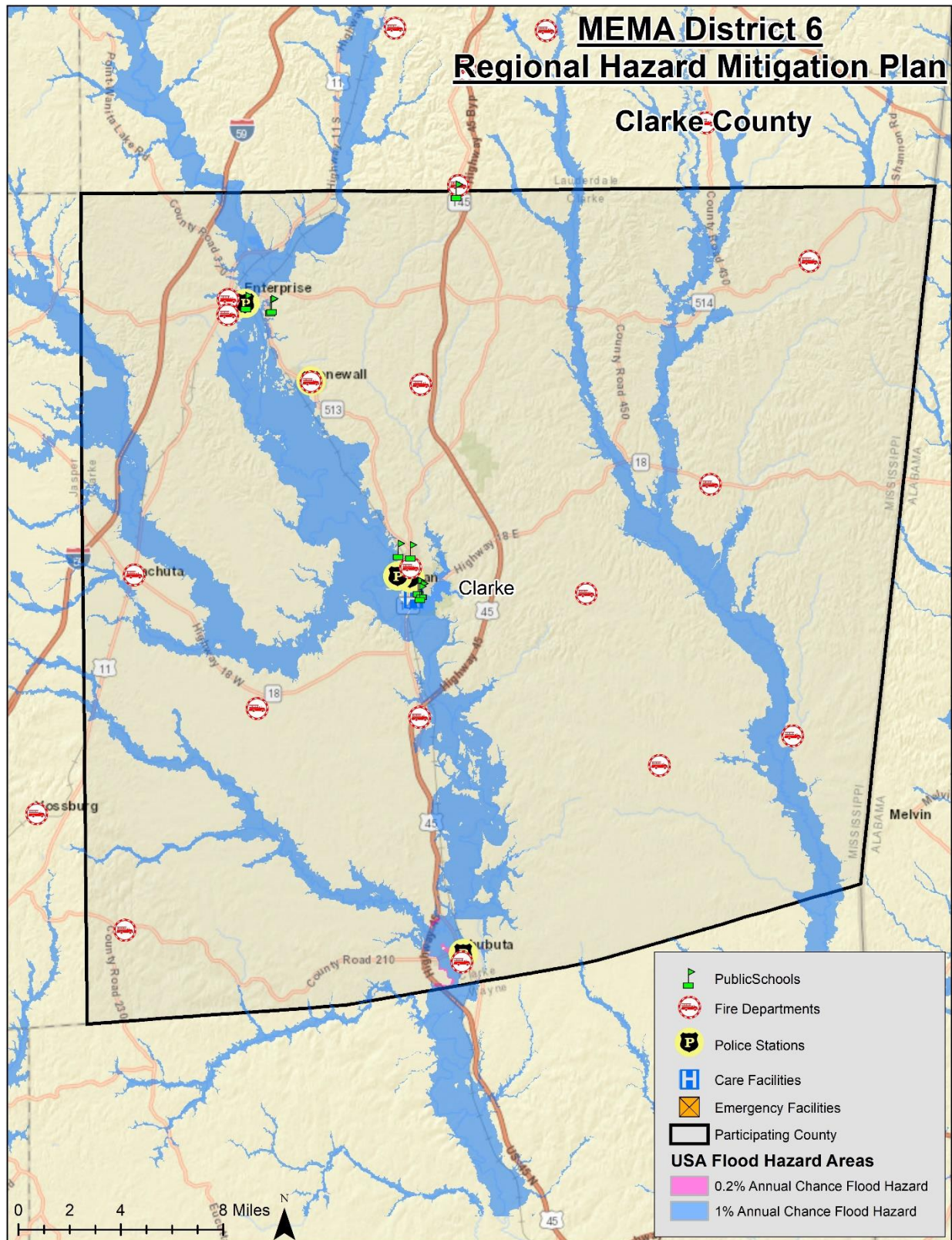


Source: Federal Emergency Management Agency DFIRM, United States Census 2019

Critical Facilities

The following figure shows critical facility locations in relation to Special Flood Hazard Areas. (Please note, as previously indicated, this analysis does not consider building elevation, which may negate risk.) Both facilities are schools located in the 1.0 percent annual chance flood zone. A list of specific critical facilities and their associated risk can be found at the end of this section.

Figure A.16: CRITICAL FACILITY LOCATION ANALYSIS – SFHA



In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in Clarke County, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates. Furthermore, areas subject to repetitive flooding should be analyzed for potential mitigation actions.

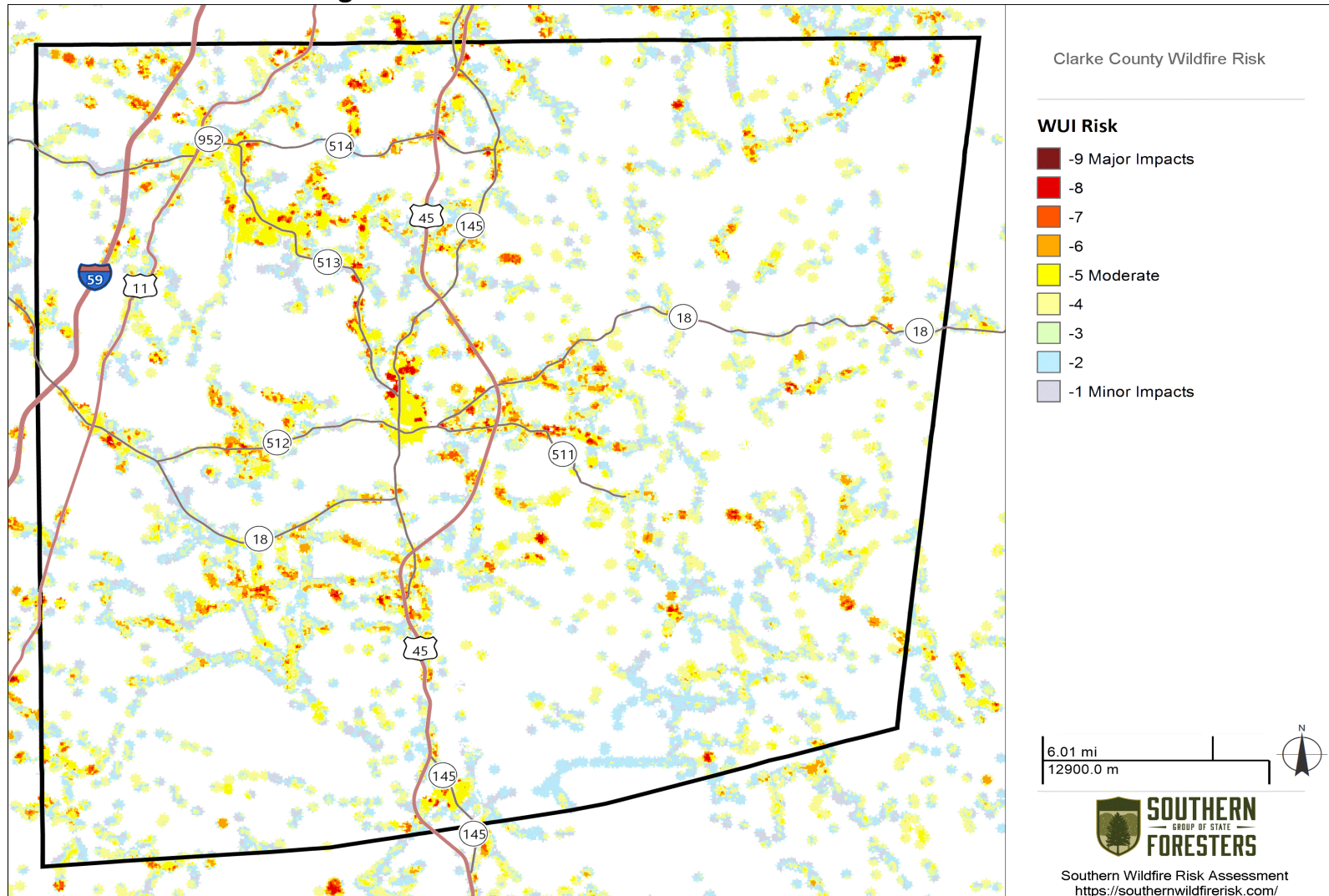
WILDFIRE

Although historical evidence indicates that Clarke County is susceptible to wildfire events, there are few reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result in significant damages throughout the county.

To estimate exposure to wildfire, building data was obtained from Hazus-MH 2.2 which includes information that has been aggregated at the Census block level and which has been deemed useful for analyzing wildfire vulnerability. However, it should be noted that the accuracy of Hazus data is somewhat lower than that of parcel data. For the critical facility analysis, areas of concern were intersected with critical facility locations.

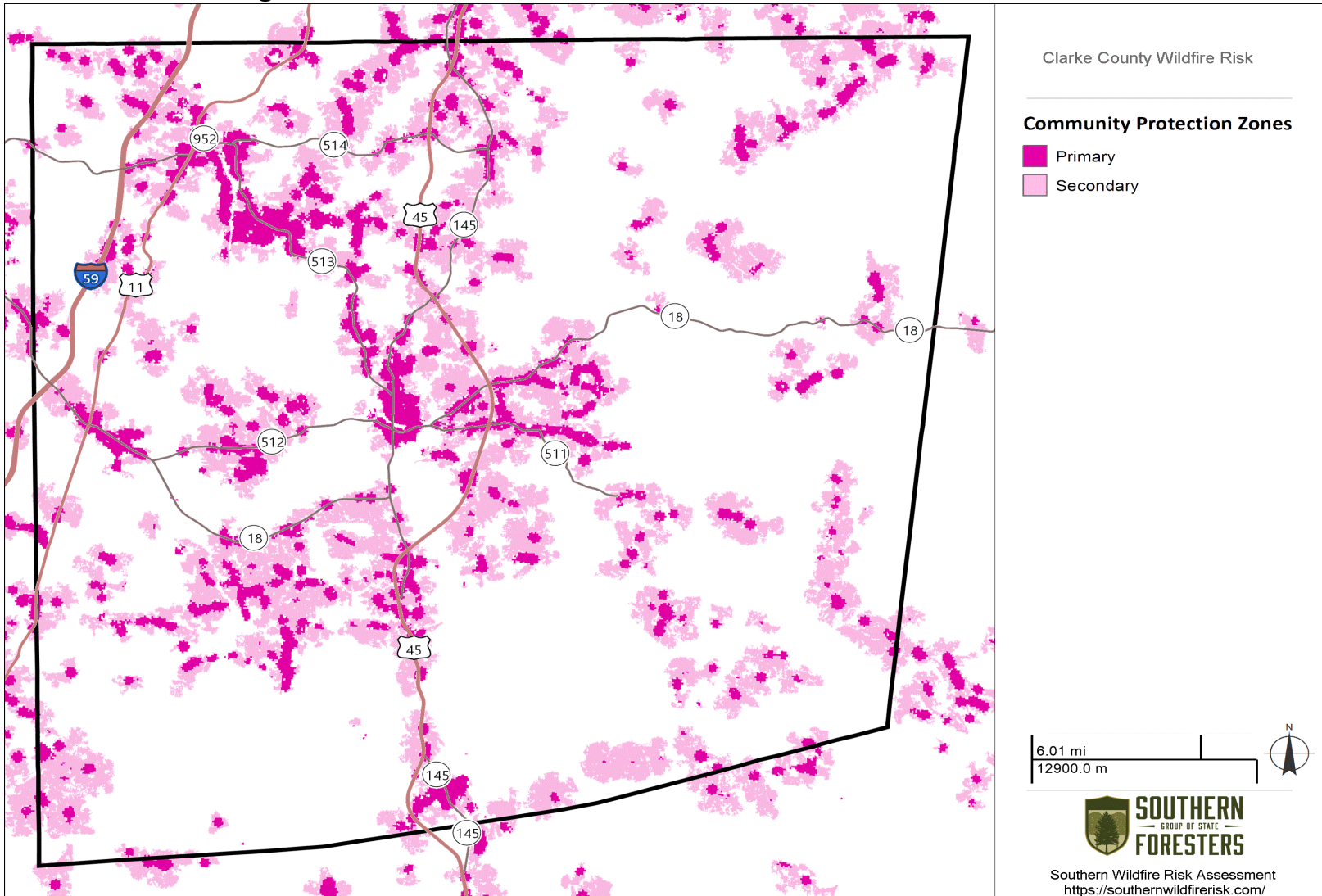
Figure A.17 shows the Wildland Urban Interface Risk Index (WUIRI) data, which is a data layer that shows a rating of the potential impact of a wildfire on people and their homes. The key input, Wildland Urban Interface (WUI), reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the WUI and rural areas is key information for defining potential wildfire impacts to people and homes. Initially provided as raster data, it was converted to a polygon to allow for analysis. The Wildland Urban Interface Risk Index data ranges from 0 to -9 with lower values being most severe (as noted previously, this is only a measure of relative risk). **Figure A.18** Community Protection Zones (CPZ) represent those areas considered highest priority for mitigation planning activities. CPZs are based on an analysis of the *Where People Live* housing density data and surrounding fire behavior potential. Rate of Spread data is used to determine the areas of concern around populated areas that are within a 2-hour fire spread distance. This is referred to as the Secondary CPZ. **Figure A.19** shows critical facility locations in relation to historical wildfire burns.

Figure A.17: WUI RISK INDEX AREAS IN CLARKE COUNTY



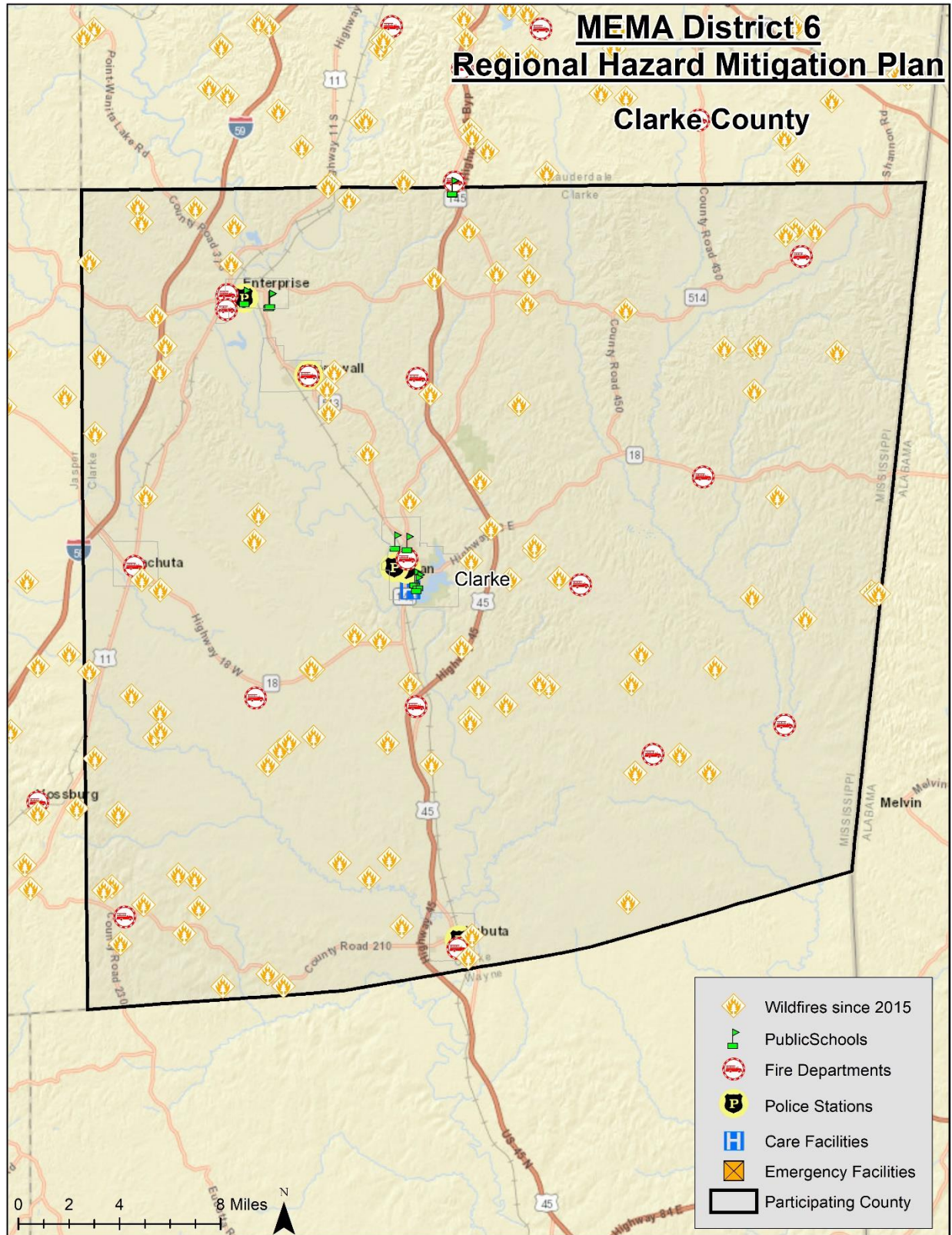
Source: Southern Wildfire Risk Assessment Data

Figure A.18: COMMUNITY PROTECTION ZONES IN CLARKE COUNTY



Source: Southern Wildfire Risk Assessment Data

Figure A.19: CRITICAL FACILITY ANALYSIS - WILDFIRE



Source: Southern Wildfire Risk Assessment Data

Social Vulnerability

Given some level of susceptibility across the entire county, it is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading. In particular, the expansion of residential development from urban centers out into rural landscapes, increases the potential for wildland fire threat to public safety and the potential for damage to forest resources and dependent industries. This increase in population across the region will impact counties and communities that are located within the Wildland Urban Interface (WUI). The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire. For the Clarke County Wildfire Risk project area, it is estimated that 16,515 people or 98.6 % percent of the total project area population (16,751) live within the WUI.⁷

Critical Facilities

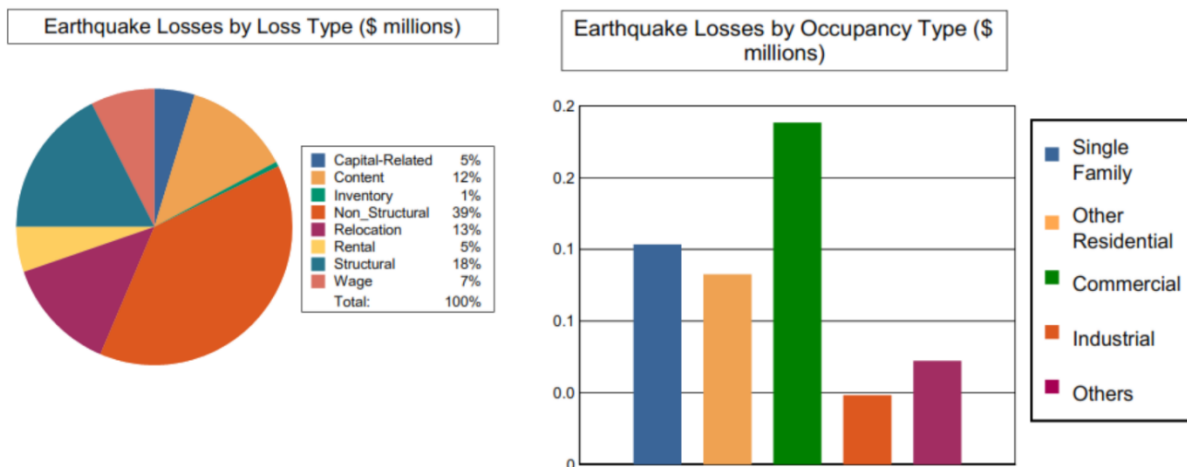
The critical facility analysis revealed that there are two critical facilities located in wildfire areas of concern, including one police station and one school. It should be noted, that several factors could impact the spread of a wildfire putting all facilities at risk. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a wildfire event has the potential to impact many existing and future buildings, critical facilities, and populations in Clarke County.

EARTHQUAKE

A probabilistic earthquake model was performed for the MEMA District 6 Region. As the Hazus-MH model suggests below, and historical occurrences confirm, any earthquake activity in the area is likely to inflict minor damage to the county. Hazus-MH 2.2 estimates the total building-related losses were \$520,000; 31 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 44 % of the total loss. The figure below provides a summary of the losses associated with the building damage.

Figure A.20: MEMA D6 EARTHQUAKE LOSSES BY TYPE



For the earthquake hazard vulnerability assessment, a probabilistic scenario was created to estimate the average annualized loss for the region. The results of the analysis are generated at the Census Tract level

⁷ Southern Wildfire Risk Assessment 2021

ANNEX A: CLARKE COUNTY

within Hazus-MH and then aggregated to the region level. Since the scenario is annualized, no building counts are provided. Losses reported included losses due to structure failure, building loss, contents damage, and inventory loss.

Social Vulnerability

It can be assumed that all existing and future populations are at risk to the earthquake hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 39 households to be displaced due to the earthquake. Of these, 32 people (out of a total population of 244,467) will seek temporary shelter in public shelters.⁸ The total economic loss estimated for the earthquake is 76.76 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory.

Critical Facilities

The Hazus-MH probabilistic analysis indicated that no critical facilities would sustain measurable damage in an earthquake event. However, all critical facilities should be considered at-risk to minor damage, should an event occur. Before the earthquake, the region had 1,241 hospital beds available for use. On the day of the earthquake, the model estimates that only 1,035 hospital beds (83.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 93.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

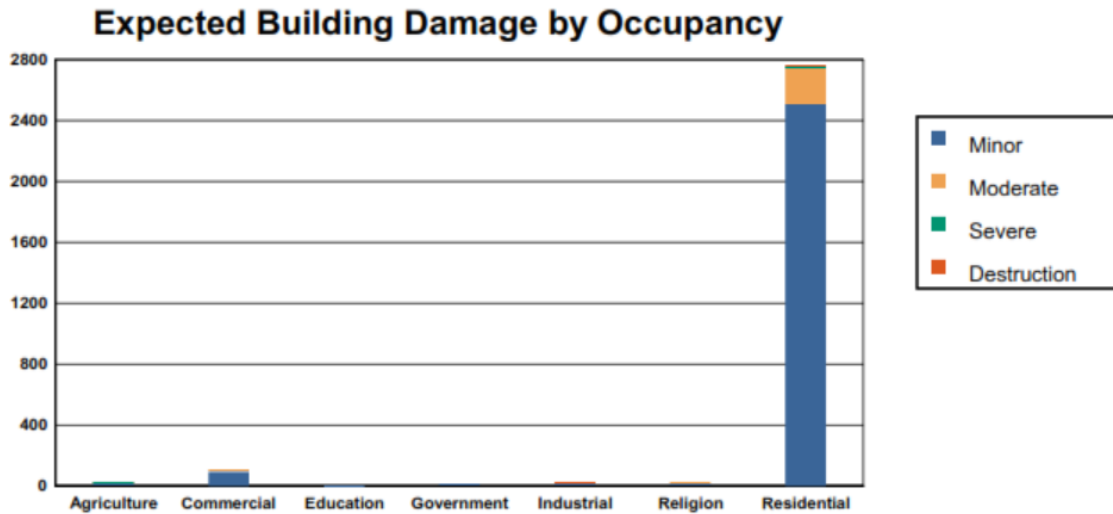
In conclusion, an earthquake has the potential to impact all existing and future buildings, facilities, and populations in Clarke County. The Hazus-MH scenario indicates that minimal to moderate damage is expected from an earthquake occurrence. While Clarke County may not experience a large earthquake (the greatest on record is a magnitude II MMI), localized damage is possible with an occurrence. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

HURRICANE AND TROPICAL STORM

Historical evidence indicates that Clarke County has some risk to the hurricane and tropical storm hazard. There have been five disaster declarations due to hurricanes (Hurricanes Frederic, Ivan, Dennis, Katrina, and Isaac). Several tracks have come near or traversed through the county, as shown and discussed in Section A.2.10.

A probabilistic 100-year hurricane model was performed for the MEMA District 6. Hazus estimates that about 289 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 12 buildings that will be completely destroyed. The figure below summarizes the expected damage by general occupancy for the buildings in the region.

⁸ HAZUS-MH utilizes 2010 Census Data

Figure A.21: MEMA D6 100-YEAR HURRICANE

Hurricanes and tropical storms can cause damage through numerous additional hazards such as flooding, erosion, tornadoes, and high winds, thus it is difficult to estimate total potential losses from these cumulative effects. The current Hazus-MH hurricane model only analyzes hurricane winds and is not capable of modeling and estimating cumulative losses from all hazards associated with hurricanes; therefore, only hurricane winds are analyzed in this section. It can be assumed that all existing and future buildings and populations are at risk to the hurricane and tropical storm hazard.

Social Vulnerability

Given equal susceptibility across the county, it is assumed that the total population, both current and future, is at risk to the hurricane and tropical storm hazard. Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 34 households to be displaced due to the hurricane. Of these, 26 people (out of a total population of 244,467) will seek temporary shelter in public shelters.

Critical Facilities

Given equal vulnerability across Clarke County, all critical facilities are considered to be at risk. Some buildings may perform better than others in the face of such an event due to construction and age, among other factors. Determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation action for especially vulnerable structures and/or critical facilities to mitigate against the effects of the hurricane hazard. A list of specific critical facilities can be found at the end of this subsection.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in Clarke County.

HAZARDOUS MATERIALS INCIDENT

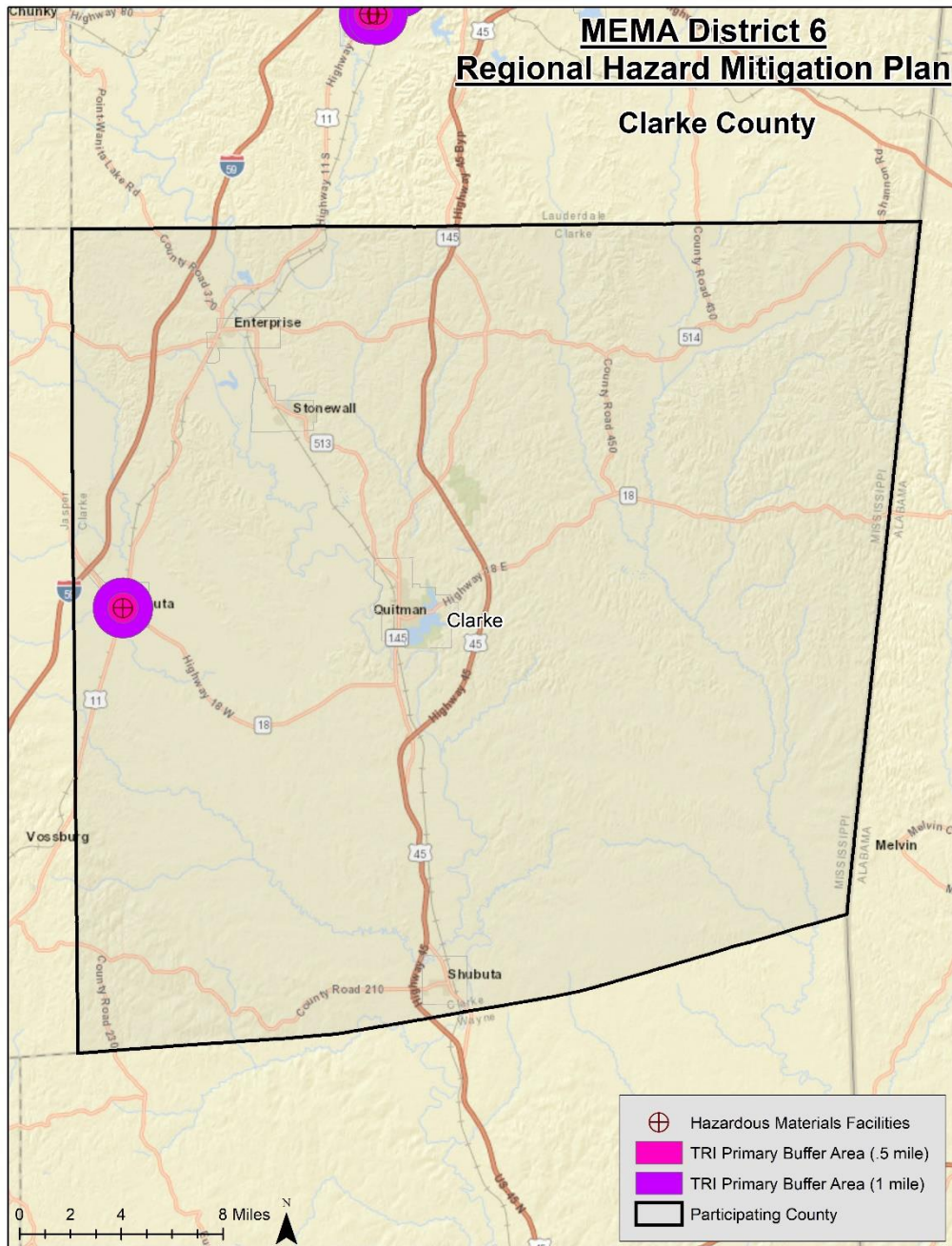
Historical evidence indicates that Clarke County is susceptible to hazardous materials events. A total of eight HAZMAT incidents have been reported by the Pipeline and Hazardous Materials Safety Administration, resulting in \$404,262 in property damage. On an annualized level, these damages amount

to \$12,738 for the county.

Most hazardous materials incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

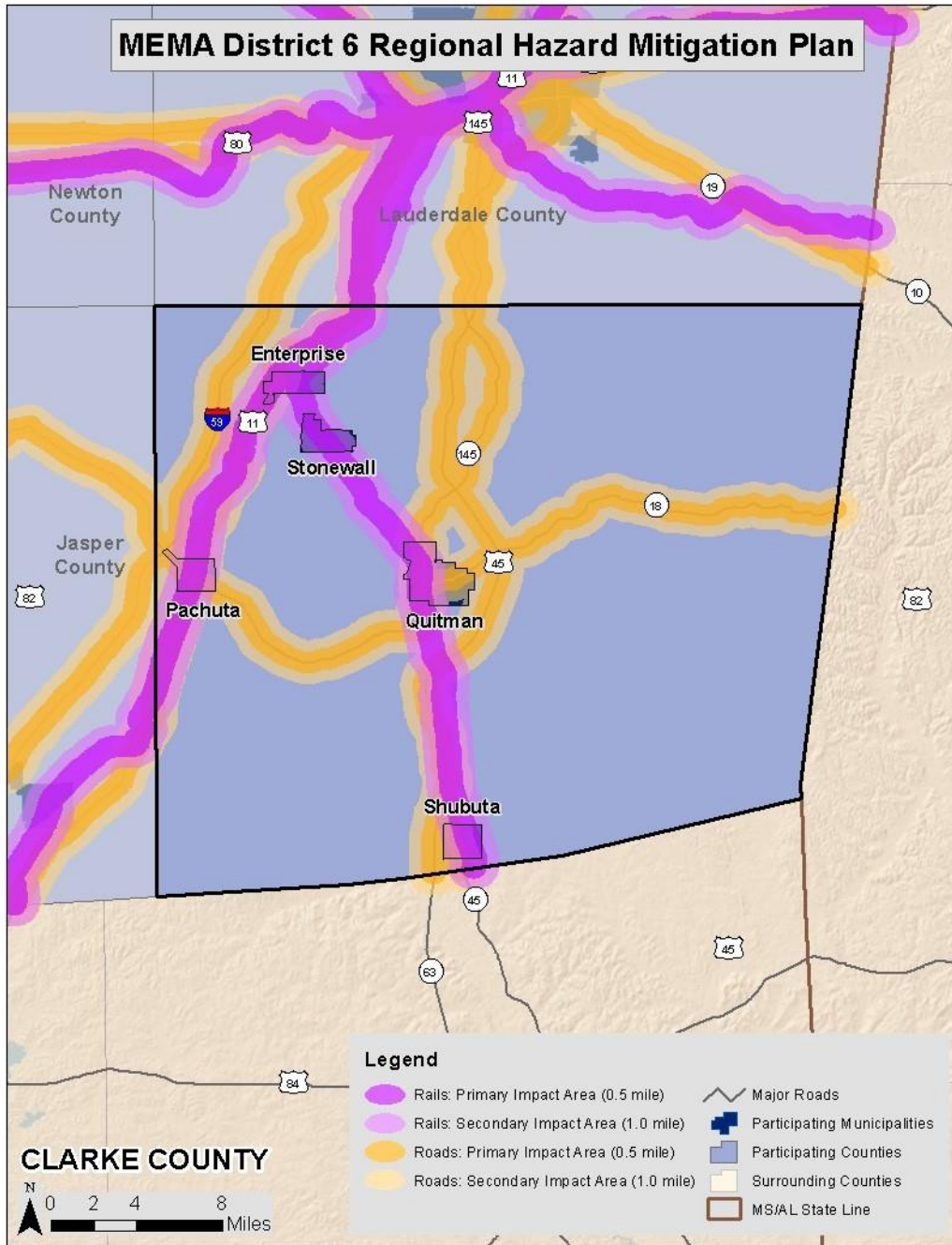
In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas and building footprints/parcels. In both scenarios, two sizes of buffers—0.5-mile and 1.0-mile—were used. These areas are assumed to represent the different levels of effect: immediate (primary) and secondary. Primary and secondary impact zones were selected based on guidance from the PHMSA Emergency Response Guidebook. For the fixed site analysis, geo-referenced TRI sites in the region, along with buffers, were used for analysis as shown in **Figure A.22**. For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure A.23** shows the areas used for mobile toxic release buffer analysis.

Figure A.22: TRI SITES WITH BUFFERS IN CLARKE COUNTY



Source: Environmental Protection Agency

Figure A.23: MOBILE HAZMAT BUFFERS IN CLARKE COUNTY



Social Vulnerability

Given high susceptibility across the entire county, it is assumed that the total population is at risk to a hazardous materials incident. It should be noted that areas of population concentration may be at an elevated risk due to a greater burden to evacuate population quickly.

Critical Facilities

Fixed Site Analysis:

The critical facility analysis for fixed TRI sites revealed that there are no facilities located in a HAZMAT risk zone. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

Mobile Analysis:

It should be presumed that any facility located near a public roadway or rail line is susceptible to a potential HAZMAT event. A list of specific critical facilities and their associated risk can be found at the end of this subsection.

A list of specific critical facilities and their associated risk can be found at the end of this subsection.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in Clarke County. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area (i.e., direction and speed of wind, volume of release, etc.). Further, incidents from neighboring counties could also impact the county and participating jurisdictions.

CONCLUSIONS ON HAZARD VULNERABILITY

The following table presents a summary of annualized loss for each hazard in Clarke County. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the county.

Table A.34: ANNUALIZED LOSS FOR CLARKE COUNTY

| Event | Clarke County | Enterprise | Pachuta | Quitman | Shubuta | Stonewall |
|------------------------------|---------------|------------|------------|------------|------------|------------|
| Flood-related Hazards | | | | | | |
| Flood | \$203,260 | \$125,083 | \$208 | \$27,000 | \$208 | \$15,083 |
| Erosion | Negligible | Negligible | Negligible | Negligible | Negligible | Negligible |
| Dam and Levee Failure | Negligible | Negligible | Negligible | Negligible | Negligible | Negligible |
| Winter Storm & Freeze | \$5,200 | Negligible | Negligible | Negligible | Negligible | Negligible |
| Fire-related Hazards | | | | | | |
| Drought / Heat Wave | \$8,125 | Negligible | Negligible | Negligible | Negligible | Negligible |
| Wildfire | Negligible | Negligible | Negligible | Negligible | Negligible | Negligible |
| Geologic Hazards | | | | | | |
| Earthquake | Negligible | Negligible | Negligible | Negligible | Negligible | Negligible |
| Landslide | Negligible | Negligible | Negligible | Negligible | Negligible | Negligible |
| Land Subsidence | Negligible | Negligible | Negligible | Negligible | Negligible | Negligible |
| Wind-related Hazards | | | | | | |
| Hurricane & Tropical Storm | \$576,000 | Negligible | Negligible | Negligible | Negligible | Negligible |
| Thunderstorm / High Wind | \$78,740 | \$14,750 | \$10,920 | \$5,210 | \$3,600 | \$4,410 |
| Hail | \$6,781 | Negligible | \$909 | \$2,290 | \$654 | \$545 |
| Lightning | \$33,857 | Negligible | Negligible | \$2,857 | Negligible | Negligible |
| Tornado | \$446,468 | Negligible | \$1,406 | \$1,328 | \$7,031 | Negligible |
| Other Hazards | | | | | | |
| HAZMAT Incident | \$24,335 | Negligible | Negligible | Negligible | Negligible | Negligible |
| Pandemic | Negligible | Negligible | Negligible | Negligible | Negligible | Negligible |

**In this table, the term “Negligible” is used to indicate that no records of dollar losses for the particular hazard were recorded. This could be the case either because there were no events that caused dollar damage or because documentation of that particular type of event is not well kept. . It could also mean that event data is reported on a county-level only. Annualized losses were calculated based on the total number of years of reporting and damage totals.*

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to atmospheric hazards including drought / heat wave, hurricane and tropical storm, thunderstorm (wind, hail, lightning), tornado, and winter storm and freeze. In addition, all buildings and populations are vulnerable to all of the man-made and technological hazards identified above. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. The following table shows the critical facilities vulnerable to additional hazards analyzed in this subsection. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an “X”).

Table A.35: AT-RISK CRITICAL FACILITIES IN CLARKE COUNTY

| FACILITY NAME | FACILITY TYPE | FLOOD-RELATED | | | | FIRE-RELATED | | | GEOLOGIC | | | WIND-RELATED | | | OTHER | | | | | | |
|--|-----------------------|----------------|----------------|---------|-------------------------------------|-------------------------|---------------------|----------|------------|-----------|-----------------|------------------------------|---------------------------|---------|-------------------------|-------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|----------|
| | | Flood – 100 yr | Flood – 500 yr | Erosion | Dam and Levee Failure ³² | Winter Storm and Freeze | Drought / Heat Wave | Wildfire | Earthquake | Landslide | Land Subsidence | Hurricane and Tropical Storm | Thunderstorm (wind, hail, | Tornado | Fixed HAZMAT – 0.5 mile | Fixed HAZMAT – 1.0 mile | Mobile HAZMAT – 0.5 mile (road) | Mobile HAZMAT – 1.0 mile (road) | Mobile HAZMAT – 0.5 mile (rail) | Mobile HAZMAT – 1.0 mile (rail) | Pandemic |
| CLARKE COUNTY | | | | | | | | | | | | | | | | | | | | | |
| Carmichael Volunteer Fire Department | Fire Station | | | X | X | X | X | | X | X | X | X | X | X | | | | | | | X |
| DESOTO VOLUNTEER FIRE DEPARTMENT | Fire Station | | | X | | | | | X | X | X | X | X | X | | | | | | | X |
| EAST QUITMAN VOLUNTEER FIRE | Fire Station | | | X | | | | | X | X | X | X | X | X | | | | | | | X |
| Enterprise Volunteer Fire Department & A | Fire Station | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | | X | X |
| Enterprise Volunteer Fire Department | Fire Station | | | X | | | | | X | X | X | X | X | X | | | | | | | X |
| HARMONY VOLUNTEER FD | Fire Station | | | X | | | | | X | X | X | X | X | X | | | | | | | X |
| Hopewell Volunteer Fire Department | Fire Station | | | X | X | X | X | | X | X | X | X | X | X | | | | | | | X |
| Pachuta Volunteer Fire Department | Fire Station | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | X | X | X |
| QUITMAN VOLUNTEER FD | Fire Station | | | X | | | | | X | X | X | X | X | X | | | | | | | X |
| ROLLING CREEK VOLUNTEER FD | Fire Station | | | X | | | | | X | X | X | X | X | X | | | | | | | X |
| Shubuta City Fire Dept | Fire Station | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | X | X | X |
| Stonewall VFD | Fire Station | | | X | X | X | X | | X | X | X | X | X | X | | | | | | X | X |
| THEADSVILLE VOLUNTEER FD | Fire Station | | | X | | | | | X | X | X | X | X | X | | | | | | | X |
| H C Watkins Memorial Hospital | Medical Care Facility | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | X | X | X |
| Clarke County Sheriff Dept | Police Station | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | X | X | X |
| Enterprise Police Dept | Police Station | | | X | X | X | X | | X | X | X | X | X | X | | | | X | X | X | X |
| Quitman City Police Dept | Police Station | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | X | X | X |
| Shubuta Police Department | Police Station | | | X | | | | | X | X | X | X | X | X | | | | | | | X |
| Stonewall Police Dept | Police Station | | | X | X | X | X | | X | X | X | X | X | X | | | | | | X | X |

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| FACILITY NAME | FACILITY TYPE | FLOOD-RELATED | | | | | FIRE-RELATED | | GEOLOGIC | | | WIND-RELATED | | | OTHER | | | | | | Pandemic |
|---------------------------------|---------------|----------------|----------------|---------|-------------------------------------|-------------------------|---------------------|----------|------------|-----------|-----------------|------------------------------|---------------------------|---------|-------------------------|-------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|----------|
| | | Flood – 100 yr | Flood – 500 yr | Erosion | Dam and Levee Failure ³³ | Winter Storm and Freeze | Drought / Heat Wave | Wildfire | Earthquake | Landslide | Land Subsidence | Hurricane and Tropical Storm | Thunderstorm (wind, hail, | Tornado | Fixed HAZMAT – 0.5 mile | Fixed HAZMAT – 1.0 mile | Mobile HAZMAT – 0.5 mile (road) | Mobile HAZMAT – 1.0 mile (road) | Mobile HAZMAT – 0.5 mile (rail) | Mobile HAZMAT – 1.0 mile (rail) | |
| Clarkdale Attendance Center | School | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | | | X |
| Clarke Co Vocational Center | School | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | X | X | X |
| Enterprise Elementary | School | X | | X | X | X | X | X | X | X | X | X | X | X | | | | X | X | X | X |
| Enterprise High School | School | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | X | X | X |
| Enterprise Middle School | School | X | | X | X | X | X | | X | X | X | X | X | X | | | | X | X | X | X |
| Quitman Alternative School | School | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | | X | X |
| Quitman High School | School | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | | X | X |
| Quitman Jr High School | School | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | X | X | X |
| Quitman Lower Elementary School | School | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | X | X | X |
| Quitman Upper Elementary School | School | | | X | X | X | X | | X | X | X | X | X | X | | | X | X | | X | X |

As noted previously, these facilities could be at risk to dam failure if located in an inundation area. Data was not available to conduct such an analysis. There was no local knowledge of these facilities being at risk to dam failure. As additional data becomes available, more in-depth analysis will be conducted.

A.4 CLARKE COUNTY CAPABILITY ASSESSMENT

This subsection discusses the capability of Clarke County to implement hazard mitigation activities. More information on the purpose and methodology used to conduct the assessment can be found in Section 7: *Capability Assessment*.

A.4.1 Planning and Regulatory Capability

The table below provides a summary of the relevant local plans, ordinances, and programs already in place or under development for Clarke County. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the MEMA District 6 Regional Hazard Mitigation Plan.

Table A.36: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

| Planning Tool/Regulatory Tool | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------|------------------------|-----------------------------|----------------------------|---|--------------------------------------|----------------------------------|---------------------|---------------------------|-------------------------------|-----------------|------------------------|---------------------------|---------------------------|----------------------------|-----------------------------------|------------------|-----------------------|-------------------------------|---------------------------------------|---------------|-----------|---|------------------------------|
| | Hazard Mitigation Plan | Comprehensive Land Use Plan | Floodplain Management Plan | Open Space Management Plan (Parks & Rec/Greenway Plan | Stormwater Management Plan/Ordinance | Natural Resource Protection Plan | Flood Response Plan | Emergency Operations Plan | Continuity of Operations Plan | Evacuation Plan | Disaster Recovery Plan | Capital Improvements Plan | Economic Development Plan | Historic Preservation Plan | Flood Damage Prevention Ordinance | Zoning Ordinance | Subdivision Ordinance | Unified Development Ordinance | Post-Disaster Redevelopment Ordinance | Building Code | Fire Code | National Flood Insurance Program (NFIP) | NFIP Community Rating System |
| CLARKE COUNTY | ✓ | | | | | | ✓ | | | | | | ✓ | | ✓ | | | | | | | ✓ | |
| Enterprise | ✓ | ✓ | | | | | ✓ | | | | | | ✓ | | ✓ | ✓ | | | | ✓ | | ✓ | |
| Pachuta | ✓ | | | | | | ✓ | | | | | | ✓ | | ✓ | | | | | ✓ | | ✓ | |
| Quitman | ✓ | ✓ | | | | | ✓ | | | | | | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | ✓ | |
| Shubuta | ✓ | | | | | | ✓ | | | | | | ✓ | | ✓ | | | | | | | ✓ | |
| Stonewall | ✓ | ✓ | | | | | ✓ | | | | | | ✓ | | ✓ | ✓ | | | | ✓ | | ✓ | |

A more detailed discussion on the county’s planning and regulatory capabilities follows.

EMERGENCY MANAGEMENT**Hazard Mitigation Plan**

Clarke County has previously adopted a hazard mitigation plan. The Town of Enterprise, Town of Pachuta, City of Quitman, Town of Shubuta, and Town of Stonewall were also included in this plan.

Emergency Operations Plan

Clarke County maintains an Emergency Operations Plan through its Emergency Management Agency. The Town of Enterprise, Town of Pachuta, City of Quitman, Town of Shubuta, and Town of Stonewall are each covered by this plan.

GENERAL PLANNING**Comprehensive Land Use Plan**

Clarke County has not adopted a county comprehensive land use plan. However, the Town of Enterprise, City of Quitman, and Town of Stonewall each have adopted a municipal comprehensive plan.

Zoning Ordinance

Clarke County does not have a zoning ordinance in place. However, the Town of Enterprise, City of Quitman, and Town of Stonewall have adopted zoning ordinances.

Building Codes, Permitting, and Inspections

The Town of Enterprise, Town of Pachuta, City of Quitman, and Town of Stonewall have adopted a building code.

FLOODPLAIN MANAGEMENT

The following table provides NFIP policy and claim information for each participating jurisdiction in Clarke County.

Table A.37: NFIP POLICY AND CLAIM INFORMATION

| Jurisdiction | Date Joined NFIP | Current Effective Map Date | NFIP Policies in Force | Insurance in Force | Closed Claims | Total Payments to Date |
|----------------|------------------|----------------------------|------------------------|--------------------|---------------|------------------------|
| CLARKE COUNTY† | 08/16/88 | 09/02/11 | 63 | \$9,406,200 | 23 | \$332,258 |
| Enterprise | 01/01/87 | 09/02/11 | 7 | \$873,800 | 6 | \$293,457 |
| Pachuta | 11/18/10 | 09/02/11(M) | 0 | \$0 | 0 | \$0 |
| Quitman | 01/01/86 | 09/02/11(M) | 18 | \$4,984,000 | 2 | \$18,401 |
| Shubuta | 09/01/91 | 09/02/11 | 23 | \$1,886,400 | 3 | \$7,781 |
| Stonewall | 08/16/88 | 09/02/11 | 15 | \$1,007,500 | 7 | \$30,121 |

†Includes unincorporated areas of county only

(M) – No Elevation Determined, All Zone A, C and X

Source: NFIP Community Status information as of 9/2/2015; NFIP claims and policy information as of 6/30/2015

Flood Damage Prevention Ordinance

All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. Clarke County, the Town of Enterprise, the Town of Pachuta, the City of Quitman, the Town of Shubuta, and the Town of Stonewall all participate in the NFIP and have adopted flood damage prevention ordinances.

A.4.2 Administrative and Technical Capability

The table below provides a summary of the capability assessment results for Clarke County with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

Table A.38: RELEVANT STAFF / PERSONNEL RESOURCES

| Staff / Personnel Resource | Planners with knowledge of land development/land management practices | Engineers or professionals trained in construction practices related to buildings and/or infrastructure | Planners or engineers with an understanding of natural and/or human-caused hazards | Emergency Manager | Floodplain Manager | Land Surveyors | Scientists familiar with the hazards of the community | Staff with education or expertise to assess the community's vulnerability to hazards | Personnel skilled in GIS and/or Hazus | Resource development staff or grant writers |
|----------------------------|---|---|--|-------------------|--------------------|----------------|---|--|---------------------------------------|---|
| CLARKE COUNTY | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Enterprise | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Pachuta | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Quitman | | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Shubuta | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Stonewall | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | |

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

A.4.3 Fiscal Capability

The following table provides a summary of the results for Clarke County with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plan.

Table A.39: RELEVANT FISCAL RESOURCES

| Fiscal Tool / Resource | Capital Improvement Programming | Community Development Block Grants (CDBG) | Special Purpose Taxes (or taxing districts) | Gas/Electric Utility Fees | Water/Sewer Fees | Stormwater Utility Fees | Development Impact Fees | General Obligation, Revenue, and/or Special Tax Bonds | Partnering Arrangements or Intergovernmental Agreements | Other: other state and Federal funding sources |
|------------------------|---------------------------------|---|---|---------------------------|------------------|-------------------------|-------------------------|---|---|--|
| CLARKE COUNTY | ✓ | ✓ | | | | | | | | ✓ |
| Enterprise | ✓ | ✓ | | | | | | | | ✓ |
| Pachuta | ✓ | ✓ | | | | | | | | ✓ |
| Quitman | ✓ | ✓ | | | | | | | | ✓ |
| Shubuta | ✓ | ✓ | | | | | | | | ✓ |
| Stonewall | ✓ | ✓ | | | | | | | | ✓ |

A.4.4 Political Capability

During the months immediately following a disaster, local public opinion in Clarke County is more likely to shift in support of hazard mitigation efforts.

A.4.5 Conclusions on Local Capability

The table below shows the results of the capability assessment using the designed scoring methodology described in Section 7: *Capability Assessment*. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions’ government websites. According to the assessment, the average local capability score for the county and its jurisdictions is 20.8, which falls into the moderate capability ranking.

Table A.40: CAPABILITY ASSESSMENT RESULTS

| Jurisdiction | Overall Capability Score | Overall Capability Rating |
|---------------|--------------------------|---------------------------|
| CLARKE COUNTY | 21 | Moderate |
| Enterprise | 22 | Moderate |
| Pachuta | 18 | Limited |
| Quitman | 25 | Moderate |
| Shubuta | 17 | Limited |
| Stonewall | 22 | Moderate |

A.5 CLARKE COUNTY MITIGATION STRATEGY

This subsection provides the blueprint for Clarke County to follow in order to become less vulnerable to its identified hazards. It is based on general consensus of the Regional Hazard Mitigation Council and the findings and conclusions of the capability assessment and risk assessment. Additional Information can be found in Section 8: *Mitigation Strategy* and Section 9: *Mitigation Action Plan*.

A.5.1 Mitigation Goals

Clarke County developed 10 mitigation goals in coordination with the other participating MEMA District 6 Region jurisdictions. The regional mitigation goals are presented in below.

Table A.41: MEMA DISTRICT 6 REGIONAL MITIGATION GOALS

| Goal # | | Goals & Objectives | Action # |
|--------|-----------|--|----------|
| #1 | Goal | Local government will be able to maintain effective mitigation programs. | PEA-1 |
| | Objective | <i>County attends regular meetings to discuss emergency preparedness and mitigation efforts.</i> | |
| #2 | Goal | The community will work together to create a disaster-resistant community. | PEA-2 |
| | Objective | <i>County maintains relationship with private sector entities such as RedCross.</i> | |
| #3 | Goal | The community will be able to initiate and sustain emergency response operations. | PEA-2 |
| | Objective | <i>County has created mutual aid agreements with neighboring jurisdictions for support during disasters.</i> | |
| #4 | Goal | Government operations will not be significantly disrupted by disasters. | |
| | Objective | <i>County has a COOP and was recently updated.</i> | |
| #5 | Goal | The health, safety, and welfare of the community's residents and visitors will be protected. | ES-5 |
| | Objective | <i>County just signed with HyperReach, and will actively work to get residents and visitors to opt-in to receive important alerts to the community.</i> | |
| #6 | Goal | Local government will support effective hazard mitigation programming in the community. | |
| | Objective | <i>County encourages ordinances such as mandatory reporting of spills.</i> | |
| #7 | Goal | Residents of the community will have homes, institutions, and work places that are safer. | PEA-3 |
| | Objective | <i>County encourages saferooms, and residents can register them and receive an address for their shelter so that they may be used for those that are nearby.</i> | |
| #8 | Goal | The local economy of the community will be prepared for a disaster. | |
| | Objective | <i>County works with RedCross and local religious organizations to ensure necessary resources are available in times of disaster.</i> | |
| #9 | Goal | Local infrastructure will not be significantly disrupted by a disaster. | ES-4 |
| | Objective | <i>Some emergency standby generators have been installed, and they are looking to purchase more.</i> | |
| #10 | Goal | All members of the community will understand the hazards threatening their community. | PEA-1 |
| | Objective | <i>County makes use of social media and news to get information out, and in the near future, HyperReach will be in service.</i> | |

To attain the listed mitigation goals, the county has also identified objectives that will assist them in the mitigation action process. Objectives are broader than specific actions, but are measurable, unlike goals. Objectives connect goals with the actual mitigation actions. The action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered and incorporated into the community's existing planning mechanisms.

A.5.2 Mitigation Action Plan

The mitigation actions proposed by Clarke County, Enterprise, Pachuta, Quitman, Shubuta, and Stonewall are listed in the following individual Mitigation Action Plans.

Clarke County Mitigation Action Plan

| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|-------------------|--|---------------------|-------------------|-----------------------------|------------------------------|-------------------------|--|
| Prevention | | | | | | | |
| P-1 | Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas. | Flood | Moderate | Board of Supervisors | FEMA/MEMA, Local funds | 2025 | Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan. |
| P-2 | Consider adoption of the International Code Council’s International Building Code. | All | Moderate | Board of Supervisors | FEMA/MEMA, Local funds | 2025 | Deferred. The International Building Code has not been adopted. The county will review this code and consider adoption, so this action will remain in the |
| P-3 | Purchase smoke alarms to be distributed to elderly residents. | Wildfire | Low | County Fire Service | FEMA/MEMA, AFGP, Local funds | 2025 | Ongoing. Although some effort has been made to purchase and distribute smoke alarms to elderly residents, there are likely still large numbers of residents who lack this service. The county will continue to seek funding the implement this action. |
| P-4 | Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan. | All | Low | County Emergency Management | FEMA/MEMA, Homeland Security | 2025 | Ongoing. Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan. |

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| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|------------------------------------|---|---------------------|-------------------|---|---|-------------------------|--|
| P-5 | Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine their assessed value in order to determine potential losses due to a flood event. | Flood | Low | County Emergency Management | FEMA/MEMA, Local funds | 2025 | Ongoing. Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred. |
| Property Protection | | | | | | | |
| PP-1 | | | | | | | |
| Natural Resource Protection | | | | | | | |
| NRP-1 | | | | | | | |
| Structural Projects | | | | | | | |
| SP-1 | | | | | | | |
| Emergency Services | | | | | | | |
| ES-1 | Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strike. | Hurricane | High | County Emergency Management | FEMA/MEMA, Local funds | 2025 | Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan. |
| ES-2 | Installation of a public warning system in the unincorporated areas of the County. | All | High | Board of Supervisors, County Emergency Management | FEMA/MEMA, Homeland Security, Local funds | 2025 | Some have been installed, but more are needed. The county will continue to look at the feasibility of this action going forward. |
| ES-3 | Purchase generators for the County Fire Service. | All | Moderate | County Fire Service | FEMA/MEMA, Homeland Security, AFGP, Local funds | 2025 | Some generators have been purchased for the fire service, but there is still as strong need for additional generators. The county will continue to look for funding sources for these. |

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| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|---------------------------------------|--|---------------------|-------------------|-----------------------------|---|-------------------------|---|
| ES-4 | Purchase generators for the rural water associations to provide adequate backup power during emergencies. | All | Low | Rural Water Associations | FEMA/MEMA, Homeland Security, Local funds | 2025 | Generators for the rural water associations have not been purchased due to lack of funding. The county is looking at possible alternative funding sources. |
| ES-5 | County is in the process of signing up with HyperReach for mass notifications. This system is opt-in, and will require an extensive campaign to get residents to sign up for emergency alerts. | All | High | County EMA | Local | 2022 | New Action. County recently signed the contract with HyperReach, but will need to conduct extensive outreach to get residents to opt-in. |
| Public Education and Awareness | | | | | | | |
| PEA-1 | Education of local citizens on the danger of driving across flooded roads. | Flood | High | County Emergency Management | FEMA/MEMA, JAG, Local funds | 2025 | The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward. |
| PEA-2 | Purchase materials to educate the public on being prepared for hazards, including tornadoes, flooding, severe weather, etc. | All | Low | County Emergency Management | FEMA/MEMA, Homeland Security, Local funds | 2025 | The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place. |
| PEA-3 | Encourage the construction of safe rooms and tornado shelters. | Tornado, High Wind | Moderate | County Emergency Management | FEMA/MEMA, Local funds | 2025 | Some residents have built safe rooms, and are then issued an address so that those nearby know there is a shelter. This campaign is ongoing. |

Town of Enterprise Mitigation Action Plan

| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|------------------------------------|---|---------------------|-------------------|--|---|-------------------------|---|
| Prevention | | | | | | | |
| P-1 | Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas. | Flood | Moderate | Board of Aldermen | FEMA/MEMA, Local funds | 2025 | Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan. |
| P-2 | Passage of an ordinance requiring property owners to clean out ditches that cause flooding of local streets. The ordinance would also get the Town legal recourse to go onto such property and do the work if the owner did not comply. | Flood | Low | Board of Aldermen | Local budget | 2025 | The town has not passed an ordinance to require property owners to clean out ditches, but it will continue to evaluate the political feasibility of this alternative and will keep this action in place. |
| P-3 | Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan. | All | Low | Volunteer Fire Department, Police Department | FEMA/MEMA, Homeland Security, Local funds | 2025 | Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan. |
| P-4 | Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine their assessed value in order to determine potential losses due to a flood event. | Flood | Low | Volunteer Fire Department, Police Department | FEMA/MEMA, Local funds | 2025 | Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred. |
| Property Protection | | | | | | | |
| PP-1 | | | | | | | |
| Natural Resource Protection | | | | | | | |
| NRP-1 | | | | | | | |

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| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|----------------------------|--|---------------------|-------------------|-------------------------------------|---|-------------------------|---|
| Structural Projects | | | | | | | |
| SP-1 | | | | | | | |
| Emergency Services | | | | | | | |
| ES-1 | Purchase backup generator to provide adequate backup power for the water system. | Tornado, High Wind | High | Public Works | FEMA/MEMA, Homeland Security, Local funds | 2025 | The town has not purchased a backup generator for the water system. It will look into trying to find funding for this going forward. |
| ES-2 | Purchase of portable generators to provide adequate backup power to operate sewer lift stations. | Tornado, High Wind | High | Public Works | FEMA/MEMA, Homeland Security, Local funds | 2025 | The town has not purchased portable generators for lift stations. It will look into trying to find funding for this going forward. |
| ES-3 | Purchase portable generators for public works department to use during emergencies. | All | High | Public Works | FEMA/MEMA, Homeland Security, Local funds | 2025 | The town has not purchased portable generators for public works. It will look into trying to find funding for this going forward. |
| ES-4 | Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes. | Hurricane | High | Fire Department , Police Department | FEMA/MEMA, Local funds | 2025 | Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan. |
| ES-5 | Purchase a generator to provide adequate backup power for the Enterprise Volunteer Fire Department. | Tornado, High Wind | Moderate | Volunteer Fire Department | FEMA/MEMA, Homeland Security, Local funds | 2025 | The town has not purchased a backup generator for the fire department. It will look into trying to find funding for this going forward. |
| ES-6 | Installation of a public warning system for the Town. | Tornado, High Wind | Moderate | Board of Aldermen | FEMA/MEMA, Homeland Security, Local funds | 2025 | The town has not installed a public warning system, but it would like to continue to look at funding options for this system |

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| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|---------------------------------------|---|---------------------|-------------------|--|------------------------------|-------------------------|---|
| Public Education and Awareness | | | | | | | |
| PEA-1 | Education of local citizens on dangers of driving across flooded roads. | Flood | High | Fire Department, Police Department | FEMA/MEMA, JAG, Local funds | 2025 | The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward. |
| PEA-2 | Purchase materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, fire, etc. | All | Low | Volunteer Fire Department, Police Department | FEMA/MEMA, AFGP, Local funds | 2025 | The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place. |
| PEA-3 | Encourage the construction of safe rooms and tornado shelters. | Tornado, High Wind | Moderate | County Emergency Management | FEMA/MEMA, Local funds | 2025 | Some residents have built safe rooms, and are then issued an address so that those nearby know there is a shelter. This campaign is ongoing. |

Town of Pachuta Mitigation Action Plan

| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|------------------------------------|--|---------------------|-------------------|--|---|-------------------------|---|
| Prevention | | | | | | | |
| P-1 | Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas. | Flood | Moderate | Board of Alderman | FEMA/MEMA, Local funds | 2025 | Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan. |
| P-2 | Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan. | All | Low | Volunteer Fire Department, Police Department | FEMA/MEMA, Homeland Security, Local funds | 2025 | Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan. |
| Property Protection | | | | | | | |
| PP-1 | | | | | | | |
| Natural Resource Protection | | | | | | | |
| NRP-1 | | | | | | | |
| Structural Projects | | | | | | | |
| SP-1 | | | | | | | |
| Emergency Services | | | | | | | |
| ES-1 | Installation of an emergency warning system for the Town. | Tornado, High Wind | High | Board of Alderman | FEMA/MEMA, Homeland Security, Local funds | 2025 | A public warning system has not been installed in the town due to lack of funding. The town will continue to look at the feasibility of this action going forward. |
| ES-2 | Purchase of a generator to provide adequate backup power for the water system. | Tornado, High Wind | High | Public Works | FEMA/MEMA, Homeland Security, Local funds | 2025 | The town has not purchased a backup generator for the water system. It will look into trying to find funding for this going forward. |

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| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|---------------------------------------|--|---------------------|-------------------|--|---|-------------------------|---|
| ES-3 | Purchase of a generator to provide adequate backup power for the volunteer fire department. | Tornado, High Wind | High | Volunteer Fire Department | FEMA/MEMA, Homeland Security, AFGP, Local funds | 2025 | The town has not purchased a backup generator for the fire department. It will look into trying to find funding for this going forward. |
| ES-4 | Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes. | Hurricane | High | Volunteer Fire Department, Police Department | FEMA/MEMA, Local funds | 2025 | Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan. |
| ES-5 | Purchase of additional turnout suits, radios, and nozzles for the volunteer fire department. | Wildfire | Moderate | Volunteer Fire Department | FEMA/MEMA, Homeland Security, AFGP, Local funds | 2020 | Completed |
| Public Education and Awareness | | | | | | | |
| PEA-1 | Education of local citizens on the dangers of driving across flooded roads. | Flood | High | Volunteer Fire Department, Police Department | FEMA/MEMA, JAG, Local funds | 2025 | The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward. |
| PEA-2 | Purchase materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, etc. | All | Low | Volunteer Fire Department, Police Department | FEMA/MEMA, Homeland Security, AFGP, Local funds | 2025 | The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place. |

ANNEX A: CLARKE COUNTY

| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|-----------------|--|----------------------------|--------------------------|--------------------------------|----------------------------------|--------------------------------|-------------------------------------|
| PEA-2 | Encourage the construction of safe rooms and tornado shelters. | Tornado, High Wind | Moderate | County Emergency Management | FEMA/MEMA, Local funds | 2025 | New action |

City of Quitman Mitigation Action Plan

| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|-------------------|---|---------------------|-------------------|-------------------------------------|---|-------------------------|--|
| Prevention | | | | | | | |
| P-1 | Rehabilitation of the storm drain system, including the cleaning out of the drains and lining them with plastic coating. | Flood | High | Public Works | FEMA/MEMA, CDBG, Local funds | 2025 | The storm drain system has been cleaned out in the past, but a large-scale project to fix the inherent problems has not been undertaken. The city will continue to work on improving the drain system going forward. |
| P-2 | Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas. | Flood | Moderate | Board of Aldermen | FEMA/MEMA, Local funds | 2025 | Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan. |
| P-3 | Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan. | All | Low | Fire Department , Police Department | FEMA/MEMA, Homeland Security, Local funds | 2025 | Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan. |
| P-4 | Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine their assessed value in order to determine potential losses due to a flood event. | Flood | Low | Fire Department , Police Department | FEMA/MEMA, Local funds | 2025 | Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred. |
| P-5 | Hydrology Study for City of Quitman | Flood | Very High | Clarke County EMA | FEMA/MEMA, Local | 2022 | New Item |

ANNEX A: CLARKE COUNTY

| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|-------------------|--|---------------------|-------------------|----------------------------------|------------------------------|-------------------------|---|
| Prevention | | | | | | | |
| P-6 | Flash Flooding is our number one threat as the north entrance to the city is 20' to 30' higher than all areas below to the city limits in the south. | Flood | High | Public Works / Street Department | FEMA/MEMA, CDBG, Local | 2022 | New Action. Each area or storm basin has been analyzed, with one hydrology study completed. |
| P-7 | Culverts at the end of W. Franklin going under the Street and Railroad are Undersized and the risk is flooding the entire business center of downtown. | Flood | Very High | Public Works / Street Department | FEMA/MEMA, CDBG, Local | 2022 | New Action. Culverts under Railroad Ave. Need to be enlarged to handle storm water. Once done the culverts under the railroad need to be enlarged. |
| P-8 | Bailey Avenue has flooded twice in the last five years. Hydrology study indicates size of 30" culvert should be replaced with two 36"x 42" culverts. | Flood | High | Public Works / Street Department | FEMA/MEMA, CDBG, Local | 2022 | New Action. Several Homes have flooded with one home experiencing a loss of \$67,000. Have increased the flow away from Bailey to culverts under N. Jackson to reduce pressure on Bailey. |
| P-9 | Water volume and pressure on the east side of Archusa Lake is a serious problem. Fire protection is suspect and sewer service is not complete to most homes. | | High | Contractor Engineer | Corps of Engineers 592 Funds | 2022 | New Action. First phase (\$1.9) million will start in 2021 with an additional \$4. million In other stages. In ground pressure tank will be built. |
| P-10 | Pine View Circle has had flood losses in four of the last 10 yrs. Junior High School has raw sewage flooding twice in 4 yrs. | Flood | High | Public Works / Engineer | FEMA/MEMA, CDBG, Local | 2022 | New Action. Sewer lines north of Pine View Circle and the Jr. High have been lined to reduce the infiltration of storm waters. |
| P-11 | Culverts at end of Sycamore and Railroad Avenue can't handle the storm water surge and need to be increased in size. Three Homes have flooded in last 5 yrs. | Flood | High | Public Works / Engineer | FEMA/MEMA, CDBG, Local | 2023 | New Action |

ANNEX A: CLARKE COUNTY

| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|-------------------|--|---------------------|-------------------|-------------------------|-------------------------------|-------------------------|------------------------------|
| Prevention | | | | | | | |
| P-12 | Homes on the lower end of Lorretta Drive suffer flooding from storm waters going down their driveways and getting into their homes. | Flood | High | Public Works / Engineer | FEMA/MEMA, CDBG, Local | 2024 | New Action |
| P-13 | Warning systems to alarm when weather or other threats develop Currently have two new sirens that have voice command ability | All | High | Fire | HMGP, FEMA, MEMA, CDBG | 2021 | New Action |
| P-14 | Standby Emergency generator for City Hall and Economic Dev. Center. | All | High | Public Works | HMGP, FEMA, MEMA, CDBG | 2021 | New Action |
| P-15 | Infiltration of storm waters in the lines from Grecimar to Pecan Circle and Dogwood have caused homes to be unable to flush their toilets | Flood | High | Water Department | HMGP, FEMA, MEMA, Local, CDBG | 2022 | New Action |
| P-16 | Security around water wells and Lift Stations is needed. Currently, only a fence is around all of them. Needed is better security, cameras, and SCATA systems to alert us. | Security | High | Water Department | FEMA, MEMA, CDBG, Local | 2021 | New Action |
| P-11 | Keeping gutters cleaned is currently being done by a 30 year old street sweeper, and other equipment is needed Back-hoe and Tractor to pull leaf machine are essential | All | Moderate | Street Department | Volkswagen Funds & Local | 2021 | New Action |
| P-12 | Collect additional data on the number of buildings located in storm surge flooding. Determine their assessed value to determine potential losses | Flood | Moderate | Zoning | Local | 2021 | New Action |

ANNEX A: CLARKE COUNTY

| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|-------------------|--|---------------------|-------------------|----------------------------|-------------------------------|-------------------------|------------------------------|
| Prevention | | | | | | | |
| P-13 | City has numerous old brick Man-holes that are subject to collapse. We have replaced several but have many others | All | Moderate | Engineer, Water Department | HMGP, FEMA, MEMA | 2023 | New Action |
| P-14 | City has cast iron water pipes and one street uses an Asbestos pipe for water. Some water lines need to be increased, especially to the other side of the lake | Health & Safety | Moderate | Engineer, Water Department | HMGP, FEMA, MEMA, CDBG, Local | 2022 | New Action |

ANNEX A: CLARKE COUNTY

| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|------------------------------------|---|---------------------|-------------------|----------------------------------|---|-------------------------|--|
| Property Protection | | | | | | | |
| PP-1 | Repair of roof at the Quitman Fire Department. | High Wind | High | Fire Department | FEMA/MEMA, Homeland Security, Local funds | 2017 | COMPLETED |
| PP-2 | Installation of a pitched roof on City Hall to replace the current flat roof. | Flood | High | Board of Aldermen | FEMA/MEMA, Homeland Security, Local funds | 2017 | COMPLETED |
| PP-3 | Depot | Flood & High Wind | High | Board of Alderman | Local, MDAH | 2025 | New Action |
| Natural Resource Protection | | | | | | | |
| NRP-1 | Chickasawhay River Natural Asset | Debris | Moderate | City and Army Corps of Engineers | Local | 2023 | New Action |
| Structural Projects | | | | | | | |
| SP-1 | Installation of larger culverts on Railroad Avenue. | Flood | High | Public Works | FEMA/MEMA, CDBG, Local funds | 2023 | Larger culverts have not been installed on Railroad Avenue. The city will continue to look into potential funding sources for this project. |
| SP-2 | Installation of a cement drainage ditch behind Pineview Circle. | Flood | High | Public Works | FEMA/MEMA, CDBG, Local funds | 2023 | A cement drainage ditch has not been installed behind Pineview Circle. The city will continue to look into potential funding sources for this project. |
| SP-3 | Installation of approximately 400' of culverts on Anderson Street. | Flood | High | Public Works | FEMA/MEMA, CDBG, Local funds | 2023 | Culverts have not been installed on Anderson Street. The city will continue to look into potential funding sources for this project. |

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| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|---------------------------|--|---------------------|-------------------|-------------------------------------|------------------------------|-------------------------|---|
| SP-4 | Installation of additional pumps at the sewer to handle excess water due to heavy rainfall. | Flood | High | Public Works | FEMA/MEMA, CDBG, Local funds | 2025 | Additional pumps have not been installed to the sewer system. The city will continue to look into potential funding sources for this project. |
| SP-5 | Sewer Lines draining into Brock Street Lift Station are incurring excessive Infiltration | Flood | High | Water Sewer | HMGP, CDBG, Local | 2022 | New Action |
| SP-6 | Combine the small lagoon with the larger lagoon after cleaning smaller one | Health & Safety | Moderate | Water Sewer | HMGP, CDBG, Local | 2024 | New Action |
| SP-7 | Bringing Sewer to other side of lake and increase water volume and pressure | Health & Safety | High | Water Sewer | CDBG, Local | 2022 | New Action |
| SP-8 | Above Ground 150,000 gal. Water Tank for other side of Lake | Health & Safety | Moderate | Water Sewer | CDBG, Local | 2024 | New Action |
| SP-9 | Retainage Ponds at Lumber Mill Property to lessen the effect of storm waters | Flood | High | Engineer, Water Sewer | CDBG, Local | 2024 | New Action |
| Emergency Services | | | | | | | |
| ES-1 | Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane. | Hurricane | High | Fire Department , Police Department | FEMA/MEMA, Local funds | 2022 | Have implemented ISIS Communication System and have place two warning sirens of the three needed plan is ongoing. |

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| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|---------------------------------------|--|---------------------|-------------------|------------------------------------|---|-------------------------|---|
| ES-2 | Installation of an emergency warning system for the city. | All | High | Board of Aldermen | FEMA/MEMA, Homeland Security, Local funds | 2020-2025 | We now have three of the warning sirens of the four needed. One more to go. |
| ES-3 | Purchase generators to provide adequate backup power for critical facilities. | Tornado, High Wind | Moderate | Board of Aldermen | FEMA/MEMA, Homeland Security, AFGP, Local funds | 2022 | We have no back-up for City Hall or the two water wells. Need two 100K's and two 50K generators |
| ES-4 | Purchase wildland firefighting gear for the volunteer fire department. | Wildfire | Moderate | Volunteer Fire Department | FEMA/MEMA, Homeland Security, DFGP, Local funds | 2022 | Wildfire fighting gear has not been purchased but is needed. One more to go. |
| ES-5 | Purchase Equipment for Police Officers to respond to civil unrest and protection of Officers | Safety | Moderate | Police Department | FEMA, MEMA, Homeland Security | 2022 | New Action |
| Public Education and Awareness | | | | | | | |
| PEA-1 | Education of local citizens on the dangers of driving across flooded roads. | Flood | High | Fire Department, Police Department | FEMA/MEMA, JAG, Local funds | 2022 | Considerable improvement in this program, but it will remain an ongoing effort |
| PEA-2 | Purchase of materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, etc. | All | Low | Fire Department, Police Department | FEMA/MEMA, Homeland Security, AFGP, Local funds | 2025 | The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place. |
| PEA-3 | Encourage the construction of safe rooms and tornado shelters. | Tornado, High Wind | Moderate | County Emergency Management | FEMA/MEMA, Local funds | 2025 | New action |
| PEA-4 | Using the Iris System to notify citizens by area of boil water notices | Health & Safety | High | Public Works | FEMA, MEMA, Local | 2025 | New Action |

Town of Shubuta Mitigation Action Plan

| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|-------------------|--|---------------------|-------------------|--|--|-------------------------|---|
| Prevention | | | | | | | |
| P-1 | Clean out three drainage ditches that lead to the Chickasawhay River. | Flood | High | Public Works | FEMA/MEMA, CDBG, Local funds | 2025 | These drainage ditches have been cleaned up fairly regularly, but the town would like to continue carrying out this task and evaluate the effectiveness of keeping them cleared. |
| P-2 | Consider adoption of the International Code Council's International Building Code. | All | Moderate | Board of Aldermen | FEMA/MEMA, Local funds | 2025 | The International Building Code has been adopted. The county will need to review this code over the next 5 years, so this action will remain in the plan. |
| P-3 | Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas. | Flood | Moderate | Board of Aldermen | FEMA/MEMA, Local funds | 2025 | Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan. |
| P-4 | Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas. | Wildfire | Moderate | Board of Aldermen | FEMA/MEMA, Local funds | 2025 | Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan. |
| P-5 | Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan. | All | Low | Volunteer Fire Department, Police Department | FEMAMEMA, Homeland Security, Local funds | 2025 | Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan. |

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| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|------------------------------------|--|---------------------|-------------------|--|---|-------------------------|---|
| P-6 | Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine the value in order to determine the potential losses due to a flood event. | Flood | Low | Volunteer Fire Department, Police Department | FEMA/MEMA, Local funds | 2025 | Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred. |
| Property Protection | | | | | | | |
| PP-1 | | | | | | | |
| Natural Resource Protection | | | | | | | |
| NRP-1 | | | | | | | |
| Structural Projects | | | | | | | |
| SP-1 | | | | | | | |
| Emergency Services | | | | | | | |
| ES-1 | Purchase of a generator to provide adequate backup power for the water system. | Tornado, High Wind | High | Public Works | FEMA/MEMA, Homeland Security, Local funds | 2025 | The town has not purchased a backup generator for the water system. It will look into trying to find funding for this going forward. |
| ES-2 | Develop a plan to notify and educate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strike. | Hurricane | High | Volunteer Fire Department, Police Department | FEMA/MEMA, Local funds | 2025 | Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan. |
| ES-3 | Installation of an emergency warning system for the Town. | Tornado, High wind | High | Board of Aldermen | FEMA/MEMA, Homeland Security, Local funds | 2025 | The town has not installed an emergency warning system, but it would like to continue to look at funding options for this system |
| ES-4 | Purchase of a generator to provide adequate backup power for the volunteer fire department. | Tornado, High Wind | Moderate | Volunteer Fire Department | FEMA/MEMA, Homeland Security, AFGP, Local funds | 2025 | The town has not purchased a backup generator for the fire department. It will look into trying to find funding for this going forward. |

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| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|---------------------------------------|---|---------------------|-------------------|--|---|-------------------------|---|
| ES-5 | Purchase wildland firefighting gear for the volunteer fire department. | Wildfire | Moderate | Volunteer Fire Department | FEMA/MEMA, Homeland Security, AFGP, Local funds | 2025 | This equipment has not been purchased for volunteer fire departments due to lack of funding. The town will continue to look for ways to fund this going forward. |
| Public Education and Awareness | | | | | | | |
| PEA-1 | Education of local citizens on the dangers of driving across flooded roads. | Flood | High | Volunteer Fire Department, Police Department | FEMA/MEA, JAG, Local funds | 2025 | The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward. |
| PEA-2 | Purchase materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, fire, etc. | All | Low | Volunteer Fire Department, Police Department | FEMA/MEMA, Homeland Security, Local funds | 2025 | The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place. |
| PEA-3 | Encourage the construction of safe rooms and tornado shelters. | Tornado, High Wind | Moderate | County Emergency Management | FEMA/MEMA, Local funds | 2025 | Ongoing |

Town of Stonewall Mitigation Action Plan

| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|------------------------------------|---|---------------------|-------------------|--|---|-------------------------|---|
| Prevention | | | | | | | |
| P-1 | Work with ECPDD to develop a model ordinance to regulate construction in flood-prone areas. | Flood | Moderate | Board of Aldermen | FEMA/MEMA, Local funds | 2025 | Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan. |
| P-2 | Work with ECPDD to develop a model ordinance to regulate construction in heavily wooded areas. | Wildfire | Moderate | Board of Aldermen | FEMA/MEMA, Local funds | 2025 | Deferred. A model ordinance has not been developed. The action is currently under consideration from local officials and will remain in the plan. |
| P-3 | Collect additional data to define hazards, risk areas, and vulnerabilities to be used in future updates of the plan. | All | Low | Volunteer Fire Department, Police Department | FEMA/MEMA, Homeland Security, Local funds | 2025 | Although much work has been done to collect data on risks, especially through this planning process, there are still significant needs in terms of data collection. Therefore, this action will remain in the plan. |
| P-4 | Collect additional data on the number of buildings located in flood-prone areas near the Chickasawhay River and determine the assessed value in order to determine the potential losses due to a flood event. | Flood | Low | Volunteer Fire Department, Police Department | FEMA/MEMA, Local funds | 2025 | Although some data has been collected and analyzed on buildings that are flood prone in this area, the flood risk is not static and needs further evaluation, so this action is being deferred. |
| Property Protection | | | | | | | |
| PP-1 | | | | | | | |
| Natural Resource Protection | | | | | | | |
| NRP-1 | | | | | | | |

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| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|----------------------------|--|---------------------|-------------------|--|---|-------------------------|--|
| Structural Projects | | | | | | | |
| SP-1 | Replacement of the bridge on Highway 513. | Flood | High | Public Works | FEMA/MEMA, CDBG, LSBP, Local funds | 2025 | This bridge has not been replaced yet, but the town still sees it as a priority, so it will look at determining how to get the project funded going forward. |
| Emergency Services | | | | | | | |
| ES-1 | Installation of an emergency warning system for the Town. | Tornado, High Wind | High | Board of Aldermen | FEMA/MEMA, Homeland Security, Local funds | 2025 | The town has not installed an early warning system, but it would like to continue to look at funding options for this system |
| ES-2 | Purchase of generators to provide adequate backup power for the water and sewer systems. | Tornado, High Wind | High | Public Works | FEMA/MEMA, Homeland Security, Local funds | 2025 | The town has not purchased a backup generator for the water system. It will look into trying to find funding for this going forward. |
| ES-3 | Develop a plan to notify and evacuate residents living in special hazard areas, mobile homes, and areas of substandard housing before a hurricane strikes. | Hurricane | High | Volunteer Fire Department, Police Department | FEMA/MEMA, Local funds | 2025 | Some discussions have taken place concerning an evacuation plan for residents with high vulnerability but the county is seeking funding to develop a full plan. |
| ES-4 | Purchase a generator to provide adequate backup power for the Stonewall Volunteer Fire Department. | Tornado, High Wind | Moderate | Volunteer Fire Department | FEMA/MEMA, Homeland Security, AFGP, Local funds | 2025 | The town has not purchased a backup generator for the fire department. It will look into trying to find funding for this going forward. |
| ES-5 | Purchase wildland firefighting gear for the volunteer fire department. | Wildfire | Moderate | Volunteer Fire Department | FEMA/MEMA, Homeland Security, AFGP, Local funds | 2025 | This equipment has not been purchased for volunteer fire departments due to lack of funding. The town will continue to look for ways to fund this going forward. |

| Action # | Description | Hazard(s) Addressed | Relative Priority | Lead Agency/ Department | Potential Funding Sources | Implementation Schedule | Implementation Status (2021) |
|---------------------------------------|--|---------------------|-------------------|--|---|-------------------------|---|
| Public Education and Awareness | | | | | | | |
| PEA-1 | Education of local citizens on the dangers of driving across flooded roads. | Flood | High | Volunteer Fire Department, Police Department | FEMA/MEMA, JAG, Local funds | 2025 | The county has worked hard to inform citizens of the dangers of driving across flooded roads, but this action needs to be continued going forward. |
| PEA-2 | Purchase of materials to educate the public on being prepared for all hazards, including tornadoes, flooding, severe weather, etc. | All | Low | Volunteer Fire Department, Police Department | FEMA/MEMA, Homeland Security, AFGP, Local funds | 2025 | The county has done a good job of sending out information on preparedness and weather updates to media. This task needs to be continual evaluation and implementation to ensure the public is well-informed, so this action will remain in place. |
| PEA-3 | Encourage the construction of safe rooms and tornado shelters. | Tornado, High Wind | Moderate | County Emergency Management | FEMA/MEMA, Local funds | 2025 | Ongoing |

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