Pittsburg Public Schools	The school district stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
Hartshorne Public Schools	The school district stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
	The school district does not have an emergency generator.	Without generators, school facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, parents may have to miss work.
Indianola Public Schools	The school district doesn't have adequate covered parking for their busses.	Vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
Kiowa Public Schools	The school district doesn't have adequate covered parking for their busses.	Vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
Carlton Landing Academy	The school district does not have an emergency generator.	Without generators, school facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, parents may have to miss work.
	The school district stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.

	The jurisdiction is concerned about the debris a major hail storm can leave behind.	Debris left behind by storms can cause build up that can become fire hazards.

3.4.7 Extreme Heat

Description

Extreme summer weather is characterized by a combination of very high temperatures and exceptionally humid conditions. A heat wave occurs when such conditions persist over long periods. A lack of nighttime cooling can exacerbate the conditions when community infrastructure fails to release ambient heat increases gained during the day.

Location

Extreme heat affects the entire Planning Area and can be expected every summer. In rural areas, extreme heat can significantly damage crops, especially if too hot of temperatures occur during critical growth periods. Certainly, hot temperatures dramatically increase the rate of evaporation off crop fields and farmers must irrigate at much higher rates to maintain growth.

The population most at risk to extreme heat is the public aged 65 and above, the population that is classified as low income, and those that work outdoors.

Previous Occurrence

There were 21 extreme heat events within the Planning Area between 2010 and 2020. Previous Occurrence data from the National Oceanic and Atmospheric Administration (NOAA) website is located below.

Figure 3-30 Extreme Heat Previous Occurrences From the NOAA National Centers for Environmental Information https://www.ncdc.noaa.gov/stormevents/		
Date	**Jurisdiction**	**Narrative**
06/22/2010	All Participating Jurisdictions	Temperatures in the middle to upper 90s combined with high relative humidity resulted in a period of excessive heat across eastern Oklahoma. Afternoon heat indices reached 105 to 110 degrees and morning low temperatures only fell into the middle to upper 70s
07/13/2010	All Participating Jurisdictions	A strong subtropical high pressure system developed and remained over the south central United States for a prolonged period during the middle of July. This resulted in an extended period of exceptionally hot weather. Temperatures were above normal with daytime readings reaching the mid 90s to near 100 and overnight temperatures only falling into the mid to upper 70s. Very humid conditions as a result of the excessive rainfall that occurred earlier in the month and subsequent highly saturated soils resulted in afternoon heat index values between 105 and 115 degrees. At least 28 people were treated for heat-related illness in the Tulsa area during this period and a heat-related death occurred in Skiatook on the 22nd.
08/09/2010	All Participating Jurisdictions	A strong subtropical high pressure system reestablished itself over the south central and southeastern United States during the August 8th through 15th timeframe. Exceptionally hot weather was the result with above normal daytime temperatures of 101 to 106 degrees, which combined with high humidity resulted in 105 to 115 degree heat index values. Little relief was felt at night as temperatures only fell into the 75 to 80 degree range during the overnight hours. Overnight low temperatures only fell into the lower to middle 80s for several consecutive days at Tulsa International Airport, which is highly unusually even for northeastern Oklahoma during the summertime. At least 17 people were treated for heat-related illness in Tulsa during this period.
08/20/2010	All Participating Jurisdictions	A strong subtropical high pressure system reestablished itself over the south central United States during the August 19th through 22nd timeframe. Exceptionally hot weather was the result with above normal daytime temperatures of 98 to 102 degrees, which combined with high humidity resulted in 105 to 110 degree heat index values. Little relief was felt at night as temperatures only fell into the upper 70s to near 80 degrees during the overnight hours. At least four people were treated for heat-related illness in Tulsa during this period.

06/27/2011	All Participating Jurisdictions	A strong ridge of high pressure in the middle and upper atmosphere developed across the south central United States resulting in strong subsidence over the region. High temperatures climbed into the upper 90s to near 105 under mostly clear skies. This heat combined with fairly high relative humidity values resulted in afternoon heat index values, or apparent temperatures, in the 105 to 110 degree range. Very little relief was realized during the overnight period as temperatures only fell to near 80.
06/30/2011	All Participating Jurisdictions	A strong ridge of high pressure in the middle and upper atmosphere redeveloped across the south central United States resulting in strong subsidence over the region. High temperatures climbed into the mid 90s to near 103 under mostly clear skies. This heat combined with fairly high relative humidity values resulted in afternoon heat index values, or apparent temperatures, in the 105 to 110 degree range. Very little relief was realized during the overnight period as temperatures only fell into the mid to upper 70s. This period of excessive heat continued into July.
070/9/2011	All Participating Jurisdictions	A strong ridge of high pressure in the middle and upper atmosphere redeveloped across the south central United States in mid July resulting in strong subsidence over the region. High temperatures climbed to above 100 degrees on all but two days during the remainder of the month at the Tulsa International Airport and July 2011 went down as the second warmest July on record for that area since records began in 1905. Numerous record temperatures were exceeded this month across eastern Oklahoma. This heat combined with fairly high relative humidity values resulted in afternoon heat index values, or apparent temperatures, in the 105 to 115 degree range. Very little relief was realized during the overnight period as temperatures only fell into the upper 70s to mid 80s. This period of excessive heat continued into August.
08/01/2011	All Participating Jurisdictions	A strong ridge of high pressure that dominated the weather across the south central United States for much of July, continued through the first couple weeks of August. Unseasonably hot weather resulted across the region with official records at the Tulsa International Airport indicating that August 2011 was the 5th hottest August on record since 1905. During this period, the daily temperature exceeded 100 degrees and the hottest all-time temperature in Tulsa came to within two degrees of being broken on August 3rd when the temperature soared to 113 degrees. The humidity combined with this heat resulted in afternoon heat indices in the 105 to 115 degree range. Little relief from the heat was realized at night as temperatures only fell to near 80 degrees.

07/28/2012	All Participating Jurisdictions	Extremely hot temperatures and high humidity combined to produce dangerously hot weather conditions across much of eastern Oklahoma. Daily heat index values climbed into the 105 to 111 degree range with little relief occurring at night as temperatures only fell into the upper 70s to mid 80s. The temperature at the Tulsa International Airport only fell to 88 degrees the mornings of the 30th and 31st, becoming the all-time warmest daily low temperatures on record for the area.
08/01/2012	All Participating Jurisdictions	This period of excessively hot weather began in late July and continued into early August 2012. Extremely hot temperatures and high humidity combined to produce dangerously hot weather conditions across much of eastern Oklahoma. Daily heat index values climbed into the 105 to 115 degree range with little relief occurring at night as temperatures only fell into the upper 70s to mid 80s.
06/26/2013	All Participating Jurisdictions	Unseasonably hot temperatures combined with very high humidity resulted in excessive heat across much of eastern Oklahoma. Temperatures climbed into the mid 90s to near 100 and heat index values ranged from 105 to 110 degrees. Very little relief was realized at night with temperatures only falling into the mid 70s to near 80. At least 18 people were treated for heat-related illness in the Tulsa area alone during this period.
08/06/2013	All Participating Jurisdictions	A subtropical ridge of high pressure over Texas helped produce a period of excessive heat across portions of eastern Oklahoma as typical summertime heat combined with high humidity to produce high temperatures around 100 degrees. Heat index values of 105 to 110 degrees occurred during the day with temperatures only falling into the mid to upper 70s at night, resulting in little relief from the heat.
08/07/2015	All Participating Jurisdictions	A ridge of high pressure in the middle and upper atmosphere centered over the south central United States promoted strong subsidence across eastern Oklahoma for several days in early August. Mostly sunny skies, unseasonably hot temperatures near 100 degrees, and unseasonably humid conditions combined to produce afternoon heat indices in the 110 to 115 degree range from August 7th through August 9th. Overnight temperatures only fell into the upper 70s to near 80, resulting in little relief from the heat at night.
08/10/2016	All Participating Jurisdictions	A strong ridge of high pressure in the middle and upper atmosphere over the south central and southeastern United States resulted in unseasonably hot weather across eastern Oklahoma during the middle of August. Afternoon temperatures in the upper 90s to near 100 prevailed across much of the area. This heat, combined with very humid conditions, resulted in heat index values in the 110 to 115 degree range during the afternoons of August 10th and 11th.

07/21/2017	All Participating Jurisdictions	An upper level ridge of high pressure over the south central United States resulted in a period of unseasonably hot weather over the area in late July. Temperatures on the 21st and 22nd climbed to near 100 degrees across much of eastern Oklahoma. This heat, combined with high humidity, resulted in afternoon heat index values in the 110 to 115 degree range. This heat continued through the afternoon of the 23rd in portions of southeastern Oklahoma. At least eleven people were treated for heat-related illness in Tulsa on those dates, most of which were transported to local hospitals.
07/19/2018	All Participating Jurisdictions	An upper level ridge of high pressure over the south central United States resulted in a period of unseasonably hot weather over the area in late July. Temperatures on the 19th and 20th climbed to 100 to 105 degrees across much of eastern Oklahoma. This heat, combined with high humidity, resulted in afternoon heat index values from 105 to 112 degrees. At least 20 people were treated for heat-related illness in Tulsa on those dates.
08/11/2019	All Participating Jurisdictions	An upper level ridge of high pressure over the south central United States resulted in a period of unseasonably hot weather over eastern Oklahoma from the 10th through the 12th. Afternoon high temperatures in the upper 90s to near 100 degrees, combined with high humidity, resulted in afternoon heat indices each day from 110 to 115 degrees.
08/19/2019	All Participating Jurisdictions	An upper level ridge of high pressure over the south central United States resulted in a period of unseasonably hot weather over eastern Oklahoma from the 19th through the 20th. Afternoon high temperatures near 100 degrees, combined with high humidity, resulted in afternoon heat indices each day from 110 to 115 degrees.
07/02/2020	All Participating Jurisdictions	A ridge of high pressure developed into the Southern Plains in early July, setting the stage for a couple days of excessive heat. Temperatures across eastern Oklahoma in the 90s, combined with high humidity, resulted in afternoon heat indices near 110 degrees on July 1st and 2nd.
07/11/2020	All Participating Jurisdictions	A large ridge of high pressure over the southern United States during the middle of July set the stage for excessive heat across the region. Temperatures in the middle to upper 90s, combined with high humidity, resulted in heat indices of 110 to 115 degrees across much of eastern Oklahoma during the afternoon of the 11th.
08/29/2020	All Participating Jurisdictions	A ridge of high pressure over the southern United States late in the month, set the stage for excessive heat across portions of eastern Oklahoma. Temperatures in the upper 90s, combined with high humidity, resulted in afternoon heat index values from 110 to 115 degrees on the 29th.

Probability of Future Events

Oklahoma has a consistent temperature pattern in the high 90s to over 100 degrees every summer. Due to past events, the probability of future extreme heat events occurring within the Planning Area is to be considered high.

Extent

The entire Planning Area uses the chart in Figure 3-31 to measure the extent of extreme heat. While the Planning Area has seen and expects to continue seeing the full scale, impacts to the public begin at a moderate level.

Figure 3-31

Unacclimated and Acclimated Work/Rest and Water Intake Chart

Heat Risk Category		Wet Bulb Globe Temp	Light Work		Moderate Work		Heavy Work	
			Work/Rest	Water Intake (quart/hr)	Work/Rest	Water Intake (quart/hr)	Work/Rest	Water Intake (quart/hr)
No Risk	Unacclimated	78 – 79.9	50/10 min	½	40/20 min	¾	30/30 min	¾
	Acclimated	78 – 79.9	continuous	½	continuous	¾	50/10 min	¾
Low	Unacclimated	80 – 84.9	40/20 min	½	30/30 min	¾	20/40 min	1
	Acclimated	80 – 84.9	continuous	½	50/10 min	¾	40/20 min	1
Moderate	Unacclimated	85 – 87.9	30/30 min	¾	20/40 min	¾	10/50 min	1
	Acclimated	85 – 87.9	continuous	¾	40/20 min	¾	30/30 min	1
High	Unacclimated	88 – 90	20/40 min	¾	10/50 min	¾	avoid	1
	Acclimated	88 – 90	continuous	¾	30/30 min	¾	20/40 min	1
Extreme	Unacclimated	> 90	10/50 min	1	avoid	1	avoid	1
	Acclimated	> 90	50/10 min	1	20/40 min	1	10/50 min	1

Adapted from: 1) USGS Survey Manual, Management of Occupational Heat Stress, Chapter 45, Appendix A. 2) Manual of Naval Preventive Medicine, Chapter 3: Prevention of Heat and Cold Stress Injuries. 3) OSHA Technical Manual Section III: Chapter 4 Heat Stress. 4) National Weather Service Tulsa Forecast Office, Wet Bulb Globe Temperature.

Impact and Vulnerability

The impact of extreme heat is primarily to the public. High heat events typically will not affect facilities as adversely as they will vulnerable populations such as outdoor laborers, individuals with existing health concerns, children, the elderly, and low-income populations. Possible impacts to the public include muscle cramps, nausea, heat exhaustion, heat stroke, and death. Secondary events such as wildfire and drought can lead to financial losses for the Planning Area. These losses would mostly affect ranchers, farmers, and water management.

Extreme heat is unlikely to impact the trust of the public, but secondary impacts may lead to a disruption of services.

The county, city, towns, and school districts all identified outdoor activities such as sports, festivals, fishing tournaments, and other outdoor activities as a concern where individuals may underestimate the heat. The entire Planning Area believes the best way to combat the effects of this hazard is with education and the unified use of Figure 3-31. As such, an action item was created to address this strategy.

Figure 3-32 Extreme Heat Impacts and Vulnerabilities		
Jurisdiction	Vulnerabilities	Impact
Pittsburg County	The county considers elders the most vulnerable to this hazard, but they don't have those individuals identified or mapped to educate them or know how to check on them during extreme heat events.	Elders who are exposed to extreme heat conditions are susceptible to sickness and heat stress.
	The county is concerned about employees who primarily work outside.	County workers who are active during extreme heat events run the risk of falling to heat stress or other heat related illnesses.
Town of Alderson	The jurisdiction is worried that citizens underestimate this hazard.	Citizens who aren't properly educated or who don't take the risk of heat exposure seriously may fall victim to the effects. Heat stroke, heat stress, or the aggravation of existing conditions are impacts of this hazard.
Town of Ashland	The jurisdiction is worried that citizens underestimate this hazard.	Citizens who aren't properly educated or who don't take the risk of heat exposure seriously may fall victim to the effects. Heat stroke, heat stress, or the aggravation of existing conditions are impacts of this hazard.
Town of Canadian	Fishers come from out of town, sometimes out of state, to participate in tournaments on Lake Eufala. Some of them may not be used to the extreme temperatures.	If the participants come from out of town, they may not understand how the heat or humidity can affect them and they may fall victim to the hazard.
Carlton Landing	Carlton Landing hosts several outdoor community events in the summer. Some citizens have underestimated the effects of Extreme Heat. Citizens need additional education on how to mitigate the risk of Extreme Heat.	Citizens who aren't properly educated or who don't take the risk of heat exposure seriously may fall victim to the effects. Heat stroke, heat stress, or the aggravation of existing conditions are impacts of this hazard.

Town of Crowder	Fishers come from out of town, sometimes out of state, to participate in tournaments on Lake Eufala. Some of them may not be used to the extreme temperatures.	If the participants come from out of town, they may not understand how the heat or humidity can affect them and they may fall victim to the hazard.
Town of Indianola	The jurisdiction is worried that citizens underestimate this hazard.	Citizens who aren't properly educated or who don't take the risk of heat exposure seriously may fall victim to the effects. Heat stroke, heat stress, or the aggravation of existing conditions are impacts of this hazard.
Town of Kiowa	The town considers elders the most vulnerable to this hazard, but they don't have those individuals identified or mapped to educate them or know how to check on them during extreme heat events.	Elders who are exposed to extreme heat conditions are susceptible to sickness and heat stress.
Town of Pittsburg	The jurisdiction is worried that citizens underestimate this hazard.	Citizens who aren't properly educated or who don't take the risk of heat exposure seriously may fall victim to the effects. Heat stroke, heat stress, or the aggravation of existing conditions are impacts of this hazard.
Town of Quinton	The jurisdiction is worried that citizens underestimate this hazard.	Citizens who aren't properly educated or who don't take the risk of heat exposure seriously may fall victim to the effects. Heat stroke, heat stress, or the aggravation of existing conditions are impacts of this hazard.
Town of Savanna	The jurisdiction is worried that citizens underestimate this hazard.	Citizens who aren't properly educated or who don't take the risk of heat exposure seriously may fall victim to the effects. Heat stroke, heat stress, or the aggravation of existing conditions are impacts of this hazard.

City of Haileyville	The city considers elders the most vulnerable to this hazard, but they don't have those individuals identified or mapped to educate them or know how to check on them during extreme heat events.	Elders who are exposed to extreme heat conditions are susceptible to sickness and heat stress.
City of Hartshorne	The city considers elders the most vulnerable to this hazard, but they don't have those individuals identified or mapped to educate them or know how to check on them during extreme heat events.	Elders who are exposed to extreme heat conditions are susceptible to sickness and heat stress.
City of Krebs	The city hosts several summer festivals where heat is a major concern for vulnerable populations.	Citizens who aren't properly educated or who don't take the risk of heat exposure seriously may fall victim to the effects. Heat stroke, heat stress, or the aggravation of existing conditions are impacts of this hazard.
City of McAlester	The city considers elders the most vulnerable to this hazard, but they don't have those individuals identified or mapped to educate them or know how to check on them during extreme heat events.	Elders who are exposed to extreme heat conditions are susceptible to sickness and heat stress.
	The city is concerned about employees who primarily work outside.	County workers who are active during extreme heat events run the risk of falling to heat stress or other heat related illnesses.
McAlester Public Schools	The school district has several sports and supporting programs that keep kids outdoors for extended periods of time during the summer months.	Staff who aren't properly educated about this hazard or students who don't understand how to mitigate the effects of being active in the heat may become sick.
Quinton Public Schools	The school district has concerns about students and staff not understanding the risks or heat or how to use Figure 3-31 to determine whether they should be active outside.	Students or staff who don't understand how to tell when the heat is too much may fall ill in preventable situations.

Crowder Public Schools	The school district has concerns about students and staff not understanding the risks or heat or how to use Figure 3-31 to determine whether they should be active outside.	Students or staff who don't understand how to tell when the heat is too much may fall ill in preventable situations.
Haileyville Public Schools	The school district has several sports and supporting programs that keep kids outdoors for extended periods of time during the summer months.	Staff who aren't properly educated about this hazard or students who don't understand how to mitigate the effects of being active in the heat may become sick.
Frink-Chambers Public Schools	The school district has concerns about students and staff not understanding the risks or heat or how to use Figure 3-31 to determine whether they should be active outside.	Students or staff who don't understand how to tell when the heat is too much may fall ill in preventable situations.
Tannehill Public Schools	The school district has concerns about students and staff not understanding the risks or heat or how to use Figure 3-31 to determine whether they should be active outside.	Students or staff who don't understand how to tell when the heat is too much may fall ill in preventable situations.
Krebs Public Schools	The school district has concerns about students and staff not understanding the risks or heat or how to use Figure 3-31 to determine whether they should be active outside.	Students or staff who don't understand how to tell when the heat is too much may fall ill in preventable situations.
Haywood Public Schools	The school district has concerns about students and staff not understanding the risks or heat or how to use Figure 3-31 to determine whether they should be active outside.	Students or staff who don't understand how to tell when the heat is too much may fall ill in preventable situations.
Savanna Public Schools	The school district has concerns about students and staff not understanding the risks or heat or how to use Figure 3-31 to determine whether they should be active outside.	Students or staff who don't understand how to tell when the heat is too much may fall ill in preventable situations.
Canadian Public Schools	The school district has concerns about students and staff not understanding the risks or heat or how to use Figure 3-31 to determine whether they should be active outside.	Students or staff who don't understand how to tell when the heat is too much may fall ill in preventable situations.

Pittsburg Public Schools	The school district has concerns about students and staff not understanding the risks or heat or how to use Figure 3-31 to determine whether they should be active outside.	Students or staff who don't understand how to tell when the heat is too much may fall ill in preventable situations.
Hartshorne Public Schools	The school district has several sports and supporting programs that keep kids outdoors for extended periods of time during the summer months.	Staff who aren't properly educated about this hazard or students who don't understand how to mitigate the effects of being active in the heat may become sick.
Indianola Public Schools	The school district has concerns about students and staff not understanding the risks or heat or how to use Figure 3-31 to determine whether they should be active outside.	Students or staff who don't understand how to tell when the heat is too much may fall ill in preventable situations.
Kiowa Public Schools	The school district has concerns about students and staff not understanding the risks or heat or how to use Figure 3-31 to determine whether they should be active outside.	Students or staff who don't understand how to tell when the heat is too much may fall ill in preventable situations.
Carlton Landing Academy	The Academy has concerns about students and staff not understanding the risks or heat or how to use Figure 3-31 to determine whether they should be active outside.	Students or staff who don't understand how to tell when the heat is too much may fall ill in preventable situations.

3.4.8 Hazardous Materials (Fixed Site/Transportation)

Description

Hazardous materials are chemical substances used in industry, agriculture, medicine, research, and consumer goods. Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. If released or misused, these materials could pose a threat to the environment or human health. These substances are often released as a result of chemical accidents at plant sites or in transportation accidents. Hazardous materials are moved through railways, highways, waterways, and pipelines daily. If one of these carriers were to have an accident and spill their contents through cities, it would be an instant threat to the inhabitants.

Location

Locations with the highest probability of hazardous material events are identified in the Planning Area's Tier II Reports.

Probability of Future Events

Due to the number of events in previous years, the probability of having a hazardous material event is considered high.

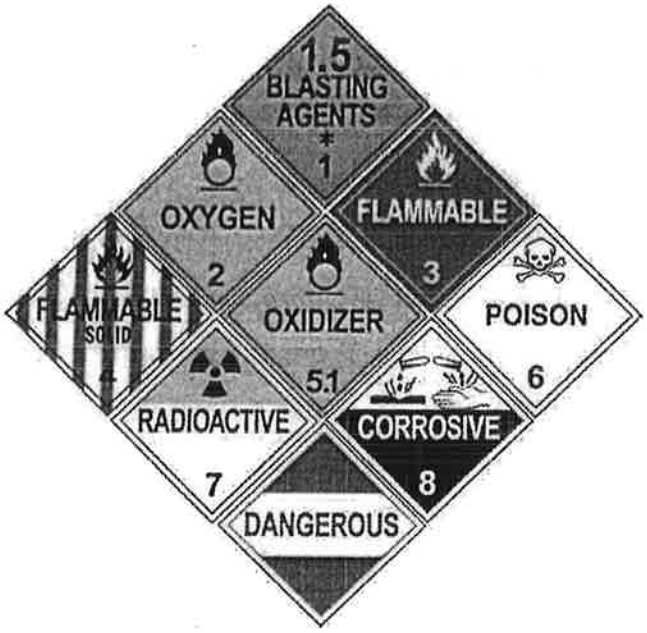
Extent

The federal government has established detailed systems for keeping track of Tier II site as any location that has, for any 24-hour period, either: 1) specified threshold amounts of defined Extremely Hazardous Substances, or 2) any other substance requiring a Safety Data Sheet (SDS) for amounts greater than 10,000 pounds. The United States Environmental Protection Agency sorts hazardous materials into six categories:

1. Toxic Agents (irritants, asphyxiates, narcotics)
2. Other Toxic Agents (hepatoxic, nephrotoxic)
3. Hazardous Wastes
4. Hazardous Substances
5. Toxic Pollutants
6. Extremely Hazardous Substance

For hazardous materials transportation, the table below provides a classification and placards identification symbol.

Figure 3-33



Impact and Vulnerability

The impact of this hazard can interrupt business, affect transportation systems, disable emergency response capability, and cause injury, or loss of life. Hazardous material event may cause a disruption in services to citizens and therefore may create a lack of confidence in the Planning Area's ability to govern. In the event that services are disrupted due to hazardous material incidents, the Planning Area may activate the Continuity of Operations/Government Plan to maintain a level of essential services to the tribal members and public. Impact to emergency responders is considered high. At this time, only Pittsburg County and the City of McAlester have this capability. All other participating jurisdictions have defined this as a deficiency.

Possible impacts to the public and responders include chemical inhalation, burns, and possible death. No future structure projects have been identified within the hazard prone areas. Possible impacts to the environment include soil, air and water pollution. Secondary impacts would include possible illness or death to animals and humans from polluted soil, air and water.

3.4.9 Drought

Description

A drought is a period of drier than normal conditions that results in a lack of water. Precipitation falls in irregular patterns that prevent the plants and soils in the area from getting the moisture they need to survive. It can also have adverse effects on the waterways. Bodies of water will start to drop lower than the normal depth. This results in water supply issues if the problem persists and can become a drought.

Location

The entire Planning Area is susceptible to the effects of a drought.

Previous Occurrences

Figure 3-34
Drought Previous Occurrences
2010-2020
From the NOAA National Centers for Environmental Information
https://www.ncdc.noaa.gov/stormevents

Date	Jurisdiction	Narrative
03/08/2011	All Participating Jurisdictions	A prolonged period of unseasonably dry weather resulted in severe to extreme drought conditions to develop across much of east-central and southeastern Oklahoma during the month. During the month of March, the McAlester area received 0.52 inches of precipitation, making this month the driest March on record for the McAlester Regional Airport observing site. Most of southeastern Oklahoma received between five and twenty-five percent of the normal monthly precipitation for March. The unseasonably dry conditions in this part of the state extended back about a year as the past three months, six months, and twelve month periods are all the 2nd or 3rd driest on record, according to the Oklahoma Climatalogical Survey.||The drought conditions contributed to a number of wildfires that occurred across a lot of eastern Oklahoma during the month.

07/01/2011	All Participating Jurisdictions	A persistent subtropical ridge of high pressure over the south central United States during the month of July resulted in prolonged hot and dry weather across the region. There were a few days on which isolated to widely scattered thunderstorms occurred but these were far too few to have much affect. Much of eastern Oklahoma received precipitation amounts during the month that were well below average and some locations only received a few hundredths of an inch of rainfall during the entire month. As a result, severe to extreme drought conditions had redeveloped across the majority of the region by month's end. Monetary damages as a result of this drought were not available.
08/01/2011	All Participating Jurisdictions	A persistent subtropical ridge of high pressure continued to dominate the weather across the south central United States during much of August, resulting in prolonged hot and dry weather across the region. As a result, drought conditions worsened during the early half of the month across eastern Oklahoma with Okfuskee, Creek, and Pawnee Counties slipping into exceptional drought conditions while severe drought conditions developed across the remainder of the region with the exception of the far northeast part of the state. Some relief was felt by month's end across northeastern Oklahoma as several precipitation events that affected that region resulted in a lot of the area ultimately receiving near to slightly above normal precipitation amounts for the month. Being that August is typically one of the driest months of the year in this region of the country, the affects of the long-term drought were only subtly improved by this rainfall. Monetary damages as a result of the drought were not available.
09/01/2011	All Participating Jurisdictions	A persistent subtropical ridge of high pressure continued to dominate the weather across the south central United States during much of August, resulting in prolonged hot and dry weather across the region. As a result, drought conditions worsened during the early half of the month across eastern Oklahoma with Okfuskee, Creek, and Pawnee Counties slipping into exceptional drought conditions while severe drought conditions developed across the remainder of the region with the exception of the far northeast part of the state. Some relief was felt by month's end across northeastern Oklahoma as several precipitation events that affected that region resulted in a lot of the area ultimately receiving near to slightly above normal precipitation amounts for the month. Being that August is typically one of the driest months of the year in this region of the country, the affects of the long-term drought were only subtly improved by this rainfall. Monetary damages as a result of the drought were not available.

10/01/2011	All Participating Jurisdictions	Several precipitation events during the month produced beneficial rainfall across portions of east-central Oklahoma but given the long-term shortage of precipitation across the area, it had little impact on the long-term drought. The northeastern and southeastern portion of the state experienced another month of below normal precipitation with some areas receiving between 10 and 25 percent of normal precipitation, so drought conditions in those regions persisted or even worsened in some cases. Severe to extreme drought conditions continued across all of northeastern and east-central Oklahoma while southeastern Oklahoma continued to experience exceptional drought conditions in October. Monetary damage estimates resulting from the drought were not available.
11/01/2011	All Participating Jurisdictions	Several precipitation events resulted in widespread, significant rainfall across much of eastern Oklahoma during the month with much of the region receiving between four and eight inches of precipitation. Rainfall totals for the month were from about 2.50 inches across portions of Osage and Pawnee Counties (about 75 percent of normal rainfall for the month) to 15 to 20 inches across southern Le Flore County (from 200 to 300 percent of normal rainfall for the month). As a result of this rainfall, drought conditions across much of eastern Oklahoma improved during the month with the exception of Osage, Pawnee, Washington, and Nowata Counties where severe drought conditions persisted. Monetary damage estimates resulting from the drought were not available.
07/01/2012	All Participating Jurisdictions	Very hot temperatures combined with a lack of appreciable rainfall resulted in significantly worsening drought conditions across all of eastern Oklahoma during the month of July. Much of northeastern Oklahoma received less than 25 percent of average precipitation for the month while much of the southeastern portion of the state received less than 50 percent of average monthly precipitation amounts. By the end of the month, much of eastern Oklahoma was considered to be in extreme drought (D3). The USDA declared all counties in eastern Oklahoma disaster areas due to the drought. Monetary damage estimates resulting from the drought were not available.
08/01/2012	All Participating Jurisdictions	Rainfall was typically sporadic for August across eastern Oklahoma. Much of the region received below average rainfall for the month with areas north of I-44 only receiving between 10 and 25 percent of normal rainfall. Given the prolonged period of unusually dry weather that the region has experienced, the precipitation that was received in August 2012 did little to improve the drought, which had slipped into the extreme (D3) category across

		much of eastern Oklahoma early in the month. Much of the area north of I-40 had moved into the exceptional drought (D4) category by the middle of the month. Monetary damage estimates resulting from the drought were not available.
09/01/2012	All Participating Jurisdictions	Rainfall was once again sporadic across eastern Oklahoma during September 2012 with hot and dry weather dominating the region throughout much of the month. A few cold frontal passages did yield some much needed rainfall but it was too spotty to make a real difference in the ongoing drought conditions across the area. Despite a few locations actually receiving slightly above normal precipitation during the month, the area as a whole received between 25 and 75 percent of normal. Much of Osage and Pawnee Counties received less than 25 percent of normal average rainfall for the month. Exceptional (D4) drought conditions persisted during the month across much of northeastern Oklahoma along and north of I-44 while extreme (D3) drought conditions persisted across the remainder of eastern Oklahoma. Monetary damage estimates resulting from the drought were not available.
10/01/2012	All Participating Jurisdictions	Rainfall during October 2012 was once again below normal across much of eastern Oklahoma. The exception was across northern Tulsa County and much of Rogers County, where thunderstorms brought locally heavy rainfall to those areas during the middle of the month. Most of eastern Oklahoma received between 25 and 75 percent of normal rainfall for the month, while the east-central portion of the state received less than 25 percent of normal rainfall for that region. Severe (D2) to extreme (D3) drought conditions persisted across all of eastern Oklahoma during the month while exceptional (D4) drought conditions persisted across much of Pawnee, Osage, Washington, and Nowata Counties. Monetary damage estimates resulting from the drought were not available.
11/01/2012	All Participating Jurisdictions	November 2012 was extremely dry across all of eastern Oklahoma. In fact, the entire region received less than 50 percent of its normal average precipitation for the month with much of the region south of I-44 receiving less than 25 percent of normal precipitation. Portions of far southeastern Oklahoma only received about 5 percent of normal precipitation for the month. For the southeastern climate region of the state, November 2012 was the second driest on record and rainfall received during the Autumn months also went down as the second driest Autumn period on record. As a result of this continued dry weather, most of eastern Oklahoma remained in extreme (D3) drought conditions while exceptional (D4) drought conditions persisted across much of Pawnee, Osage, Washington, and

		Creek Counties. Monetary damage estimates resulting from the drought were not available.
12/01/2012	All Participating Jurisdictions	Precipitation over eastern Oklahoma continued below normal during December 2012, ranging from 0.25 inches near the Kansas/Missouri border to nearly four inches locally in southeastern Oklahoma. Much of southeastern Oklahoma received between 75 and 90 percent of normal precipitation while much of northeastern Oklahoma north of I-44 only received between 10 and 25 percent of normal precipitation. As a result of this continued dry weather, most of eastern Oklahoma remained in extreme drought (D3) conditions while exceptional drought (D4) conditions continued across much of Osage, Pawnee, Washington, and Creek Counties. Monetary damage estimates resulting from the drought were not available.
01/01/2013	All Participating Jurisdictions	Several storm systems brought generally light precipitation to eastern Oklahoma during early to mid January 2013. Toward month's end, a strong storm system moved across the region producing one half to more than three inches of rain as widespread showers and thunderstorms tracked across the area. As a result of this rain event on the 29th, portions of northeastern Oklahoma ended up receiving near normal to well above normal monthly precipitation while much of southeastern Oklahoma received well below normal precipitation. Due to the persistent dry pattern the area had experienced for much of 2012, the rainfall during January 2013 generally resulted in only a very slight improvement in the overall drought conditions over eastern Oklahoma. Much of the region remained in extreme drought (D3) conditions during the month while Osage, Pawnee, Washington, Creek, and Nowata Counties remained in exceptional drought (D4) conditions. Monetary damage estimates resulting from the drought were not available.
02/01/2017	All Participating Jurisdictions	Precipitation across much of eastern Oklahoma to the south of I-40 was above average for the month of February 2017, while areas to the north of I-40 experienced a very dry month. In fact, areas north of I-44 only received between 25 and 50 percent of normal average precipitation for the month. These unusually dry conditions followed a period of below normal precipitation that began in late summer. As a result, Severe Drought (D2) conditions persisted this month across much of northeastern and east central Oklahoma, with some improvement of the Extreme Drought (D3) conditions to Severe Drought (D2) conditions across much of the southeastern portion of the state. Monetary damage estimates resulting from the drought were not available.

03/01/2017	All Participating Jurisdictions	Several rounds of showers and thunderstorms across the region during March 2017 resulted in near to above average rainfall amounts across much of northeastern Oklahoma north of I-44. Unfortunately, areas of eastern Oklahoma to the south of I-44 received below average rainfall amounts for the month, with some areas only receiving between 25 and 50 percent of normal rainfall. As a result, Severe Drought (D2) conditions persisted during the month across much of eastern Oklahoma south of I-44, and even expanded into Mayes and Delaware Counties. Monetary damage estimates resulting from the drought were not available.
04/01/2017	All Participating Jurisdictions	Widespread, heavy rainfall occurred across much of eastern Oklahoma during the month of April 2017. Rainfall amounts across the area ranged from about four inches to more than fifteen inches, which corresponded to near normal rainfall to as much as 400 percent above normal average rainfall for the month. As a result of this widespread, heavy rainfall, Severe Drought (D2) conditions that began the month across much of the region, were eliminated toward the end of the month. Monetary damage estimates resulting from the drought were not available.
12/01/2017	All Participating Jurisdictions	Unusually dry conditions persisted through December 2017 across much of eastern Oklahoma, with the exception of portions of southeastern Oklahoma. Much of east central and northeastern Oklahoma received less than 50 percent of the average monthly rainfall for the area. These very dry conditions allowed severe drought (D2) conditions to expand across much of east central and southeastern Oklahoma. Monetary damage estimates resulting from the drought were not available.
01/01/2018	All Participating Jurisdictions	Portions of northeastern Oklahoma experienced a light snowfall event on the 15th and 16th of January 2018. Additionally, thunderstorms resulted in 1.5 to 2.5 inches of rain across portions of southeastern Oklahoma and east central Oklahoma on the 21st. Otherwise, little to no precipitation occurred across the area in January. As a result, precipitation amounts for the month were below normal across most of the region, which allowed severe drought (D2) conditions to expand through the month over much of eastern Oklahoma. Monetary damage estimates resulting from the drought were not available.
02/01/2018	All Participating Jurisdictions	Severe drought (D2) conditions continued across much of eastern Oklahoma through mid-February. An active weather pattern began across the area on February 16th and continued for over a week, resulting in multiple rain events across the region. Several of these events were significant.

		Due to these late-month rains, total monthly rainfall from six to ten inches occurred across eastern Oklahoma generally along and south of I-44, with one to four inches occurring to the north of I-44. The normal average rainfall for February across this region is from around two inches in Osage and Pawnee Counties to around three inches in southeastern Oklahoma. The excessive rainfall that fell across much of the area during the latter part of the month resulted in much improved drought conditions by the end of February, with the exception of portions of Osage and Pawnee Counties, where severe drought conditions persisted through the end of the month. Monetary damage estimates due to the drought were not available.

Probability of Future Events

The probability of a drought occurring in the Planning Area is medium.

Extent

Due to its complexity, it is difficult to predict drought probabilities. Drought evolves over time, as certain conditions are met, and can spread over a large area and, at the same time, have widely differing impacts in specific areas, depending upon duration, intensity, water supplies, and demands made upon supplies by human activities and vegetation. The impacts of related hazards, such as extreme heat, expansive soils and wildfires, can be intensified during periods of drought.

Drought conditions can be monitored through the U.S. Drought Monitor. This tool monitors rainfall trends and determines how harsh drought impacts might be. In addition to providing an effective comparison between lack of rainfall versus normal rainfall values, it also assesses drought based on agriculture and reservoir conditions as well.

There are five categories on the Drought Monitor; D0 (abnormally dry), D1 (moderate drought), D2 (severe drought), D3 (extreme drought), and D4 (exceptional drought). It should be noted that the Drought Monitor focuses on broad-scale conditions, and local conditions may vary. The Planning Area can experience the full scale on the Drought Monitor, but conditions past D2 can greatly affect the function of the local jurisdictions.

The Palmer Drought Severity Index (PDSI) is another tool used to measure the duration and intensity of the long-term drought-inducing circulation patterns. Long-term drought is cumulative, so the intensity of drought during the current month is dependent on the current weather patterns plus the cumulative patterns of previous months. Since weather patterns can change almost literally overnight from a long-term drought pattern to a long-term wet pattern, the PDSI can respond fairly rapidly. The Planning Area can experience the full scale of the Index.

			Ranges				
Category	Description	Possible Impacts	Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	[illegible] (Percentiles)
D0	Abnormally Dry	Going into drought: • [illegible] Coming out of drought: • [illegible] • [illegible]	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	• [illegible] • [illegible] • [illegible]	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	• [illegible] • [illegible]	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	• [illegible] • [illegible]	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	• [illegible] • [illegible]	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

Figure 3-35
Palmer Drought Severity Index

	< -4.0	Extreme Drought
	-3.99 to -3.0	Severe Drought
	-2.99 to -2.0	Moderate Drought
	-1.99 to -1.0	Mild Drought
	-0.99 to -0.5	Incipient Drought
	-0.49 to 0.49	Near Normal
	0.5 to 0.99	Incipient Moist Spell
	1.0 to 1.99	Moist Spell
	2.0 to 2.99	Unusual Moist Spell
	3.0 to 3.99	Very Moist Spell
	> 4.0	Extreme Moist Spell

Impact and Vulnerability

The impact of this hazard primarily affects agriculture, livestock, the public, and economics through water shortage, increase of fire danger, and damage to critical infrastructure and facilities. Possible environmental impacts of this hazard include the evaporation of bodies of water, loss of plant and animal life, soil drying up, and the disturbance of natural ecosystems. The environmental impact for all jurisdictions within the Planning Area is considered high.

One of the most significant potential impacts of drought relates to public water supply. If drought persists through a hot summer, there may be a need to stop washing cars, cease watering the grass, and other water conservation steps. In smaller communities, reduced flow in rivers and streams can have a significant effect on the water amount allowed for municipal use. Hot weather during the summer increases demand and subsequent use of supplies, as well as evaporation. In turn, increased water demand can stress many smaller and/or antiquated delivery and treatment facilities to the point of collapse. Prolonged drought has a much greater impact on rural communities, which usually rely on relatively small watersheds and are especially vulnerable during such periods.

Drought causes the terrain to become dry, which provides ample fuel for fires. During prolonged drought events, water supply begins to dwindle, making it hard to respond to fires during this high-risk time.

Additionally, when the water supply for the city, ponds, lakes, and rivers begin to disappear, it creates a financial and time hardship to the local governments and school districts. The City of McAlester maintains a public pool that would be shut down during a prolonged drought event. This pool collects revenue from the general public and is where the school district's summer programs take children. These children learn essential water safety lessons that could save their lives later on in life. Should a drought event close the pool, these lessons wouldn't be possible.

Farmers and ranchers located in the unincorporated areas of Pittsburg County rely on ponds, rivers, and streams to water livestock. Drought events can significantly affect this. Mitigation activities have been identified to educate on the many existing programs available to minimize the effects of drought on farmers and ranchers.

An additional concern for all jurisdictions included in the Planning Area is foundation damage. Mitigation projects exist in incorporated city and towns that can help protect and reduce the effects of drought on the public in the Planning Area.

Services to the public, such as those provided by local fire departments, could be limited during prolonged drought events. This could lead to a lack of confidence in the local jurisdictions' ability to govern. In the event of a prolonged drought event, the local jurisdictions should activate their Continuity of Operations Plans to ensure minimal disruption of essential services. At this time, only Pittsburg County and the City of McAlester have this capability. All other participating jurisdictions have defined this as a deficiency.

The entire planning area is vulnerable to drought. Because of the close proximity to each other and similarities in terrain, the jurisdictions within the Planning Area face similar vulnerabilities and impacts. Water supply has been a major issue for the entire Planning Area over the last few years. All the water lines within the Planning Area are outdated and don't function at optimal levels, compromised water supplies have led to multiple boil orders, and there aren't sufficient water towers to keep up with the Planning Area's demand. All jurisdictions within the Planning Area wish to come up with a joint solution to fix these problems so that when a drought happens, they don't have to worry about the extra strains on supply.

Because of this, all jurisdictions within the Planning Area have identified a need for specific action items relating to this hazard such as educating the community on the effects of drought along with extending water distribution to parts of the county currently without.

3.4.10 Dam Failure

Description

A dam is an artificial barrier usually constructed across a stream channel to impound water. Timber, rock, concrete, earth, steel or a combination of these materials may be used to build the dam. In Pittsburg County, most dams are constructed of earth or concrete. Dams must have spillway systems to safely convey normal stream and flood flows over, around, or through the dam. Spillways are commonly constructed of non-erosive materials such as concrete. Dams should also have a drain or other water-withdrawal facility for control of the pool or lake level and to lower or drain the lake for normal maintenance and emergency purposes. A dam that impounds water in the upstream area is referred to as a reservoir. The amount of water impounded is measured in acre-feet. An acre-foot is the volume of water that covers an acre of land to a depth of one foot. As a function of upstream topography, even a very small dam may impound or detain acre-feet of water.

A dam failure is an uncontrolled release of water from a reservoir through a dam as a result of structural failures or deficiencies in the dam. Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream.

Location

Only High Hazard Dams are profiled in this plan. Dams falling within the OWRB's jurisdiction are non-Federally constructed and maintained dams which are: 1) greater than 6 feet in height with storage capacities of 50 acre-feet or more; 2) and/or 25 feet or greater in height with storage capacities of 15 acre-feet or more.

The program requires inspections every five and three years for low and significant hazard structures, respectively. The Oklahoma Water Resources Board (OWRB) requires submittal and subsequent approval of plans and specifications prior to dam modifications. The OWRB also coordinate periodic training sessions and workshops on dam safety issues and regulation for dam owners and engineers. There are five high-hazard dams that would affect Pittsburg County based on the OWRB data base:

1) Fin & Feather Lake Dam
2) Smithson Lake Dam
3) SCS Brushy Peaceable Creek Site 037
4) SCS Brushy Peaceable Creek Site 032

5) Pittsburg Lake Dam

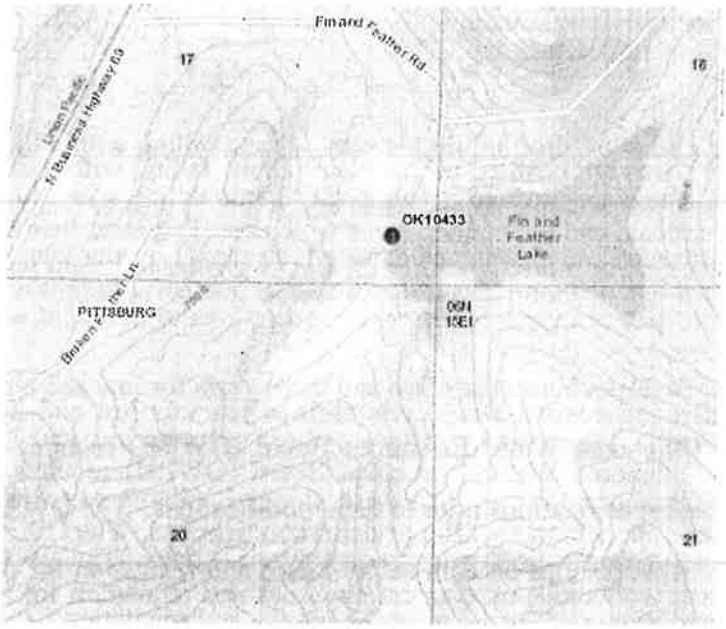
The jurisdictions not affected by this hazard include Alderson, Ashland, Canadian, Indianola, Kiowa, Quinton, Savanna, Haileyville, Hartshorne, Krebs, and Public Schools of Quinton, Crowder, Haileyville, Frink-Chambers, Tannehill, Krebs, Haywood, Savanna, Canadian, Hartshorne, Kiowa, and Carlton Landing Academy. The jurisdictions and school districts that are at risk include Pittsburg County, Pittsburg, McAlester, and the public school districts of McAlester and Pittsburg.

Fin and Feather Lake Dam

The Fin and Feather Lake Dam was listed as a high hazard dam by the OWRB. It was built in 1933 and has a height of 33 feet. The Dam is located a few miles north of McAlester and Krebs. Should this dam fail, it would affect the unincorporated areas of Pittsburg Co.

Figure 37

Fin and Feather Lake Dam



Smithson Lake Dam

Smithson Lake Dam is located in Pittsburg County immediately west of State Highway 69 and north of State Highway 270 in McAlester with a close proximity to Krebs. It was listed as high hazard by the OWRB and was built in 1930. The Smithson Lake Dam has a height of 18 feet. Should this dam fail, it would affect McAlester and McAlester PS.

Figure 38
Smithson Dam

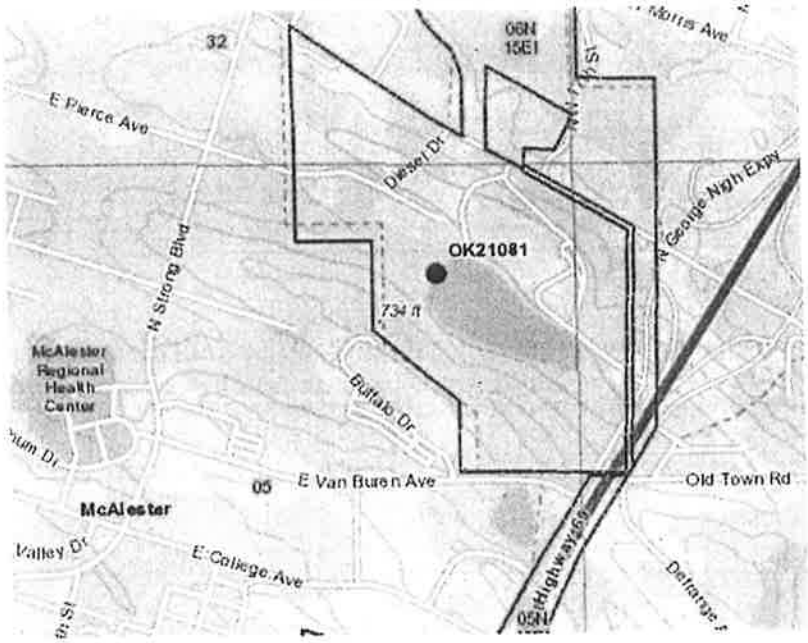


Figure 39
Smithson Dam

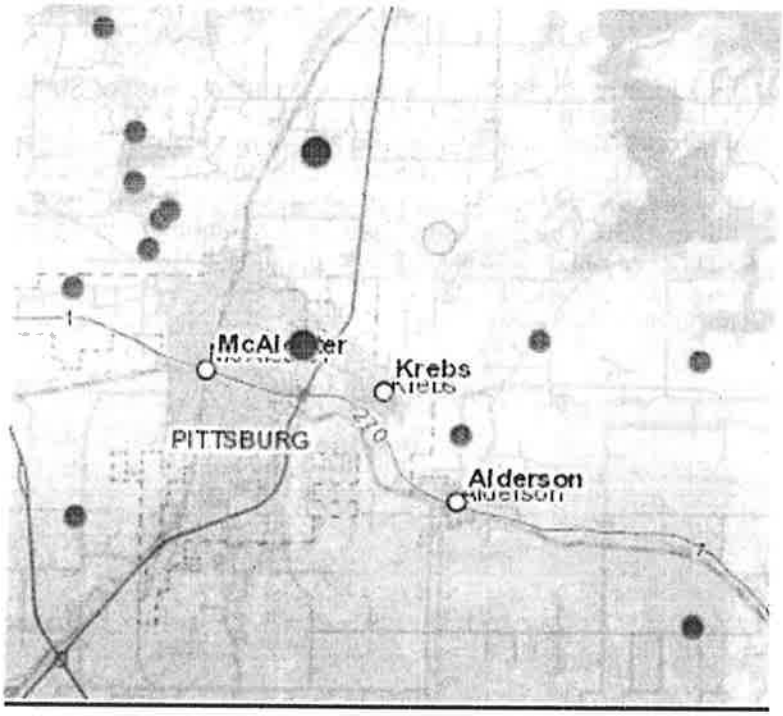
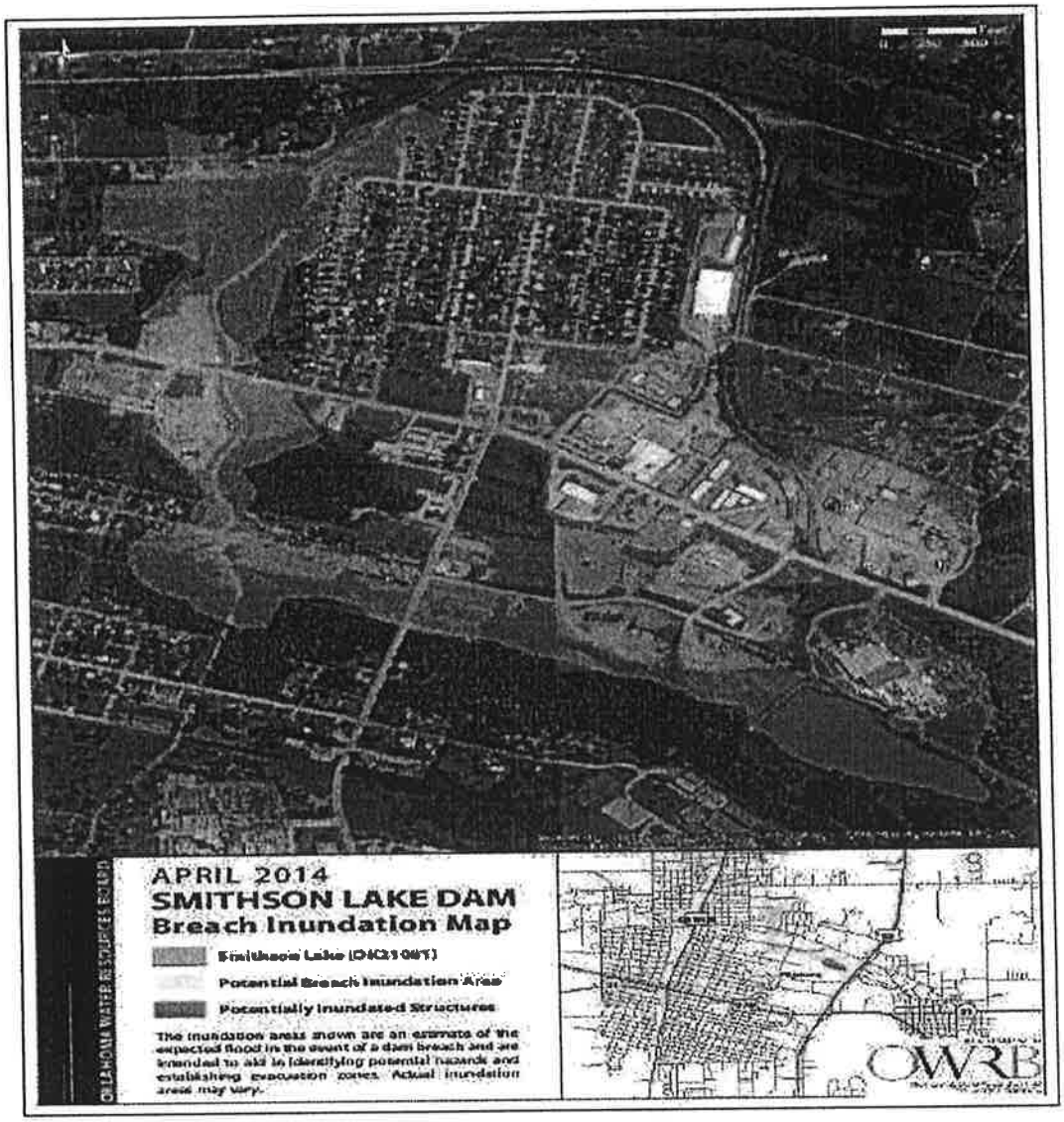


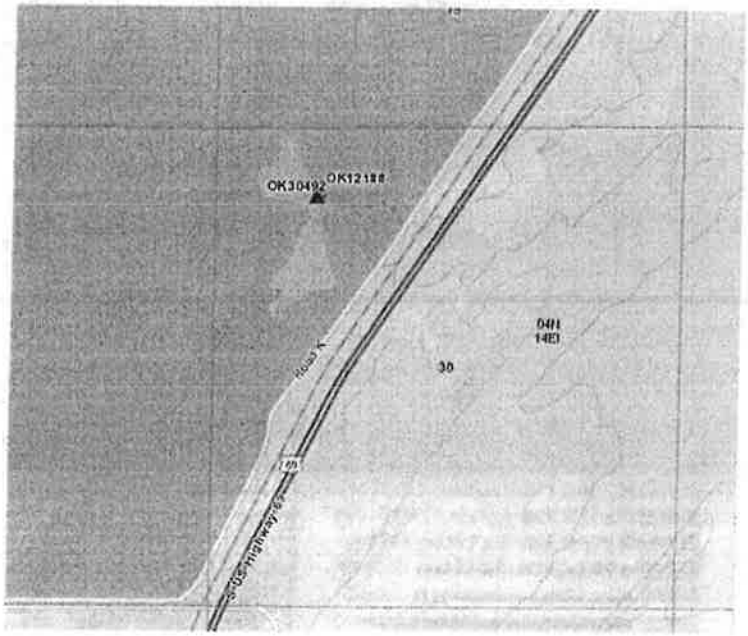
Figure 40
Smithson Dam Inundation Map


APRIL 2014
SMITHSON LAKE DAM
Breach Inundation Map
Smithson Lake (OK21007)
Potential Breach Inundation Area
Potentially Inundated Structures
The inundation areas shown are an estimate of the expected flood in the event of a dam breach and are intended to aid in identifying potential hazards and establishing evacuation zones. Actual inundation areas may vary.
OKLAHOMA WATER RESOURCES BOARD
OWRB

SCS Brushy Peaceable Creek Site-037

Site-037 is located a few miles southwest of Savanna and approximately five miles north of Kiowa. It was rated as a high hazard dam by the NRCS and was built in 1978. It has a height of 26 feet. Should this dam fail, it would affect the unincorporated areas of Pittsburg Co.

Figure 41
Site-037



SCS Brushy Peaceable Creek Site-032

Site-032 was built in 1978 and has aa height of 34 feet. It was classified as a high hazard dam by the. NRCS. It's located close to Site-032, though only Savanna is within a five-mile radius of it. Should this dam fail, it would affect the unincorporated areas of Pittsburg Co.

Figure 42
Site-032

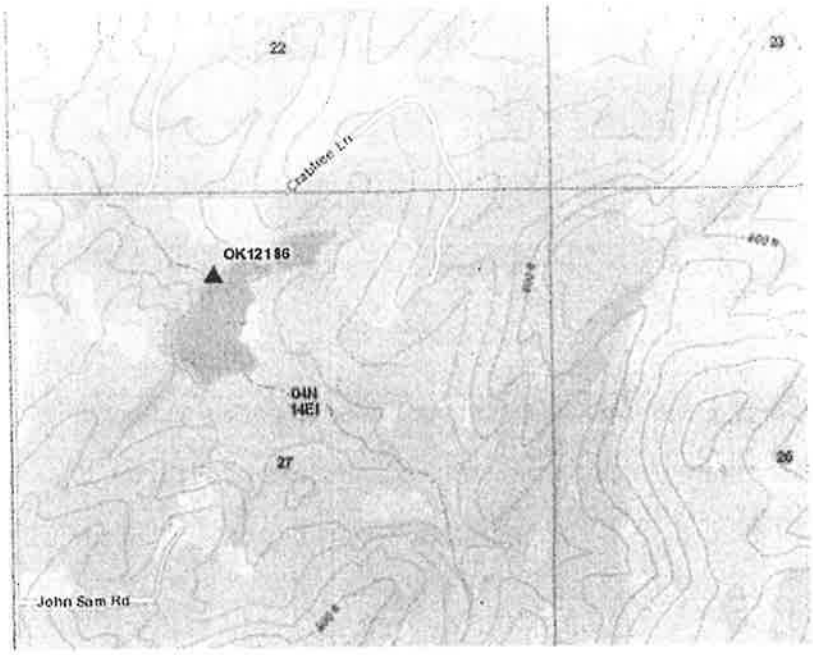
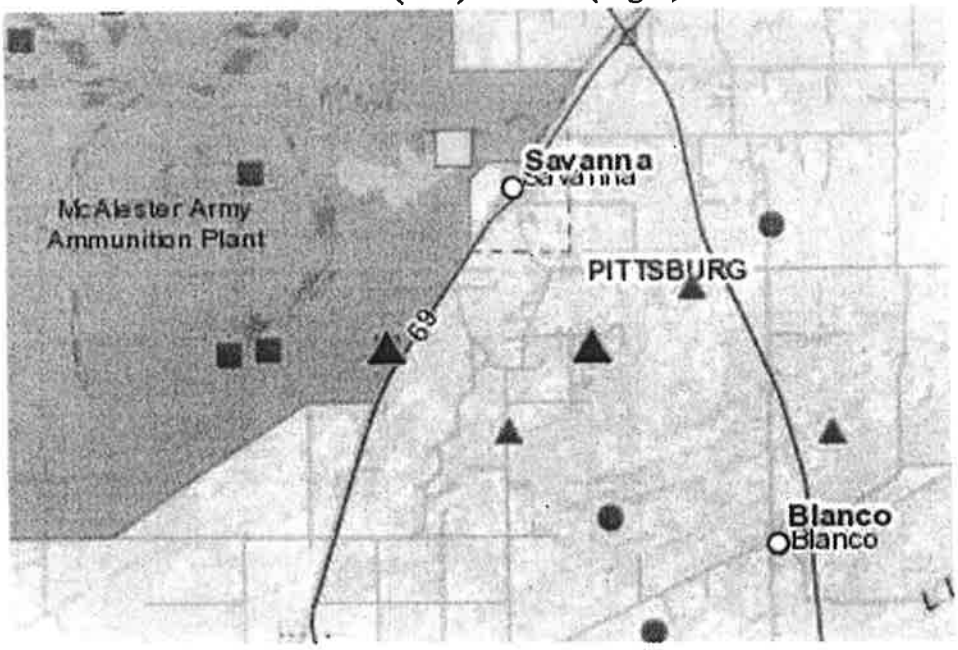


Figure 43
Sites 037 (Left) and 032 (Right)



Pittsburg Lake Dam

The Pittsburg Lake Dam listed as High hazard was rated by the OWRB as a high hazard dam because there are occupied structures below the dam. This dam would primarily affect small rural communities, ranches, farms, and acreages. It is also just south of the Town of Pittsburg. The dam height is 24 feet. Should this dam fail, it would affect the town of Pittsburg and Pittsburg PS.

Figure 44
Pittsburg Lake Dam

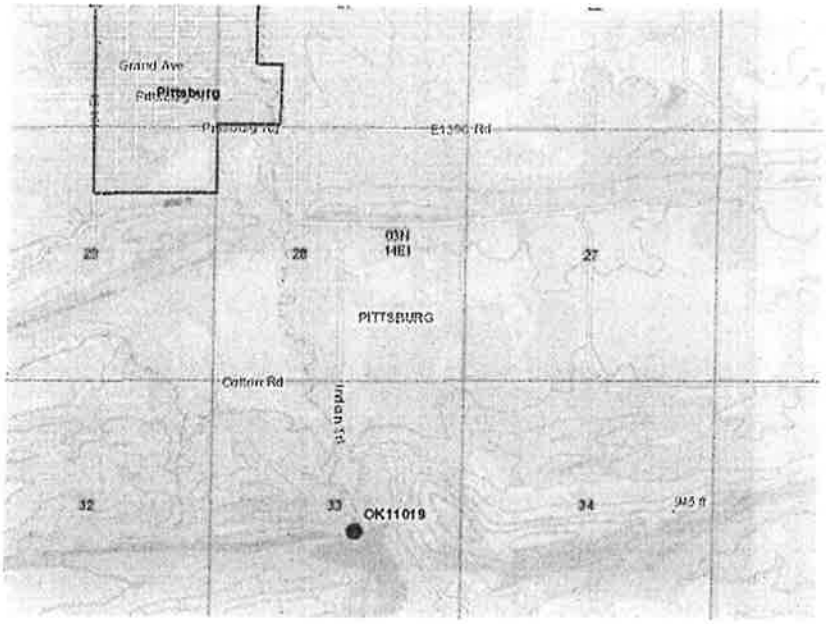


Figure 45
Pittsburg Lake Dam

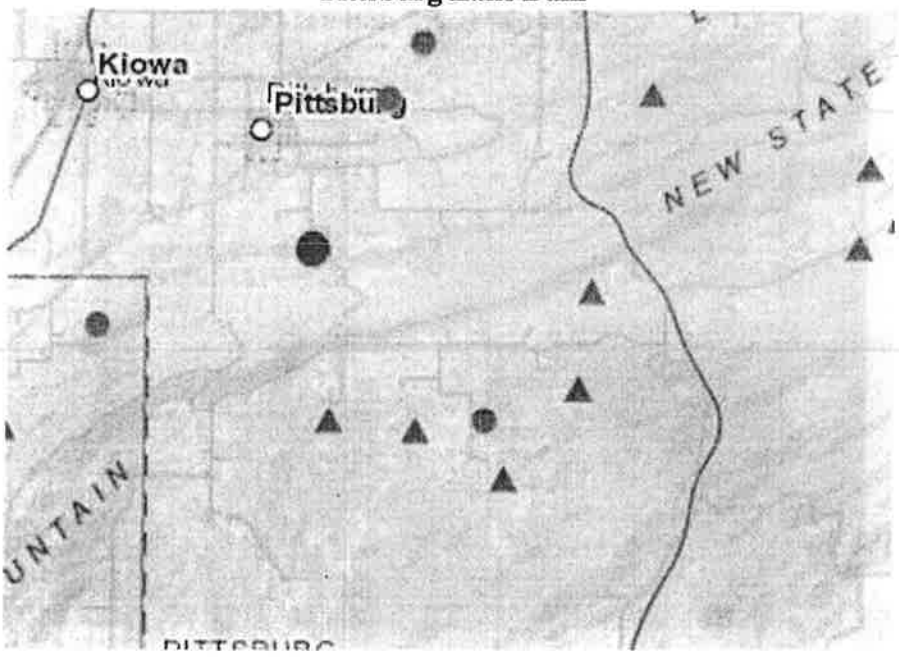
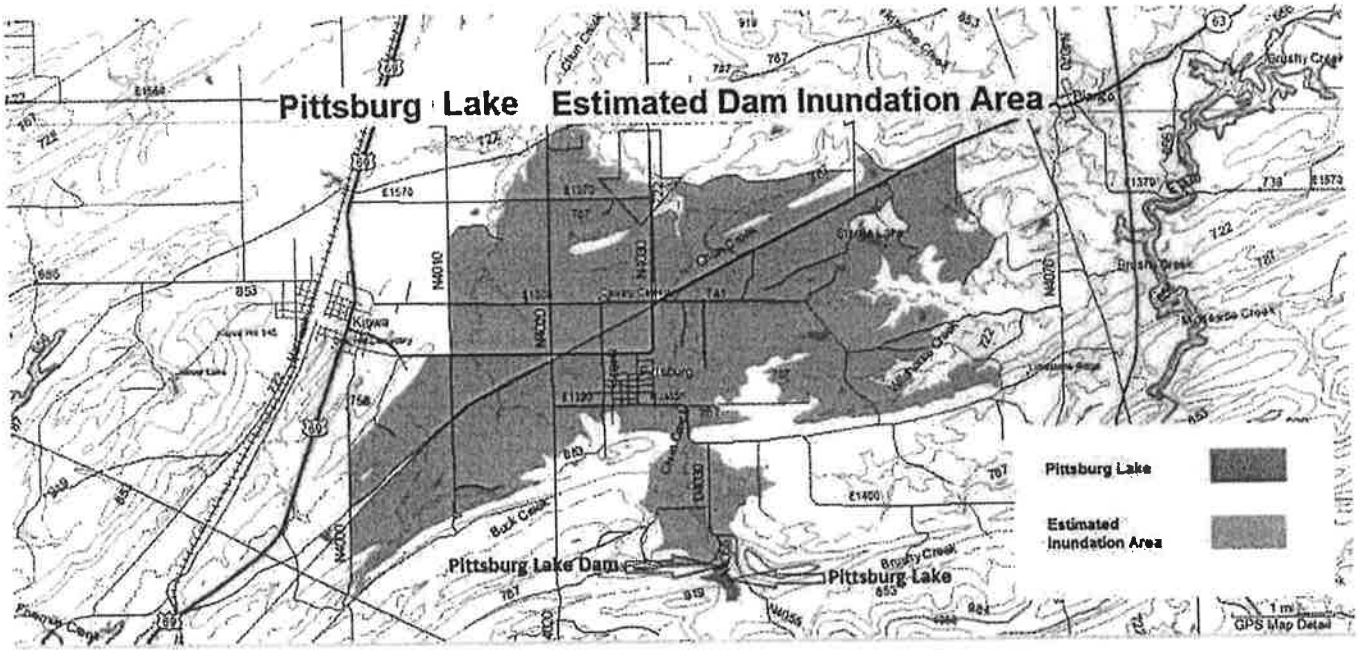


Figure 46



Previous Occurrences

There have not been any dam failures in the Planning Area from 2010-2020.

Probability of Future Events

The probability of future events is low.

Extent

Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream. Dams assigned the Low Hazard Potential classification are those dams where failure or mis- operation results in no probable loss of human life and low economic and/or environmental losses. Significant Hazard Potential classification are dams that are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure, and where failure or mis-operation results in no probable loss of human life but can cause serious economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. High Hazard Potential classifications are those dams where failure or mis- operation will probably cause loss of human life. The Oklahoma Water Resources Board defines dam classification as:

Figure 3-47

OWRB CLASSIFICATION OF HAZARD POTENTIAL

Category	Loss Of Life	Economic Loss
Low	None - No probable future development; may be zoned to prevent future development.	Minimal - undeveloped to occasional structure or agriculture
Significant	None - Potential for future development exists; habitable structures may exist in inflow design flood floodplain, however, dam failure would not endanger lives that would not be endangered if structure did not exist.	Appreciable notable agriculture, industrial or structural
High	Yes (One or more habitable structures with loss of life due to dam failure likely)	Excessive extensive community, industrial or agricultural losses. Possible loss of life.

Currently, only inundation maps are available for Smithson Lake Dam and Pittsburg Lake Dam. There are no inundation maps available for Fin and Feather Dam, SCS Brushy Peaceable Creek Site 037, or SCS Brushy Peaceable Creek Site 032. In addition, the inundation maps for Smithson Lake Dam and Pittsburg Lake Dam are older and do not depict flood inundation depth, or time of speed flood onset data. Extent cannot be determined adequately for any of the five high hazard dams in the Planning Area due to a data deficiency.

The Conservation District has state that, "As a general rule in the absence of a formal breach inundation map, we consider the area five miles downstream at the top-of-dam elevation and below to be the potential area of risk."

The Planning Area has never experienced a dam failure, but the Planning Area has defined that any dam failure event would devastate and tax the Planning Area's resources.

Impact and Vulnerability

Please see the location section of the Dam Failure Profile to see the inundation maps.

The impact of this hazard can affect homes, business, agriculture, and infrastructure located downstream from the dam. Dam Failure can occur over prolonged periods of time where people have time to prepare for the imminent failure or can be sudden with little to no warning time.

Additionally, community services to the public could be delayed leading to a lack of confidence in the local jurisdictions' ability to govern. In the event facilities or access to facilities are damaged, the local jurisdictions' Continuity of Operations/Government Plan may be activated ensuring minimal disruption to essential services for the public. At this time, only Pittsburg County and the City of McAlester have a Continuity of Operations Plan to enact. All other participating jurisdictions do not have a plan, and this is considered a vulnerability.

Impacts to responders may include injury, fatalities, swift water, the increase of snakes, and disease infested water. Possible environmental impacts of flooding are unsightly deposition of sediment and debris, infectious diseases, disruption of the natural balance of the ecosystem; chemicals and other hazardous substances may result in water contamination, or destruction of plants and animals. Environmental impact of flooding is considered high but there is a low probability of occurrence. Possible impacts to responders are swift water, increase in snakes, drowning and disease infested water.

Figure 3-48
Dam Failure Impacts and Vulnerabilities

Jurisdiction	Vulnerabilities	Impact
Pittsburg County	As seen in the location section, there are several high hazard dams located in Pittsburg County.	Flooding from these dams would most likely impact rural areas and farm lands.
Town of Alderson	While the Town of Alderson is within 5 miles of the Smithson Lake Dam, it isn't considered to be threatened by it.	
Town of Ashland	Ashland is not affected by this hazard.	
Town of Canadian	Canadian is not affected by this hazard.	
Carlton Landing	Carlton Landing is not affected by this hazard.	
Town of Crowder	Crowder is not affected by this hazard.	
Town of Indianola	Indianola isn't affected by this hazard.	
Town of Kiowa	Kiowa is just outside of the impact area for Site-037.	
Town of Pittsburg	The Town of Pittsburg is located near a high hazard dam.	If a dam failure were to occur, the Town of Pittsburg would be completely inundated, as shown in Figure 46
Town of Quinton	Quinton is not affected by this hazard.	
Town of Savanna	While Savanna is within the five-mile radius, it is unlikely that the town would experience flooding.	
City of Haileyville	Haileyville is not affected by this hazard.	
City of Hartshorne	Hartshorne is not affected by this hazard.	

City of Krebs	Smithson Lake Dam is located within close proximity to the City of Krebs, but inundation maps show that it isn't likely to be affected.	
City of McAlester	Smithson Lake Dam is located within close proximity to the City of McAlester.	Figure 40 shows that several streets and buildings would be inundated by a dam failure.
McAlester Public Schools	Smithson Lake Dam is located within close proximity to the school district.	If a dam failure were to occur, the school district could potentially be inundated.
Quinton Public Schools	The school district isn't affected by this hazard.	
Crowder Public Schools	The school district isn't affected by this hazard.	
Haileyville Public Schools	The school district isn't affected by this hazard.	
Frink-Chambers Public Schools	The school district isn't affected by this hazard.	
Tannehill Public Schools	The school district isn't affected by this hazard.	
Krebs Public Schools	Smithson Lake Dam is located within close proximity to the school district, but inundation maps show that it isn't likely to be affected.	
Haywood Public Schools	The school district isn't affected by this hazard.	
Savanna Public Schools	While the school district is within the five-mile radius of a high hazard dam, it is unlikely that the town would experience flooding.	
Canadian Public Schools	The school district isn't affected by this hazard.	
Pittsburg Public Schools	The school district is located near a high hazard dam.	If a dam failure were to occur, the school district would be completely inundated, as shown in Figure 46.
Hartshorne Public Schools	The school district isn't affected by this hazard.	
Indianola Public Schools	The school district isn't affected by this hazard.	
Kiowa Public Schools	Kiowa Public Schools is just outside of the impact area for Site-037.	
Carlton Landing Academy	The school district isn't affected by this hazard.	

3.4.11 Earthquake

Description

An earthquake is a sudden, rapid shaking of the ground caused by the fracture and movement of rock beneath the Earth's surface. Most severe earthquakes take place where the huge tectonic plates that form the Earth's surface collide and slide slowly over, under, and past each other. They can also occur along any of the multitude of fault and fracture lines within the plates themselves.

Location

Earthquakes have the possibility of affecting the entire Planning Area.

Previous Occurrences

Earthquake Data from Oklahoma Geological Survey

2010-2020

https://www.ou.edu/ogs/research/earthquakes

Year	# of Earthquakes	Range of Magnitude
2010	7	Undetected - 3.1
2011	17	Undetected – 2.7
2012	7	Undetected - 3.0
2013	12	1 – 2.8
2014	2	2.6 – 2.7
2015	2	2.4 – 2.7
2016	1	2.7
2017	5	2.2 – 2.7
2018	12	1.8 – 2.7
2019	149	1.4 – 3.7
2020	170	0.7 - 3.2

Probability of Future Events

The probability of future earthquakes in the Planning Area is high.

Extent

Earthquakes are relatively common in southeastern Oklahoma, but they are rarely felt and have caused little damage. The size of an earthquake can be expressed quantitatively as a magnitude and the local strength of shaking as intensity. The inherent size of an earthquake is expressed using a magnitude. Table 3-28 is the scale the Planning Area uses. The Planning Area has experienced and is expected to continue experiencing earthquakes of magnitudes from I-IV. Anything above a II could cause concern to the Planning Area.

Figure 3-49
Mercalli Scale

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest,especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Impact and Vulnerability

Most earthquake injuries and fatalities occur within buildings from collapsing walls and roofs, flying glass, and falling objects. As a result, the extent of a community's risk depends not just upon its location relative to a known fault, and its underlying geology and soils, but also on the design of its structures. Buildings constructed to earlier seismic standards (or to no standard) can pose major threats to life and the continued functioning of key public services during an earthquake disaster. Unreinforced masonry structures are the most vulnerable, while wood frame structures typically perform well. Of special concern are the design and construction of critical facilities such as hospitals and transportation facilities, oil and gas pipelines, electrical power and communication facilities, and water supply and sewage treatment facilities.

Oklahoma is in the relatively stable Central Plains Province. It does have a sustained level of seismicity, due to the complex seismic zone that includes the Meers, Nemaha, Central Oklahoma, Choctaw, Chickasha, and Windingstair Faults.

Any earthquake risk would most likely come from proximity to the New Madrid and Meers Faults. According to Dr. James Lawson, chief geophysicist of the Oklahoma Geological Survey's Seismic Observatory at Leonard, the risk of an earthquake in the New Madrid Fault Zone should not be

over emphasized. He believes a major seismic event there would have no greater impact on most Oklahoma communities than a locally generated earthquake. An 8-magnitude event in New Madrid would likely produce only VI-intensity tremors in northeastern Oklahoma, and would not be as severe as the Ft. Gibson quake of 1882.

Although minor earthquakes are relatively common in Oklahoma, due to their small magnitude they pose only low to moderate risk to the facilities within the Planning Area. Earthquakes are more frequent in the north central part of the Oklahoma, but are rarely felt events, and cause little to no damage. The earthquake hazard poses no significant risk to the Planning Area.

Unfortunately, earthquakes and their impacts are hard to predict. Even though risk is considered low, a lack of planning would make the jurisdiction even more vulnerable than it already is should a major event occur.

Since the Planning Area hasn't ever experienced devastating effects, the public wouldn't know how to handle a major earthquake event. All jurisdictions identify a lack of public knowledge to be their greatest vulnerability. Others would include a lack of generators in the event infrastructure became damaged and a lack of a Continuity of Operations Plan.

Just like with drought, the entire Planning Area sees the same impacts and vulnerabilities. While weak, barely felt earthquakes happen in the Planning Area all the time, they don't typically cause issues. But, if a stronger earthquake were to occur, none of the buildings within the Planning Area were built to withstand damage from earthquakes. Additionally, the Planning Area has 2,870 structures built before 1940, which puts them at an even greater risk. Because these are mostly the locations of citizen homes and businesses, the Planning Team did not want to include them in the plan. This list is kept and maintained at the County Assessor Office.

CHAPTER FOUR: CAPABILITY ASSESSMENT

4.1 Capability Assessment

Jurisdictions can do a number of things to prevent or mitigate the impacts of natural disasters. Such actions range from instituting regulatory measures (e.g., building and zoning codes) and establishing Emergency Operations Plans (EOP) and Emergency Operations Centers (EOC), to constructing large and small infrastructure projects like levees and safe rooms. The hazard mitigation measures are divided into six categories: Public Information and Education, Prevention, Structural Projects, Property Protection, Emergency Services, and Natural Resource Protection.

There are several national hazard mitigation programs incorporating elements from several of these categories. They have been developed by FEMA and other agencies and are designed to help jurisdictions organize their mitigation activities to achieve tangible results in specific areas, such as flood protection and fire hazard abatement. This Chapter looks at the Planning Area's participation programs. The Planning Team reviewed relevant jurisdictional studies, plans, reports, and technical documents in the inventory, evaluation and plan phases of the hazard mitigation plan development.

Existing programs and policies were reviewed in order to identify those that may weaken or enhance the hazard mitigation objectives outlined in this plan. This list does not necessarily reflect every plan, ordinance, or other guidance document within each jurisdiction. Administrative capability is determined by evaluating whether there are an adequate number of personnel with the ability to survey and utilize Geographic Information Systems.

The charts below only depict current capabilities for the jurisdictions within the Planning Area, but each participating jurisdiction has the ability to potentially build on these existing capability areas through grants and local funding.

In the charts below, the Y's and N's indicate a Yes or a No respectively, to indicate whether the jurisdiction has the authority to implement the specified regulatory toll and that the tool is currently in place.

Figure 4-1 Pittsburg County Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	N
Zoning Ordinances	N
Subdivision Ordinances	N
Floodplain Ordinance	Y
Special Purpose Ordinance	N
Growth Management Ordinance	N
Site Plan Review Requirements	N
Comprehensive Plan	N
Capital Improvement Plan	Y
Economic Development Plan	N
Emergency Response Plan	Y
Post-Disaster Recovery Plan	Y
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	Y
Engineers or professionals trained in construction practices related to buildings	Y
Planners or Engineers with an understanding of natural and/or human caused hazards	Y
Surveyors	N
Floodplain Manager	Y
Staff with education or experience to assess the community's vulnerability to hazards	Y
Personnel skilled in GIS and/or HAZUS	Y
Scientists familiar with the hazards of the community	N
Emergency manager	Y
Grant writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Authority to levy taxes for specific purposes	Y
Water, sewer. Gas, or electric service fees	N
Incur fees for new development	N
Incur debt through general obligation funds and/or special tax bonds	Y
Community development Block Grant	Y
Federal Funding Programs	Y
State Funding Programs	Y
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disaster or safety related programs	Y
StormReady Certification	Y
Firewise Community Certification	Y
Public-Private partnership	Y

Pittsburg Co can build upon its capabilities by hiring an additional staff position for the Emergency Management office.

Figure 4-2 Town of Ashland Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	N
Zoning Ordinances	N
Subdivision Ordinances	N
Special Purpose Ordinance	N
Growth Management Ordinance	N
Site Plan Review Requirements	N
Comprehensive Plan	N
Capital Improvement Plan	N
Economic Development Plan	N
Emergency Response Plan	N
Post-Disaster Recovery Plan	N
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	N
Engineers or professionals trained in construction practices related to buildings	N
Planners or Engineers with an understanding of natural and/or human caused hazards	N
Surveyors	N
Staff with education or experience to assess the community's vulnerability to hazards	N
Personnel skilled in GIS and/or HAZUS	N
Scientists familiar with the hazards of the community	N
Emergency manager	N
Grant writers	N
Financial Capabilities	
Capital Improvements Project Funding	N
Authority to levy taxes for specific purposes	N
Water, sewer. Gas, or electric service fees	N
Incur fees for new development	N
Incur debt through general obligation funds and/or special tax bonds	N
Community development Block Grant	N
Federal Funding Programs	N
State Funding Programs	N
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	N
Natural disaster or safety related programs	N
StormReady Certification	N
Firewise Community Certification	N
Public-Private partnership	N

Ashland can build upon its capabilities by obtaining StormReady and Firewise certification.

Figure 4-3 Town of Alderson County Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	N
Zoning Ordinances	N
Subdivision Ordinances	N
Special Purpose Ordinance	N
Floodplain Ordinance	N
Growth Management Ordinance	N
Site Plan Review Requirements	N
Comprehensive Plan	N
Capital Improvement Plan	N
Economic Development Plan	N
Emergency Response Plan	N
Post-Disaster Recovery Plan	N
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	N
Engineers or professionals trained in construction practices related to buildings	N
Planners or Engineers with an understanding of natural and/or human caused hazards	N
Surveyors	N
Floodplain Manager (Utilizes Pittsburg Co Floodplain Manager)	Y
Staff with education or experience to assess the community's vulnerability to hazards	N
Personnel skilled in GIS and/or HAZUS	N
Scientists familiar with the hazards of the community	N
Emergency manager	N
Grant writers	N
Financial Capabilities	
Capital Improvements Project Funding	N
Authority to levy taxes for specific purposes	N
Water, sewer. Gas, or electric service fees	N
Incur fees for new development	N
Incur debt through general obligation funds and/or special tax bonds	N
Community development Block Grant	N
Federal Funding Programs	N
State Funding Programs	N
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	N
Natural disaster or safety related programs	N
StormReady Certification	N
Firewise Community Certification	N
Public-Private partnership	N

Alderson can build upon its capabilities by adopting floodplain ordinance, and obtaining StormReady and Firewise certification.

Figure 4-4 Town of Canadian Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	N
Zoning Ordinances	N
Subdivision Ordinances	N
Floodplain Ordinance	N
Special Purpose Ordinance	N
Growth Management Ordinance	N
Site Plan Review Requirements	N
Comprehensive Plan	N
Capital Improvement Plan	Y
Economic Development Plan	N
Emergency Response Plan	N
Post-Disaster Recovery Plan	N
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	N
Engineers or professionals trained in construction practices related to buildings	N
Planners or Engineers with an understanding of natural and/or human caused hazards	Y
Floodplain Manager (Utilizes Pittsburg Co Floodplain Manager)	Y
Surveyors	N
Staff with education or experience to assess the community's vulnerability to hazards	N
Personnel skilled in GIS and/or HAZUS	N
Scientists familiar with the hazards of the community	N
Emergency manager	Y
Grant writers	N
Financial Capabilities	
Capital Improvements Project Funding	Y
Authority to levy taxes for specific purposes	Y
Water, sewer. Gas, or electric service fees	Y
Incur fees for new development	N
Incur debt through general obligation funds and/or special tax bonds	Y
Community development Block Grant	N
Federal Funding Programs	Y
State Funding Programs	Y
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	N
Natural disaster or safety related programs	N

StormReady Certification	N
Firewise Community Certification	Y
Public-Private partnership	N

Canadian can build upon its capabilities by adopting floodplain ordinance, and obtaining StormReady certification.

Figure 4-5 Town of Carbon Landing Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	Y
Zoning Ordinances	Y
Subdivision Ordinances	N
Special Purpose Ordinance	N
Growth Management Ordinance	N
Site Plan Review Requirements	Y
Comprehensive Plan	Y
Capital Improvement Plan	Y
Economic Development Plan	Y
Emergency Response Plan	N
Post-Disaster Recovery Plan	N
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	Y
Engineers or professionals trained in construction practices related to buildings	Y
Planners or Engineers with an understanding of natural and/or human caused hazards	N
Surveyors	Y
Staff with education or experience to assess the community's vulnerability to hazards	Y
Personnel skilled in GIS and/or HAZUS	N
Scientists familiar with the hazards of the community	N
Emergency manager	N
Grant writers	N
Financial Capabilities	
Capital Improvements Project Funding	Y
Authority to levy taxes for specific purposes	Y
Water, sewer. Gas, or electric service fees	Y
Incur fees for new development	Y
Incur debt through general obligation funds and/or special tax bonds	Y
Community development Block Grant	N
Federal Funding Programs	Y
State Funding Programs	Y
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y

Ongoing public education or information programs	N
Natural disaster or safety related programs	N
StormReady Certification	N
Firewise Community Certification	N
Public-Private partnership	N

Carlton Landing can build upon its capabilities by obtaining StormReady and Firewise certification.

Figure 4-6 Town of Crowder Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	N
Zoning Ordinances	N
Subdivision Ordinances	N
Floodplain Ordinance	N
Special Purpose Ordinance	N
Growth Management Ordinance	N
Site Plan Review Requirements	N
Comprehensive Plan	N
Capital Improvement Plan	Y
Economic Development Plan	N
Emergency Response Plan	Y
Post-Disaster Recovery Plan	N
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	N
Engineers or professionals trained in construction practices related to buildings	N
Planners or Engineers with an understanding of natural and/or human caused hazards	N
Floodplain Manager (Utilizes Pittsburg Co Floodplain Manager)	Y
Surveyors	N
Staff with education or experience to assess the community's vulnerability to hazards	Y
Personnel skilled in GIS and/or HAZUS	N
Scientists familiar with the hazards of the community	N
Emergency manager	N
Grant writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Authority to levy taxes for specific purposes	Y
Water, sewer. Gas, or electric service fees	Y
Incur fees for new development	Y
Incur debt through general obligation funds and/or special tax bonds	Y
Community development Block Grant	Y

Federal Funding Programs	Y
State Funding Programs	Y
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	N
Natural disaster or safety related programs	N
StormReady Certification	N
Firewise Community Certification	Y
Public-Private partnership	N

Crowder can build upon its capabilities by adopting floodplain ordinance, and obtaining StormReady certification.

Figure 4-7 Town of Indianola Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	N
Zoning Ordinances	N
Subdivision Ordinances	N
Special Purpose Ordinance	N
Growth Management Ordinance	N
Site Plan Review Requirements	N
Comprehensive Plan	N
Capital Improvement Plan	N
Economic Development Plan	N
Emergency Response Plan	N
Post-Disaster Recovery Plan	N
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	N
Engineers or professionals trained in construction practices related to buildings	N
Planners or Engineers with an understanding of natural and/or human caused hazards	N
Surveyors	N
Staff with education or experience to assess the community's vulnerability to hazards	N
Personnel skilled in GIS and/or HAZUS	N
Scientists familiar with the hazards of the community	N
Emergency manager	N
Grant writers	N
Financial Capabilities	
Capital Improvements Project Funding	N
Authority to levy taxes for specific purposes	N
Water, sewer. Gas, or electric service fees	N

Incur fees for new development	N
Incur debt through general obligation funds and/or special tax bonds	N
Community development Block Grant	N
Federal Funding Programs	N
State Funding Programs	N
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	N
Natural disaster or safety related programs	N
StormReady Certification	N
Firewise Community Certification	N
Public-Private partnership	N

Indianola can build upon its capabilities by obtaining StormReady and Firewise certification.

Figure 4-8 Town of Kiowa Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	N
Zoning Ordinances	Y
Subdivision Ordinances	N
Floodplain Ordinance	Y
Special Purpose Ordinance	Y
Growth Management Ordinance	N
Site Plan Review Requirements	N
Comprehensive Plan	N
Capital Improvement Plan	N
Economic Development Plan	N
Emergency Response Plan	Y
Post-Disaster Recovery Plan	Y
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	Y
Engineers or professionals trained in construction practices related to buildings	Y
Planners or Engineers with an understanding of natural and/or human caused hazards	Y
Floodplain Manager (Utilizes Pittsburg Co Floodplain Manager)	Y
Surveyors	N
Staff with education or experience to assess the community's vulnerability to hazards	Y
Personnel skilled in GIS and/or HAZUS	N
Scientists familiar with the hazards of the community	N
Emergency manager	Y
Grant writers	Y
Financial Capabilities	
Capital Improvements Project Funding	Y

Authority to levy taxes for specific purposes	N
Water, sewer. Gas, or electric service fees	Y
Incur fees for new development	N
Incur debt through general obligation funds and/or special tax bonds	N
Community development Block Grant	Y
Federal Funding Programs	Y
State Funding Programs	Y
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	N
Natural disaster or safety related programs	N
StormReady Certification	N
Firewise Community Certification	N
Public-Private partnership	Y

Kiowa can build upon its capabilities by funding a local Floodplain Manager, and obtaining StormReady and Firewise certification.

Figure 4-9 Town of Pittsburg Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	N
Zoning Ordinances	N
Subdivision Ordinances	N
Floodplain Ordinance	N
Special Purpose Ordinance	N
Growth Management Ordinance	N
Site Plan Review Requirements	N
Comprehensive Plan	N
Capital Improvement Plan	N
Economic Development Plan	N
Emergency Response Plan	N
Post-Disaster Recovery Plan	N
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	N
Engineers or professionals trained in construction practices related to buildings	N
Planners or Engineers with an understanding of natural and/or human caused hazards	N
Floodplain Manager (Utilizes Pittsburg Co Floodplain Manager)	Y
Surveyors	N
Staff with education or experience to assess the community's vulnerability to hazards	N
Personnel skilled in GIS and/or HAZUS	N

Scientists familiar with the hazards of the community	N
Emergency manager	N
Grant writers	N
Financial Capabilities	
Capital Improvements Project Funding	Y
Authority to levy taxes for specific purposes	Y
Water, sewer. Gas, or electric service fees	Y
Incur fees for new development	Y
Incur debt through general obligation funds and/or special tax bonds	Y
Community development Block Grant	Y
Federal Funding Programs	Y
State Funding Programs	Y
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	N
Natural disaster or safety related programs	N
StormReady Certification	N
Firewise Community Certification	N
Public-Private partnership	N

Pittsburg can build upon its capabilities by adopting floodplain ordinance, and obtaining StormReady and Firewise certification.

Figure 4-10 Town of Quinton Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	N
Zoning Ordinances	Y
Subdivision Ordinances	N
Floodplain Ordinance	N
Special Purpose Ordinance	N
Growth Management Ordinance	N
Site Plan Review Requirements	N
Comprehensive Plan	N
Capital Improvement Plan	N
Economic Development Plan	N
Emergency Response Plan	N
Post-Disaster Recovery Plan	N
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	N
Engineers or professionals trained in construction practices related to buildings	N

Planners or Engineers with an understanding of natural and/or human caused hazards	N
Floodplain Manager (Utilizes Pittsburg Co Floodplain Manager)	Y
Surveyors	N
Staff with education or experience to assess the community's vulnerability to hazards	N
Personnel skilled in GIS and/or HAZUS	N
Scientists familiar with the hazards of the community	N
Emergency manager	N
Grant writers	N
Financial Capabilities	
Capital Improvements Project Funding	N
Authority to levy taxes for specific purposes	Y
Water, sewer. Gas, or electric service fees	Y
Incur fees for new development	N
Incur debt through general obligation funds and/or special tax bonds	Y
Community development Block Grant	N
Federal Funding Programs	N
State Funding Programs	N
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	N
Natural disaster or safety related programs	N
StormReady Certification	N
Firewise Community Certification	N
Public-Private partnership	N

Quinton can build upon its capabilities by adopting floodplain ordinance, and obtaining StormReady and Firewise certification.

Figure 4-11 Town of Savanna Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	N
Zoning Ordinances	Y
Subdivision Ordinances	N
Special Purpose Ordinance	N
Growth Management Ordinance	N
Site Plan Review Requirements	N
Comprehensive Plan	N
Capital Improvement Plan	N
Economic Development Plan	N
Emergency Response Plan	N
Post-Disaster Recovery Plan	N

Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	N
Engineers or professionals trained in construction practices related to buildings	N
Planners or Engineers with an understanding of natural and/or human caused hazards	N
Surveyors	N
Staff with education or experience to assess the community's vulnerability to hazards	N
Personnel skilled in GIS and/or HAZUS	N
Scientists familiar with the hazards of the community	N
Emergency manager	N
Grant writers	N
Financial Capabilities	
Capital Improvements Project Funding	N
Authority to levy taxes for specific purposes	Y
Water, sewer. Gas, or electric service fees	Y
Incur fees for new development	Y
Incur debt through general obligation funds and/or special tax bonds	Y
Community development Block Grant	N
Federal Funding Programs	N
State Funding Programs	N
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	N
Natural disaster or safety related programs	N
StormReady Certification	N
Firewise Community Certification	N
Public-Private partnership	N

Savanna can build upon its capabilities by obtaining StormReady and Firewise certification.

Figure 4-12 City of Halleyville Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	N
Zoning Ordinances	N
Subdivision Ordinances	N
Floodplain Ordinance	N
Special Purpose Ordinance	N
Growth Management Ordinance	N
Site Plan Review Requirements	N
Comprehensive Plan	N
Capital Improvement Plan	Y
Economic Development Plan	Y

Emergency Response Plan	Y
Post-Disaster Recovery Plan	N
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	N
Engineers or professionals trained in construction practices related to buildings	N
Planners or Engineers with an understanding of natural and/or human caused hazards	N
Floodplain Manager (Utilizes Pittsburg Co Floodplain Manager)	Y
Surveyors	N
Staff with education or experience to assess the community's vulnerability to hazards	N
Personnel skilled in GIS and/or HAZUS	N
Scientists familiar with the hazards of the community	N
Emergency manager	Y
Grant writers	Y
Financial Capabilities	
Capital Improvements Project Funding	Y
Authority to levy taxes for specific purposes	N
Water, sewer. Gas, or electric service fees	Y
Incur fees for new development	Y
Incur debt through general obligation funds and/or special tax bonds	Y
Community development Block Grant	Y
Federal Funding Programs	Y
State Funding Programs	Y
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	N
Ongoing public education or information programs	N
Natural disaster or safety related programs	N
StormReady Certification	N
Firewise Community Certification	N
Public-Private partnership	N

Haileyville can build upon its capabilities by adopting floodplain ordinance, and obtaining StormReady and Firewise certification.

Figure 4-13 City of Hartshorne Capabilities	
Existing Institutions, Plans and Ordinances	
Building Code	Y
Zoning Ordinances	Y
Subdivision Ordinances	Y
Floodplain Ordinance	N
Special Purpose Ordinance	Y
Growth Management Ordinance	N
Site Plan Review Requirements	N

Comprehensive Plan	N
Capital Improvement Plan	Y
Economic Development Plan	N
Emergency Response Plan	N
Post-Disaster Recovery Plan	N
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	Y
Engineers or professionals trained in construction practices related to buildings	Y
Planners or Engineers with an understanding of natural and/or human caused hazards	Y
Floodplain Manager (Utilizes Pittsburg Co Floodplain Manager)	Y
Surveyors	N
Staff with education or experience to assess the community's vulnerability to hazards	Y
Personnel skilled in GIS and/or HAZUS	N
Scientists familiar with the hazards of the community	N
Emergency manager	Y
Grant writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Authority to levy taxes for specific purposes	N
Water, sewer. Gas, or electric service fees	Y
Incur fees for new development	Y
Incur debt through general obligation funds and/or special tax bonds	Y
Community development Block Grant	N
Federal Funding Programs	Y
State Funding Programs	Y
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disaster or safety related programs	N
StormReady Certification	N
Firewise Community Certification	N
Public-Private partnership	N

Hartshorne can build upon its capabilities by adopting floodplain ordinance, and obtaining StormReady and Firewise certification.

Figure 4-14 City of Krebs Capabilities	
Existing Institutions, Plans, and Ordinances	
Building Code	Y
Zoning Ordinances	Y

Subdivision Ordinances	Y
Floodplain Ordinance	Y
Special Purpose Ordinance	N
Growth Management Ordinance	N
Site Plan Review Requirements	N
Comprehensive Plan	N
Capital Improvement Plan	Y
Economic Development Plan	N
Emergency Response Plan	Y
Post-Disaster Recovery Plan	Y
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	N
Engineers or professionals trained in construction practices related to buildings	Y
Planners or Engineers with an understanding of natural and/or human caused hazards	N
Floodplain Manager (Utilizes Pittsburg Co Floodplain Manager)	Y
Surveyors	N
Staff with education or experience to assess the community's vulnerability to hazards	Y
Personnel skilled in GIS and/or HAZUS	N
Scientists familiar with the hazards of the community	N
Emergency manager	Y
Grant writers	N
Financial Capabilities	
Capital Improvements Project Funding	N
Authority to levy taxes for specific purposes	Y
Water, sewer. Gas, or electric service fees	Y
Incur fees for new development	Y
Incur debt through general obligation funds and/or special tax bonds	Y
Community development Block Grant	N
Federal Funding Programs	Y
State Funding Programs	N
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	N
Ongoing public education or information programs	Y
Natural disaster or safety related programs	Y
StormReady Certification	N
Firewise Community Certification	N
Public-Private partnership	N

Krebs can build upon its capabilities by funding a local Floodplain Manager, and obtaining StormReady and Firewise certification.

Figure 4-15
City of McAlester Capabilities

Existing Institutions, Plans, and Ordinances	
Building Code	Y
Zoning Ordinances	Y
Subdivision Ordinances	Y
Floodplain Ordinance	N
Special Purpose Ordinance	N
Growth Management Ordinance	Y
Site Plan Review Requirements	Y
Comprehensive Plan	Y
Capital Improvement Plan	Y
Economic Development Plan	Y
Emergency Response Plan	Y
Post-Disaster Recovery Plan	Y
Administrative and Technical Capabilities	
Planners or Engineers with knowledge of land development and management practices	Y
Engineers or professionals trained in construction practices related to buildings	Y
Planners or Engineers with an understanding of natural and/or human caused hazards	Y
Floodplain Manager (Utilizes Pittsburg Co Floodplain Manager)	Y
Surveyors	Y
Staff with education or experience to assess the community's vulnerability to hazards	Y
Personnel skilled in GIS and/or HAZUS	Y
Scientists familiar with the hazards of the community	Y
Emergency manager	Y
Grant writers	Y
Financial Capabilities	
Capital Improvements Project Funding	Y
Authority to levy taxes for specific purposes	Y
Water, sewer. Gas, or electric service fees	Y
Incur fees for new development	Y
Incur debt through general obligation funds and/or special tax bonds	Y
Community development Block Grant	Y
Federal Funding Programs	Y
State Funding Programs	Y
Education and Outreach Capabilities	
Local citizen groups/non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disaster or safety related programs	Y
StormReady Certification	Y
Firewise Community Certification	Y
Public-Private partnership	Y

McAlester can build upon its capabilities by adopting floodplain ordinance.

4.1.1 Opportunities for Public Education and Outreach

All jurisdictions within the Planning Area recognize the importance of education and outreach. When possible, the jurisdictions coordinate social media campaigns through the Emergency Management Page. The Pittsburg County Emergency Management Team frequently attends events within the Planning Area to set up and promote hazard education. The Pittsburg County Emergency Management Team also engages with local news outlets.

4.1.2 School District Capability Assessment

McAlester Public Schools

The McAlester Public School District has received positive responses to bond issues in the past. The school district has also taken measures to protect students during hazard events by practicing tornado drills, closing schools, and changing bus routes as needed. Over the past ten years the facilities associated with the school have not sustained any significant damage during weather events.

Figure 4-16 McAlester Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	N
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	N
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

McAlester PS can build upon its capabilities by obtaining StormReady certification.

Quinton Public Schools

Quinton Public School District is experiencing a decline in population. The school district has received positive response to bond issues. The school district has also taken measures to protect students during hazard events by practicing tornado drills, closing schools, and changing bus routes as needed, and have installed storm shelters. Over the past ten years, Quinton Public School experienced heavy damage in 2017 to numerous buildings associated with the school during flooding/flash flooding event.

Figure 4-17 Quinton Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Quinton PS can build upon its capabilities by obtaining StormReady certification.

Crowder Public Schools

The Crowder Public School District has seen a decrease in population and has received positive responses to bond issues. The school district has taken measures to protect students during hazard events by installing new safe rooms, cameras, and securely locked doors. Over the past ten years the facilities associated with the school has experienced flooding inside school buildings and hail damage to the outside of buildings.

Figure 4-18 Crowder Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Crowder PS can build upon its capabilities by obtaining StormReady certification.

Haileyville Public Schools

The Haileyville Public School District has seen a decline in population, but has received positive responses to bond issues. The school district has taken measures to protect students during hazard events by installing new safe rooms, doors, and cameras. Over the past ten years the facilities associated with the school has experienced nearby trees downed that have affected day to day operations.

Figure 4-19 Haileyville Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Haileyville PS can build upon its capabilities by obtaining StormReady certification.

Frink-Chambers Public Schools

Over the past few years, the Frink-Chambers Public School District has seen a decline in population but has had positive responses to bond issues. The district frequently holds drills to test their students' knowledge of hazards and how they should respond to them. The school has previously had wind damage to the roof.

Figure 4-20 Frink-Chambers Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	N
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	N
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Frink-Chambers PS can build upon its capabilities by obtaining StormReady certification.

Tannehill Public Schools

The Tannehill Public School has experienced a decrease in population and has not received positive responses to bond issues. The school district has taken measures to protect students during hazard events by conducting safety drills and employs a full-time nurse. Over the past ten years, the facilities associated with the school have experienced several flooding episodes. Heavy rains, wind and hail have caused numerous roof leaks.

Figure 4-21 Tannehill Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Tannehill PS can build upon its capabilities by obtaining StormReady certification.

Krebs Public Schools

Krebs Public Schools has seen an increase in population and has had positive response to bond issues. The school has taken measures to protect its students by constructing a safe room for students/faculty and conducting emergency drills. Krebs Public Schools has sustained some minor hail and wind damage to the outside of their buildings over the past ten years.

Figure 4-22 Krebs Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Krebs PS can build upon its capabilities by obtaining StormReady certification.

Haywood Public Schools

The Haywood Public School has seen a decline in population and has received positive responses to bond issues. The school district has also taken measures to protect students during hazard events by practicing tornado drills, closing schools, and changing bus routes as needed. Over the past ten years the facilities associated with the school have not sustained any significant damage during weather events.

Figure 4-23 Haywood Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Haywood PS can build upon its capabilities by obtaining StormReady certification.

Savanna Public Schools

The Savanna Public School has seen an increase in population and has had positive response to bond issues. The school has taken measures to protect students including tornado drills and evacuation drills. Over the past ten years the facilities associated with the school have experienced roof leaks and flood damage.

Figure 4-24 Savanna Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Savanna PS can build upon its capabilities by obtaining StormReady certification.

Canadian Public Schools

Over the past few years, the school district has seen a decline in population but still remains positive on bond issues. They frequently drill students but hope to improve their hazard education over the next few years.

The school district has experienced some roof leaking from hail damage.

Figure 4-25 Canadian Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Canadian PS can build upon its capabilities by obtaining StormReady certification.

Pittsburg Public Schools

Pittsburg Public School has experienced an increase in population. It has also had positive responses to bond issues. The school district has taken measures to protect its students by conducting emergency drills with their students. Over the past ten years, Pittsburg Public Schools has sustained wind damage to their gym and heavy rain has caused flooding.

Figure 4-26 Pittsburg Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Pittsburg PS can build upon its capabilities by obtaining StormReady certification.

Hartshorne Public Schools

The Hartshorne Public School District has positive responses to bond issues but has seen a decrease in population over the past few years. They frequently maintain emergency plans and have drills for several different hazards. The teachers hope to incorporate more hazard education into lesson plans in the future. In the past, the school building has sustained damages from wind and hail.

Figure 4-27 Hartshorne Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Hartshorne PS can build upon its capabilities by obtaining StormReady certification.

Indianola Public Schools

Indianola Public School has increased in population and has seen positive response to bond issues with a bond issued being passed in 2015 to build a safe room in the new gymnasium. Measures to protect students include the previously mention safe room, fire drills and tornado drills. Over the past ten years the facilities associated with the school have experienced ice storm damage to roofs and buildings.

Figure 4-28 Indianola Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Indianola PS can build upon its capabilities by obtaining StormReady certification.

Kiowa Public Schools

The school district has positive responses to bond issues but has seen a recent decrease in population. They hold quarterly drills and test the knowledge of their students on hazards several times a year. Kiowa Public Schools have not suffered any damages due to hazard events.

Figure 4-29 Kiowa Public Schools	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Kiowa PS can build upon its capabilities by obtaining StormReady certification.

Carlton Landing Academy

The Carlton Landing Academy District has experienced a growth of population but has not approached bond issues yet. The school district is currently exploring grant opportunities for safe rooms to protect students during hazard events. Over the past ten years the facilities associated with the academy have not sustained any significant damage during weather events.

Figure 4-30 Carlton Landing Academy	
Administrative and Planning Capabilities	
Policies/Procedures for hazards and threats	Y
Staff with ability to assess the schools' vulnerability to hazards	Y
Emergency Action Plan that includes hazards/threat	Y
Emergency/Safety Coordinator	Y
Grant Writers	Y
Financial Capabilities	
Capital Improvements Project Funding	N
Federal Funding Program	Y
State Funding Programs	Y
Educational and Awareness Capabilities	
Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Y
Ongoing public education or information programs	Y
Natural disasters or safety related programs	Y
Public-Private partnership initiatives addressing disaster-related issues	Y

Carlton Landing Academy can build upon its capabilities by obtaining StormReady certification.

4.1.3 NFIP Participation

Alderson, Canadian, Crowder, Haileyville, Hartshorne, Kiowa, Krebs, McAlester, Pittsburg County, Pittsburg, and Quinton all participate in the NFIP Program, although the jurisdictions have found it difficult to keep up with the requirements. Those difficulties include lack of staff, equipment, training, and not having Floodplain ordinances for some jurisdictions. As such, the jurisdictions have identified a need to remedy these deficiencies in order to get their programs up and running and to pinpoint the jurisdiction's flood vulnerabilities. As of right now, not all jurisdictions have an dedicated floodplain manager who keeps up with the records and permits.

To maintain compliance, Pittsburg County, Kiowa, and Krebs will continue to review these ordinances on a yearly basis. Pittsburg County will also continue to enable the Floodplain Manager to obtain required training, and the Floodplain manager will assist other jurisdictions with their

NFIP complainace. Alderson, Canadian, Crowder, Haileyville, Hartshorne, McAlester, Pittsburg, and Quinton will work tto improve compliance by the adoption of ordinance.
At this time, there aren't any repetitive loss properties in the Planning Area.

Ashland, Carlton Landing, Indianola, and Savanna do not participate in the NFIP. Ashland and Indianola do not participate because they are both small towns with a minimum tax base, and they do not have the manpower, or local interest, to join NFIP. Carlton Landing does not participate in the NFIP because there are no identified Special Flood Hazard Area within its jurisdictional boundaries. Savanna does not participate in the NFIP due to having limited means to administer the requirements of the NFIP.

4.1.4 Capabilities Conclusion

Mitigation requires capabilities necessary to reduce loss of life and property by lessening the impacts of disasters. Each jurisdiction has demonstrated a set of capabilities unique to their community. The capability assessment finds that Pittsburg County and the participating jurisdictions collectively have a moderate level of legal, technical, and fiscal tools and resources necessary to implement hazard mitigation strategies. All the jurisdictions have the legal capabilities or ordinances and codes in place that might help reduce loss due to a disaster. The jurisdictions including school districts have a range of staff trained or have knowledge about hazards and their impacts.
The Pittsburg County Planning Committee put a significant amount of effort into making this plan a useful document. Because the information in this plan is relevant, and was developed by the Planning Team members directly, the plan will be more easily integrated into the plans and ordinances listed in this section. The Emergency Manager for the county and each jurisdiction, through maintenance of this document, will provide a copy of this plan to parties responsible for other planning processes in the Planning Area. This document can be integrated into other plans when determining future growth areas, capital improvement projects, building code and ordinance proposals, and prioritizing local funds.

Each jurisdiction within the Planning Area has the ability to expand and improve existing capabilities through training, review of other programs, sharing resources and expertise, and seeking best practice programs.

4.2 Changes in Jurisdictional Development

Since the last mitigation plan, there haven't been any significant changes to the jurisdiction that have impacted hazard vulnerabilities and there aren't any current plans to build in known hazard areas. With the NFIP requirements in place, the jurisdictions have no intention to build or change the floodplain. Additionally, over the past five years, the participating jurisdictions have put more thought into hazard mitigation and how development could potentially harm other nearby developments and future populations.

Jurisdcition	Changes in Development	How Development Increased/Decreased Jurisdictions' Risk Hazard to Vulnerability
Pittsburg Co	Pittsburg Co and the unincorporated areas have not had any changes in development, but the decrease in population in McAlester has negatively affected their tax base.	Less tax revenue results in less funding for mitigation projects, which increases jurisdictional vulnerability.
Alderson	None	No change in Vulnerability.
Ashland	None	No change in Vulnerability.
Canadian	None	No change in Vulnerability.
Carlton Landing	During the past five years, Carlton Landing has been incorporated as a town. This has caused an increase of housing development.	The new housing developments do not have adequate warning siren coverage. This increases residents' vulnerability to hazard events.
Crowder	None	No change in Vulnerability.
Indianola	None	No change in Vulnerability.
Kiowa	None	No change in Vulnerability.
Pittsburg	None	No change in Vulnerability.
Quinton	None	No change in Vulnerability.
Savanna	None	No change in Vulnerability.
Haileyville	None	No change in Vulnerability.

Hartshorne	None	No change in Vulnerability.
Krebs	None	No change in Vulnerability.
McAlester	Two larger employers closed down, which has caused some residents to leave the area. This has shrunk the tax base.	The reduced tax base means less funding is available for municipal mitigation efforts. This increases the town's vulnerability to hazards.
McAlester PS	Due to the decrease in population, there are less student in the school.	The reduced tax base means less funding is available for school mitigation efforts. This increases the school's vulnerability to hazards.
Quinton PS	The school received damage due to hazard events in 2017.	No change in Vulnerability.
Crowder PS	The school sustained hail and flood damage.	No change in Vulnerability.
Haileyville PS	None	No change in Vulnerability.
Frink-Chambers PS	The school received damage to roof due to a High Wind event.	No change in Vulnerability.
Tannehill PS	The school built a new storm shelter.	This decreases the risk of vulnerability for students and staff.
Krebs PS	The school sustained damage during a hazard event.	No change in Vulnerability.
Haywood PS	None	No change in Vulnerability.
Savanna PS	The school sustained roof and flood damage.	No change in Vulnerability.
Canadian PS	The school built a new storm shelter.	This decreases the risk of vulnerability for students and staff.
Pittsburg PS	The school built a new storm shelter.	This decreases the risk of vulnerability for students and staff.
Harthorne PS	The school sustained damage during a hazard event.	No change in Vulnerability.
Indianola PS	The school built a new storm shelter.	This decreases the risk of vulnerability for students and staff.
Kiowa PS	None	No change in Vulnerability.
Carlton Landing Academy	The school has had an increase of students.	The school does not have adequate safe room capacity for its students and staff, which increases their

		vulnerability during hazard events.

CHAPTER FIVE: ACTION PLAN

5.1 Mitigation Goals

During the development of the Pittsburg County Hazard Mitigation Plan, the following goals were identified as priorities.

Goal 1: Enhance public awareness of disaster preparedness and understanding of hazards specific to Pittsburg County.

Goal 2: Ensure coordination between local, federal, state, non-profit, and private business to maximize mitigation activities.

Goal 3: Explore mitigation actions for new construction.

Goal 4: Educate the public on mitigation and prevention activities.

5.2 Integration of Data, Goals, and Action Items

The Pittsburg County Planning Team will use the same efforts currently in place for other community plans and the previous mitigation plan to ensure integration of the data, goals, and action items of the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan into each jurisdictions' planning efforts. It is the responsibility of the Planning Team members to make contact with those in their jurisdictions who oversee the plans, ordinances, and community programs on an annual basis to suggest integration. In addition, each existing and new plan will be reviewed for opportunities for integration before they are renewed or when they are being updated. Examples of these plans include Emergency Operations Plans, Floodplain Ordinances, Capital Improvement Plans, and Development Plants.

It is the responsibility of each Planning Team member to stay apprised of their own jurisdictions new and existing plans, as well as the implementation and/or overseeing of their jurisdiction's action items. They will report any new updates or changes at each Planning Team meeting.

It is the responsibility of the Pittsburg County Emergency Manager to update the County Commissioners of any significant changes for the jurisdictions, planning process, and action items. This will be done at every public County Commissioner meeting.

It is the responsibility of the County Commissioners to ensure the Planning Team is making clear and actionable steps to implement the Plan and integrate into other jurisdictional plans within the Planning Area.

Specifically the Pittsburg Co HM Plan will be incorporated into the following planning mechanisms:

Pittsburg Co and Kiowa: Both jurisdcitions have Emergency Response Plans. The Pittsburg EM is responsible for keeping these plans current. Changes to these plans are reviewed annually, or as needed, by the LEPC. The Pittsburg Co HM Pla data will be incorporated as needed during this review. Once changes are approved, the Pittsburg EM brings the Emergency Response Plan to the respective municipal governing board for approval.

Canadian, Carlton Landing, Crowder, Haileyville, Hartshorne, Krebs, McAlister: These jurisdictions have Capital Improvement Plans that are reviewed annually by town and city councils. During these reviews, the HM Plan mitigation action items can be reviewed to see which mitigation projects are feasible. Once the project is approved, it will go to the respective city's/town's citizens for a bond vote, as needed.

Ashland, Alderson, Indianola, Pittsburg, Quinton, and Savanna: These jurisdictions have limited planning mechanisms at this time, and the monthly town/city council meetings serve as a mechanism for planning. The Pittsburg Co HM Plan data will be reviewed as needed during these meetings. If the council votes to approve a mitigation project, it will go to the respective town's citizens for a bond vote.

McAlister PS, Quinton PS, Crowder PS, Haileyville PS, Frink-Chambers PS, Tannehill PS, Krebs PS, Haywood PS, Savanna PS, Canadian PS, Pittsburg PS, Harthorne PS, Indianola PS, Kiowa PS, and Carlton Landing Academy: The primary planning mechanism of each school jurisdiction is the school board meeting. School boards meet monthly, and the Pittsburg Co HM Plan data will be reviewed by school board members, and incorporated into planning within the context of those meetings. As a mitigation project is considered, the school board will vote to affirm the project, and if needed, a bond issue to fund that project will go the citizens of their respective towns for a vote.

Over the past five years, the Pittsburg Co HM plan data has been integrated into capital improvement projects as needed. While there has not been a deliberate effort to integrate it into every jurisdictional planning mechanism in the past, the jurisdictions will make more of an effort to integrate the hazard mitigation data into more planning mechanisms going forward.

5.3 Changes in Jurisdictional Priorities

The Planning Committee determined that the priorities of the plan or the participating jurisdictions have not changed since the last plan. It is the priority of all jurisdictions to address all the hazards identified but have a particular interest mitigating the flood hazard due to past incidents and the possibility of future events.

5.4 Action Items Prioritized

The action items listed in section 5.6 identify who is responsible for project implementation, the potential funding sources, and the timeframe for implementation. The Planning Committee also identified the economic considerations and impacts of the action items by listing the estimated project costs. To prioritize the hazards, the Planning Team asked the following questions and considered the benefit-cost of each item.

- Does the project enhance public awareness and understanding of hazards specifics to the Planning Area?
- Can the project be accomplished in a way that maximizes mitigation activities between the local community, non-profit, and private business entities?
- Will the project provide an opportunity for new construction that enhances mitigation?
- Will the project help to educate the public on mitigation and prevention activities?

Another way action items will be prioritized is by determining which projects will provide the maximum benefit to the jurisdiction, based off what is considered affordable for the jurisdiction. Each jurisdiction in the Planning Area has limited funds in which to implement action items, and projects will be implemented as jurisdictional budgets allow.

5.5 Status of Previous Mitigation Action Items

Figure 5-1 Community/School Safe Rooms	
Description	Construct ADA accessible safe rooms where needed in Pittsburg County for citizens and emergency responders. Construct safe rooms on all school campuses currently without such a facility to ensure the students and staff have a safe place to go during weather events.
Hazards Addressed	Hail, Lightning, Tornado, High Wind
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill.
Completed?	Partially
Reason if Not Completed	Funding
Still Relevant?	Yes

Figure 5-2 Outdoor Warning Devices	
Description	Purchase and install outdoor warning devices in the incorporated and unincorporated areas of the county where adequate warning is lacking. Upgrade existing units with newer up to date technology units to provide ability to broadcast warnings during power outages.
Hazards Addressed	Tornado, High Wind
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	Partially
Reason if Not Completed	Funding
Still Relevant?	Yes

Figure 5-3 Individual Safe Rooms	
Description	This program would encourage citizens to build safe rooms in new and existing houses. The construction of safe rooms will provide greater protection to the citizens of Pittsburg County from Tornado/Wind/Severe Thunderstorms, and has been proven to save lives. The protection of its citizens is of the utmost importance, since Pittsburg County is vulnerable to Tornado/Wind/Severe Thunderstorms.
Hazards Addressed	Tornado, High Wind
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna
Completed?	Completed

Figure 5-4 Alternate Power Supply	
Description	Install backup power supplies at critical facilities and acquire portable generators as emergency power sources to ensure continuity of government and critical services during periods of extended power loss.
Hazards Addressed	Dam Failure, Earthquake, Excessive Heat, Flooding, Hail, Lightning, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	Partially Completed
Reason if Not Completed	Funding
Still Relevant?	Yes

Figure 5-5 Repetitive Flooding	
Description	Identify and mitigate repetitive Loss Properties throughout Pittsburg County and participating jurisdictions.
Hazards Addressed	Flood
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna
Completed?	No
Reason if Not Completed	Funding
Still Relevant?	Yes

Figure 5-6 Bank Stabilization	
Description	Install Rip Rap as needed to stabilize riverbanks to prevent wash out and loss of homes.
Hazards Addressed	Flood
Jurisdictions Affected	Pittsburg County
Completed?	Partially Completed
Reason if Not Completed	Funding
Still Relevant?	Yes

Figure 5-7 NFIP Continued Participation	
Description	Pittsburg County will maintain their status as a member in good standing with the NFIP.
Hazards Addressed	Dam Failure, Flood
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna
Completed?	Yes

Figure 5-8 Surge Suppression	
Description	Install surge suppressors/backup power supplies on electronic equipment and computers in critical facilities to prevent power surge damage and loss of critical information during power outages and surges.
Hazards Addressed	Dam Failure, Drought, Earthquake, Excessive Heat, Flooding, Hail, Lightning, Sink Holes, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	Partially Completed
Reason if Not Completed	Funding
Still Relevant?	Yes