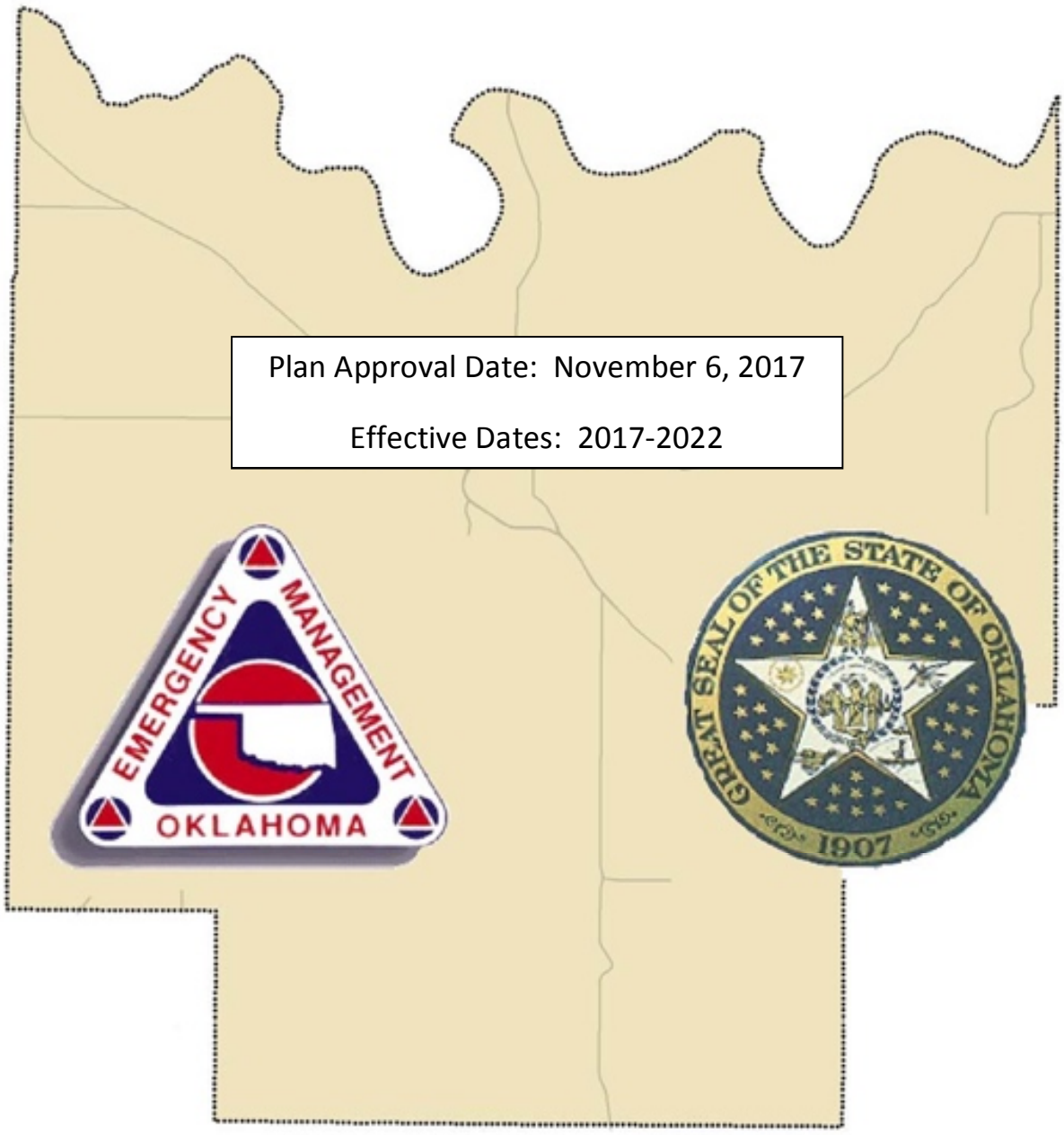
Multi-Jurisdictional Multi-Hazard Mitigation Plan

For

Pontotoc County, the Towns of, Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall, and the School Districts of, Allen, Byng, Latta, Roff, Stonewall, and Vanoss.



Plan Approval Date: November 6, 2017

Effective Dates: 2017-2022

Pontotoc County Emergency Management
Chad Letellier—Director P.O. Box
1425, Ada, OK 74821 (580) 421-7777

May 5, 2017

Matt Rollins, State Hazard Mitigation Officer
Oklahoma Department of Civil Emergency Management
P.O. Box 53365
Oklahoma City, OK 73152

RE: Pontotoc County Multi-Jurisdictional Multi-Hazard Mitigation Plan Update

We are pleased to submit this *Pontotoc County Multi-Jurisdictional Multi- Hazard Mitigation Plan*, update for your review.

This Multi-Hazard Mitigation Plan, prepared in accordance with State and Federal guidance, addresses floodplain management, dam failures, tornadoes and high winds, hailstorms, lightning, winter storms, extreme heat, drought, expansive soils, wild fires, and earthquakes.

We look forward to implementing the updates to this plan in order to enhance protection of the lives and property of our citizens from natural hazards and hazard materials incidents. If we can answer any questions or be of further assistance, please contact me at 580-421-7777 or 580-421-5145.

Sincerely,

Chad Letellier
Pontotoc County, Emergency Management

ADOPTION RESOLUTION

#18-29

(Name of Jurisdiction) Pontotoc County

(Governing Body) Board of Commissioners

(Address) 113 W 13th St, Ada, OK 74820

RESOLUTION

WHEREAS, Pontotoc County, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Hazard Mitigation Plan; and

WHEREAS, the Pontotoc County Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, Pontotoc County is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, Pontotoc County has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by Pontotoc County Board of Commissioners that Pontotoc County adopts the Pontotoc County Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 9th day of October, 2017 at the meeting of the Pontotoc County Board of Commissioners.

(Commissioner)

(Commissioner)

(Commissioner)

(Clerk)

COUNTY CLERK
PONTOTOC COUNTY OKLAHOMA

ADOPTION RESOLUTION

(Name of Jurisdiction) Town of Allen

(Governing Body) Allen City Council

(Address) P. B. 402 Allen, OK. 74825

RESOLUTION

WHEREAS, Town of Allen, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Multijurisdictional Hazard Mitigation Plan; and

WHEREAS, the Pontotoc County Multijurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, Town of Allen is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, Town of Allen have reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by Allen City Council that Town of Allen adopts the Pontotoc County Multijurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 20th day of September, 2017 at the meeting of the Allen City Council.

Dianne Banner
(Mayor)

Kala Stephens
(Clerk)

RESOLUTION 2018-05

(Name of Jurisdiction) Town of Byng

(Governing Body) Town of Byng Board of Trustees

(Address) 110 Byng Avenue, Byng, Oklahoma, Pontotoc County

RESOLUTION

WHEREAS, the Town of Byng, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, the Pontotoc County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the Town of Byng is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, the Town of Byng Board of Trustees have reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by the Town of Byng Board of Trustees that Town of Byng adopts the Pontotoc County Multi-Jurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 21st day of September, 2017 at the meeting of the Town of Byng Board of Trustees

Mayor

Town Clerk

ADOPTION RESOLUTION

RECEIVED 9/12/17
Marcie Ellenberg

(Name of Jurisdiction) Town of Fitzhugh

(Governing Body) Town Council

(Address) 22390 CR 3500 Roff, OK. 74865

RESOLUTION

WHEREAS, Town of Fitzhugh, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Multijurisdictional Hazard Mitigation Plan; and

WHEREAS, the Pontotoc County Multijurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, Town of Fitzhugh is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, Town of Fitzhugh have reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by Town of Fitzhugh that Town of Fitzhugh adopts the Pontotoc County Multijurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 11th day of September, 2017 at the meeting of the Town Council.

Sharon Phillips
(Mayor)

(Clerk)

ADOPTION RESOLUTION

(Name of Jurisdiction) Town of Francis

(Governing Body) Town Council

(Address) PO Box 10, Francis, OK 74844

RESOLUTION

WHEREAS, the Town of Francis, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Multi-Jurisdictional Hazard Mitigation Plan; and

WHEREAS, the Pontotoc County Multi-Jurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the Town of Francis is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, the Town of Francis has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by the Town of Francis Board of Trustees that Francis adopts the Pontotoc County Multi-Jurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 4th Day of (September), 2017 at the meeting of the Francis Board of Trustees.

Craig Thompson

Craig Thompson (Mayor)

Linda G. West

(Clerk)

Resolution Proposal

Notice of Proposed Resolution

Town of Roff, Oklahoma

BE IT RESOLVED by the governing body of the Town of Roff with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Multijurisdictional Hazard Mitigation Plan; and

Whereas, the Pontotoc County Multijurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

Whereas the Town of Roff is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

Whereas, the Town of Roff has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

Now Therefore, Be It Resolved by the Roff City Council that the Town of Roff adopts the Pontotoc County Multijurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

PASSED AND APPROVED by the Town Council of the Town of Roff, Oklahoma, on this 2nd day of October4, 2017.

Lyle Hedges, Mayor

ATTEST:

Joe McCullar, Board of Trustees

Town Seal

The Town of Stonewall

State of Oklahoma
201 W. Main Street; P.O. Box 278
Stonewall, Oklahoma 74871
580-265-4511

Resolution #17-009

RESOLUTION

Jurisdiction: Town of Stonewall

Governing Body: Stonewall City Council

WHEREAS, The Town of Stonewall, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Multijurisdictional Hazard Mitigation Plan; and

WHEREAS, the Pontotoc County Multijurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, Town of Stonewall is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, Town of Stonewall have reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by Stonewall City Council that the Town of Stonewall adopts the Pontotoc County Multijurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 14th day of September 2017, at the regularly scheduled meeting of the governing body, in compliance with the Open Meeting Act, 25 O.S Sec. 301-314 (2001).

William Nichols
Mayor

Subscribed and sworn before me September 14, 2017

Karl Burkhardt, Notary Public

KARL BURKHARDT NOTARY No. 17007089 Expires Aug. 1, 2021 STATE OF OKLAHOMA

My commission expires 8/1/2021

Mayor/Trustee – William Nichols
Trustee – Jim Mills
Trustee – Janet Truitt
Trustee – Richard Dickerson
Trustee – Lori Roundtree

City Administrator – Dennis Heath
City Clerk/Treasurer – Karl Burkhardt
Municipal Judge/Court Clerk – Blake Bostick
Chief of Police – Eric Carmichael
Fire Chief – Danny Summers

ADOPTION RESOLUTION

(Name of Jurisdiction) Allen Public Schools

(Governing Body) Allen School Board

(Address) 105 N. Denver Allen, OK. 74825

RESOLUTION

WHEREAS, Allen Public Schools, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Multijurisdictional Hazard Mitigation Plan; and

WHEREAS, the Pontotoc County Multijurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, Allen Public Schools is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, Allen Public Schools have reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by Allen School Board that Allen Public Schools adopts the Pontotoc County Multijurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 11th day of September, 2017 at the meeting of the Allen School Board.

Dr. Bill Caudle
(Superintendent)

(Clerk)

ADOPTION RESOLUTION

(Name of Jurisdiction) Byng Public School

(Governing Body) Byng Board of Education

(Address) 500 S. New Bethel Boulevard; Ada, OK 74820-1177

RESOLUTION

WHEREAS, Byng Public School, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Multijurisdictional Hazard Mitigation Plan; and

WHEREAS, the Pontotoc County Multijurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, Byng Public School is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, Byng Public School have reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by Byng Board of Education that Byng Public School adopts the Pontotoc County Multijurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 14th day of September, 2017 on behalf of the Byng Board of Education.

(Superintendent)

ADOPTION RESOLUTION

(Name of Jurisdiction) Latta Public Schools

(Governing Body) Latta School Board

(Address) 13925 CR 1560 Ada, OK. 74820

RESOLUTION

WHEREAS, Latta Public Schools, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Multijurisdictional Hazard Mitigation Plan; and

WHEREAS, the Pontotoc County Multijurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, Latta Public Schools is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, Latta Public Schools have reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by Latta School Board that Latta Public Schools adopts the Pontotoc County Multijurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this ~~XX~~ 25th day of September, 2017 at the meeting of the Latta School Board.

(Superintendent)

(Clerk)

ADOPTION RESOLUTION

(Name of Jurisdiction) Roff Public Schools

(Governing Body) Roff School Board

(Address) 100 N. Broadway Roff, OK. 74865

RESOLUTION

WHEREAS, Roff Public Schools, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Multijurisdictional Hazard Mitigation Plan; and

WHEREAS, the Pontotoc County Multijurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, Roff Public Schools is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, Roff Public Schools have reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by Roff School Board that Roff Public Schools adopts the Pontotoc County Multijurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 9th day of ~~September~~ October, 2017 at the meeting of the Roff School Board.

(Superintendent)

Karon A Hedges

(Clerk)

ADOPTION RESOLUTION

Stonewall Public Schools
Stonewall Board of Education
600 South High School
Stonewall, Oklahoma 74871

RESOLUTION

WHEREAS, Stonewall Public Schools, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Multijurisdictional Hazard Mitigation Plan; and

WHEREAS, the Pontotoc County Multijurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, Stonewall Public Schools is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, Stonewall Public Schools have reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by the Stonewall Board of Education that Stonewall Public Schools adopts the Pontotoc County Multijurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

September 12, 2017

Signed Kevin D. Flowers, Superintendent

ADOPTION RESOLUTION

(Name of Jurisdiction) Vanoss Public Schools

(Governing Body) Vanoss School Board

(Address) 4665 CR 1555

RESOLUTION

WHEREAS, Vanoss Public Schools, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pontotoc County Multijurisdictional Hazard Mitigation Plan; and

WHEREAS, the Pontotoc County Multijurisdictional Hazard Mitigation Plan has been prepared in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, Vanoss Public Schools is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, Vanoss Schools have reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW THEREFORE, BE IT RESOLVED by Vanoss School Board that Vanoss Public Schools adopts the Pontotoc County Multijurisdictional Hazard Mitigation Plan as this jurisdiction's Natural Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this 14th day of September, 2017 at the meeting of the Vanoss School Board.

Marjana Sharp
(Superintendent)

Linda Embry
(Clerk)

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Acknowledgements

The Pontotoc County Multi-Jurisdictional Multi-Hazard Mitigation Plan includes the unincorporated areas of the county as well as the incorporated communities of Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall, and the Public School Systems of Allen, Byng, Latta, Pickett-Center-(Now a Part of Vanoss), Roff, Stonewall, and Vanoss. The plan was developed with assistance from a Hazard Mitigation Grant Program Grant from the Oklahoma Department of Emergency Management, the Federal Emergency Management Agency, and local funding from Pontotoc County. The Pontotoc County Multi-Jurisdictional Multi-Hazard Mitigation Plan was prepared under the direction of the Pontotoc County Commission, participating community councils, and Public Schools Boards of Education. Numerous agencies, organizations and individuals participated in the study, including:

Pontotoc County

Gary Starnes Commissioner, District 1
Randy Floyd Commissioner, District 2
Justin Roberts Commissioner, District 3
John Christian Sheriff
Tami Brown County Clerk

Chad Letellier Project Manager, Pontotoc County Emergency Manager

Allen

Diana Brannon	Mayor
Douglas Stinson	City Manager
Rob Johnson	Fire Chief
Billy Sanford	Police Chief
Dale Johnson	Town of Allen, Trustee
Rhonda Skelton	Town of Allen, Trustee
Joy Anderson	Town of Allen, Trustee

Byng

John Burchett	Mayor
Coleen Bishop	Town Clerk
Chris McGill	Fire Chief
Joe Daniel	Assistant Chief
Jeff Rollins	Emergency Manager

Fitzhugh

Sharon Phillips	Mayor
Richard Barnes	Fire Chief
Joey Marrow	Town of Fitzhugh, Trustee
Timothy Avid	Town of Fitzhugh, Trustee
Greg Pierce	Town of Fitzhugh, Trustee
David Roara	Town of Fitzhugh, Trustee

Francis

Craig Thompson	Mayor
Marty Canada	Fire Chief
Darrell Phillips	Town of Francis, Trustee
James A. Fowler	Town of Francis, Trustee
Roxine Littlefield	Town of Francis, Trustee
James E. Fowler	Town of Francis, Trustee

Roff

Zach Braun	Mayor
Jeremy Grissom	Fire Chief
Tom Cox	Police Chief
Charles Hunt	Town of Roff, Trustee
Angie Hyatt	Town of Roff, Trustee
Lyle Hedges	Town of Roff, Trustee
Joe McCullar	Town of Roff, Trustee

Stonewall

Jim Mills	Mayor
Dennis Heath	City Manager
Phillip Nuner	Fire Chief
Kent Kerr	Police Chief
Lon Shelton	Town of Stonewall, Trustee
Lori Roundtree	Town of Stonewall, Trustee
William Nichols	Town of Stonewall, Trustee

Allen Public Schools

Bob Gragg	Superintendent
Greg Mills	Dean of Students
Chad Ward	J.H. and High School Principal

Byng Public Schools

Leon Petete	School Board President
Todd Crabtree	Superintendent
Craig Williams	School Board Clerk

Latta Public Schools

Connie Smith	School Board President
Cliff Johnson	Superintendent
Sammy Estes	School Board Clerk

Roff Public Schools

Christopher S. Morgan	Superintendent
Justin Priest	School Board President

Stonewall Public Schools

Kevin Flowers	Superintendent
Charlie Hall	School Board President
Donald James	School Board Clerk

Vanoss Public Schools

Marjana Tharp	Superintendent
Noralene Groves	School Board President
Anthony Prince	School Board Clerk

Executive Summary

Oklahoma's location at the intersection of the hot arid zone to the west, the temperate zone to the northeast, and the hot humid zone to the southeast make it subject to a wide variety of potentially violent weather and natural hazards.

The Pontotoc County Planning Group provided information and insight in the development of the plan

Making people and businesses as safe as possible from a variety of natural and man-made hazards is the first step in making the area attractive for new residents and expanding businesses. The Pontotoc County Multi-Jurisdictional Multi-Hazard Mitigation Plan is a comprehensive effort to identify potential hazards and develop a sound plan to mitigate their impacts, with the goal of saving the lives and property of the citizens of Pontotoc County, the incorporated and unincorporated communities, and the Public School systems of Pontotoc County. This plan fulfills the requirements of the Pre-Disaster Mitigation (PDM) Grant Program and Hazard Mitigation Grant Program (HMGP) of the Federal Emergency Management Agency (FEMA) and the Oklahoma Department of Emergency Management (OEM).

In December 2005, the Multi-hazard Mitigation Council of the National Institute of Building Sciences completed a study to assess future savings from mitigation activities. Their findings reflected the fact that mitigation activities in general produced over $4 in savings for every $1 invested in mitigation actions, with the greatest savings in the areas of flood-related events (5:1) and wind-related events (3.9:1). In addition, the report concludes, *"Mitigation is most effective when carried out on a comprehensive, community-wide, and long-term basis. Single activities can help, but carrying out a slate of coordinated mitigation activities over time is the best way to ensure that communities will be physically, socially, and economically resilient to future hazard impacts."*

Approval of this plan will qualify Unincorporated Pontotoc County, the incorporated communities of Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall, and the Public School Systems of Allen, Byng, Latta, Pickett-Center-(Now a Part of Vanoss), Roff, Stonewall, and Vanoss to apply for Pre-Disaster Mitigation (PDM) as well as Hazard

Mitigation Grant Program (HMGP) disaster mitigation funds following a federal disaster declaration, as required under Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 2000.

Background

Pontotoc County and the included communities and school districts are vulnerable to natural and man-made hazards. The Pontotoc County Hazard Mitigation Planning Group identified the 15 hazards most likely to affect the County as a whole. These hazards included floods, tornadoes, high winds, lightning, hailstorms, severe winter storms, extreme heat, drought, expansive soils, urban fires, wildfires, earthquakes, transportation, hazardous materials events, and dam failures.

Purpose

The purpose of this plan is to:

- Assess the ongoing mitigation activities within each jurisdiction
- Identify and assess the hazards that pose a threat to citizens and property
- Evaluate additional mitigation measures that should be undertaken
- Outline a strategy for implementation of mitigation projects

The objective of this plan is to provide guidance for community activities for the next five years. It will ensure that Pontotoc County will implement activities that are most effective and appropriate for mitigating the 15 identified natural and man-made hazards.

Pontotoc County Hazard Mitigation Planning Group

Citizens and professionals active in disasters provided important input in the development of the plan and recommended goals and objectives, mitigation measures, and priorities for actions. The Planning Group is comprised of citizen leaders of the County and the various communities as well as representatives of the included Public School Districts.

The Planning Process

Planning for the Pontotoc County Multi-Jurisdictional Multi-Hazard Mitigation Plan followed a ten-step process, based on guidance and requirements of FEMA for the PDM grant program, HMGP, the Flood Mitigation Assistance (FMA) program, and the Community Rating System (CRS).

1. Organize to prepare the plan
2. Involve the public
3. Coordinate with other agencies and organizations
4. Assess the hazard
5. Assess the problem
6. Set goals
7. Review possible activities
8. Draft the action plan
9. Adopt the plan
10. Implement, evaluate, and revise

Plan Summary

The Pontotoc County Multi-Jurisdictional Multi-Hazard Mitigation Plan provides guidance to help citizens protect life and property from natural and man-made hazards. The plan identifies the hazards that are most likely to strike each jurisdiction, provides a profile and risk assessment of each hazard, identifies mitigation measures for each hazard, and presents an action plan for the implementation of the mitigation measures.

Chapter 1 provides a profile of Pontotoc County and an overview and discussion of existing resources and hazard mitigation programs. This chapter includes a community description including demographics, lifelines, and critical facilities. Communities and School Districts are profiled in Appendix A.

Chapter 2 presents detailed information documenting the planning process including citizen and agency involvement, a table describing how and why each hazard was identified, and methodologies used in the plan for damage estimates and risk assessments.

Chapter 3 provides an assessment of 15 natural and man-made hazards. Each assessment includes a hazard profile, catalogs historical events, identifies the vulnerable populations, and presents a conclusion.

Chapter 4 sets disaster-specific goals and objectives and organizes proposed mitigation strategies under six mitigation categories: public information and education, preventive activities, structural projects, property protection, emergency services, and natural resource protection.

Chapter 5 outlines an action plan for the implementation of high priority mitigation projects, including a description of the project, the responsible party, anticipated cost, funding sources, and timelines for implementation.

Chapter 6 provides a discussion of the plan maintenance process and documentation of the adoption. Plan maintenance includes monitoring, evaluating, and updating the plan with involvement of the public.

Appendix A presents an overview of each incorporated community and public school system, its history, economy, demographics and vulnerability to hazards, and includes maps of site-specific hazards such as flooding, expansive soils, wildfire, hazardous materials, and transportation.

Highest Priority Mitigation Measures

The following is a list of the top nineteen prioritized mitigation measures for Pontotoc County as defined by the planning group. The complete list of recommended mitigation measures is found in Table 4□1, at the end of Chapter 4.

Rank	Hazard	Category	Mitigation Measure
1	Tornadoes, High Wind, Lightning, Severe Winter Storms	Emergency Services	Develop an Emergency Back-up Generator Hazard Mitigation Plan Annex for the community, assessing and prioritizing generator needs for critical facilities, both public and private. Assessment should include generator needs, costs of installation for pads/transfer panels only, or for complete generator assembly installation.
2	Tornadoes, High Winds, Earthquakes	Structural Projects	Provide employee shelters/safe-rooms at critical facilities, such as 911 Center, fire stations and police stations to protect first responders.
3	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events	Public Information and Education	Educate the public on the importance of a family disaster plan and supply kit
4	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Develop an inventory of Special Needs populations requiring special assistance during disasters.
5	Floods, Tornadoes, High Winds, Lightning, Severe Winter Storms, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events	Preventive Measures	Based on the results of the Emergency Back-up Generator Hazard Mitigation Plan Annex, provide wiring and transfer switches to accommodate emergency generators during disaster power outages for critical facilities including Emergency Operations Centers, City Hall, Dispatch, Police, Fire, Community Centers used for emergency housing during disasters, critical facilities, lift stations, water treatment plants, and community medical facilities

Rank	Hazard	Category	Mitigation Measure
6	Floods, Tornadoes, High Winds, Hail, Severe Winter Storms, Earthquakes	Preventive Measures	Develop / Review / Update the debris management plan
7	Tornadoes, High Winds, Lightning, Severe Winter Storms, Extreme Heat, Earthquakes	Property Protection	Provide surge protection for computer-reliant critical facilities (e.g. 911 Center, EOC, police stations, fire stations, etc.).
8	Tornadoes, High Winds, Lightning, Hail	Emergency Services	Evaluate, upgrade and maintain community-wide outdoor omni- directional voice/siren warning systems
9	Lightning	Preventive Measures	Provide lightning warning systems for outdoor sports areas, pools, golf courses, ball fields, and parks.
10	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Wildfires, Earthquakes	Public Information and Education	Train/Educate builders, developers, architects and engineers in techniques of disaster resistant homebuilding, such as the Fortified Home standards developed by the Institute for Business & Home Safety (IBHS), the Blueprint for Safety guidelines developed by the Federal Alliance for Safe Homes (FLASH)
11	Floods	Preventive Measures	Prepare a comprehensive basin-wide Flood & Drainage Annex to the Hazard Mitigation Plan for all watersheds within the jurisdiction. The plan should identify all flooding problems within the jurisdiction, and recommend the most cost-effective and politically acceptable solutions.
12	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Public Information and Education	Develop an all-hazard public information, education, and awareness strategy and program.
13	Floods, Dam Failures	Property Protection	Continue Compliance with, and Participation in the National Flood Insurance Program (NFIP) and the Community Rating System (CRS)

Rank	Hazard	Category	Mitigation Measure
14	Urban Fires/Wildfires	Structural Projects	Replace/continue replacing inadequately sized hydrants and water mains/lines to provide proper fire protection.
15	Severe Winter Storms	Preventive Measures	Acquire equipment for responding to a massive power outage due to severe winter storm, ice and snow.
16	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Install Street addresses on all Buildings, Curbs, and rural home sites.
17	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Preventive Measures	Supply NOAA Weather Radios for all local government facilities, school, hospitals, and critical facilities.
18	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Provide backup facilities for the 911 center and the Emergency Operations Center.
19	Floods	Structural Projects	Maintain culverts to adequately allow for storm water drainage.

Mitigation Action Plan

The mitigation action plan includes strategies for implementing the mitigation measures, including information on the responsible agency, time frame, cost estimate, funding sources, and a statement of the measurable results. The Action Plan is included in this document as Chapter 5.

For further information about the Pontotoc County Multi-Jurisdictional Multi-Hazard Mitigation Plan, contact:

Primary Contact:
Chad Letellier
Director, Emergency Management
Pontotoc County
Ada, OK 74820
(580) 421-7777

Secondary Contact:
Justin Roberts
Chairman, Pontotoc County
Board of Commissioners
100 S Broadway Ada, OK 74820
(580) 332-8977
Justinpon3@yahoo.com

Chapter 1: Introduction and Capability Assessment

1.1 About the Plan

This document is the multi-jurisdictional multi-hazard mitigation plan for Unincorporated and Incorporated Pontotoc County and Pontotoc County School Districts, excluding the City of Ada, and the Ada Public Schools. It is a strategic planning guide developed in fulfillment of the Hazard Mitigation Grant Program requirements of the Federal Emergency Management Agency (FEMA), according to the Stafford Disaster Relief and Emergency Assistance Act. This act provides federal assistance to state and local governments to alleviate suffering and damage from disasters. It broadens existing relief programs to encourage disaster preparedness plans and programs, coordination and responsiveness, insurance coverage, and hazard mitigation measures. This plan is developed in accordance with and with guidance from, and fulfills requirements for, the Hazard Mitigation Grant Program (HMGP) and addresses 15 natural and man-made or technological hazards.

Included in this Chapter:

1.1.1 Purpose

The purpose of this plan is to:

- ☐ Provide a description of the planning area and assess the ongoing mitigation activities (Chapter 1) in Unincorporated Pontotoc County, Incorporated Pontotoc County Communities excluding Ada, and Pontotoc County School Districts, excluding Ada Public Schools.
- ☐ Describe the Multi-Hazard Mitigation Planning Process used to identify and select natural and man-made hazards, identify appropriate mitigation measures, and to develop the plan (Chapter 1).

- Identify and assess the hazards that pose a threat to residents, businesses and property (Chapter 2).
- Evaluate mitigation measures that should be undertaken by communities to protect residents, businesses, and property, and by Public Schools Systems to protect Faculty, Staff, and Students (Chapter 3).

Pontotoc County Courthouse, Ada OK

- Identify and recommend an Action Plan for implementation of mitigation projects (Chapter 4), and
- Develop a strategy for the adoption, maintenance, upkeep, and revision of the Pontotoc County Multi-Jurisdictional Multi-Hazard Mitigation Plan (Chapter 5).

The objective of this plan is to provide guidance for countywide mitigation activities for the next five years. It will ensure that Pontotoc County and other partners implement hazard mitigation activities that are most effective and appropriate for the natural and man-made hazards that threaten the County and communities within Pontotoc County. For additional information on Plan review and updating guidelines, refer to Chapter 5.

1.1.2 Scope

The scope of the Pontotoc County Multi-Hazard Mitigation Plan includes the areas in incorporated and unincorporated Pontotoc County (with the exception of the City of Ada and the Ada Public Schools, which are covered by their own Multi-Hazard Mitigation Plan.) This includes the incorporated communities of Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall, and the Public School Systems of Allen, Byng, Latta, Pickett-Center-(Now a Part of Vanoss), Roff, Stonewall, and Vanoss. The Pontotoc County Hazard Mitigation Plan addresses all natural hazards deemed a threat to the residents of Pontotoc County, plus urban structure fires, fixed site hazardous materials, and hazardous materials/mass casualty transportation events. Both short-term and long-term hazard mitigation opportunities are addressed, beyond existing federal, state, and local funding programs.

1.1.3 Authority

Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5165, enacted under Section 104 the Disaster Mitigation Act of 2000, P.L. 106-390, provides new and revitalized approaches to mitigation planning. A major requirement of the law is the development of a local hazard mitigation plan. Section 322, in concert with other sections of the Act, provides a significant opportunity to reduce the Nation s disaster losses through mitigation planning.

1.1.4 Goals

Pontotoc County's Goal:

To improve the safety and well-being of the residents living and working in Pontotoc County by reducing the potential of deaths, injuries, property damage, environmental and other losses from natural and technological hazards in a manner that creates disaster-resistant communities, enhances economic development opportunities, and advances the county□s goals and quality of life, resulting in more livable, viable, and sustainable communities.

Pontotoc County Public School Districts' Goals

The primary goal of the Public School Districts of Pontotoc County is to collaborate with the County and their respective communities in identifying potential natural hazards and developing mitigation action plans that would prevent or soften the impact of the identified hazards on school sites that comprise the eight School Districts.

Particularly, the Public Schools would like to develop safe rooms/buildings to protect school communities from weather related hazards. These safe structures during non-emergency times could be used to enhance instruction, and provide much needed space for fine arts programs, student activities, spectator events, and community meetings.

1.1.5 Definition of Terms

Hazard Mitigation is defined as: Sustained actions taken to reduce or eliminate long-term risk to human life and property from natural and technological hazards and their effects. Note that this emphasis on □long-term□risk distinguishes mitigation from actions geared primarily to emergency preparedness and short-term recovery.

1.1.6

Points of Contact

Primary Contact:
Chad Letellier
Director, Emergency Management
Pontotoc County
Ada, OK 74820
(580) 421-7777
pontotocem@adaok.com

Secondary Contact:
Justin Roberts
Chairman, Pontotoc County Board of Commissioners
100 S Broadway Ada, OK 74820
(580) 332-8977
Justinpon3@yahoo.com

1.2 Community Description

Appendix A covers community specific data where appropriate. Unincorporated towns are included in Unincorporated Pontotoc County.

Pontotoc County is faced with a variety of hazards, both natural and man-made. In recent history, winter storms, dam releases, lightning, floods, wildfires and tornadoes have made the national headlines but, in fact, any part of the county can also be impacted by high winds, drought, hail, urban fires, hazardous materials events, and other threats. In some cases, such as flooding and dam failure, the areas most at risk have been mapped and delineated. A base map of Pontotoc County with its major features and highways are shown in Figure 1-1. Pontotoc County School Districts are displayed in Figure 1-2.

Pontotoc County consists of 725 square miles in south-central Oklahoma. Pontotoc County had a Census 2010 population of 37,492, accounting for 1% of Oklahoma's population. The County has experienced a population growth rate of 6.65% since 2000, with an annual average of .66%. The 2014 Census Bureau estimate is 38,005, or an additional increase of 1.4%. See ***Section 1.2.4, Demographics***, for additional census information.

Each jurisdiction in the plan has a unique set of capabilities, including authorities, policies, programs, staff, funding, and other resources available to accomplish mitigation and reduce long-term vulnerability. By reviewing the existing capabilities in each jurisdiction, the planning team identified capabilities that currently reduce disaster losses or could be used to reduce losses in the future. The following table outlines the capability assessment for Pontotoc County and participating jurisdictions.

Jurisdiction	*Existing Authorities*	*Policies and Programs*	*Available Resources*
Pontotoc County	Planning Staff, Emergency Management, Board of County Commissioners, Planning and Zoning Board	Emergency Operations Plan, Capital Improvements Plan, Floodplain Regulations, Zoning Ordinances.	Annual Budget, PW Resources
Town of Allen	Planning Staff, City Council	Emergency Operations Plan, Capital Improvements Plan, Zoning Ordinances.	Taxes/Annual Budget, PW Resources, Contracts with Pontotoc County
Town of Byng	Planning Staff, City Council, Emergency Management	Emergency Operations Plan, Capital Improvements Plan, Floodplain Ordinances, Zoning Ordinances.	Taxes/Annual Budget, Contracts with Pontotoc County
Town of Fitzhugh	Planning Staff, City Council	Emergency Operations Plan, Capital Improvements Plan	Taxes/Annual Budget, Contracts with Pontotoc County
Town of Francis	Planning Staff, City Council	Emergency Operations Plan, Capital Improvements Plan	Taxes/Annual Budget, Contracts with Pontotoc County
Town of Roff	Planning Staff, City Council	Emergency Operations Plan, Capital Improvements Plan,	Taxes/Annual Budget, PW Resources, Contracts with

		Floodplain Ordinances, Zoning Ordinances.	Pontotoc County
Town of Stonewall	Planning Staff, City Council	Emergency Operations Plan, Capital Improvements Plan, Zoning Ordinances.	Taxes/Annual Budget, PW Resources, Contracts with Pontotoc County
Allen Public Schools	Planning Staff, School Board	School Emergency Plans, Improvement Plan	Taxes/Annual Budget
Byng Public Schools	Planning Staff, School Board	School Emergency Plans, Improvement Plan	Taxes/Annual Budget
Latta Public Schools	Planning Staff, School Board	School Emergency Plans, Improvement Plan	Taxes/Annual Budget
Roff Public Schools	Planning Staff, School Board	School Emergency Plans, Improvement Plan	Taxes/Annual Budget
Stonewall Public Schools	Planning Staff, School Board	School Emergency Plans, Improvement Plan	Taxes/Annual Budget
Vanoss Public Schools	Planning Staff, School Board	School Emergency Plans, Improvement Plan	Taxes/Annual Budget

Table 1-1: Pontotoc County Communities & School District Overview
Source: 2010 Census and Pontotoc County Emergency Operations Plan, Rev. 2015 and U.S. Department of Education, National Center for Education Statistics

Community	***Population***	***Key Personnel***				
		Mayor	**Fire**	**Police**	**EM**	**Other**
Ada, City of (*not included in Mitigation Plan)*	17,140	Guy Sewel	Rob Johnson	Mike Miller	--	Cody Holcomb, City Mgr.
Allen	932	Dianna Brannan	Mike Lawler	Billy Sanford	--	Doug Stinson City Mgr
Byng, Town of	1,175	John Burchett	Chris McGill	--	Jeff Rollins	--
Fitzhugh, Town of	230	Sharon Phillips	Richard Barnes	--	--	--
Francis, Town of	315	Craig Thompson	Marty Canada	--	--	--
Roff, Town of	725	Zach Braun	Jeremy Grissom	Tom Cox	--	--
Stonewall, Town of	470	Jim Mills	Phillip Nuner	Kent Kerr	--	--
Unincorporated Area	17,018	--	--	Sheriff, John Christian	Chad Letellier	--
Total	**38,005**					

Name	Superintendent Address Phone	Total Schools Grade Span	Total Students Classroom Teachers (FTE)
Ada City Schools(*not included in Mitigation Plan)*	Pat Harrison PO Box 1359 Ada, OK (580) 310-7200	6 Pre-K thru 12	2,666 197.1
Allen Public Schools	Bob Gragg PO Box 430 Allen, OK (580) 857-2417	2 Pre-K thru 12	444 31.2
Byng Public Schools	Todd Crabtree 500 S Bethel Blvd Ada, OK (580) 310-6751	5 Pre-K thru 12	1,818 122
Latta Public Schools	Cliff Johnson 13925 Cnty Rd 1560 Ada, OK (580) 332-2092	3 Pre-K thru 12	846 51.9
Roff Public Schools	Christopher S. Morgan PO Box 157 Roff, OK (580) 456-7663	2 Pre-K thru 12	329 25
Stonewall Public Schools	Kevin Flowers 600 S High School Stonewall, OK (580) 265-4241	3 Pre-K thru 12	444 31.5
Vanoss Public Schools	Marjana Tharp 4665 County Rd 1555 Ada, OK (580) 759-2251	2 Pre-K thru 12	531 38
There is also one private State-accredited school in Pontotoc County □McCall□s Chapel School in Ada			

Figure 1-1: Pontotoc Count Basemap

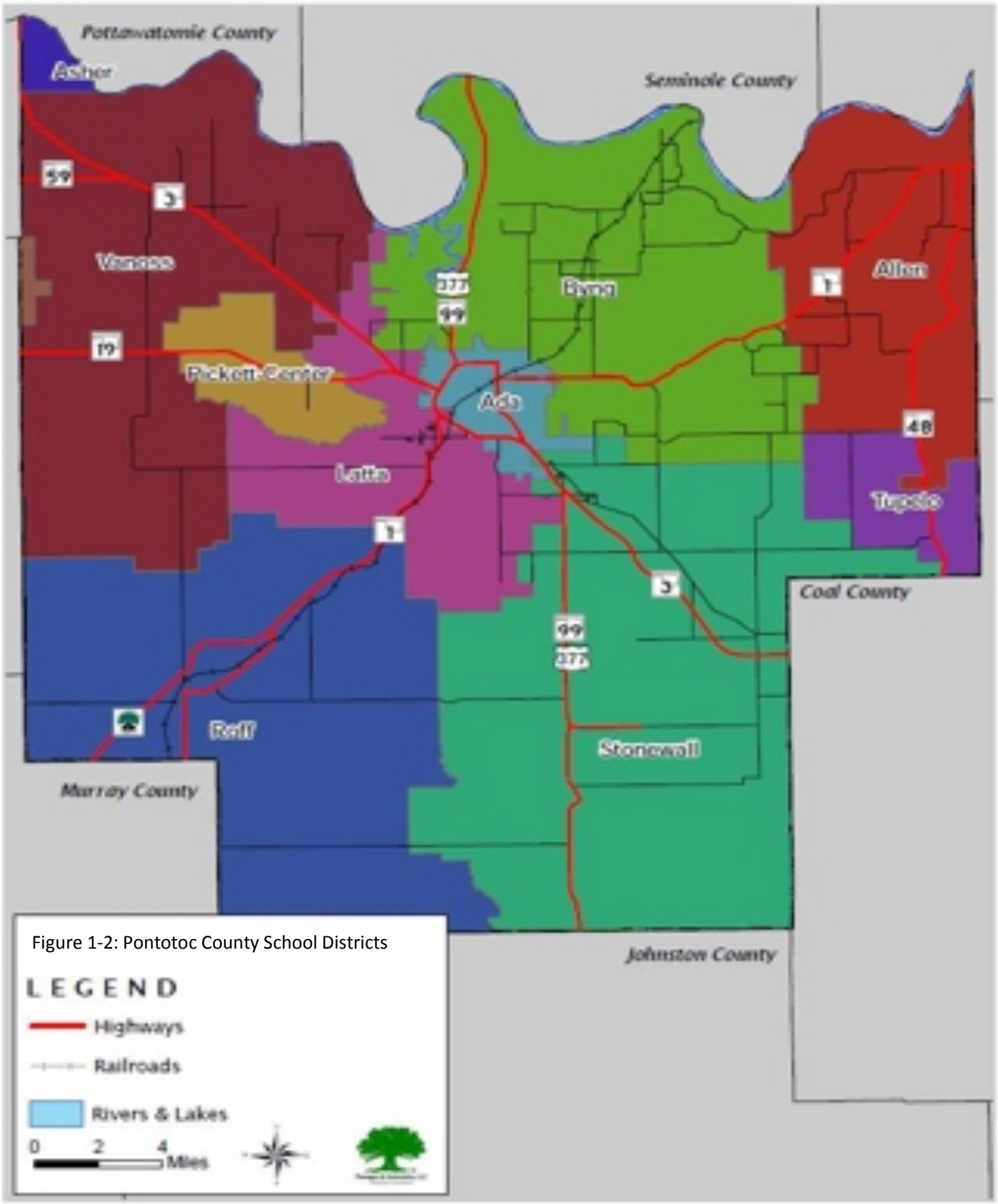

Figure 1-2: Pontotoc County School Districts

1.2.1 Demographics

Individual Community descriptions and data are included in Appendix A.
At 1907 statehood the County's population was 23,057. Numbers continued to increase from 24,331 to 32,469 in 1910 and 1930, peaking at 39,792 in 1940. The population declined for three decades, then rebounded in 1980. By 2000 it had 35,143 inhabitants and 13,978 households. Incorporated towns include Ada, Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall. These recent trends are shown in Table 1-2, below.

Table 1-2: Population Change, 1940-2010

Subject	*1940*	*1950*	*1960*	*1970*	*1980*	*1990*	*2000*	*2010*
Pontotoc County Population	39,792	30,875	26,089	27,867	32,598	34,119	35,143	37,492
Change from Previous Census	-	-8,917	-4,786	1,778	4,731	1,521	1,024	2,349
% Change	-	-22.4%	-15.5%	6.8%	17%	4.7%	3.0%	6.65%

Pontotoc County's population figures defy precise definition, due to the fluctuating student population of East Central State University. As a rule, ECU students are not counted in the Pontotoc County Census. Inevitably, however, some of ECU's 4,600 students (i.e., those living and working off campus at the time of the Census) might well have been counted as Pontotoc County residents. For the purposes of this report, it is assumed that the 2010 Census did not include ECU students. Consequently, Pontotoc County's actual daytime population during most of 2010 was probably around 40,000.

Since elderly and low-income populations may be at potentially greater risk from some hazards, a map depicting the percentage of the population aged 65 and above by Census block is shown in Figure 1-4. In addition, the percentage of the population living in poverty by Census block group is also shown in Figure 1-3. Pontotoc County's demographic data is detailed in Table 1-3.

Table 1-3: Pontotoc County Population Data
Source: 2010 Census

Subject	*Number*	*%*	*State %*
Total Population	37,492	100	100
Under 5 years old	2,588	6.9	7.0
Between 5-19 years old	7,601	20.3	20.8
65 years and older	5,570	14.9	13.4
ECU Students	5,727	15.3	
White	26,687	71.2	72.2
African-American	902	2.4	7.4
Native American	6,512	17.4	8.6
Hispanic	1,523	4.1	8.9
Poverty Status in 2013 * (Families)	1,407	14.5	12.6
Poverty Status in 2013 * (Individuals)	7,048	18.8	16.9

* The Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. For more information on the thresholds and what qualifies as eligible vs. non- eligible income, go to http://www.census.gov/

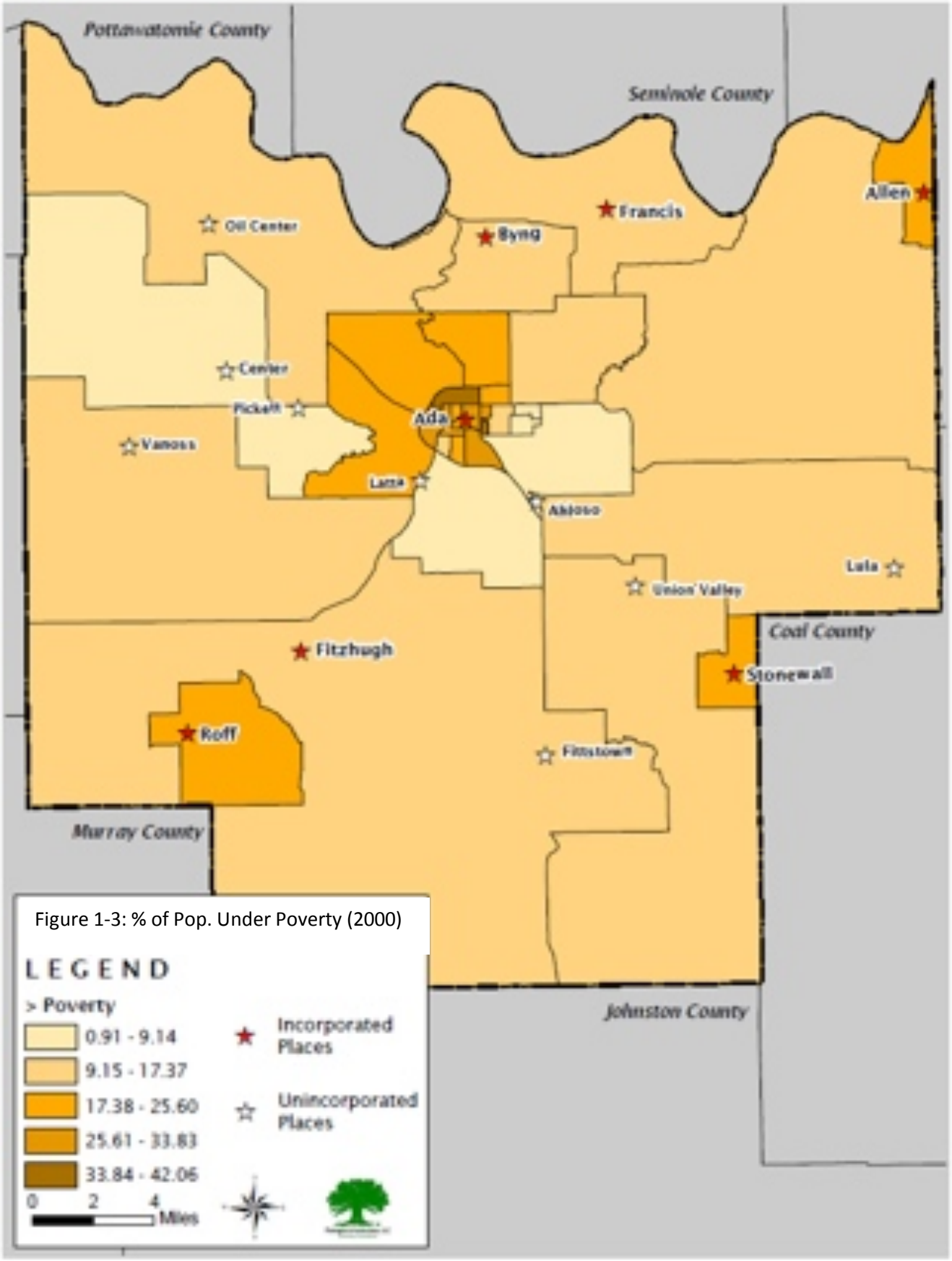

Figure 1-3: % of Pop. Under Poverty (2000)

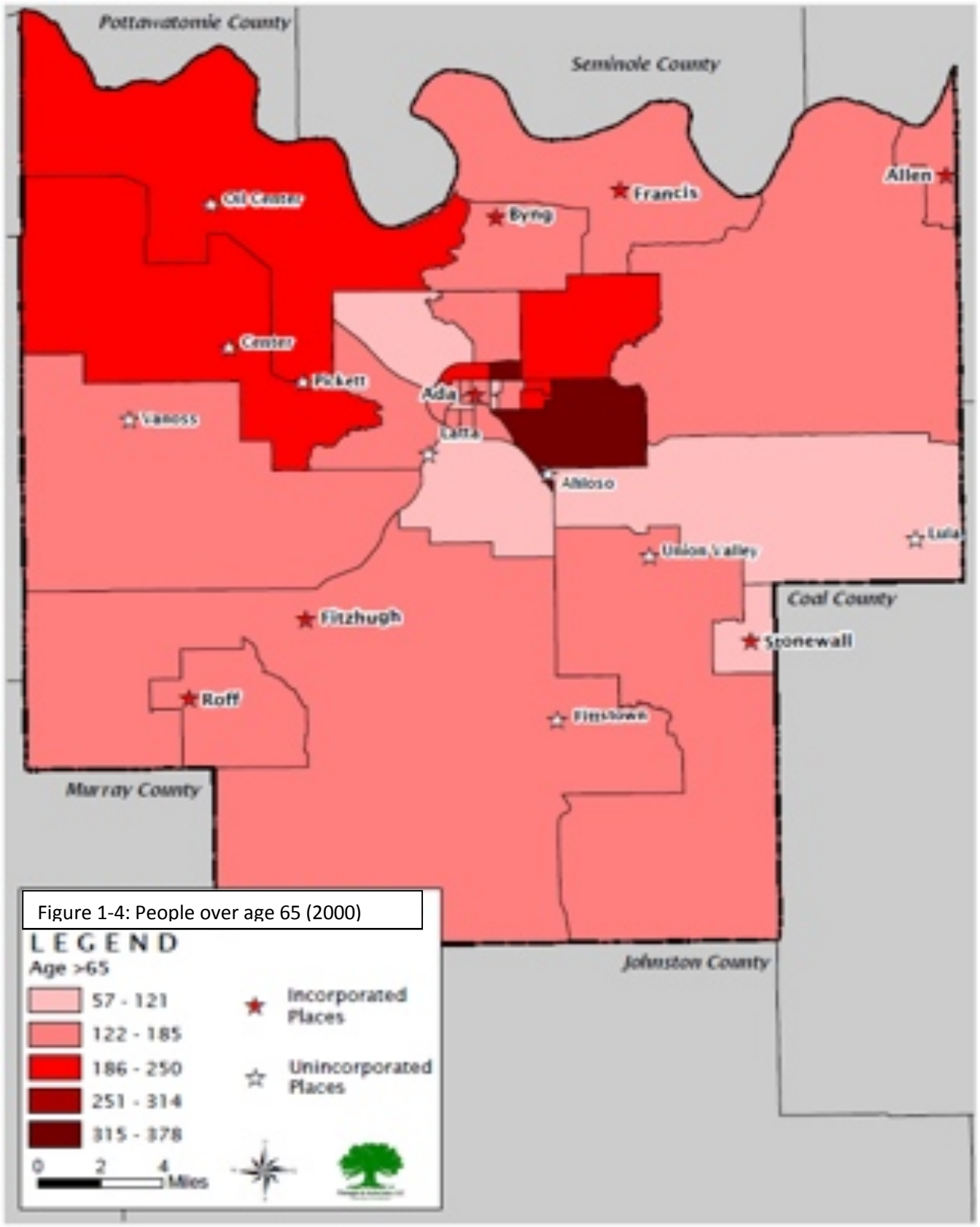

Figure 1-4: People over age 65 (2000)

1.2.2 Lifelines

Utility Systems

Table 1-4: Utility Suppliers for Pontotoc County
From Oklahoma Commerce Commission

Community	*Population*	*Natural Gas*	*Electric*	*Telephone*
Ada	17,140	CenterPoint Energy	Oklahoma Gas & Electric	AT&T Oklahoma
Allen	932	CenterPoint Energy	Public Service of Oklahoma	AT&T Oklahoma Allegiance
Byng	1,175	CenterPoint Energy	OG&E, Peoples Electric Coop, Byng Public Works	AT&T Oklahoma & CableOne
Francis	315	CenterPoint Energy	OG&E	AT&T Oklahoma
Roff	725	Propane Only	OG&E	AT&T Oklahoma
Stonewall	470	CenterPoint Energy	OG&E	TDS Telecom

Electricity

Pontotoc County's primary electrical service is provided by Oklahoma Gas & Electric (OG&E) based in Oklahoma City, with service in Allen provided by American Electric Power, dba Public Service Company of Oklahoma, with state offices in Tulsa.

Water

The City of Ada supplies most of the water needs of Pontotoc County. Ada's water is supplied by the Arbuckle-Simpson Aquifer and Byrd's Mill Spring, and is supplemented with local well water. Byrd's Mill Spring, located about 12 miles south of Ada, has recorded flows in excess of 20 million gallons per day (GPD).

Ada has a water processing plant with a capacity of 11 million GPD. The plant is in fair to good condition, and is currently in the process of being upgraded. Water use averages about 8 million GPD, leaving a reserve capacity of around three million GPD.

Ada has 5,000,000 gallons of in-ground storage at the municipal water plant. An additional re 1-4 · is currently being installed and will hold 2,500,000 of storage . There are 2,000,000 gallons of overhead storage in three water towers, the fourth tower is almost complete and will add an additional 1,000,000 gallons of overhead storage.

Other than Ada, the water systems in the County include the following, with the exception of some private water systems at mobile home parks that serve less than 50 people:

Table 1-5: Community Water Systems (except Ada Municipal Supply)
From the Ok Department of Environmental Quality (GWP = "Ground Water Purchased")

Population Served	Water System Name	Primary Source Water Type
950	Allen PWA	Well
300	Country Hills Mobile Home Park	GWP from Ada
390	Francis	Well
55	Latta Trailer Park	GWP from Ada
441	Pontotoc Co RWD # 1 (Homer)	GWP from Ada
1,395	Pontotoc Co RWD # 3	GWP from Ada
896	Pontotoc Co RWD # 6 (Fittstown)	GWP from Ada
4,568	Pontotoc Co RWD # 7	GWP from Ada
4,935	Pontotoc Co RWD # 8	Well
1,577	Pontotoc Co RWD # 9	GWP (from Ada & RWD #8)
734	Roff	Well
465	Stonewall PWA	Well
200	Chickasaw Housing Auth (Byng)	GWP from Ada
617	Pontotoc Co RWD # 4	GWP from Ada
1,700	Pontotoc Co RWD #8	GWP from Ada

In August 2009, the Oklahoma Water Resources Board completed a 5-year study of the Arbuckle-Simpson aquifer. The study concluded that the recharge rate of the aquifer would allow the withdrawal of groundwater at a rate considerably below that which has been customary for a century: about 0.15 acre-feet per year for each surface acre an almost 90% reduction in groundwater mining rates, which in the past has been 2 acre-feet per year for each acre of surface land. The new rate should effectively eliminate the possibility of outside parties pumping massive amounts of water from the aquifer for commercial export. The bad news is that Ada s groundwater allotment has also been reduced by 90%. (Byrd s Mill Spring water has not been affected, as it is considered surface water.) To maintain its current water regime, Ada will have to purchase 40,000 acres of aquifer water rights, or look at other options, such as building Scissortail Lake or tapping into a major pipeline to Oklahoma City or Norman. Byrd s Mill is abundant enough to meet Ada s (and the County s) basic needs, but not the summer peaks. The decision of the OWRB is considered controversial, and will likely be challenged both in the courts and the legislature. Whatever the outcome of the OWRB decision, Ada and Pontotoc County will be facing major water decisions in the coming decades.

Wastewater Treatment

The City of Ada maintains a wastewater treatment plant. The discharge point for the wastewater plant is into an unnamed tributary of the Little Sandy Creek.

In addition, there is wastewater treatment in the town of Stonewall, at the location of NE/4 of the NW/4 of the NE/4 of Section 13, Township 2 North, Range 7 East, to receiving waters on Buck Creek.

The town of Roff has lagoons located at State highway 1 and North 7th, for emergency overflow the town uses irrigation.

In the unincorporated areas of the County, most wastewater is treated by individual septic tank systems. The towns of Allen, Stonewall, and Francis have wastewater lagoons.

Natural Gas Service

Most natural gas service in Pontotoc County is provided by CenterPoint Energy (CNP), a Houston-based holding company formed in 2002 from Reliant Energy Arkla. CNP operates 8,200 miles of gas pipelines that serve as a hub for customers in Arkansas, Illinois, Kansas, Louisiana, Mississippi, Missouri, Oklahoma and Texas. For additional companies supplying specific communities, see Table 1-4 above.

Telephone, Internet, and Cable Service

With some exceptions (see Table 1-4 above) telephone service for Pontotoc County is provided by AT&T-Oklahoma, which also provides high-speed Internet to the area. CableONE, in Ada, is the primary provider for cable area television services. Cell phone service is available from AT&T, Sprint, U.S. Cellular and T-Mobile. Verizon has sharing arrangements with Sprint.

Transportation Systems

Major Highways and Roads

Pontotoc County includes a number of major highways including:

- U.S. Highway 377 (duplexed with OK Hwy 99) N-S through Ada
- The Chickasaw Turnpike heads SW from Ada
- State Highway 1 from NE to Ada where it joins the Chickasaw Turnpike
- State Highway 3 NW-SE thru entire county
- State Highway 19 W from Ada
- State Highway 48 N-S along eastern County border

Railway

Pontotoc County is served by the Burlington Northern Santa Fe (BNSF), and is a BNSF main line national switching yard. Ada is one of 245 stations serviced by BNSF in Oklahoma, which also includes Oklahoma City, Tulsa, Muskogee, Henryetta and Okmulgee, as well as nearby towns of Holdenville and Madill. The BNSF operates on tracks originally built by the St. Louis and San Francisco Railroad (Frisco). The trackage was absorbed into the BNSF's Texas Division when the Frisco was dissolved in 1981. The BNSF is one of the two largest railroads in the US, and is particularly strong in the Midwest and West. The railroad operates at least three local trains a day.

Primary cargoes shipped through Ada are agricultural and mining products. Among the agricultural products are soybean meal, corn and corn syrup, nut and vegetable oil, cottonseed meal and oil, wheat and wheat bran, and malt. Mining products include coal, oil, propane, asphalt, gypsum, and limestone. Additionally, these trains carry numerous types of hazardous materials including extremely hazardous substances (EHS).

Bus Lines and Taxi Service

Public transit is provided by Call-a-Ride, which is jointly sponsored by the City of Ada, Pontotoc County, East Central University, United Way and the Chickasaw Nation. Call-a-Ride primarily serves residents of Ada (including ECU), Byng, Latta, Pickett, and Stonewall within Pontotoc County. Demand-response routes to Seminole and Pauls

Valley are available. Hours of operation are week days 8 a.m. to 5 p.m. Discount fares for riders who are disabled or elderly. Call-a-Ride has 21 vehicles with a capacity of 258 passengers. Ada does not have a municipal bus service. Taxi service is available from Ada Cab. The Chickasaw Nation Service provides service to the Chickasaw population.

Several organizations have transportation services that may be of use in the event of a disaster. East Central State University has bus service available for disabled or handicapped students. New Horizons Unlimited is a sheltered workshop for mentally handicapped and disabled adults. They have eight vehicles with a 100-passenger capacity. McCall's Chapel School Group Home has six vehicles with 100-passenger capacity. Mental Health of Southeastern Oklahoma has five vehicles with 100-passenger capacity. Additionally, all schools in the county and in the city of Ada have authorized use of their busses in the event of a disaster or other emergency.

Airports

Pontotoc County is served by Ada Municipal Airport. The airport code is owned and operated by the City of Ada. The airport is an uncontrolled field with four runways and is open to the public. Jet fuel is available, as are hangers and tie downs, and major aircraft ground support. Aircraft located at the field are 40 general aviation singles, five general aviation multi, and three jet aircraft. The traffic includes 2% military aircraft. Aircraft operations average 34 planes per day, 33% of which is local general aviation, 65% transient general aviation, and 2% military. Instrument approach (with GPS, VOR, and Localizer) is available for all runways.

The nearest commercial airport is Will Rogers World Airport in Oklahoma City (67 miles), which is served by multiple national and international carriers, both passenger and airfreight.

1.2.3 Economy

As of 2010, 29,671 people were over the age of 16 in Pontotoc County and of that, 18,511 (63.7%) were in the labor force. Of this number, 17,530 (or 60.4%) were employed and 913 unemployed (3.1%). About 67.2% of the employed were private wage and salary workers, 25% were government workers, and 7.3% were self-employed in unincorporated businesses. The median household income in 2010 was $37,484, and the median family income was $48,494.

Pontotoc County, outside of Ada, has two industrial areas of note. One is located 5 miles SE of Ada on HWY 3E, and the other is located on the west side of the town of Allen. Within the boundaries of the city of Ada, there are 2 industrial areas that are county. One is located on the east side of Ada, and the other is on the north side of Ada. Both areas encompass major industrial sites.

Major employers in Pontotoc County are listed in Table 1-6 and are briefly described in the following paragraphs.

Table 1-6: Pontotoc County Major Employers

Company	*Product/Services*	*# Employed*
Chickasaw Nation & Chickasaw Enterprises	Varied Services	1,700
Mercy Hospital	Health Care / Social Assistance	744
Legal Shield, Inc	Finance & Insurance	625
Dart Container	Manufacturing	500
East Central University	Education	456
IRT	Service industry	450
Wal-Mart Supercenter	Retail	450
Chickasaw Nation Medical Center	Health Care / Social Assistance	375
Flex-N-Gate Technologies	Manufacturing	300
City of Ada	City Administration	210
Robert Kerr Environmental Research Center	Scientific, & Technical Services	165
Pontotoc County	County Government	135
Holcim Inc.	Cement Manufacturing	120

Solo Cup manufactures plastic cups and containers at its 267,000 sq. ft. plant in north Ada.

East Central University is a four-year state university with an enrollment of around 5,000.

IRT (Interactive Response Technologies) is a call center for clients in the financial services industry, telecommunications, healthcare, insurance and education, such as T-Mobile, LensCrafters, Blue Cross/Blue Shield, and Mutual of Omaha.

Wal-Mart Supercenter Wal-Mart is the nation□s largest retailer & employer.

Chickasaw Nation Medical Center is a 53-bed acute-care hospital (and part of the Public Health Service) administered by the Chickasaw Nation.

Flex-N-Gate Technologies produces body moldings, bumpers, grilles, hinges, latches and other external automobile parts at its 352,000 square foot facility.

EPA Robert Kerr Environmental Research Center conducts research and technical assistance to protect and restore ground water, surface water, and ecosystems.

Holcim Inc. (formerly Holnam, Inc.) produces cement from its plant and quarry in southeast Ada. The Holcim head office is in Switzerland

1.2.4 Development

According to 2015 Pontotoc County Assessor's data, there are 24,204 properties and 15,063 with improvements within Pontotoc County with a total value, adjusted for fair market value, of $1,324,054,133. Numbers of properties with improvements (buildings, garages, pools, storage, and so forth), and improvement values, by type, are shown in Table 1-7 for Pontotoc County. No land values are include

Table 1-7: Pontotoc County Properties and Values by Improvement Type
Source: Pontotoc County Assessor's Office

Improvement Type	*Count*	*Market Value*
Residential	16,647	$752,973,414
Agricultural	4,117	$355,845,199
Commercial/Industrial	1,305	$215,271,520
Tax Exempt	2,247	$0
Total	**24,316**	**$1,324,054,133**

Pontotoc County Assessor's data from 2007 was used to identify properties with mobile homes, as well as their respective values. There are a total of 952 properties with mobile homes in Pontotoc County with a combined value, adjusted for fair market value, of $1,791,459.

Pontotoc County has a large percentage of homes built prior to 1969, and some communities where a relatively large percentage were constructed prior to 1939. These figures are shown in the following table.

Table 1-8: Pontotoc County Homes Built Prior to 1969, 1959 and 1939
Source: US 2010 Census

Jurisdiction	*Percentage built prior to 1969*	*Percentage built prior to 1959*	*Percentage built prior to 1939*
Pontotoc County	41.0%	27.2%	8.7%
Allen	48.3%	33.6%	13.9%
Byng	13.2%	9.6%	3.7%
Fitzhugh	52.5%	26.5%	4.9%
Francis	49.9%	40.5%	27%
Stonewall	61.6%	41.5%	12.8%
Roff	54.8%	36.8%	17.7%

Future Development

According to the 2010 census, Pontotoc County's population is 37,492. Projections put the population at 39,000 by 2030, approximately a 4% increase, with most of the development occurring in the neighborhood of Ada's city limits.

Ranching in Pontotoc County brought in $24 million in 2002. Pontotoc County still has a major railroad, the BNSF, with a rail-yard in Ada. There is also a four-lane highway

connecting I-35 to Ada. This highway starts at I-35 on Hwy 7, meets the Chickasaw Turnpike near Sulphur, goes North-East to Hwy 1 near Fitzhugh, then proceeds on to Ada. Hwy 377 in Ada continues as a 4-lane highway, north to the Pontotoc-Seminole County line. Eventually this highway will be four-lane to I-40 near Seminole, which should increase both passenger and truck traffic through the county. East Central University remains an economic anchor, along with Holcim Cement.

Ada and Pontotoc County have worked hard to attract new industry, but have also supported the growth of local enterprises, such as Pre-Paid Legal Services and Edge Tech Corp. Perhaps one of the County's biggest economic boosts has come from Ada's selection as the capital of the reconstituted Chickasaw Nation. Casinos and other tribal enterprises and charities have brought new revenue streams into the jurisdiction. The Chickasaw Nation is now the County's largest employer. Another factor shaping the County's future development is the construction of the Council on Law Enforcement Education and Training, or CLEET, in northwest Ada.

Ada is growing in the northwest, north, south and east. The CLEET facility in the northwest, along OK Hwy 3E and 99 should stimulate development in that part of Pontotoc County. Commercial development is happening along Lonnie Abbott Blvd. in the north of Ada, and south along OK Hwy 3E. The Chickasaw Nation is developing land on Lonnie Abbott, at Mississippi Ave., where the City of Ada has recently annexed 47 acres. Office commercial and campus industrial development is taking place south of Ada along Kerr Lab Rd., Kerr Lab Blvd., and Stonecipher Blvd., where Pre-Paid Legal is located. The Chickasaw Nation is building a new medical facility in this area, on the south side of Stonecipher Blvd.

Future Growth Areas within Pontotoc County are generally within a seven mile radius of the City of Ada.

1.2.5 Critical Facilities

Critical facilities are defined differently by different organizations and agencies, but are usually classified as those facilities that, if put out of operation by any cause, would have a broadly adverse impact on the community as a whole.

ID	Name	Address	Phone
46	Chickasaw Nation Medical Center	Stonecipher Blvd., Ada	580-436-3980
58	Allen Clinic	W. Broadway, Allen	580-857-2424
60	Rural Community Clinic	Easton (Hwy 98)	580-857-1300
	Senior Housing & Special Needs Citizens		
	Education and Daycare		
45	Hacienda Academy	435 Idlewile Dr., Ada	580-332-7799
44	Latta Kids Zone Academy	13924 CR 1560, Latta	580-332-3035
43	Roff Headstart	21880 CR 3499, Fitzhugh	580-332-8976
42	Stonewall Headstart	26050 CR 3490, Fittstown	580-265-4322
39	Allen School	P.O. Box 430, Allen	580-857-2419
47	Byng Elementary School	500 S. New Bethel Rd., Byng	580-310-6723
49	Byng High School	500 S. New Bethel Rd., Byng	580-310-6733
48	Byng Junior High School	500 S. New Bethel Rd., Byng	580-310-6744
50	Francis Elementary School	18461 County Rd. 1480, Francis	580-332-4114
52	Homer Elementary School	1400 N. Monte Vista, Ada	580-332-4303
38	Latta School	13925 County Rd. 1560, Latta	580-332-7669
05	McCall s Chapel School & Group Home	Rural Route 9, Box 975, McCall	
35	McLish Middle School	600 S. High School, Stonewall	580-265-2221
10	Pontotoc County Technology Center	601 W. 33rd, Ada	580-310-2200
40	Roff School	100 N Broadway, Roff	580-456-7251
36	Stonewall School	600 S. High School, Stonewall	580-265-4243
20	Vanoss School	4665 County Rd. 1555, Vanoss	580-759-2503
	Commercial		
55	Farmers State Bank of Allen	201 E. Broadway, Allen	580-857-2402
56	First American Bank of Stonewall	301 W. Main St, Stonewall	580-265-4222
57	First American Bank of Roff	131 E. Main St, Roff	
04	Pontotoc County Agri-plex	1710 N. Broadway, Ada	
13	Call-A-Ride Public Transit	15425 CR 3540, Ada	580-332-7950
59	Allen Camper Mfg. Co.	29981 State Highway 1, Allen	580-857-2413

FEMA includes the following:

- Structures or facilities that produce, use or store highly volatile, flammable, explosive, toxic and/or water-reactive materials;
- Hospitals, nursing homes, and housing likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a disaster;
- Law enforcement facilities, fire stations, vehicle and equipment storage facilities, and emergency operations centers that are needed for disaster response activities before, during, and after an event; and
- Public and private utility facilities that are vital to maintaining or restoring normal services to affected areas before, during and after an event.

This may also include buildings designated as emergency shelters, schools, childcare centers, senior citizen centers, major medical facilities, disability centers, and government buildings. Since 9/11, FEMA has also added banks and other financial institutions to their critical facilities list. Pontotoc County s critical facilities are listed in Table 1-9.

Table 1-9: Pontotoc County Critical Facilities

ID	Name	Address	Phone
	Local Government		
27	Allen Fire Dept.	Memphis Street, Allen	580-857-2100
31	Byng Fire Dept.	110 Byng Ave, Byng	580-436-2545
21	Center Fire Dept	12834 CR 3477, Center	911
26	Fittstown Fire Dept	18070 CR 1655, Fittstown	580-777-4480
18	Fitzhugh Fire Dept.	21930 CR 3499, Fitzhugh	911
30	Francis Fire Dept.	127 S David, Francis	580-332-6295
28	Happyland Fire Dept.	22680 CR 1530, Happyland	580-272-4573
29	Homer Fire Dept.	13849 CR 3590, Homer	911
24	Lula Fire Dept.	19613 SH 48, Lula	911
32	Oil Center Fire Dept.	8144 CR 3470, Oil Center	911
22	Pickett Fire Dept.	9940 CR 1542, Ada	580-421-9668
19	Roff Fire Dept.	110 W Main, Roff	580-456-7232
23	Stonewall Fire Dept.	113 S Harrison, Stonewall	580-265-4511
25	Union Valley Fire Dept.	21120 CR 3 DR, Fittstown	580-265-9598
34	Vanoss Fire Dept.	15260 County Road 3445, Ada	580-759-3334
61	Allen Public Works Office	109 N. Memphis, Allen	580-857-2461
51	Francis Town Hall	127 S. David, Francis	580-320-3352
63	Stonewall City Hall	100 E. 7th Street, Stonewall	580-265-4511
65	Stonewall Public Works Shop	100 E. 7th St., Stonewall	
66	Stonewall Water Supply		
67	Stonewall Police Department	100 E. 7th Street, Stonewall	580-265-4511
	Federal, State and County Government		
02	Pontotoc County Court House	120 W. 13th Street, Ada	580-332-5763
06	Pontotoc County District 1 Barn	14210 CR 3610	
07	Pontotoc County District 2 Barn	9693 CR 3490	
08	Pontotoc County District 3 □ Roff		
09	Pontotoc County District 3 □ Stonewall	224 E Main, Stonewall	
15	Pontotoc Count Health Dept.	1630 Beverly, Ada	580-332-2011
03	Pontotoc County Jail	131 Court Street, Ada	580-332-5755
01	Pontotoc County Emergency Ops Center	231 S Townsend, Ada	580-421-7777
11	PCSO Repeater Tower	CR 1571	
33	Pontotoc County Communications Repeater	17835 SH 1W	
12	Pontotoc County Fire Repeater	SE of cement plant	
16	Rural Water District #7	11960 CR 3590	

1.3 About Hazard Mitigation Programs

1.3.1 National Flood Insurance Program (NFIP)

For decades, the national response to flood disasters was simply to provide disaster relief to flood victims. Funded by citizen tax dollars, this approach failed to reduce losses and didn't provide a way to cover the damage costs of all flood victims. To compound the problem, the public generally couldn't buy flood coverage from insurance companies, because private insurance companies see floods as too costly to insure. In the face of mounting flood losses and escalating costs of disaster relief to U.S. taxpayers, Congress established the National Flood Insurance Program (NFIP). The goals of the program are to reduce future flood damage through floodplain management, and to provide people with flood insurance. Community participation in the NFIP is voluntary.

Pontotoc County participates in the National Flood Insurance Program. In addition, Ada (Not Participating in this Plan), Byng, and Roff are NFIP participants. The town of Allen was a member but withdrew from the program in 1997, and the town of Stonewall was suspended from the NFIP program in 1987. The other towns in Pontotoc County have no Hazard Areas identified.

Pontotoc County, a type D community, the Town of Byng, a type D community, and the town of Roff, a Pre-1980 Community, all participate in the NFIP by adhering to the NFIP Regulations as required by FEMA and the NFIP itself. These regulations include: Having a floodplain board, having an appeals process, having a set of regulations for the jurisdiction that meet or exceed minimum NFIP Standards, enforcement of those regulations, a development permitting process, a floodplain manager that is accredited by OWRB. The complete NFIP requirements can be found in Chapter 44 of the Code of Federal Regulations (44 CFR).

Repetitive Loss (RL)

A repetitive loss property is defined by FEMA as □a property for which two or more National Flood Insurance Program losses of at least $1,000 each have been paid within any 10-year period. □No jurisdictions covered by this plan currently have any repetitive loss properties.

1.3.2 Firewise Community

The Firewise Community certification is a project of the National Wildfire Coordinating Group. It recognizes communities that have gone through a process to reduce the dangers of wildfires along what is referred to as the Wildland-Urban Interface (WUI). A specialist from Firewise Communities USA will work with the local community to assess wildfire dangers and create a plan that identifies agreed-upon achievable solutions to be implemented. Additional information on the Firewise Community program can be accessed at www.firewise.org/usa. For more details on the Firewise Program, see Chapter 5, Section 5.2.9.

The Town of Allen was certified as a Firewise Community in 2009.

1.3.3 Fire Hazard Mitigation

ISO's Public Protection Classification (PPC) program provides important information about municipal fire-protection services, which is used by insurance companies to establish fire insurance premiums. The program also helps communities plan for, budget, and justify improvements in order to mitigate the effects of the fire hazard.

A uniform set of criteria, which incorporates nationally recognized standards developed by the National Fire Protection Association and the American Water Works Association, is used to evaluate a community's fire protection service and rate it on a scale from 1 to 10, where lower numbers indicate a better rating. The evaluation inventories and analyzes the following segments of fire protection resources:

- Fire Alarm and Communication Systems – including telephone systems and lines, staffing, and dispatching systems;
- The Fire Department – including equipment, staffing, training, and geographic distribution of fire companies;
- The water supply system – including condition and maintenance of hydrants, and a careful evaluation of the amount of available water compared with the amount needed to suppress fires.

There are 16 different Fire Departments operating in Pontotoc County. Each community has its own individual fire insurance rating. On average, the fire insurance ratings range from 4 to 8, with Ada having a rating of 4, Francis an 8, Allen a 6, and Stonewall a rating of 7/8. Fire insurance ratings range from 1 to 10, where lower numbers indicate a better rating. There is only one community in Oklahoma with a rating of 1.

1.3.4 StormReady Community

StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather – from tornadoes to tsunamis. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations. To be officially StormReady, a community must:

- establish a 24-hour warning point and emergency operations center;
- have more than one way to receive severe weather warnings and forecasts and to alert the public;
- create a system that monitors weather conditions locally;
- promote the importance of public readiness through community seminars;
- develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

Additional information can be found at http://www.stormready.noaa.gov/.

In Pontotoc County area, the Town of Byng is the only community that is StormReady certified. The County received certification in 2009.

1.4 Public Information and Education

Public information and education strategies are an important part of any successful program to mitigate the loss of life and property from natural and man-made hazards. Examples of such strategies include outreach projects, hazard information distribution, and school age and adult education programs. This section examines the existing communications infrastructure in Pontotoc County, and the programs and activities that the County currently has in place to serve this purpose.

1.4.1 Public Information Infrastructure

2-1-1 System

A community 2-1-1 system is to non-emergency assistance what 9-1-1 is for emergency response □a quick and easy way for people to access needed help by phone for information or social services. During times of severe weather, or while people are preparing for emergencies, they may use 2-1-1 to access information. Ensuring that disaster safety information is available to the 2-1-1 operators is an easy and effective way to make sure that information is disseminated to people who need it. For more information on 2-1-1 in Oklahoma, refer to the Oklahoma 2-1-1 Advisory Collaborative, www.211oklahoma.org. Pontotoc County is served by the ***2-1-1 of Southeastern Oklahoma*** system.

1.4.2 Outreach Programs

- □ Emergency Management does programs in the schools and with civic groups geared toward storms, planning, Hazardous Materials, and other disasters.
- □ Local Fire Departments do annual programs in the schools.

Pontotoc County Radio/TV Programs/Communications

- □ Channel 11 Public Access hosts a program called □Explore Ada,□which appeals primarily to the audience in the City of Ada, but has some listeners in other parts of the County.
- □ CableOne is a resource during an emergency, but access to Cable TV is mostly limited to the communities, and not rural Pontotoc County.

1.5 Preventive Measures

Preventive measures are defined as government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. This section contains a summary of the current ordinances and codes that relate to land use, zoning, subdivision, and storm water management in the Pontotoc County area.

1.5.1 Comprehensive Planning and Zoning

Planning in Pontotoc County is guided by several documents. The purpose of these Plans is to coordinate the County s physical development in accordance with present and future goals and objectives. At the present time, planning and zoning activities for subdivisions and such go through the Planning and Zoning Committee in Ada.

1.5.2 Floodplain and Storm water Management

- Pontotoc County has been a member of the National Flood Insurance Program since 1978.
- The Town of Byng has been an NFIP member since 2014.
- The Town of Roff is a Pre-1980 Community.

Flood and storm water management are discussed in Chapter 4.

1.5.3 Building Codes

- The building codes adopted by Pontotoc County mirror the state codes, and are as follows:
- International Building Code 2012 Edition, with modifications
- International Fire Prevention Code, 2012 Edition
- International Residential Code 2012, with modifications
- International Mechanical 2012, with modifications
- International Plumbing 2012
- National Electrical Code 2014
- International Fuel and Gas Code 2012, with modifications

1.5.4 Capital Improvements Plan

The Pontotoc County Capital Improvement Plan that was adopted in July 2014, incorporates the following measures, which could have an impact on mitigation activities:

- Upgrading substandard roads;
- Improving and upgrading substandard bridges;
- Building Fittstown Storm Shelter;
- Building Allen Storm Shelter;
- Building Pickett Storm Shelter;
- Improving and upgrading facilities at the Agri-plex;

1.6 Structural Projects

Structural projects are usually designed by engineers or architects, constructed by the public sector, and maintained and managed by governmental entities, and may include such projects as storm water detention reservoirs, levees and floodwalls, channel modifications, drainage and storm sewer improvements, and community tornado safe-rooms. The following section includes measures that are already in place or are already included in current planning. See Chapter 5 and Appendix A for discussion of potential activities and programs within this category.

1.6.1 Existing Structural Projects

1. The town of Francis, working with Pontotoc County is replacing the 12th street bridge over the railroad tracks.
2. The city of Ada is constructing 19 miles of main water line from Byrd's Mill Spring to the City of Ada Water plant. This line will also supply water to all but RWD 8 for water needs in the county.

1.6.2 Planned Structural Projects

1. Latta School is planning on constructing an additional safe room.
2. Allen School plans to construct additional class rooms and a safe room.
3. The town of Byng plans to construct a waste water system.
4. Byng School plans to construct a safe room
5. The town of Stonewall plans to replace there waterlines throughout the town and constructing a new water tower.
6. There will be a wind farm constructed south and west of the town of Roff consisting of 100 large wind generators providing power to the county.
7. Pontotoc County is planning on constructing flood prevention/mitigation measures in the community of Latta.
8. Pickett VFD is planning to construct a new Fire Department.
9. Fittstown VFD is planning to construct a new Fire Department.

1.7 Emergency Services

In times of emergency, it is critical that a community have resources available to respond in an efficient manner to a hazard event. This section outlines the County's emergency management resources that are available for response. See Chapter 5 and Appendix A for discussion of potential activities and programs within this category.

1.7.1 Emergency Operations Plan (EOP)

Pontotoc County's emergency procedures are contained in the Comprehensive Emergency Operations Plan, Revised September, 2015. This comprehensive Plan defines who does what, when, where and how in order to prepare for, and respond to natural disasters, technological accidents, nuclear incidents and other major incidents/hazards. Utilizing this plan aids in effective recovery efforts and assists in identifying mitigation actions needed. According to Pontotoc County Emergency Management, Pontotoc County, as a whole, along with several communities in the county, is NIMS compliant and has incorporated NIMS/ICS into its 2015 Emergency Operations Plan and other protocols.

- Preparation develops the response capabilities needed if an emergency does arise.
- Response provides emergency services during a crisis to reduce casualties and damage and speed recovery.
- Recovery is short-term and long-term. Short-term response restores vital services and provides for basic public needs; long-term response restores the community to a normal or improved state of affairs.

The Plan establishes the Emergency Operations Center, lays out emergency tasks and responsibilities, direction and control, continuity of government, and administration and logistics. The Plan is revised annually and tested at least once each year.

1.7.2 Emergency Operations Center (EOC)

During major emergencies, Pontotoc County's government will be moved to the Emergency Operations Center (EOC). The County's primary EOC is located in the Pontotoc County Argi-Plex located at 1710 N Broadway, in Ada. Communities in Pontotoc County may also establish EOCs in their facilities as required. An alternate EOC is available using the Byng EOC located within the City Hall/Fire Department building. The establishment and operation of the EOC is covered in the Pontotoc County *Emergency Operations Plan, Annex A*.

The Emergency Management Director has overall responsibility for the operation of the EOC. The EOC has three stages of operation:

- Normal Peacetime Readiness
- Increased Readiness, and
- Emergency Period.

The EOC is equipped with operations and communications room, one office, restrooms, small kitchen facilities, and a conference room. All critical equipment and systems are backed up by power supplies and portable generators are available as needed. During an

emergency, the EOC operates on a two-shift, around-the-clock basis. An incident command post (ICP) may be set up to coordinate activities at the scene of the disaster.

During an emergency, the EOC may become the seat of County government. Day-to-day functions that do not contribute directly to response actions may be suspended for the duration of the emergency.

All computers at both locations are equipped with surge protectors and emergency battery power until the generators start.

Individual community EOCs may be activated in addition to or in place of the Pontotoc County EOC if that community is heavily involved or if the location is more appropriate for response to an emergency.

Chapter 2: The Planning Process

The planning for the Pontotoc County Multi- Jurisdictional Multi-Hazard Mitigation Plan followed a ten-step process, based on the guidance and requirements of FEMA.

2.1 Step One: Organize to Prepare the Plan

(January 2015 – December 2015) Citizens, community leaders, government staff personnel, and professionals active in disasters provided important input into the development of the plan and recommended goals and objectives, mitigation measures, and priorities for actions.

The planning process was formally created by a resolution of the governing body of Pontotoc County.

The Pontotoc County Planning Group meeting to review the plan

The following table states the names of the contributors to the Hazard Mitigation Plan and their Agency name. Each person had a valuable role in the update of the Plan.

Table 2-1: Contribution to plan by name and agency

Name	Agency	Contributions to Plan
Chad Letellier	Pontotoc County Emergency MGMT	Planning group leader, Lead information provider for Pontotoc County, consolidation of plan information provided by other jurisdictions. Coordination of mitigation measures
Micah Cheatwood	Pontotoc County Emergency MGMT	Consolidation of information for plan, plan formatting and information gathering for all agencies and jurisdictions.
Doug Stinson	Town of Allen--City Manager	Lead information gathering and lead planner for the town of Allen, selection of mitigation measures for the town, selection of action items for town of Allen
Jeff Rollins	Town of Byng--EM Director	Lead information gathering and lead planner for the town of Byng, selection of mitigation measures for the town, selection of action items for town of Byng
John Burchett	Town of Byng--Mayor	Assisted in gathering information for the town of Byng, selection of mitigation measures, and action items for the town and the county
Sharon Phillips	Town of Fitzhugh--Mayor	Lead information gathering and lead planner for the town of Fitzhugh, selection of mitigation measures for the town, selection of action items for town of Fitzhugh
Richard Barnes	Town of Fitzhugh--Fire Chief	Assisted in gathering information for the town of Fitzhugh, selection of mitigation measures, and action items for the town.
Josh Littlefield	Town of Francis--Fire Chief	Lead information gathering and lead planner for the town of Francis, selection of mitigation measures for the town, selection of action items for town of Francis
Jeremy Grissom	Town of Roff	Lead information gathering and lead planner for the town of Roff, selection of mitigation measures for the town, selection of action items for town of Roff

Dennis Heath	Town of Stonewall	Lead information gathering and lead planner for the town of Stonewall, selection of mitigation measures for the town, selection of action items for town of Stonewall
Phillip Nuner	Town of Stonewall--Fire Chief	Assisted in gathering information for the town of Stonewall, selection of mitigation measures, and action items for the town.
Bob Gragg	Allen Schools	Lead information gathering and lead planner for Allen Schools, selection of mitigation measures for the school, selection of action items for Allen School System
Michael James	Allen Schools	Assisted in gathering information for Allen Schools, selection of mitigation measures, and action items for the School system.
JoAnne Layne	Byng Schools	Lead information gathering and lead planner for Byng Schools, selection of mitigation measures for the school, selection of action items for Byng School System
Cliff Johnson	Latta Schools	Lead information gathering and lead planner for Latta Schools, selection of mitigation measures for the school, selection of action items for Latta School System
Scott Morgan	Roff Schools	Lead information gathering and lead planner for Roff Schools, selection of mitigation measures for the school, selection of action items for Roff School System
Phillip Nuner	Stonewall School	Lead information gathering/lead planner for Stonewall Schools, selection of mitigation measures for the school, selection of action items for Stonewall School System
Kevin Flowers	Stonewall School	Assisted in gathering information for Stonewall Schools, Assistant planner, selection of mitigation measures, and action items for the School system.
Marjana Tharp	Vanoss School	Lead planner for Vanoss Schools, selection of mitigation measures for the school, selection of action items for Vanoss School System
Charles Hill	Vanoss School	Lead information gathering/asst planner for Vanoss Schools, selection of mitigation

		measures for the school, selection of action items for Vanoss School System
Gary Johnson	Vanoss School	Assisted in gathering information for Vanoss Schools, Assistant planner, selection of mitigation measures, and action items for the School system.
Gary Starns	Pontotoc County Dist 1	Provided Information for plan
Randy Floyd	Pontotoc County Dist 2	Provided Information for plan
Justin Roberts	Pontotoc County Dist 3	Provided Information for plan
John Christian	Pontotoc County Sheriff	Provided Information for plan
Chris Mcgill	Town of Byng Fire Chief	Provided Information for plan
Dianne Brannon	Town of Allen--Mayor	Provided Information for plan
Tammy Brown	Pontotoc County Clerk	Provided Information for plan
Jeremy Grissom	Town of Roff--Fire Chief	Provided Information for plan
Annie Vest	State of OK OEM Hazard Mitigation	Assisted in plan layout and redesign, assisted county planning staff in coordination of chapters and annexes. Provided assistance for information gathering and referencing.
Betty Weber	Pontotoc County Health Dept.	Provided Information for plan
Greg Mills	Allen Schools	Assisted in gathering information for Allen Schools, selection of mitigation measures, and action items for the School system.

Hazard Mitigation Planning meeting dates

1. 12-30-14
2. January meeting with Annie Vest
3. 1-28-15
4. 3-25-15
5. October 21 meeting with Annie vest
6. 9-30-2015
7. 10-7-2015
8. 10-28-15

2.2 Step Two: Involve the Public

(June 2015 – Ongoing)
The Pontotoc County Planning Group undertook projects to inform the public of this effort and to solicit their input. All meetings of the planning group were publicly posted as required by ordinances and rules of the jurisdiction and were open to the public. The public had opportunities to review the plan and participate in the planning process throughout the development of the plan. The Public was invited several times to open and posted meetings, and since no one attended, jurisdiction and school representatives were relied on for information and input.

2.3 Step Three: Coordinate with Other Agencies and Organizations

(January 2015 – October 2015)
Many public agencies, private organizations, and businesses contend with natural hazards. Management team members contacted them to collect their data on the hazards and determine how their programs can best support the Pontotoc County Multi-Hazard Mitigation planning program. A list of agencies contacted are included below.

Agency		
Schools	**Person Contacted**	**Method of Contact**
Latta Public Schools	Cliff Johnson-Superintendent	Phone and Email
Roff Public Schools	Scott Morgan-Superintendent	Email
Stonewall Public Schools	Kevin Flowers-Superintendent	Email
Vanoss Public Schools	Marjana Tharp-Superintendent	Email
Businesses		
BNSF	Joe White-Operations MGR	Email
Reagent Chemical	Dave Piercy-Office Manager	Phone and Email
Magellan	Troy Hill-Operations Tech	Email
People s Electric	John Hudson-CEO	Email
OG&E	Kenny Howard-Line Super	Email
Mercy Hospital/EMS	James Lampkin-Director	Phone and Email

Agency		
Federal	**Person Contacted**	**Method of Contact**
NWS Norman	Rick Smith-WFM	Phone and Email
NRCS	Clay Horton-Dam Supervisor	Phone and Email
USACoE		
Floodplain MGMT	Joe Remondini-Floodplain Srv	Email
Tribal		
Chickasaw Nation	Sarah Jones-EM Director	Phone and Email
Chickasaw Nation Hospital	Charity Webb-EM Coordinator	Phone and Email
National Non-Profit		
American Red Cross	Renee Beasley-Area Mgr	Phone and Email
State		
Oklahoma Corporation Comm	Randy Williamson-Tech	Phone and Email
OEM	Annie Vest-St. Haz. Mit. Off.	Phone and Email
ODEQ	Tom Bergman-Tier II Coord.	Phone and Email
Ok Dept of Health	Bob Stewart-MERC Coordin.	Phone and Email
OWRB		
State NFIP Coordinator	Matt Rollins	Email
Regional		
SODA	Cecil Mackey-Fire Coordinator	Phone
Banner Baptist Association	Bob Feighner-Liaison	Phone and Email
Universities		
OSU Extension Service	Justin McDaniel-Ext Agent	Phone and Email
East Central University	Bert Miller-Police Chief	Phone and Email
Pontotoc County		
County Commissioners	Gary Starns-Commissioner	Phone and Email
County Assessor	Debbie Byrd	Phone and Email
County Health Dept	Jill Williams-Annex H Liaison	Phone and Email
County Emergency MGMT	Chad Letellier	Phone and Email
County Clerk	Tammy Brown	Phone and Email
County Sheriff	John Christian	Phone and Email
RWD 7	Buck Cooper	Phone and Email
RWD 8	Joyce Williams	Email
RWD 9	Eric Stone	Phone
LEPC	Jeremy Danielson-Chairman	Phone and Email
Local Government		
Allen Mayor	Diane Brannon	Phone and Email
Allen Fire Chief	Mike McCarn	Phone and Email
Byng Emergency MGMT	Jeff Rollins-Director	Phone and Email
Byng Mayor	John Burchett	Phone and Email
Fitzhugh Mayor	Sharon Phillips	Email
Fitzhugh Fire Chief	Richard Barnes	Email
Francis Mayor	Craig Thompson	Email
Francis Fire Chief	Josh Littlefield	Phone and Email
Roff City Council	Mike Bradley	Phone and Email
Roff Fire Chief	Jeremy Grissom	Phone
Stonewall City Manager	Dennis Heath	Phone and Email
Stonewall Fire Chief	Danny Summers	Phone
Schools		
Allen Public Schools	Bob Gragg-Principal	Email
Byng Public Schools	Joanne Layne-Counselor	Email

Chapter 3: Natural and Man Made Hazards

Introduction

Included in this Chapter:

According to the Federal Emergency Management Agency (FEMA), a hazard is defined as an event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, or agricultural loss, among other types of loss or harm. Hazards are generally classed into two categories based on their source: natural hazards and man-made hazards. Each hazard has its own defining characteristics, such as time of year and geographic area of probable occurrence, severity, and risk level.

Natural phenomena, such as floods, tornadoes, severe drought, and wildfires, are natural hazards because they have the potential to destructively impact human settlements and activities. When damage from a natural hazard occurs, the event is generally called a natural disaster.

Man-made hazards are broadly defined as hazards that originate from accidental or intentional human activity. They can affect localized or widespread areas and are frequently unpredictable. This category of hazard includes such events as dam breaks and hazardous material events.

While Oklahoma communities can expect disaster-related losses, hazard assessments can be used to create proactive measures against likely events, and thereby significantly decrease or eliminate their impacts. Therefore, this chapter contains a risk identification and assessment for 13 hazards. The hazards addressed are those deemed most likely to impact Pontotoc County, Pontotoc County Communities, and Pontotoc County school districts. The hazards include:

1. Floods
2. Tornadoes/ High winds
3. Lightning
4. Hail
5. Severe Winter Storms
6. Extreme Heat
7. Drought
8. Expansive Soils
9. Urban Fires
10. Wildfires
11. Earthquakes
12. Dam Failures
13. Transportation Events

Table 3-1: Presidential Disasters for Pontotoc County 2010-2015

Year	Title	Disaster #
2010	Severe Winter Storm	1876, 1883, 3308
2010	Severe Winter Storm	3316

Hazards Risk Analysis: Probability and Vulnerability

A Hazard Risk Analysis is a quantitative process for assessing and evaluating hazards and provides a common base for performing the analysis by defining criteria and establishing a rating and scoring system.

Table 3-2 shows the results of the Risk Analysis for Pontotoc County, which includes a quantification of the history, probability, vulnerability, and maximum threat for each event. Hazard Analysis, of course, for individual communities and school districts may vary, depending on their specific circumstances. Table 3-3 provides a summary of the ranking criteria and the scoring method.

Table 3–2: Pontotoc County Hazard Risk Analysis

Disaster	History (2)*	Vulnerability (5)*	Maximum Threat (10)*	Probability (7)*	Score
Winter Storm	High	High	High	High	240
Hailstorm	High	High	High	High	240
Extreme Heat	High	High	Medium	High	190
High Wind	High	High	Medium	High	190
Transportation Event	High	High	Medium	High	190
Expansive Soil	High	Medium	Medium	High	165
Drought	High	Medium	Medium	High	165
Urban Fire	High	High	Low	High	150
Lightning	High	High	Low	High	150
Fixed Site HazMat Event	High	High	Low	High	150
Tornado	High	High	Medium	Medium	145
Wildfire	High	Medium	Low	High	125
Earthquake	Medium	Low	Medium	Medium	100
Flood	Medium	Low	Low	Medium	60
Dam Failure	Low	Low	Low	Low	24
*** Criteria weighted by value in column title.**					
Values: **High**	**10**	**Medium**	**5**	**Low**	**1**

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Table 3-3: Summary of Hazard Analysis Ranking Criteria

Criteria	*Description*	*Scoring*
History	If a certain kind of disaster occurred in the past, conditions causing the event can occur again.	Number occurrences in the past 100 years: 0-1 Low 2-3 Medium 4+ High
Vulnerability	The number of people and value of property in jeopardy determine vulnerability. Vital facilities, such as hospitals, office buildings, emergency facilities, and population groups of special concern should be included in vulnerability determination.	Population exposed: < 1% Low 1%-10% Medium >10% High Property damaged or destroyed: < 1% Low 1%-10% Medium >10% High
Maximum Threat	Maximum threat is the worst-case scenario of a hazard. Its impact is expressed in terms of human casualties and property loss. Secondary events need to be factored in where necessary.	Area of town impacted: < 5% Low 5%-25% Medium >25% High
Probability	Probability is the likelihood an event will occur. History and probability are similar; however, two criteria are used to distinguish between newly developing hazards and hazards for which there is a lack of historical information.	Chance per year of disaster: < .1% Low .1%-10% Medium >10% High

Vulnerability Assessment

The assessment based on the following analyses indicates that Pontotoc County is vulnerable at some level to all hazards studied in this document.

Table 3–4: Hazard Vulnerability for Pontotoc County Communities

Jurisdiction	Flood	Tornado	High Winds	Lightning	Hailstorm	Winter Storm	Extreme Heat	Drought	Expansive Soils	Urban Fire	Wildfire	Earthquake	Fixed Site HazMat	Dam Failure	Transportation Event
Unincorporated Pontotoc County	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Town of Allen	x	x	x	x	x	x	x	x	x	x	x	x	x		x
Town of Byng	x	x	x	x	x	x	x	x	x	x	x	x	x		x
Town of Fitzhugh		x	x	x	x	x	x	x	x	x	x	x	x		x
Town of Francis		x	x	x	x	x	x	x	x	x	x	x	x		x
Town of Roff	x	x	x	x	x	x	x	x	x	x	x	x	x		x
Town of Stonewall	x	x	x	x	x	x	x	x	x	x	x	x			
Byng Public Schools		x	x	x	x	x	x	x	x		x	x			x
Latta Public Schools	x	x	x	x	x	x	x	x	x	x	x	x			x
Roff Public Schools	x	x	x	x	x	x	x	x	x	x		x			x
Stonewall Public Schools		x	x	x	x	x	x	x	x		x	x	x		x
Vanoss Public Schools	x	x	x	x	x	x	x	x			x	x			
Allen Public Schools		x	x	x	x	x	x	x		x		x	x		x

3.1 Floods

Flooding is defined as the accumulation of water within a watercourse or body of water and the overflow of excess water onto adjacent floodplain lands. The floodplains are the lands adjoining the channel of a river, stream, ocean, lake, or other watercourse or body of water that is susceptible to flooding.

3.1.1 Hazard Profile

Location

The South Canadian River is Pontotoc County's northern boundary and the river's southern banks and floodplains contribute to the Special Flood Hazard Area (SFHA) of Pontotoc County. The other significant rivers and streams within the county are the Blue River, Canadian Sandy Creek, Muddy Boggy Creek, and Clear Boggy Creek.

Table 3–5: FEMA Flood Insurance Rate Map Flood Zones

Zone A	The 100-year or Base Floodplain. There are six types of A zones:	
	A	The base floodplain mapped by approximate methods, i.e., BFEs, are not determined. This is often called an unnumbered A zone or an approximate A zone.
	A1-30	These are known as numbered A zones (e.g., A7 or A14). This is the base floodplain where the firm shows a BFE (old format).
	AE	The base floodplain where base flood elevations are provided. AE zones are now used on new format FIRMs instead of A1-30 zones.
	AO	The base floodplain with sheet flow, ponding, or shallow flooding. Base flood depths (feet above ground) are provided.
	AH	Shallow flooding base floodplain. BFE's are provided.
	A99	Area to be protected from base flood by levees or Federal flood protection systems under construction. BFEs are not determined.
	AR	The base floodplain that results from the de-certification of a previously accredited flood protection system that is in the process of being restored to provide a 100-year or greater level of flood protection.
Zone V and VE	**V**	The coastal area subject to velocity hazard (wave action) where BFEs are not determined on the FIRM.
	VE	The coastal area subject to velocity hazard (wave action) where BFEs are provided on the FIRM.
Zone B and Zone X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100-year and the 500-year floods. B zones are also used to designate base floodplains or lesser hazards, such as areas protected by levees from the 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.	
Zone C and Zone X (unshaded)	Area of minimal flood hazard, usually depiction FIRMs as exceeding the 500-year flood level. Zone C may have ponding and local drainage problems that do not warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood.	
Zone D	Area of undetermined but possible flood hazards.	
Source: *Understanding Your Risks, identifying hazards and estimating losses, FEMA 386-2*		

Extent

Flood planning is based on what are termed "100-year floods" or "500-year floods." That terminology is somewhat misleading. Floods are more commonly being referred to as having a 1% chance of occurring in any given year (100 year event), or .2% chance of occurring in any given year (500 year event).

FEMA has established the 100-year flood as the base flood elevation for planning and development along waterways. Only Pontotoc County, the City of Ada and the Town of Byng are members of the National Flood Insurance Program (NFIP) and have adopted regulations making the 100-year flood the baseline for planning and development. Allen has withdrawn from the NFIP, and Stonewall was once a member and has been sanctioned. The towns of Fitzhugh and Francis have no mapped SFHA within their boundaries. Unincorporated communities in Pontotoc County are included in the NFIP because of Pontotoc County's membership.

Of the schools participating in the plan, only Byng and Stonewall Schools have not reported and flooding damages in the past. Although none of the schools are located in the SFHA of the county, all other schools reported some damages from DR-4222. Stonewall School, the Stonewall Campus, does have a portion of their property (N Side) located in SFHA, however it is open ground with the nearest structure on an elevated pad 80 feet outside the boundary of the SFHA.

Pontotoc County and participating jurisdictions consider a rainfall of one inch in an hour to be a minor severity and a six inch rainfall in two hours to be a major event for both Urban and Flash Flooding.

Pontotoc County Rivers and Streams

Pontotoc County consists of rolling prairies, forested slopes, and some rough hilly terrain. The entire southern portion of the county consists of a high plain, 1100 to 1300 ft above sea level, which drains to the southeast into tributaries of the Blue River. The rolling plain extending across the northern portion of the county has an elevation of 800 to 1100 feet and drains northward and eastward into tributaries of the Canadian River. The east and southeast portions drain into Muddy Boggy and Clear Boggy creeks. The extreme southwestern part of the county drains into Guy Sandy Creek, the Lake of the Arbuckles and the Washita River. Virtually all of the towns of Pontotoc County were built on high ground and are not subject to riverine flooding.

Canadian River. The 760-mile-long Canadian River flows from its headwaters in the Sangre de Cristo Mountains of southern Colorado through east central New Mexico, east across the Texas Panhandle into Oklahoma, along the northern boundary of Pontotoc County, before joining the Arkansas River near Fort Smith, Arkansas. The Canadian River is dammed east of Eufaula, forming Eufaula Reservoir. Pontotoc County communities in the Canadian River drainage are Byng and Francis. Significant tributaries of the Canadian River in Pontotoc County are Canadian Sandy, Spring Brook, and Little Sandy Creeks.

Canadian Sandy Creek. Flows east and north along the west boundary of Ada into the Canadian River. Ada has studied the feasibility of building a municipal lake on the Canadian Sandy, about 1 mile west of the city. The proposed Scissortail Lake would impound a reservoir at about 937 feet elevation, and does not appear to pose a

hazard for Ada or Latta, which have no development in this basin lower than about the 950 feet contour. The Town of Vanoss is located on Burris Creek in the Canadian Sandy drainage.

Spring Brook Creek. This stream flows east from near Stratford in Garvin County to join Canadian Sandy Creek about one mile west of Ada. The communities of Center and Pickett are in the Spring Brook drainage, but are built well above the floodplains of the creek.

Little Sandy Creek. Drains 5.2 square miles in Ada and flows north into Canadian Sandy Creek. Ada's wastewater treatment plant is located on this stream, on N. Mississippi. The stream passes to the south of Byng.

Clear Boggy Creek. All streams on the south side of Ada flow into Clear Boggy Creek. The creek flows southeast into the Muddy Boggy and eventually into the Red River. The community of Ahloso is along Clear Boggy Creek, and the communities of Fittstown, Union Valley, Lula and Stonewall are in the drainage basin.

Buck Creek- This stream flows south past Coil and Stonewall to join Clear Boggy Creek in Coal County, west of Tupelo. A tributary of Buck Creek also passes near Union Valley. Stonewall has structures in the Buck Creek SFHA.

Muddy Boggy Creek. The Muddy Boggy flows east from the eastern fence line of Ada and then south into the Red River near Hugo, but does not pass through any Pontotoc County communities.

Table 3-6: Watershed Rehabilitation Recovery Act Funding Awards and Transfers

State	Project/Dam Name	Original Award Amount	Net Funds Transferred to or from Project After Original Award	Award Amount After Fund Transfers
OK	Upper Clear boggy Creek No. 33	1,010,000	946,000	1,956,000
OK	Upper Clear boggy Creek No. 34	960,000	893,000	1,853,000
OK	Upper Clear boggy Creek No. 35	840,000	0	840,000
OK	Cottonwood Creek	3,610,000	226,000	3,836,000
OK	Sallisaw Creek 4,160,000	4,160,000	250,000	4,410,000
OK	Washita-Sugar Creek No. L-43	1,645,000	550,000	2,195,000
OK	Washita-Sugar Creek No. L-44	1,790,000	545,000	2,335,000

3.1.2 History/Previous Occurrences

Oklahoma's most frequent and most costly natural hazard is flooding. There are numerous flooding events on record, often with serious impacts: Eleven of the twelve events listed in NCDC for Pontotoc County were listed as Flash Floods.

Table 3–7: Floods in Oklahoma and Pontotoc County for 2010 through 2015
From Pontotoc County Emergency Office of Emergency Management

Location	*Events*	*Deaths*	*Injuries*	*Damage Events*	*Property Damage*
Pontotoc County	3	0	4	3	$2.5 M (Est. based on damage assessment conducted on county infrastructure and reports from the FEMA DRC from DR-4222.)

*** Information in NCDC does not allow for damages to a community to be separated from the county report.**

Pontotoc County Flood Events

The months of May-July of 2015 were an extremely wet period for Pontotoc County. The 79 day period beginning May 5, 2015 and ending on July 22, 2015, was the wettest on record for the county. During this period, the Ada Mesonet site recorded 39.88 of rainfall while the Fittstown Mesonet site recorded 39.11 of rainfall.

During the period, there were numerous heavy rainfall and flooding events which caused extensive damage to infrastructure and to private homes and property. Additionally, NRCS was monitoring closely all of the dams in the county for possible failures, as all of the dams in the county flowed the emergency spillways several times. Four swift water rescues were performed by the county, first responders and a total of 11 people were rescued from the floodwaters. This included a total of 4 injuries.

The rainfall listed here was measured from the Ada Mesonet site located at the Ada Airport, and the Fittstown Mesonet site located on CR 1700 16 miles south of Ada.

May 5-10-2015—Major flooding with measured rainfall during this period from the Ada Mesonet site of 8.68 and the Fittstown site measured 9.36 This heavy rainfall caused many roads to be flooded and all low water crossings in the county to become impassable. Damage assessments showed that many of the roads in the county had sustained heavy damage and many culverts were damaged or destroyed causing road closures for an extended tome. One bridge was also washed out during this event. Private home owners suffered some residential losses as well as property damages during this event. First responders had to perform two swift water rescues during this time period, and one person was injured.

May 19-29, 2015—Minor to moderate flooding during this period measured rainfall from the Ada Mesonet site was 8.68 and the Fittstown Mesonet site measured 9.57 Additional high water and some flooding occurred during this period causing additional

damages to infrastructure and private property. The NRCS dams continued to flow the emergency spillways at times and were being monitored. Rainfall occurred nearly every day with notable days on the 22nd 1.88□, 24th 1.75□, and the 27th-29th 2.96□

June 13-16, 2015—Moderate rainfall over the three day period, 3.54□measured at the Ada Mesonet site, and 4.11□measured at the Fittstown Mesonet site, produced additional minor flooding of roads and caused additional damages to roadways throughout the county. This event also served to set the county up for the major flood event which began the next day.

June 17-18, 2015—Major flooding from heavy rainfall, 6.92□at the Ada Mesonet site, and 4.56□measured at the Fittstown Mesonet site, caused major flooding of roadways and private property throughout the county. Once again county infrastructure county wide was damaged or destroyed and many home and business owners sustained severe damages to private property. Damage was also noted to the county Sheriff□s office and the office of the district Attorney. Numerous roads throughout the county were closed due to high water and some roads being destroyed. One swift water rescue was conducted during this event with one person injured.

June 29-July 3, 2015—Moderate rainfall during this period kept the county wet and the lakes and creeks near flood stages. 1.24□were measured at Ada and 3.62□at Fittstown. This rainfall caused little damage to the county, but again served as a primer to the event that occurred on the 7th and 8th of July.

July 7-8, 2015—Major flooding occurred with this heavy rainfall event. Measured rainfall of 7.92□at the Ada Mesonet site, and 5.25□at the Fittstown Mesonet site caused major flooding in the county. Infrastructure was again severely damaged or destroyed as was private property. During this rainfall event, several areas of the county extending from Roff, to Ada, to Allen measured over 8.00□of rainfall. 6.00□of this rainfall was measured during a two hour period. Most of the roadways in the affected areas were close due to high water or having been washed out. Some closures lasted for several days. NRCS was again closely monitoring dams in the county for possible dam failures as all dams in the county were flowing the emergency spillways. One swift water rescue was conducted during the time period with one person injured.

Pontotoc County was also declared under disaster declarations DR 1712/1723 in 2007 for extensive flooding county wide.

Probability/Future Events

Large storms and heavy rains will continue to frequent Pontotoc County, and the jurisdiction□s streams will overflow their banks onto the surrounding floodplains. However, since Pontotoc County communities are generally built on high ground along railroad lines, devastating flooding is not likely to increase, so long as structures are kept out of the floodplains. Stonewall and Roff are exceptions to this generalization, as both communities have many parcels and structures located in the SFHA. Stonewall appears to be particularly vulnerable, as it no longer participates in the NFIP. With the exception of

Byng School and Stonewall School, all other schools in the county reported some damages from DR-4222 in 2015.

Pontotoc County and participating jurisdictions have a medium probability of a flood event.

3.1.3 Vulnerability/Impact

Pontotoc County and participating jurisdictions were determined to be at Low risk to the Flood hazard. (See Table 3-2 Hazard Risk Analysis, and Table 3-3, Summary of Hazard Risk Analysis Ranking Criteria for an explanation of how the rankings were derived.) Appendix A identifies where the Incorporated Communities and Public School Systems differ from Pontotoc County.

FEMA has identified the areas within Pontotoc County jurisdiction that have a one-percent chance of flooding in any given year. These areas, commonly referred to as the 100-year floodplain, are designated as the Special Flood Hazard Area (SFHA) on FEMA's Flood Insurance Rate Maps (FIRM). The SFHA identifies the National Flood Insurance Program's (NFIP) minimum national standard, and reflects development conditions at the time the study was done. The following table shows the total number of parcels in Pontotoc County which are touched by a designated SFHA. The following paragraphs look at each of the incorporated communities individually. More detail on the SFHA in each community is presented in Appendix A.

Table 3–8: Pontotoc County Improved Parcels Touched by SFHA

GIS Floodplain Analysis	*#*	*Market Value*
Parcels With Improvement Values Touched by the Floodplain	795	$27,239,043
Flood Insurance Information		
Policies in Force	24	$3,602,000
Paid Premiums	24	$14,485
Total Number of Losses Paid(2010 Numbers)	2	$6813.51

Floodplains of Pontotoc County Pontotoc County has approximately 160 structures located within the SFHAs of its various rivers and streams. This number is an approximation using GIS analysis, 2011 aerial photography, and from data from the County Assessor's office. None of these structures are schools, and not all are dwellings, many of these structures are accessory structures such as barns or sheds. The most vulnerable populations to flooding in Pontotoc County are those living or working in structures located in the SFHA, particularly in the Pickett area, in or near the towns of Stonewall and Roff, and in the floodplains of the Canadian Sandy Creek, Clear Boggy Creek, Muddy Boggy Creek, and the Blue River.

There are no county critical facilities situated in the 100-year floodplain. The towns of Roff, Stonewall, and Allen have waste water treatment facilities located in the SFHA, and OG&E has a power substation located in the SFHA at Roff. None of the school districts

have facilities in the SFHA. Transportation facilities in Pontotoc County, such as roads and bridges, are vulnerable to flood damage, as are some electrical facilities and parts of the water distribution system.

3.1.4 Sources

Extreme Weather and Climate Events at National Climatic Data Center website: www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms.

FEMA Flood Insurance Statistics at Website: www.fema.gov/cis/OK.pdf.

3.2 High Winds and Tornados

Wind is defined as the motion of air relative to the earth's surface. Extreme windstorm events are associated with cyclones, severe thunderstorms, and accompanying phenomena such as tornadoes and downbursts. Winds vary from zero at ground level to 200 mph in the upper atmospheric jet stream at 6 to 8 miles above the earth's surface. The mean annual wind speed in the mainland United States is reported by FEMA to be 8 to 12 mph, with frequent speeds of 50 mph and occasional wind speeds of greater than 70 mph.

A tornado is a rapidly rotating vortex or funnel of air extending to the ground from a cumulonimbus cloud. When the lower tip of a vortex touches earth, the tornado becomes a force of destruction. The path width of a tornado is generally less than a half-mile, but the path length can vary from a few hundred yards to dozens of miles. A tornado moves at speeds from 30 to 125 mph, but can generate winds exceeding 300 mph.

3.2.1 Hazard Profile

Location

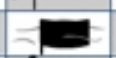
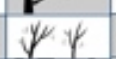
The entire jurisdiction of Pontotoc County is considered to be vulnerable to the effects of a high wind or tornado event. Each school district is also vulnerable to the effects of a high wind or tornado event. All school districts included in the plan have shelters.

Extent

Various wind scales and resultant damages include the Beaufort and the Fujita measurement scales. The table below containing the Beaufort Scales of Wind Strength shows what wind speeds produce various damages.

Table 3–9: Beaufort Scale of Wind Strength
Source: Huler, Scott (2004). ***Defining the Wind: The Beaufort Scale***

Beaufort Scale

Beaufort number	Wind Speed (mph)	Seaman's term		Effects on Land
0	Under 1	Calm		Calm; smoke rises vertically.
1	1-3	Light Air		Smoke drift indicates wind direction; vanes do not move.
2	4-7	Light Breeze		Wind felt on face; leaves rustle; vanes begin to move.
3	8-12	Gentle Breeze		Leaves, small twigs in constant motion; light flags extended.
4	13-18	Moderate Breeze		Dust, leaves and loose paper raised up; small branches move.
5	19-24	Fresh Breeze		Small trees begin to sway.
6	25-31	Strong Breeze		Large branches of trees in motion; whistling heard in wires.
7	32-38	Moderate Gale		Whole trees in motion; resistance felt in walking against the wind.
8	39-46	Fresh Gale		Twigs and small branches broken off trees.
9	47-54	Strong Gale		Slight structural damage occurs; slate blown from roofs.
10	55-63	Whole Gale		Seldom experienced on land; trees broken; structural damage occurs.
11	64-72	Storm		Very rarely experienced on land; usually with widespread damage.
12	73 or higher	Hurricane Force		Violence and destruction.

Pontotoc County considers a minor severity wind event to be a 9 on the Beaufort Scale and lower (Strong Gale, below 54 mph), and a major severity storm to be a 10 or above on the Beaufort Scale (Whole Gale/Storm) with winds 55-mph and higher.

Almost 70% of all tornadoes are measured F0 and F1 on the Fujita Tornado Scale (see Table 4-10), which cause light to moderate damage, with wind speeds between 40 and 112 miles per hour. F4 and F5 tornadoes are considerably less frequent, but are the big killers. Sixty-seven percent of all tornado deaths were caused by F4 and F5 storms, which represent only 1% of all tornadoes. A description of the Enhanced Fujita Scale (EF) are included in Table 4-10. Additional information on the Enhanced scale is available at http://www.spc.noaa.gov/efscal.

Pontotoc County and participating jurisdictions consider an EF0 with minimum damage to be a minor severity and an EF0 or greater to be major.

Table 3–10: Fujita Scale and Enhanced Fujita Scale

Fujita Scale			EF Scale	
Category	***Wind Speed (mph)***	***Current Damage Indicators***	***Category***	***3 Second Gust (mph)***
F0	Gale (40-72)	***Light***: Damage to chimneys, tree branches, shallow-root trees, sign boards	EF0	65-85
F1	Moderate (73-112)	***Moderate***: Lower limit is beginning of hurricane wind speed--surfaces peeled off roofs, mobile homes pushed off foundations or overturned, cars pushed off roads	EF1	86-110
F2	Significant (113-157)	***Considerable***: Roofs torn off frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted, light-object missiles generated	EF2	111-135
F3	Severe (158-206)	***Severe***: Roofs and some walls torn off well-constructed houses, trains overturned, most trees in forest uprooted, cars lifted off the ground and thrown	EF3	136-165
F4	Devastating (207-260)	***Devastating***: Well-constructed houses leveled, structures with weak foundations blown off some distance, cars thrown and large missiles generated	EF4	166-200
F5	Incredible (261-318)	***Incredible***: Strong frame houses lifted off foundations and carried considerable distance to disintegrate, automobile-sized missiles fly through the air in excess of 100 yards, trees debarked	EF5	Over 200
The F-scale and Enhanced F-scales are a set of wind estimates (not measurements) based on damage. The Enhanced Scale uses three-second gusts estimated at the point of damage based on a judgment of 8 levels of damage to the 28 indicators listed below. These estimates vary with height and exposure.				

Structures Used as Damage Indicators in the Enhanced Fujita Scale	
Small barns, farm outbuildings	One- or two-family residences
Single-wide mobile home (MHSW)	Double-wide mobile home
Apartment, condo, townhouse (3 stories or less)	Motel
Masonry apartment or motel	Small retail building (fast food)
Small professional (doctor office, branch bank)	Strip mall
Large shopping mall	Large, isolated ("big box") retail building
Automobile showroom	Automotive service building
School - 1-story elementary (interior or exterior halls)	School - middle or senior high school
Low-rise (1-4 story) bldg.	Mid-rise (5-20 story) building
High-rise (over 20 stories)	Institutional building (hospital, govt. or university)
Metal building system	Service station canopy
Warehouse (tilt-up walls or heavy timber)	Transmission line tower
Free-standing tower	Free-standing pole (light, flag, luminary)
Tree - hardwood	Tree - softwood

On February 1, 2007, the Fujita scale was decommissioned in favor of the more accurate Enhanced Fujita Scale, which replaces it. None of the tornadoes recorded on or before January 31, 2007 will be re-categorized. Therefore maintaining the Fujita scale will be necessary when referring to previous events.

3.2.2 History/Previous Occurrences

Pontotoc County Historic Wind Events

April 23, 2003 – A barn was destroyed near Vanoss. Approximately $5,000 in damage.

May 16, 2003 - Straight-line wind gusts ranging from 60 to 70 mph caused sporadic damage along a path approximately 17 miles long, from Latta to Allen, with Ada receiving the worst damage. One home was damaged in Latta. The Red Cross reported 85 homes damaged along the path with lots of shingle and roof damage. Several businesses in Ada were also damaged. Numerous trees were damaged with large limbs downed near the courthouse. A nursing home lost a portion of its roof. Several garage doors were blown in across the area. Some debris from factories in Ada was found approximately 4 miles east of town. Damage was estimated at $300,000.

March 4, 2004 – Several roofs were damaged and a tree blown down in Roff. Approximately $30,000 in damage. In Ada, power poles were downed, several small sheds were destroyed, and Brooke Trailer Park sustained some damage.

March 30, 2007 - Damage reported to trees at Harden City, with one foot diameter limbs torn off.

April 29, 2009 – Severe straight-line winds as high as 95 mph were reported from Fitzhugh to northeast of Ada. One home, two barns, and three smaller outbuildings were destroyed. An 8 x 40 foot single wide trailer was turned over. Three more barns sustained damaged,

along with the Pontotoc County Agri-Plex and an airport hangar at the Ada Airport. Numerous large trees were downed or severely damaged. The airport measured a 65 mph gust, a 71 mph gust was measured the Agri-plex, and a mesonet station 2 miles north-northeast of Ada measured a 64 mph gust. The majority of this damage was noted from six miles west-southwest of Latta to 3 miles west of Latta and on the north side of Ada. Although a small tornado may have occurred west-southwest of Latta, the majority of damage was from severe thunderstorm winds estimated around 90 to 95 mph.

Pontotoc County Historic Tornado Events

March 21, 1991 – F3 – 350 yards in width with an 11-mile track, with estimated damages nearing $1,000,000. This tornado moved ENE from 6.5 miles west of Ada to 4 miles NE of Ada, then turned the NNW, ending 6 miles NE of the city. Six frame homes were destroyed along the north edge of Ada and 130 others were damaged by this event and an F1 tornado that hit the town at the same time.

April 11, 2001 – F2 This tornado formed 2.5 miles SW of Jesse in Pontotoc County and tracked northeastward for 15 miles, crossed through NW Coal County, and then re-entered eastern Pontotoc County before dissipating. A mobile home and barn were destroyed, and power poles were downed 1.5 miles west of Jesse. The mobile home was picked up, thrown over a fence and completely broken apart with contents spread over a half-mile area. About 1 mile northwest of Jesse, a barn was destroyed; oil storage tanks were overturned and smashed; an oil pumping unit was overturned and torn apart; power poles were downed, and fences were blown over.

Probability/Future Events

With 78 high wind events recorded within the Pontotoc County in a 12-year period (between 1995 and 2009), and 35 of these events producing reported economic damages, it is apparent that damaging high winds can be expected each year, with about 6-7 events per year, and about half of the events producing economic loss. Although there were no reported injuries from these events, injuries in the past from high winds in Pontotoc County indicate that casualties are a very real likelihood in future events. Additionally tornadoes can, and do appear in nearly all months of the year at all hours of the day, so it is important that even in light activity years, education and preparations continue to move forward.

Pontotoc County and its participating jurisdictions have a high probability of future high wind and tornado events.

Pontotoc County has been hit by 40 reported tornado events according to the NCDC severe storms database in the last 65 years, which equates to a frequency of .62 per year.

3.2.3 Vulnerability/Impact

This section summarizes information about Pontotoc County s vulnerability to High Winds and Tornadoes, including the impact on people, structures and buildings, critical facilities, and infrastructure. This information, as well as information provided by the

County, Incorporated Communities and Public Schools, was used to determine the Vulnerability Criteria identified in Tables 3-2 and 3-3. Pontotoc County was determined to be at High risk to the High Wind and Tornado hazard. (See Table 3-2 Hazard Risk Analysis, and Table 3-3, Summary of Hazard risk Analysis Ranking Criteria for an explanation of how the rankings were derived.) Appendix A identifies where the Incorporated Communities and Public School Systems differ from Pontotoc County.

Population

The people most vulnerable to high wind-related deaths, injuries, and property damage are those residing in mobile homes and deteriorating or poorly constructed homes. However, as shown by the record of damaging wind events, such as the 80-95 mph event of April 29, 2009, Pontotoc County is at risk from high winds, downbursts, toppled trees and fallen power lines.

Those living in mobile homes are significantly more vulnerable to the effects of a tornado than any other identifiable population. While the number of mobile homes is a small fraction of total residential dwellings, the number of deaths in mobile homes significantly exceeds the number of deaths associated with inhabitants of permanent homes.

Also at an increased risk for these events are members of the hard-of-hearing/deaf community, people for whom English is not their primary language and those without access to broadcast media messages (television or radio) alerting them of approaching severe weather. While much progress has been made in expanding communication resources for these individuals, there is still a large number of residents facing these challenges unable to receive vital warnings in a timely manner.

Structures/Buildings

Property damage and loss of life from windstorms are increasing due to a variety of factors. Use of manufactured housing is on an upward trend, and this type of structure provides less resistance to wind than conventional construction. Tornado damage is a factor of severity and location, both on a landscape scale □rural/urban areas □and on a structure-by-structure scale. An F4/F5 tornado in an urban area will create phenomenal damage, as experienced with the tornadoes that struck Greensburg, KS (F5, 5/4/2007) and Picher, OK (F4, 5/10/2008), but damage to structures will vary depending on how they are constructed. For example, mobile homes are more easily damaged than permanent structures, buildings with crawl spaces are more susceptible to lift, and foundation and roof construction can increase or decrease the structure□s vulnerability.

With the high percentage of older homes in Pontotoc County as a whole, (47.8% of homes in the county were built prior to 1969), the jurisdiction is particularly vulnerable to wind damage. See Table 1-8 for percentages of homes built prior to 1969, 1959 and 1939. Almost half of the residential structures in Allen, Francis, Fitzhugh and Stonewall were built prior to 1959.

Structures utilizing more modern-looking building materials (reflective glass facades, open breezeways between wings, etc.) should be considered more vulnerable to damage from a tornado. Wind-driven debris (wood, metal, other larger items picked up by larger funnels) can cause catastrophic damage to buildings.

Critical Facilities

All critical facilities within Pontotoc County should be considered vulnerable to the effects of a high wind or tornado event. Structural integrity may be compromised if in the direct path of the storm, in addition to secondary impacts, such as power disruption, water damage from accompanying rain, injury to workers/residents, etc. For a complete list of critical facilities for Pontotoc County, see Table 1-9.

Infrastructure

Water Treatment – Most significant effect during a high wind or tornado would be loss of electrical power. Although this would have less of an impact on Ada's water supply, as it is gravity fed and requires little in the way of treatment, it would impact pumps and treatment facilities of Stonewall, Roff, Francis and Allen.

Wastewater Treatment – The most significant threat to the operation of wastewater treatment facilities during a high wind or tornado would be power outages.

Utilities – Pontotoc County's primary electrical service is provided by Oklahoma Gas & Electric (OG&E) based in Oklahoma City, with service in Allen provided by American Electric Power, and Public Service Company of Oklahoma, with state offices in Tulsa.

Electricity – During a high wind or tornado event, providers of electrical service could experience any combination of the following challenges in meeting the needs of Pontotoc County: Destruction of distribution and transmission poles, downed broken power lines, danger to workers derived from downed power lines, and fallen debris from trees or insufficient field and/or office staff to effectively handle the workload.

Gas: During a high wind or tornado event, providers of gas service to a community could experience a variety of challenges, such as broken gas lines; fallen power lines or tree debris; inaccessibility to underground gas meters from debris; extreme temperatures; and insufficient field and/or office staff to effectively handle workload generated by the event.

Transportation Systems (Highways, Public Transportation, Railway, Airports) – High Wind or Tornado conditions could result in the interruption of normal operations at Ada's Municipal Airport, as occurred after the F3 tornado that struck the city on April 20, 1973.

Emergency Services – Fire, Police and Medical Services are all similarly at risk to secondary effects of a tornado, such as downed power lines or debris blocking county and community roads and streets. Excessive debris in the streets could lead to damage to emergency vehicles, potentially reducing the number of vehicles available for response. Medical Services (including treatment facilities) could be strained in responding to large numbers of injuries.

3.2.5 Sources

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Talking About Disaster: Guide for Standard Messages, p. 109. National Disaster Education Coalition, Washington, D.C., 1999.

The Central Oklahoma Tornado Outbreak of May 3, 1999, at Website: www.srh.noaa.gov/oun/storms/19990503/intro.html National Oceanic and Atmospheric Administration. 19.

National Weather Service Storm Prediction Center, at Website: http://www.spc.noaa.gov/climo/index.html.

3.3 Lightning

Lightning is generated by the buildup of charged ions in a thundercloud. When the buildup interacts with the best conducting object or surface on the ground, the result is a discharge of a lightning bolt. Thunder is the sound of the shock wave produced by the rapid heating and cooling of the air near the lightning bolt. The air in the channel of a lightning strike reaches temperatures higher than 50,000° Fahrenheit.

Lightning can strike 10 miles out in front of an advancing rain column

3.3.1 Hazard Profile

Location

Lightning can strike ten miles out from the rain column, and lightning deaths often occur under a clear sky ahead of the storm. This is largely because people wait until the last minute to seek shelter □not fully comprehending the true danger of lightning.

As lightning is a by-product of thunderstorms, the entire jurisdiction of Pontotoc County is subject to the exposure and effects of lighting events.

Extent (Magnitude/Severity)

According to information provided by the Tulsa, OK National Weather Service (NWS) office, cloud-to-ground (CG) lightning is classified as either negative or positive. Positive CG flashes make up approximately 5-10% of the total CG lightning. Positive CG flashes typically originate in the upper portion of thunderstorms. This increases the distance between the charge region within the cloud and the earth. Stronger charge is needed to overcome the electric potential of this distance compared to negative CG flashes, which originate lower in the cloud. The result is that positive CG flashes have a higher peak current compared to negative CG flashes. Positive CG flashes may have a peak current 10x that of a negative CG flash.

The National Weather Service explained that positive CG flashes are often observed as far away as 10 miles or more from the main precipitation area of a thunderstorm due to the location of the upper charge region. This poses an extra fire danger, and can catch people who are outdoors off guard.

Once in contact with an object on the ground, a CG flash can have multiple return strokes, (this looks like a flickering flash), a continuous current, (this looks like a steady flash), or a combination of these two. Continuous current is more destructive and leads to a greater chance of fire. This is because the electricity remains in contact with an object for a longer

period of time, allowing for greater heat to build up. (Lightning can be as hot as 50,000 degrees Fahrenheit.) Positive CG flashes predominantly have continuous currents and are more likely to cause damage than negative CG flashes, due to the likelihood of continuous and high peak currents. It is important to remember that all lightning can cause damage. Based on information provided by the National Weather Service, Pontotoc County considers a negative cloud-to-ground flash with multiple return strokes, that causes no loss of life or injury and less than $1,000 in property damage, to be a minor severity lightning event; and a positive cloud-to ground flash with a continuous or high peak current, that causes loss of life and/or injury and more than $1,000 property damage, to be a major severity lightning event.

3.3.2 History/Previous Occurrences

Table 3–11: Casualties and Damages Caused by Lightning from 1995 thru 2015

From NOAA National Climatic Data Center http://www.ncdc.noaa.gov/stormevents/

Location	*Events*	*Deaths*	*Injuries*	*Damage Events*	*Property Damages*
Pontotoc County	1	1	0	0	$0

Probability/Future Events

Oklahoma and Pontotoc County are all subject to frequent thunderstorms and convective weather patterns, and are therefore vulnerable to lightning, which is a constant and widespread threat during the thunderstorm season. Future lightning strikes within the Pontotoc County jurisdictions are certain, but their locations and impacts are unpredictable.

3.3.3 Vulnerability/Impact

Population

Anyone out-of-doors during a thunderstorm is exposed to and at risk from lightning. More people are killed by lightning strikes while participating in some form of recreational activity than any other incident, source, or location. The next largest group of fatalities involves people located under trees, followed by those in proximity to bodies of water. Other common incidents are related to agricultural activity, telephone users, and people in proximity to radios and antennas.

Particularly at risk are Pontotoc County s school districts. Especially vulnerable to lightning strikes are school children playing out of doors on jungle-gym equipment during the approach of a thunderstorm.

Structures/Buildings

Oklahoma is vulnerable to frequent thunderstorms and convective weather patterns, and therefore its vulnerability to lightning is a constant and widespread threat during the thunderstorm season. Pontotoc County no exception, as demonstrated by the 5 injuries

and $110,000 damages reported between the years of 1997 and 2007. The entire jurisdiction is at risk to lightning-caused fires, damages and casualties.

Critical Facilities

All critical facilities within the jurisdiction of Pontotoc should be considered vulnerable to the effects of a lightning event. Power disruption and potential destruction of electronic equipment (computers, vital medical equipment, communication equipment, data storage, etc.) should be considered a primary threat to critical facilities. Critical facilities in Pontotoc County are listed in Table 1-9.

Infrastructure

Lightning-caused problems are one of the most common troubles faced by American business today. A recent Carnegie-Mellon study showed that 33% of U.S. businesses are affected by lightning, and that more businesses are affected by lightning storms than by floods, fires, explosions, hurricanes, earthquakes, and violence.

Electronic equipment from computers to enterprise-level communications systems can be seriously damaged by power surges from lightning. Surge protection should be included in any electronic system to minimize the risk of damage from lightning. In addition, lightning warning/detection systems (such as ThorGuard©) should be included in protection plans for critical components of the County's infrastructure, and for the County's school districts.

Water Treatment – A significant effect of a lightning event would be the loss of electrical power and damage to electrical equipment. Water plants experience power outages related to lightning and thunderstorms on a regular basis. As a rule, outages are of short in duration and affect only a portion of the facility.

Wastewater Treatment The most significant threat to the operation of the wastewater treatment plants of Pontotoc County from a lightning event would be power outages. All plants and lift stations should have either double feeds or backup generators.

Utilities- The primary utility providers for Pontotoc County are Oklahoma Gas & Electric (OG&E) based in Oklahoma City, with service in Allen provided by American Electric Power, dba Public Service Company of Oklahoma, and CenterPoint Energy (natural gas). The service stations and substations for these providers would be vulnerable to lightning events. **Electricity:** During a lightning event, providers of electrical service could experience any combination of the following challenges in meeting the needs of the County's communities: Damage to transformers or other transmission components, downed broken power lines, danger to workers derived from downed power lines, and fallen debris from trees or insufficient field and/or office staff to effectively handle the workload. **Gas:** During a lightning, providers of gas service to a community could experience a variety of challenges, such as electrical outages and insufficient field and/or office staff to effectively handle workload generated by such an event.

Transportation Systems (Highways, Public Transportation, Railway, Airports) Transportations systems would experience the same vulnerability to lightning events as other county facilities.

Emergency Services- Fire, Police and Medical Services would all be similarly at risk to the secondary effects of a lightning event. Electrical outages and the interruption of

communication capabilities are the two main vulnerabilities.

3.3.4 Sources

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3.4 Hailstorm

Hailstones can cause widespread damage to crops and automobiles and serious bodily injury

A hailstorm is an outgrowth of a severe thunderstorm in which balls or irregularly shaped lumps of ice fall with rain. Extreme temperature changes from the ground upward into the jet stream produce strong updraft winds that cause hail formation.

The size of hailstones is a direct function of the severity and size of a storm. High velocity updraft winds keep hail in suspension in thunderclouds. The greater the intensity of heating at the Earth's surface, the stronger the updraft will be. Higher temperatures relative to elevation result in increased suspension time, allowing hailstones to grow in size.

3.4.1 Hazard Profile

Location

All buildings and agricultural areas in Pontotoc County and participating jurisdictions are at risk.

Extent

Hailstones are typically measured by their diameter. The damages expected from a hail event are a function of the diameter of the hailstones and wind speed, or velocity. There have been numerous instances of hailstones reaching four inches in diameter, or grapefruit size, in Pontotoc County. When hailstones reach such dimensions, they can be extremely dangerous to property, agriculture and people caught outside, without shelter. Hailstorms are usually considered Destructive when hail reaches 2.75 inches in diameter and is accompanied by high winds. Pontotoc County and participating jurisdictions consider a minor severity to be an H2 or lower on the Combined NOAA/TORRO hailstorm Intensity Scale and a major severity to be an H3 or higher.

Table 3-12: Common Sizes and descriptions of Hail

Hail Size	Description	Hail Size	Description
0.25 inch	Pea Size	1.75 inch	Golf Ball Size
0.50 inch	Mothball Size	2.00 inch	Hen Egg Size
0.75 inch	Dime/Penny Size	2.50 inch	Tennis Ball Size
0.88 inch	Nickel Size	2.75 inch	Baseball Size
1.00 inch (Severe Criteria)	Quarter Size	3.00 inch	Teacup Size
1.25 inch	Half Dollar Size	4.00 inch	Grapefruit Size
1.50 inch	Walnut or Ping Pong Ball Size	4.50 inch	Softball Size

Source: National Weather Service

Table 3-13: Combined NOAA/TORRO Hailstorm Intensity Scales

Size Code	Intensity Category	Typical Hail Diameter (inches)	Approximate Size	Typical Damage Impacts
H0	Hard Hail	up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33-0.60	Marble or Mothball	Slight damage to plants, crops
H2	Potentially Damaging	0.60-0.80	Dime or grape	Significant damage to fruit, crops, vegetation
H3	Severe	0.80-1.20	Nickel to Quarter	Severe damage to fruit & crops, damage to glass & plastic structures, paint & wood scored
H4	Severe	1.2-1.6	Half Dollar to Ping Pong Ball	Widespread glass damage, vehicle bodywork damage
H5	Destructive	1.6-2.0	Silver dollar to Golf Ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0-2.4	Lime or Egg	Aircraft bodywork dented, brick walls pitted
H7	Very destructive	2.4-3.0	Tennis ball	Severe roof damage, risk of serious injuries
H8	Very destructive	3.0-3.5	Baseball to Orange	Severe damage to aircraft bodywork
H9	Super Hailstorms	3.5-4.0	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	4+	Softball & up	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

3.4.2 History/Previous Occurrences

The Midwest hailstorm and tornado event in April 1994 lasted four days. According to Property Claims Services in Rahway, NJ, it produced 300,000 damage claims against insurers, more than Hurricane Andrew or the Northridge earthquake. According to NOAA, the most expensive thunderstorm in United States history occurred on May 5, 1995 in the Fort Worth, Texas area. Hailstones up to four inches in diameter caused 109 hailstone-related injuries and contributed to over $2 billion in damage.

Pontotoc County has reported 160 hail events from 1995 through 2015, with no damage reported from the events. Table 4-19 lists the number of events, number of death, number of injuries, number of events that reported damages, and the amount of property damaged reported to the NCDC for Pontotoc County, Oklahoma, and the US.

Table 3–14: Casualties and Damages Caused by Hail from 2010 to 2015

Location	*Events*	*Deaths*	*Injuries*	*Damage Events*	*Property Damage*
Pontotoc County	36	0	0	0	$0

Probability/Future Events

Hail is a direct by-product of the thunderstorms that sweep across the state from spring to autumn each year. The entire Pontotoc County jurisdiction is subject to thunderstorms of varying severity, with hail present in many of these storms.

Based on history and previous occurrences from the past 10 years, Pontotoc County can expect an average of 8 hail events each year, and about 1 "Destructive" H5 event per year with hailstones 1.75 inches or larger.

The National Climatic Data Center lists 328 hail events in Pontotoc County between 1955 and 2015 that did a reported $6.5 million in damage. Since 1993, the county has been hit by 240 hailstorms. (It should be cautioned that this data often includes multiple reports of the same hailstorm – such as April 2, 1994, which generated 9 separate reports. The actual number of separate storm event days is closer to 146 in 53 years, or about 2.7hailstorm event days per year.) In this more selective counting of hail events, since 1993 (when NCDC reports began tagging events to communities) 39 have occurred in Ada, and 81 in the rest of Pontotoc County.

3.4.3 Vulnerability/Impact

Pontotoc County was determined to be at High risk to the Hailstorm hazard.

Population

Given the climatic environment in this jurisdiction, all demographic groups located within Pontotoc County are vulnerable to the effects and potential damages of hailstorm events. Particularly vulnerable are those pursuing farming and/or ranching activities, as crop damage is the highest percentage of reported hail damages. In addition, people engaged in outdoor recreational activities, such as team sports, golfing or camping, may find themselves without sufficient shelter.

Structures/Buildings

Severe hailstorms cause considerable damage to buildings and (increasingly) to automobiles, but rarely results in loss of life.
Given its significant exposure to hailstorms, virtually all buildings and structures in the jurisdiction are at risk. The entirety of Pontotoc County and Pontotoc County school districts are vulnerable to the damaging effects of hail.

Critical Facilities

All critical facilities are vulnerable to hail damage (see Table 1-9 for a complete list of Pontotoc County critical facilities). Hail, however, is unlikely to render a critical facility non-operational.

Infrastructure

Water Treatment – It is not anticipated that a hail event would cause a major disruption in the normal operation of the water treatment systems in Pontotoc County.

Wastewater Treatment – It is not anticipated that a hail event would cause a major disruption in the normal operation of Pontotoc County's wastewater treatment systems.

Utilities The primary utility providers for Pontotoc County are Oklahoma Gas & Electric (OG&E) and American Electric Power, dba Public Service Company of Oklahoma. Gas is provided by CenterPoint Energy. Neither electric power nor gas service would suffer a major disruption from hail.

Transportation Systems (Highways, Public Transportation, Railway, Airports) During a hail event, public vehicles may sustain damage. If severe enough such as a Very destructive H8 event, there could be some loss of functionality, possibly disrupting normal County operations. During a major storm that is producing hail, it is reasonable to assume that flights leaving and arriving at Ada Municipal Airport could be delayed. Aircraft on the runway during an H5 to H8 event could potentially experience some damage, especially if the event is prolonged.

Emergency Services – Fire, Police and Medical Services would all be similarly at risk to the secondary effects of a hail event. Response vehicles in the open would likely be exposed to window and/or windshield damages. A secondary effect could be an increased call and work volume for County services.

If a major hail event were to occur between 7:30 8:30 am or 5 6 pm on any weekday, the risk of commuters being caught in the event is substantially higher. Drivers seeking to pull under bridges to escape vehicle damage could cause accidents and injuries.

3.4.4 Sources

Institute for Business and Home Safety, at Web address: www.ibhs.org.

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NCDC Storm Event Database, at Web address: www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms. National Climatic Data Center.

National Weather Service: Office of Climate, Water, and Weather Services, at Web address: www.nws.noaa.gov/om/hazstats.shtml.

3.5 Winter Storms

A severe winter storm is one that drops more than 2 inches of snow or more than ¼ inch of ice. An ice storm occurs when freezing rain falls from clouds and freezes immediately upon contact.

The National Weather Service (NWS) in Tulsa issues a winter weather advisory when one to three inches of new snow is expected or icing which could make driving and walking hazardous. A winter storm warning is issued when a variety of hazardous conditions are forecast to occur across the area, or when there is difficulty in determining the type of conditions which will predominate.

3.5.1 Hazard Profile

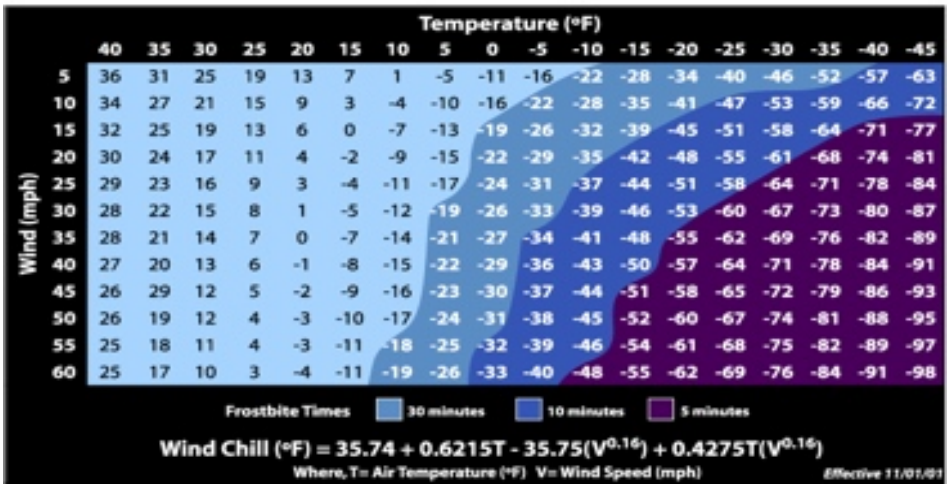
Location

Pontotoc County is considered vulnerable to the effects of a severe winter ice/snow event.

Extent

The *Wind Chill* temperature is a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a blustery 30° day would feel just as cold as a calm day with 0° temperatures. The index was created in 1870, and on November 1, 2001, the National Weather Service released a more scientifically accurate equation, which used today. The following chart is used for calculating wind chill. (Please note that it is not applicable in calm winds or when the temperature is over 50°.)

Figure 3-1: Wind Chill Chart



Pontotoc County and participating jurisdictions consider a minor severity winter storm to be a Level 2 event (ice accumulation up to ¼ inch see Table 4-21), and a major severity event to be Level 3 and above (ice accumulation above ¼ inch) resulting in power outages and hazardous travel conditions.

3.5.2 History/Previous Occurrences

Table 3–15: Casualties and Damages Caused by Winter Storms, 2010 to 2015
Source: National Climatic Data Center

Location	Events	Deaths	Injuries	Damage Events	Property Damages
Pontotoc County	2	0	0	2	$0

Pontotoc County Winter Storm Events

January 1-2, 1996 - A strong cold front moved across Oklahoma early New Year's Day, dropping temperatures into the teens and 20s. Snow began falling during the afternoon of January 1st and continued until evening of the 2nd. In Oklahoma, the southwestern end of a heavy snow band extended into Hughes and Pontotoc Counties, where 4 and 6 inches of snow were measured, respectively. Forty-two injury accidents and over 175 non-injury accidents were reported due to the slick road conditions in central Oklahoma.

November 24, 1996 - A strong arctic cold front dropped temperatures into the 20s. Precipitation changed to sleet then freezing rain then finally to snow as the temperatures fell and the cold air pushed farther south. Ice accumulated up to 1 inch thick from Holdenville to Ada to Ardmore and southeastward. Damage across southeastern and south central Oklahoma was severe. Power was out to a large portion of the area due to icing of power lines and tree limbs. Electric companies throughout south central and southeastern Oklahoma estimated that over 152,000 people were without power at some time during the storm. It took as long as 3 days to restore power to some customers. Officials in Pontotoc County reported 20 poles and numerous trees and limbs down around the county with the worst damage in Fitzhugh.

December 23, 1998 - An extended period of light freezing drizzle or light freezing rain mixed with periods of light snow and light sleet affected portions of central and southern Oklahoma. Glaze of ice formed on most roads creating treacherous driving conditions. The most significant icing occurred across Garvin, Pontotoc, and Coal Counties. Many roads had to be closed for extended periods of time due to icing and/or traffic accidents.

January 26, 2000 - A narrow band of heavy snow fell across portions of western and central Oklahoma with 8 to 10 inches reported in Ada.

December 26, 2000 - The worst ice storm in decades affected much of south central and southeast Oklahoma with a mixture of freezing rain and sleet accumulating to a depth of 1 to 2 inches. Where the precipitation fell as mainly freezing rain, ice accumulations were about 1 inch. Damage to property was extensive with the greatest damage observed in a narrow corridor from Cotton County northeastward through Pontotoc and Hughes County. Thousands of homes and vehicles were damaged by falling trees and ice, while thousands of additional trees and utility poles were damaged or destroyed. Tens of thousands of residents were left without electricity for nearly a week. Statewide, near 170,000 residents were without electricity on the December 26 and 27.

January 12-14, 2007 - A strong winter storm crippled much of Oklahoma with snow, freezing rain and sleet. Freezing rain and sleet occurred mainly over central and southwest Oklahoma. The wintry precipitation caused numerous traffic accidents and 14 indirect fatalities. Many trees and powers lines were downed leaving thousands of residents without power in southern and eastern Oklahoma. The severe cold and ice

caused two awnings to collapse in Allen and Ada. Airports, schools, malls and other businesses closed, and many schools remained closed for several days after the winter precipitation had ended. The Governor of Oklahoma issued an Emergency Declaration for all 77 counties in the state.

December 9-11, 2007 - One half inch of ice accumulated in Ada. A devastating ice storm affected a large swath of Oklahoma beginning on the 9th and continuing through the 11th over parts of the area. The storm left behind a trail of severe damage to trees and power lines, which in turn led to the worst power outage in Oklahoma history (in terms of the number of people impacted). By the time the storm had ended, over one inch of ice had accumulated over a good portion of Oklahoma. The governor declared a State of Emergency for all 77 Oklahoma counties. At least 27 deaths were reported statewide, mainly due to hundreds of automobile accidents, although some were due to prolonged cold air exposure or carbon monoxide poisoning. Tree, power line and power pole damage was widespread, resulting in 641,000 electric customers without power (the actual number of people was likely much larger). Electrical crews from dozens of states worked 12-hour shifts to restore power. More than 150,000 residents were still without power one week later. Even city water and sewage plants were without power, making them unable to pump water for a short time. Fallen power lines created another hazard as the broken lines sparked structure fires. Fire departments responded to over 100 structure fires in all. Other fires were caused by portable heating sources inside the home. Schools, churches, and local businesses had to close, some for several days due to the power outages. Local economies took a huge hit. The pecan crop loss alone was estimated at $25 million statewide. Shelters were opened across the state. The storm cleanup was estimated to cost at least $200 million statewide. Cities removed over 750,000 cubic yards of debris. The Governor of Oklahoma issued an Emergency Declaration for all 77 counties in the state.

December 24-25, 2009 – DR 1876 – A severe winter storm produced sleet and freezing rain which produced up to 1 □of ice accumulation on roadways, trees, and powerlines. Pontotoc County and participation jurisdictions experienced road closures, roads being impassable due to debris, and power outages. Assessed damages in the county were in excess of $120,000.00 to public facilities.

January 28-30, 2010 – DR 1883 – A severe winter storm produced freezing rain that resulted in large accumulations of ice and record freezing temperatures which caused injuries, fatalities, and considerable damages to public and private properties. Many roads were closed due to ice and debris and power was out across the jurisdiction. Assessed damages to public infrastructure was in excess of $900,000.00.

Probability/Future Events

Based on 32 winter storm events in the 20-year period from 1995 to 2015, Pontotoc County can expect one winter storm each year, and a severe ice storm every 3 years that significantly disrupts businesses, schools and transportation.

Oklahoma averages 24 winter storm events each year. Occurrences of daily low temperatures below freezing range from an average of 140 days per year in the western panhandle to 60 days in the Red River plain in southeastern Oklahoma. Occurrences of daily high temperatures below freezing range from an average of 15 days per year in portions of north central and northwest Oklahoma to three days per year in the southeast.

3.5.3 Vulnerability/Impact

Pontotoc County was determined to be at High risk to the hazard.

Population

A broad spectrum of any community's population is vulnerable to the effects of winter storms. People who travel in winter storms are at the most risk. 70% of winter storm-related deaths occur in cars, more than the number of people caught out in the storm. The elderly are also at risk due to poor health and frequent isolation. People over 60 years of age account for half of all exposure-related deaths. According to NOAA, 50% of hypothermia cases occurred in people over the age of 60. In addition, more than 75% of all hypothermia victims were found to be male. Exhaustion and heart attacks caused by overexertion are also likely causes of winter storm-related deaths. The homeless population is also at high-risk to the effects of a severe Winter Event.

As witnessed to by the 30 winter storm events between 1995 and 2009, Pontotoc County and its communities have a high vulnerability to winter storms, including all future development areas.

Structures/Buildings

A direct threat to structures/buildings from a severe winter event would be excessive snow/ice accumulation onto flat / low grade sloped roofing surfaces. This would be especially true of older structures that were not constructed to withstand that type of stress. More indirect threats to structures/buildings would be from power outages causing interruption to heating (loss of supplies, food, sensitive equipment) and frozen water pipes (excessive flooding causing damage to interior and sensitive electronic equipment if pipes break) and; fires caused by power lines being torn away from structure or power surges when power is restored.

Critical Facilities/Schools

During a winter event, all critical facilities in Pontotoc County, including the Public Schools, would be vulnerable to power outages, structural damage, frozen pipes, water damage to equipment, and the interruption of vital services. Road closures and blockages from ice/snow accumulation or downed trees are expected as well as damage to roadways and parking lots from extended exposure to ice coating and ice removal.

Extensive power outages can force hospitals and other emergency services to rely on generators for extended periods, as during the winter storm of November 24, 1996.

Infrastructure

Water Treatment – Most significant effect during a winter event would be from loss of electrical power, delays to chemical deliveries (road inaccessibility), personnel and staffing issues. Water treatment plants are particularly vulnerable to long-term power loss. During the 2007 ice storm in Tulsa, the City's Mohawk Water Treatment Plant was offline for 4 days, due to the loss of power from its dual feed lines.

Wastewater Treatment – The most significant threat to the operation of Pontotoc County's wastewater treatment plants during a winter storm would be power outages.

Utilities: As shown by the November 24, 1996 winter storm, damage to utility infrastructure can cause staggering losses in the wider economy.

Electricity – Pontotoc County s electric power is provided Oklahoma Gas & Electric (OG&E) and Peoples Electric Cooperative, with small populations covered by PSO. During a winter event, providers of electrical service could experience any combination of the following challenges in meeting the needs of Pontotoc County customers: Destruction of distribution and transmission poles, downed broken power lines, staffing issues due to the inclement weather (some workers may not be able to get out of their homes), danger to workers derived from downed power lines, hazardous road conditions and fallen debris from trees or insufficient field and/or office staff to effectively handle the workload.

During the November 1996 storm, over 150,000 people were without power at some point during the storm. It took as long as 3 days to restore power to some customers. Pontotoc County officials reported 20 power poles and numerous trees and limbs downed as a result of the storm.

Gas During a winter event, providers of gas service to a community could experience a variety of challenges, including: damage to gas meters from ice accumulation, falling power lines or tree debris, inaccessibility to underground gas meters from fallen debris, danger to field employees related to road conditions, downed power lines, extreme temperatures, and insufficient field and/or office staff to effectively handle workload generated by such an event.

Transportation Systems (Highways, Public Transportation, Railway, Airports) – All manner of transportation would be at risk during a winter event in Pontotoc County. Road closures due to ice/snow accumulation can result in loss of retail trade, wages and tax revenue. Such closures sometimes cost $10 million/day in the eastern part of the country. The inability of public transportation (taxis, buses) to function after a winter event can also contribute to increased risk to the population if it hampers access to necessary medical care or safe shelter.

Flight delays cost an average of $3.2 billion annually for air carriers in the United States. Will Rogers Airport in Oklahoma City was closed for several days during the November 1996 storm. In addition to delaying the transportation of goods and materials, passengers were stranded, and the impassability of roads in the area stranded fliers at the airport.

Emergency Services- Fire, Police and Medical Services would all be vulnerable to the same potential effects of a Winter Storm event. Staffing issues due to the weather (some workers may not be able to get out of their homes), danger to workers derived from downed power lines, hazardous road conditions and fallen debris from trees, and insufficient field and/or office staff to effectively handle the workload would be expected in all areas.

Additionally, the fallen debris or impassable roads could potentially hamper effective response times for emergency calls and hazardous road conditions add to the risk of accidents for responders, therefore potentially reducing both fleet resources and

manpower (injuries)

3.5.4 Sources

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3.6 Extreme Heat

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.

3.6.1 Hazard Profile

Location

Extreme heat is a hazard that impacts the entire jurisdiction of Pontotoc County, but particularly the aged, the poor, the obese, those with heart problems, and people who work out of doors. See Figures 1-5, and 1-6 for demographic data on locations of elderly and low income in Pontotoc County.

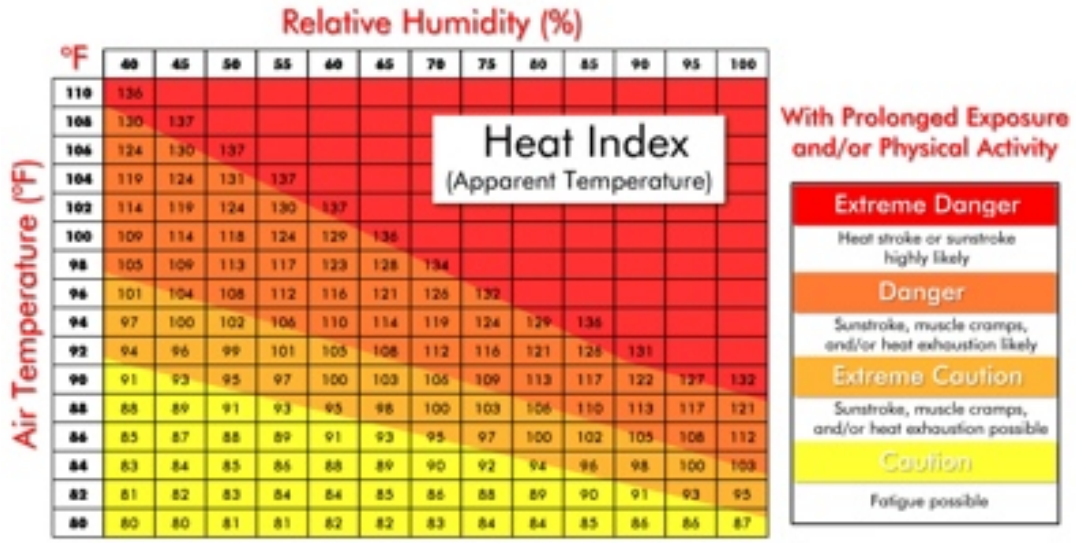
Extent

The Heat Index and Heat Disorders table relates index ranges with specific disorders, particularly for people in the higher risk groups. The heat index illustrates how the human body experiences the combined effects of high temperature and humidity. It more accurately reflects what the body experiences than simply measuring the air temperature. For example, when the air temperature is 98° Fahrenheit and the relative humidity is
50%, the human body experiences the discomfort and stress equivalent to 113° Fahrenheit with no humidity.

The extent of the extreme heat hazard is largely dependent on the weather conditions occurring across the jurisdiction. High heat events typically will not affect property as adversely as vulnerable populations.

Over the past ten years, the average high temperature for July and August in the Pontotoc County area has been 93 degrees F with an average humidity of 56%, which puts the area in the Extreme Caution category on the National Weather Service (NWS) Heat Index scale, without factoring in relative humidity.

Figure 3–2: Heat Index Chart



Sustained high temperatures are a hazard that impacts the entire county, but particularly the aged, the poor, the obese, those with heart problems, and people who work out of doors. The impact of the extreme heat hazard can be mitigated by notifications and warnings to vulnerable populations, the establishment of cooling rooms, utility cost assistance programs, backup electric generation for critical facilities, Medical Reserve Corps training, and similar measures.

Extreme heat also puts pressure on electrical grids as people crank up air conditioners, often resulting in widespread power outages. Blackouts and brownouts from overloaded grids can further increase the risk of heat-related injuries and deaths among the vulnerable populations.

Pontotoc County and participating jurisdictions consider a heat event of minor severity to be one with temperature and humidity in the Extreme Caution and below range on the Heat Index; a major severity event is a period of 5 days or more with temperature and humidity in the Danger and above range, and nighttime temperatures not falling below 80 degrees.

Frequency

Pontotoc County has experienced two major heat waves in the past 15 years: in 2001 and 2006. Based on this limited data, extended periods of temperatures above 100 degrees Fahrenheit can be expected at least once every 7.5 years.

Impact

The impact of extreme heat is primarily the danger to people, resulting in muscle cramps, nausea, heat exhaustion, heat stroke, and death, but it can also increase the risk of and impacts from wildfire and drought.

3.6.2 History/Previous Occurrences

Table 3–16: Casualties and Damages Caused by Extreme Heat 2010 to 2015

Location	Events	Deaths	Injuries	Damage Events	Property Damages
Pontotoc County	0	0	0	0	0

Source: National Climatic Data Center

Pontotoc County Extreme Heat Events

Pontotoc County has reported two extreme heat events since 1997, which included:

July 4-31, 2001 - An extended period of excessive heat affected all of western and central Oklahoma. Most areas experienced temperatures at or above 100 degrees, particularly western and north central Oklahoma. Eight fatalities resulted from the heat in Oklahoma. No deaths were reported in Pontotoc County because of this event.

July-August, 2006 The triple digit heat that began at the end of July continued through the first half of August across Oklahoma. Overnight lows remained high with temperatures only falling into the upper 70s to low 80s most nights. A woman was found dead in her home in Ada. The air conditioner was not on in this home. Emergency services also made numerous calls across the area due to heat related illnesses. The heat

caused several streets to buckle across the area.
No recent events have happened in the last 5 years due to extreme heat.

Probability/Future Events

Extreme heat will continue to be a vulnerability for the residents of Pontotoc County, with temperatures in the mid-90s through much of July and August. Extreme heat waves, with temperatures in the triple digits for two and three weeks at a time can be expected every 4 to 5 years.

3.6.3 Vulnerability/Impact

Pontotoc County was determined to be at High risk to the Extreme Heat hazard.

3.6.4 Sources

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3.7 Drought

Drought is a normal, recurrent feature of climate, although many erroneously consider it a rare and random event. It occurs in virtually all climate zones, but its characteristics vary significantly from one region to another. Drought is defined as a climatic dryness severe enough to reduce soil moisture and water below the minimum necessary for sustaining plant, animal and human life systems. Drought is caused by a deficiency of precipitation, which can be aggravated by high temperatures, high winds, and low relative humidity. Duration and severity are usually measured by deviation from norms of annual precipitation and stream flows.

3.7.1 Hazard Profile

Location

Pontotoc County is at risk from Drought.

Extent

Different methods are used to predict the severity and impact of droughts, but each one measures different aspects or types of drought. Any single index cannot describe everything about the original data, and the indices are only approximations of real-world phenomena.

Pontotoc County considers a minor severity drought to be Mild or Moderate on the Palmer Index, and a major severity event to be a Severe or Extreme drought on the Index, which results in crop loss, restrictions on water use, and serious depletion of flows from the Arbuckle-Simpson Aquifer.

Palmer Drought Severity Index (PDSI)

The Palmer Index, the most familiar and widely used, measures the departure from normal precipitation.

The objective of the Palmer Drought Severity Index (PDSI), as this measure is called, is to provide a standardized yardstick for determining moisture conditions, so comparisons can be made between different locations over time. It is based on precipitation, temperature and moisture in the soil, and can be applied to any site for which sufficient data is available. The Index does not allow an abnormally wet month in the middle of a long-term drought to have a major impact on the index, or a series of months with near-normal precipitation during a prolonged and serious drought to indicate that the drought is over.

Weekly Palmer Index values are calculated for the Climate Divisions during every growing season and are on the World Wide Web from the Climate Prediction Center. (See http://drought.unl.edu/whatis/indices.htm)

Figure 3–3: Chart showing effects of three types of drought conditions

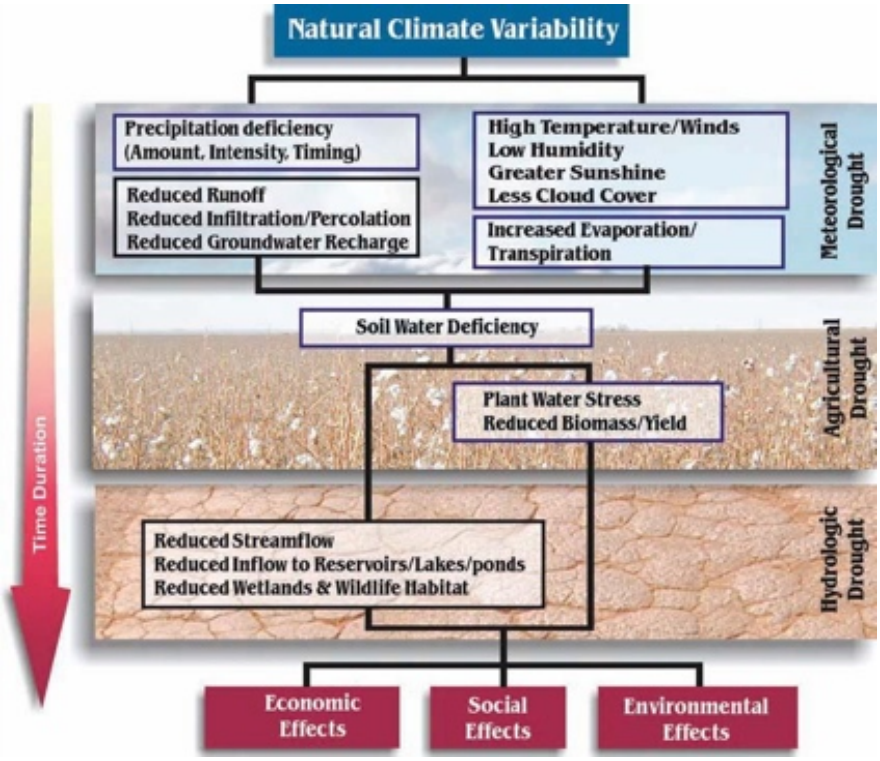

Table 3–17: Palmer Drought Severity Index (PDSI)

PDSI Classifications for Dry and Wet Periods	
4.00 or more	Extremely wet
3.00 to 3.99	Very wet
2.00 to 2.99	Moderately wet
1.00 to 1.99	Slightly wet
0.50 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.50 to -0.99	Incipient dry spell
-1.00 to -1.99	Mild drought
-2.00 to -2.99	Moderate drought
-3.00 to -3.99	Severe drought
-4.00 or less	Extreme drought

Keetch-Byram Drought Index

The Keetch-Byram Drought Index (KBDI) is a mathematical system for relating current and recent weather conditions to potential or expected fire behavior. This system was originally developed for the southeastern United States and is based primarily on recent rainfall patterns. The KBDI is the most widely used drought index system by fire managers in the south. This Index is covered in greater detail in Section 4.11 Wildfire.

Pontotoc County considers a minor severity drought to be Mild or Moderate on the Palmer Index, and a major severity event to be a Severe or Extreme drought on the Index, which results in crop loss, restrictions on water use, and serious depletion of flows from the Arbuckle-Simpson Aquifer.

3.7.2 History/Previous Occurrences

Pontotoc County Drought Events

August 2000. Oklahoma began the new century with drought conditions. In early August 2000, an extended period of unusually dry weather lasted for 2 months. Many parts of the state did not receive rain in August, and portions of southern and south central Oklahoma remained dry for almost 90 days, starting in June. Total agricultural losses were estimated between 600 million and 1 billion dollars statewide. Reservoir levels across southwest and south central Oklahoma averaged 50 percent of normal. Seven counties near the Texas border were declared federal disaster areas.

July 2001 – A month of excessive heat and little rainfall brought drought to central Oklahoma and killed eight people from heat-related illnesses.

March 2002- Lack of rainfall and an infestation of insects took a toll on western Oklahoma's wheat crop. State officials said 26 percent of the wheat crop was in very poor shape and conditions were so dry in the Panhandle that soil erosion was beginning to occur. The state's "wheat belt" region, the area around and west of U.S. 81, had received less than 50 percent of its normal rainfall since October of 2001, according to Derek Arndt of the Oklahoma Climatological Survey.

March 2005-April 2006 – A sustained period of dry weather and high temperatures spread drought across much of Oklahoma, especially the east central and southeast portions of the state. The winter of 2005-2006 was the second driest since records began being kept in 1895. High winds, combined with dry soil conditions, helped spread the worst series of wildfire outbreaks in Oklahoma history. (See *4.11- Wildfire*) By April 2006, the severe drought had become "extreme drought" in some areas. Over 40 cities in Oklahoma, including Ada, had to impose some form of water rationing or restrictions on water use.

As illustrated in Figure 4-22, Oklahoma has gone through six drought cycles, state-wide, since the early 1900s, with the latest being an almost 20-year period of wet weather lasting from about 1983 to 2003. If these trends continue, and the recent wet phase of the cycle is followed by a more or less equal number of dry years, then the State may well be facing a period of prolonged drought in the coming decades.

Table 4-28 lists the number of events, number of deaths, number of injuries, number of events that reported damages, and the amount of property and crop damage reported to the NCDC for Pontotoc County and Oklahoma.

Table 3–18: Casualties and Damages Caused by Drought from 2010 to 2015
From NOAA National Climatic Data Center http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

Location	Events	Deaths	Injuries	Damage Events	Property/Crop Damages
Pontotoc County	26	0	0	0	$0

Probability/Future Events

As drought is a direct by-product of normal climatological activity, it is accepted that Pontotoc County will continue to be hit by droughts of varying severity and as such, Pontotoc County was determined to be at High risk to the Drought hazard.

Based on history and previous occurrences, Pontotoc County can expect Extreme to Exceptional drought conditions every 10-15 years. The region has gone through alternating wet and dry cycles since the early 1900s, and the region is just coming out of a 20-year period of wet weather, which lasted from about 1983 to 2003.

Drought, generally, will have a more devastating effect on the County's rural areas and agricultural and ranching communities than on its urban residents. Until the future of the Arbuckle-Simpson aquifer is more clearly defined, and certain water rights issues adjudicated, Pontotoc County will continue to be vulnerable to drought. A recent (August 2009) ruling on the Arbuckle-Simpson aquifer by the OWRB has reduced Ada's future groundwater mining allotment by 90% beginning in 2029 (see 4.8.3). Although Pontotoc County's water supplies are, for the present, adequate to meet all but the most severe drought conditions, the jurisdiction will remain vulnerable to drought over the long term.

3.7.3 Vulnerability/Impact

In all droughts, agriculture feels the impact, especially in non-irrigated areas such as dry land farms and rangelands. Other heavy water users, such as landscapers, are also negatively impacted. Water related activities of residential users might be restricted. Droughts may exacerbate the impacts of expansive soils (see Section 3.8). Droughts also cause power shortages in Oklahoma, because much of the state's power comes from hydroelectric plants. Heavy power users can be negatively affected by the results of electricity shortages due to drought, such as brownouts, blackouts, and spiking prices.

Population

Generally, in times of severe drought, states rely on the Federal Government to provide relief to drought victims when water shortages reach near-disaster proportions. Forty separate drought relief programs administered by 16 Federal agencies provided nearly $8 billion in relief because of the series of drought years during the mid-1970s. Federal assistance efforts totaled more than $5 billion in response to the 1987–1989 drought. However, since the mid-1970s, most states have taken a more active role and drought contingency plans are now in place in at least 27 states. In Pontotoc County, farmers and ranchers would be impacted by drought, as well as those communities which receive water from Ada's municipal water system and from uncertain groundwater wells. Given that the bulk of Pontotoc County's water is taken from the Arbuckle-Simpson aquifer,

there is considerable anxiety in the area about the adequacy and preservation of this resource over the long term. The water is of superior quality and requires virtually no treatment. Of special concern are demands for aquifer water by mining operations, which do not require high quality water for their processes, and out of state water merchants, who do. Water has been called "the oil of Southeastern Oklahoma." Groundwater is essential not just to farming and ranching, but also to tourism, recreation, and the County's long-term economic development. Drought is both a major concern and high risk for Pontotoc County and its schools.

In August 2009, the Oklahoma Water Resources Board completed a 5-year study of the Arbuckle-Simpson aquifer. The scientific task force that conducted the study concluded that the recharge rate of the aquifer would allow the withdrawal of groundwater at a rate considerably below that which has been customary for a century: about 0.15 acre-feet per year for each surface acre – an almost 90% reduction in water allotments, which in the past has been 2 acre-feet per year for each acre of surface land. The good news for Pontotoc County is that this new rate should effectively eliminate the possibility of outside parties pumping massive amounts of water from the aquifer for commercial export. The bad news is that Ada's groundwater allotment has also been reduced by 90%. When the new water regime takes effect in 20 years, Ada and the County's rural water systems will no longer be able to meet their water needs of 6 to 12 MGD. Ada will be faced with having to purchase 40,000 acres of aquifer water rights to regain its current allotment, or look at other options, such as building Scissortail Lake or tapping into a new pipeline from Southeastern Oklahoma to Norman. Ada's draw from Byrd's Mill Spring will not be affected, since it is surface water. As stated elsewhere above, Byrd's Mill is abundant enough to meet Ada's basic needs, but not its summer peaks. It is Ada's groundwater wells that provide the extra 3 to 5 MGD to meet the County's peak demand. The decision of the OWRB is considered controversial, however solid its science, and is certain to be challenged both in the courts and the legislature. Whatever the outcome, Ada and Pontotoc County will be facing major water decisions in the coming decades.

Structures/Buildings

The primary threat to structures in Pontotoc County from drought is from the secondary impacts of drought from Expansive Soils and Wildfire. See Sections 3.8 and 3.10 for more information on these hazards.

Critical Facilities

The critical facilities most impacted by drought are those that rely upon water to fulfill their primary functions, or to operate at all, such as fire departments, rural water districts, medical and health care facilities, water and wastewater treatment plants, and schools and daycare centers. So long as water from the Arbuckle-Simpson aquifer remains abundant, drought would carry at most the likelihood of shortages and rationing. If the demand for the region's quality water remains high, this assessment of the threat of drought to the County's critical facilities should be reviewed on an annual basis.

Infrastructure

The effect on infrastructure is, for the most part, similar to the effect on structures, in that the primary danger is drought's effect on expansive soils and wildfire.

In many communities, drought can have impacts on the community's ability for firefighting, with both wildland and structure fires. Although Ada's municipal water supply is relatively plentiful, there have been several occasions in the last decade that the

City had to declare water emergencies and impose rationing.

Water Treatment □Drought increases the demand for water and at the same time may impact the availability of raw water. The City of Ada supplies water to the rural water districts, which serve most of the County, while the towns of Allen, Francis, Roff and Stonewall are supplied by their own wells. As stated above, Ada□s water is relatively plentiful and requires little treatment. However, a significant amount of water is lost due to aging pipeline infrastructure□ by some estimates, as high as 25%. Some of this damage has been the result of soil shrinkage during periods of drought.

Wastewater Treatment □Water shortages during periods of drought can reduce the capacity of wastewater systems in the County. Shrinking soils can cause wastewater pipeline breaks and groundwater contamination.

Utilities- No vulnerabilities but that of the secondary impact of wildfire, the smoke from which can cause flashovers, and burn distribution poles.

Transportation Systems (Highways, Public Transportation, Railway, Airports) □ Roadways and railways can be damaged by the secondary effects of drought: expansive soils.

Emergency Services- Fire services could potentially be affected if a severe drought reduces availability of water for fire suppression. Police and medical services would not face any vulnerabilities outside those experienced by other City services/facilities.

3.7.4 Sources

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3.8 Expansive Soils

Soils and soft rock that tend to swell or shrink due to changes in moisture content are commonly known as expansive soils. Expansive soils are often referred to as swelling clays because clay materials attract and absorb water. Dry clays will increase in volume as water is absorbed and, conversely, decrease as they dry.

3.8.1 Hazard Profile

Changes in soil volume present a hazard primarily to structures built on top of expansive soils. Most often, these volume changes involve swelling clays beneath areas covered by buildings and slabs or layers of concrete and asphalt.

The total annual cost of expansive soil-related damage and preventive design of moderate to high-risk structures throughout the United States has been conservatively estimated at just under $2.5 billion. Recent estimates put the annual damage as high as $10 billion.

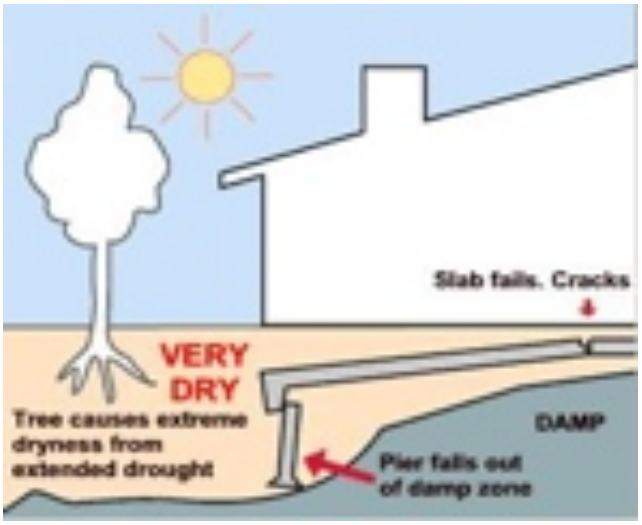
Because the hazard develops gradually and seldom presents a threat to life, expansive soils have received limited attention, despite their costly effects. Many problems are not recognized as being related to expansive soils or may be considered only nuisances and therefore are never repaired.

The most extensive damage from expansive soils occurs to highways and streets. Damage to the built environment results from differential vertical movement that occurs as clay moisture content adjusts to the changed environment.

Houses and one-story commercial buildings are more apt to be damaged by the expansion of swelling clays than are multi-story buildings, which usually are heavy enough to counter swelling pressures.

The increase in soil volume also causes damage to foundations. The most obvious manifestations of damage to buildings are sticking doors, uneven floors, and cracked foundations, floors, walls, ceilings, and windows. If damage is severs, the cost of repair may exceed the value of the building.

Figure 3–4: Expansive Soil Diagram



Pontotoc County is underlain by soils with shrink-swell potentials ranging from low to very high

Location

Based on surveys of underlying soils, Figure 3□5 shows a generalized map of the areas of Pontotoc County where soils have from low to very high expansive qualities.

All of the participating jurisdictions in this plan have facilities affected by moderate to very high expansive soils potential. While some areas are affected less than others, the overall problem of expansive soils is a county wide issue that cause our citizens damages each year in both private homes and businesses as well as to our public infrastructure.

Extent

The risk associated with expansive soil is related to shrink/swell potential in a qualitative manner: very high, high, moderate and low. Probability and frequency analyses have not been prepared because of the nature of this hazard, which is consistent with other geologic hazards that occur rarely or slowly over time.

The National Resource Conservation Service (NRCS), in its Soil Survey Geographic Database (SSURGO), identified expansive soils for Pontotoc County, as shown in Figures 4□27. SSURGO map units were classified from □low□to □very high□based on the weighted average of the Coefficient of Linear Extensibility (COLE) percent for the soils within the identified map units to depths between 0 inches and 60 inches, the depths at which damage to improvements from expansive soils is most likely to occur. In addition, the Oklahoma Department of Transportation has a program to evaluate the expansive tendencies of soils and shale formations in the state. Data on shrink-swell potential for each major soil type is kept for 77 counties.

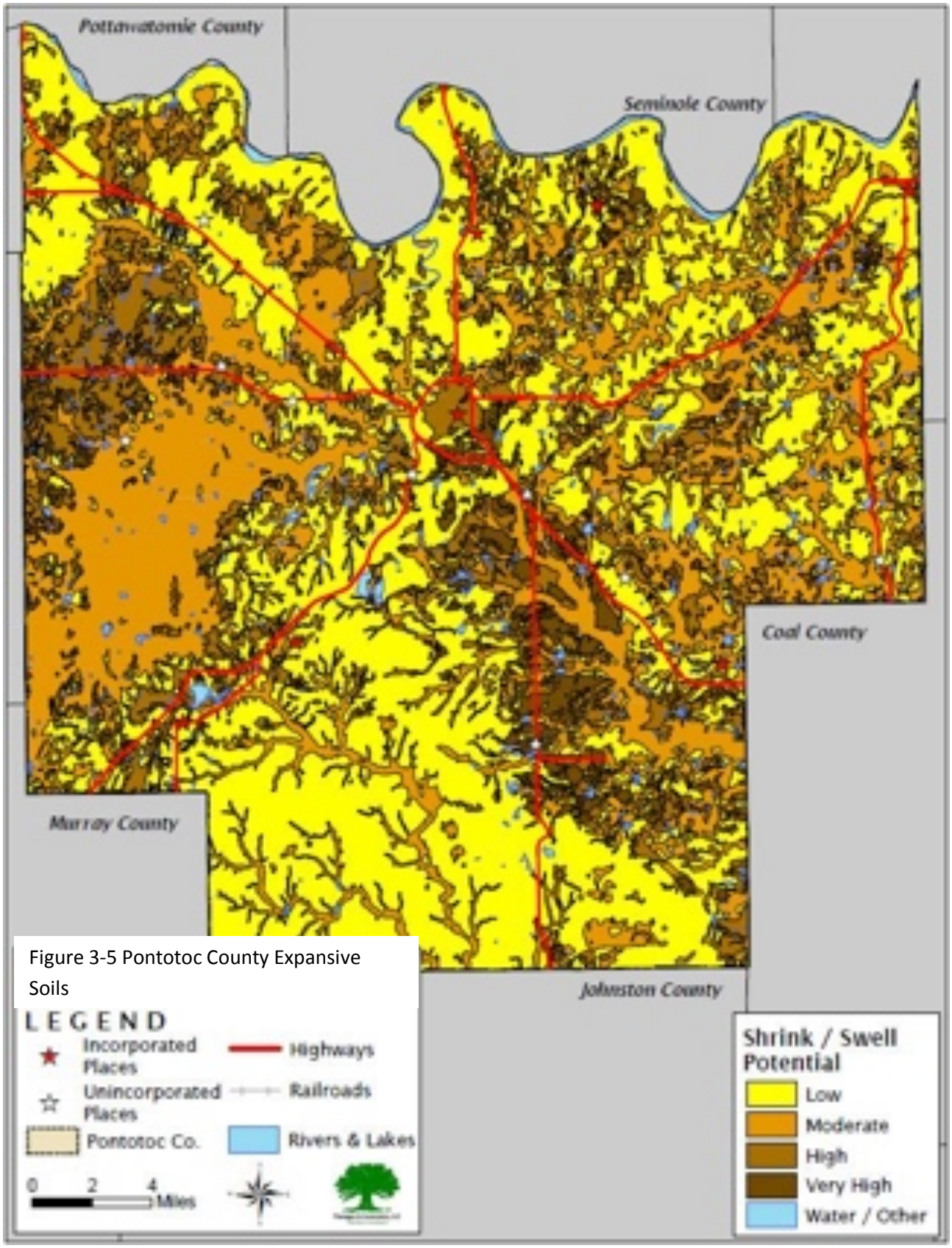


Figure 3-5 Pontotoc County Expansive Soils

3.8.2 History/Previous Occurrences

As expansive soil impacts occur over large periods of time and are impacted by other hazards such as drought, no recorded event history is available.

Probability/Future Events

Long referred to as the "unknown hazard," expansive soils may be a hazard with more of a future than a past. As Pontotoc County's infrastructures continue to age – particularly water and sewer lines built at the beginning of the last century with materials and techniques that would not meet today's codes – a prolonged period of drought could significantly speed and intensify infrastructure deterioration. The rehabilitation of roads and aging central business districts in the County will likely include the replacement of much of the underground infrastructure, especially if located in expansive soils. The use of the more flexible PVC piping could reduce the impact of expansive soils.

Pontotoc County and participating jurisdictions have a high probability of experiencing the effects of expansive soils.

3.8.3 Vulnerability/Impact

The effects of expansive soils are most prevalent in regions of moderate to high precipitation, especially where prolonged periods of drought are followed by long periods of ground-saturating rainfall.

With about 100 sq. miles of Pontotoc County having "high" to "very high" shrink/swell potential, the jurisdiction could suffer damage from expansive soils. Of the three districts, District 1 has 12.94 sq. mi. (6.45%) of "high" and "very high" soils, District 2 has 42.56 sq. mi. (20.10%) of such soils, and District 3 has 45.87 sq. mi. (14.71%). Of Pontotoc County's towns, those with the highest percentage of expansive soils are Ahloso (43.13% or 0.43 sq. mi.), Francis (36.17%, 0.21 sq. mi.), Roff (28.18%, 0.27 sq. mi.), and Allen (25.97%, 0.20 sq. mi.) The frequency of expansive soils is shown in Figure 3-5. (For information on individual communities, see Appendix A.)

With about 14% of Pontotoc County having "high" to "very high" shrink/swell potential, the jurisdiction could suffer damage from expansive soils. This being said, the extent of expansive soils property damage can vary greatly across a jurisdiction, based on several factors: the long-term weather conditions, the type and quality of construction, materials used in construction, and, most importantly, the soils the structures are built upon. For example, aging gas and water pipelines, especially when originally constructed in wet soil, can rupture during periods of extended drought.

Of particular concern is Ada's aging water infrastructure, which is increasingly vulnerable to pipe damage from expansive soils. The system loses as much as 3 MGD to raw water-main and feeder line breaks.

Pontotoc County considers expansive soils that result in cracks in wall to be a minor hazard, but those that result in water-main breaks and leaks from hazardous materials pipelines to be a serious hazard.

The extent of damage from expansive soils can be reduced by mapping the soils in the jurisdiction and by informing property owners and prospective buyers and builders of potential soil hazards and the techniques that can be used to limit their impacts. The area

extent of the expansive soils in Pontotoc County is shown on the map in Figure 3-5. (For information on individual communities, see Appendix A.)

Population

Direct threats to life or personal injury have not generally been documented for expansive soils, due to the nature of the hazard.

Structures, Buildings

Houses and small buildings are impacted more by expansive soils than larger buildings. The greatest damage occurs when small buildings are constructed when clays are dry, such as during a drought, and then subsequent soaking rains swell the clay. Other cases of damage involve increases of moisture volume from broken or leaking water and sewer lines, over-watering of lawns and landscape, and surface modifications that produce ponding.

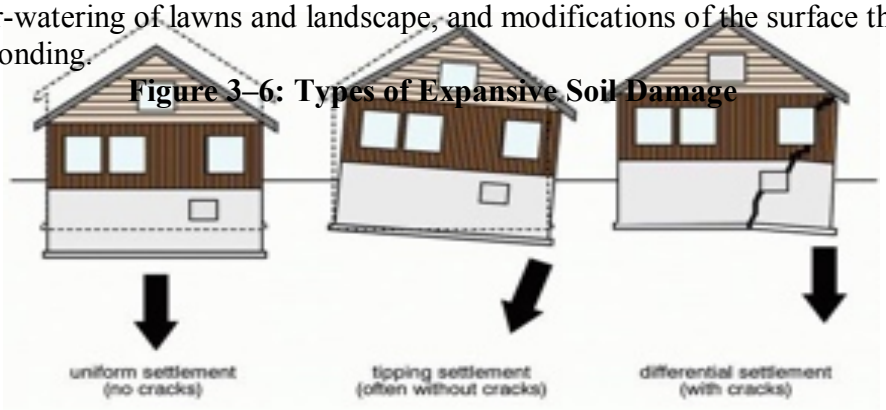
The increase in soil volume as soils expand can cause damage to foundations. The most obvious manifestations of damage to buildings are sticking doors, uneven floors, and cracked foundations, floors, walls, ceilings, and windows. If damage is severe, the cost of repair may exceed the value of the building.

It does not take much movement to damage buildings. As little as a differential movement of 0.25 inches between adjacent columns can cause cracking in load-bearing walls of a 2-foot wide bay.

Houses and one-story commercial buildings are more apt to be damaged by the expansion of swelling clays than are multi-story buildings, which usually are heavy enough to counter swelling pressures. However, if constructed on wet clay, multi-story buildings may be damaged by shrinkage of the clay if moisture levels are substantially reduced, such as by evapotranspiration or by evaporation from beneath heated buildings.

The greatest damage occurs when small buildings are constructed when clays are dry, such as during a drought, and then subsequent soaking rains swell the clay. Other cases of damage involve increases of moisture volume from broken or leaking water and sewer lines, over-watering of lawns and landscape, and modifications of the surface that produce ponding.

Figure 3–6: Types of Expansive Soil Damage



Critical Facilities

Pontotoc County has one critical facility built on □very high□shrink/swell soil (PSCO repeater tower) and six on □high□soils (Pontotoc County Courthouse, Pontotoc County

Jail, Pontotoc County Health Dept., Pontotoc County Technology Center, Pontotoc County Agri-plex, and the Pontotoc County EOC). The normal operation of these facilities is not at risk from the hazard. However, over time, foundations and walls could develop cracks, and water and wastewater pipes could break. Critical facilities in Pontotoc County, excluding Ada, and the underlying soils are identified in Table 3-19.

Table 3–19: Critical Facilities Vulnerability to Expansive Soils

ID	N	Address	Type	Threat
27	Allen Fire Dept.	Memphis St, Allen	Local Government	High
31	Byng Fire Dept.	110 Byng Ave.	Local Government	Moderate
47/48/49	Byng Public Schools	500 S New Bethel, Byng	Education	High
13	Call-A-Ride	15425 CR 3540	Commercial	Low
21	Center Fire Dept.	12834 CR 3477	Local Government	High
01	Pontotoc Co. EOC	231 S. Townsend, Ada	County Govt	High
26	Fittstown Fire Dept.	18070 CR 1655	Local Government.	High
18	Fitzhugh Fire Dept.	21930 CR 3499	Local Government	Low
30	Francis Fire Dept.	127 S. David, Francis	Local Government	High
28	Happyland Fire Dept.	22680 CR 1530	Local Government	Moderate
29	Homer Fire Dept.	13849 CR 3590	Local Government	Low
38	Latta Public Schools	13925 CR 1560	Education	High
24	Lula Fire Dept.	19613 SH 48	Local Government	Low
05	McCall's Chapel School	13546 CR 3600	Education	Low
32	Oil Center Fire Dept.	8144 CR 3470	Local Government	Low
11	PCSO Repeater Tower		County Govt	Very High
22	Pickett Fire Dept.	9940 CR 1542	Local Government	Low
06	Pontotoc County District 1 Barn	14210 CR 3610	County Govt	Low
33	Pontotoc County Communications	17835 SH 1	County Govt	Low
07	Pontotoc County District 2 Barn	9693 CR 3490	County Govt	Low
08	Pontotoc County District 3 - Roff		County Govt	Low
09	Pontotoc County District 3 - Stonewall	224 E. Main, Stonewall	County Govt	Low
15	Pontotoc County Health Dept.	1630 Beverly, Ada	County Govt	High
12	Pontotoc County Fire Repeater		County Govt	Low
10	Pontotoc County Technology Center	601 W. 33rd, Ada	Education	High
04	Pontotoc County Agri-plex	1700 N. Broadway, Ada	Commercial	High
02	Pontotoc County Courthouse	120 W. 13th Street, Ada	County Govt	High
03	Pontotoc County Jail	Broadway N. of Agri-plex	County Govt	High
19	Roff Fire Dept.	110 W. Main, Roff	Local Government	Low
40/43	Roff Public Schools	100 S Broadway, Roff	Education	Low
16	Rural Water District 7	11960 CR 3590	County Govt	Moderate
14	Rural Water District 8	13992 CR 1555	County Govt	Low
17	Rural Water District 9	21022 CR 1600	County Govt	Moderate
23	Stonewall Fire Dept.	113 S. Harrison, Stonewall	Local Government	Moderate
25	Union Valley Fire Dept.	21120 CR 3	Local Government	Moderate
34	Vanoss Fire Dept.	15260 CR 3445	Local Government	Moderate

Infrastructure

Pontotoc County does not operate water or sewer systems, and therefore has no pipelines exposed to damage from expansive soils. However, people living in unincorporated Pontotoc County who are served by water lines from the rural water districts and neighboring jurisdictions, such as Ada, remain at risk to such damage. Ada's aging water infrastructure, which provides Arbuckle-Simpson water to most of Pontotoc County, is vulnerable to expansive soils. Broken water mains serving areas with already marginal service could be impacted by breaks due to a combination of deteriorating infrastructure and expansive soils.

3.8.4 Sources

Landslides and Expansive Soils in Oklahoma, at Web address: www.ou.edu/special/ogs-pttc/earthsci/landsl.htm. Oklahoma Geological Survey, Earth Sciences, October, 1998. (Source no longer available)

Multi-Hazard Identification and Risk Assessment, p. 122-125. Federal Emergency Management Agency, 1997

3.9 Urban Fires/Structure Fires

Fire fighters responding to a house fire, one of thousands that occur every year across the state.

Structure fire is the fifth leading unintentional cause of injury and death in the United States, behind motor vehicle crashes, falls, poisoning by solids or liquids, and drowning. Fire kills more Americans than all natural disasters combined. It also ranks as the first cause of death for children under the age of 15 at home. Approximately 80% of all fire deaths occur where people sleep, such as in homes, dormitories, barracks, or hotels. The majority of fatal fires occur when people are less likely to be alert, such as nighttime sleeping hours. Nearly all home and other building fires are preventable, even arsons.

3.9.1 Hazard Profile

Location

While the entire planning area is at risk from structure fires, there are some factors that can increase or decrease the risk of a fire occurring in a given location. Average age of structures, type of construction, and location relative to fire stations can all influence the likelihood or extent of damage of structure fires.

Urban structures have an increased risk of causing damage due to fire spreading from one structure to another.

Historic properties in particular, due to a lack of applicable modern fire codes at the time of construction, and the reliance on older building materials, are at an increased risk of the initiation of fire, and an increased damage level. Alternative heating methods often used in older homes can also increase the potential for fire.

The Town of Allen is susceptible to urban fires due to the closeness of houses and building in the town. Lots in town are also moderately to heavily covered in brush and trees making an urban fire easily spread.
The Town of Byng is susceptible to urban fires due to the dense wooded and open land area the town is made up of making a fire easy to spread.
The Town of Fitzhugh is susceptible to urban fire due to the town being mostly open lots of grass and trees.
The Town of Francis is susceptible to urban fires with many homes and businesses being close together and the lots being heavily covered in trees and grass as well as having many older structures within the town.
The Town of Roff is susceptible to urban fires with building and homes being close together and many lots being mostly covered with bushes and trees. Additionally, as with most small towns in Pontotoc County, many buildings are old and are more susceptible

to fire.
The Town of Stonewall is susceptible to urban fire with the town having many closely built old building and homes in town. Many lots in town are covered with trees and bushes making a fire easy to spread.
Byng Public School is surrounded by homes on two sides making it susceptible to an urban fire that could easily spread onto campus building.
Latta Public Schools has homes and housing additions to the North and South of the school which would make an urban fire easy to spread to campus buildings.
Roff Public School sets near the middle of town with homes and businesses surrounding the school.
Allen Public School is susceptible to urban fire with many homes and trees around the school.

Extent

Various factors can determine the extent of an urban fire. The contents and age of a structure influence the extent of an urban fire, as do the local weather conditions. Damages from urban fire can range from minor to substantial with damages far exceeding the value of the structure. In recent years, the impact of urban fire has been greatly reduced due to the improvements in firefighting technology and training of local fire management officials. Improvements in building codes and technology have also enhanced a jurisdiction s ability to contain and mitigate the damage caused by urban fire. The extent of an urban fire can be affected by notification techniques and procedures, fire department response speed, structure type and age, density of development, presence of flammable substances, water pressure and availability, and the use of smoke alarms.

Pontotoc County considers a minor urban fire to be a structure or building fire that is contained and has no wider economic impact; a major severity urban fire is one that completely destroys a residence, business, or multiple structures and/or results in wider economic impacts, such as lost jobs, incomes and tax revenues.

3.9.2 History/Previous Occurrences

Pontotoc County, during the period from 2011 to 2015, excluding Ada, experienced a total of 140 structural fires, 4 deaths, 7 injuries, and almost $3.2 Million in fire damage, not including critical facilities. Table 4-32 details the type and number of fires, along with damages and casualties related to these fires during this 5-year period.

Pontotoc County s 140 structural fires with over $3.1 million in fire damage equates to $22,585 per fire, while its 1 fire in critical facilities did **$500** in damage (or $500 per fire). Given this frequency, Pontotoc County can expect $632,400 in structural fire losses each year, and using the latest 5 year records, minimal damage to critical facilities. However, the previous 5 year period shows critical facility losses per year of over $400,000. With this in mind, Pontotoc County and planning jurisdictions need to ensure that fire mitigation in critical facilities remain a priority.

Of the Schools participating in the plan, Byng School is the only one to have suffered extensive damages from a structural fire in the recent past (2009).

Table 3–20: County (except Ada) Urban/Structural Fire Damages, Injuries & Deaths 2011-2015

Source: Oklahoma State Fire Marshal

Type of Structure	*2011*		*2012*		*2013*		*2014*		*2015*		*Total*	
	#	Damage	#	Damage	#	Damage	#	Damage	#	Damage	#	Damage
Single Family	29	$643,000	26	$825,000	19	$422,000	15	$327,000	10	$500,000	99	$2,717,000
Apartments	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
Mobile Homes	3	$92,000	4	$82,000	3	$42,500	5	$79,500	3	$45,000	18	$341,000
Other Residential	0	$0	1	$0	0	$0	9	$0	0	$0	10	$0
Commercial	0	$0	0	$0	1	$20,000	1	$40,000	0	$0	2	$60,000
Warehouse	0	$0	0	$0	1	$5,000	0	$0	0	$0	1	$5,000
Industrial	0	$0	0	$0	0	$0	2	$4,000	0	$0	2	$4,000
Office	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
Other	1	$12,000	3	$15,000	2	$5,000	1	$1,000	1	$2,000	8	$35,000
Total	33	$747,000	34	$922,000	26	$494,500	33	$451,500	14	$547,000	140	$3,162,000

Fire-Related Casualties

Casualty	*2011*	*2012*	*2013*	*2014*	*2015*	*Total*
Civilian Injuries	1	3	0	1	2	**7**
Civilian Deaths	0	3	0	1	0	**4**
Firefighter Injuries	0	0	0	0	0	**1**
Firefighter Deaths	0	0	0	0	0	**0**
Total Injuries	**1**	**3**	**0**	**1**	**2**	**7**
Total Deaths	**0**	**3**	**0**	**1**	**0**	**4**

Table 3–21: Pontotoc County (except Ada) Critical Facility Fires, 2011-2015

Source: Oklahoma State Fire Marshal

Type of Structure	*2011*		*2012*		*2013*		*2014*		*2015*		*Total*	
	#	Damage	#	Damage	#	Damage	#	Damage	#	Damage	#	Damage
School, University	0	$0	0	$0	0	$0	0	$0	0	$0	**0**	**$0**
Public Assembly	0	$0	0	$0	0	$0	0	$0	0	$0	**0**	**$0**
Hospital	0	$0	0	$0	0	$0	0	$0	0	$0	**0**	**$0**
Correctional Facilities	0	$0	0	$0	0	$0	0	$500	0	$0	**1**	**$500**
Child Care	0	$0	0	$0	0	$0	0	$0	0	$0	**0**	**$0**
Nursing/ Retirement	0	$0	0	$0	0	$0	0	$0	0	$0	**0**	**$0**

Total	0	$0	0	$0	0	$0	0	$500	0	$0	1	$500

Frequency

Pontotoc County and participating jurisdictions have a high probability of an urban/structural fire event.

Probability/Future Events

Pontotoc County, like Oklahoma, is vulnerable to urban/structural fires, and therefore its vulnerability is a constant and widespread threat. Urban fires can occur at any time, so it is important that even during light activity periods, education and preparations continue to move forward.

Older frame houses are particularly vulnerable to urban fires

3.9.3 Vulnerability/Impact

Pontotoc County was determined to be at High risk to the Urban/Structural Fire hazard. (See Table 3-2 Hazard Risk Analysis, and Table 3-3, Summary of Hazard risk Analysis Ranking Criteria for an explanation of how the rankings were derived.) Appendix A identifies where the Incorporated Communities and Public School Systems differ from Pontotoc County

Population

The populations most at risk to structural fire are those living in aging and dilapidated structures with substandard heating and wiring, located in sections of the County where water lines are small and pressure low during hours of peak use.

Structures/Buildings

Table 3–22: Pontotoc County Homes Built Prior to 1939 and Substandard Heating
Source: US 2010 Census

Jurisdiction	*% built prior to 1939*	*% with Wood Heat*
Pontotoc County	9.1	1.4
Allen	15.1	0.8
Byng	4.9	None
Fitzhugh	9.1	1.4
Francis	27.6	8.2
Stonewall	31.8	None
Roff	21.3	None

Critical Facilities

As with other structures/buildings within Pontotoc County, the most severe threat to

Critical Facilities is from water availability and distance from fire protection facilities. All critical facilities should plan for the possibility of water shortages, particularly during drought events, as these could have a severe impact on fire protection.

Critical Facilities are also vulnerable to fire, and are of special importance because the impact of a fire in these facilities may be especially detrimental to the community's ability to continue normal operation or have a major impact on the city's vulnerable populations. Critical facilities deserving special attention include nursing and retirement homes, hospitals and clinics, child care centers, correctional institutions, schools and colleges.

Infrastructure

The vulnerability of infrastructure is related to the age and condition of the various water delivery systems as well as the age and condition of the infrastructure itself. The County should encourage communities to upgrade lines where delivery systems are inadequate and upgrade facilities to incorporate newer fire codes.

3.9.4 Sources

Eisenberg, Elliot, November 2002. House fire Deaths. *Housing Economics,* p. 11-13. National Association of Home Builders.

Multi-Hazard Identification and Risk Assessment, p. 264, 266-267. Federal Emergency Management Agency, 1997.

National Fire Protection Association, "Fire Statistics," at web address: www.nfpa.org/categoryList.asp?categoryID=951&URL=Research%20&%20Reports/Fire%20statistics.

Oklahoma State Fire Marshal, "Fire Statistics 1997-2000," at web address: http://www.state.ok.us/~firemar/index.htm. Office of the Oklahoma State Fire Marshal

Talking About Disaster: Guide for Standard Messages, "Fire," p. 51. National Disaster Coalition, Washington, D.C., 1999.

3.10 Wildfires

As more people make their homes in wild land settings in close proximity to large tracts of grasslands or forests, the number of citizens and structural improvements at risk to the impacts of wildfire increases. Wildfires often begin unnoticed and spread quickly, igniting grass, brush, trees, and homes.

Wildfires can move on three different levels. A *surface fire* is the most common type and burns along the surface of grasslands or forests, usually moving quickly through an area. A *ground fire* is usually started by lightning and burns on or below the forest floor in the humus layer down to the mineral soil, mostly by smoldering combustion. A *crown fire* has ascended from the ground into the forest canopy, spreads rapidly by wind and moves by jumping along the tops of trees.

3.10.1 Hazard Profile

Location

Within the Pontotoc County jurisdiction development in more remote and wooded areas, also referred to as the Wildland Urban Interface (WUI) continues to take place. Residential and business structures developed in close proximity to grassy and woody fuels will be natural risks for this event. In addition, wildland/grassland fires are a strong threat to agricultural areas such as farms and/or ranches, especially during the high risk fire season.

Unincorporated Pontotoc County is susceptible to wildfires due to the area being mostly rural and is made up of mostly farmland and over grown fields of trees, shrubbery and large open areas of land.
The towns of Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall are susceptible to wildfires due to the towns being surrounded by open fields and pasture lands of trees and shrubbery that run right into the city limits of most towns. There are no barriers between the towns and the fields to stop a wildfire from entering the town and causing structure fires. Also in town are over grown lots, parks and other undeveloped open areas that make them susceptible to wildfires.
The public schools of Byng, Latta, Stonewall (McLish campus), and Vanoss have some building that are susceptible to wildfires due to being located in rural Pontotoc County which is made up of mostly farmland and over grown fields of trees, shrubbery and large open areas of land.
Byng public school has building on the North, North-East, and South-East that are more susceptible to wildfires than other parts of the school due to these areas have trees and shrubbery that come right up next to the school building.
Latta public school is susceptible to wildfire on the South-West side of campus with a large open field that comes up next to the school building. The East side of the campus has a large open field next to it with a county road as a separator between the buildings and the field.
Stonewall public school is susceptible to wildfires from the West, South, and East with large open grassy fields. The West side of the school has a county road as a divider between the field and the school.
Vanoss public school has open fields and fields of trees and shrubbery surrounding the

school making it susceptible to wildfires. Many building on the school ground border up next to the fields.

Extent

Wildfire danger is measured using indexes that relate longer-term soil and vegetation conditions to shorter-term weather patterns. The most explosive conditions occur when dry, gusty winds blow across dry vegetation. These factors are contained in the Keetch-Byram Drought Index (KDBI), the Haines Index, the Fire Danger Rating System, and the Burning Index (BI). The Keetch-Byram Index, Table 3-23, relates weather conditions to potential or expected fire behavior, using numbers from 0 to 800 to represent the amount of moisture that is present in soil and vegetation. A Zero rating would indicate no moisture deficiency, while 800 would indicate maximum drought conditions. The Fire Danger Rating System, Table 3-24, combines the combustibility of vegetation and weather conditions to derive the easily understood Green-Blue-Yellow-Orange-Red fire danger alerts. The Burning Index, Table 3-25, relates temperature, relative humidity, wind speed and solar radiation to the relative greenness of vegetation (taken from satellite measurements) and fuel models for native vegetation (assigned on a 1-kilometer grid across the State). The Haines Index (also known as Lower Atmosphere Severity Index) is a weather index that measures the potential for dry, unstable air to contribute to the development of large or erratic wildland fires. The index is derived from the stability (temperature difference between different levels of the atmosphere) and moisture content (dew point depression) of the lower atmosphere. A Haines Index of 6 means a high potential for an existing fire to become large or exhibit erratic fire behavior, 5 means medium potential, 4 means low potential, and anything less than 4 means very low potential.

Table 3–23: The Keetch-Byram Drought Index (KBDI)

Source: Oklahoma Hazard Mitigation Plan

Rating	Description
0 - 200	Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
200 – 400	Fires more readily burn and will carry across an area with no gaps. Heavier fuels will still not readily ignite and burn. Also, expect smoldering and the resulting smoke to carry into and possibly through the night.
400 – 600	Fire intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
600 – 800	Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn through the night and heavier fuels will actively burn and contribute to fire intensity.

Table 3–24: Fire Danger Rating System

Source: Oklahoma Hazard Mitigation Plan

Color	Brief Description	Detailed Description
Low (L) (Green)	Fires not easily started	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may bum freely a few hours after rain, but woods fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.
Moderate (M) (Blue)	Fires start easily and spread at moderate rate	Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
High (H) (Yellow)	Fires start easily and spread at a rapid rate	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Very High (VH) (Orange)	Fire start very easily and spread at a very fast rate	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
Extreme (E) (Red)	Fire situation is explosive and can result in extensive property damage	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.

Table 3–25: Burning Index

Flame Length (ft)	Fire Line Intensity (Btu/(ft-s)	Interpretations
<4 (BI <40)	<100	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4 – 8 (BI 40 – 80)	100 □ 500	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers and retardant aircraft can be effective.
8 – 11 (BI 80 – 110)	500 □ 1,000	Fires may present serious control problems, such as torching out, crowning and spotting. Control efforts at the fire head will probably be ineffective.
>11 (BI >110)	>1,000	Crowning, spotting and major fire runs are probable. Control efforts at head of fire are ineffective.

Pontotoc County considers a minor severity wildfire to be one that burns fewer than 50 acres, destroys no structures, crops or livestock, and results in neither death nor injury. A major wildfire event would be one that burns over 500 acres, destroys residences, farm crops and structures, and/or results in death of injury. Additionally, a fire smaller than 500 acres that involves the WUI may be considered a major event if large numbers of structures were threatened or lost.

3.10.2 History/Previous Occurrences

Pontotoc County Wildfires

Pontotoc County, and the planning area, is predominantly rural, with about 55% of the agricultural land being in pasture and 30% cropland*. Consequently, it is vulnerable to wildland fire. This is particularly true during times of drought, as occurred during the fall and winter of 2005-2006. During that time period, the state of Oklahoma, including Pontotoc County, received its first and only state-wide disaster declaration for wildfire. Because of its terrain and varied vegetation types, Pontotoc County did not suffer the catastrophic wind-blown wildfires that swept across the western and northern Oklahoma. Nevertheless, Pontotoc County did have a large number of wildfires, and suffered several periods of wild fire □outbreaks□ From the last week of November 2005 to third week of March 2006, fire departments in Pontotoc County responded to 350 wildfires. Many days had multiple significant fires. Some of the largest fires were 1000-2000 acres, while many were small 5-50 acre fires.

All departments of the county were highly active during that period of time and all departments were providing mutual aid to each other as well as responding out of county in support of other fires.

None of the school districts participating in this plan have reported damages from a wildfire event.

Probability/Future Events

The continuing alarming spread of Eastern Red cedar in open grassland and the abundant fuel load in place from heavy rains and other naturally occurring events, combined with the historical data available demonstrates that the threat of wildland/grass fires will

continue to be a regularly occurring event in Pontotoc County. In addition, suburban growth in the wildland interface on the periphery of Ada will be a significant factor in the potential increase in number of wildfire events. Pontotoc County has a medium probability to wildfires.

3.10.3 Vulnerability/Impact

Pontotoc County was determined to be at Medium risk to the Wildfire hazard. (See Table 3-2 Hazard Risk Analysis, and Table 3-3, Summary of Hazard risk Analysis Ranking Criteria for an explanation of how the rankings were derived.) Appendix A identifies where the Incorporated Communities and Public School Systems differ from Pontotoc County.

Though wildfires can potentially impact anywhere in the planning area, the combination of pastureland, brush, and trees around the schools of Byng, Stonewall (McLish), and Vanoss call for concern. These schools have all had several close calls in the past 10 years. The schools should continue to maintain defensible space around the facilities.

Population

As evidenced by the 2005-2006 wildfire outbreaks, all rural and urban/wildland interface areas of Pontotoc County are vulnerable to the wildfire hazard.

Structures/Buildings

Any structures/buildings constructed within the wildland/urban interface area or on ranches/farms situated in grassy/wooded areas should be considered at risk to the effects of a wildfire event.

Critical Facilities

Critical facilities such as medical care facilities, resident care homes, daycare facilities, and utility out-stations located in these high-risk areas should be considered vulnerable to the effects of wildfires. Critical facilities at risk are listed in the following table. The only facility at "high" risk is Union Valley Fire Department. At "moderate" risk are the Fitzhugh Fire Department, Hacienda Academy, McCall's Chapel School, Roff Headstart, Call A Ride, Rural Water District #7, and two Pontotoc County repeater towers. (For information on individual communities, see Appendix A.)

Table 3–26: Critical Facilities Vulnerability to Wildfire Events

ID	Name	LOC Threat Level	ID	Name	LOC Threat Level
27	Allen Fire Dept.	N	02	Pontotoc Co. Courthouse	N
39	Allen School	N	06	Pontotoc Co. District 1 Barn	M
47	Byng Elementary School	N	07	Pontotoc Co. District 2 Barn	L
31	Byng Fire Dept.	M	08	Pontotoc Co. District 3 Barn, Roff	N
49	Byng High School	N	09	Pontotoc Co. District 3, Stonewall	N
48	Byng Junior High School	N	01	Pontotoc Co. EOC	N
13	Call A Ride	M	12	Pontotoc Co. Fire Repeater	N
21	Center Fire Dept.	H	15	Pontotoc Co. Health Dept.	N
46	Chickasaw Nation Hospital	L	03	Pontotoc Co. Jail	N
55	Farmer's State Bank of Allen	N	41	Pontotoc Co. Sheriff	N
57	First American Bank, Roff	N	10	Pontotoc Co. Technology Center	N

56	First American Bank, Stonewall	N	19	Roff Fire Dept.	N
26	Fittstown Fire Dept.	N	43	Roff Headstart	M
18	Fitzhugh Fire Dept.	M	40	Roff School	N
30	Francis Fire Dept.	N	16	Rural Water District #7	M
51	Francis Town Hall	N	14	Rural Water District #8	N
28	Happyland Fire Dept.	H	17	Rural Water District #9	N
52	Homer Elementary	N	63	Stonewall City Hall	N
29	Homer Fire Dept.	N	23	Stonewall Fire Dept.	N
44	Latta Kids Zone Daycare	N	67	Stonewall Police Dept	N
38	Latta School	N	62	Stonewall Post Office	N
24	Lula Fire Dept.	N	65	Stonewall Public Works Dept.	N
05	McCall□s Chapel School	M	36	Stonewall School	N
35	McLish School	N	66	Stonewall Water Supply	N
32	Oil Center Fire Dept.	H	25	Union Valley Fire Dept.	H
22	Pickett Fire Dept.	N	34	Vanoss Fire Dept.	N
11	PCSO Repeater Tower	M	20	Vanoss School	N
04	Pontotoc Co. Agri-Plex	N	54	Woodland Hills Nursing Home	N
33	Pontotoc Co. Communications Repeater	M			

Infrastructure

Utilities- The primary utility providers for Pontotoc County are Oklahoma Gas & Electric and American Electric Power (dba Public Service Co.) (electricity) and CenterPoint Energy (natural gas). **Electricity**: The largest threat to the delivery of electrical service would be the destruction/damage of power poles/lines, and flashovers from line to ground via smoke.

Transportation Systems (Highways, Public Transportation, Railway, Airports) – Roadway inaccessibility would be the largest vulnerability posed to the transportation system during a Wildfire event. During a wildfire located near a major highway, it may become necessary to close a section of highway or divert traffic along that route, as occurred on Interstate 35 during the wildfires of April 8-10, 2009. Roads and bridges in Pontotoc County would be at risk during a widespread event as they are located in closer proximity to fields/grasslands that could become involved in a wildfire.

Emergency Services- Fire, Police and Medical Services would all be similarly at risk to effects of a Wildfire event. During a severe outbreak of wildfire, roads may become impassable, potentially isolating portions of the community to vital services and/or supplies. Residential developments in the wildland/urban interface areas of Pontotoc County, along with any businesses/utilities supporting them in the immediate area, are especially at risk in the event of a large wildfire event.

3.10.4 Sources

Multi-Hazard Identification and Risk Assessment, p. 234, 236, 239. Federal Emergency Management Agency, 1997.

Oklahoma State Fire Marshal, □Fire Statistics 1997-2000,□at web address: http://www.state.ok.us/~firemar/index.htm. Office of the Oklahoma State Fire Marshal

Talking About Disaster: Guide for Standard Messages, □Wildfire,□p. 135. National Disaster Coalition, Washington, D.C., 1999.

USGS Wildland Fire Research, at Web address: http://www.usgs.gov/themes/Wildfire/fire.html. U.S. Geological Survey, August 23, 2000

3.11 Earthquakes

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.

3.11.1 Hazard Profile

Location

Pontotoc County is at medium risk from earthquakes.

Extent

Modern seismological technology has greatly enhanced the capability of scientists to sense earthquakes. Before the development of today's delicate sensors, only "felt" earthquakes were captured in the historical record.
Two standard measures are used to classify an earthquake's extent: *magnitude* and *intensity*. These measures are sometimes referred to as the Richter Scale (magnitude) and the Modified Mercalli (intensity).

Magnitude is an Arabic number representing the total amount of energy released by the earthquake source. It is based on the amplitude of the earthquake waves recorded on seismographs that have a common calibration. The magnitude of an earthquake is thus represented by a single, instrumentally determined value.

Intensity, expressed as a Roman numeral, is based on the earthquake's observed effects on people, buildings and natural features. It varies depending on the location of the observer with respect to the earthquake's epicenter. In general, the intensity decreases with distance from the fault, but other factors such as rupture direction and soil type also influence the amount of shaking and damage. The Modified Mercalli and Richter Scales are compared in Table 3-27.

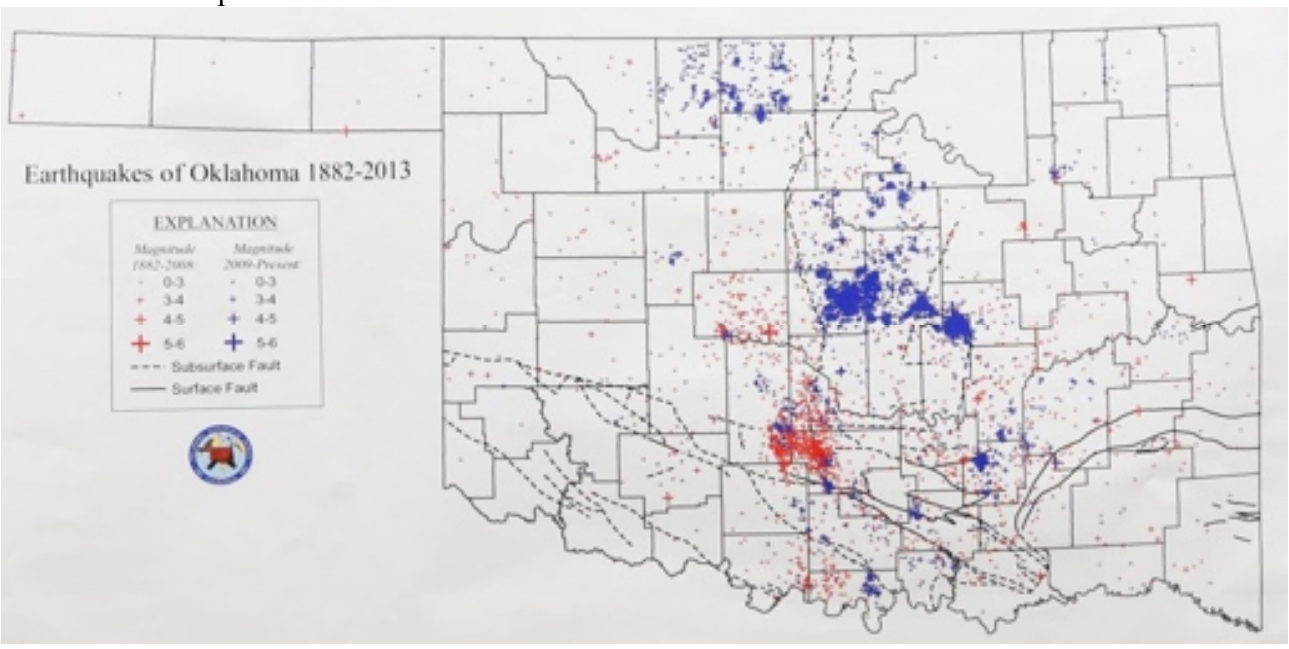


Table 3–27: Comparison of Mercalli and Richter Scales

Mercalli	*Richter*	*Description*
I	0-4.3	Vibrations are recorded by instruments. People do not feel any Earth movement.
II		A few people might notice movement if they are at rest and/or on upper floors of tall buildings.
III		Shaking felt indoors; hanging objects swing. People outdoors might not realize that an earthquake is occurring.
IV	4.3-4.8	Dishes rattle; standing cars rock; trees might shake. Most people indoors feel movement. Hanging objects swing. Dishes, windows, and doors rattle. A few people outdoors may feel movement.
V		Doors swing; liquid spills from glasses; sleepers awake. Almost everyone feels movement. Dishes are broken. Pictures on the wall move. Small objects move or are turned over. Trees shake.
VI	4.8-6.2	People walk unsteadily; windows break; pictures fall off walls. Everyone feels movement. Objects fall off shelves. Furniture moves. Plaster in walls may crack. Trees and bushes shake. Damage is slight in poorly built buildings. No structural damage.
VII		Difficult to stand; plaster, bricks, and tiles fall; large bells ring. Drivers feel their cars shaking. Some furniture breaks. Loose bricks fall from buildings. Damage is slight to moderate in well-built buildings; considerable in poorly built buildings.
VIII	6.2-7.3	Chimneys fall; branches break; cracks in wet ground. Drivers have trouble steering. Houses that are not bolted down might shift on their foundations. Tall structures such as towers and chimneys might twist and fall. Well-built buildings suffer slight damage. Poorly built structures suffer severe damage. Water levels in wells might change.
IX		General panic; damage to foundations; sand and mud bubble from ground. Well-built buildings suffer considerable damage. Houses that are not bolted down move off their foundations. Some underground pipes are broken. The ground cracks. Reservoirs suffer serious damage.
X		Most buildings destroyed; large landslides; water thrown out of rivers and lakes. Some bridges are destroyed. Dams are seriously damaged. The ground cracks in large areas. Railroad tracks are bent slightly.
XI	7.3-8.9	Roads break up; large cracks appear in ground; rocks fall. Most buildings collapse. Some bridges destroyed. Underground pipelines destroyed. Railroad tracks badly bent.
XII		Total destruction; "waves" seen on ground surface; river courses altered; vision distorted. Almost everything is destroyed. Objects are thrown into the air. Large amounts of rock may move.

Pontotoc County considers a minor severity earthquake event to be a VII or lower intensity (Mercali) and 5.9 or lower magnitude (Richter). A major severity event would be an VIII or higher intensity and 6 or higher magnitude. This being said, any magnitude quake that resulted in a loss of a significant amount of water storage in the Arbuckle-Simpson Aquifer (a distant possibility) would be considered a major event.

3.11.2 History/Previous Occurrences

Pontotoc County Earthquakes

The Oklahoma Geological Survey lists 64 earthquakes for Pontotoc County between 1953 and 2009. From 1977 to 2009, Pontotoc County has had 59 earthquakes, virtually all of them unfelt. This equates to 1.8 earthquakes per year in the county. Two felt

earthquakes have been reported within Pontotoc County, on June 15, 1959, and on September 6, 1997, registering 4.0 and 4.4 on the Richter Scale, respectively. From 2010 to present no earthquakes were centered in Pontotoc County, however several from outside the county were felt, including the 5.6 magnitude earthquake in 2011. It was centered northwest of Prague and caused some notable damage in the city of Ada.

- **June 15, 1959** A 4.0 Richter-Scale quake rattled Pontotoc County. The epicenter was about 1 mile west of Ada, in the neighborhood of the CLEET facility.
- **June 12, 1963**- A 2.4 earthquake occurred 2 miles north of Fitzhugh.
- **October 23, 1983**- A 2.9 earthquake on the Richter scale hit 4 miles north of Vanoss.
- **June 30, 1986**- A 2.0 quake struck 2 miles north of Lawrence, or 3.5 miles southeast of Latta.
- **July 26, 1986**- A 2.3 earthquake on the Richter Scale occurred 1.5 miles southeast of Fittstown.
- **January 6, 1988**- A 2.2 Richter-Scale quake hit 2 miles northeast of Fittstown.
- **February 25, 1994**- A 2.1 earthquake struck 4.5 miles northeast of Ada, midway between Oakman and Happyland.
- **September 6, 1997-** A 4.4 earthquake shook Ada in Pontotoc County and rattled dishes as far away as Holdenville. The epicenter was 10 miles southeast of Ada, and about 2 miles northeast of Stonewall, at a depth of 15 km.
- **July 25, 2005-** A 2.2 quake hit 3.5 miles northwest of Fitzhugh.

Probability/Future Events

Although earthquakes are relatively frequent events in Pontotoc County, their intensities are low, usually in the 1.5 to 2.5 range on the Richter Scale - enough to rattle dishes, but do little damage. Earthquakes in the 4.0 to 4.4 ranges can be expected about once every 20 years. Pontotoc County and its future development areas are at low risk from damaging earthquakes.
Pontotoc County and participating jurisdictions have a medium probability of an earthquake event.

3.11.3 Vulnerability/Impact

Pontotoc County was determined to be at medium risk to the Earthquake hazard.

Population

Although earthquakes are relatively frequent in Pontotoc County, they pose little danger to the population.

Structures/Buildings

Although Pontotoc County is near the most seismically active part of Oklahoma, the earthquakes have historically not been of an intensity to cause serious damage to buildings or structures.

Critical Facilities

Although a frequent occurrence, earthquakes do not pose a serious threat to Pontotoc County critical facilities or their operation.

Infrastructure

Water Treatment – Earthquakes of 4.0 magnitude and above can result in cracked water lines, if the pipes are old and deteriorating.

Wastewater Treatment – Earthquakes of 4.0 magnitude and above could pose a threat to aging sewage lines, or cause cracks in sewage lagoon dikes and berms.

Utilities - A 4.0-magnitude quake could possibly result in a break in already weakened gas distribution lines.

Transportation Systems (Highways, Public Transportation, Railway, Airports) – Historically, earthquakes in Pontotoc County have not been severe enough to damage roadways, railways, or airport landing strips.

Emergency Services - The earthquake hazard does not pose a threat to Pontotoc County emergency services.

3.11.4 Sources

Oklahoma Geophysical Observatory Examines Earthquakes in Oklahoma, at Web address: http://www.ogs.ou.edu/earthquakes.htm. University of Oklahoma, 1996.

Oklahoma Strategic All-Hazards Mitigation Plan, Hazard Identification and Vulnerability Assessment, p 7. Oklahoma Department of Emergency Management, September 2001.

Program Statement, at Web address: www.cusec.org. Central United States Earthquake Consortium.

Talking About Disaster: Guide for Standard Messages, Earthquake, p. 41 49. National Disaster Coalition, Washington, D.C., 1999.

Von Hake, Carl A. *Earthquake History of Oklahoma*, Abridged from Earthquake Information Bulletin, Vol.8, Number 2. USGS National Earthquake Information Center, March April 1976.

3.12 Dam Failures

The Federal Emergency Management Agency (FEMA) defines a dam as "a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water." Dams typically are constructed of earth, rock, concrete, or tailings (chaff) from mining operations. A dam failure is the collapse, breach, or other failure resulting in downstream flooding.

The amount of water impounded in the reservoir behind a dam 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, or approximately 325,000 gallons. As a function of upstream topography, even a very small dam may impound or detain many acre-feet or millions of gallons of water.

3.12.1 Hazard Profile

Location

The OWRB coordinates the Oklahoma Dam Safety Program to ensure the safety of more than **4,700** dams in the state. The Program requires inspections for all **jurisdictional size** dams based on the presence of **downstream development**.

Table 3-28: Classification of Dams

Hazard-Potential Classification	Risk Involved with Dam Failure	Inspection Frequency
High	probable loss of human life	annually, by a registered professional engineer
Significant	no probable loss of human life but can cause economic loss or disruption of lifeline facilities	every three years by a registered professional engineer
Low	no probable loss of human life and low economic loss	every five years

Dam Emergency Levels and Description:

Emergency Level 1—Non-emergency, unusual event, slowly developing:

This situation is not normal but has not yet threatened the operation or structural integrity of the dam, but possibly could if it continues to develop. NRCS technical representatives or state dam safety officials should be contacted to investigate the situation and recommend actions to take. The condition of the dam should be closely monitored, especially during storm events, to detect any development of a potential or imminent dam failure situation. The emergency management director should be informed if it is determined that the conditions may possibly develop into a worse condition that may require emergency actions.

Emergency Level 2—Potential dam failure situation, rapidly developing:

This situation may eventually lead to dam failure and flash flooding downstream, but there is not an immediate threat of dam failure. The emergency management director should be notified of this emergency situation and placed on alert. The dam operator should closely monitor the condition of the dam and periodically report the status of the situation to the emergency management director. If the dam condition worsens and failure becomes imminent, the emergency management director must be notified immediately of the change in the emergency level to evacuate the people at risk downstream.

If time permits, NRCS and state dam safety officials should be contacted to evaluate the situation and recommend remedial actions to prevent failure of the dam. The dam operator should initiate remedial repairs (note local resources that may be available). Time available to employ remedial actions may be hours or days.

This emergency level is also applicable when flow through the earth spillway has or is expected to result in flooding of downstream areas and people near the channel could be endangered. Emergency services should be on alert to initiate evacuations or road closures if the flooding increases.

Emergency Level 3—Urgent; dam failure appears imminent or is in progress:

This is an extremely urgent situation when a dam failure is occurring or obviously is about to occur and cannot be prevented. Flash flooding will occur downstream of the dam. This situation is also applicable when flow through the earth spillway is causing downstream flooding of people and roads. The Emergency management director should be contacted immediately so emergency services can begin evacuations of all at-risk people and close roads as needed (see *Breach Inundation Map*s).

See figures, 3-10, 3-12, 3-14, 3-16, 3-20, and 3-22 for dam inundation depth data.

Figure 3-9

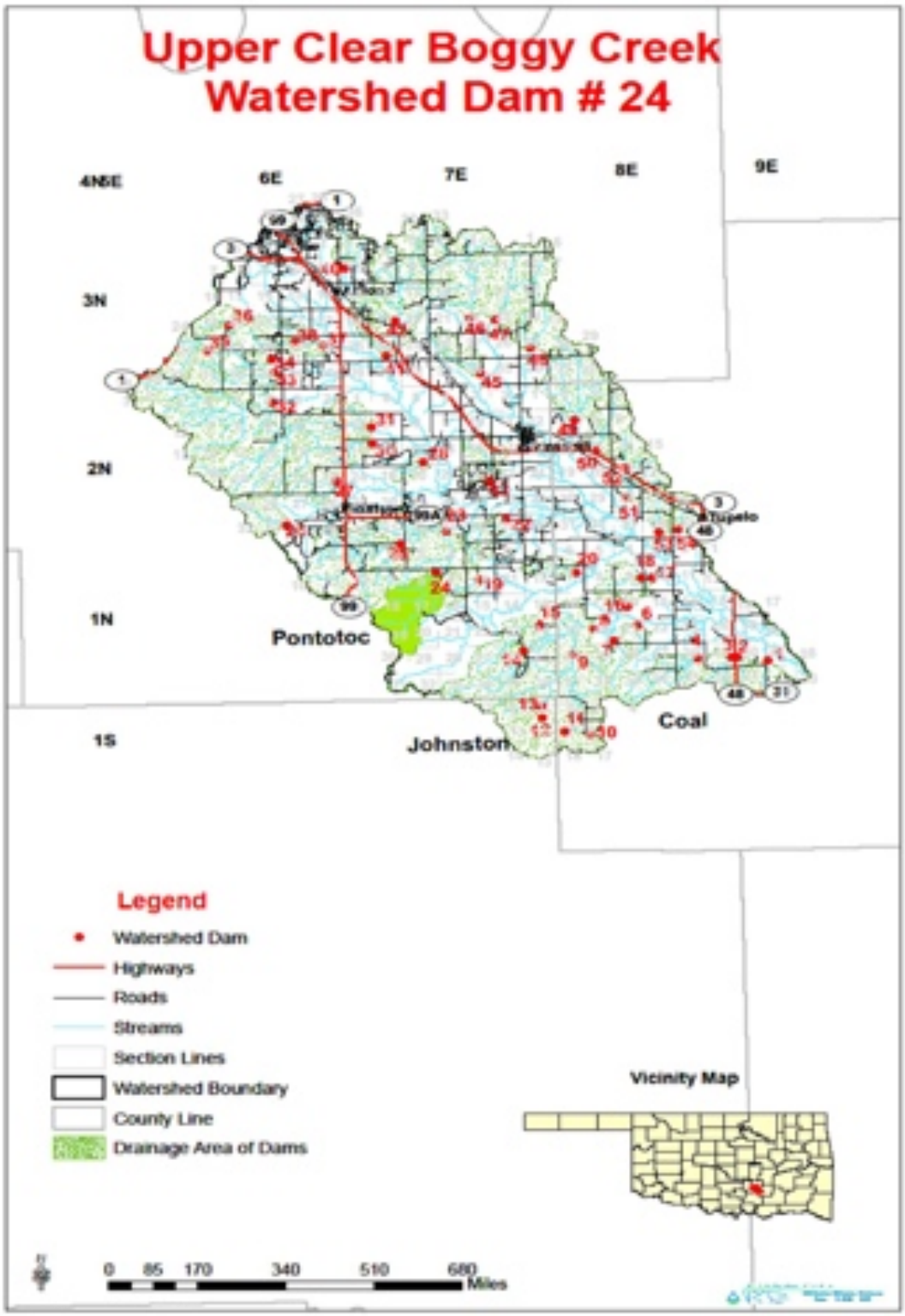

Upper Clear Boggy Creek
Watershed Dam # 24
4N&E
6E
7E
8E
9E
3N
2N
1N
1S
Pontotoc
Johnston
Coal
Tupelo
Legend
Watershed Dam
Highways
Roads
Streams
Section Lines
Watershed Boundary
County Line
Drainage Area of Dams
Vicinity Map
0 85 170 340 510 680
Miles

Figure 3-10


Breach Inundation Map
Upper Clear Boggy Creek
Dam No. 24
Pontotoc Co. Ok
July 2010
Legend
Breach Inundation Area
Potential area flooded by dam failure
Potential Damage Locations
Water Depth (ft. from ground/roadway)
> 3 ft.
Undocumented Structures (Outside Breach Boundary)

Figure 3-11

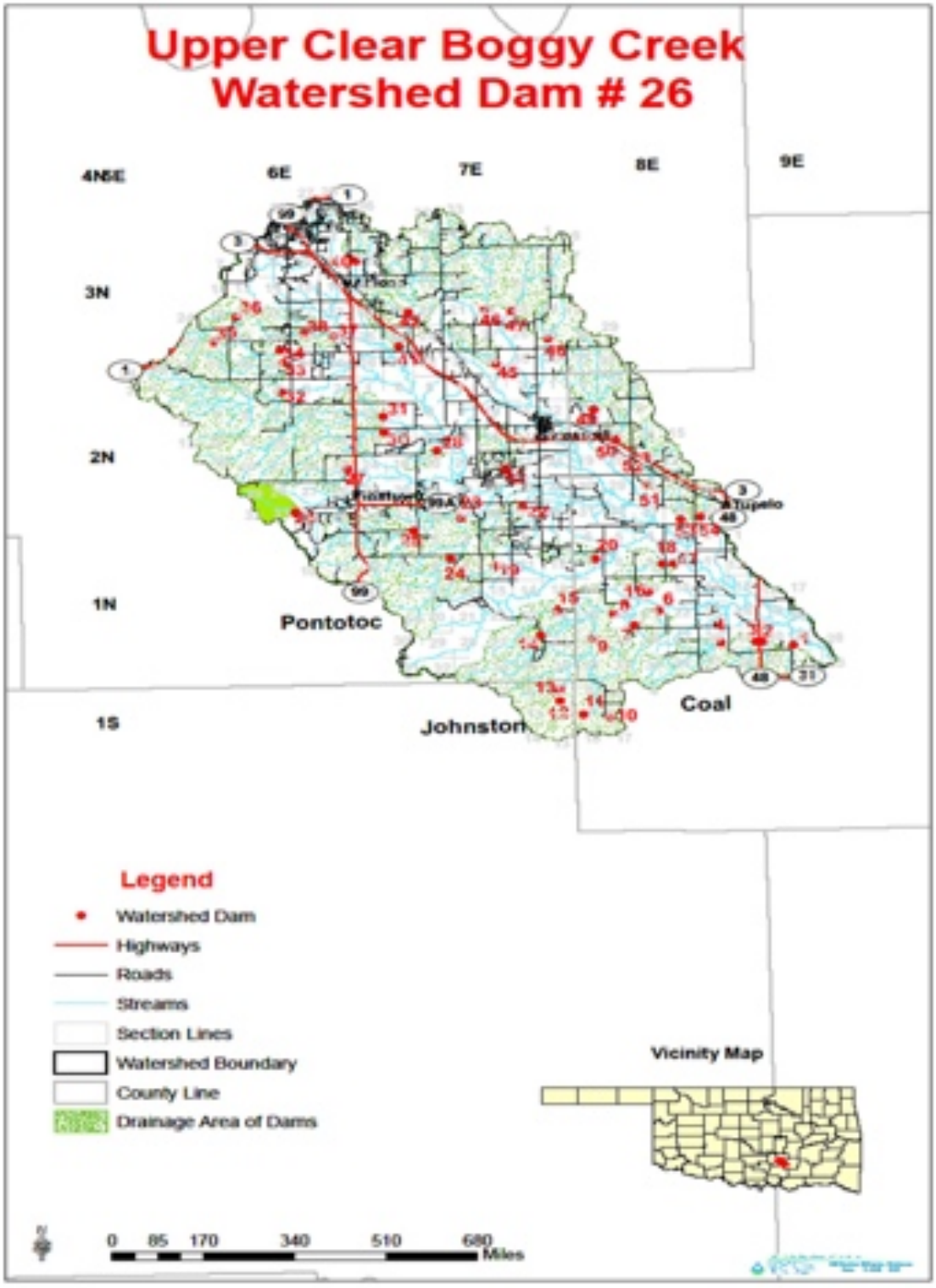

Upper Clear Boggy Creek
Watershed Dam # 26
4N6E
6E
7E
8E
9E
3N
2N
1N
1S
Pontotoc
Johnston
Coal
Tupelo
Legend
Watershed Dam
Highways
Roads
Streams
Section Lines
Watershed Boundary
County Line
Drainage Area of Dams
Vicinity Map
0 85 170 340 510 680
Miles

Figure 3-12

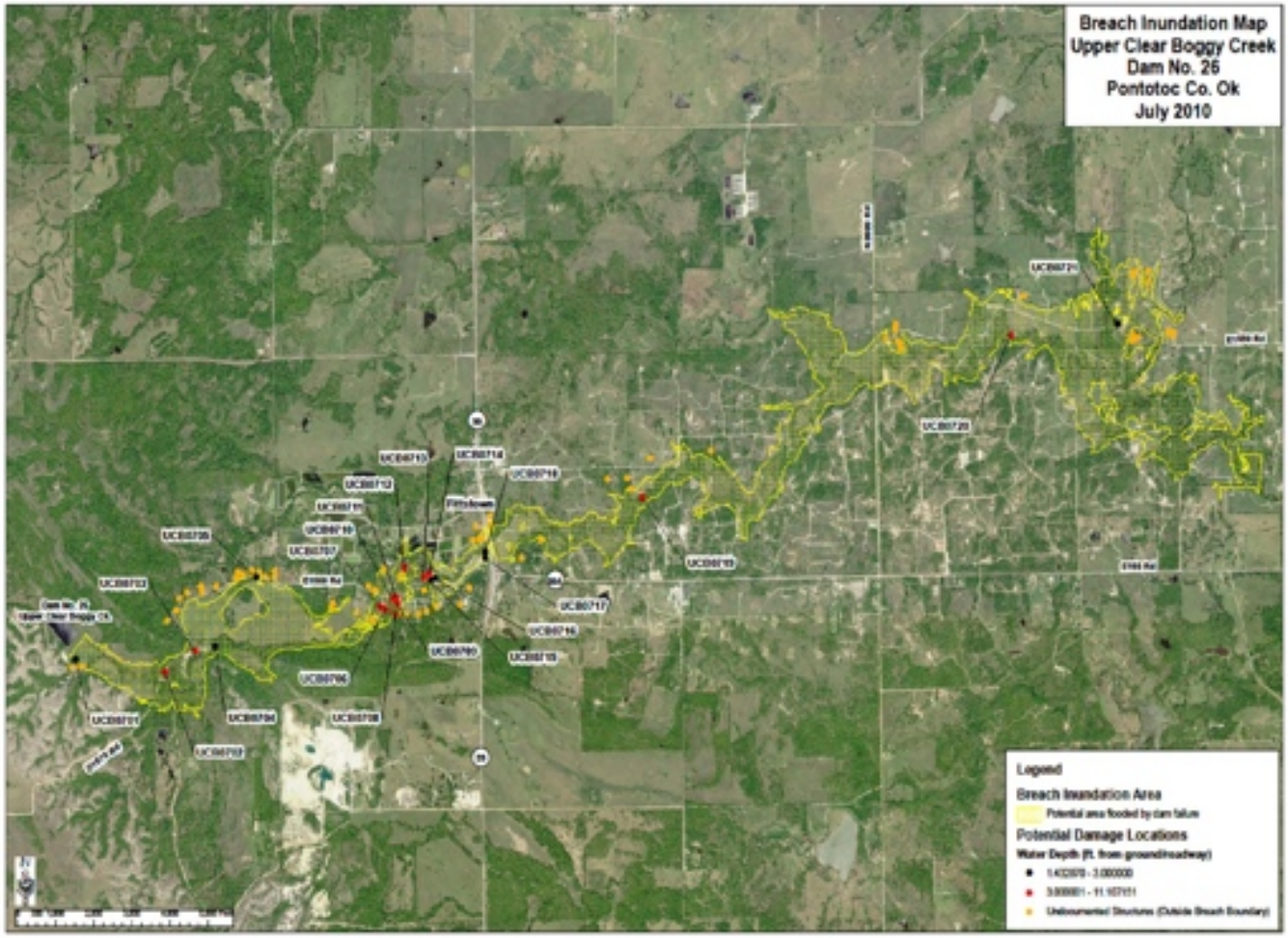

Breach Inundation Map
Upper Clear Boggy Creek
Dam No. 26
Pontotoc Co. Ok
July 2010
Legend
Breach Inundation Area
Potential Damage Locations

Figure 3-13 Upper Clear Boggy Watershed Dam No. 33

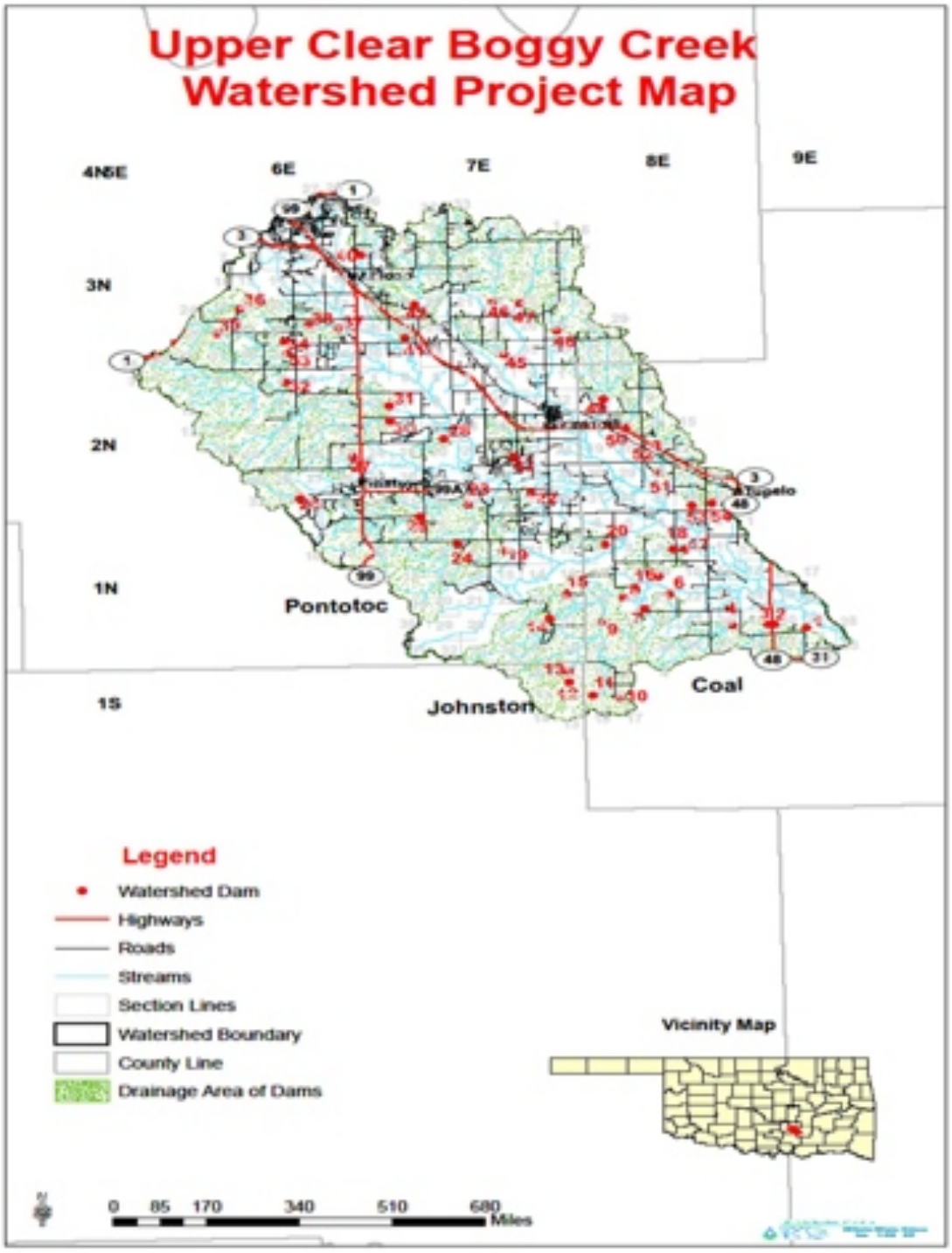


Figure 3-14

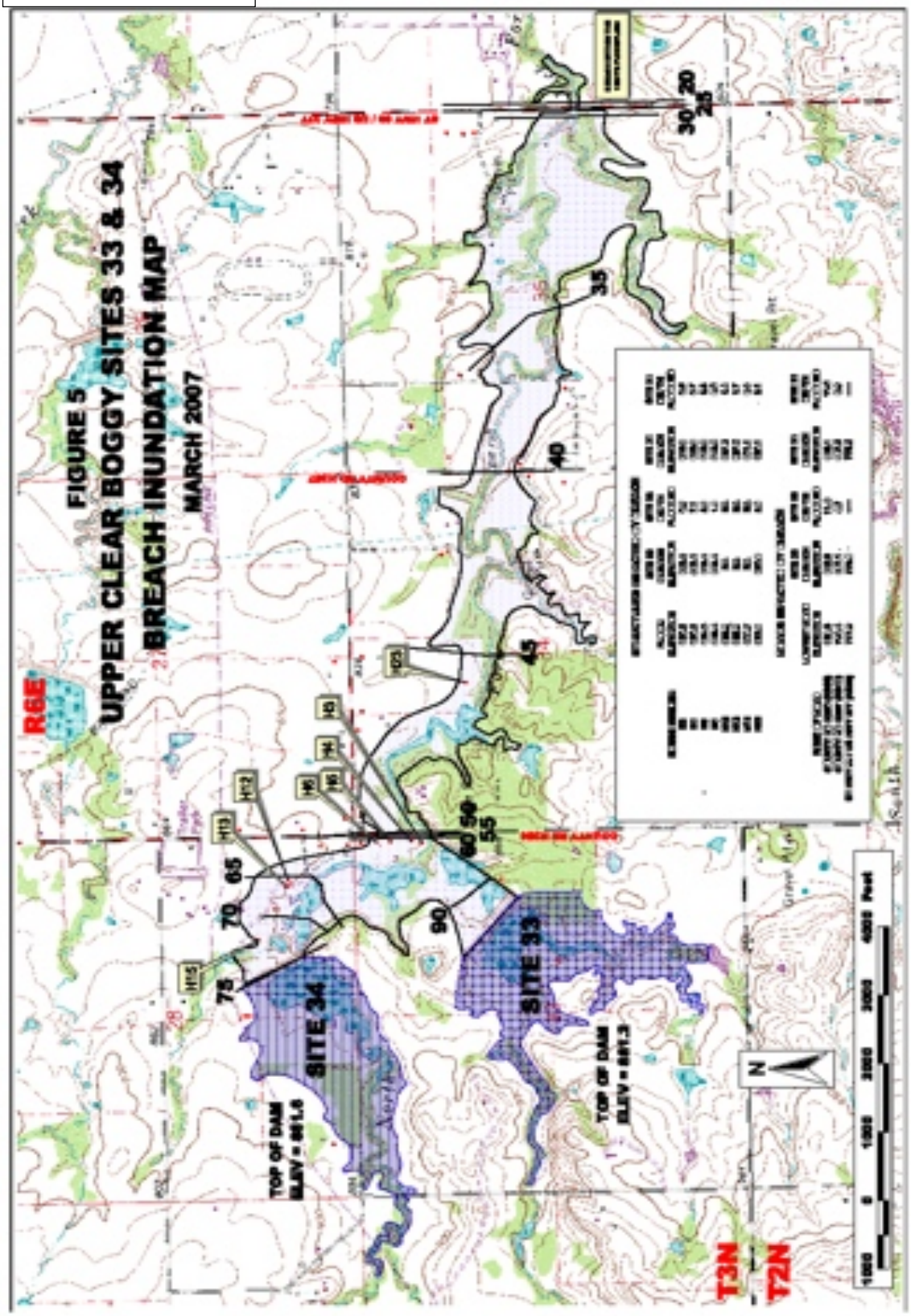


FIGURE 5
UPPER CLEAR BOGGY SITES 33 & 34
BREACH INUNDATION MAP
MARCH 2007
R6E
SITE 34
SITE 33
TOP OF DAM
ELEV = 881.6
TOP OF DAM
ELEV = 881.3
T3N
T2N
N

Figure 3-15 Upper Clear Boggy Watershed Dam No. 34

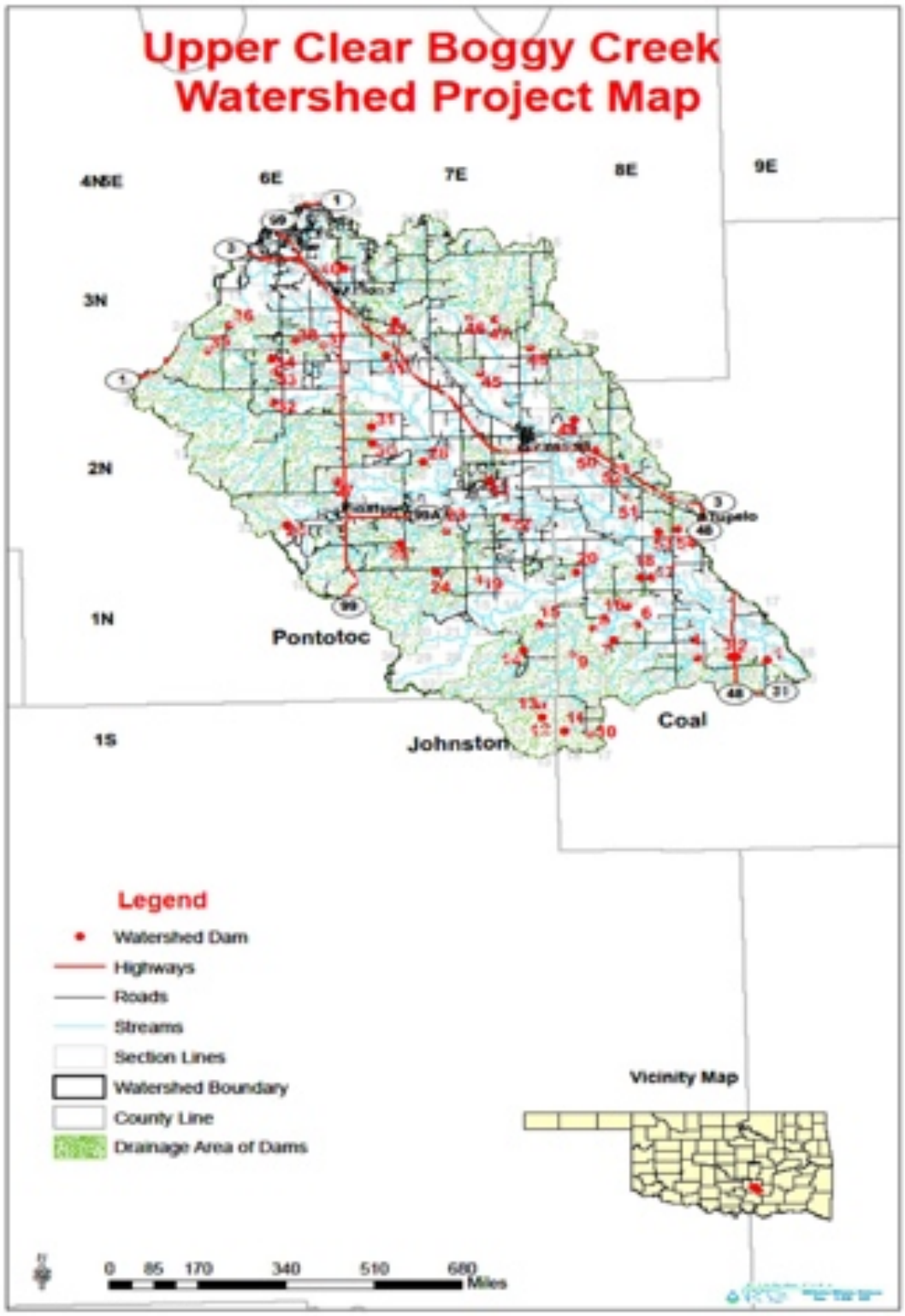


Figure 3-16 Upper Clear Boggy Watershed Dam No. 34

(See enlarged copy of this breach map in back of this binder)

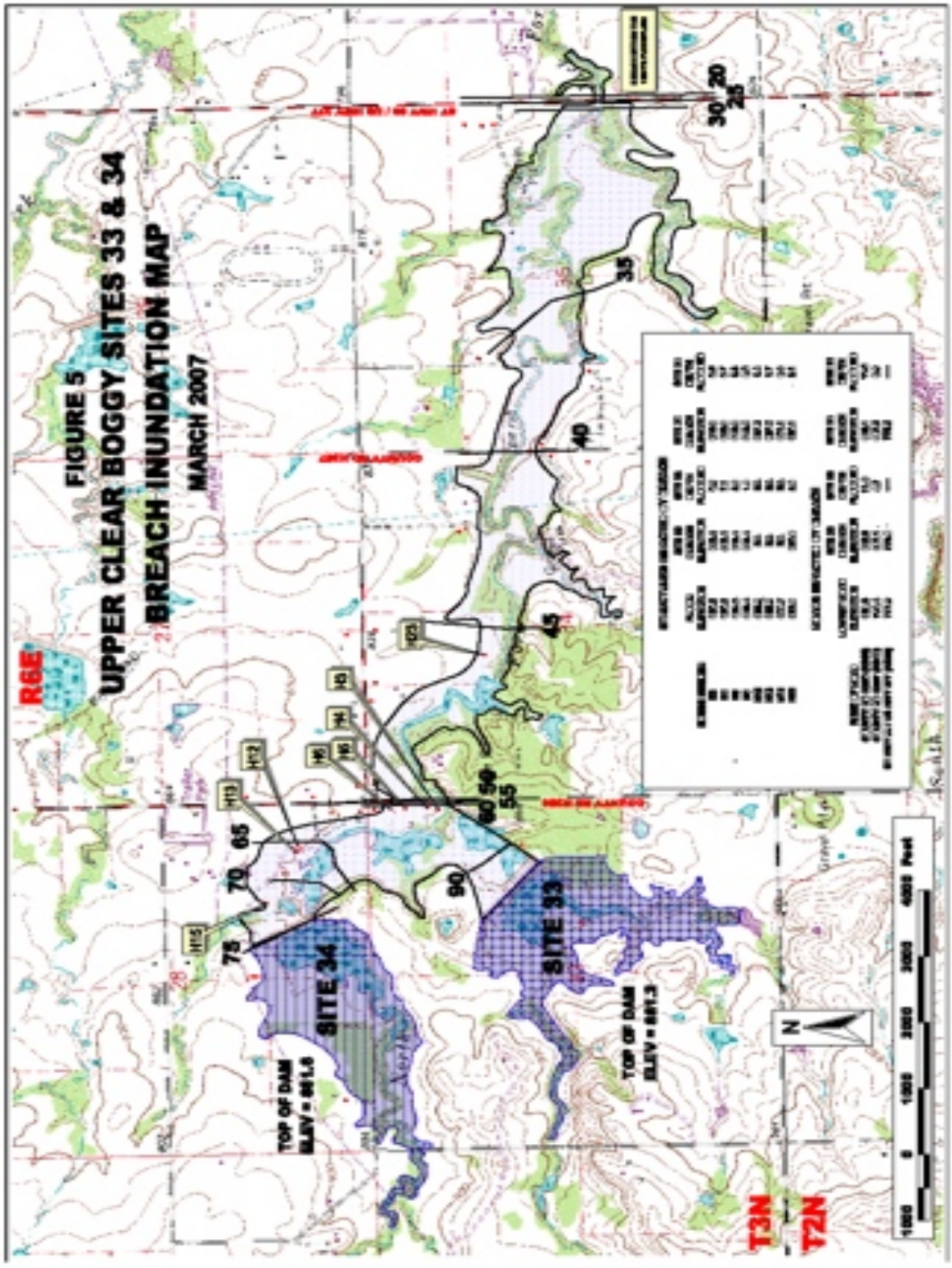


Figure 3-17 Sandy Creek Watershed Project Map

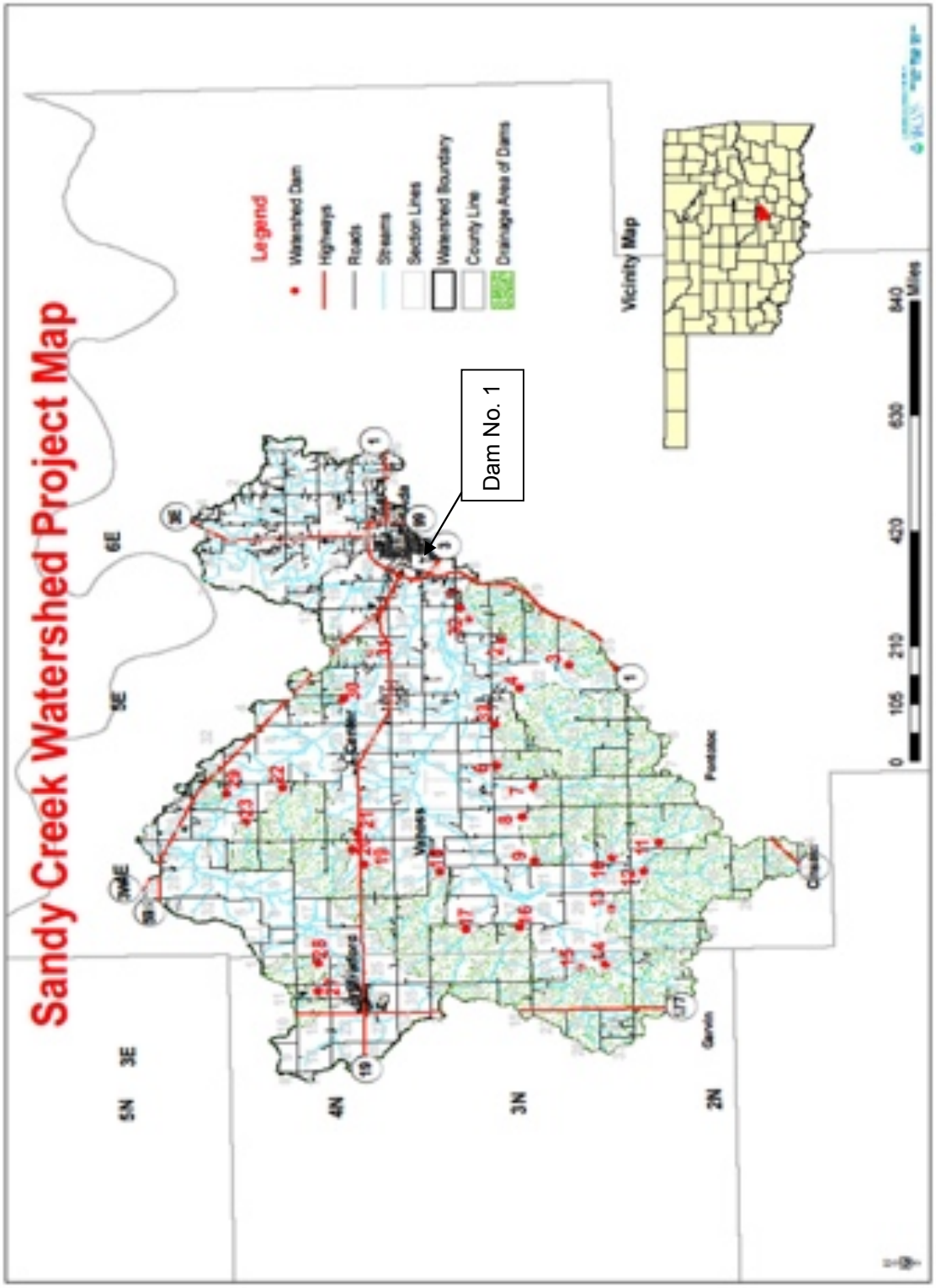


Figure 3-18 Breach Inundation Map

Sandy Creek Watershed Dam No. 1

Figure 3-19 Sandy Creek Watershed Dam No. 7

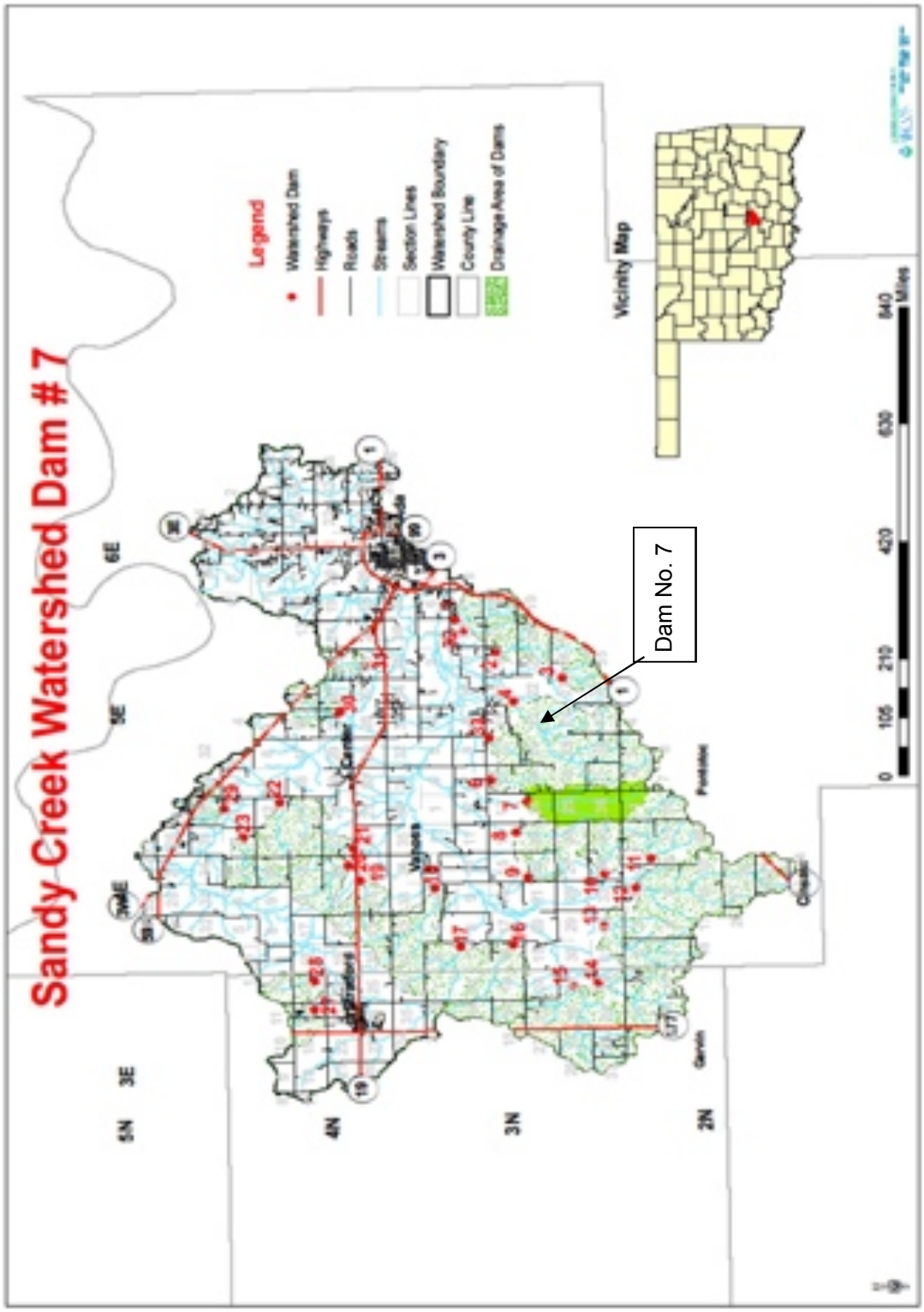


Figure 3-20 Breach Inundation Map

Sandy Creek Watershed Dam No. 7

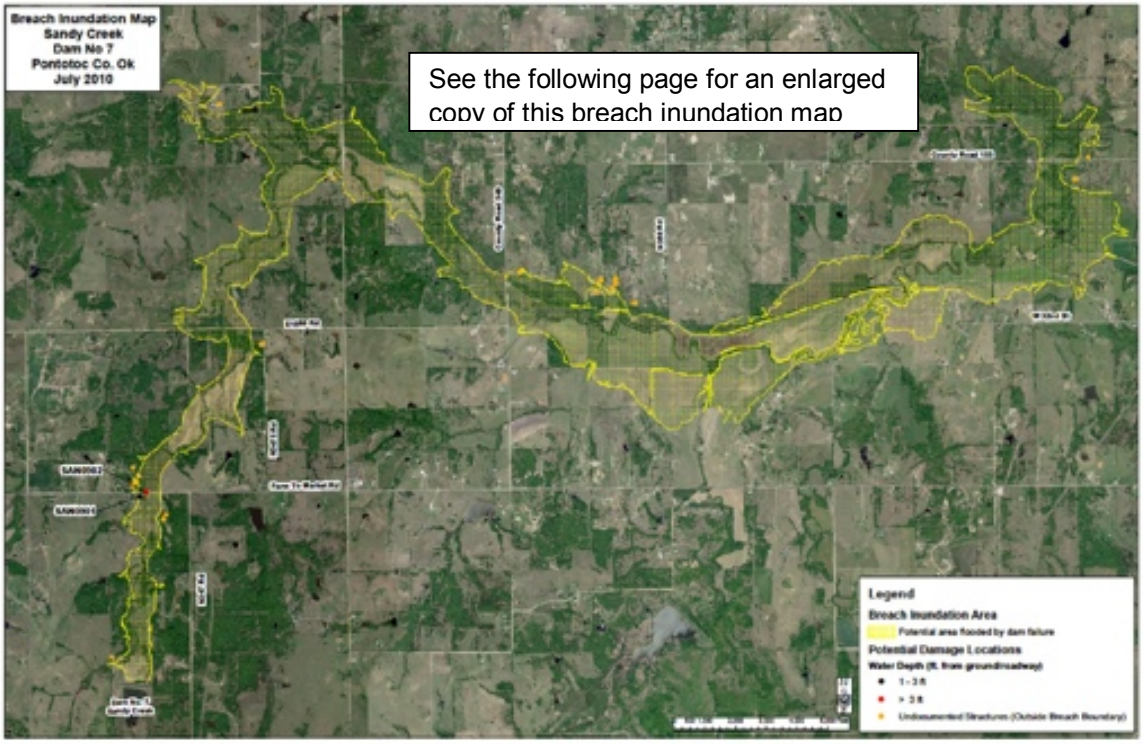


Figure 3-21 Sandy Creek Watershed Dam No.18

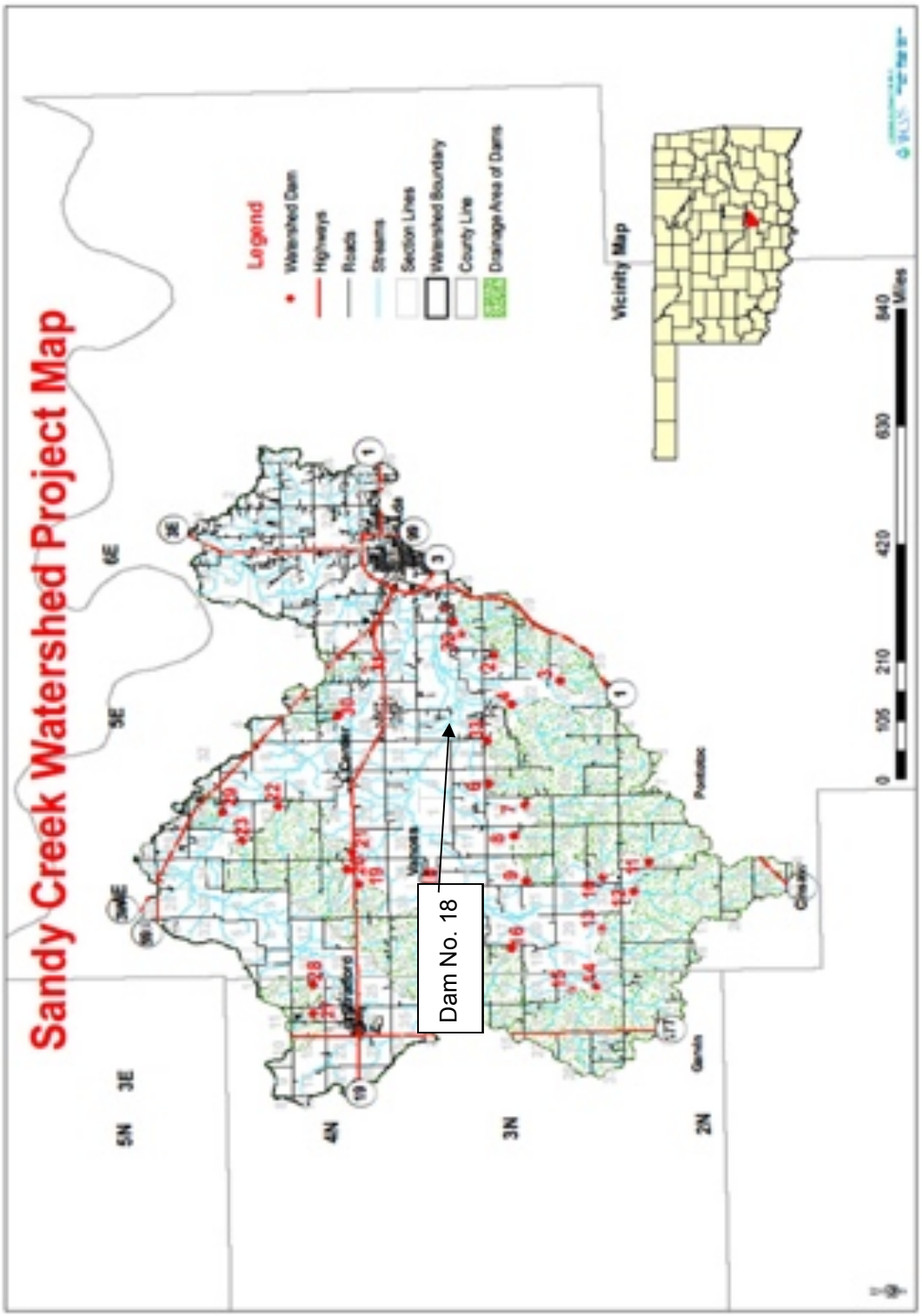
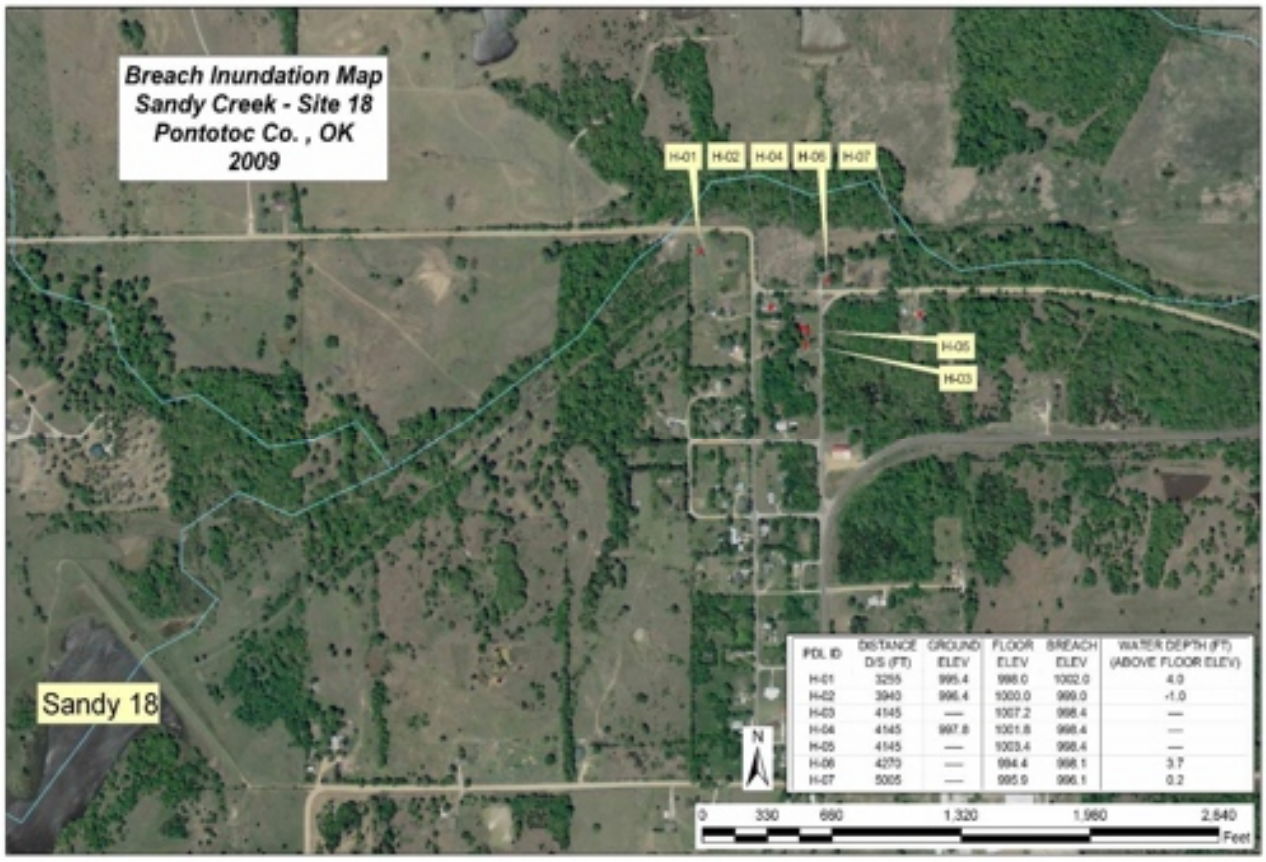


Figure 3-22 Breach Inundation Map

Sandy Creek Watershed Dam No.18



FDL ID	DISTANCE D/S (FT)	GROUND ELEV	FLOOR ELEV	BREACH ELEV	WATER DEPTH (FT) (ABOVE FLOOR ELEV)
H-01	3255	995.4	998.0	1002.0	4.0
H-02	3940	996.4	1000.0	999.0	-1.0
H-03	4145	—	1007.2	998.4	—
H-04	4145	997.8	1001.8	998.4	—
H-05	4145	—	1003.4	998.4	—
H-06	4270	—	994.4	998.1	3.7
H-07	5005	—	995.9	996.1	0.2

Extent

The amount of water impounded in the reservoir behind a dam 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, or approximately 325,000 gallons. As a function of upstream topography, even a very small dam may impound or detain many acre-feet or millions of gallons of water.

Any artificial water barrier structure that has a height of 25 feet or more from the natural streambed and 50 acre feet or more of storage capacity qualifies as a dam and is under the jurisdiction of the Oklahoma Water Resources Board (OWRB).

There are 4,524 dams in Oklahoma (including private structures), with approximately half (2,300) operated by the National Resources Conservation Service (NRCS). Emergency Action Plans have been filed for 160 of the most important dams in the state.

The OWRB classifies dams as high-hazard, significant-hazard, and low-hazard, depending on the amount of water stored and downstream populations. The state has 165 high-hazard dams, which must be inspected every year. There are 88 dams having significant hazard potential, which are inspected every three years. The rest are classified as low hazard, and are inspected every five years.

Dams are classified based on the potential damages to downstream development. If a

high-hazard dam fails, there likely will be loss of life and extensive damage to development □communal, industrial, or agricultural. Failure of a dam classified as significant would cause no loss of life and appreciable agricultural, industrial, or structural damage. Failure of a low hazard dam would cause no loss of life and minimal economic loss. The classification scheme in no way suggests that a dam is in need of repair □it could be in excellent condition or in poor condition. It simply reflects a dam□s potential for doing damage downstream if it were to fail.

Areas likely to be impacted by a dam break are delineated using dam breach analyses that consider both □sunny day□failures and failures under flood conditions.

The Pontotoc County Planning Area considers a minor Dam Breach event to be a release that results in neither injury nor death, and does less than $50,000 damage. A major event is one that requires evacuation, damages downstream structures, and results in injury or loss of life.

3.12.2 History/Previous Occurrences

There have been no recorded events of dam failure within the Planning Area.

Probability/Future Events

Pontotoc County is vulnerable to dam failures, and therefore its vulnerability is a constant and widespread threat. Dam failures, while rarely occurring, can, and do occur in nearly all months of the year at all hours of the day, so it is important that education and preparations continue to move forward. Pontotoc County and participating jurisdictions have a low probability of a dam failure event.

3.12.3 Vulnerability/Impact

Pontotoc County was determined to be at Low risk to the Dam Failure hazard.

Population

With the exception of Stonewall, virtually all of Pontotoc County□s communities are built on high ground, well out of the way of floodwaters, including those along the south bank of the Canadian River. There are no major dams whose failure would result in catastrophic damage or death. However, the County has four High Hazard dams and three Significant Hazard dams whose failure during a flood event could endanger populations and impact infrastructure downstream. These dams are discussed below.

Buildings

There are a number of residences and outbuildings that would be damaged in the event of a failure due to flooding of one of the County□s Seven High Hazard dams.

Critical Facilities

No critical facilities would be impacted by a dam breach in Pontotoc County. There are no Tier II sites in Pontotoc County that would be impacted by a dam breach.

Infrastructure

Several Pontotoc County roads and bridges are vulnerable to a breach of one of the seven High Hazard dams. These are detailed below.

Pontotoc County High Hazard Dams

SCS – Sandy Creek- Site 01 This earthen construction, earthen-core, soil conservation and flood control dam on a tributary to Canadian Sandy Creek has water intermittently behind it. The latest aerial photography, flown in 2011, shows water behind the dam. A breach would likely only occur during a flooding event, after a period of heavy rainfall. There are 22 parcels and 13 structures valued at $810,844 that would possibly be impacted by a breach of the dam during flood conditions.

There are two structures directly downstream, on the north side of W. 32nd St.

Location: 3 miles southwest of Ada
Source: Tributary to Canadian Sandy Creek
Owner/Operator: Pontotoc County Conservation District
Year built: 1960
Height: 33 feet
Length: 1,500 feet
Use of Dam: Flood control, soil conservation
Normal Storage: 49 acre-feet
Capacity: 864 acre-feet
Surface Area: 12 acres

SCS – Sandy Creek- Site 07 This earthen construction, earthen-core, soil conservation and flood control dam on a tributary to Canadian Sandy Creek normally has water behind it. The latest aerial photography, flown in 2012, shows water behind the dam. A breach would likely only occur during a flooding event, after a period of heavy rainfall. There is 1 home, 1 county road, and 1 bridge valued at $400,000 that would possibly be impacted by a breach of the dam during flood conditions.

Location: 5 miles SE of Vanoss
Source: Tributary to Canadian Sandy Creek
Owner/Operator: Pontotoc County Conservation District
Year built: 1960
Height: 42 feet
Length: 1,060 feet
Use of Dam: Flood control, soil conservation
Normal Storage:104 acre-feet
Capacity: 1561 acre-feet
Surface Area: 20 acres

SCS – Sandy Creek- Site 18 This earthen dam on Burris Creek, a tributary of Canadian Sandy Creek, had water behind it in 2011, and presents a threat to the unincorporated community of Vanoss, which is located immediately below the dam. While the lake is not large, this dam is classified as high hazard, meaning that a failure could cause loss of life. There are 66 parcels and 12 structures valued at $335,999 that would possibly be impacted by a breach of the dam during flood conditions.

Location: Half mile west of Vanoss
Source: Burris Creek

Owner/Operator: Pontotoc County Conservation District
Year built: 1973
Height: 40 feet
Length: 1,470 feet
Use of Dam: Flood control, soil conservation
Normal Storage: 58 acre-feet
Capacity: 1,077 acre-feet
Surface Area: 21 acres

SCS – Upper Clear Boggy Creek – Site 24 This earthen construction, earthen-core, soil conservation and flood control dam is on the Upper Clear Boggy Creek and upstream from UCB Dam #23. There 1 home and 1 county road valued at $150,000 downstream that would possibly be impacted by a breach of the dam during flood conditions.

Location: 5 miles SE of Fittstown
Source: Upper Clear Boggy Creek
Owner/Operator: Pontotoc County Conservation District
Year built: 1963
Height: 56 feet
Length: 1,320 feet
Use of Dam: Flood control, soil conservation
Normal Storage:111 acre-feet
Capacity: 1,337 acre-feet
Surface Area: 14 acres

SCS – Upper Clear Boggy Creek – Site 26 This earthen construction, earthen-core, soil conservation and flood control dam is located on Mill Creek, a tributary of the Upper Clear Boggy. There are 18 structures and a seasonal trailer/RV park valued at $1,300,000.00 downstream that would possibly be impacted by a breach of the dam during flood conditions.

Location: 2 miles WSW of Fittstown
Source: Mill Creek, a tributary of Upper Clear Boggy
Owner/Operator: Pontotoc County Conservation District
Year built: 1980
Height: 41 feet
Length: 850 feet
Use of Dam: Flood control, soil conservation
Normal Storage: 45 acre-feet
Capacity: 579 acre-feet
Surface Area: 9 acres

SCS – Upper Clear Boggy Creek – Site 33 This earthen construction, earthen-core, soil conservation and flood control dam is directly downstream of SCS Site 34. The area behind this dam is the smallest of the high hazard dams of Pontotoc County. There are 39 parcels and 13 structures valued at $742,751 downstream of both Site 33 and 34 that would possibly be impacted by a breach of these dams during flood conditions. This dam has been allocated $1.01 Million for rehabilitation under 2009 Economic Stimulus funding.

Location: 3.3 miles southwest of Ahloso
Source: Tributary to North Fork Jack Fork Creek

Owner/Operator: Pontotoc County Conservation District
Year built: 1963
Height: 47 feet
Length: 2,700 feet
Use of Dam: Flood control, soil conservation
Normal Storage: 55 acre-feet
Capacity: 1,146 acre-feet
Surface Area: 11 acres

SCS – Upper Clear Boggy Creek – Site 34 This earthen construction, earthen-core, soil conservation and flood control dam is directly upstream of SCS Site 33. There are 39 parcels and 13 structures valued at $742,751 downstream of both Site 33 and 34 that would possibly be impacted by a breach of these dams during flood conditions. This dam has been allocated $960,000 for rehabilitation under 2009 Economic Stimulus funding.

Location: 3.3 miles southwest of Ahloso
Source: Tributary to North Fork Jack Fork Creek
Owner/Operator: Pontotoc County Conservation District
Year built: 1965
Height: 37 feet
Length: 1,130 feet
Use of Dam: Flood control, soil conservation
Normal Storage: 78 acre-feet
Capacity: 1,436 acre-feet
Normal Surface Area: 17 acres

3.12.4 Sources

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3.13 Transportation Events

Transportation is defined as the physical movement of an object through components of a system and its subsystems. Transportation includes the use of aviation, highway, railroad, pipeline, and marine systems to convey movement of objects and people. In 1967, the Department of Transportation (DOT) was created in order to administer and protect the nation s transportation systems. The National Transportation Safety Board (NTSB) was established within the DOT as an independent agency responsible for investigating transportation incidents and promoting transportation safety.

3.13.1 Hazard Profile

Location

Water: Pontotoc County does not have navigable waterways. The water transport hazard will not be assessed in this Plan.

Pontotoc County Transportation Infrastructure

Pontotoc County has 163 miles of United States and State highways, 73 miles of railroad track, approximately 210 miles of natural gas and hazardous material pipelines, and one airport within its boundaries.

Roads: In Pontotoc County, there are a number of major highways carrying hazardous materials transport. These are listed in Table 3-28. Table 3-29 lists major County roads. Because of the ubiquity of oil and gas wells and pipelines in the County, hazardous materials will likely be occasionally carried over all local, rural roads.

Of the jurisdictions participating in the plan, only the Town of Stonewall, and Vanoss Schools do not list a vulnerability to Hazardous Materials Transportation Event. These 2 jurisdictions are located far enough from a major transportation corridor to have a negligible hazard. All other participating jurisdictions are near or adjacent to one of our major transportation corridors and are significantly vulnerable to a transportation event.

Table 3–29: Pontotoc County Highways

Highway	Description
U.S Hwy 377	N-S, Also known as Oklahoma State Highway 99. Highway runs from southern border of Pontotoc County through Fittstown, Ahloso, Ada and Byng before crossing over the Canadian River into Seminole County.
S.H. 1	NE-SW, Enters Pontotoc County near Allen, passes through Happyland, Ada, Latta Fitzhugh and Roff before exiting into Murray County.
S.H. 3	SE-NW, Enters Pontotoc County near Stonewall in far SE Pontotoc County, passes through Ada, Union Hill and Oil Center before exiting the county in the far NW, into Pottawatomie County.
S.H. 19	E-W, Begins west of Ada, branches off from S.H. 3, exits county on western border, continues into Garvin County, having passed through Pickett and Center.
S.H. 48	N-S, Begins near Allen in far NE Pontotoc County, continues in a southerly direction, exiting the County south of Lula into Coal County.
S.H. 59A	E-W, Branches off highway 3 in far NW Pontotoc County, exits Pontotoc County on the western border into McClain County.
S.H. 99	Duplexes U.S. Hwy 377 from north to south through Pontotoc County.
Chickasaw Turnpike	A 17-mile-long, 2-lane toll road that begins west of Sulphur in Murray County and ends northeast of Roff, where it joins S.H. 1.

Table 3–30: Major County Roads in Pontotoc County

County Roads	Description
CR 3	Old State Highway 3
CR 1570	Runs between Latta and Vanoss
CR 1600	Provides an east □ west link to the unincorporated community of Lula
CR 1650	Provides an east-west link between Roff and the unincorporated community of Fittstown
CR 3450	Provides a N-S link between the unincorporated community of Vanoss, S.H. 3 and S.H. 19
CR 3460	Provides a N-S link between Roff and CR 1570
CR 3640	Provides a N-S link, both north and south of Stonewall

Air: The only airport in Pontotoc County is Ada Municipal Airport. Ada Municipal has 2 single runways, AV fuel storage, and has 8 aircraft based at the field.

Rail: Railroad service for Pontotoc County is provided by the Burlington Northern Santa Fe (BNSF), with a main line running from southwest, near Roff, to the northeast, via Fitzhugh, Latta, Ada, and Francis. Ada is a BNSF main line national switching yard. The BNSF is one of the two largest railroads in the US, and operates at least three local trains a day through the county. Primary cargoes are agricultural and mining products. Mining products include coal, oil, propane, asphalt, gypsum, and limestone. There are many other hazardous materials that are transported by BNSF through the county as well, but in lessor quantities.

Pipeline: ten companies operate pipelines in Pontotoc County:

- Bobwhite Production Co. Inc.
- Enable
- Enterprise
- Explorer Pipeline Company
- Holcim
- Magellan
- Oneok NGL Pipeline LP
- Sterling
- Sunoco Pipeline, LP
- Technisand

Extent

The largest economic impact associated with hazardous material transport incidents comes from flammable and combustible liquids. In terms of incident cost, release-causing enroute accidents have the highest average cost, followed by enroute accidents in which a release does not occur. Of those enroute accidents resulting in a release, explosions have the highest per incident cost, followed by fires and then releases where neither a fire nor explosion ensues. Explosions result in an average cost of over $2.1 million per accident, followed by $1.2 million per accident involving fire, and accidents involving releases with no fire or explosions average slightly over $400,000. The greatest economic impact though, is associated with accidents enroute where a release does not occur, due to the higher frequency of these events.

The extent of a transportation event can range from relatively harmless to catastrophic in scope, with the population, property and long-term mobility of a jurisdiction impacted for months or years. The extent of a transportation event can be lessened by, among other measures, Reverse 9-1-1 notifications of people in the impact area, by planned and practiced notification and evacuation procedures, and by relocating hazardous material transportation routes away from populated areas and critical facilities.

Pontotoc County considers a minor severity Transportation incident to be one that results in inconvenience (such as traffic delays), minor injury, and some financial loss (less than $50,000), and a major severity event to be one that requires immediate intervention to save lives and property, and/or results in serious injury, death or massive financial loss (greater than $50,000).

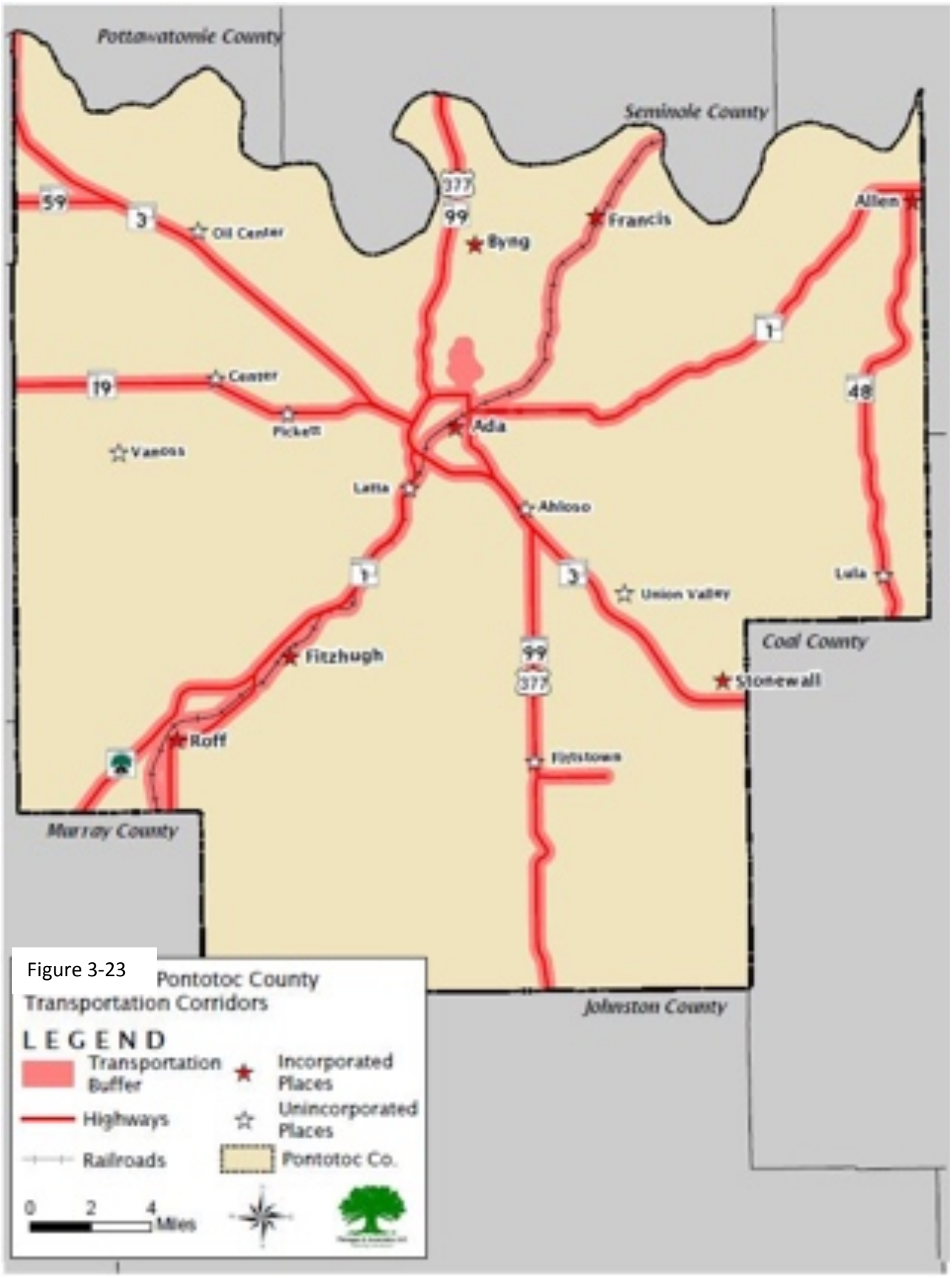
Pottawatomie County
Seminole County
Coal County
Murray County
Johnston County
59
3
Oil Center
377
99
Byng
Francis
Allen
1
19
Cromer
Pickett
Vanoss
Ada
48
Latta
Ahloso
Union Valley
Lula
Fitzhugh
Stonewall
Roff
Fittstown
Pontotoc County
Transportation Corridors
LEGEND
Transportation Buffer
Highways
Railroads
Incorporated Places
Unincorporated Places
Pontotoc Co.
0 2 4 Miles

Figure 3-23

3.13.2 History/Previous Occurrences

Explorer Pipeline tank fire

Pontotoc County Transportation Events

The National Response Center lists 9 reported incidents from 2006 to 2016 in Pontotoc County. Pipeline and storage tank incidents were the most numerous, accounting for 4 of the incidents. 3 involving railroad transport, and 2 motor vehicle. During the same time period, the NTSB reports no airplane accidents. The reported transportation events for Pontotoc County are listed in Table 3-31.

None of the jurisdictions participating in the plan have reported damages from a Transportation Event. Any damages noted have occurred on private property.

Table 3–31: Pontotoc County Transportation Events outside Ada city limits, 2006-2016

Date	Location	Nearest City	Suspected Responsible Party	Material
07/21/06	3 Miles South of Ada	Latta	BNSF Railroad	Barite, Plastic Pellets
11/02/07	Chickasaw Turnpike mile marker 14 South of Ada,	Roff	NUTECH INC	TC99M
12/11/07	2N-7E-Sec27	Jesse	CITATION OIL AND GAS	Produced Water
12/16/08	Highway 3 BETWEEN ADA, OK & STONEWALL, OK	Union Valley	UNITED PETROLEUM TRANSPORT	Oil, Diesel
12/30/08	3610&1460	Francis	Unknown	Unknown
05/03/11	7668 CR 1610	Fitzhugh	Unknown	Crude Oil
08/13/12	Mile Post 548.2	Ada	BNSF Railroad	Sand
04/17/13	34 49 00.7N 96 31 49.5W	Ada	SUNOCO LOGISTICS	Crude Oil
09/19/14	Mile Post 542.2	Ada	Unknown	Sand

Probability/Future Events

Pontotoc County, like Oklahoma, is vulnerable to transportation incidents, and therefore its vulnerability is a constant and widespread threat. Transportation incidents can, and do occur in all months of the year at all hours of the day, so it is important that even when not responding to an incident, education and preparations continue to move forward.

3.13.3 Vulnerability/Impact

This section summarizes information about Pontotoc County's vulnerability to Transportation hazards, including the impact on people, structures and buildings, critical facilities, and infrastructure. This information, as well as information provided by the County, Incorporated Communities and Public Schools, was used to determine the Vulnerability Criteria identified in Tables 3-2 and 3-3. Pontotoc County was determined to be at High risk to the Transportation hazard. (See Table 3-2 Hazard Risk Analysis, and

Table 3-3, Summary of Hazard risk Analysis Ranking Criteria for an explanation of how the rankings were derived.) Appendix A identifies where the Incorporated Communities and Public School Systems differ from Pontotoc County.

Communities close to highway, railroad, pipeline and air transportation systems are at risk from vehicle or facility accidents and possible subsequent hazardous material events. Pontotoc County has 163 miles of United States and State highways, 73 miles of railroad tracks and approximately 210 miles of natural gas and hazardous material pipelines within its boundaries. Pontotoc County is also home of Ada Municipal Airport. A ¼ mile buffer was placed around these transportation features, as shown in Figure 4-35, to identify vulnerable populations and critical facilities.

Though transportation events can potentially impact most locations in the planning area, the areas of most concern for this planning team is the Town of Allen and Allen Schools due to the Magellan tank farm located adjacent to the city, and the Stonewall School campus of McLish due to the extensive oil field activities adjacent to and near by the campus. The towns of Roff, Fitzhugh, and Francis, as well as Latta School are also a major concern due to BNSF railroad running through or adjacent to those jurisdictions.

Population

Although Pontotoc County is not a major highway transportation hub, with only one US Hwy (US 377) and a short stretch of the Chickasaw Turnpike within its jurisdiction, it is a significant hub for railroad and pipeline transport. Since volatile petroleum products move over its highways, county roads, railways and through its pipelines, the jurisdiction is at high risk to the transportation hazard. All populations living and working within ¼ mile of a transportation corridor are exposed to accidents involving hazardous materials.

As shown in Table 3-31, approximately 32% (11,295) of the County□s population lives within at least one of the four corridors. The transportation corridor as a whole (highways, railroads and runways) covers a total of approximately 89 square miles, while the pipeline corridor covers about 99 square miles.

Table 3–32: Transportation Corridor Statistics

Name	*Area (sq. mi)*	*Transport Buffer Area (sq. mi)*	*% of Area*	*Total Pop.*	*Pop. in ¼ mi Buffer*	*% of Pop. In 1/4 mi Buffer*
Unincorporated Pontotoc County	689.05	76.12	11	15,451	1,798	12
City of Ada	19.30	8.21	42	15,916	7,817	49
Town of Allen	.91	.59	65	951	479	50
Town of Byng	6.51	1.4	22	1,090	267	24
Town of Fitzhugh	7.3	1.85	25	204	54	26
Town of Francis	.59	.45	77	332	264	80
Town of Roff	.94	.85	90	734	616	84
Town of Stonewall	.32	0	0	465	0	0
Total	**724.92**	**89.48**	**12**	**35,143**	**11,295**	**32**

Buildings

Structures alongside the major traffic ways are at high risk from the transport of explosive or highly flammable products by highway, rail or pipeline. Most vulnerable are structures where loading and unloading of hazardous materials occurs, including pipeline facilities.

Critical Facilities

Critical facilities located next to major traffic corridors are at high risk to the transportation hazard. As the following table illustrates, Pontotoc County has high vulnerability to transportation hazards, with 38 out of 57 (66%) County critical facilities located in at least one transportation or pipeline corridor, including 24 County schools. Only 19 out of Pontotoc County's 57 (33%) critical facilities are situated outside of a transportation or pipeline corridor.

Infrastructure

Pontotoc County roads, bridges, railways and pipelines can themselves become hazardous due to deterioration and insufficient maintenance. Although Pontotoc County transportation facilities are in good condition, private rail and pipeline networks require oversight to ensure that these do not become hazardous to surrounding populations. Specifically, aging pipelines are subject to corrosion and equipment failure.

3.13.4 Sources

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Chapter 4: Mitigation Goals and Objectives

This chapter identifies the hazard mitigation goals set by Pontotoc County and the Pontotoc County School Districts, and discusses the mitigation projects, or measures, to be taken to achieve those goals.

Included in this Chapter:

The Research, Review, and Prioritization Process

The Hazard Mitigation Planning Committee (HMPC) and supporting staff identified and prioritized the measures that will help protect the lives and property of the residents of Pontotoc County.

National literature and sources were researched to identify best practice mitigation measures for each hazard. These measures were documented, and staff screened several hundred recommended mitigation actions and selected those that were most appropriate for the County.

The HMPC reviewed the measures recommended by staff and revised, added, deleted, and approved measures for each hazard. The HMPC and staff prioritized the measures through a prioritization exercise using STAPLEE criteria recommended by FEMA. Table 4-1 lists these criteria. The results were tabulated and the individual measures were ranked by priority. The measures were then grouped into categories.

Table 4–1: STAPLEE Prioritization and Review Criteria

Evaluation Category	Sources of Information
Social	Members of Local, County and State Government were members of the Hazard Mitigation Planning Committee and had input throughout the planning process. The plan was coordinated with existing community and county mitigation and response plans. Members of the Media were contacted and invited to attend all HMPC meetings.
Technical	The following Persons/Agencies were consulted as to the technical feasibility of the various projects: Oklahoma Emergency Management, Soil Conservation Service, County and State Health Departments, and the Oklahoma Forestry Service. All of these had their comments and suggestions incorporated.

Evaluation Category	Sources of Information
Administrative	Staffing for proper implementation of the plan currently will rely on existing members of the various agencies involved. Technical assistance is available from contractors and various State Agencies. Some local jurisdictions have incorporated Hazard Mitigation efforts into their Capital Improvement Plans. The HMPC, led by the Pontotoc County Emergency Management Director, has agreed to an annual review and assessment of the Plan and its progress. Operations Costs are under discussion by the relevant department heads.
Political	County Commissioners, representatives of Public School Systems, and a representative of the U.S. Congressman's office participated in the planning process. In addition, representatives of regional, state, Tribal and federal offices were invited to attend the HMPC meetings and were consulted on all aspects of the Plan.
Legal	Members of the HMPC discussed legal issues with City and County officials, and it was their opinion that no significant legal issues were involved in the projects that were selected by the HMPC.
Economic	Economic issues were the predominant issues discussed by all concerned, with an emphasis on benefit/cost review. Each entity felt that the projects selected would have a positive effect in that the projects would attract business and recreation to the area as well as help the community be better prepared for a disaster. Funding for the various projects was the major concern as local budgets were not capable of fulfilling the needs due to the economic down turn. Reliance on outside grants will be relied on heavily for completion of projects.
Environmental	Oklahoma Department of Environmental Quality, Oklahoma Forestry Service, and the Oklahoma Water Resources Board were all consulted as to the environmental impact of the various projects and it was felt that there would be no negative impact. Local governments are currently considering zoning of environmentally sensitive areas.

Mitigation Categories

The measures that communities and individuals can use to protect themselves from, or mitigate the impacts of, natural and man-made hazards fall into six categories:

- Public Information and Education;
- Preventive Measures;
- Structural Projects;
- Property Protection;
- Emergency Services;
- Natural Resources Protection.

This chapter is organized by mitigation category, with the HMPC mitigation mission statement and goals listed first in section 4.1.

Pontotoc County's natural hazard mitigation planning process involves citizens in every phase

4.1 Pontotoc County Hazard Mitigation Goals

4.1.1 Mission Statement

To create a disaster-resistant community and improve Pontotoc County s safety and well-being by reducing deaths, injuries, property damage, environmental and other losses from natural and technological hazards in a manner that advances community goals, quality of life, and results in a more livable, viable, and sustainable community.

4.1.2 Mitigation Goal

To identify County policies, actions and tools for long-term implementation in order to reduce risk and future losses stemming from natural and technological hazards that are likely to impact the Pontotoc County.

4.1.3 Goals for All Natural Hazards

- Minimize loss of life and property from natural hazard events.
- Protect public health and safety.
- Increase public awareness of risk from natural hazards.
- Reduce risk and effects of natural hazards.
- Identify hazards and assess risk for Pontotoc County.
- Ascertain historical incidence and frequency of occurrence.
- Determine increased risk from specific hazards due to location and other factors.
- Improve disaster prevention.
- Improve forecasting of natural hazard events.
- Limit building in high-risk areas.
- Improve building construction to reduce the dangers of natural hazards.
- Improve government and public response to natural hazard disasters.

4.2 Hazard-Specific Goals and Objectives

Flood	
GOAL: ***To reduce injuries and loss of life; trauma; damage to property, equipment and infrastructure; community disruption; and economic, environmental, and other losses caused by floods and flash floods.***	
Objective 1.	**Public Information & Education.** Improve public awareness of flood and flash flood hazards in general and at specific high-risk locations; and give people knowledge about measures they can use to protect themselves, their property and their community.
Objective 2.	**Preventive Measures.** Expand mapping, regulations, and loss-prevention programs in areas with high risks and catastrophic potential, such as local portions of multi- jurisdictional riverine floodways and floodplains where additional safety considerations are warranted because a community does not have jurisdiction to regulate upstream and downstream runoff, blockages, or other actions that can affect safety.
Objective 3.	**Structural Projects.** Obtain funding for and implement projects that can reduce flood and drainage hazards, with consideration for comprehensive solutions in accord with watershed-wide management plans.
Objective 4.	**Property Protection.** Identify and protect people, structures, critical facilities, and critical infrastructure that are vulnerable to flood and flash flood hazards.
Objective 5.	**Emergency Services.** Identify the needs, and implement additional emergency operations plans and services for areas at high risk of flooding, including additional prediction and forecasting capability, emergency alerts, and evacuation plans.
Objective 6.	**Natural Resource Protection.** Protect and enhance natural floodplain and storm water resources by adopting and implementing sustainable flood-management policies that have few or no negative impacts and have positive environmental effects whenever possible.

Tornado	
GOAL: ***To reduce injuries and loss of life; trauma; damage to property, equipment and infrastructure; community disruption; and economic, environmental and other losses caused by tornadoes.***	
Objective 1.	**Public Information & Education.** Improve public awareness of tornado hazards, in general and in specific high-risk situations; and give people knowledge about measures they can use to protect themselves, their property, and their community.
Objective 2.	**Preventive Measures.** Prevent or reduce tornado losses by strengthening buildings and by publicizing, training, and creating market options for fortified new construction, retrofits, code changes and code-plus innovations.
Objective 3.	**Structural Projects.** Provide safe tornado shelters, Safe Rooms, and fortified buildings for vulnerable populations, including children; offer training and incentives to encourage people of means to include shelters and Safe Rooms in new and retrofit building projects.
Objective 4.	**Property Protection.** Identify and protect people, structures, and critical infrastructure that are vulnerable to tornado hazards, with emphasis on critical facilities.
Objective 5.	**Emergency Services.** Identify the needs for and implement additional emergency operations plans and services to expand tornado safety.

Tornado	
Objective 6.	**Natural Resource Protection.** Take advantage of opportunities for tornado programs and policies that reduce negative environmental impacts. Examples include sustainable programs for debris management and recycling, and fortified construction with environmentally friendly materials.

High Wind	
GOAL: ***To reduce injuries and loss of life; trauma; damage to property, equipment and infrastructure; community disruption; and economic, environmental and other losses caused by high winds.***	
Objective 1.	**Public Information & Education.** Improve public awareness of high-wind hazards, in general and in specific high-risk situations; and give people knowledge about measures they can use to protect themselves, their property, and their community.
Objective 2.	**Preventive Measures**. Prevent or reduce high-wind losses by strengthening buildings and by publicizing, training, and creating market options for fortified new construction, retrofits, code changes and code-plus innovations.
Objective 3.	**Structural Projects.** Provide fortified buildings for critical public facilities and vulnerable populations, including children; offer training and incentives to encourage people of means to build stronger structures in new and retrofit building projects.
Objective 4.	**Property Protection.** Identify and protect people, structures, and critical infrastructure that are vulnerable to high winds, with emphasis on critical facilities.
Objective 5.	**Emergency Services.** Identify needs for and implement additional emergency operations plans and services to expand safety in dangerous windstorms, including Community Emergency Response Team training.
Objective 6.	**Natural Resource Protection.** Take advantage of opportunities for high-wind programs and policies that reduce negative environmental impacts. Examples include sustainable programs for debris management and recycling, and fortified construction with environmentally friendly materials.

Lightning	
GOAL: ***To reduce injuries, loss of life, and damage to property, equipment and infrastructure caused by Lightning strikes.***	
Objective 1.	**Public Information & Education.** Improve public awareness of lightning hazards and measures by which people can protect themselves, their property and their community.
Objective 2.	**Preventive Measures.** Identify the costs and the benefits of loss-prevention programs, such as whole building surge protection, with consideration for uncalculated benefits such as data or work productivity loss.
Objective 3.	**Structural Projects**. Provide for necessary construction, renovation, retrofitting or refurbishment of city infrastructure to protect vulnerable populations from the effects of lightning strikes.
Objective 4.	**Property Protection**. Identify ways to protect structures, infrastructure, and critical facilities and their occupants from damage caused by lightning strikes.
Objective 5.	**Emergency Services**. Establish or expand emergency services protocols that adequately address response scenarios in the event of scenarios with the possibility of severe lightning.

Lightning	
Objective 6.	**Natural Resource Protection**. Ensure that lightning damage mitigation policies have no negative impacts and, whenever possible, provide positive enhancements to the environment.

Hail	
GOAL: ***To reduce the high costs of property and infrastructure damage caused by Hailstorms.***	
Objective 1.	**Public Information and Education.** Improve public awareness of hailstorm hazards and measures by which people can protect themselves, their property and their community.
Objective 2.	**Preventive Measures**. Identify the costs and the benefits of loss-prevention ordinances, such as building codes, with consideration for uncalculated benefits such as employee downtime or loss of city services.
Objective 3.	**Structural Projects**. Identify costs and benefits of loss-prevention programs, such as covered vehicle parking, with consideration for uncalculated benefits such as averting response delays and business losses.
Objective 4.	**Property Protection.** Identify, fund, and implement projects to protect people and public and private property from losses in hail events, including critical infrastructure such as utilities or public vehicles.
Objective 5.	**Emergency Services**. Establish or expand emergency services protocols that adequately address response scenarios in the event of severe hail events.
Objective 6.	**Natural Resource Protection**. Ensure that Hail mitigation policies have no negative impacts and, whenever possible, provide positive enhancements to the environment. Encourage homeowners, for example, to use Class 4 roofing made of recycled materials.

Winter Storms	
GOAL: ***To reduce injuries and loss of life; trauma; loss of critical utilities; damage to property, equipment and infrastructure; community disruption; and economic, environmental and other losses caused by winter storms. Winter hazards can include extreme temperatures, ice and snow, high winds, and cascading hazards such as loss of utilities.***	
Objective 1.	**Public Information & Education.** Improve public awareness of winter storm hazards and give people knowledge about measures they can use to protect themselves, their property and their community.
Objective 2.	**Preventive Measures.** Identify costs and the benefits of loss-prevention programs such as burying power lines to reduce utility outages or building snow-load roofs, with consideration for uncalculated benefits such as averting environmental and business losses.
Objective 3.	**Structural Projects.** Identify, fund, and implement measures, such as winterization retrofits to homes, critical facilities, transportation systems and infrastructure, to avert or reduce losses from winter storms. Provide additional protection, such as generators and emergency shelters, for agencies and facilities that serve vulnerable populations.
Objective 4.	**Property Protection.** Identify, fund, and implement projects to protect people and public and private property from losses in winter storms.

Winter Storms	
Objective 5.	**Emergency Services.** Identify and expand emergency services for people who are at high risk in winter storms, such as the homeless, elderly, disabled, and oxygen-dependent people.
Objective 6.	**Natural Resource Protection.** Evaluate options and take advantage of opportunities for sustainable winter-storm policies and programs to reduce negative environmental impacts; examples include programs for debris management, streets snow removal, tree trimming and replacement, energy conservation, and winterization.

Heat	
GOAL: ***To reduce heat-related illnesses, loss of life, and exacerbation of other hazards such as drought and expansive soils caused by extreme Heat conditions.***	
Objective 1.	**Public Information and Education.** Improve public awareness of extreme heat hazards and measures by which people can protect themselves, their property and their community.
Objective 2.	**Preventive Measures.** Identify and protect people and critical infrastructure that are vulnerable to extreme heat conditions.
Objective 3.	**Structural Projects.** Provide for necessary construction, renovation, retrofitting or refurbishment of city properties to protect vulnerable populations from the effects of extreme heat.
Objective 4.	**Property Protection.** Implement construction and retrofitting measures to minimize the risk to public properties and their occupants caused by extreme heat.
Objective 5.	**Emergency Services.** Ensure that a Heat Emergency Action Plan is followed and that heat alerts are issued in a timely manner. Establish or expand emergency services protocols that adequately address response scenarios in the event of extreme heat.
Objective 6.	**Natural Resources Protection.** Ensure that extreme heat mitigation policies have no negative impacts and, whenever possible, provide positive enhancements to the environment, such as the creation and development of urban green spaces.

Drought	
GOAL: ***To reduce the impact of Drought on property, infrastructure, natural resources and local government response functions.***	
Objective 1.	**Public Information and Education.** Improve public awareness of drought and measures by which people can protect themselves, their property, and their community.
Objective 2.	**Preventive Measures.** Identify and protect resources and critical infrastructure that are vulnerable to drought.
Objective 3.	**Structural Projects.** Provide for necessary construction, renovation, retrofitting or refurbishment to protect vulnerable structures from the effects of drought.
Objective 4.	**Property Protection.** Implement measures to minimize the risk to public property caused by drought events.
Objective 5.	**Emergency Services.** Establish or expand emergency services protocols that adequately address response scenarios in the event of drought.

Drought	
Objective 6.	**Natural Resource Protection.** Ensure that Drought mitigation policies have no negative impacts and, whenever possible, provide positive enhancements to the environment.

Expansive Soil	
GOAL: ***To reduce the damage and economic losses caused by expansive soils on property and local infrastructure.***	
Objective 1.	**Public Information & Education.** Improve public awareness of expansive-soil hazards, with both general and site-specific information, and provide knowledge about available measures by which people can protect their property and their community.
Objective 2.	**Preventive Measures.** Avoid expansive-soils locations, whenever possible. Explore options for loss-mitigation from expansive soils, including building codes and code-plus options. Examine expansive soils before building critical facilities and infrastructure.
Objective 3.	**Structural Projects.** Identify and implement measures to reduce or avert expansive-soils damages and losses to structures and infrastructure, with emphasis on critical facilities and utilities.
Objective 4.	**Property Protection.** Identify and protect resources and critical infrastructure that are vulnerable to expansive soils.
Objective 5.	**Emergency Services.** Survey emergency and critical facilities for potential expansive-soil problems; repair and retrofit as needed; and consider soils when building emergency facilities.
Objective 6.	**Natural Resource Protection.** Protect and enhance natural resources by adopting and implementing sustainable expansive-soils policies that have few or no negative impacts and have positive environmental effects whenever possible.

Urban Fire	
GOAL: ***To reduce the incidence of injuries, loss of life, and damage to property, equipment and infrastructure due to Urban Structure Fires.***	
Objective 1.	**Public Information & Education.** Improve public awareness of urban Fire hazards and measures by which people can protect themselves, their property and their community.
Objective 2.	**Preventive Measures.** Identify and protect populations, structures, and critical infrastructure that are vulnerable to Urban Fires.
Objective 3.	**Structural Projects**. Include structural fire considerations in the development of public buildings, schools, and community centers. Include infrastructure improvements that support effective firefighting.
Objective 4.	**Property Protection**. Implement building materials and techniques in retrofitting or in new construction to minimize the risk to public property caused by urban structure fires.
Objective 5.	**Emergency Services**. Establish or expand emergency services protocols that adequately address response scenarios in structure fire events, to include equipment, training, and exercise scenarios for high-impact events.
Objective 6.	**Natural Resource Protection.** Ensure that urban fire mitigation policies have no negative impacts and, whenever possible, provide positive enhancements to the environment.

Wildfire	
GOAL: ***To reduce injuries, loss of life, and damage to property, equipment and infrastructure caused by Wildfires.***	
Objective 1.	**Public Information & Education.** Improve public awareness of wildfire hazards and measures by which people can protect themselves, their property and their community.
Objective 2.	**Preventive Measures.** Identify and protect populations, structures, and critical infrastructure that are vulnerable to wildfires.
Objective 3.	**Structural Projects**. Include wildfire considerations in landscaping, public parks, and other properties that would fall into wildland-urban interface or other areas of wildfire risk. Include infrastructure improvements that support effective firefighting.
Objective 4.	**Property Protection**. Implement building materials and techniques in retrofitting or in new construction to minimize the risk to public property caused by wildfires.
Objective 5.	**Emergency Services**. Establish or expand emergency services protocols that adequately address response scenarios in wildfire events.
Objective 6.	**Natural Resource Protection.** Ensure that Wildfire mitigation policies have no negative impacts and, whenever possible, provide positive enhancements to the environment.

Earthquake	
GOAL: ***To reduce injury, loss of life, and damage to property, equipment and infrastructure caused by Earthquakes.***	
Objective 1.	**Public Information and Education.** Improve public awareness of earthquake hazards and measures by which people can protect themselves, their property and their community.
Objective 2.	**Preventive Measures.** Identify and protect populations, structures, and critical infrastructure that are vulnerable to Earthquakes.
Objective 3.	**Structural Projects.** Provide for necessary construction, renovation, retrofitting or refurbishment to protect vulnerable structures from the effects of earthquakes.
Objective 4.	**Property Protection.** Implement building materials and techniques in retrofitting or in new construction to minimize the risk to public properties and their occupants caused by earthquakes.
Objective 5.	**Emergency Services.** Establish emergency services protocols that adequately address response scenarios in the event of earthquake.
Objective 6.	**Natural Resource Protection.** Take advantage of opportunities for tornado programs and policies that reduce negative environmental impacts. Examples include sustainable programs for debris management and recycling, and fortified construction with environmentally friendly materials.

Dam Break	
GOAL: ***To reduce injuries and loss of life; trauma; damage to property, equipment, critical facilities, and infrastructure; community disruption; and economic, environmental, and other losses caused by partial or total dam and levee failures.***	
Objective 1.	**Public information & education**. Improve public awareness of dam and levee break hazards, in general and at specific high-risk locations; and give people knowledge about measures they can use to protect themselves, their property, and their community.
Objective 2.	**Preventive measures.** Expand mapping, regulations, and loss-prevention programs in areas with high risks, including extension of flood insurance regulations behind high-risk levees; updated risk mapping downstream of high-risk dams; and pre-disaster evacuation and hazard-mitigation programs.
Objective 3.	**Structural projects.** Analyze safety of existing high-risk dams and levees, including maintenance programs and funding; and implement highest-priority measures to strengthen the structures and reduce risks.
Objective 4.	**Property protection measures.** Identify and protect people, structures, critical facilities, and critical infrastructure that are vulnerable to dam and levee break hazards.
Objective 5.	**Emergency services.** Identify needs for and implement additional emergency operations plans and services in areas at high risk to dam and levee breaks, including additional prediction and forecasting capability, emergency alerts, and evacuation plans.
Objective 6.	**Natural resource protection.** Protect and enhance natural resources by adopting and implementing sustainable dam and levee break policies that have few or no negative impacts and have positive environmental effects whenever possible. Include analysis of downstream impacts on environment and wildlife in dam and levee planning.

Transportation	
GOAL: ***To reduce the incidence of injuries and loss of life and the negative impact on public infrastructure and the environment due to Transportation-related hazardous material incidents and other Transportation incidents with the potential for causing mass casualties.***	
Objective 1.	**Public information & education**. Improve public awareness of transportation incidents and measures by which people can protect themselves and their community.
Objective 2.	**Preventive measures.** Identify and protect populations and critical infrastructure that are vulnerable to transportation incidents.
Objective 3.	**Structural projects.** Provide for necessary construction, renovation, retrofitting or refurbishment to protect against releases of hazardous chemicals in government buildings and critical facilities located in transportation corridors.
Objective 4.	**Property Protection.** Implement building materials and techniques in retrofitting or in new construction to minimize the risk to their occupants caused by transportation accidents.
Objective 5.	**Emergency services.** Identify needs for and implement additional emergency operations plans and services to facilitate response to potential mass casualty transportation incidents, including emergency alerts, evacuation plans, and exercises.
Objective 6.	**Natural resource protection.** Protect and enhance natural resources by adopting and implementing sustainable policies that have few or no negative impacts and have positive environmental effects whenever possible. Include analysis of downstream impacts on environment and wildlife in potential transportation incidents.

Chapter 5: Action Plan

Pontotoc County and participating jurisdictions, have reviewed and analyzed the risk assessment studies for the natural hazards and hazardous material events that may impact the community.

Included in this Chapter:

Pontotoc County and participating jurisdictions did not experience significant growth or development since the previous plan. Development, including schools district growth, was discussed in the planning process. It was determined any growth was minimal and had no impact on the exposure of the planning area to hazards addressed in this plan. Future buildings, infrastructure, and critical facilities are not expected to have any different vulnerability than existing structures. Continued enforcement of building codes, the Flood Damage Prevention Ordinance, and encouragement to build safe rooms in both public and private future structures will have a positive impact in reducing vulnerability. The committee is unable to approximate associated costs, numbers, and types for future structures.

Pontotoc County Hazard Mitigation Planning Team prioritized the mitigation measures and determined and developed an Action Plan for the highest priority measures. This chapter identifies specific high priority actions to achieve the plan participant s mitigation goals, the lead agency responsible for implementation of each action item, an anticipated time schedule, estimated cost opinion, and identification of possible funding sources. It also lists the Prioritized Mitigation Measures for each hazard in the Public Information and Education, Preventive Measures, Structural Projects, Property Protection, Emergency Services, and Natural Resource Protection categories.

Table 5-1: Mitigation Measures by Jurisdiction Chosen From List in Table 5-3

Jurisdiction	Mitigation Measures
Unincorporated Pontotoc County	1,2,3,7,8,10,13,14,15,18,20,23,27,31,34,39,42,64,71
Town of Allen	1,2,3,7,8,10,13,14,15,18,20,23,27,31,34,39,42,64,71
Town of Byng	1,2,3,7,8,10,13,14,15,18,20,23,27,31,34,39,42,64,71
Town of Fitzhugh	2,3,7,8,10,13,14,15,18,23,27,31,34,39,42,64,71
Town of Francis	2,3,7,8,10,13,14,15,18,23,27,31,34,39,42,64,71
Town of Roff	1,2,3,7,8,10,13,14,15,18,20,23,27,31,34,39,42,64,71
Town of Stonewall	1,2,3,7,8,10,13,14,15,18,20,23,27,31,34,39,42,64,71
Allen Public Schools	1,2,3,7,8,10,13,14,15,18,23,27,31,34,39,42,64,71
Byng Public Schools	2,3,7,8,10,13,14,15,18,23,27,31,34,39,42,64,71
Latta Public Schools	1,2,3,7,8,10,13,14,15,18,23,27,31,34,39,42,64,71
Roff Public Schools	1,2,3,7,8,10,13,14,15,18,23,27,31,34,39,42,64,71
Stonewall Public Schools	2,3,7,8,10,13,14,15,18,23,27,31,34,39,42,64,71
Vanoss Public Schools	1,2,3,7,8,10,13,14,15,18,23,27,31,34,39,42,64,71

5.1 Action Plan

Floods

1. **Prepare a comprehensive basin-wide Master Flood & Drainage Plan for the jurisdiction. The plan should identify all flooding problems within the jurisdiction, and recommend the most cost-effective and politically acceptable solutions.**

Jurisdictions Affected by Mitigation Measure: All, except as noted below.

Lead: Emergency Management

Time Schedule: 2016 - Ongoing Estimated

Cost: To be determined

Source of Funding: Local/General budget, Federal Emergency Management Agency (FEMA) PDM and/or HMGP.

Note This hazard does not affect the jurisdictions of Francis and Fitzhugh which have no mapped flood hazards. Additionally, the public schools of Byng and Stonewall have no identified flood risk, nor have they experienced past flood damages.

Work Product/Expected Outcome: A comprehensive Master Flood & Drainage Annex Plan for all communities that identify flooding problems, and provides guidance for cost-effective and politically acceptable actions to correct the problems, and to address future development impacts and appropriate mitigation measures.

Resource: Appendix A.2.1

Tornadoes, High Winds, Lightning, Severe Winter Storms

2. **Develop an Emergency Back-up Generator Needs Assessment and Plan for the community, assessing and prioritizing generator needs for critical facilities, both public and private. Assessment should include generator needs, costs of installation for pads/transfer panels only, or for complete generator assembly installation.**

Jurisdictions affected by Mitigation Measure: All, including schools as they are critical facilities per this plan.

Lead: Pontotoc County Emergency Management

Time Schedule: 2015 - Ongoing

Estimated Cost: To be determined

Source of Funding: Local/General budget.

Work Product/Expected Outcome: An Emergency Back-up Generator Plan that inventories Critical Facilities; sets priorities, evaluates current electrical usage, emergency electrical load/needs, fuel sources (natural gas/diesel/propane), pad location, wiring, transfer switches, contract or on-site, and generator types and sizes.

Resource: Appendix A.2.12 Back-Up Generators

Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events

3. Obtain funding for development and distribution of public information and education plans for responding to all-hazards to at-risk and vulnerable populations and contact agencies that distribute information to at-risk populations

Jurisdictions affected by Mitigation Measure: All Towns and Pontotoc County.

Lead: Pontotoc County Emergency Management

Time Schedule: 2015 - Ongoing

Estimated Cost: To be determined

Source of Funding: Local/General budget, Federal Emergency Management Agency (FEMA) PDM and/or HMGP.

Work Product/Expected Outcome: Informational kiosks and display racks easily available to the public that contain brochures and materials on various natural and man-made hazards, and how citizens can prepare for, mitigate, respond to, and recover from disasters. Information will be distributed in the schools as well as other venues within jurisdictions of the towns and county.

Resource: Appendix A.1.3 Outreach Projects

Floods, Tornadoes, High Winds Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events

4. Develop and distribute a Family Emergency Preparedness Guide to all families.

Jurisdictions affected by Mitigation Measure: All Towns and Pontotoc County

Lead: Pontotoc County Emergency Management

Time Schedule: 2015 - Ongoing

Estimated Cost: Minimal$

Source of Funding: Local, FEMA HMGP and PDM

Work Product/Expected Outcome: Develop a preparedness guide on various natural and man- made hazards, and how citizens can prepare for, mitigate, respond to, and recover from disasters and distribute to county residents. Information will be distributed in the schools as well as other venues within jurisdictions of the towns and county.

Resource: Appendix A.1.3 Outreach Projects

Floods, Tornadoes, High Winds, Severe Winter Storms, Extreme Heat, Drought, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Event

5. **Continue services for the HyperReach Mass notification system purchased by the county.**

Jurisdictions affected by Mitigation Measure: All including schools.

Lead: Pontotoc County Emergency Management

Time Schedule: 2015 - Ongoing

Estimated Cost: $7,500.00-$10,000.00 Annual Expense

Source of Funding: Local Funds.

Work Product/Expected Outcome: An Emergency Mass Communications System (Reverse 911) capable of simultaneously calling targeted areas and delivering specific emergency/hazard messages to the occupants.

Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Drought, Expansive Soils, Wildfires, Earthquakes

6. **Train/Educate builders, developers, architects and engineers in techniques of disaster-resistant building, such as the Fortified Home standards developed by the Institute for Business & Home Safety (IBHS), the Blueprint for Safety guidelines developed by the Federal Alliance for Safe Homes (FLASH).**

Jurisdictions affected by Mitigation Measure: All including schools.

Lead: Code Enforcement Officials, Emergency Management

Time Schedule: 2015 - Ongoing

Estimated Cost: To be determined

Source of Funding: Local Funds and FEMA HMGP/PDM

Work Product/Expected Outcome: A better informed building industry about the cost-effectiveness of enhanced building standards to protect against High Winds, Tornadoes, and Earthquakes, and other hazards.

Floods, Tornadoes, High Winds, Lightning, Severe Winter Storms, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events

7. **Based on the results of the Emergency Back-up Generator Assessment and Plan, provide wiring and transfer switches to accommodate emergency generators during disaster power outages for critical facilities.**

Jurisdictions affected by Mitigation Measure: All including schools.

Lead:	Pontotoc County Emergency Management
Time Schedule:	2015 - Ongoing
Estimated Cost:	To be determined as a result of the Master Generator Plan.
Source of Funding:	Local Funds, FEMA HMGP/PDM

Work Product/Expected Outcome: Adequate pre-installed wiring and required automatic transfer switches in Critical Facilities of the jurisdictions that will accommodate emergency generators during power outages in a disaster.

Resource: Appendix A.2.12 Back-Up Generators

Floods, Tornadoes, High Winds, Hail, Severe Winter Storms, Earthquakes

8. Develop / Review / Update the debris management plan.

Jurisdictions affected by Mitigation Measure: All Towns and Pontotoc County

NOTE Schools are covered by the Debris Plan of the Town/County.

Lead:	Pontotoc County Emergency Management, Community Public Works Departments
Time Schedule:	2015 - Ongoing
Estimated Cost:	To be determined
Source of Funding:	Local/General budget

Work Product/Expected Outcome: 1) Identify locations clean up crews can deposit debris before a final disposal. Public safety and efficiency in relocating debris piles should be considered; 2) Assess priorities for clearing routes involving critical structures or facilities.3) Purchase tub grinder for areas serviced by Pontotoc County Landfills.

Resource: Appendix A.5.10 Debris Management

Tornadoes, High Winds, Lightning, Severe Winter Storms, Extreme Heat, Earthquakes

9. Provide surge protection for computer-reliant critical facilities (e.g. 911 Center, EOC, police stations, fire stations, Schools, etc.)

Jurisdictions affected by Mitigation Measure: All including Schools.

Lead:	Pontotoc County Emergency Management
Time Schedule:	2015 - Ongoing
Estimated Cost:	To be determined

Source of Funding: Local/General budgets, Federal Emergency Management Agency (FEMA) PDM and/or HMGP.
Work Product/Expected Outcome: Computer-reliant systems in government and public critical facilities are protected from lightning and power surges.

Resource: Appendix A.4.9 Lightning Protection Systems; B.4.10 Surge Protection

Tornadoes, High Winds, Lightning, Hail

10. Evaluate, Enhance, and Maintain community-wide outdoor omni-directional voice/siren warning systems

Jurisdictions affected by Mitigation Measure: All including schools.

Lead: Pontotoc County Emergency Management

Time Schedule: 2015 - Ongoing

Estimated Cost: To be determined after inventory and analysis

Source of Funding: Local/General budget, Federal Emergency Management Agency (FEMA) PDM and/or HMGP.

Work Product/Expected Outcome: 1) Identify locations were warning siren coverage is less than adequate; 2) Obtain funding for warning system enhancement, 3) Routinely test sirens for operational adequacy and maintenance/system required updates.

Tornadoes, High Winds, Lightning, Severe Winter Storms

11. Identify source of generators that are required as identified in the Emergency Back-up Generator Plan. Add the information to the

Pontotoc County Resource Database.

Jurisdictions affected by Mitigation Measure: All including

schools.

Lead: Pontotoc County Emergency Management

Time Schedule: 2015 - Ongoing

Estimated Cost: To be determined

Source of Funding: Local/General budget.

Work Products/Expected Outcome: This will provide sufficient generators or access to generators during a disaster that will provide sufficient power for critical community functions. This will aid in the recovery and response effort after a disaster.

Resource: Appendix A.2.12 Back-Up Generators

Tornadoes, High Winds, Earthquakes

12. Educate residents, building professionals and safe room vendors on the International Codes Council/National Storm Shelter Association's "Standard for the Design and Construction of Storm Shelters".

Jurisdictions affected by Mitigation Measure: All including schools

Lead:	Pontotoc County Emergency Management
Time Schedule:	2015 - Ongoing
Estimated Cost:	Minimal $
Source of Funding:	Local/General budget

Work Product/Expected Outcome: Work with the Pontotoc County LEPC to create a brochure with the purpose of educating citizenry and professionals in the building and design community as to the advantages and requirements of the ICC/NSSA Standard for the Design and Construction of Storm Shelters.

Resource: Appendix A.3.1 Safe Rooms

Tornadoes, High Winds, Earthquakes

13. Provide employee/student shelters/safe-rooms at critical facilities, such as Public Works facilities, schools, city halls, and administrative offices.

Jurisdictions affected by Mitigation Measure: Pontotoc County, Towns of Allen, Francis, and Stonewall, Schools of Allen, Byng, Latta, and Stonewall.

Lead:	Pontotoc County Emergency Management
Time Schedule:	2015 - Ongoing
Estimated Cost:	$165.00 per sq. ft. x 4 sq. ft. per employee/student.
Source of Funding:	Local/General budget, Federal Emergency Management Agency (FEMA) PDM and/or HMGP.

Work Product/Expected Outcome: Construction of shelters or safe rooms with the intent of protecting first responders from tornadoes and high winds.

Floods, Dam Failures

14. Continue Compliance with, and Participation in the National Flood Insurance Program (NFIP).

Jurisdictions affected by Mitigation Measure: All, except as noted below.

Lead:	Pontotoc County Emergency Management, Community Floodplain Managers
Time Schedule:	2015 - Ongoing
Estimated Cost:	Included in existing budgets.
Source of Funding:	Local/General budget

Note This hazard does not affect the jurisdictions of Francis and Fitzhugh which have no mapped flood hazards. Additionally, the public schools within the county are not responsible for this mitigation measure as it is the responsibility of city/county government leadership to ensure NFIP Compliance.

Work Product/Expected Outcome: Compliance with, and enforcement of local storm drainage and floodplain management ordinances and regulations, and requirements of the National Flood Insurance Program.

Resource: Appendix A.4.2 Insurance

Lightning

15. Provide lightning warning systems for outdoor sports areas, pools, golf courses, ball fields, and parks.

Jurisdictions affected by Mitigation Measure: All including schools.

Lead: Pontotoc County Emergency Management

Time Schedule: 2015 - Ongoing

Estimated Cost: Approximately $6,000 per school/park out door facility

Source of Funding: Local/General budget, Federal Emergency Management Agency (FEMA) PDM and/or HMGP.

Work Product/Expected Outcome: Lightning sensing and warning systems for outdoor sports areas, pools, golf courses, ball fields, and parks.

Resource: Appendix A.2.10 Lightning Warning Systems

Expansive Soils

16. Educate builders on appropriate foundation types for soils with different degrees of shrink-swell potential. For example, using "post-tensioned slab-on-grade" or "drilled pier" vs. standard "slab-on-grade" or "wall-on-grade" foundations.

Jurisdictions affected by Mitigation Measure: All Except as noted below.

Note The schools of Stonewall and Vanoss do not have a noted hazard from expansive soils.

Lead: Pontotoc County Emergency Management, Community Code Enforcement Officials

Time Schedule: 2015 - Ongoing

Estimated Cost: Minimal, information is readily available

Source of Funding: Local/General budget

Work Product/Expected Outcome: By working with the NRCS and builders already using the standards, provide information to builders and residents discussing the construction of structures and foundations appropriate for, and able to withstand the hazards of expansive soils.

Expansive Soils

17. Establish administrative procedures, and provide maps and information to inform builders about Expansive Soils when they apply for development and building permits.

Jurisdictions affected by Mitigation Measure: All except as noted below.

Note The schools of Stonewall and Vanoss do not have a noted hazard from expansive soils.

Lead:	Pontotoc County Emergency Management, Community Planning and Code Enforcement Officials
Time Schedule:	2015 - Ongoing
Estimated Cost:	Minimal. Information is readily available from NRCS. Source of
Funding:	Local/General budget

Work Product/Expected Outcome: In conjunction with the NRCS and County Extension Office, prepare and distribute Expansive Soils maps and information on appropriate foundation design to developers and builders.

The following actions from the previous plan were Completed or Deleted:

3. Develop an all-hazard public information, education, and awareness strategy and Program. The emergency MGMT agencies of the county have conducted a program for the past 3 years in conjunction with the LEPC to print and distribute preparedness booklets to the public. Additionally, County and Byng EM s have spent time each year in schools of the county raising awareness and distributing information to the public. These programs, plus additional standalone outreach efforts have helped to achieve a higher level of awareness in the county. Pontotoc County Emergency MGMT and the Byng Fire Department also have facebook pages now to pass information to the public and assist in education and awareness.

6. Provide new/retrofit facilities for the 911 Center and the Emergency Operations. Pontotoc County during the past 5 year period has a new location for the EOC complete with enhanced communications abilities and situational awareness technologies. The 911 Center is being taken care of by the City of Ada.

9. Educate the public on the importance of a Family Disaster Plan and supply kit. Efforts over the past 6 years have greatly enhanced the education of the public on having a disaster plan and a kit. This training was combined with the All Hazards public information and education training that has been conducted.

11. Modify/Adopt a Land Use Plan to: No plan has been adopted, however work in the area was conducted

1) Guide development away from hazardous areas: Primary work has been conducted in Floodplains, but has also educate about Expansive soil areas.

2) Reduce population density in hazardous areas: Again, an NFIP issue, but also addressed through the LEPC when areas of chemical hazardous materials are present.

3) Implement stronger development restrictions: No action, leadership unable to accomplish

4) Encourage Natural Resource Protection: Storm runoff has been addressed and some county projects have been conducted as well for streamlining or cleaning of storm water infrastructure.

12. Adopt and Implement a plan for continuity and restoration of power to the community and critical facilities as a result of power outages due to natural and manmade hazards. PEC and OG&E both have plans for restoration of power which addresses all critical facilities of the county.

19. When replaced, install break resistant glass in government offices, and critical facilities including schools. This measure is still ongoing, however as it is a measure being accomplished, it was dropped from the list in favor of a new measure.

21. Develop and distribute flood and flash flood safety tips to inform citizens of the dangers of flood waters. This was considered completed in conjunction with our all hazard booklets as well as some of the standalone projects conducted with in the county. Although it is still ongoing, we dropped it from the list in order to have a new item in its place.

22. Acquire and remove floodplain and repetitive loss properties where the community s Repetitive Loss Plan and Flood & Drainage Plan identify acquisition as the most cost-effective and desirable mitigation measure. This project was not completed due to not having a master drainage plan

completed. It may be looked at again in the future, but as of now it is out as a mitigation measure.

26. Develop a Wildfire Susceptibility Analysis and Wildfire Mitigation Plan for the vulnerable Rural/Urban Interface area of the County and Communities. A wildfire analysis and mitigation plan was not developed. However, through work with the BIA and the fire departments of the county, we did begin mitigation talks with the citizens and demonstrations of how mitigation in the urban interface can help during a wildfire. This was dropped as a mitigation measure because we want to continue the success we are having with the community interfacing that we are doing. Pontotoc County has not lost an occupied home to wild fire in over 12 years.

5.2 Mitigation Measures

Each Jurisdiction picked their top 20 mitigation measures from table 5.3. A list of the top 19 mitigation measures was then compiled. The table below lists the top selection of mitigation measures chosen by the survey of the jurisdictions involved in the plan. It should be noted that not ALL of the 19 mitigation measures are for hazards affecting every jurisdiction covered in the plan. (Refer to Table 5-1 for Jurisdiction List)

Table 5-2: Top 19 Mitigation Measures

Rank	Hazard	Category	Mitigation Measure
1	Tornadoes, High Wind, Lightning, Severe Winter Storms	Emergency Services	Develop an Emergency Back-up Generator Hazard Mitigation Plan Annex for the community, assessing and prioritizing generator needs for critical facilities, both public and private. Assessment should include generator needs, costs of installation for pads/transfer panels only, or for complete generator assembly installation.
2	Tornadoes, High Winds, Earthquakes	Structural Projects	Provide employee shelters/safe-rooms at critical facilities, such as 911 Center, fire stations and police stations to protect first responders.
3	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events	Public Information and Education	Educate the public on the importance of a family disaster plan and supply kit
4	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Develop an inventory of Special Needs populations requiring special assistance during disasters.
5	Floods, Tornadoes, High Winds, Lightning, Severe Winter Storms, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events	Preventive Measures	Based on the results of the Emergency Back-up Generator Hazard Mitigation Plan Annex, provide wiring and transfer switches to accommodate emergency generators during disaster power outages for critical facilities including Emergency Operations Centers, City Hall, Dispatch, Police, Fire, Community Centers used for emergency housing during disasters, critical facilities, lift stations, water treatment plants, and community medical facilities

Rank	Hazard	Category	Mitigation Measure
6	Floods, Tornadoes, High Winds, Hail, Severe Winter Storms, Earthquakes	Preventive Measures	Develop / Review / Update the debris management plan
7	Tornadoes, High Winds, Lightning, Severe Winter Storms, Extreme Heat, Earthquakes	Property Protection	Provide surge protection for computer-reliant critical facilities (e.g. 911 Center, EOC, police stations, fire stations, etc.).
8	Tornadoes, High Winds, Lightning, Hail	Emergency Services	Evaluate, upgrade and maintain community-wide outdoor omni- directional voice/siren warning systems
9	Lightning	Preventive Measures	Provide lightning warning systems for outdoor sports areas, pools, golf courses, ball fields, and parks.
10	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Wildfires, Earthquakes	Public Information and Education	Train/Educate builders, developers, architects and engineers in techniques of disaster resistant homebuilding, such as the Fortified Home standards developed by the Institute for Business & Home Safety (IBHS), the Blueprint for Safety guidelines developed by the Federal Alliance for Safe Homes (FLASH)
11	Floods	Preventive Measures	Prepare a comprehensive basin-wide Flood & Drainage Annex to the Hazard Mitigation Plan for all watersheds within the jurisdiction. The plan should identify all flooding problems within the jurisdiction, and recommend the most cost-effective and politically acceptable solutions.
12	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Public Information and Education	Develop an all-hazard public information, education, and awareness strategy and program.
13	Floods, Dam Failures	Property Protection	Continue Compliance with, and Participation in the National Flood Insurance Program (NFIP) and the Community Rating System (CRS)

Rank	Hazard	Category	Mitigation Measure
14	Urban Fires/Wildfires	Structural Projects	Replace/continue replacing inadequately sized hydrants and water mains/lines to provide proper fire protection.
15	Severe Winter Storms	Preventive Measures	Acquire equipment for responding to a massive power outage due to severe winter storm, ice and snow.
16	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Install Street addresses on all Buildings, Curbs, and rural home sites.
17	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Preventive Measures	Supply NOAA Weather Radios for all local government facilities, school, hospitals, and critical facilities.
18	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Provide backup facilities for the 911 center and the Emergency Operations Center.
19	Floods	Structural Projects	Maintain culverts to adequately allow for storm water drainage.

Table 5-3: Basic List of Mitigation Measures for Pontotoc County

Rank	Hazard	Mitigation Category	Mitigation Measure
1	Floods	Preventive Measures	Prepare a comprehensive basin-wide Flood & Drainage Annex to the Hazard Mitigation Plan for all watersheds within the jurisdiction. The plan should identify all flooding problems within the jurisdiction, and recommend the most cost-effective and politically acceptable solutions.
2	Tornadoes, High Winds, Lightning, Severe Winter Storms	Emergency Services	Develop an Emergency Back-up Generator Hazard Mitigation Plan Annex for the community, assessing and prioritizing generator needs for critical facilities, both public and private. Assessment should include generator needs, costs of installation for pads/transfer panels only, or for complete generator assembly installation.
3	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Public Information and Education	Develop an all-hazard public information, education, and awareness strategy and program.
4	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Public Information and Education	Obtain funding for development and distribution of public information and education plans for responding to all-hazards to at-risk and vulnerable populations and contact agencies that distribute information to at-risk populations
5	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Public Information and Education	Develop and distribute a Family Emergency Preparedness Guide to all families.
6	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Structural Projects	Provide new/retrofit facilities for the 911 Center and the Emergency Operations Center.

Rank	Hazard	Mitigation Category	Mitigation Measure
7	Floods, Tornadoes, High Winds, Severe Winter Storms, Extreme Heat, Drought, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Install a Mass Emergency Telephone Communication system, such as Reverse 911 or Black Board Connect, for mass call-outs to targeted areas of the community for emergency notification and/or information.
8	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Wildfires, Earthquakes	Public Information and Education	Train/Educate builders, developers, architects and engineers in techniques of disaster-resistant homebuilding, such as the Fortified Home standards developed by the Institute for Business & Home Safety (IBHS), the Blueprint for Safety guidelines developed by the Federal Alliance for Safe Homes (FLASH)
9	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events	Public Information and Education	Educate the public on the importance of a family disaster plan and supply kit
10	Floods, Tornadoes, High Winds, Lightning, Severe Winter Storms, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events	Preventive Measures	Based on the results of the Emergency Back-up Generator Hazard Mitigation Plan Annex, provide wiring and transfer switches to accommodate emergency generators during disaster power outages for critical facilities including Emergency Operations Centers, City Hall, Dispatch, Police, Fire, Community Centers used for emergency housing during disasters, critical facilities, lift stations, water treatment plants, and community medical facilities
11	Floods, Tornadoes, High Winds, Expansive Soils, Earthquakes, Fixed Site Haz Mat Events, Dam Failures	Preventive Measures	Modify/Adopt a Land Use Plan to: 1) Guide development away from hazardous areas 2) Reduce population density in hazardous areas 3) Implement stronger development restrictions 4) Encourage Natural Resource Protection
12	Floods, Tornadoes, High Winds, Severe Winter Storms, Earthquakes, Dam Failures	Preventive Measures	Adopt and Implement a plan for continuity and restoration of power to the community and critical facilities as a result of power outages due to natural and man-made hazards.
13	Floods, Tornadoes, High Winds, Hail, Severe Winter Storms, Earthquakes	Preventive Measures	Develop / Review / Update the debris management plan.
14	Tornadoes, High Winds, Lightning, Severe Winter Storms, Extreme Heat, Earthquakes	Property Protection	Provide surge protection for computer-reliant critical facilities (e.g. 911 Center, EOC, police stations, fire stations, etc.).
15	Tornadoes, High Winds, Lightning, Hail	Emergency Services	Evaluate, upgrade and maintain community-wide outdoor omni-directional voice/siren warning systems

Rank	Hazard	Mitigation Category	Mitigation Measure
16	Tornadoes, High Winds, Lightning, Severe Winter Storms	Emergency Services	Obtain or Identify source of generators that are required as identified in the Emergency Back-up Generator Hazard Mitigation Plan Annex
17	Tornadoes, High Winds, Earthquakes	Preventive Measures	Educate residents, building professionals and safe room vendors on the International Codes Council/National Storm Shelter Association's "Standard for the Design and Construction of Storm Shelters" and consider incorporating this Standard into current regulatory ordinances
18	Tornadoes, High Winds, Earthquakes	Structural Projects	Provide employee shelters/safe-rooms at critical facilities, such as 911 Center, fire stations and police stations to protect first responders.
19	Tornadoes, High Winds, Hail	Structural Projects	When replaced, install break resistant glass in government offices, and critical facilities including schools.
20	Floods, Dam Failures	Property Protection	Continue Compliance with, and Participation in the National Flood Insurance Program (NFIP) and the Community Rating System (CRS)
21	Floods	Public Information and Education	Develop and distribute flood and flash flood safety tips to inform citizens of the dangers of flood waters
22	Floods	Property Protection	Acquire and remove floodplain and repetitive loss properties where the community's Repetitive Loss Plan and Flood & Drainage Annex to the Hazard Mitigation Plan identify acquisition as the most cost-effective and desirable mitigation measure.
23	Lightning	Public Information and Education	Provide lightning warning systems for outdoor sports areas, pools, golf courses, ball fields, and parks.
24	Expansive Soils	Preventive Measures	Educate builders on appropriate foundation types for soils with different degrees of shrink-swell potential. For example, using "post-tensioned slab-on-grade" or "drilled pier" vs. standard "slab-on-grade" or "wall-on-grade" foundations.
25	Expansive Soils	Preventive Measures	Establish administrative procedures, and provide maps and information to inform builders about Expansive Soils when they apply for development and building permits.
26	Wildfires	Preventive Measures	Develop a Wildfire Susceptibility Analysis and Wildfire Mitigation Plan for the vulnerable Rural/Urban Interface area of the community.
27	Floods, Tornadoes, High Winds, Severe Winter Storms, Extreme Heat, Earthquakes, Dam Failures	Preventive Measures	Supply NOAA weather radios to all local government facilities, schools, hospitals, and critical facilities.
28	Tornadoes, High Winds, Earthquakes	Structural Projects	Install safe-rooms in schools.

Rank	Hazard	Mitigation Category	Mitigation Measure
29	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Preventive Measures	Acquire and utilize GIS and GPS technologies to record and maintain information on private safe rooms and private water wells.
30	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Install an emergency communications network for fire, police, 911, EMT and other emergency operations.
31	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Develop an inventory of Special Needs populations requiring special assistance during disasters.
32	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Provide survival equipment and supplies for the jurisdiction's emergency response teams to cover employees and others who use jurisdiction buildings.
33	Floods, Tornadoes, High Winds, Severe Winter Storms, Extreme Heat, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Provide emergency equipment for community emergency response teams (CERT)
34	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Provide backup facilities for the 911 Center and the Emergency Operations Center.

Rank	Hazard	Mitigation Category	Mitigation Measure
35	Floods, Tornadoes, High Winds, Severe Winter Storms, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Provide security and surveillance equipment for police, fire stations, and schools.
36	Tornadoes, High Winds, Earthquakes	Preventive Measures	Perform tornado, high wind, and earthquake evaluations of schools to determine the best ways to retrofit or remodel buildings to make them more disaster resistant.
37	Tornadoes, High Winds, Earthquakes	Structural Projects	Install safe-rooms in licensed childcare centers.
38	Urban Fires, Wildfires	Preventive Measures	Develop and implement a plan to provide sufficient water and water pressure by replacing inadequately sized water lines and/or installing a water booster near the water tower and by developing a secondary water supply system
39	Urban Fires, Wildfires	Structural Projects	Replace/continue replacing inadequately sized hydrants & water mains/lines with sufficient size hydrants & water lines to provide proper fire protection to annexed and existing areas.
40	Lightning	Property Protection	Construct lightning rods for protection of critical facilities.
41	Hail	Property Protection	Provide covered shelter for local government vehicles (e.g., Police and Public Works)
42	Severe Winter Storms	Preventive Measures	Acquire equipment for responding to a massive power outage due to severe winter storm, ice and snow
43	Drought	Structural Projects	Develop a secondary, tertiary or extended water supply system.
44	Tornadoes, High Winds, Earthquakes	Structural Projects	Provide group safe rooms at jurisdiction recreation centers
45	Tornadoes, High Winds	Structural Projects	Provide manufactured home parks with community shelters/safe rooms.
46	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Public Information and Education	Investigate making educational materials for all hazards standardized, readily available off the shelf, and economical.
47	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Public Information and Education	Develop a process for updating appropriate disaster safety information for the non-emergency 211 system, such as cooling shelters in extreme heat, and heating shelters in severe winter storms.

Rank	Hazard	Mitigation Category	Mitigation Measure
48	Floods, Tornadoes, High Winds, Severe Winter Storms, Extreme Heat, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Public Information and Education	Develop/continue a program to inform the public on proper evacuation plans for government buildings, businesses, offices, and residences.
49	Tornadoes, High Winds, Hail	Preventive Measures	Record GPS locations of private water wells and underground storm shelters (to rescue potentially trapped storm victims).
50	Urban Fires, Wildfires	Property Protection	Install fire suppression systems for all jurisdiction facilities.
51	Fixed Site Haz Mat Events, Transportation Events	Emergency Services	Prepare Fire Departments and other Emergency Response Units with equipment for potential biological and chemical threats
52	Floods	Property Protection	Implement structural and non-structural flood mitigation measures for flood-prone properties, as recommended in the Flood Mitigation Assistance Plan.
53	Hail	Structural Projects	Provide hail-resistant measures/materials to protect existing public infrastructure improvements.
54	Extreme Heat	Preventive Measures	Purchase and distribute A/C units for elderly, low income, and people with handicaps.
55	Fixed Site Haz Mat Events	Emergency Services	Develop a "Quick Response Guide to Local Hazardous Material Sites" with evacuation maps and chemical details of local Tier 2 facilities for emergency responders
56	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Preventive Measures	Develop and test site emergency plans for schools
57	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Preventive Measures	Institute Continuity of Operations (COOP) within local utilities, government departments and social service agencies so that operations during and after an emergency incident are still accessible and operable.
58	Floods, Tornadoes, High Winds, Severe Winter Storms, Expansive Soils, Earthquakes, Fixed Site Haz Mat Events, Transportation Events	Preventive Measures	Develop and Implement a Capital Improvements Plan that includes hazard mitigation considerations for flooding, expansive soils, earthquakes, severe winter storms, high winds, tornados, and hazardous materials events.

Rank	Hazard	Mitigation Category	Mitigation Measure
59	Tornadoes, High Winds, Earthquakes	Public Information and Education	Develop public information and education programs and provide materials about construction methods and mitigation measures that protect a building's roof, outside openings, and the building envelope for overall structural resistance to tornadoes, high winds and earthquakes.
60	Tornadoes, High Winds, Earthquakes	Property Protection	Cover all exposed fluorescent lighting tubes in city and school facilities with impact resistant plastic coverings
61	Lightning, Urban Fires, Wildfires	Preventive Measures	Implement red cedar eradication program (NRCS to assist) to reduce red cedar trees and wild fire potential.
62	Floods, Dam Failures	Structural Projects	Obtain and install flood level monitoring equipment in area creeks
63	Floods	Preventive Measures	Inventory inadequate bridges.
64	Floods	Structural Projects	Maintain culverts to adequately allow stormwater drainage
65	Drought	Preventive Measures	Identify major "water-dependent" entities in the community, including large water usage employers, hospitals, food services, and so on. Work with those entities to (a) prioritize the most critical facilities, and (b) develop drought contingency plans in the event of water shortages or rationing.
66	Fixed Site Haz Mat Events	Public Information and Education	Provide public awareness about household pollutants, their danger, and disposal information through media, schools, public offices, police, and fire stations.
67	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Preventive Measures	Design and Implement a stormwater ordinance that supports multi-hazard mitigation planning
68	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Expansive Soils, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Preventive Measures	Design and Implement a zoning ordinance that supports multi-hazard mitigation planning
69	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Continue educational programs for jurisdiction employees to recognize and render assistance for symptoms of life-threatening emergencies.

Rank	Hazard	Mitigation Category	Mitigation Measure
70	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Drought, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Provide Certified Disaster Training for jurisdiction employees, and coordinate efforts with local CERT Teams.
71	Floods, Tornadoes, High Winds, Lightning, Hail, Severe Winter Storms, Extreme Heat, Urban Fires, Wildfires, Earthquakes, Fixed Site Haz Mat Events, Dam Failures, Transportation Events	Emergency Services	Install street addresses on all buildings and curbs.
72	Floods, Dam Failures	Natural Resources Protection	Maintain natural and beneficial functions of streams and floodplains
73	Floods	Structural Projects	Eliminate storm-water infiltration and inflow (I&I) into the sanitary sewer system.
74	Tornadoes	Structural Projects	Investigate a voluntary pilot program for mobile home communities to provide a storm shelter / safe-room for residents.
75	Severe Winter Storms	Property Protection	Upgrade communities equipment and vehicles for combating ice storm damage/adverse impact to public infrastructure.
76	Expansive Soils	Structural Projects	Identify and repair critical facilities that show evidence of or have expansive soils-related damage.
77	Fixed Site Haz Mat Events	Public Information and Education	Distribute information identifying hazardous materials to at risk citizens, such as the elderly, infirm, poor, and outside laborers.
78	Fixed Site Haz Mat Events	Public Information and Education	Identify populations around potential fixed-site hazmat hazards, and distribute information and materials to support "Shelter-in-Place" actions among home and business owners

Chapter 6: Plan Maintenance and Adoption

This chapter includes a discussion of the plan maintenance process and documentation of the adoption of the plan by the following entities:

- ☐ Pontotoc County Board of Commissioners
- ☐ Allen Town Council
- ☐ Byng Town Council
- ☐ Fitzhugh Town Council
- ☐ Francis Town Council
- ☐ Roff Town Council
- ☐ Stonewall Town Council
- ☐ Allen Public School Board
- ☐ Byng Public School Board
- ☐ Latta Public School Board
- ☐ Roff Public School Board
- ☐ Stonewall Public School Board
- ☐ Vanoss Public School Board

Included in this Chapter:

6.1 Monitoring, Evaluating, and Updating the Plan

The plan participants listed above will ensure that a regular review and update of the *Multi-Jurisdictional Multi-Hazard Mitigation Plan* occurs. The Pontotoc County Hazard Mitigation Planning Team (PCHMPT) will continue to meet on an annual basis beginning the year after plan approval and adoption, or as conditions warrant, to oversee and review updates and revisions to the Plan. The Pontotoc County Emergency Manager will continue to head the Pontotoc County Hazard Mitigation Planning Team which will monitor and oversee the day-to-day implementation of the Plan. Each jurisdiction is expected to maintain a representative on the Planning Committee who shall fulfill the monitoring, evaluation, and updating responsibilities identified in this section. The Plan will be updated and resubmitted through the State Hazard Mitigation Officer for review and approval, and to FEMA no later than six (6) months prior to the end of the original performance period.

Members of the Pontotoc County Hazard Mitigation Planning Team

Name	Agency	Title/Position
Chad Letellier	Pontotoc County Emergency MGMT	Director, Pontotoc Co. Emergency MGMT
Doug Stinson	Town of Allen	City Manager
Jeff Rollins	Town of Byng	EM Director
John Burchett	Town of Byng	Mayor
Sharon Phillips	Town of Fitzhugh	Mayor
Richard Barnes	Town of Fitzhugh	Fire Chief
Josh Littlefield	Town of Francis	Fire Chief
Jeremy Grissom	Town of Roff	Fire Chief
Dennis Heath	Town of Stonewall	City Manager
Phillip Nuner	Town of Stonewall	Fire Chief
Bob Gragg	Allen Schools	Superintendent
Michael James	Allen Schools	Principal
JoAnne Layne	Byng Schools	Counselor
Cliff Johnson	Latta Schools	Superintendent
Scott Morgan	Roff Schools	Superintendent
Phillip Nuner	Stonewall School	Secretary to the Superintendent
Kevin Flowers	Stonewall School	Superintendent

Marjana Tharp	Vanoss School	Superintendent
Gary Starns	Pontotoc County Dist 1	County Commissioner
Randy Floyd	Pontotoc County Dist 2	County Commissioner
Justin Roberts	Pontotoc County Dist 3	County Commissioner
John Christian	Pontotoc County	Sheriff
Chris Mcgill	Town of Byng	Fire Chief
Dianne Brannon	Town of Allen	Mayor
Tammy Brown	Pontotoc County	Clerk

Monitoring the Plan- Monitoring of the Plan, the Action Plan, and Mitigation Measures is the responsibility of the Emergency Manager, City Manager(s), School Superintendents, and Floodplain Administrator(s). Departments responsible for implementation of the Action Plan and the Mitigation Measures will update their Progress Reports on an annual basis, and report to the HMPC on progress and/or impediments to progress of the mitigation measures.

The local HMPT representatives may use the progress reporting forms, Worksheets 1 and 3, in the FEMA 386-4 guidance document, to facilitate collection of progress data and information on specific mitigation actions. This information shall be provided to the Pontotoc County EM Director acting as the PCHMPT Coordinator prior to the annual meeting.

The information that the HMPT representatives shall be expected to document, as needed and appropriate include:

1. Any grant applications filed on behalf the any participating jurisdiction
2. Hazard events and losses occurring in their jurisdiction
3. Progress on the implementation of mitigation actions, including efforts to obtain outside funding.
4. Obstacles or impediments to implementation of actions
5. Additional mitigation actions believed to be appropriate and feasible
6. Public and stakeholder input

Evaluating the Plan- The *Pontotoc County Multi-Hazard Mitigation Plan* will be continually evaluated by the County EM Director, and a report will be made to the PCHMPT each year. The evaluation will assess:

- adequacy of adopted Goals and Objectives in addressing current and future expected conditions;
- whether the nature and magnitude of the risks have changed;
- appropriateness of current resources allocated for implementation of the Plan;
- to what extent the outcomes of the Mitigation Measures occurred as expected;
- whether agencies, departments and other partners participated as originally anticipated.

- Actions were cost effective
- Schedules and budgets were feasible
- Whether implementation or coordination problems exist
- Any new departments or agencies that should be included
- Documentation for hazards that occurred during the year

Additionally, the PCHMPT will evaluate how other programs and policies have conflicted or augmented the planned or implemented mitigation measures and identify those policies and programs for changes as required. Other programs and polices include those that address:

- Floodplain Management
- Economic Development
- Environmental preservation and permitting
- Historic preservation
- Redevelopment
- Health and safety
- Recreation
- Land use and zoning
- Public education and outreach
- Transportation

The plan will also be evaluated and revised following any major disaster, to determine if the recommended actions remain relevant and appropriate. The risk assessment will also be revisited to see if any changes are necessary based on the pattern of disaster damages, or if data listed in the section on Hazard Profiles of this plan has been collected to facilitate the risk assessment.

Updating the Plan- The *Pontotoc County Multi-Hazard Mitigation Plan* will be updated according to the following schedule:

1. Revise and Update- the county will incorporate revisions to the Plan document identified during the monitoring and evaluation period, as well as items identified in the previous Crosswalk.
2. Submit for Review- the revised Plan will be submitted to ODEM and FEMA for review and approval.
3. Final Revision and Adoption- if necessary, the Plan will be revised per ODEM and FEMA remarks, adopted by Pontotoc County, and the updated Plan sent to FEMA prior to the expiration of the 5-year approval period.

6.2 Public Involvement

Pontotoc County is committed to involving the public directly in updating and maintaining the Multi-Hazard Mitigation Plan.

Copies of the Plan will be maintained at the public libraries, and the Plan will be placed on the Pontotoc County Website.

A public meeting will be held prior to submission of the update of the *Pontotoc County Multi-Hazard Mitigation Plan*. This meeting will be advertised to the general public, and will update residents on the progress that has been made in implementing the Plan and related capital projects. The meeting will also be used to distribute literature and inform and educate residents as to actions they can take to mitigate natural hazards, save lives, and prevent property damage. Input from the public will be solicited as to how the mitigation process can be more effective.

6.3 Implementation and Incorporation of the Multi-Hazard Mitigation Plan through Existing Programs

Pontotoc County and Plan Participant□s local planning mechanisms available for incorporating the recommendations and requirements of the Hazard Mitigation Measures are listed below. *Pontotoc County Multi-Hazard Mitigation Plan* will be approved and adopted by the Board of Commissioners as an amendment to the County□s Comprehensive Plan and as a guide to County mitigation activities. All other plan participants will adopt the plan as a stand-alone plan which will guide mitigation activities and be integrated into appropriate areas of existing plans.

Each jurisdiction in the plan has a unique set of capabilities, including authorities, policies, programs, staff, funding, and other resources available to accomplish mitigation and reduce long-term vulnerability. By reviewing the existing capabilities in each jurisdiction, the planning team identified capabilities that currently reduce disaster losses or could be used to reduce losses in the future. The following table outlines the capability assessment for Pontotoc County and participating jurisdictions.

Jurisdiction	*Existing Authorities*	*Policies and Programs*	*Available Resources*
Pontotoc County	Planning Staff, Emergency Management, Board of County Commissioners, Planning and Zoning Board	Emergency Operations Plan, Capital Improvements Plan, Floodplain Regulations, Zoning Ordinances.	Annual Budget, PW Resources
Town of Allen	Planning Staff, City Council	Emergency Operations Plan, Capital Improvements Plan, Zoning Ordinances.	Taxes/Annual Budget, PW Resources, Contracts with Pontotoc County
Town of Byng	Planning Staff, City Council, Emergency Management	Emergency Operations Plan, Capital Improvements Plan, Floodplain Ordinances, Zoning Ordinances.	Taxes/Annual Budget, Contracts with Pontotoc County
Town of Fitzhugh	Planning Staff, City Council	Emergency Operations Plan, Capital Improvements Plan	Taxes/Annual Budget, Contracts with Pontotoc County
Town of Francis	Planning Staff, City Council	Emergency Operations Plan, Capital Improvements Plan	Taxes/Annual Budget, Contracts with Pontotoc County
Town of Roff	Planning Staff, City Council	Emergency Operations Plan, Capital Improvements Plan, Floodplain Ordinances, Zoning Ordinances.	Taxes/Annual Budget, PW Resources, Contracts with Pontotoc County

Town of Stonewall	Planning Staff, City Council	Emergency Operations Plan, Capital Improvements Plan, Zoning Ordinances.	Taxes/Annual Budget, PW Resources, Contracts with Pontotoc County
Allen Public Schools	Planning Staff, School Board	School Emergency Plans, Improvement Plan	Taxes/Annual Budget
Byng Public Schools	Planning Staff, School Board	School Emergency Plans, Improvement Plan	Taxes/Annual Budget
Latta Public Schools	Planning Staff, School Board	School Emergency Plans, Improvement Plan	Taxes/Annual Budget
Roff Public Schools	Planning Staff, School Board	School Emergency Plans, Improvement Plan	Taxes/Annual Budget
Stonewall Public Schools	Planning Staff, School Board	School Emergency Plans, Improvement Plan	Taxes/Annual Budget
Vanoss Public Schools	Planning Staff, School Board	School Emergency Plans, Improvement Plan	Taxes/Annual Budget

Appropriate Action Items and Mitigation Measures from the Plan will be incorporated into the following plans and codes:

Mitigation Measures	*Jurisdiction*	*Plan/Code of integration*
Develop a Back-up Generator MHMP Annex for the community, assessing and prioritizing generator needs for critical facilities. Assessment should include needs, costs of installation for pads and transfer panels only, or for complete generator installation.	All Jurisdictions	PCHMP, EOP Annex A.IV.C.1.
Provide employee shelters/safe rooms at critical facilities to protect first responders.	Pontotoc County, Towns of Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall	CIP, EOP/ County Safety Plan EOP Annex A.IV.C.1.
Educate the public on the importance of a family disaster plan and supply kit	All Jurisdictions working with and through the Schools to get information out.	Local Emergency Management Project, EOP Annex A.IV.C.1.
Develop an appendix to the EOP of Special Needs populations requiring special assistance during disasters.	Pontotoc County, Towns of Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall	Annex H to EOP
Provide wiring and transfer switches to accommodate emergency generators during disaster power outages for critical facilities including Emergency Operations Centers, City Hall, Dispatch, Police, Fire, Community Centers, and schools, used for emergency housing during disasters, and critical facilities, lift stations, water treatment plants, and community medical facilities	All Jurisdictions	PCHMP, EOP Annex A.IV.C.1.
Develop / Review / Update the debris management plan	Pontotoc County, Towns of Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall	State OEM Guidance, FEMA Guidance
Provide surge protection for computer-reliant critical facilities and schools.	All Jurisdictions	PCHMP, Electrical Best Practices Guidelines
Evaluate, upgrade and maintain community-wide outdoor omni- directional voice/siren warning systems	Pontotoc County, Towns of Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall	EOP (warning annex) Severe Weather SOG EOP Annex A.IV.C.1.
Provide lightning warning systems for outdoor sports areas, pools, golf courses, ball fields, and parks.	All Jurisdictions	PCHMP, School Safety Plans

Train/Educate builders, developers, architects and engineers in techniques of disaster resistant homebuilding, such as the Fortified Home standards developed by the Institute for Business and Home Safety (IBHS), the Blueprint for Safety guidelines developed by the Federal Alliance for Safe Homes (FLASH)	All Jurisdictions	PCHMP, FEMA Building Codes Toolkit, ICC Codes, Standards and Guidelines
Prepare a comprehensive basin-wide Flood & Drainage Annex to the Hazard Mitigation Plan for all watersheds within the jurisdiction. The plan should identify all flooding problems within the jurisdiction, and recommend the most cost-effective and politically acceptable solutions.	Pontotoc County, Towns of Allen, Byng, Roff, and Stonewall	PCHMP, Pontotoc County, Byng Floodplain Ordinances.
Develop an all-hazard public information, education, and awareness strategy and program.	All Jurisdictions	EOP Annex A.IV.C.1.
Continue Compliance with, and Participation in the National Flood Insurance Program (NFIP) and the Community Rating System (CRS)	Pontotoc County, Town of Byng, Town of Roff	NFIP Regulations, OWRB Requirements
Replace/continue replacing inadequately sized hydrants and water mains/lines to provide proper fire protection.	Pontotoc County, Towns of Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall	CIP's for towns and RWD 7/8/9 CIP's for Pontotoc County
Acquire equipment for responding to a massive power outage due to severe winter storm, ice and snow.	Pontotoc County, Towns of Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall	PCHMP, EOP Annex A.IV.C.1.
Install Street addresses on all Buildings, Curbs, and rural home sites.	Pontotoc County, Towns of Allen, Byng, Fitzhugh, Francis, Roff, and Stonewall	
Supply NOAA Weather Radios for all local government facilities, school, hospitals, and critical facilities.	All Jurisdictions	Pontotoc County
Provide backup facilities for the 911 center and the Emergency Operations Center.	Pontotoc County, Town of Byng	MOU between Pontotoc County and Town of Byng, MOU between 911 center and Chick. Nat. LHPD
Maintain culverts to adequately allow for storm water drainage.	All Jurisdictions	Pontotoc County Road district maint. Plan, and town maint plan/ MOU's between towns and county

Action Items	***Jurisdiction***	***Plan/Code of Integration***
1. Prepare a comprehensive basin-wide Master Flood & Drainage Plan for the jurisdiction. The plan should identify all flooding problems within the jurisdiction, and recommend the most cost-effective and politically acceptable solutions.	All except Fitzhugh, Francis, And Byng/Stonewall Schools	PCHMP, Pontotoc County, Byng Floodplain Ordinances.
2. Develop an Emergency Back-up Generator Needs Assessment and Plan for the community, assessing and prioritizing generator needs for critical facilities, both public and private. Assessment should include generator needs, costs of installation for pads/transfer panels only, or for complete generator assembly installation.	All, Including schools	PCHMP, EOP Annex A.IV.C.1.
3. Obtain funding for development and distribution of public information and education plans for responding to all-hazards to at-risk and vulnerable populations and contact agencies that distribute information to at-risk populations	All Towns and Pontotoc County	LEPC Projects, EMPG Project

4. Develop and distribute a Family Emergency Preparedness Guide to all families.	All Towns and Pontotoc County	LEPC Projects, EMPG Projects
5. Continue services for the HyperReach Mass notification system purchased by the county.	All, including schools	Pontotoc County Resolution to purchase, EOP Annex A.IV.C.1.
6. Train/Educate builders, developers, architects and engineers in techniques of disaster-resistant building, such as the Fortified Home standards developed by the Institute for Business & Home Safety (IBHS), the Blueprint for Safety guidelines developed by the Federal Alliance for Safe Homes (FLASH).	All Including schools	PCHMP, FEMA Building Codes Toolkit, ICC Codes, Standards and Guidelines
7. Based on the results of the Emergency Back-up Generator Assessment and Plan, provide wiring and transfer switches to accommodate emergency generators during disaster power outages for critical facilities.	All including schools	PCHMP, EOP Annex A.IV.C.1.
8. Develop / Review / Update the debris management plan.	All Towns and Pontotoc County	State OEM Guidance, FEMA Guidance
9. Provide surge protection for computer-reliant critical facilities (e.g. 911 Center, EOC, police stations, fire stations, Schools, etc.)	All including Schools	PCHMP, Electrical Best Practices Guidelines
10. Evaluate, and maintain community-wide outdoor omni-directional voice/siren warning systems	All Including Schools	EOP (warning annex) Severe Weather SOG EOP Annex A.IV.C.1.
11. Identify source of generators that are required as identified in the Emergency Back-up Generator Plan. Add the information to the Pontotoc County Resource Database.	All Including Schools	Pontotoc County Resource Data Base
12. Educate residents, building professionals and safe room vendors on the International Codes Council/National Storm Shelter Association s "Standard for the Design and Construction of Storm Shelters .	All Including Schools	State OEM Guidance and FEMA Guidance
13. Provide employee/student shelters/safe-rooms at critical facilities, such as Public Works facilities, schools, city halls, and administrative offices.	Pontotoc County Towns of, Allen, Francis, Stonewall, Schools of, Allen, Byng, Latta, Stonewall	CIP, EOP/ County Safety Plan EOP Annex A.IV.C.1.
14. Continue Compliance with, and Participation in the National Flood Insurance Program (NFIP).	All Except: Francis, Fitzhugh, and Schools	NFIP Regulations, OWRB Requirements
15. Provide lightning warning systems for outdoor sports areas, pools, golf courses, ball fields, and parks.	All Including Schools	PCHMP, School Safety Plans
16. Educate builders on appropriate foundation types for soils with different degrees of shrink-swell potential. For example, using "post-tensioned slab-on-grade" or "drilled pier" vs. standard "slab-on-grade" or "wall-on-grade" foundations.	All Except: Schools of Stonewall and Vanoss	PCHMP, FEMA Building Codes Toolkit, ICC Codes, Standards and Guidelines
17. Establish administrative procedures, and provide maps and information to inform builders about Expansive Soils when they apply for development and building permits.	All Except: Schools of Stonewall and Vanoss	PCHMP

The process of including the adopted Mitigation Measures into the listed local planning mechanisms includes the following:

1. Mitigation Measures will be assigned to the appropriate departments for planning and implementation.

2. The responsible departments will report to the HMPC on an annual basis as to the progress made on each measure, identifying successes and impediments to their implementation.

To be included on the following pages of this chapter are Resolutions of Adoption of the *Pontotoc County Multi-Hazard Mitigation Plan*:

1. Pontotoc County
2. Town of Allen
3. Town of Byng
4. Town of Fitzhugh
5. Town of Francis
6. Town of Roff
7. Town of Stonewall
8. Allen Public Schools
9. Byng Public Schools
10. Latta Public Schools
11. Roff Public Schools
12. Stonewall Public Schools
13. Vanoss Public Schools

Appendix A: Communities & School Districts

Pontotoc County has seven incorporated communities, twelve unincorporated towns, seventeen unincorporated populated places, and seven public school systems. This plan covers all but the City of Ada and Ada Public Schools, which have their own plan, and Allen Public School System, who did not participate.

The following pages contain information on the incorporated communities, and the public school systems. The unincorporated towns and populated places are included in unincorporated Pontotoc County.

Table A–1: Pontotoc County Public Schools

Name	School System	Type	Grades	Address
Allen Elementary School	Allen Public Schools	Elementary	PK-8	Lexington & Richmond Allen, OK 74825
Allen High School	Allen Public Schools	High School	9-12	Lexington & Gilmore Allen, OK 74825
Byng Elementary School	Byng Public Schools	Elementary	4-6	500 S. New Bethel Blvd. Ada, OK 74820
Francis Elementary School	Byng Public Schools	Elementary	PK-3	18461 CR 1480 Ada, OK 74820
Homer Elementary School	Byng Public Schools	Elementary	PK-5	1400 N. Monte Vista Ada, OK 74820
Byng Junior High School	Byng Public Schools	Middle	7-9	500 S. New Bethel Blvd. Ada, OK 74820
Byng High School	Byng Public Schools	High School	10-12	500 S. New Bethel Blvd. Ada, OK 74820
Latta Elementary School	Latta Public Schools	Elementary	PK-6	13925 County Road 1560 Ada, OK 74820
Latta Junior High School	Latta Public Schools	Middle	7-9	13925 County Road 1560 Ada, OK 74820
Latta High School	Latta Public Schools	High School	10-12	13925 County Road 1560 Ada, OK 74820
Roff Elementary School	Roff Public Schools	Elementary	PK-8	100 N. Broadway Roff, OK 74865
Roff High School	Roff Public Schools	High School	9-12	100 N. Broadway Roff, OK 74865
Stonewall Elementary School	Stonewall Public Schools	Elementary	PK-4	600 High School Stonewall, OK 74871
McLish Middle School	Stonewall Public Schools	Middle	5-8	26050 CR 3590 Stonewall, OK 74871
Stonewall High School	Stonewall Public Schools	High School	9-12	600 High School Stonewall, OK 74871
Vanoss Elementary School	Vanoss Public Schools	Elementary	PK-8	4665 CR 1555 Ada, OK 74820
Vanoss High School	Vanoss Public Schools	High School	9-12	4665 CR 1555 Ada, OK 74820

A.1 Allen

The Town of Allen is an incorporated community located in northeast Pontotoc County, and is shown on the map below.

A.1.1 Geography

Latitude: 34.88 N
Longitude: 96.41 W
FIPS Code: 4012301400

The Town of Allen is located in northeast Pontotoc County in south-central Oklahoma, approximately 87.8 miles southeast of Oklahoma City. Total land area within Allen is 0.91 sq mi.

A.1.2 Demographics

The Town of Allen has a 2010 Census population of 932, with 355 households with an average household size of 2.53 persons. The median resident age was 38.4 years. In 2007, the median home value was $58,321. Races in Allen:

White Non-Hispanic (75.5%)
American Indian (17.87%)
Two or more races (5.9%)
Hispanic (1.0%)
Other race (0.3%)

A.1.3 Economy

As of 2010, 744 people were over the age of 16 in Allen. Of this number, 379 (or 93%) were employed and 27 unemployed (7%). The median household income in 2007 was $29,881.

Main Street, Allen Ok

A.1.4 Critical Facilities

Table A–2: Allen Critical Facilities

ID	Name	Address	Phone
Local Government			
	Allen City Hall	Memphis Street, Allen	
	Allen Volunteer Fire Dept.	Memphis Street Allen	
	Allen Police Department		580-857-2722
	Allen Library/EOC		
Medical			
	Rural Community Clinic	Easton (Hwy 98)	580-857-1300
	Allen Clinic	W. Broadway	
Senior Housing & Special Needs Citizens			
	Woodland Hills Nursing Home	200 N. Easton, Allen	580-857-2472
Education and Daycare			
	Allen Elementary School	P.O. Box 430, Allen	580-857-2419
	Allen High School	P.O. Box 430, Allen	580-857-2417
Commercial			
	Farmers State Bank of Allen	201 E. Broadway, Allen	

A.1.5 Hazards

The following table displays hazard information where there is community-specific data, as shown in the maps on the following pages.

General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes affect the entire community equally, and are addressed in Chapter 3.

Table A–3: Allen Hazard Impacts

Hazard	Area (Sq. Mi.)	Improved Parcels	Value	% Area Impacted	Impacted Population
Floods	0.09	13	$192,667	9.89%	59
Highly Expansive Soils	0.20	137	$2,735,000	21.98%	-
Wildfire	0.56	-	-	61.54%	-
Dam Failure	N/A	N/A	N/A	N/A	N/A
Tier II Hazardous Materials ¼ Mile*	0.04	10	$300,916	4.40%	0
Tier II Hazardous Materials ½ Mile*	0.22	99	2,383,505	24.18%	125
Transportation - Highway	0.59	273	$5,308,627	64.83%	479
Transportation - Railroad	N/A	N/A	N/A	N/A	N/A

Floodplains in Allen – One stream, Town Branch, has an SFHA in the Town of Allen. Although eighteen properties are touched by the SFHA, only three structures have been identified in the SFHA, using aerial photography and Pontotoc County Assessor's GIS files. None of Allen's public schools, or any other critical facilities, are within the SFHA. The Town of Allen withdrew from the NFIP on 4/10/1997.

Table A–4: Town of Allen Parcels Touched by SFHA

GIS Floodplain Analysis	*#*	*Market Value*
Parcels With Improvement Values Touched by the Floodplain	18	$328,502

Expansive Soils in Allen – The Town of Allen has identified areas of Expansive Soils that are classified as High. Allen consists of 0.12 square miles in Hughes County, and 0.79 square miles in Pontotoc County. The table below shows the breakdown of soil types for Allen in Pontotoc County.

Table A–5: Town of Allen Expansive Soils

Expansion Potential	*Area (mi^2)*	*Area (%)*
Very High	n/a	n/a
High	.20	25.97
Moderate	.11	13.63
Low	.48	60.40
Water	n/a	n/a

Urban Fires in Allen – According to the US 2010 Census, The Town of Allen had 15.1% of its homes built prior to 1939, and 0.8% of its homes were being heated using wood heat as a source.

*** Tier II Sites ¼ and ½ mile -** The town of Allen is unique in Pontotoc County in that it is the only town within the county that houses a major hazardous materials tank farm. This facility is owned by Magellan Industries. This facility houses 10 – 1,000,000 barrel tanks, as well as 3 – 10,000 gal propane tanks. Numerous pipelines also feed this facility carrying petroleum products ranging from jet fuel to crude oil.

This facility is just outside the city limits and the closest critical facility for the town, the waste water treatment facility, is only .1 miles from the nearest storage tank. The city hall, police department, and the fire department are all within ½ mile of this facility.

Due to the special hazards related to this facility in this location, special considerations are taken into account in the mitigation planning for the town of Allen.

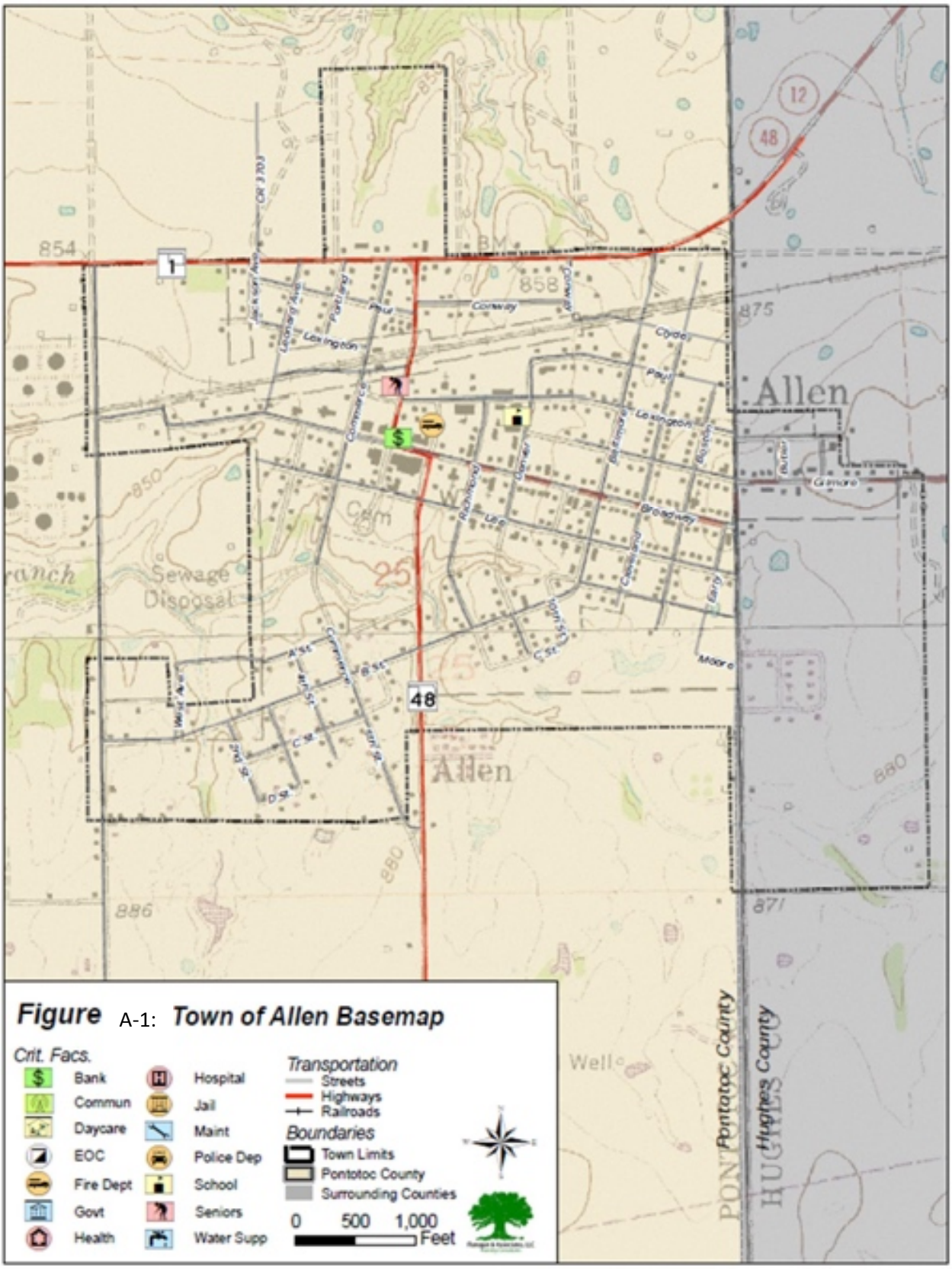


Figure A-1: ***Town of Allen Basemap***

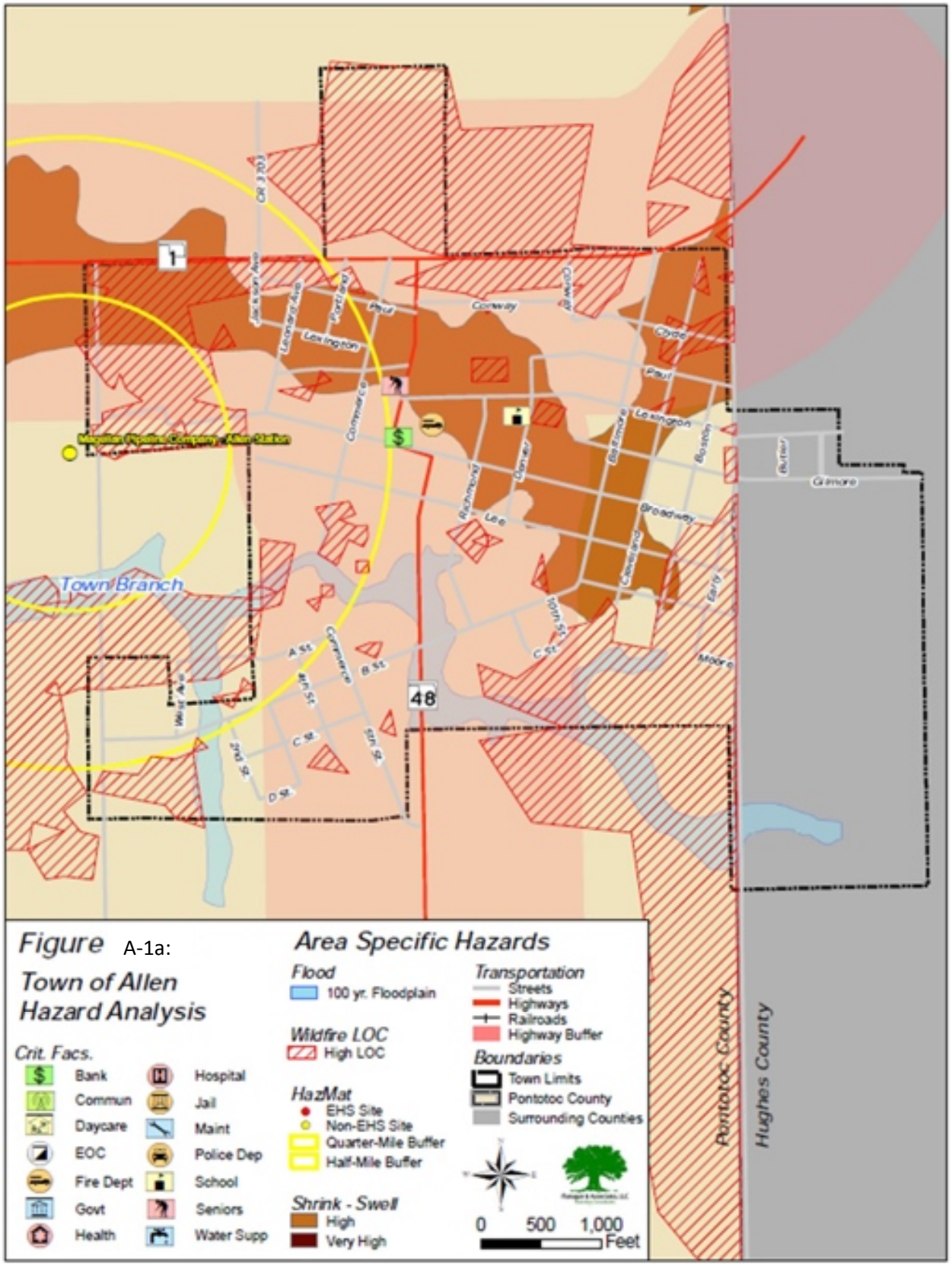


Figure A-1a:
Town of Allen
Hazard Analysis
Area Specific Hazards
Flood
100 yr. Floodplain
Wildfire LOC
High LOC
HazMat
EHS Site
Non-EHS Site
Quarter-Mile Buffer
Half-Mile Buffer
Shrink - Swell
High
Very High
Transportation
Streets
Highways
Railroads
Highway Buffer
Boundaries
Town Limits
Pontotoc County
Surrounding Counties
Crit. Facs.
Bank
Commun
Daycare
EOC
Fire Dept
Govt
Health
Hospital
Jail
Maint
Police Dep
School
Seniors
Water Supp
0 500 1,000
Feet
Town Branch
Pontotoc County
Hughes County
48
1

A.2 Byng

The Town of Byng is an incorporated community located in north-central Pontotoc County, shown on the map below.

A.2.1 Geography

Latitude: 34.86 N
Longitude: 96.67 W
FIPS Code: 4012310600

The Town of Byng is located in north Pontotoc County in south-central Oklahoma, approximately 73.3 southeast of Oklahoma City, and about 6.9 miles north of Ada. Total land area within Byng is 6.5 sq mi.

A.2.2 Demographics

The Town of Byng has a 2010 Census population of 1,175, and includes 482 households with an average household size of 2.2 persons. The median resident age was 38.2 years. In 2015, the median home value was $120,000.

Races in Byng:

White Non-Hispanic
(65.79%) American Indian
(23.57%)
Two or more races (6.89%)
Hispanic (4.77%)
Black (2.13%)
Other race
(1.19%)

A.2.3 Economy

As of 2010, 863 people were over the age of 17 in Byng. The median household income in 20010 was $49,702.

A.2.4 Critical Facilities

Table A–6: Byng Critical Facilities

ID	Name	Address	Phone
Local Government			
	Byng Town Hall	110 Byng Ave., Byng	(580) 436-2545
	Byng Fire Dept.	110 Byng Ave., Byng	(580) 436-2545
Education and Daycare			
	Byng Elementary School	500 S. New Bethel Rd., Byng	580-310-6723
	Byng High School	500 S. New Bethel Rd., Byng	580-310-6733
	Byng Junior High School	500 S. New Bethel Rd., Byng	580-310-6744
Commercial			
	Oklahoma Heritage Bank	101 N. Main, Byng	(580) 436-3090

A.2.5 Hazards

The following table displays hazard information where there is community-specific data.

General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes affect the entire community equally, and are addressed in Chapter 3.

Table A–7: Byng Hazard Impacts

Hazard	Area (Sq. Mi.)	Improved Parcels	Value	% Area Impacted	Impacted Population
Floods	0.24	12	$357,915	3.69%	0
Highly Expansive Soils	0.61	55	$2,292,878	9.37%	-
Very Highly Expansive Soils	0.18	8	$225,000	2.76%	-
Wildfire	2.97	-	-	45.69%	-
Dam Failure	N/A	N/A	N/A	N/A	N/A
Tier II Hazardous Materials ¼ Mile	0.02	2	$23,333	0.31%	0
Tier II Hazardous Materials ½ Mile	0.21	10	$279,166	3.23%	0
Transportation - Highway	1.41	65	$2,034,663	21.66%	267
Transportation - Railroad	N/A	N/A	N/A	N/A	N/A

Floodplains in Byng The community of Byng is touched by the floodplains of the South Canadian River, Little Sandy Creek, Canadian Sandy Creek and Rock Creek. The floodplains of these streams affect 12 parcels. No structures have been identified in any of the floodplains, using aerial photography and Pontotoc County Assessor s GIS files. There is no data concerning the number of flood insurance policies in Byng. Byng is a member in good standing with the NFIP. Participation in the NFIP is discussed on page 33 of this document.

Table A–8: Town of Byng Parcels Touched by SFHA

GIS Floodplain Analysis	*#*	*Market Value*
Parcels With Improvement Values Touched by the Floodplain	12	$357,915

Expansive Soils in Byng The Town of Byng has identified areas of Expansive Soils that are classified as High and Very High. The table below shows the breakdown of soil types in Byng.

Table A–9: Town of Byng Expansive Soils

Expansion Potential	*Area (mi^2)*	*Area (%)*
Very High	.18	2.8
High	.61	9.42
Moderate	1.79	27.53
Low	3.91	60
Water	.02	.25

Urban Fires in Byng According to the US 2010 Census, The Town of Byng had 4.6% of its homes built prior to 1939, and 0% of its homes were being heated using wood heat as a source.

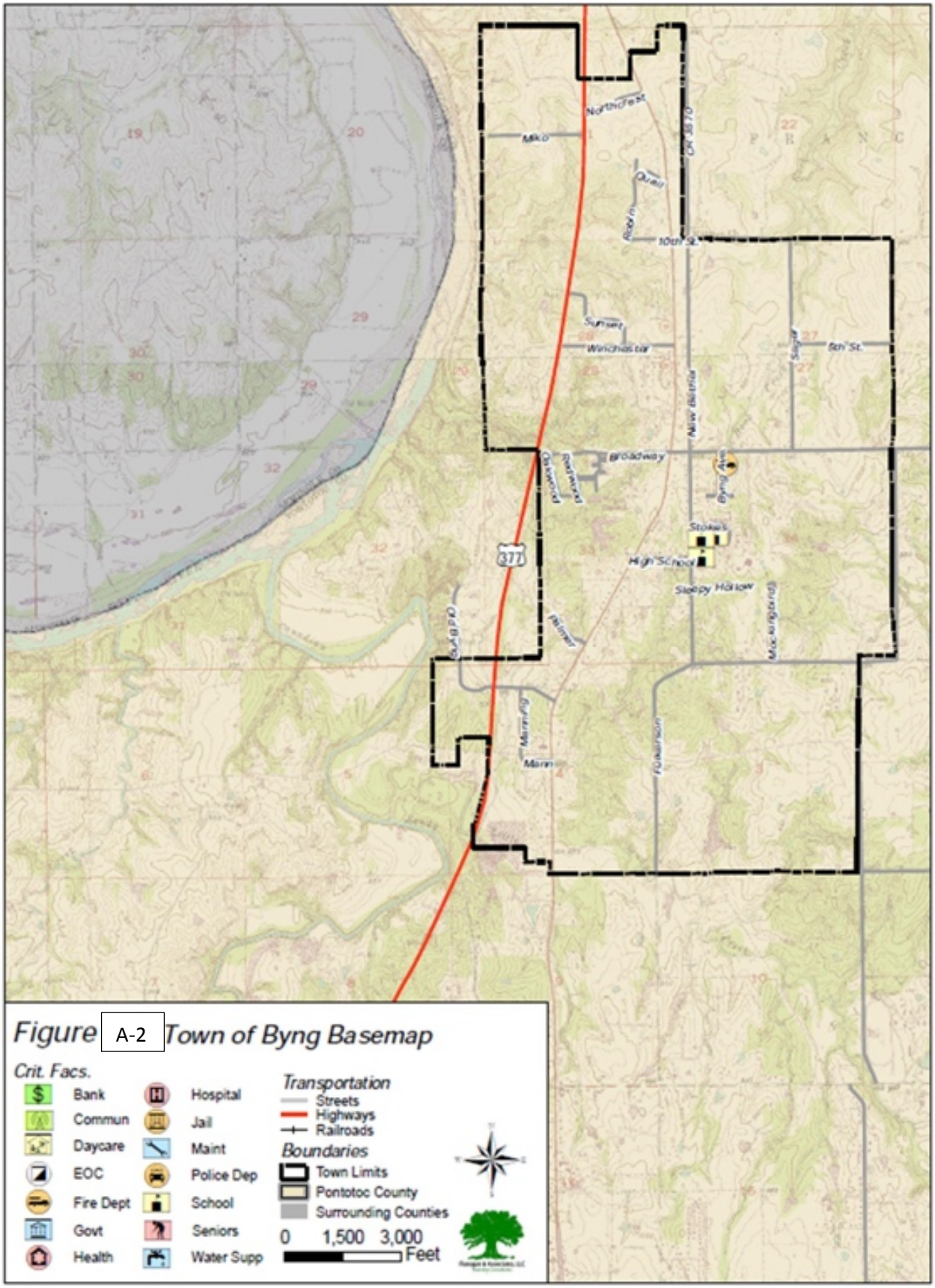


Figure A-2 Town of Byng Basemap
Crit. Facs.
Bank
Commun
Daycare
EOC
Fire Dept
Govt
Health
Hospital
Jail
Maint
Police Dep
School
Seniors
Water Supp
Transportation
Streets
Highways
Railroads
Boundaries
Town Limits
Pontotoc County
Surrounding Counties
0 1,500 3,000
Feet
Northcrest
Sunset
Winchester
Broadway
Byng Ave
Stokes
High School
Sleepy Hollow
Mockingbird
Palmer
Fulkerson
Maple
Oakwood
Rosewood
New Bethel
Sugar
9th St.
10th St.
Robin
Quail
Mike
377
OK 3E70

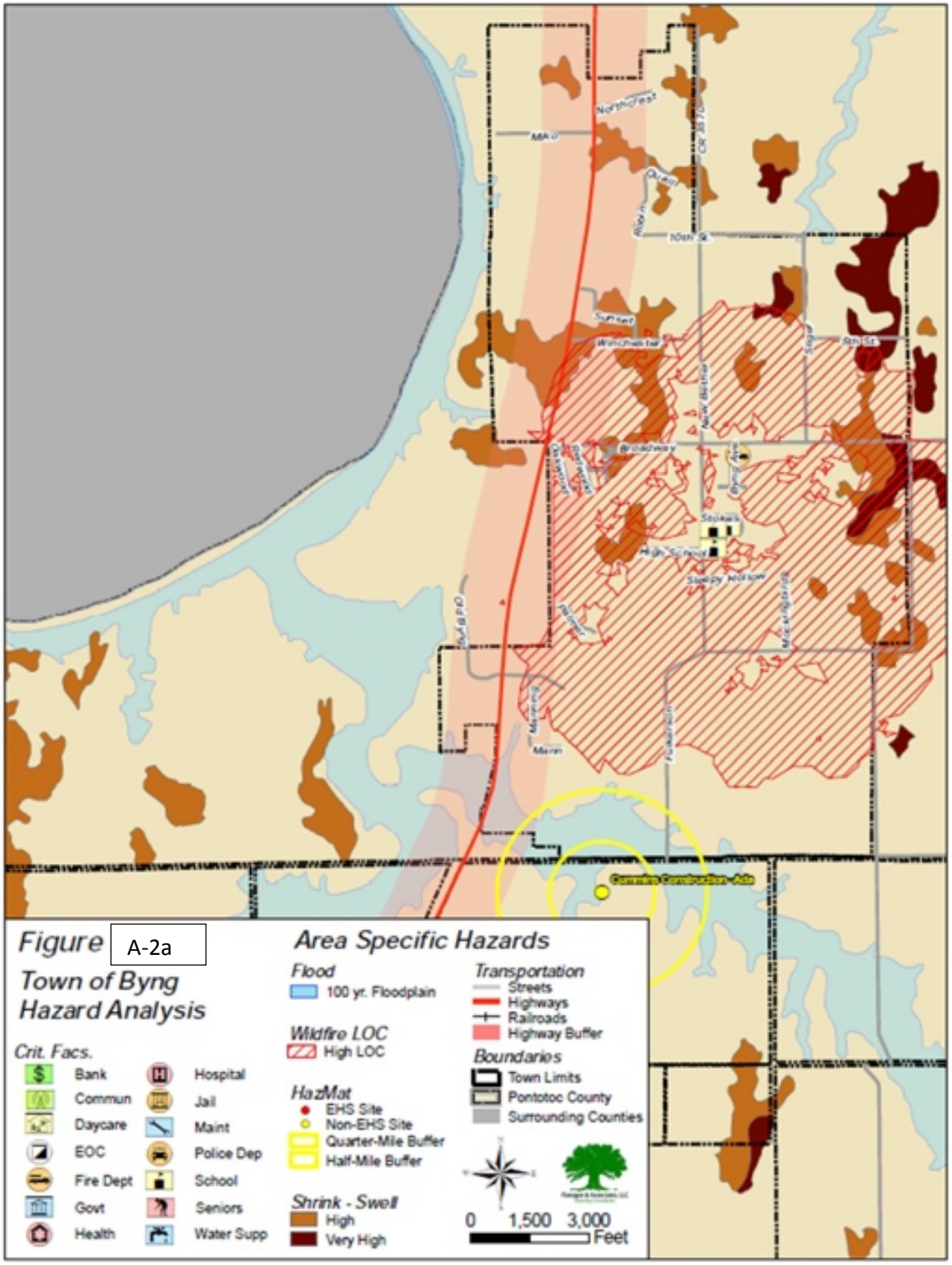


Figure A-2a
Town of Byng
Hazard Analysis
Area Specific Hazards
Flood
100 yr. Floodplain
Wildfire LOC
High LOC
HazMat
EHS Site
Non-EHS Site
Quarter-Mile Buffer
Half-Mile Buffer
Shrink - Swell
High
Very High
Transportation
Streets
Highways
Railroads
Highway Buffer
Boundaries
Town Limits
Pontotoc County
Surrounding Counties
Crit. Facs.
Bank
Commun
Daycare
EOC
Fire Dept
Govt
Health
Hospital
Jail
Maint
Police Dep
School
Seniors
Water Supp
0 1,500 3,000
Feet

A.3 Fitzhugh

The Town of Fitzhugh is an incorporated community located in southwest Pontotoc County, shown on the map below.

A.3.1 Geography

Latitude: 34.66 N
Longitude: 96.78 W
FIPS Code: 4012326250

The Town of Fitzhugh is located in southwest Pontotoc County in south-central Oklahoma, approximately 69 miles southeast of Oklahoma City, and about 112 miles south of Tulsa. Total land area within Fitzhugh is 7.3 sq mi.

A.3.2 Demographics

The Town of Fitzhugh had a reported Census 2010 population of 230. This includes 89 households with an average household size of 2.58 persons. The median resident age was 31.3 years. In 2007, the median home value was $93,012.

Races in Fitzhugh:

White Non-Hispanic (83%) American Indian (11.7%) Two or more races (5.2%) Hispanic (0%) Other race (0%)

A.3.3 Economy

As of 2010, 181 people were over the age of 16 in Fitzhugh. Of this number, 165 (or 92%) were employed and 16 unemployed (8%). The median household income in 2007 was $46,485.

A.3.4 Critical Facilities

Table A–10: Fitzhugh Critical Facilities

ID	A-2: Name	Address	Phone
Local Government			
	Fitzhugh Fire Dept	21930 CR 3499 Fitzhugh	
	Fitzhugh Town Hall	21930 CR 3499 Fitzhugh	
	Community Center/Storm Shelter	(75% complete)	
Federal, State and County Government			
	Post Office		
Education and Daycare			
	Roff Headstart		

A.3.5 Hazards

The following table displays hazard information where there is community-specific data, as shown in the maps on the following pages.

General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes affect the entire community equally, and are addressed in Chapter 3.

Table A–11: Fitzhugh Hazard Impacts

Hazard	Area (Sq. Mi.)	Improved Parcels	Value	Area Impacted	Impacted Population
Floods	N/A	N/A	N/A	N/A	N/A
Highly Expansive Soils	0.74	18	$480,833	10.14%	-
Wildfire	7.3	18	$480K	100	All
Dam Failure	N/A	N/A	N/A	N/A	N/A
Tier II Hazardous Materials ¼ Mile	0.20	21	$254,373	2.74%	12
Tier II Hazardous Materials ½ Mile	0.79	44	$808,122	10.82%	58
Transportation - Highway	1.00	17	$384,249	13.70%	29
Transportation - Railroad	1.30	32	$585,205	17.81%	34

Floodplains in Fitzhugh The community of Fitzhugh is not touched by floodplains.

Expansive Soils in Fitzhugh The Town of Fitzhugh has identified areas of Expansive Soils that are classified as High and Very High. The table below shows the breakdown of soil types in Fitzhugh.

Table A–12: Town of Fitzhugh Expansive Soils

Expansion Potential	*Area (mi^2)*	*Area (%)*
Very High	.007	.09
High	.74	10.13
Moderate	1.67	22.90
Low	4.87	66.77
Water	.004	.05

Urban Fires in Fitzhugh According to the US 2010 Census, The Town of Fitzhugh had 11.8% of its homes built prior to 1939, and 0% of its homes were being heated using wood heat as a source.

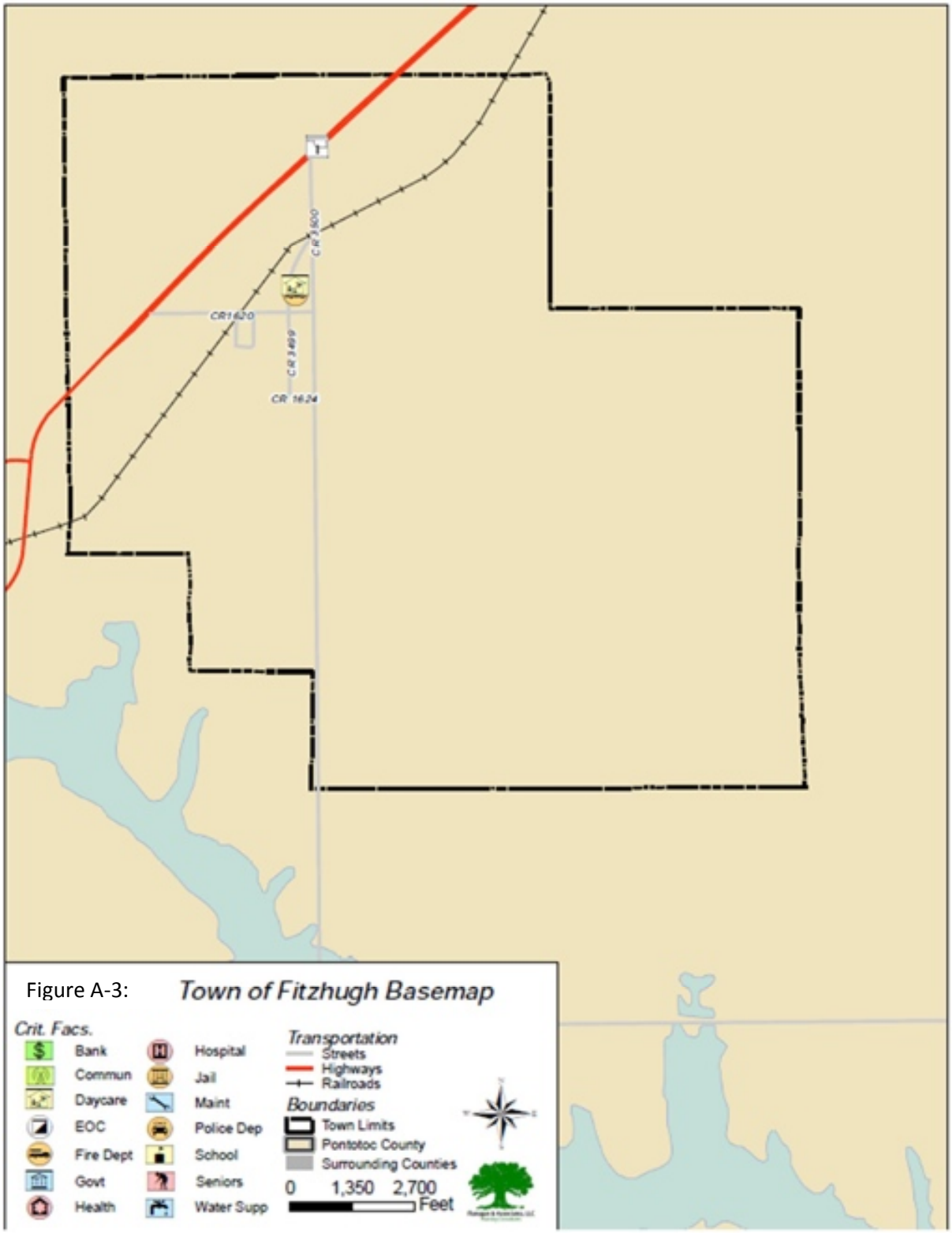

CR3500
CR1620
CR3499
CR 1624
Town of Fitzhugh Basemap
Crit. Facs.
Bank
Commun
Daycare
EOC
Fire Dept
Govt
Health
Hospital
Jail
Maint
Police Dep
School
Seniors
Water Supp
Transportation
Streets
Highways
Railroads
Boundaries
Town Limits
Pontotoc County
Surrounding Counties
0 1,350 2,700
Feet

Figure A-3:

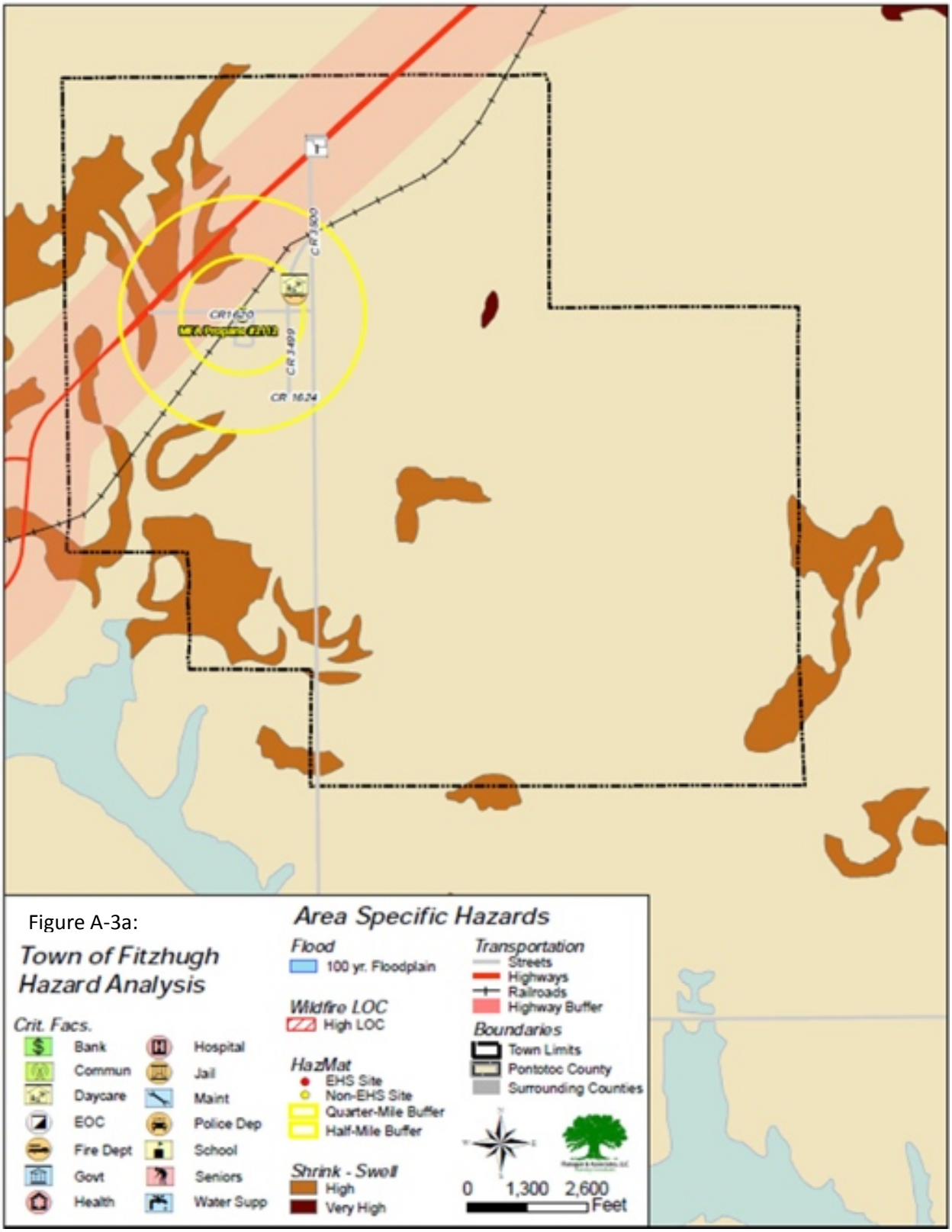

Area Specific Hazards
Flood
100 yr. Floodplain
Wildfire LOC
High LOC
HazMat
EHS Site
Non-EHS Site
Quarter-Mile Buffer
Half-Mile Buffer
Shrink - Swell
High
Very High
Transportation
Streets
Highways
Railroads
Highway Buffer
Boundaries
Town Limits
Pontotoc County
Surrounding Counties
Crit. Facs.
Bank
Commun
Daycare
EOC
Fire Dept
Govt
Health
Hospital
Jail
Maint
Police Dep
School
Seniors
Water Supp
0 1,300 2,600
Feet
Town of Fitzhugh
Hazard Analysis
CR 3600
CR 1670
CR 3499
CR 1624

Figure A-3a:

A.4 Francis

The Town of Francis is an incorporated community located in north-central Pontotoc County, shown on the map below.

A.4.1 Geography

Latitude: 34.87 N
Longitude: 96.59 W
FIPS Code: 4012327650

The Town of Francis is located in north-central Pontotoc County in the south-central Oklahoma, approximately 65 miles southeast of Oklahoma City, and about 95 miles south of Tulsa. Total land area within Francis is .59 sq mi.

A.4.2 Demographics

The Town of Francis had a reported Census 2010 population of 315. This includes 121 households with an average household size of 2.6 persons. The median resident age was 39.7 years. In 2013, the median home value was $61,000.

Races in Francis:

White Non-Hispanic (76.5%)
American Indian (16.5%) Two or more races (4.4%) Hispanic (4.8%)

A.4.3 Economy

As of 2010, 244 people were over the age of 16 in Francis. Of this number, 230 (or 4.6%) were employed and 13 unemployed (5.4%). The median household income in 2013 was $39,531.

A.4.4 Critical Facilities

Table A–13: Francis Critical Facilities

ID	Name	Address	Phone
Local Government			
	Francis Town Hall		
	Francis Volunteer Fire Dept.	127 S David, Francis	
Federal, State and County Government			
	Francis Post Office		
Education and Daycare			
	Francis Elementary School (Byng PS)	18461 County Rd. 1480	580-332-4114

A.4.5 Hazards

The following table displays hazard information where there is community-specific data, as shown in the maps on the following pages.

General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes affect the entire community equally, and are addressed in Chapter 3.

Table A–14: Francis Hazard Impacts

Hazard	Area (Sq. Mi.)	Improved Parcels	Value	Area Impacted	Impacted Population
Floods	N/A	N/A	N/A	N/A	N/A
Highly Expansive Soils	0.26		$	36.17%	
Wildfire	.59			100	All
Dam Failure	N/A	N/A	N/A	N/A	N/A
Tier II Hazardous Materials ¼ Mile	0.59			100%	All
Tier II Hazardous Materials ½ Mile	0.59			100%	All
Transportation - Highway	.59		$	100%	All
Transportation - Railroad	.59		$	100%	All

Floodplains in Francis The community of Francis is not touched by floodplains.

Expansive Soils in Francis The Town of Francis has identified areas of Expansive Soils that are classified as High and Very High. The table below shows the breakdown of soil types in Francis.

Table A–15 : Town of Francis Expansive Soils

Expansion Potential	*Area (mi^2)*	*Area (%)*
Very High	.08	14.23
High	.13	21.94
Moderate	.13	22.91
Low	.24	40.92
Water	N/A	N/A

Urban Fires in Francis According to the US 2010 Census, The Town of Francis had 27.6% of its homes built prior to 1939, and .8% of its homes were being heated using wood heat as a source.

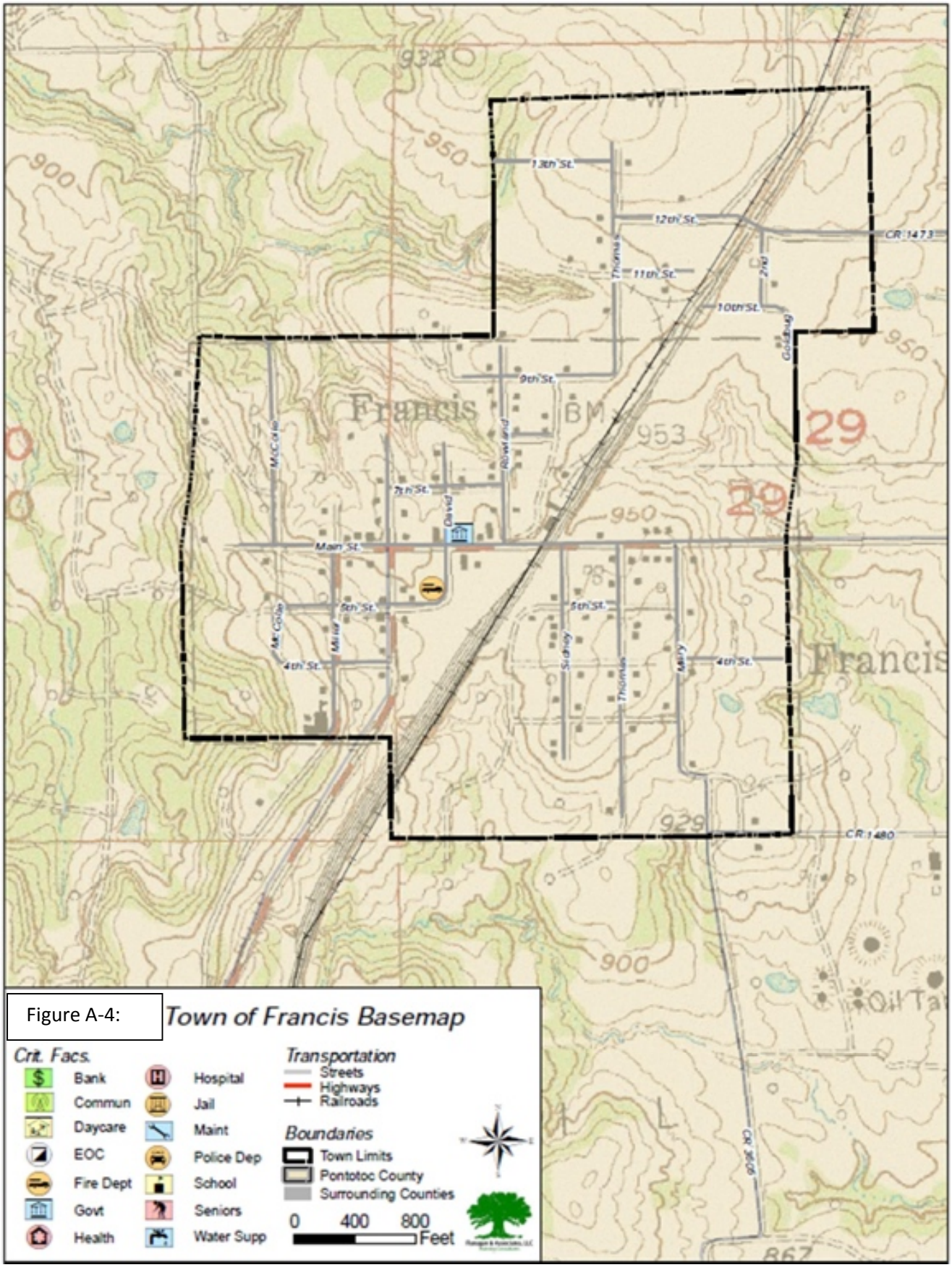

Francis
Main St.
9th St.
8th St.
7th St.
5th St.
4th St.
13th St.
12th St.
11th St.
10th St.
CR 1473
CR 1480
Town of Francis Basemap
Crit. Facs.
Bank
Commun
Daycare
EOC
Fire Dept
Govt
Health
Hospital
Jail
Maint
Police Dep
School
Seniors
Water Supp
Transportation
Streets
Highways
Railroads
Boundaries
Town Limits
Pontotoc County
Surrounding Counties
0 400 800
Feet

Figure A-4:

B-4:

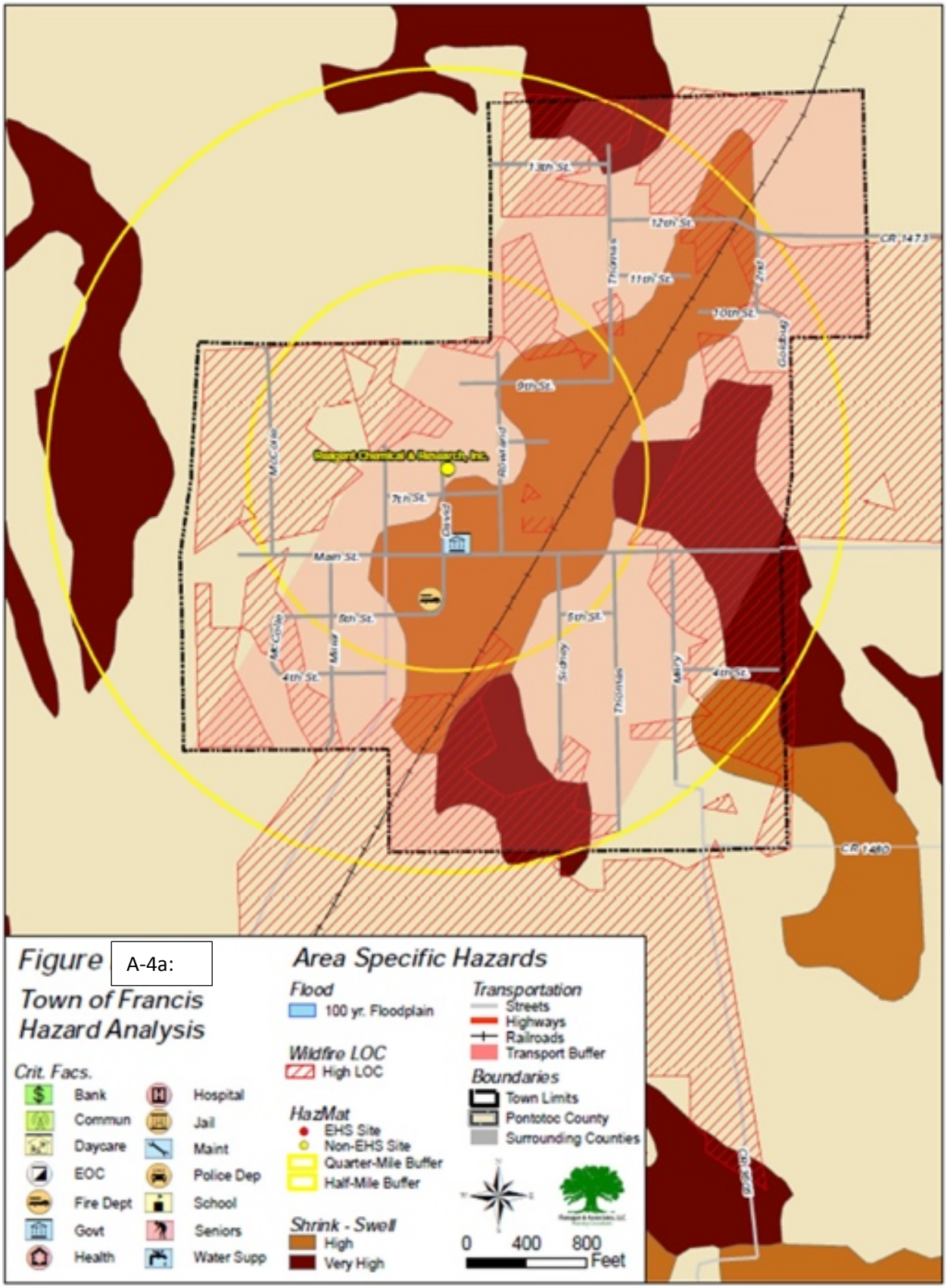
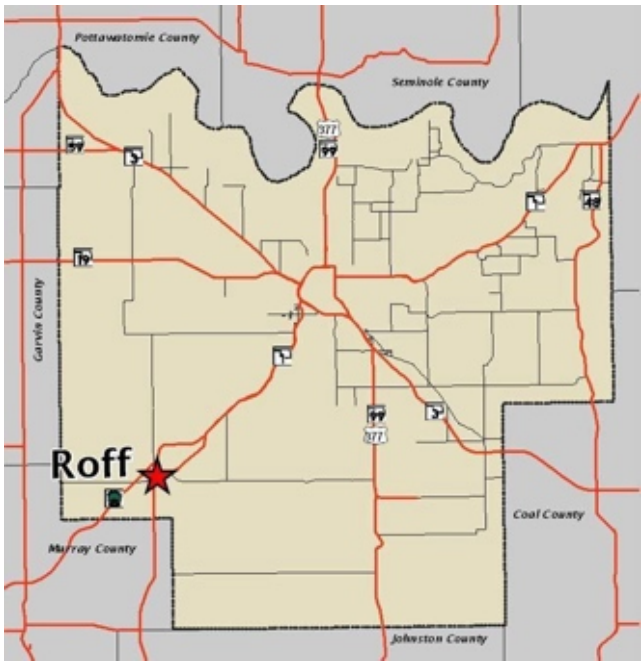


Figure A-4a:
Town of Francis
Hazard Analysis
Area Specific Hazards
Flood
100 yr. Floodplain
Wildfire LOC
High LOC
HazMat
EHS Site
Non-EHS Site
Quarter-Mile Buffer
Half-Mile Buffer
Shrink - Swell
High
Very High
Transportation
Streets
Highways
Railroads
Transport Buffer
Boundaries
Town Limits
Pontotoc County
Surrounding Counties
Crit. Facs.
Bank
Commun
Daycare
EOC
Fire Dept
Govt
Health
Hospital
Jail
Maint
Police Dep
School
Seniors
Water Supp
0 400 800
Feet
Rangaire Chemical & Research, Inc.
13th St.
12th St.
11th St.
10th St.
9th St.
7th St.
Main St.
8th St.
4th St.
CR 1473
CR 1480
McCollar
Rowland
Thomas
Sidney
Mary

A.5 Roff

The Town of Roff is an incorporated community located in southwest Pontotoc County, as shown on the map.



A.5.1 Geography

Latitude: 34.87 N
Longitude: 96.59 W
FIPS Code: 4012363750

The Town of Roff is located in southwest Pontotoc County in south-central Oklahoma, approximately 69 miles southeast of Oklahoma City, and about 116 miles south of Tulsa. Total land area within Roff is 0.94 sq mi.

A.5.2 Demographics

The Town of Roff had a reported Census 2010 population of 725. This includes 272 households with an average household size of 2.67 persons. The median resident age was 36.4 years. In 2013, the median home value was $66,300.

Races in Roff:

White Non-Hispanic (79.7%)
American Indian (13.0%)
Two or more races (5.5%)
Hispanic (2.8%)

A.5.3 Economy

As of 2010, 543 people were over the age of 16 in Roff. Of this number, 281 (or 94%) were employed and 17 unemployed (6%). The median household income in 2007 was $36,250.

A.5.4 Critical Facilities

Table A–16: Roff Critical Facilities

ID	Name	Address	Phone
Local Government			
	Roff Fire Dept.	110 W Main, Roff	
	Roff City Hall		
	Roff Police Department		
Federal, State and County Government			
	Pontotoc County District 3 □Roff		
Education and Daycare			
	Roff Elementary School	P.O. Box 157, Roff	580-456-7251
	Roff High School	P.O. Box 157, Roff	580-456-7252
Commercial			
	Pontotoc County Bank ATM at Roff	701 S. Hickory St., Roff 74865	
	First American Bank		
	Oklahoma Heritage Bank	131 W Main St., Roff 74865	

A.5.8 Hazards

The following table displays hazard information where there is community-specific data, as shown in the maps on the following pages.

General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes affect the entire community equally, and are addressed in Chapter 3.

Table A–17: Roff Hazard Impacts

Hazard	Area (Sq. Mi.)	Improved Parcels	Value	Area Impacted	Impacted Population
Floods	0.02	11	$138,749	2.13%	21
Highly Expansive Soils	0.27	68	$1,285,003	28.72%	-
Wildfire	0.14	-	-	14.89%	-
Dam Failure	N/A	N/A	N/A	N/A	N/A
Tier II Hazardous Materials ½ Mile	0.08	5	$89,583	8.51%	5
Transportation - Highway	0.64	245	$4,763,091	68.09%	541
Transportation - Railroad	0.52	122	$2,173,503	55.32%	276

Floodplains in Roff The northern and western areas of incorporated Roff come in contact with the floodplains of the Blue River. There are 9 structures in the designated floodplain. The following table shows the parcels touched by the SFHA and their associated market values. There are 2 flood insurance policies in force in the Town of Roff. None of Roff's public schools are within an SFHA. Roff is a member of the NFIP and is a pre-1980 community. Roff's participation in the NFIP is discussed on page 33 of this document.

Table A–18: Town of Roff Parcels Touched by SFHA

GIS Floodplain Analysis	*#*	*Market Value*
Parcels With Improvement Values Touched by the Floodplain	20	$377,583
Flood Insurance Information		
Policies in Force	2	-
$ Flood Insurance in Force	2	$145,000

Expansive Soils in Roff The Town of Roff has identified areas of Expansive Soils that are classified as High. The table below shows the breakdown of soil types in Roff.

Table A–19: Town of Roff Expansive Soils

Expansion Potential	*Area (mi^2)*	*Area (%)*
Very High	N/A	N/A
High	.27	28.18
Moderate	.14	15.18
Low	.53	55.78
Water	.008	.86

Urban Fires in Roff According to the US 2010 Census, The Town of Roff had 21.3% of its homes built prior to 1939, and 0% of its homes were being heated using wood heat as a source.

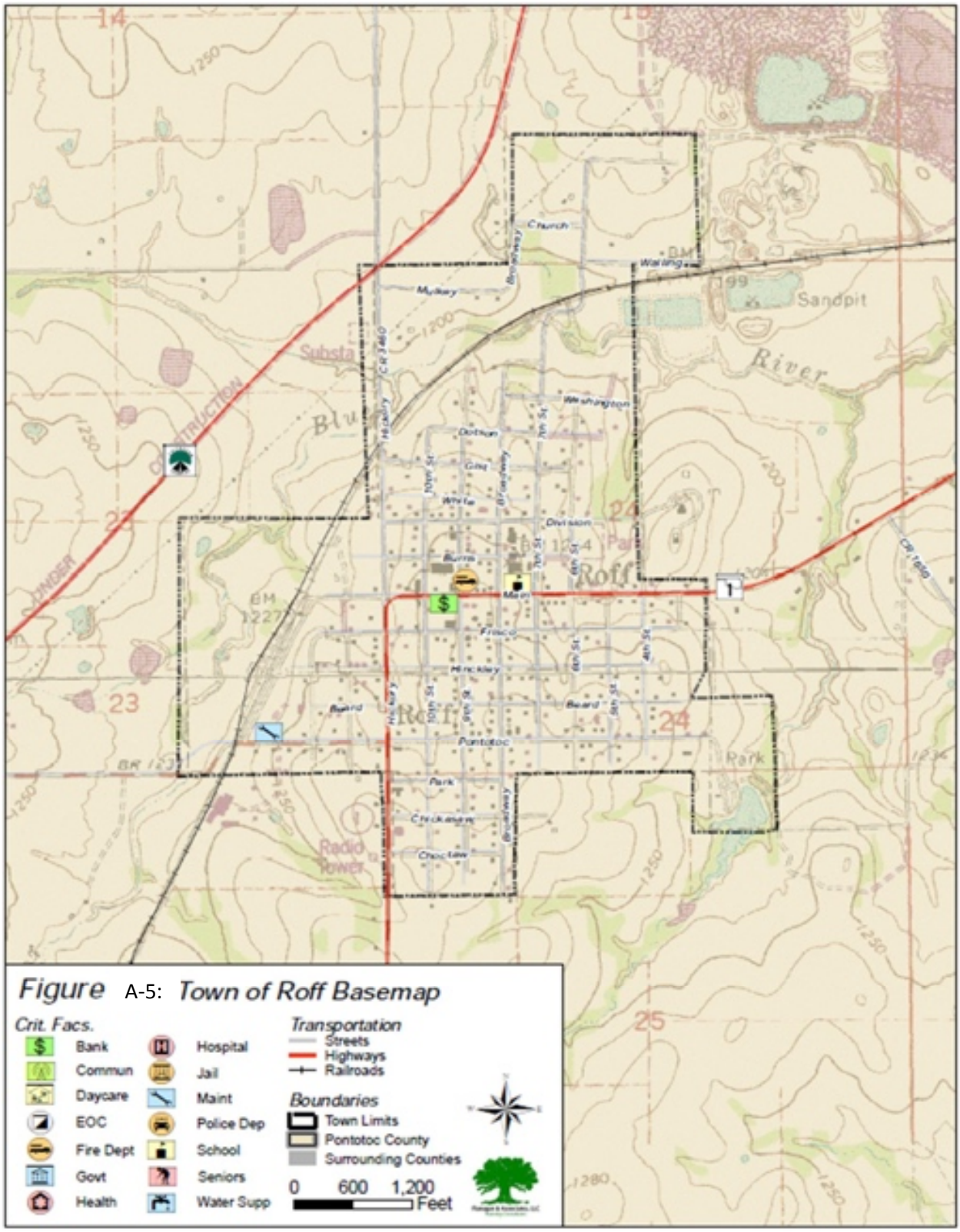


Figure A-5: Town of Roff Basemap
Crit. Facs.
Bank
Commun
Daycare
EOC
Fire Dept
Govt
Health
Hospital
Jail
Maint
Police Dep
School
Seniors
Water Supp
Transportation
Streets
Highways
Railroads
Boundaries
Town Limits
Pontotoc County
Surrounding Counties
0 600 1,200
Feet
Roff
Sandpit
River
Pontotoc
Park
Church
Broadway
Washington
Division
Main
Hickory
Chickasaw
Choctaw
Radio Tower
Substa

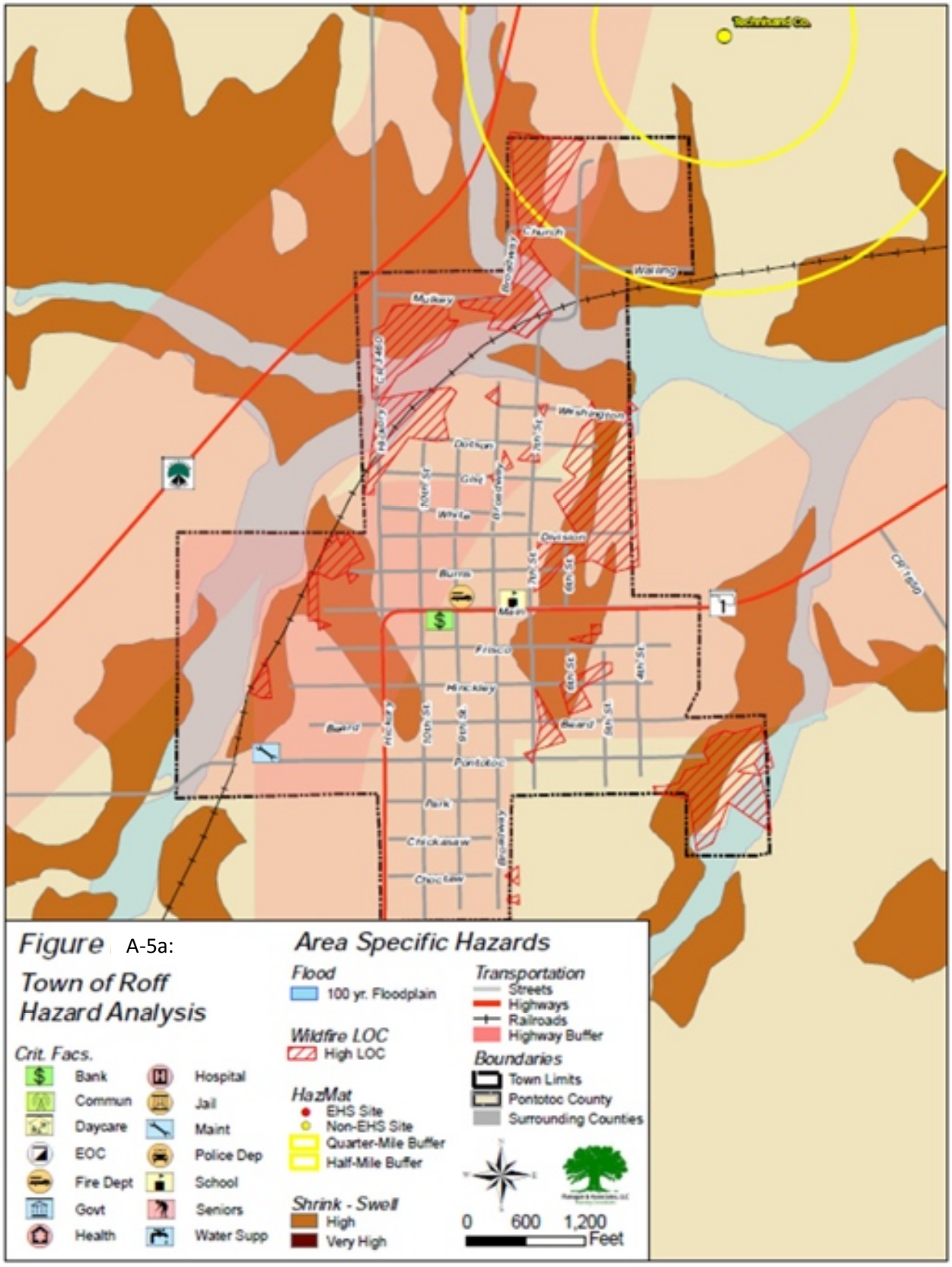


Figure A-5a:
Town of Roff
Hazard Analysis
Crit. Facs.
Bank
Commun
Daycare
EOC
Fire Dept
Govt
Health
Hospital
Jail
Maint
Police Dep
School
Seniors
Water Supp
Area Specific Hazards
Flood
100 yr. Floodplain
Wildfire LOC
High LOC
HazMat
EHS Site
Non-EHS Site
Quarter-Mile Buffer
Half-Mile Buffer
Shrink - Swell
High
Very High
Transportation
Streets
Highways
Railroads
Highway Buffer
Boundaries
Town Limits
Pontotoc County
Surrounding Counties
0 600 1,200
Feet

A.6 Stonewall

The Town of Stonewall is an incorporated community located in southeast Pontotoc County, shown on the map below.

A.6.1 Geography

Latitude: 34.65 N
Longitude: 95.53 W
FIPS Code:
4012370500

The Town of Stonewall is located in southeast Pontotoc County in south-central Oklahoma, approximately 79 miles southeast of Oklahoma City, and about 108 miles south of Tulsa. Total land area within Stonewall is 0.32 sq mi.

A.6.2 Demographics

The Town of Stonewall had a reported Census 2010 population of 470as of July 1 2010, the population was 478, and this includes 190 households with an average household size of 2.4 persons. In 2010, the median resident age was 42 years, and the median home value was $58,457.

Races in Stonewall:

White Non-Hispanic (70.6%)
American Indian (14.7%)
Black (2.6%)
Two or more races
(11.7%)
Hispanic (3.0%)

A.6.3 Economy

As of 2010, 184 people were over the age of 16 and participating in the labor force in Stonewall. Of this number,
184 (or 100%) were employed and none unemployed (0%). The median household income in 2013 was $21,071.

A.6.4 Critical Facilities

Table A–20: Stonewall Critical Facilities

ID	Name	Address	Phone
Local Government			
	Stonewall Fire Dept.	113 S Harrison, Stonewall	911
	Stonewall City Hall, EOC and Police Dept	127 W Main	580-265-4511
	Public Works Office	116 S Harrison	
	Public Works Water Treatment Plant		
Federal, State and County Government			
	Pontotoc County District 3 □ Stonewall	224 E Main, Stonewall	580-265-4564
	Stonewall Post Office		
Education and Daycare			
	Stonewall Elementary School	600 S. High School, Stonewall	580-265-4243
	Stonewall High School	600 S. High School, Stonewall	580-265-4242
	McLish Middle School	26050 CR 3590, Stonewall	580-265-2221
Commercial			
	First American Bank of Stonewall	301 W. Main St, Stonewall	580-265-4222
	Central Oklahoma Family Medical Center	201 W main St.	580-265-9292

A.6.5 Hazards

The following table displays hazard information where there is community-specific data, as shown in the maps on the following pages.

General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes affect the entire community equally, and are addressed in Chapter 3.

Table A–21: Stonewall Hazard Impacts

Hazard	Area (Sq. Mi.)	Improved Parcels	Value	Area Impacted	Impacted Population
Floods	0.11	42	$453,417	34.38%	52
Highly Expansive Soils	N/A	N/A	N/A	N/A	N/A
Wildfire	.04	-	-	12.5%	-
Dam Failure	N/A	N/A	N/A	N/A	N/A
Tier II Hazardous Materials ½ Mile	N/A	N/A	N/A	N/A	N/A
Transportation	N/A	N/A	N/A	N/A	N/A

Floodplains in Stonewall The northeastern and eastern areas of incorporated Stonewall are exposed to flooding along Buck Creek. There are 48 parcels that are touched by the creek's 100-year floodplain. The number and improvements value of these parcels are shown in the following table. There is one critical facility in the Buck Creek floodplain the Pontotoc District 3 Maintenance Barn. None of Stonewall's public schools are within the SFHA. The Town of Stonewall was sanctioned by the NFIP and has not participated in the program since 8/1/1987.

Table A–22: Town of Stonewall Parcels Touched by SFHA

GIS Floodplain Analysis	*#*	*Market Value*
Parcels With Improvement Values Touched by the Floodplain	48	$573,416

Expansive Soils in Stonewall The Town of Stonewall has identified areas of Expansive Soils that are classified as High. The table below shows the breakdown of soil types in Stonewall.

Table A–23: Town of Stonewall Expansive Soils

Expansion Potential	*Area (mi^2)*	*Area (%)*
Very High	N/A	N/A
High	.004	.89
Moderate	.19	58.13
Low	.13	39.38
Water	N/A	N/A

Urban Fires in Stonewall According to the US 2010 Census, The Town of Stonewall had 31.8% of its homes built prior to 1939, and none of its homes were being heated using wood heat as a source.

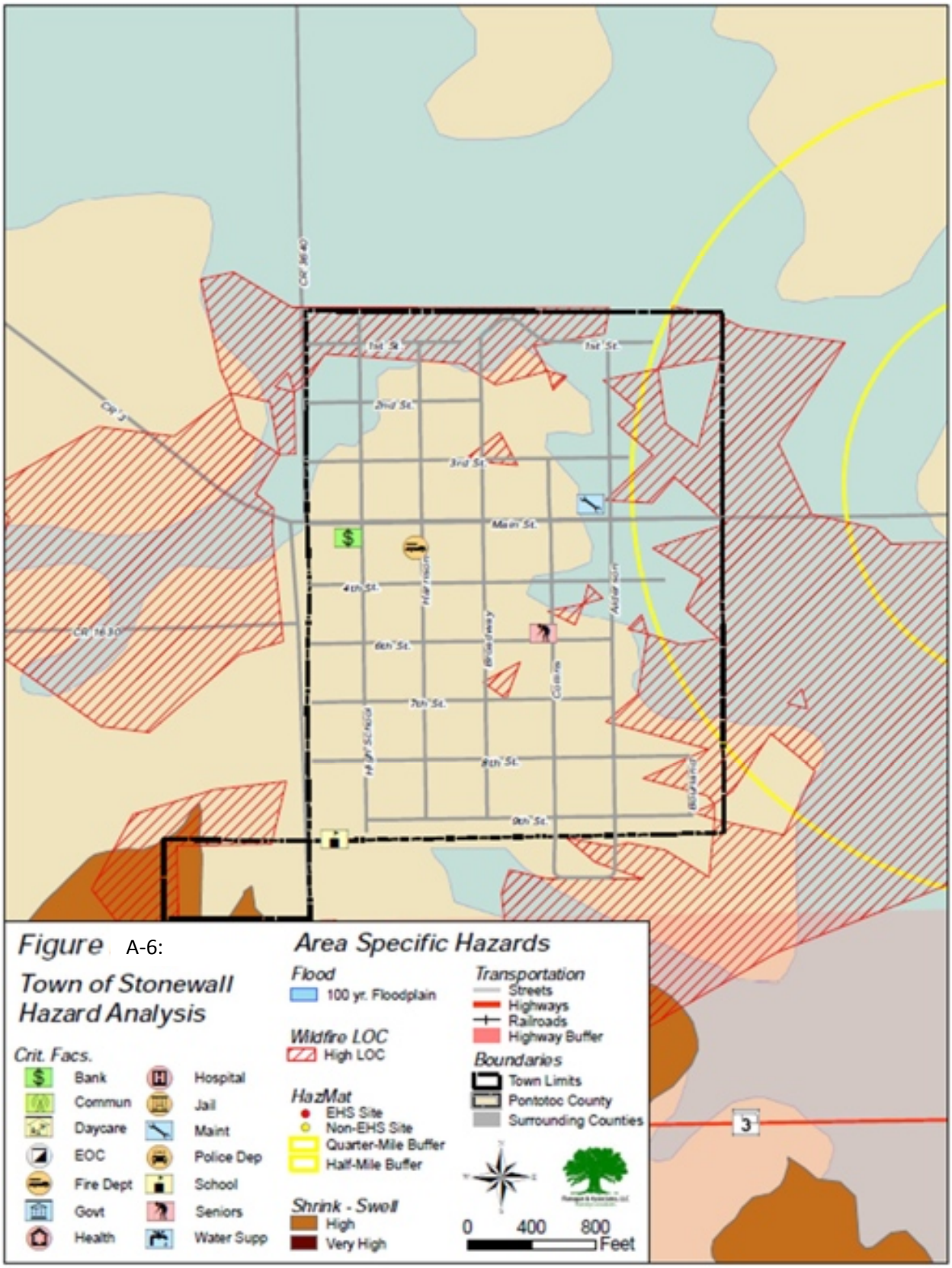


Figure A-6:
Town of Stonewall
Hazard Analysis
Crit. Facs.
Bank
Commun
Daycare
EOC
Fire Dept
Govt
Health
Hospital
Jail
Maint
Police Dep
School
Seniors
Water Supp
Area Specific Hazards
Flood
100 yr. Floodplain
Wildfire LOC
High LOC
HazMat
EHS Site
Non-EHS Site
Quarter-Mile Buffer
Half-Mile Buffer
Shrink - Swell
High
Very High
Transportation
Streets
Highways
Railroads
Highway Buffer
Boundaries
Town Limits
Pontotoc County
Surrounding Counties
0 400 800
Feet
1st St.
2nd St.
3rd St.
Main St.
4th St.
6th St.
7th St.
8th St.
9th St.
3

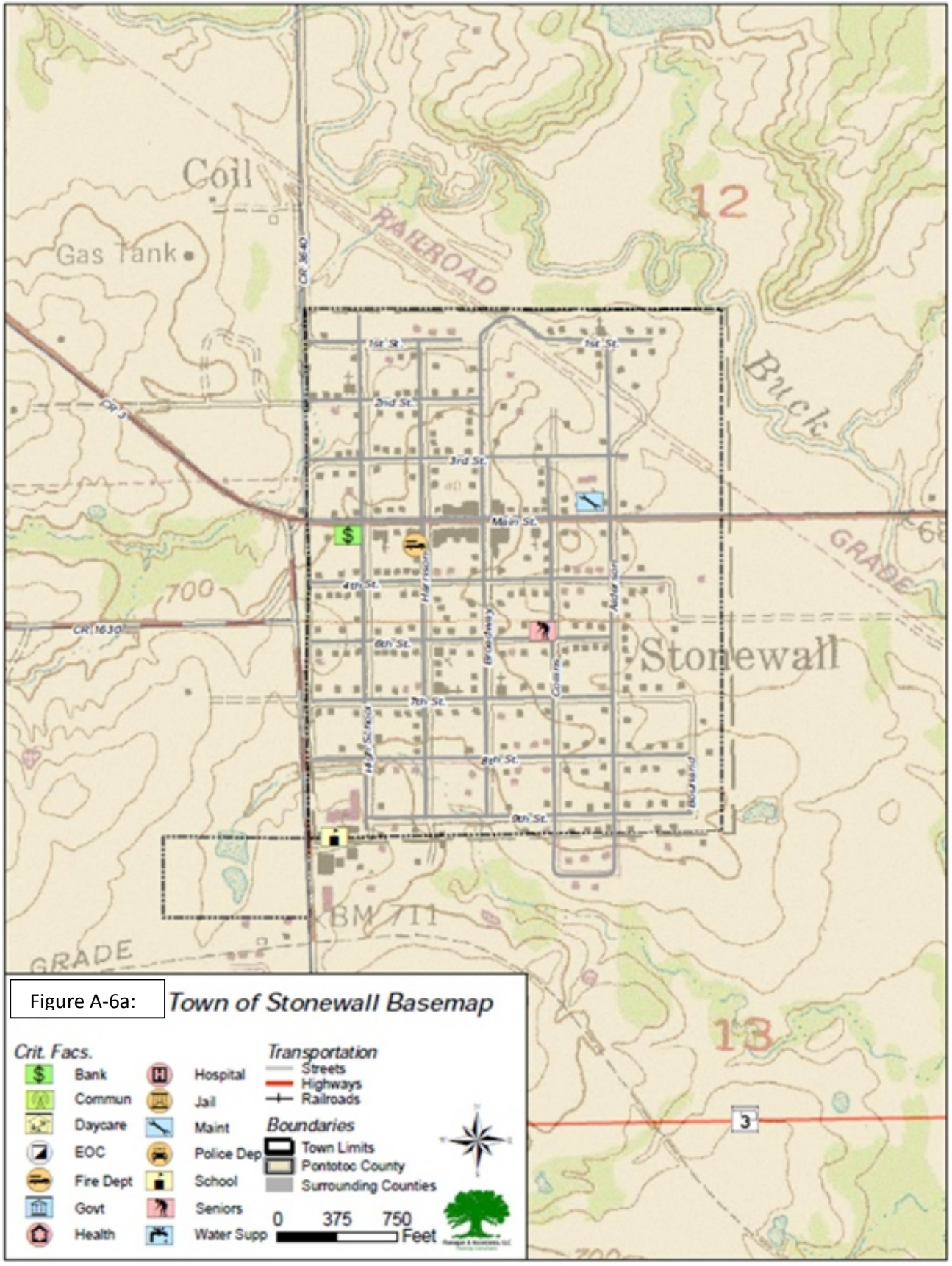


Figure A-6a: *Town of Stonewall Basemap*

A.7 Allen Public Schools

Allen Public Schools are located at: 105 N. Denver St., Allen, OK 74825

A.7.1 Services Summary

The Allen School District provides a public education for children in our district from pre-K through 12th grade. Our school sites serve as a social institution in our rural community. We help provide multi-hazard public information and education in our community.

A.7.2 Geo-Political Summary

Jurisdiction: The Allen Public School District values quality, integrity, compassion teamwork and life-long learning. Our mission is to prepare each student for the demands of tomorrow by providing him/her with the best, most appropriate education of today. Allen School Board Members are: Robert Hammonds, President; Jeff Maloy, Vice President; Cindy Davis, Clerk; Frayne Black, member; and Chad Goodson, member. Bob Gragg is the Superintendent.

Area (sq. mi): There are 130 total square miles in the district with two sites within our county. Allen School District owns about 127 acres within this area. There are 50+ buildings. The Allen School District has an approximate valuation of $25 million.

A.7.3 Population Summary

Students	***Allen Elementary School – 222*** Grades PK-8 ***Allen High School – 290*** Grades 9 - 12
Certified Staff	***Allen School – 24***
Support Staff	***Allen School – 20***

A.7.4 Infrastructure

Facilities: Allen Public School: 105 N. Denver St., Allen, OK 74825

Allen School Softball Field: Highway 48 South of Allen, OK

A.7.5 Hazards

The following table displays hazard information where there is school district specific data as shown in the maps on the following pages. General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes affect the entire community equally, and are addressed in Chapter 4.

Table A–24: Allen Public Schools Hazard Impacts

Hazard	Structure Vulnerability
Floods	None
Highly Expansive Soils	None
Very Highly Expansive Soils	None
Wildfire	None
Dam Failure	None
Tier II Hazardous Materials ¼ Mile	None
Tier II Hazardous Materials ½ Mile***	Yes
Transportation - Highway	Yes
Transportation - Railroad	None

***Allen Schools and the town of Allen are unique in Pontotoc County in that this is the only area within the county that houses a major hazardous materials tank farm. This facility is owned by Magellan Industries. This facility houses 10 □1,000,000 barrel tanks, as well as 2□ 96,000 gal Butane tanks, 1□ 60,000 gal Butane tank, and soon to be installed 3□ 104,000 Gal Butane tanks. Numerous pipelines also feed this facility carrying petroleum products ranging from jet fuel to crude oil.

The school is located approximately .6 miles from the closest storage tank and approximately .7 miles from the large propane storage tanks.

Due to the special hazards related to this facility and its proximity to the Allen School, special considerations have been taken in the mitigation planning for this location.

Figure A 7: Allen School District Map

A.8 Byng Public Schools

Byng Public Schools are located at:

500 S. New Bethel Boulevard
Byng, OK 74820

A.8.1 Services Summary

The Byng School District provides a public education for children in our district from pre-K through 12th grade. Our school sites serve as a social institution in our rural community. We help provide multi-hazard public information and education in our community.

A.8.2 Geo-Political Summary

Jurisdiction: The Byng Public School District values quality, integrity, compassion, teamwork and life-long learning. Our mission is to prepare each student for the demands of tomorrow by providing him/her with the best, most appropriate education of today. Byng School Board Members are: Jamie Perry, President; Stanley Sawyers, Vice President; Judy Brooks, Clerk; Jeff Case, member: and Craig Williams, member. Todd Crabtree is the Superintendent.

Area (sq mi): There are 130 total square miles in the district with three sites within our county. Byng School District owns about 127 acres within this area. There are 50+ buildings. The Byng School District has about a $25 million dollar valuation.

A.8.3 Population Summary

Students

Byng Elementary School – 222
Grades 4-6

Francis Elementary School – 246
Grades PK-3

Homer Elementary School – 660
Grades PK-5

Byng Junior High School – 321
Grades 7-9

Byng High School – 290
Grades 10-12

Certified Staff ***Byng Elementary School - 24***

Francis Elementary School - 18

Homer Elementary School - 40

Byng Junior High School - 25

Byng High School - 28

A.8.4 Infrastructure

Facilities: ***Byng Elementary School***

500 South New Bethel Blvd.
Ada, OK 74820-1177

Byng Francis Elementary School

18461 CR 1480
Ada, OK 74820-0391

Byng Homer Elementary School

1400 N. Monte Vista
Ada, OK 74820

Byng Junior High School

500 South New Bethel Blvd.
Ada, OK 74820-1177

Byng High School

500 South New Bethel Blvd.
Ada, OK 74820-1177

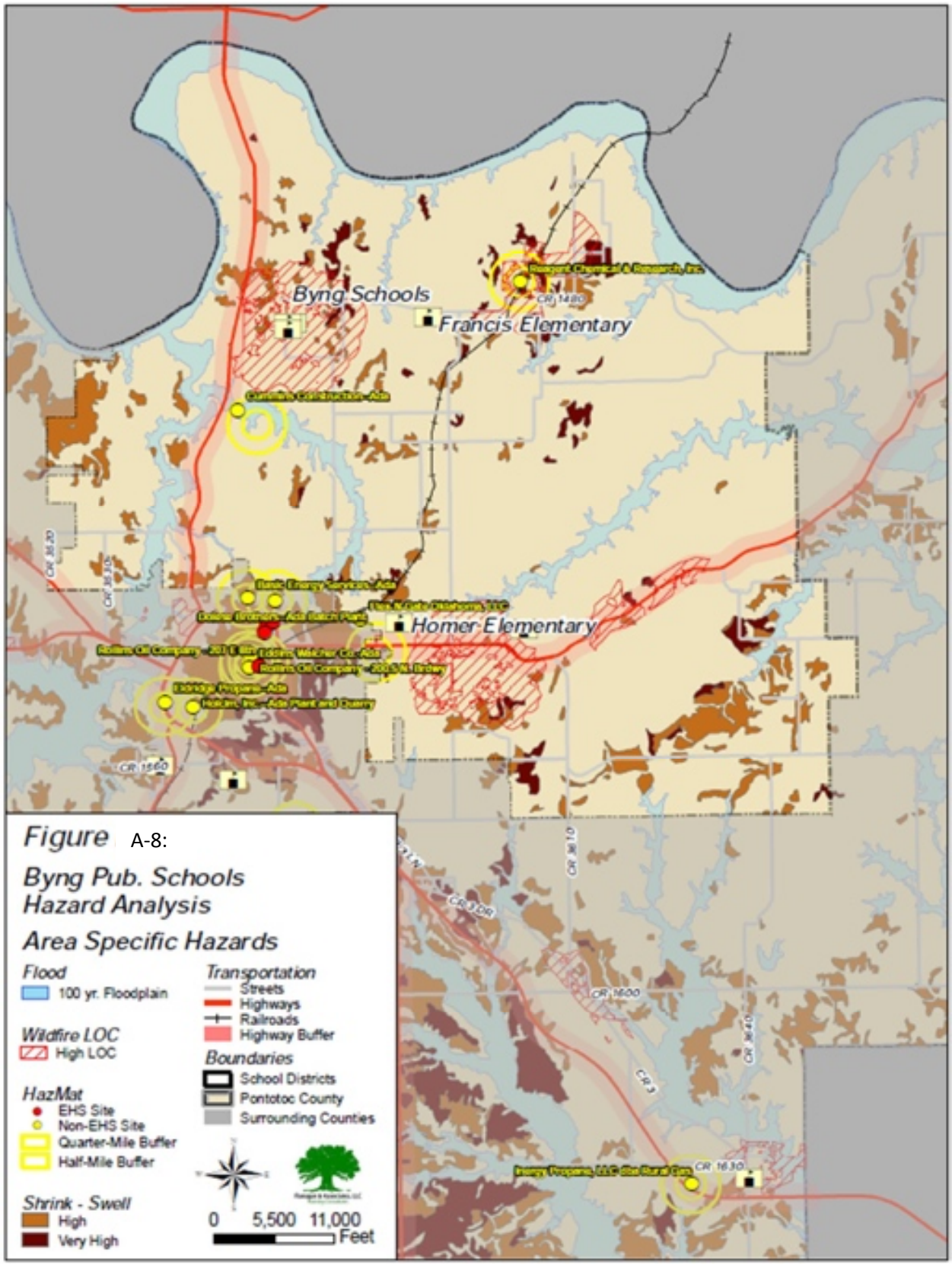
A.8.5 Hazards

The following table displays hazard information where there is school district specific data as shown in the maps on the following pages.

General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes affect the entire community equally, and are addressed in Chapter 3.

Table A–25: Byng Public Schools Hazard Impacts

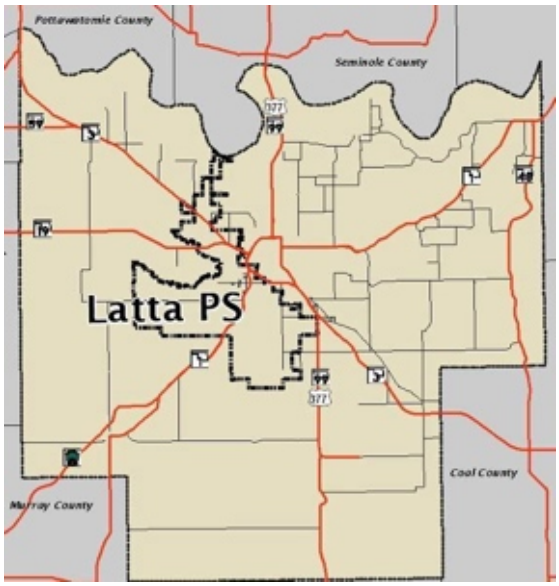
Hazard	Structure Vulnerability
Floods	None
Highly Expansive Soils	Yes
Very Highly Expansive Soils	None
Wildfire	Yes
Dam Failure	None
Tier II Hazardous Materials ¼ Mile	Yes
Tier II Hazardous Materials ½ Mile	Yes
Transportation - Highway	Yes
Transportation - Railroad	No


Byng Schools
Francis Elementary
Homer Elementary
Figure A-8:
Byng Pub. Schools
Hazard Analysis
Area Specific Hazards
Flood
100 yr. Floodplain
Wildfire LOC
High LOC
HazMat
EHS Site
Non-EHS Site
Quarter-Mile Buffer
Half-Mile Buffer
Shrink - Swell
High
Very High
Transportation
Streets
Highways
Railroads
Highway Buffer
Boundaries
School Districts
Pontotoc County
Surrounding Counties
0 5,500 11,000
Feet

A.9 Latta Public Schools

Latta Public School is a rural school located outside the city limits of Ada at:

13925 County Road 1560
Ada, OK 74820



A.9.1 Services Summary

The District provides the following services:

PK □ 12th Grade education to students in the district.

Area (sq mi): The district includes approximately 50 square miles.

A.9.2 Geo-Political Summary

Jurisdiction: The Byng Public School District values quality, integrity, compassion teamwork and life-long learning. Our mission is to prepare each student for the demands of tomorrow by providing him/her with the best, most appropriate education of today. Byng School Board Members are: Leon Petete, President; Jeff Case, Vice President; Craig Williams, Clerk; Judy Brooks, member; and Jamie Perry, member. Todd Crabtree is the Superintendent.

Area (sq mi): There are 130 total square miles in the district with three sites within our county. Byng School District owns about 127 acres within this area. There are 50+ buildings. The Byng School District has about a $25 million dollar valuation.

A.9.3 Population Summary

Students	***Latta Elementary School* – 421** Grades PK-6
	Latta Junior High School – 151 Grades 7-9
	Latta High School – 164 Grades 10-12
Certified Staff	***Latta Elementary School - 25***
	Latta Junior High School - 14
	Latta High School - 15

A.9.4 Infrastructure

Facilities: ***Latta Elementary School***
13925 County Road 1560
Ada, OK 74820-0804

Latta Elementary School has a saferoom with a 426-person capacity.

Latta Junior High School
13925 County Road 1560
Ada, OK 74820-0804

Latta High School
13925 County Road 1560
Ada, OK 74820-0804

Latta Junior High and High Schools share a saferoom with a 390-person capacity.

Other Assets:

5 - 71-passenger school buses
5 □ 65-passenger school buses
3 □ Pick-up trucks
3 □ Suburbans
1 □ Mini-van
6 □ Weather radios

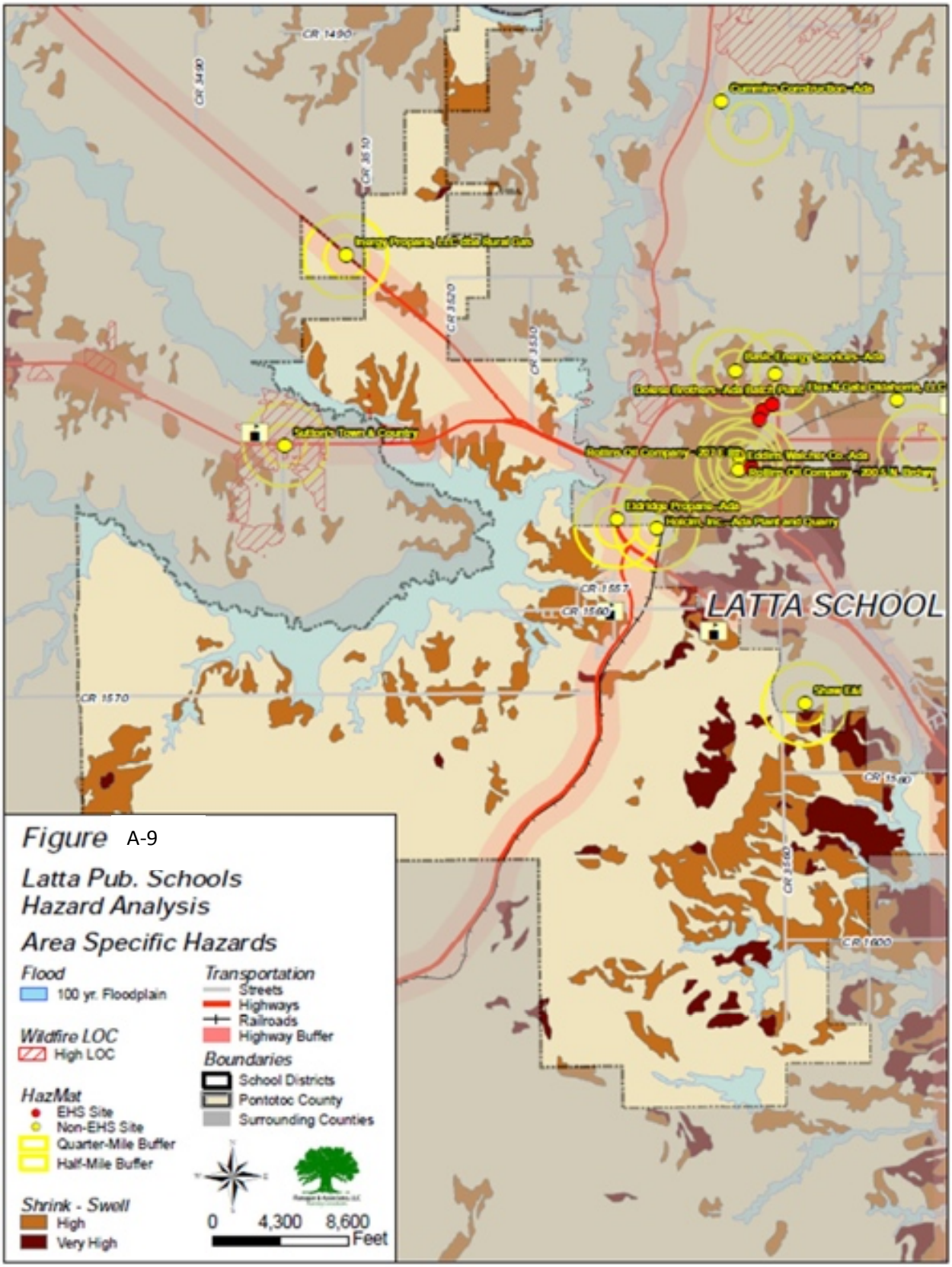
A.9.5 Hazards

The following table displays hazard information where there is school district specific data as shown in the maps on the following pages.

General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes affect the entire community equally, and are addressed in Chapter 3.

Table A–26: Latta Public Schools Hazard Impacts

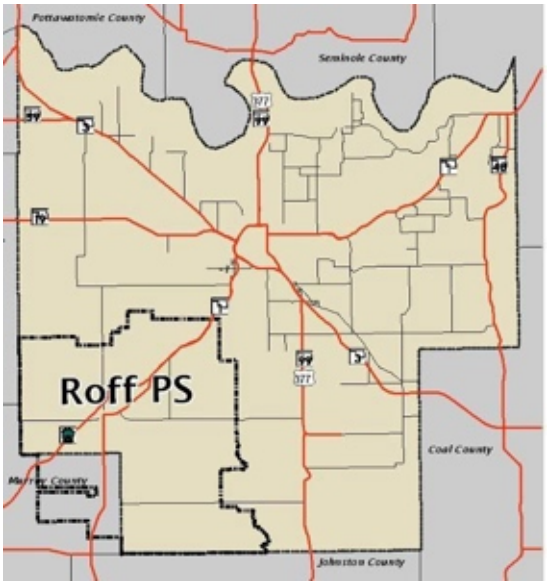
Hazard	Structure Vulnerability
Floods	Yes
Highly Expansive Soils	Yes
Very Highly Expansive Soils	None
Wildfire	Yes
Dam Failure	None
Tier II Hazardous Materials ¼ Mile	None
Tier II Hazardous Materials ½ Mile	None
Transportation - Highway	Yes
Transportation - Railroad	Yes


LATTA SCHOOL
CR 1490
CR 3490
CR 3510
CR 3520
CR 3530
CR 1557
CR 1560
CR 1570
CR 1580
CR 3560
CR 1600
Cummins Construction - Ada
Sutton's Town & Country
Eldridge Propane - Ada
Figure A-9
Latta Pub. Schools
Hazard Analysis
Area Specific Hazards
Flood
100 yr. Floodplain
Wildfire LOC
High LOC
HazMat
EHS Site
Non-EHS Site
Quarter-Mile Buffer
Half-Mile Buffer
Shrink - Swell
High
Very High
Transportation
Streets
Highways
Railroads
Highway Buffer
Boundaries
School Districts
Pontotoc County
Surrounding Counties
0
4,300
8,600
Feet

A.10 Roff Public Schools

Roff Public Schools are located at

100 North Broadway
Roff, OK 74865-0157.



A.10.1 Services Summary

The District provides the following services:

PK □ 12th Grade education to students in the district.

A.10.2 Geo-Political Summary

Jurisdiction:

Area (sq mi): 159 sq. miles

A.10.3 Population Summary

Students	***Roff Elementary School* – 233** Grades PK-8
	Roff High School – 966 Grades 9-12
Certified Staff	***Roff Elementary School - 15***
	Roff High School - 12

A.10.4 Infrastructure

Facilities:	***Roff Elementary School*** 100 North Broadway Roff, OK 74865-0157
	Roff High School 100 North Broadway Roff, OK 74865-0157

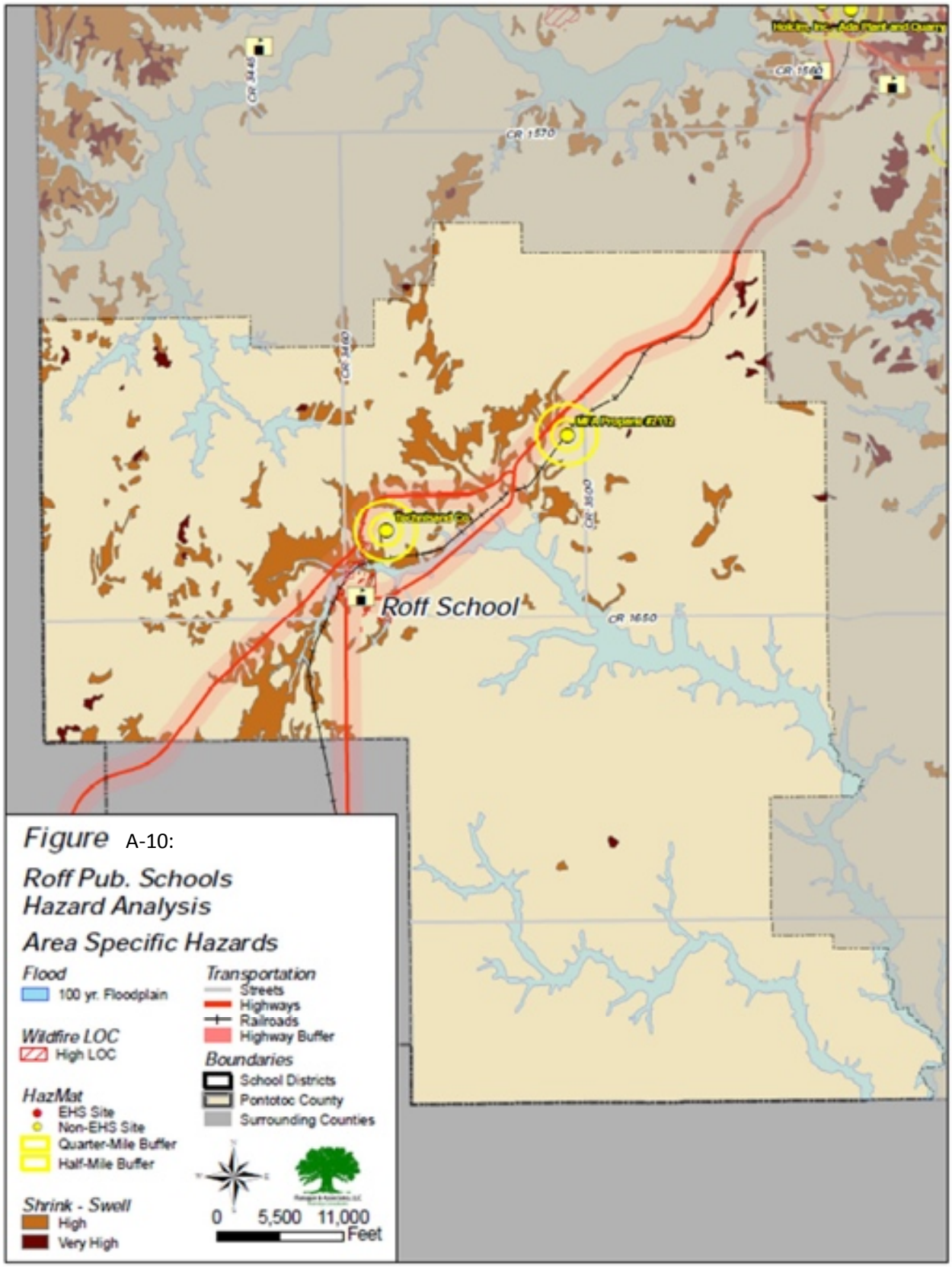
A.10.5 Hazards

The following table displays hazard information where there is school district specific data as shown in the maps on the following pages.

General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes affect the entire community equally, and are addressed in Chapter 3.

Table A–27: Roff Public Schools Hazard Impacts

Hazard	Structure Vulnerability
Floods	Yes
Highly Expansive Soils	Yes
Very Highly Expansive Soils	None
Wildfire	None
Dam Failure	None
Tier II Hazardous Materials ¼ Mile	None
Tier II Hazardous Materials ½ Mile	None
Transportation - Highway	Yes
Transportation - Railroad	Yes


Roff School
CR 1570
CR 1650
Figure A-10:
Roff Pub. Schools
Hazard Analysis
Area Specific Hazards
Flood
100 yr. Floodplain
Wildfire LOC
High LOC
HazMat
EHS Site
Non-EHS Site
Quarter-Mile Buffer
Half-Mile Buffer
Shrink - Swell
High
Very High
Transportation
Streets
Highways
Railroads
Highway Buffer
Boundaries
School Districts
Pontotoc County
Surrounding Counties
0 5,500 11,000
Feet

A.11 Stonewall Public Schools

Stonewall Public Schools are located at:

600 High School
Stonewall, OK 74871-4871.

A.11.1 Services Summary

The District provides the following services:

Public School Education.

A.11.2 Geo-Political Summary

Jurisdiction: SE Pontotoc County

Area (sq mi): Approx. 209 sq. miles.

A.11.3 Population Summary

Students ***Stonewall Elementary School – 231***
Grades PK-4

McLish Middle School – 135
Grades 5-8

Stonewall High School – 118
Grades 9-12

Certified Staff ***Stonewall Elementary School - 12***

McLish Middle School - 11

Stonewall High School - 11

A.11.4 Infrastructure

Facilities: ***Stonewall Elementary School***
600 High School
Stonewall, OK 74871-4243

McLish Middle School
26050 CR 3590
Stonewall, OK 74871-9502

Stonewall High School
600 High School
Stonewall, OK 74871-9502

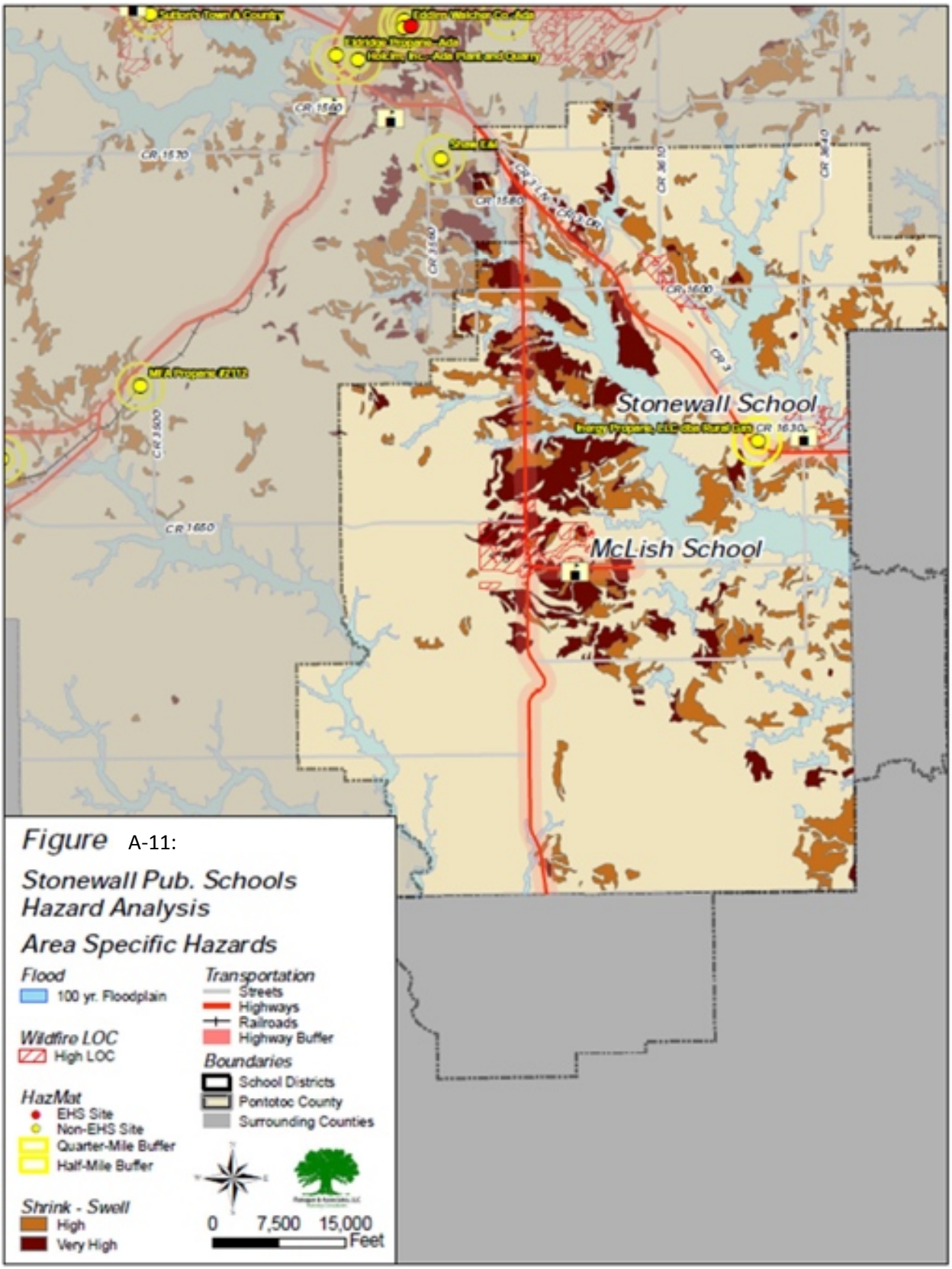
A.11.5 Hazards

The following table displays hazard information where there is school district specific data as shown in the maps on the following pages.

General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes affect the entire community equally, and are addressed in Chapter 3.

Table A–28: Stonewall Public Schools Hazard Impacts

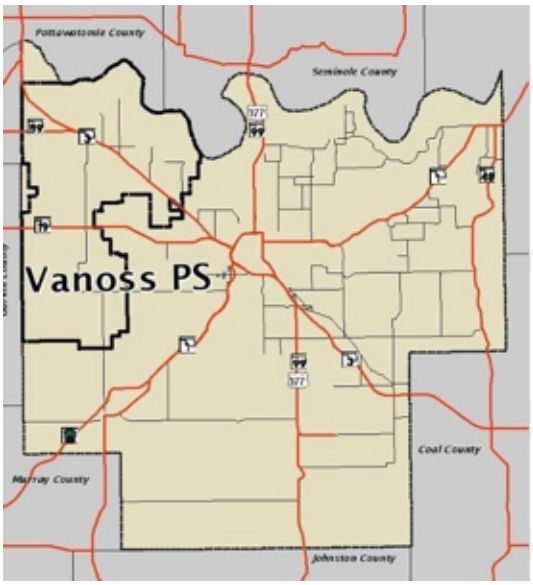
Hazard	Structure Vulnerability	McLish Structure Vulnerability
Floods	None	None
Highly Expansive Soils	None	Yes
Very Highly Expansive Soils	None	None
Wildfire	None	Yes
Dam Failure	None	None
Tier II Hazardous Materials ¼ Mile	None	Yes
Tier II Hazardous Materials ½ Mile	None	Yes
Transportation - Highway	Yes	Yes
Transportation - Railroad	None	None


Stonewall School
McLish School
Figure A-11:
Stonewall Pub. Schools
Hazard Analysis
Area Specific Hazards
Flood
100 yr. Floodplain
Wildfire LOC
High LOC
HazMat
EHS Site
Non-EHS Site
Quarter-Mile Buffer
Half-Mile Buffer
Shrink - Swell
High
Very High
Transportation
Streets
Highways
Railroads
Highway Buffer
Boundaries
School Districts
Pontotoc County
Surrounding Counties
0 7,500 15,000
Feet

A.12 Vanoss Public Schools

Vanoss Public Schools is a rural school district 10 miles west of Ada and is located at:

4665 CR 1555
Ada, OK 74820



A.12.1 Services Summary

The District provides the following services:

Education services for prekindergarten through 12th grade; community cellar for tornadoes.

Area (sq mi): The district includes approximately 127 square miles.

A.12.2 Geo-Political Summary

Jurisdiction: The Vanoss School district extends from the northwest corner of Pontotoc County. It covers approximately 142 square miles, and is the largest school district in the county. It contains no incorporated towns. Vanoss School is known as the school without a town.

Vanoss School District can be found in Range 3 North 4 East; Range 3 North 5 East; Range 4 North 4 East; Range 4 North 5 East; Range 5 North 4 East; and Range 5 North 5 East.

A.12.3 Population Summary

Students ***Vanoss Elementary School* – 348**
Grades PK-8

Vanoss High School – 175
Grades 9-12

Certified Staff ***Vanoss Elementary School - 32***

Vanoss High School - 21

A.12.4 Infrastructure

Facilities: ***Vanoss Elementary School***
4665 CR 1555
Ada, OK 74820-4820
Vanoss High School
4665 CR 1555
Ada, OK 74820-

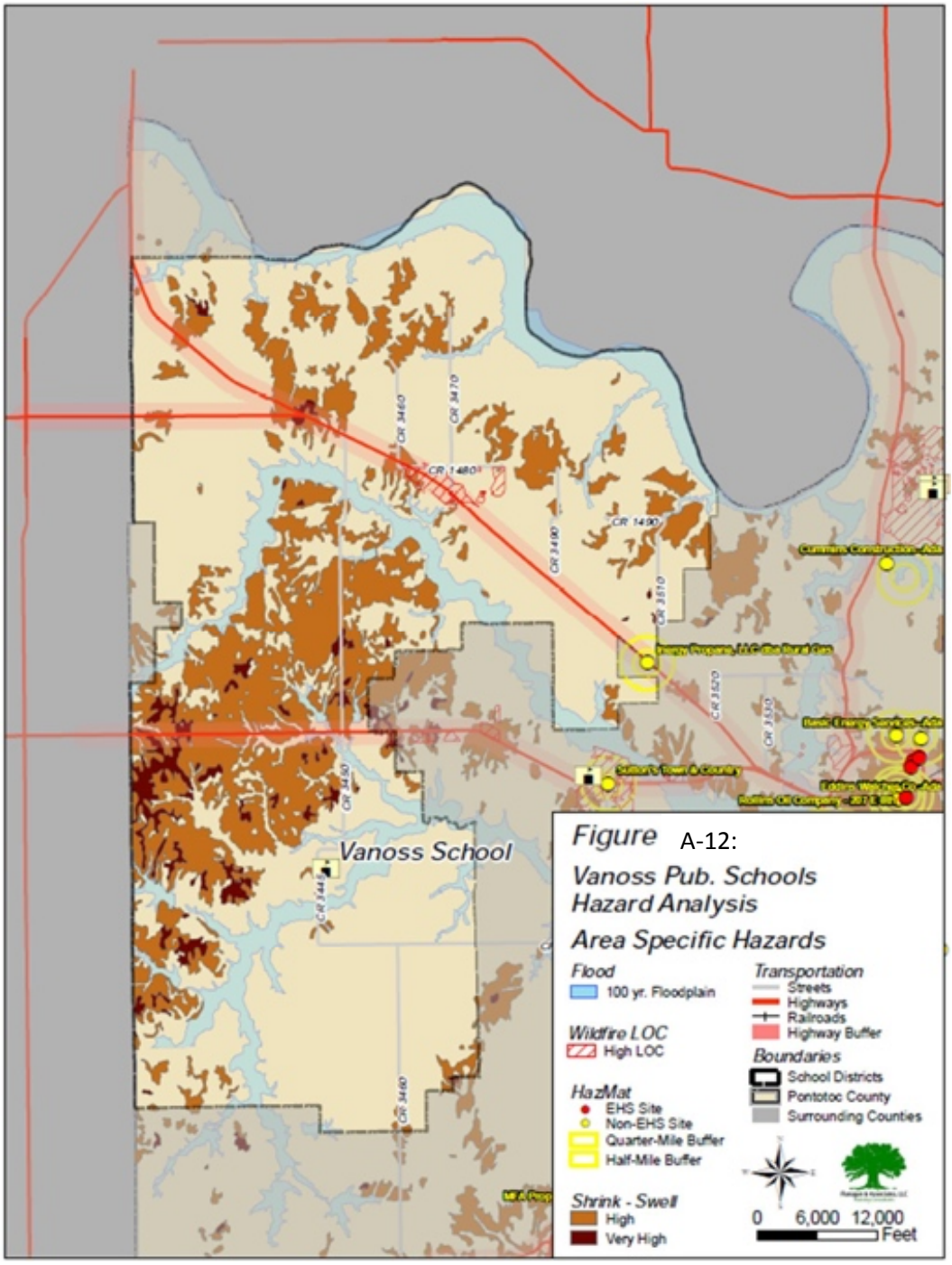
A.12.5 Hazards

The following table displays hazard information where there is school district specific data as shown in the maps on the following pages.

General natural hazards, such as Tornadoes, High Winds, Lightning, Hail, Winter Storms, Extreme Heat, Drought, and Earthquakes affect the entire community equally, and are addressed in Chapter 3.

Table A–29: Vanoss Public Schools Hazard Impacts

Hazard	Structure Vulnerability
Floods	Yes
Highly Expansive Soils	None
Very Highly Expansive Soils	None
Wildfire	Yes
Dam Failure	None
Tier II Hazardous Materials ¼ Mile	None
Tier II Hazardous Materials ½ Mile	None
Transportation - Highway	None
Transportation - Railroad	None


Vanoss School
CR 3460
CR 3470
CR 1480
CR 1490
CR 3480
CR 3510
CR 3520
CR 3530
CR 3450
CR 3440
Figure A-12:
Vanoss Pub. Schools
Hazard Analysis
Area Specific Hazards
Flood
100 yr. Floodplain
Wildfire LOC
High LOC
HazMat
EHS Site
Non-EHS Site
Quarter-Mile Buffer
Half-Mile Buffer
Shrink - Swell
High
Very High
Transportation
Streets
Highways
Railroads
Highway Buffer
Boundaries
School Districts
Pontotoc County
Surrounding Counties
0 6,000 12,000
Feet