

**TOWN OF CARLTON LANDING  
REGULAR MEETING OF THE BOARD OF TRUSTEES**

Location: 10B Boulevard, Carlton Landing, Oklahoma, also known as  
the Carlton Landing Academy Cafeteria

Saturday; April 16, 2022

Immediately following the Regular Meeting of the Carlton Landing Economic Development Trust

**NOTICE AND AGENDA**

1. Call to Order
2. Roll Call

Consent Items

To help streamline meetings and allow the focus to be on other items requiring strategic thought, the "Consent Items" portion of the agenda groups the routine, procedural, and self-explanatory non-controversial items together. These items are voted on in a single motion (one vote). However, any Council member requesting further information *on a specific item thus removes it from the "Consent Items" section for individual attention and separate vote.*

3. Approval of Minutes:
  - a. Regular Meeting of the CL Board of Trustees on March 19, 2022
4. Acknowledge receipt of Claims and Purchase Orders Report
5. Consider, discuss, and possibly vote to amend, revise, approve or deny Resolution 2022-04-01 adopting the Pittsburgh County Multi-Jurisdictional Hazard Mitigation Plan, or take any other appropriate action.  
Exhibit: Resolution 2021-04-01 - Hazard Mitigation Plan; Pittsburg Co HM Plan 2021 for FEMA
6. Consider, discuss, and possibly vote to amend, revise, approve or deny Resolution 2022-04-02 reappointing Sean Waggoner, Board Member #1, and Sarah Partin, Board Member #2 to the Board of Adjustment of the Town of Carlton Landing, Oklahoma, for three-year term ending April 2025, or take any other appropriate action.  
Exhibit: Carlton Landing - Town - Resolution - Appointing board of adjustment
7. Items Removed from Consent Agenda
8. Presentation, consider, and discuss CodeRed Notification System for alerts and public notifications, or take any other appropriate action.  
Exhibits:

9. Reports

- a. [Sales Tax Revenue](#) and other Financial Reports;[Statement of Revenue and Expenditures -BOT March 2022](#); [Bank Register BOT March 2022](#)
- b. [Town Administrator Freese & Nichols Report](#)
- c. Legal Reports, Comments, and Recommendations to the Governing Body

10. Recognize Citizens wishing to comment on non-Agenda Items

Under Oklahoma Law, the Board of Trustees are prohibited from discussing or taking any action on items not on today's agenda. Citizens wishing to address the Board on items not on the agenda are required to sign-up no later than five (5) minutes prior to the scheduled start time of the meeting. The sign-in sheet will contain space for citizens name, address, phone number, and topic to discuss. In this way, staff will be able to follow-up on any issues presented, if necessary. Citizens will be provided three (3) minutes.

11. Comments and questions by Governing Body members regarding items for future consideration.

12. Adjournment

**I certify that the foregoing Notice and Agenda was posted in prominent view at 10 Boulevard, Carlton Landing, Oklahoma, also known as "the High School Classroom"**

**at \_\_\_\_\_ M on the \_\_\_\_th day of April 2022, being at least 24 hours prior to the Regular Meeting described above.**

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**Signature of Person Posting the Agenda**

**Jan Summers**  
**Printed Name of Person Posting the Agenda**

**TOWN OF CARLTON LANDING  
REGULAR MEETING OF THE BOARD OF TRUSTEES**

Location: 10B Boulevard, Carlton Landing, Oklahoma, also known as  
the Carlton Landing Academy Cafeteria

Saturday, March 19, 2022

Immediately following the Regular Meeting of the Carlton Landing Economic Development  
Trust

**MINUTES**

1. Call to Order

The meeting was called to order at 8:07 a.m. with Mayor Chinnici presiding.

2. Roll Call

PRESENT: Joanne Chinnici  
Chuck Mai  
Kris Brule'  
Mary Myrick

ABSENT: Clay Chapman

**Consent Items**

3. Approval of Minutes:

- a. Regular Meeting of the CL Board of Trustees on February 19, 2022
- b. Special Meeting of the CL Board of Trustees on December 12, 2021

4. Acknowledge receipt of Claims and Purchase Orders Report

MOTION: A motion was made by Mai and seconded by Brule' to accept the consent agenda as presented.

AYE: Joanne Chinnici  
Chuck Mai  
Kris Brule'  
Mary Myrick

NAY: None

5. Consider, discuss and possibly vote to amend, revise, approve or deny creating an Employee Benefit Payout line item within the Reserve Fund, or take any other appropriate action. The Board of Trustees have supported a fiscal conservative approach to the Town of Carlton Landing finances. The Board established a Reserve Fund with a policy to provide and maintain a 25% operating reserve. Accrued employee leave and any separation payments creates a liability to the Town. As a

proactive measure that reduces and limits the potential impact to a fiscal year's budget is to create and fund an Employee Benefit Payout line item within the Reserve Fund. The purpose of the Employee Benefit Payout will be to pay any accrued leave liabilities and separation pay that may be owed upon an employee's separation. The funding of the Employee Benefit Payout should be done annually from year-end fund balance to fund said payout liability at 100%, but if not possible the Trustees may transfer an amount available to fund as much as possible until 100% funding is reached.

made Upon an employee's separation any employee benefit payout owed, if any, shall be from the Employee Benefit Payout line item from the Reserve Fund.

MOTION: A motion was made by Chinnici and seconded by Brule' to approve Creating an Employee Benefit Payout line item within the Reserve Fund.

AYE: Joanne Chinnici  
Chuck Mai  
Kris Brule'  
Mary Myrick

NAY: None

6. Items Removed from Consent Agenda
7. Consider, discuss and possibly vote to amend, revise, approve or deny an Ordinance # 2022-03-01 amending the Employee Retirement System, Defined Contribution Plan for the position of Town Administrator for the Town of Carlton Landing, Oklahoma by adopting a revised and restated Retirement Plan; providing retirement benefits for eligible employees of the Town of Carlton Landing, Oklahoma; providing for purpose and organization; providing for definitions; providing for eligibility and participation; providing for non-alienation of benefits; providing for employer and employee contributions; providing for accounting, allocation, and valuation; providing benefits; providing for duration and payment of expenses; providing for effective date; providing for vesting schedules; providing for a fund to finance the system to be pooled with other incorporated cities towns and their agencies and instrumentalities for purposes of administration, management, and investments part of the Oklahoma Municipal Retirement Fund; providing for payment of all contributions under the System to the Oklahoma Municipal Retirement Fund for management and investment; providing for repealer and severability; adopting those amendments mandated by the Internal Revenue Code; and Declaring an Emergency, or take any other appropriate action.  
Exhibits:

The Oklahoma Municipal Retirement Fund, as our plan provider, must follow a six-year filing cycle for approved plans to retain plan qualification pursuant to the Internal Revenue Service. Each participating member must formally adopt the new Plan documents containing the plan language after approval by the IRS to be covered by the IRS qualification determination. To remain current the Ordinance, which includes the Joinder Agreement, must be approved on or before April 30, 2022.



MOTION: A motion was made by Chinnici and seconded by Mai to approve an Ordinance #2022-03-01 amending the Employee Retirement System, Defined Contribution Plan for the position of Town Administrator for the Town of Carlton Landing, Oklahoma by adopting a revised and restated Retirement Plan; providing retirement benefits for eligible employees of the Town of Carlton Landing, Oklahoma; providing for purpose and organization; providing for definitions; providing for eligibility and participation; providing for non-alienation of benefits; providing for employer and employee contributions; providing for accounting, allocation, and valuation; providing benefits; providing for required notice; providing for amendments and termination; providing for transfer to and from other plans; creating a Retirement Committee and providing for powers, duties, and rights of Retirement Committee; providing for payment of certain obligations; providing for duration and payment of expenses; providing for effective date; providing for vesting schedules; providing for a fund to finance the system to be pooled with other incorporated cities towns and their agencies and instrumentalities for purposes of administration, management, and investments part of the Oklahoma Municipal Retirement Fund; providing for payment of all contributions under the System to the Oklahoma Municipal Retirement Fund for management and investment; providing for repealer and severability; adopting those amendments mandated by the Internal Revenue Code.

AYE: Joanne Chinnici  
Chuck Mai  
Kris Brule'  
Mary Myrick

NAY: None

MOTION: A Motion was made by Chinnici and seconded by Brule' to Declare an Emergency.

AYE: Joanne Chinnici  
Chuck Mai  
Kris Brule'  
Mary Myrick

NAY: None

8. Reports
  - a. Sales Tax Revenue and other Financial Reports (See attachment)
  - b. Town Administrator (See attachment)
  - c. Legal Reports, Comments, and Recommendations to the Governing Body
9. Recognize Citizens wishing to comment on non-Agenda Items.  
Grant gave an overview of the upcoming visit of an Urban Development Group, Urban Design Commission.
10. Comments and questions by Governing Body members regarding items for future consideration. None

11. Adjournment

There being no further business, a motion was made and seconded to adjourn the meeting at 8:20 a.m., March 19, 2022.

\_\_\_\_\_  
Mayor

Attest:

\_\_\_\_\_  
Town Clerk

DRAFT

**General Fund  
Bank Register  
2/1/2022 to 2/28/2022**

Transaction Date	Transaction Number	Name / Description	Deposit Date	Deposit Number	Receipts & Credits	Checks & Payments	Balance
<b>1000 Town of CL Checking 9683</b>							
		Beginning Balance			0.00	0.00	394,660.87
2/3/2022	R-00196	Scissortail Homes			762.91	0.00	395,423.78
2/4/2022	EFT	RWS Cloud Services			0.00	90.00	395,333.78
2/4/2022	A-10052	James G Buckley			0.00	2,803.61	392,530.17
2/9/2022	R-00203	Oklahoma Tax Commission			13,403.28	0.00	405,933.45
2/9/2022	R-00202	Oklahoma Tax Commission			3,097.16	0.00	409,030.61
2/9/2022	R-00201	Oklahoma Tax Commission			1,234.03	0.00	410,264.64
2/9/2022	1256	OPEH&W			0.00	1,436.96	408,827.68
2/9/2022	1255	OMAG			0.00	70.00	408,757.68
2/9/2022	1254	Layman's Lawn Care and Tr			0.00	1,900.00	406,857.68
2/9/2022	1253	L & Z Enterprises Inc			0.00	2,400.00	404,457.68
2/9/2022	1252	Kiamichi Electric			0.00	257.00	404,200.68
2/9/2022	1251	Cross Telephone Co			0.00	52.00	404,148.68
2/10/2022	R-00204	Oklahoma Tax Commission			14.29	0.00	404,162.97
2/11/2022	R-00205	Oklahoma Tax Commission			96.05	0.00	404,259.02
2/14/2022					0.00	71.49	404,187.53
2/14/2022	R-00197	Pittsburg County Clerk			5,039.84	0.00	409,227.37
2/14/2022	EFTPS	Oklahoma Tax Commission			0.00	239.00	408,988.37
2/14/2022	EFTPS	EFTPS			0.00	1,661.54	407,326.83
2/16/2022	EFT	CSA Software			0.00	441.05	406,885.78
2/16/2022	GJ-10070	Pittsburg County Clerk			0.00	4,874.42	402,011.36
2/18/2022	1258	OMAG			0.00	2,074.00	399,937.36
2/18/2022	R-00199	Kerney Homes			15.24	0.00	399,952.60
2/18/2022	1259	OkMRF			0.00	1,063.23	398,889.37
2/18/2022	1257	Kay Robbins Wall			0.00	600.00	398,289.37
2/18/2022	A-10053	James G Buckley			0.00	2,571.91	395,717.46
2/22/2022	R-00198	CLEDT			7,381.09	0.00	403,098.55
2/23/2022	R-00200	Scissortail Homes			762.91	0.00	403,861.46
2/28/2022	1263	OMAG			0.00	87.50	403,773.96
2/28/2022	1262	Amanda Harjo			0.00	800.00	402,973.96
2/28/2022	1261	Crawford & Associates, P.C.			0.00	230.00	402,743.96
2/28/2022	1260	BOK Credit Card			0.00	978.17	401,765.79
<b>1000 Town of CL Checking 9683 Totals</b>					<b>\$31,806.80</b>	<b>\$24,701.88</b>	<b>\$401,765.79</b>
<b>1010 2018 GO Bond Checking</b>							
		Beginning Balance			0.00	0.00	69,786.67

3/15/2022  
12:19 PM

**General Fund**  
**Payments Journal (Summary)**  
**2/1/2022 to 2/28/2022**

Page 1 of 1

Check Date	Check / Reference #	Payee	Amount
<b>1000 Town of CL Checking 9683</b>			
2/4/2022	EFT	RWS Cloud Services	90.00
2/4/2022	A-10052	James G Buckley	2,803.61
2/9/2022	1256	OPEH&W	1,436.96
2/9/2022	1255	OMAG	70.00
2/9/2022	1254	Layman's Lawn Care and Tree	1,900.00
2/9/2022	1253	L & Z Enterprises Inc	2,400.00
2/9/2022	1252	Kiamichi Electric	257.00
2/9/2022	1251	Cross Telephone Co	52.00
2/14/2022			71.49
2/14/2022	EFTPS	Oklahoma Tax Commission	239.00
2/14/2022	EFTPS	EFTPS	1,661.54
2/16/2022	EFT	CSA Software	441.05
2/16/2022	GJ-10070	Pittsburg County Clerk	4,874.42
2/18/2022	1258	OMAG	2,074.00
2/18/2022	1259	OkMRF	1,063.23
2/18/2022	1257	Kay Robbins Wall	600.00
2/18/2022	A-10053	James G Buckley	2,571.91
2/28/2022	1263	OMAG	87.50
2/28/2022	1262	Amanda Harjo	800.00
2/28/2022	1261	Crawford & Associates, P.C.	230.00
2/28/2022	1260	BOK Credit Card	978.17
<b>1000 Town of CL Checking 9683 Totals</b>			<b>\$24,701.88</b>

*Report Options*

Check Date: 2/1/2022 to 2/28/2022  
Display Notation: No  
Fund: General Fund

**General Fund**  
**Statement of Revenue and Expenditures**

		Current Period Feb 2022 Feb 2022 Actual	Year-To-Date Jul 2021 Feb 2022 Actual	Annual Budget Jul 2021 Jun 2022	Annual Budget Jul 2021 Jun 2022 Variance	Jul 2021 Jun 2022 Percent of Budget
<b>Revenue &amp; Expenditures</b>						
<b>Revenue</b>						
<b>Non-Departmental Revenues</b>						
<b>Budget Carryover</b>						
3999	Fund Balance Carryover	0.00	0.00	50,000.00	50,000.00	0.00%
<b>Other Revenue</b>						
4012	Alcohol Beverage Tax	105.51	560.11	600.00	39.89	93.35%
4100	Building Permits/Inspection Fe	1,541.06	10,940.87	23,580.00	12,639.13	46.40%
4105	Business License and Permits	0.00	191.76	200.00	8.24	95.88%
4011	Lodging Tax	3,097.16	63,343.74	24,000.00	(39,343.74)	263.93%
4500	Miscellaneous Revenue	0.00	380.60	0.00	(380.60)	0.00%
4015	Pittsburgh County Sinking Fund	4,874.42	43,501.77	57,190.00	13,688.23	76.07%
4000	Sales Tax	13,499.33	175,831.45	114,800.00	(61,031.45)	153.16%
9002	Transfer IN from TIF	7,381.09	56,139.95	101,989.00	45,849.05	55.05%
4005	Use Tax	1,234.03	7,651.39	7,200.00	(451.39)	106.27%
4010	Utility Tax	0.00	9,482.37	12,000.00	2,517.63	79.02%
4013	Vehicle Gas/Fuel Tax	74.20	393.27	0.00	(393.27)	0.00%
<b>Non-Departmental Revenues Totals</b>		<b>\$31,806.80</b>	<b>\$368,417.28</b>	<b>\$391,559.00</b>	<b>\$23,141.72</b>	
<b>Revenue</b>		<b>\$31,806.80</b>	<b>\$368,417.28</b>	<b>\$391,559.00</b>	<b>\$23,141.72</b>	
<b>Gross Profit</b>		<b>\$31,806.80</b>	<b>\$368,417.28</b>	<b>\$391,559.00</b>	<b>\$0.00</b>	
<b>Expenses</b>						
<b>Administration</b>						
<b>Personal Services</b>						
5020	Employer Paid Insurance	1,436.96	11,495.68	17,244.00	5,748.32	66.66%
5025	Employer Retirement Contributi	708.82	6,002.10	8,842.00	2,839.90	67.88%
5000	Salaries	6,763.38	57,422.42	88,424.00	31,001.58	64.94%
5010	Social Security	542.24	4,591.53	7,063.00	2,471.47	65.01%
5001	Stipend	0.00	500.00	0.00	(500.00)	0.00%
5015	Unemployment Tax	70.89	141.78	1,846.00	1,704.22	7.68%
5030	Vehicle/Cell Allowance	324.85	2,598.80	3,900.00	1,301.20	66.64%
<b>Materials &amp; Supplies</b>						
5510	Building Maintenance & Repairs	0.00	160.00	320.00	160.00	50.00%
5530	Miscellaneous	0.00	0.00	100.00	100.00	0.00%
5500	Office Supplies	0.00	110.53	600.00	489.47	18.42%
5520	Software Programs/ Services	24.95	24.95	0.00	(24.95)	0.00%
<b>Other Services</b>						
6035	Dues & Memberships	70.00	1,668.00	1,210.00	(458.00)	137.85%
6015	Insurance	87.50	420.00	350.00	(70.00)	120.00%
6005	Rent	477.78	3,309.34	5,760.00	2,450.66	57.45%
6040	School, Training, Travel	0.00	892.51	5,700.00	4,807.49	15.66%
6000	Utilities	256.00	1,575.65	4,339.00	2,763.35	36.31%
<b>Administration Totals</b>		<b>\$10,763.37</b>	<b>\$90,913.29</b>	<b>\$145,698.00</b>	<b>\$54,784.71</b>	
<b>General Government</b>						
<b>Personal Services</b>						
5001	Stipend	0.00	1,000.00	0.00	(1,000.00)	0.00%
<b>Materials &amp; Supplies</b>						
5510	Building Maintenance & Repairs	0.00	1,392.15	2,500.00	1,107.85	55.69%
5530	Miscellaneous	0.00	734.42	1,460.00	725.58	50.30%
5500	Office Supplies	0.00	855.90	1,500.00	644.10	57.06%
5505	Posatge	0.00	58.00	600.00	542.00	9.67%

Town Administrator's Report – March 19, 2022

- ☐ Entrance Road – I contacted Pittsburgh County to address the potholes and drainage created over the winter. They have been out to fill some potholes and we will work on schedule to work on the drainage. We are also discussing another round of chip and seal this year.
- ☐ Pavilion – Mike and I completed the punch list walkthrough and identified a few items still to be completed or addressed. The fans all had their blades broken from the wind. We are going to remove all the fans now and then experiment with one fan on a different height(s) to see if raising the fan toward the roof will address the wind problem. The landscaper submitted a couple plans and we selected one of the plant selection and layout options. They have started installing the landscaping. We are targeting Saturday April 16, 2022 for the ribbon cutting ceremony.
- ☐ Stephens Road/ Alley Project – Freese and Nichols surveyor has been on site to do surveying for Stephens Road and the Alleys (Park and Redbud).
- ☐ Pooled Cash – I contacted Crawford and Associates discuss process or requirements for setting-up and using pooled cash system. Pooled Cash is the ability to use a common checking account but still provide a separation of funds/accounts within the accounting system. There is no special authorization needed, but will need to work with our accounting software on setting up in our system/operation. The benefit of Pooled Cash is we won't need to maintain a separate checking account for each separate account that is operational and not required by Statute/Law.
- ☐ GASB 87 – A new accounting regulation requires us to list and account for leases within the Audit. Amanda and I worked on filling out the worksheet, compiling our leases and sending copies to Crawford.
- ☐ Corps Project Moratorium – I contacted the Corps to see if the Town projects are still under a moratorium. The Corps indicated they are open to reviewing any submittals given the Wastewater Treatment Plant is on schedule. I have inquired about installing No Hunting signs, but have not heard back from them. I will work on a formal request for the signs, expanding the Nature Center Playground.

- Other activities – Ordered Picnic Table for Town Office; reviewed Building Permits – including Marina Phase 1; creating joint project agreement with HP09, LLC to include Water Lane with our Alley project; Grounds Management for trails and Marina Property – accepted proposals and awarded Contract.

Thank you.

DRAFT

4/12/2022  
12:14 PM

CLEDT

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Payments Journal (Summary)  
3/1/2022 to 3/31/2022

Check Date	Check / Reference #	Payee	Amount
1040 BOK 3649 TIF Increment			
3/30/2022	EFT	Town of Carlton Landing	7,534.36
1040 BOK 3649 TIF Increment Totals			<u>\$7,534.36</u>
1080 BOK 3045 Rev Bond 2020			
3/9/2022	0027	New Town Development	17,971.20
1080 BOK 3045 Rev Bond 2020 Totals			<u>\$17,971.20</u>

Report Options

Check Date: 3/1/2022 to 3/31/2022

Display Notation: No

Fund: CLEDT



Item No. \_\_\_\_\_

Date: April 16, 2022

## **AGENDA ITEM COMMENTARY**

**ITEM TITLE:** Consider, discuss, and possibly vote to amend, revise, approve or deny Resolution 2022-04-01 adopting the Pittsburgh County Multi-Jurisdictional Hazard Mitigation Plan, or take any other appropriate action.

**INITIATOR:** Greg Buckley, Town Administrator,

**STAFF INFORMATION SOURCE:** Greg Buckley, Town Administrator

**BACKGROUND:** In February 2018 the Pittsburgh County Hazard Mitigation Team began the process of updating the Multi-Jurisdictional Hazard Mitigation Plan. Over the course of three years the team met, assessed risks, and developed a mitigation strategy. The final stage is the adopting and implementation of the Plan. The proposed plan has been submitted to the State of Oklahoma and the Federal Emergency Management Agency for approval. Upon final approval and adoption by the participating jurisdictions the plan will become effective and good for five years. By participating in and adopting the Hazard Mitigation Plan will assist the Town and participating jurisdictions in qualifying for grants and funding for Hazard Mitigation.

**FUNDING:** None

**EXHIBITS:** Resolution 2022-04-01, Pittsburgh County Multi-Jurisdictional Hazard Mitigation Plan

**RECOMMENDED ACTION:** Vote to approve Resolution 2022-04-01 adopting the Pittsburgh County Multi-Jurisdictional Hazard Mitigation Plan.

# **TOWN OF CARLTON LANDING**

## **Resolution 2022-04-01**

**A RESOLUTION ADOPTING THE PITTSBURGH COUNTY MULT-JURISDICTIONAL HAZARD MITIGATION PLAN.**

**WHEREAS**, the Town of Carlton Landing, with the assistance from the Hazard Mitigation Planning Team, has gathered information and prepared the Pittsburgh County Multi-Jurisdictional Hazard Mitigation Plan; and

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

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

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

**NOW THEREFORE, BE IT RESOLVED** by the Board of Trustees of the Town of Carlton Landing the Pittsburgh County Multi-Jurisdictional Hazard Mitigation Plan is hereby adopted as this jurisdiction's Natural Hazard Mitigation Plan.

**ADOPTED** by the Trustees of the Town of Carlton Landing and **SIGNED** by the Mayor of the Town of Carlton Landing on this 16th Day of April, 2022

---

Joanne Chinnici, Mayor

---

Jan Summers, Clerk



**Pittsburg County  
Multi-Jurisdictional  
Hazard Mitigation Plan  
2021**

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**PLACEHOLDER FOR  
PITTSBURG COUNTY  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Pittsburg County Intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
CITY OF HAILEYVILLE  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), The City of Haileyville intends to formally adopt The Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
CITY OF HARTSHORNE  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), the City of Hartshorne intends to formally adopt The Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.



**PLACEHOLDER FOR  
CITY OF KREBS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), The City of Krebs intends to formally adopt The Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
CITY OF MCALESTER  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), The City of McAlester intends to formally adopt The Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
TOWN OF ALDERSON  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), the Town of Alderson intends to formally adopt The Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
TOWN OF ASHLAND  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), the Town of Ashland intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
TOWN OF CANADIAN  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), the Town of Canadian intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
TOWN OF CARLTON LANDING  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), the Town of Carlton Landing intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
TOWN OF CROWDER  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and Federal Emergency Management Agency (FEMA), the Town of Crowder intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
TOWN OF INDIANOLA  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), the Town of Indianola intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.



**PLACEHOLDER FOR  
TOWN OF KIOWA  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), the Town of Kiowa intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
TOWN OF PITTSBURG  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), the Town of Pittsburg intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
TOWN OF QUINTON  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), the Town of Quinton intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
TOWN OF SAVANNA  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), the Town of Savanna intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approvable.

**PLACEHOLDER FOR  
MCALESTER PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), McAlester Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
QUINTON PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Quinton Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
CROWDER PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Crowder Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLAVEHOLDER FOR  
HAILEYVILLE PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and Federal Emergency Management Agency (FEMA), Haileyville Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.



**PLACEHOLDER FOR  
FRINK-CHAMBERS PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Frink-Chambers Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
TANNEHILL PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Tannehill Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
KREBS PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Krebs Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
HAYWOOD PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and Federal Emergency Management Agency (FEMA), Haywood Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
SAVANNA PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Savanna Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
CANADIAN PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Canadian Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide and adoption resolution for approval.

**PLACEHOLDER FOR  
PITTSBURG PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Pittsburg Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
HARTSHORNE PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Hartshorne Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.



**PLACEHOLDER FOR  
INDIANOLA PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Indianola Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
KIOWA PUBLIC SCHOOLS  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Kiowa Public Schools intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

**PLACEHOLDER FOR  
CARLTON LANDING ACADEMY  
ADOPTION RESOLUTION**

Once the plan has been reviewed and deemed “approvable pending adoption” by the State of Oklahoma and the Federal Emergency Management Agency (FEMA), Carlton Landing Academy intends to formally adopt the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan and provide an adoption resolution for approval.

# CHAPTER ONE: INTRODUCTION

## 1.1 Introduction

Making people and businesses as safe as possible from a variety of natural and man-made hazards is a primary function of government. The potential of violent weather, natural and man-made hazards in Oklahoma subjects the lives and property to many risks. The Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan is a comprehensive effort to identify potential hazards and develop sound strategies to mitigate their impacts with the goal of saving lives and property.

This plan is a strategic planning guide developed in fulfillment of the Hazard Mitigation Grant Program requirements of the Federal Emergency Management Agency (FEMA) according to Section 322 of the Stafford Disaster Relief and Emergency Assistance Act. Funding for the development of the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan was provided by grants from the Federal Emergency Management Agency (FEMA) through the Oklahoma Department of Emergency Management (OEM). A 75% FEMA grant, with a 25% local share, either cash or in-kind was provided in 2017.

## 1.2 Purpose

The purpose of this plan is to:

- Assess the ongoing mitigation activities within Pittsburg County.
- Identify and assess the hazards that pose a threat to residents and property.
- Evaluate additional mitigation measures that should be undertaken.
- Outline a strategy for implementation of mitigation projects.
- Develop a strategy for the adoption, maintenance, upkeep, and revision of the plan.

The object of the plan is to provide guidance for the next five years. It will ensure that Pittsburg County will implement activities that are most effective and appropriate for mitigating the identified hazards.

### 1.3 Authority

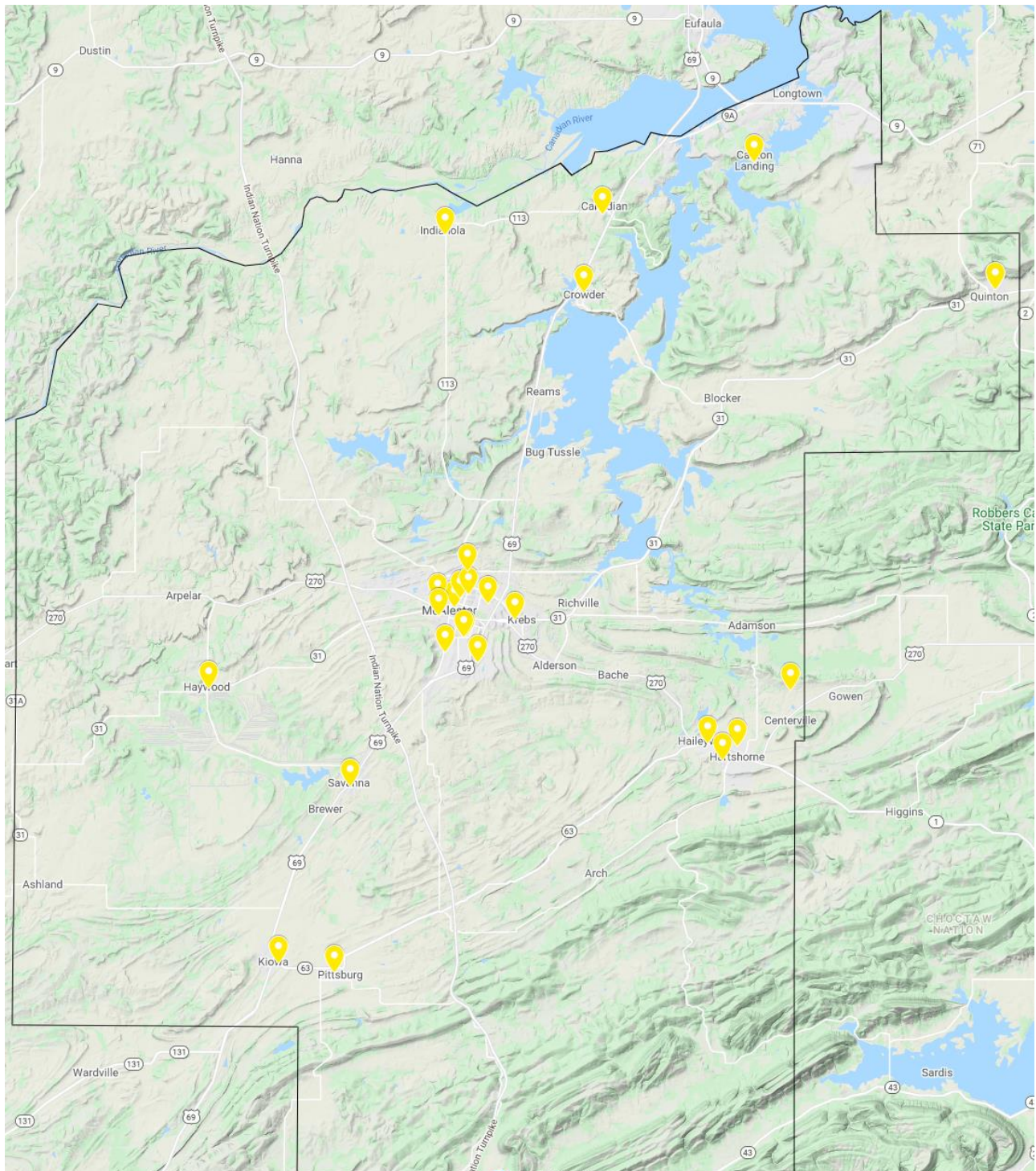
The Robert T. Stafford Relief and Emergency Assistance Act (Stafford Act), as amended by the Disaster Mitigation Act of 2000, provides the legal basis for state, tribal, and local governments to undertake risk-based approaches to reducing natural hazard risks through mitigation planning. Specifically, the Stafford Act requires state, tribal, and local governments to develop and adopt FEMA-approved hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance. This plan was written in accordance with all plan requirements per Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5165, and Title 44 Code of Federal Regulations (CFR) Part 201.

### 1.4 Overview of Planning Area

Pittsburg County is one of 77 counties in Oklahoma. Located in southeast-central Oklahoma, Pittsburg County encompasses 1,378 miles of total land area with water covering 72 miles. Bordering counties include McIntosh on the north, Haskell on the northeast, Latimer on the east, Pushmataha to the southeast, Atoka to the south, Coal on the southwest, and Hughes on the west. The City of McAlester serves as the county seat. Figure 1-1 shows the population of the towns and cities within Pittsburg County. Many residents in Pittsburg County live in rural areas and communities outside the incorporated towns. These areas and communities are included in this plan under the umbrella of Pittsburg County. A map of the Planning Area is located below.

**Figure 1-1**

**Map of the Planning Area**



## 1.5 Demographics

Demographics are the use of population characteristics (age and income distribution and trends, mobility, educational attainment, home ownership and employment status, for instant) for purpose of social studies.

The population in 2010 was 45,837. In 2016 the estimated population was 44,173. This reflects a decrease in population of 3.6% citizens in Pittsburg County.

Figure 1-2 below depicts demographics for individual jurisdictions within the county.

<b>Figure 1-2 Pittsburg County Census Figures 2010 – 2016</b>			
<b>AREA</b>	<b>CENSUS 2010</b>	<b>ESTIMATE 7-1-2016</b>	<b>% CHANGE</b>
Town of Alderson	304	287	-5.6%
Town of Ashland	66	62	-6.1%
Town of Canadian	220	204	-7.3%
Town of Crowder	430	407	-5.3%
Town of Indianola	162	153	-5.6%
Town of Kiowa	731	683	-6.6%
Town of Pittsburg	207	196	-5.3%
Town of Quinton	1051	996	-5.2%
Town of Savanna	686	648	-5.5%
City of Haileyville	813	769	-5.4%
City of Hartshorne	2125	1987	-6.5%
City of Krebs	2053	1945	-5.3%
City of McAlester	18383	18206	-1.0%
Town of Carlton Landing	0	0	0

## 1.6 Participating Jurisdictions

Table 1-2 lists all jurisdictions participating in the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan. In addition, all rural areas and unincorporated communities in Pittsburg County are also included in this plan. The Term Planning Area refers to all participating jurisdictions.

<b>Figure 1-3 Participating Jurisdictions</b>	
<b>City/Town</b>	<b>School District</b>
Town of Alderson	McAlester Public Schools
Town of Ashland	Quinton Public Schools
Town of Canadian	Crowder Public Schools
Town of Carlton Landing	Haileyville Public Schools
Town of Crowder	Frink-Chambers Public Schools
Town of Indianola	Tannehill Public Schools
Town of Kiowa	Krebs Public Schools
Town of Pittsburg	Haywood Public Schools
Town of Quinton	Savanna Public Schools
Town of Savanna	Canadian Public Schools
City of Haileyville	Pittsburg Public Schools
City of Hartshorne	Hartshorne Public Schools
City of Krebs	Indianola Public Schools
City of McAlester	Kiowa Public Schools
Pittsburg County	Carlton Landing Academy



1.7 Critical Facilities

Critical Facilities are defined 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. The tables located in the appendix provide a list of critical facilities as determined by Pittsburg County Officials, the Planning Committee, and the Pittsburg County Local Emergency Planning Committee.

1.8 Points of Contact

Figure 1-4 Points of Contact	
Primary	Secondary
Kevin Enloe 918-423-5655 <a href="mailto:Macalesterpittscoem1@gmail.com">Macalesterpittscoem1@gmail.com</a>	Lois Lupardus 918-423-5655 <a href="mailto:Mcalester.pittscom2@gmail.com">Mcalester.pittscom2@gmail.com</a>

## CHAPTER TWO: PLANNING PROCESS

### 2.1 Planning Process Overview

Hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural and/or man-made hazards. The primary purpose of hazard mitigation planning is to identify community policies, actions, and tools for implementation over the long term, resulting in a reduction of risk and potential for future losses community wide. This is accomplished by using a systematic process of learning about the hazards that can affect the community, setting clear goals, identifying appropriate actions, following through with an effective mitigation strategy, and keeping the plan current.

Pittsburg County and the participating jurisdictions began the planning process on February 1, 2018 and concluded three years after the start date. Throughout the three years, the Planning Committee held several meetings and kept in contact by phone and email to coordinate the process.

Step one was to organize the planning process and resources. In February 2018, the Pittsburg County Emergency Manager facilitated communications with all jurisdictions within the Planning Area to give the jurisdictions a chance to be incorporated in the plan. All jurisdictions within the Planning Area accepted the invitation and expressed their intent to participate in the planning process. Each jurisdiction also delegated a representative to the Planning Committee. The Planning Committee cultivated a planning schedule to include incorporating discussions into the County Commissioner's meetings every month and compiled a list of stakeholders from surrounding jurisdictions, state, regional, and tribal agencies. During this planning process, an effort was made to consult the public for feedback on threats, hazards, historical events, and possible mitigation activities. The Planning Committee defined the public as citizens residing within the jurisdiction, employees who work within the jurisdiction, and anyone who has a stake in the jurisdiction's well-being.

Step two was assessing the risks. The Pittsburg County Planning Committee researched all the past hazards that impacted the Planning Area, then calculated the possibility of future events. This step was accomplished by pulling historical data from the National Climatic Data Center and previous disaster documentation. The Planning Committee then reviewed all data and calculated the greatest impacts and vulnerabilities within the Planning Area.

Step three was to develop a mitigation strategy. Looking at the hazard risk assessment, the Planning Committee examined possible mitigation actions to minimize or eliminate the effects of hazards/threats.

All jurisdictions were asked to develop their own lists to discuss to determine the best options and how they would be implemented. During this step, a rough draft of the plan was developed and reviewed by the Planning Committee, the County Commissioners, each jurisdiction, and the public.

Step four was to adopt and implement the plan. Once the draft was completed, it was submitted to the state of Oklahoma and the Federal Emergency Management Agency (FEMA) for approval. After the plan approval, each jurisdiction will adopt the plan, and the implementation process will begin.

## 2.2 Planning Committee

The Pittsburg County Planning Committee was formed by thirty appointed representatives to guide the preparation of the Plan. These representatives were appointed from each jurisdiction within the Planning area and were approved as members of the Planning Committee by the County Commissioners.

The representatives from each jurisdiction provided local history, reviewed hazard data, addressed and analyzed cost versus health/safety issues, suggested action items, and made recommendations to the Plan. After gathering data, the committee discussed these items in the open meetings, approved the Plan, and recommended the Plan's approval to the County Commissioners.

In 2018, the committee held six open meetings on February 1, February 8, February 15, March 1, March 8, and March 15. These meetings were posted in the newspaper and at local government offices. The committee invited the public and other stakeholders to join and provide feedback.

The Planning Committee was overseen by the Pittsburg County Commissioners, who required a representative of the committee to attend monthly meetings to report on the Plan's progress. The committee unanimously appointed the Pittsburg County Director of Emergency Management.

**Figure 2-1  
Planning Committee**

<b>Name</b>	<b>Title</b>	<b>Jurisdiction Represented</b>	<b>Contribution to Plan</b>
<i>Kevin Enloe*</i>	Director, Pittsburg County Emergency Management	Pittsburg County	Provided County hazard info. /mitigation actions Provided County mitigation actions
<i>Lois Lupardus</i>	Deputy Director, Pittsburg County Emergency Management	Pittsburg County	Provided Pittsburg County weather history, descriptions, locations, extent, probability of future events, vulnerability and impacts.
<i>Gary Brooks</i>	Pittsburg County LEPC Chairman	Pittsburg County Town of Crowder	Provided Pittsburg County weather history, descriptions, locations, extent, probability of future events, vulnerability and impacts. Provided existing institutions, plans and ordinances
<i>Sandra Crenshaw</i>	1 <sup>st</sup> Deputy, Board of County Commissioners	Pittsburg County	The Pittsburg County Commissioner's Office provided county property information. This information was utilized for determining vulnerability of assets.
<i>Richard Howry*</i>	Pittsburg County Floodplain Manager	Pittsburg County	Provided information on flood prone areas
<i>Cliff Pitner*</i>	McAlester Floodplain Manager Public Works	City of McAlester	Provided City hazard info. /mitigation actions Provided building infrastructure, vulnerability info. Identify hazards with city limits / mitigation actions
<i>Jarrold Wood</i>	City Employee	City of McAlester	Provided City hazard info. /mitigation actions Provided building infrastructure, vulnerability info. Identify hazards with city limits / mitigation actions
<i>Terry Sensibaugh</i>	Public Works	City of Haileyville	Provided town hazard information and mitigation actions Provided building infrastructure, vulnerability info. Identify hazards with town limits / mitigation actions
<i>Vess Neill*</i>	Resident Designee	Town of Canadian	Provided town hazard information and mitigation actions. Provided building infrastructure, vulnerability info. Identify hazards with town limits / mitigation actions  *Vess Neill was chosen by appointed officials to represent the jurisdiction based on his knowledge and understanding of the jurisdiction.
<i>Chuck Courts</i>	Mayor	Town of Alderson	Provided town hazard information and mitigation actions. Provided building infrastructure, vulnerability info.
<i>Virginia Horn</i>	Former Mayor	Town of Ashland	Provided town hazard information and mitigation actions. Provided building infrastructure, vulnerability info.
<i>Gerald Grubbs</i>	Mayor	Town of Indianola	Provided town hazard information and mitigation actions. Provided building infrastructure, vulnerability info.

<b><i>Allen Miller</i></b>	Mayor	Town of Quinton	Provided town hazard information and mitigation actions. Provided building infrastructure, vulnerability info.
<b><i>Jeremy Pierce*</i></b>	Police Chief	City of Hartshorne	Provided city hazard info/ mitigation actions Identify hazards within city limits/mitigation actions
<b><i>Lisa Brown</i></b>	City Clerk	City of Hartshorne	Provided city hazard info. /mitigation actions Provided building infrastructure, vulnerability info. Identify hazards with city limits / mitigation actions
<b><i>Ed Klink*</i></b>	Mayor of Krebs	City of Krebs	Provided city hazard info. /mitigation actions Provided building infrastructure, vulnerability info. Identify hazards within city limits / mitigation actions
<b><i>Kevin Mick</i></b>	Public Works	City of Krebs	Identify hazards within city limits / mitigation actions
<b><i>Chip Kilburn</i></b>	Project Manager, Town of Carlton Landing Representative for Carlton Landing Academy	Town of Carlton Landing Carlton Landing Academy	Provided city hazard info. /mitigation actions Provided building infrastructure, vulnerability info. Identify hazards with city limits / mitigation actions
<b><i>Gary Brooks</i></b>	Project Coordinator	Town of Crowder	Provided town hazard info. /mitigation actions Provided building infrastructure, vulnerability info. Identify hazards with town limits / mitigation actions
<b><i>Deanna Sexton</i></b>	Emergency Management Director	Town of Kiowa	Provided town hazard info. /mitigation actions Provided building infrastructure, vulnerability info. Identify hazards with town limits / mitigation actions
<b><i>Sandy Cross</i></b>	Town Clerk	Town of Pittsburg	Provided town hazard info. /mitigation actions Provided building infrastructure, vulnerability info. Identify hazards with town limits / mitigation actions
<b><i>Donald Capps</i></b>	Former Fire Chief of the Savanna Fire Department	Town of Savanna	Provided building infrastructure, vulnerability info
<b><i>KC Buck</i></b>	Director of Maintenance	McAlester Public Schools	Assisted in providing hazards, threats, and mitigation measures
<b><i>Stacey Henderson</i></b>	Superintendent	Quinton Public Schools	Assisted in providing hazards, threats, and mitigation measures
<b><i>Robert Florenzano</i></b>	Superintendent	Crowder Public Schools	Provided school hazard info. /mitigation actions Provided building infrastructure, vulnerability info.
<b><i>Roger Hemphill</i></b>	Superintendent	Haileyville Public Schools	Assisted in providing hazards, threats, and mitigation measures
<b><i>Richard Peckio</i></b>	Superintendent	Frink-Chambers Public Schools	Assisted in providing hazards, threats, and mitigation measures
<b><i>John Wilcox</i></b>	Superintendent	Tannehill Public Schools	Assisted in providing hazards, threats, and mitigation measures
<b><i>Patrick Turner</i></b>	Superintendent	Krebs Public Schools	Assisted in providing hazards, threats, and mitigation measures
<b><i>Bud Rattan</i></b>	Superintendent	Haywood Public School	Assisted in providing hazards, threats, and mitigation measures

<b><i>Gary Reeder</i></b>	Superintendent	Savanna Public School	Assisted in providing hazards, threats, and mitigation measures
<b><i>Mike Broyles</i></b>	Superintendent	Canadian Public School	Assisted in providing hazards, threats, and mitigation measures
<b><i>Debbie Rice</i></b>	Employee Designee	Pittsburg Public School	Assisted in providing hazards, threats, and mitigation measures
<b><i>Jason Lindley</i></b>	Superintendent	Hartshorne Public School	Assisted in providing hazards, threats, and mitigation measures
<b><i>Adam Newman</i></b>	Superintendent	Indianola Public School	Assisted in providing hazards, threats, and mitigation measures
<b><i>Rick Pool</i></b>	Superintendent	Kiowa Public School	Assisted in providing hazards, threats, and mitigation measures

\* Primary Jurisdictional POC

## 2.3 Stakeholders

There are many public agencies, private organizations, and businesses that contend with natural hazards. The Planning Committee contacted these entities either in person, via email, or by phone to collect information on the hazards and determine how their programs could best support the participating jurisdictions' mitigation programs. While the individual community members aren't listed, they are considered valued stakeholders of the Plan and were invited to participate in the planning process. The organizations and agencies contacted are identified in Figure 2-2.

**Figure 2-2  
Stakeholders**

<b>Name</b>	<b>Title</b>	<b>Agency Represented</b>	<b>How Agency Was Invited</b>	<b>Contribution To Plan</b>
<i><b>Rene Beezley</b></i>	Volunteer Services Specialist	Red Cross	Email, Phone	The ARC provides response and recovery information which is needed to assess the mitigation strategies in the hazard mitigation plan.
<i><b>Michelle Fields</b></i>	County Assessor	Pittsburg County Assessor's Office	Direct, Phone	The Pittsburg County Assessor's Office provided types and numbers for residential, business, and county property information. This information was utilized for determining vulnerability of assets.
<i><b>Angela Evans</b></i>	Director	McAlester Campus, Kiamichi Technology Center	Email, phone, direct	Assisted in providing hazards, threats, and mitigation measures
<i><b>Frank Phillips</b></i>	External Affairs Manager	Public Service Company	Email, direct	Assisted in providing hazards, threats, and mitigation measures
<i><b>Todd Minshall</b></i>	Marketing and Public Relations Director	Kiamichi Electric	Email, direct	Assisted in providing hazards, threats, and mitigation measures
<i><b>Kristal Kuhn</b></i>	Southeast Area Coordinator	Oklahoma Office of Emergency Management	Email, phone	Provided assistance identifying hazards and available resources
<i><b>Paige Nutter</b></i>	Hazard Mitigation Coordinator	Choctaw Nation Office of Emergency Management	Email, phone, direct	Provided assistance with hazard data and action items.

## 2.4 Public Involvement

In 2018, the Planning Team invited the public to observe and participate in six Planning Team meetings. Invitations and details about the meetings were posted on the Pittsburg County Emergency Management Facebook page and in accordance with the Oklahoma Meeting Law. During these meetings, the public was offered the chance to review and comment on drafts of the plan.

Time was allocated in each meeting to explain the Plan, gain information about the Planning Area and previous weather occurrences, and ideas about future mitigation activities, along with time left for open comments and questions.

In addition, a social media campaign was created to encourage feedback from the public regarding hazards and potential action items.

Feedback received from the public proved valuable in the development of the draft plan. Comments and open discussions led to addressing and prioritizing mitigation actions and historical events. A draft copy of the Plan was prepared and made available to public review prior to Plan Submission to the State of Oklahoma and FEMA.

## 2.5 Literature, Resources, and Plans Reviewed

During the planning process, the Pittsburg County Hazard Planning Committee reviewed various plans and studies regarding the hazards, disaster history, and potential impact areas. Members of the Planning Committee reviewed the data from the sources listed below and utilized them in the plan's development.



**Figure 2-4**  
**Literature, Resources, and Plans Reviewed**

<b>Plan or Resource</b>	<b>Information Used</b>
<i>Local Health Risk Assessment for Disaster Related Community Preparedness and Resiliency, June 2014</i>	Plan contains much of the same information required of a local HMP. Information was reviewed and integrated into the capability assessment, risk assessment, and mitigation strategy.
<i>State of Oklahoma Hazard Mitigation Plan, 2019</i>	Hazard definitions, previous occurrence data, disaster history and state goals
<i>Pittsburg County Emergency Operations Plan, July 2017</i>	Capability Assessment
<i>School Emergency Action Plans</i>	Storm shelter plans, emergency actions
<i>Local Records</i>	Evacuation Routes, High risk areas, vulnerable populations
<i>U.S. Army Corps of Engineers Emergency Plan</i>	Information was reviewed and integrated into the capability assessment, risk assessment, and mitigation strategy.
<i>City of Madill City Lake Dam Emergency Plan</i>	Information was reviewed and integrated into the capability assessment, risk assessment, and mitigation strategy.
<i>Choctaw Nation of Oklahoma Multi-Hazard Mitigation Plan 2020</i>	Reviewed for hazard data and mitigation strategies
<i>Pittsburg County Hazard Mitigation Plan 2012</i>	Reviewed for hazard data and mitigation strategies, risk assessment, historic data.
<i>Bryan County Mitigation Plan, 2017</i>	Reviewed for hazard data and mitigation strategies
<i>National Climatic Data Center</i>	The NCDC provided valuable historical weather data for each weather-related hazard.
<i>State National Floodplain Insurance Program</i>	The NFIP provides flood risk data for the county and flood insurance rate maps. It also provides guidance for the communities' floodplain manager for participation and compliance in the NFIP.
<i>National Oceanic and Atmospheric Administration (NOAA)</i>	NOAA provides weather information for the State, County, and Community as well as past historical events, and extent maps for extreme weather events.
<i>Oklahoma Climatological Survey</i>	The OCS provides weather information for the State, County, and Community as well as past historical events, safety and mitigation ideas, and extent maps for extreme weather events.

<i>Oklahoma Geological Survey</i>	The OGS provides earthquake data, geological information, and extent mapping.
<i>Chickasaw Nation Hazard Mitigation Plan 2016</i>	Reviewed for hazard data and mitigation strategies
<i>U.S. Census Bureau Population Data, dated 3/10/2010</i>	Population, homeowner, poverty, education, and age data for Marshall County.
<i>Marshall County Hazard Mitigation Plan, 2018</i>	Reviewed for hazard data and mitigation strategies

## 2.6 Monitor

Each jurisdictional representative is in charge of monitoring and reporting the mitigation actions' progress and goals taking place within their respective jurisdictions. They will also report implementation processes that worked well, any difficulties encountered, how coordination efforts were proceeding, which strategies should be revisited, and any changes in jurisdictional plans and policies. They will report this information to the Pittsburg County Director of Emergency Management at the end of each quarter. The Director will then update the County Commissioners.

The County Commissioners will monitor the Planning Committee's progress throughout these reports to ensure the Planning Committee is setting clear, actionable, and manageable goals for each mitigation strategy.

## 2.7 Evaluate

During the five-year approval period, the Plan will be evaluated on an annual schedule. The Pittsburg County Emergency Management Director will arrange a meeting for the Planning Committee to evaluate the risk assessment to ensure the hazard information and the vulnerabilities and impacts initially addressed are still valid for the participating communities. The Planning Committee will also evaluate the goals and mitigation strategy to ensure they continue to address each participating jurisdictions' priorities.

The Planning Committee's evaluation of the Plan will be submitted to the County Commissioners for review, comments, and questions.

## 2.8 Update

The Planning Committee will update the Pittsburg County Multi-Jurisdictional Hazard Mitigation Plan under the direction of the County Commissioners according to the following schedule:

- **Review and Update**—The Planning Committee will begin the update 18 months prior to plan expiration. During this time, they will host at least two public meetings for the public to give comments and suggestions and ask questions. The Planning Committee will take the Commissioners and the public's feedback over the previous years and incorporate it into the Plan as appropriate.
- **Submit for Review**—The Plan will be submitted by the Pittsburg County Emergency Management Director to the State of Oklahoma and FEMA for approval.
- **Adoption**—Once the Plan has been completed by the Planning Committee, the Pittsburg County Emergency Management Director will present the Plan to the County Commissioners for approval and final adoption. The representatives on the Planning Committee for each jurisdiction within the Planning Area will have a period of two weeks to have the adoption letter appropriately signed for their jurisdiction. The adoption letters will then be turned in to the Pittsburg County Emergency Management Director, who will integrate them into the plan.
- **Distribution**—The Pittsburg County Emergency Management Director is responsible for distributing the final copy of the Plan to each jurisdiction within the Planning Area over a period of two weeks from when the Plan is finalized. The Plan will also be available by request to any member of the public from the Pittsburg County Office of Emergency Management.

## 2.9 Continued Public Involvement

The Planning Committee will involve the public in the continual updating of the Hazard Mitigation Plan. Public participation is an essential part of the planning process. Public input or the lack thereof can be instrumental in the success or failure of the Plan. A social media campaign will be utilized annually two weeks prior to the Planning Team's evaluation of the Plan to collect survey data on the public's hazard concerns, priorities, and preferred upcoming mitigation projects. The information collected will be used to drive the jurisdiction's mitigation priorities and be used for the next update. The Pittsburg County Emergency Management Director will be responsible for this campaign.

There will be at least two public meetings posted on the Pittsburg County Emergency Management Facebook page in the updating period. These meetings will provide the public with a forum where Pittsburg County residents can express their concerns, opinions, or ideas about the Plan.

## CHAPTER THREE: HAZARD IDENTIFICATION AND ASSESSMENT

### 3.1 List of Identified Hazards

In this section, an effort was made to identify possible natural and man-made hazards that have affected or have the potential to affect the Planning Area. During the development of the current plan, the Planning Committee, with help from the public, identified hazards specific to the Planning Area and are listed in Figure 3-1. Some hazards, such as expansive soils, landslides, and sink holes have been excluded from the plan. After looking at the hazards and data, the Planning Committee believed the hazards did not occur often enough or with enough severity to be included.

The Planning Committee also thought it would be more useful to consider tornado and high wind in the same hazard profile. While the hazards are different, they often have the same effects on the Planning Area and similar mitigation actions are used.

<b>Figure 3-1 Pittsburg County Hazards</b>	
<b>Hazard</b>	<b>Jurisdictions Affected</b>
Tornado/High Winds	All Jurisdictions
Flood	All jurisdictions with a higher probability near waterways and lakes.
Winter Storm	All Jurisdictions
Wildfire	All Jurisdictions
Lightning	All Jurisdictions
Hail	All Jurisdictions
Extreme Heat	All Jurisdictions
HAZMAT	All jurisdictions with special attention to areas around major roadways and railways.
Drought	All Jurisdictions
Earthquake	All Jurisdictions
Dam Failure	Pittsburg Co, McAlester, Pittsburg, McAlester PS, Pittsburg PS

### 3.2 Disaster History

The Planning Area has experienced several significant federally declared disasters between 2009 and 2021 as listed in Figure 3-2.

<b>Figure 3-2 2010-2020 Disaster History</b>		
<b>Disaster #</b>	<b>Declaration Date</b>	<b>Incident Type</b>
DR1876	02/25/2010	Severe Winter Storm
DR1988	5/27/2011	Severe Storms and Flooding
DR4117	5/20/2013	Severe Storms and Tornadoes
DR4222	05/26/2015	Severe Storms, Tornadoes, Straight-line Winds and Flooding
DR4256	02/10/2016	Severe Winter Storms and Flooding
DR4315	05/26/2017	Severe Storms, Tornadoes and Flooding
DR4324	07/25/2017	Severe Storms, Tornadoes, Straight-line Winds, and Flooding
DR4438	06/01/2019	Severe Storms, Straight Line Winds, Tornadoes, Flooding
DR4453	06/12/2019	Severe Storms, Tornado, Straight Line Winds, Flooding

### 3.3 Hazard Probability and Vulnerability Rating

The regulations in 44 CFR 201.7 provides guidelines for hazard analysis to include a process for assessing and evaluating hazards. This promotes a common base for performing the analysis by defining the criteria and establishing a rating and scoring system. Figure 3-3 shows the results of a hazard analysis for the Planning Area, which includes a qualification of the history probability. Vulnerability and maximum threat for each event were also examined during the analysis in prioritizing hazards.

### **Figure 3-3**

#### **Hazard Probability and Vulnerability Rating**

The probability rating in the hazards below is based on the following criteria:

High	=	Event probable in next year
Medium	=	Event probable in next 3 years
Low	=	Event probable in next 5 years
Very Low	=	Event probable in next 10 years

Based on history and using the previously mentioned probability statements, probability was quantified as follows:

High	=	Event has 1 in 1 year chance .....	76-100%
Medium	=	Event has 1 in 3 years chance .....	50-75%
Low	=	Event has 1 in 5 years chance .....	26-49%
Very Low	=	Event has 1 in 10 years chance .....	1-25%

Which result in the following ranges of probability:

High	=	Greater than 75%
Medium	=	Greater than 50%, but less than or equal to 75%
Low	=	Greater than 25%, but less than or equal to 49%
Very Low	=	25% or less

Vulnerability is defined by the number of people and value of property in jeopardy determine vulnerability:

High	=	Greater than 10% of population or property
Medium	=	1%-10% of population or property
Low	=	Less than 1 % of population or property

Maximum threat is the worst-case scenario of a hazard:

High	=	Greater than 25% of town is impacted
Medium	=	5%-25% of town is impacted
Low	=	Less than 5% of town is impacted

**Figure 3-4  
Pittsburg County Hazard Prioritization**

<b>Priority #</b>	<b>Hazard</b>	<b>History # of Events 2010-2020</b>	<b>Vulnerability</b>	<b>Max Threat</b>	<b>Probability</b>	<b>Overall Rating</b>
1	Tornado/High Wind	81	High	High	High	High
2	Flood	47	High	High	High	High
3	Winter Storm	12	High	High	High	High
4	Wildfire	900	High	Med	High	High
5	Lightning	0	Medium	Medium	High	Medium
	Hail	70	Medium	Medium	High	Medium
6	Extreme Heat	21	High	High	High	High
7	Hazardous Materials (Transportation/ Fixed Site)	Please see Tier II Reports	Low	High	High	Medium
8	Drought	25	High	High	Medium	High
9	Earthquake	295	Medium	Low	High	Medium
10	Dam Failure	0	Medium	Medium	Low	Medium



### 3.4 Profiled Hazards

#### 3.4.1 Tornado/High Wind

##### *Description*

Tornadoes are traditionally defined as a violently rotating column of air that reaches from the bottom of a cumulonimbus cloud to the ground. Tornadoes are most often located in severe thunderstorms, but not all severe thunderstorms will contain tornadoes. A tornado may be on the ground for only a few seconds, or last for hours at a time. Tornadoes can appear in a variety of shapes and sizes ranging from thin ropelike circulations to large funnel shapes greater than one mile in width. However, a tornado's size is not necessarily related to its wind speed. The strongest tornadoes can have wind speeds in excess of more than 200mph. Spring is sometimes referred to as 'tornado season' in Oklahoma because it is the peak season for tornadoes, but they can form during any season when the necessary atmospheric conditions of wind shear, lift, instability, and moisture are present.

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.

High winds can result from thunderstorms, strong cold front passages, or gradient winds between high and low pressure. Damaging winds are often called "straight-line" winds to differentiate the damage they cause from tornado damage. Downdraft winds are a small-scale column of air that rapidly sinks toward the ground, usually accompanied by precipitation as in a shower or thunderstorm. A downburst is the result of a strong downdraft associated with a thunderstorm that causes damaging winds near the ground.

##### *Location*

The entire Planning Area is threatened by tornado and high wind events, though homes and/or temporary living spaces not equipped for storms are considered to be especially vulnerable locations, such as manufactured homes.

### Previous Occurrences

There were 8 tornado events and 73 high wind events reported within the Planning Area between 2010 and 2020. Previous Occurrence data from the National Oceanic and Atmospheric (NOAA) website is split into two tables below.

<b>Figure 3-5</b>		
<b>Tornado Previous Occurrences</b>		
From the NOAA National Centers for Environmental Information <a href="https://www.ncdc.noaa.gov/stormevents">https://www.ncdc.noaa.gov/stormevents</a>		
<b>Date</b>	<b>Jurisdiction</b>	<b>Narrative</b>
04/14/2011	Pittsburg County	A tornado snapped or uprooted a number of large trees. Maximum estimated wind in the tornado based on this damage was about 105 mph.
04/14/2011	Pittsburg County	This is the third of three segments of this tornado, which developed in northeastern Atoka County and moved across northwestern Pushmataha County. In Pittsburg County, this tornado snapped or uprooted a number of trees. Maximum estimated wind in the tornado based on this tree damage was about 105 mph.
04/24/2011	Pittsburg County	A tornado blew down large tree limbs, damaged the roof of a permanent home, and blew the roof off of a barn. Maximum estimated wind in the tornado based on this damage was about 80 mph.
06/23/2014	Haileyville	A landspout tornado developed northeast of Haileyville. This tornado was witnessed by several people as it moved southeast. It produced no known damage.
05/10/2015	McAlester	A tornado destroyed a barn, rolled a horse trailer, blew down a grain silo, and uprooted trees. Based on this damage, estimated maximum wind in the tornado was 90 to 100 mph.
05/18/2017	Ashland	This tornado developed north of Ashland and moved east-northeast, snapping or uprooting numerous trees, damaging an outbuilding, damaging a home, and snapping power poles. Based on this damage, maximum estimated wind in the tornado was 95 to 105 mph.
05/18/2017	Pittsburg County	This tornado snapped or uprooted numerous trees and blew down power lines. Based on this damage, maximum estimated wind in the tornado was 100 to 110 mph.

04/30/2019	Pittsburg County	This tornado developed from a remnant mesocyclone that had a history of producing a strong tornado in Bryan and Atoka Counties. The circulation in the storm strengthened southwest of Haileyville, just east of the S Bache Road and south of Ray Road, where this tornado developed. It moved north-northeast significantly damaging several homes, destroying barns and outbuildings, and snapping or uprooting trees from Ray Road to Crawley Road. The tornado then moved through open country for a couple miles and turned northeast as it moved across S Smallwood Lane, where it snapped many trees and destroyed outbuildings. It continued to produced significant tree damage along Highway 63 as it approached Haileyville. Many homes and businesses were damaged in town, some were destroyed, as it continued northeast to Lone Oak Road W on the northeast side of town, where the tornado began to move east. Homes were damaged, many trees were snapped, an electrical substation was damaged, and power poles were snapped before it dissipated near Price Road, south of Shelton Road. This tornado was observed by multiple people. Based on this damage, maximum estimated wind in the tornado was 110 to 120 mph.
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<b>Figure 3-6</b>		
<b>High Wind Previous Occurrences</b>		
From the NOAA National Centers for Environmental Information <a href="https://www.ncdc.noaa.gov/stormevents">https://www.ncdc.noaa.gov/stormevents</a>		
<b>Date</b>	<b>Jurisdiction</b>	<b>Narrative</b>
05/10/2010	Pittsburg County	Strong thunderstorm wind blew down several trees.
06/14/2010	McAlester	Strong thunderstorm winds resulted in damage to two barns southwest of McAlester on Highway 31. Several trees and power lines were also damaged in this area with power outages in parts of McAlester.
04/10/2011	Pittsburg County	A large outdoor smoker was tossed and damaged by strong thunderstorm winds.
04/14/2011	Savanna	Emergency management reported a few power poles were blown down by strong thunderstorm wind and some outbuildings received minor damage.
04/22/2011	McAlester	The ASOS unit at KMLC measured 70 mph thunderstorm wind gusts.
05/24/2011	Ashland	Strong thunderstorm wind gusts blew down trees.

07/24/2011	McAlester	Power lines were blown down and several outbuildings were blown over by strong thunderstorm winds.
07/24/2011	Ashland	The Oklahoma Mesonet station near Stuart measured 59 mph thunderstorm wind gusts.
10/22/2011	Pittsburg County	Strong thunderstorm wind blew down large tree limbs.
05/29/2012	McAlester	Strong thunderstorm wind damaged a gas station canopy at the Phillips 66 on Highway 69 and Comanche Avenue.
05/29/2012	McAlester	The Oklahoma Mesonet station west of McAlester measured 71 mph thunderstorm wind gusts.
05/29/2012	McAlester	The ASOS unit at the McAlester Municipal Airport measured 69 mph thunderstorm wind gusts.
06/12/2012	Pittsburg County	The Oklahoma Mesonet station southeast of Stuart measured 61 mph thunderstorm wind gusts.
06/12/2012	McAlester	Strong thunderstorm wind blew down trees and large tree limbs.
07/26/2012	McAlester	Strong thunderstorm wind blew down several large tree limbs.
07/26/2012	McAlester	Strong thunderstorm wind blew down power lines.
08/07/2012	Quinton	Strong thunderstorm wind blew down several trees and large tree limbs.
08/08/2012	Pittsburg County	Strong thunderstorm wind blew down large tree limbs.
08/08/2012	McAlester	Strong thunderstorm wind blew down power lines on Highway 270.
08/08/2012	McAlester	Strong thunderstorm wind blew down trees and large tree limbs.
08/08/2012	McAlester	Strong thunderstorm wind destroyed a metal carport.
08/08/2012	Pittsburg	Strong thunderstorm wind snapped large tree limbs.
09/26/2012	Crowder	A storm chaser estimated thunderstorm winds to 80 mph.
09/26/2012	McAlester	A storm spotter measured thunderstorm wind gusts to 73 mph. Large tree limbs were also reported blown down.
10/13/2012	Kiowa	Strong thunderstorm wind blew down large tree limbs.
12/19/2012	Savanna	Strong thunderstorm wind blew down large tree limbs.

05/15/2013	Pittsburg County	Strong thunderstorm wind blew down several power poles, flipped over a storage building and blew another into a line of trees, and flipped over a pontoon boat.
05/31/2013	Pittsburg County	Numerous large trees were blown down by strong thunderstorm wind, a few of which fell onto homes.
05/31/2013	Quinton	Strong thunderstorm wind damaged a marina dock in far northeast Pittsburg County.
07/14/2013	Pittsburg County	Strong thunderstorm wind snapped large tree limbs.
07/14/2013	McAlester	Strong thunderstorm wind snapped large tree limbs.
07/24/2013	Pittsburg County	Strong thunderstorm wind blew portions of a roof off of a porch in Longtown.
10/10/2014	McAlester	The ASOS unit at the McAlester Regional Airport measured 58 mph thunderstorm wind gusts.
05/09/2015	Quinton	The roof of a nursing home was damaged by strong thunderstorm wind.
05/10/2015	McAlester	Strong thunderstorm wind snapped large tree limbs.
05/25/2015	Haileyville	Strong thunderstorm wind snapped large tree limbs.
06/26/2015	Pittsburg County	Thunderstorm wind gusts were estimated to 60 mph.
07/03/2015	Canadian	Strong thunderstorm wind blew down power lines.
11/05/2015	Pittsburg County	Strong thunderstorm wind blew down large tree limbs.
04/29/2016	Kiowa	Strong thunderstorm wind destroyed outbuildings and uprooted trees.
04/29/2016	Pittsburg	Strong thunderstorm wind uprooted trees.
04/29/2016	Pittsburg County	Strong thunderstorm wind damaged outbuildings and snapped the trunks of a few trees.
07/14/2016	Canadian	Strong thunderstorm wind destroyed an awning and blew shingles off the roofs of homes.
07/14/2016	McAlester	Strong thunderstorm wind blew down a large tree.
07/14/2016	Haileyville	A storm spotter estimated thunderstorm winds to 60 mph.
09/17/2016	Pittsburg	Strong thunderstorm wind damaged the roof of a school.
04/29/2017	Quinton	Thunderstorm wind gusts were estimated to 60 mph.

05/18/2017	Ashland	Strong thunderstorm wind snapped large tree limbs.
05/18/2017	Pittsburg County	Strong thunderstorm wind snapped large tree limbs.
05/18/2017	Pittsburg County	Strong thunderstorm wind blew down several trees.
05/18/2017	Pittsburg County	Strong thunderstorm wind blew down a large tree onto the Indian Nation Turnpike, resulting in southbound traffic being diverted.
06/30/2017	McAlester	Strong thunderstorm wind blew down a large tree onto a travel trailer at the Valley Inn RV Park.
08/17/2017	McAlester	Strong thunderstorm wind snapped large tree limbs and power poles.
12/04/2017	McAlester	Strong thunderstorm wind blew down a tree in town.
06/24/2018	Pittsburg County	Strong thunderstorm wind blew down large tree limbs.
06/24/2018	Canadian	Strong thunderstorm wind blew down a tree.
06/24/2018	McAlester	Strong thunderstorm wind snapped large tree limbs.
06/24/2018	McAlester	The ASOS at the McAlester Regional Airport measured 60 mph thunderstorm wind gusts.
04/30/2019	Quinton	Strong thunderstorm wind snapped large tree limbs.
05/18/2019	McAlester	Strong thunderstorm wind damaged homes and businesses, blew down trees, and snapped power poles.
06/19/2019	Pittsburg County	The Oklahoma Mesonet station southeast of Stuart measured 61 mph thunderstorm wind gusts.
08/20/2019	McAlester	Strong thunderstorm wind damaged several store fronts as well as the roofs of multiple homes and businesses.
05/08/2020	Pittsburg County	The Oklahoma Mesonet station near Stuart measured 61 mph thunderstorm wind gusts.
05/08/2020	McAlester	The McAlester Regional Airport ASOS measured thunderstorm wind gusts to 64 mph.
05/08/2020	McAlester	Strong thunderstorm wind snapped large tree limbs in McAlester.
05/08/2020	Pittsburg County	Strong thunderstorm wind blew down power lines across Highway 270.
05/08/2020	Haileyville	Strong thunderstorm wind blew down power lines.

05/08/2020	Pittsburg County	Strong thunderstorm wind snapped large tree limbs.
05/08/2020	Pittsburg County	Strong thunderstorm wind blew down multiple trees in and around Rattan.
07/11/2020	Quinton	Strong thunderstorm wind snapped large tree limbs.
07/11/2020	McAlester	The ASOS at the McAlester Regional Airport measured 60 mph thunderstorm wind gusts.
09/01/2020	Pittsburg County	Thunderstorm wind gusts were estimated to 60 mph.
11/24/2020	McAlester	Strong thunderstorm wind destroyed a metal awning.

#### *Probability of Future Events*

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

#### *Extent*

Tornado intensity is rated using the Enhanced Fujita Scale. The scale is described below and is based on wind speed and type of damage done. The Planning Area has the ability to experience EF0-EF5 tornados, but the Planning Area would start to see the strain on their resources and public with an EF1.

<b>Figure 3-7</b>						
<b>FUJITA SCALE</b>			<b>DERIVED EF SCALE</b>		<b>OPERATIONAL EF SCALE</b>	
<b>F Number</b>	<b>Fastest 1/4-mile (mph)</b>	<b>3 Second Gust (mph)</b>	<b>EF Number</b>	<b>3 Second Gust (mph)</b>	<b>EF Number</b>	<b>3 Second Gust (mph)</b>
0	40-72	45-78	0	65-85	<b>0</b>	<b>65-85</b>
1	73-112	79-117	1	86-109	<b>1</b>	<b>86-110</b>
2	113-157	118-161	2	110-137	<b>2</b>	<b>111-135</b>
3	158-207	162-209	3	138-167	<b>3</b>	<b>136-165</b>
4	208-260	210-261	4	168-199	<b>4</b>	<b>166-200</b>
5	261-318	262-317	5	200-234	<b>5</b>	<b>Over 200</b>

Damage from high winds account for half of all severe reports in the United States and are more common than damage sustained from tornadoes. Wind speeds around 50 mph have the ability to start producing substantial damage. With winds at this speed and higher, damage to roofs, siding, fences, and windows are common.

The extent of winds is generally measured by the Beaufort Wind Scale shown below. The Planning Area and its participating jurisdictions use this scale when considering high wind severity. The Planning Area has experienced and will continue to experience Beaufort Numbers 0-12. The Planning team considers high winds of 8 or higher to be a threat to all jurisdictions and the public.

**Figure 3-8**

**Beaufort Wind Chart – Estimating Winds Speeds**

Beaufort Number	MPH		Terminology	Description
	Range	Average		
0	0	0	Calm	Calm. Smoke rises vertically.
1	1-3	2	Light air	Wind motion visible in smoke.
2	4-7	6	Light breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	11	Gentle breeze	Leaves and smaller twigs in constant motion.
4	13-18	15	Moderate breeze	Dust and loose paper is raised. Small branches begin to move.
5	19-24	22	Fresh breeze	Smaller trees sway.
6	25-31	27	Strong breeze	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult.
7	32-38	35	Near gale	Whole trees in motion. Some difficulty when walking into the wind.
8	39-46	42	Gale	Twigs broken from trees. Cars veer on road.
9	47-54	50	Severe gale	Light structure damage.
10	55-63	60	Storm	Trees uprooted. Considerable structural damage.
11	64-73	70	Violent storm	Widespread structural damage.
12	74-95	90	Hurricane	Considerable and widespread damage to structures.



**Webpage:** <http://www.weather.gov/iwx>

**Twitter:** @nwsiwx

**Facebook:** NWSNorthernIndiana





### *Impact and Vulnerability*

While the Planning Area frequently experiences tornadoes and high winds, there have been no injuries or fatalities up to this point. Tornadoes and high winds are very unpredictable and are considered a high threat for the entire Planning Area.

The impact of the tornado hazard occurs with the culmination of several sub-hazards such as high winds, hail, lightning, and flooding. This can result in the direct loss of homes, businesses, and lives and indirectly cause the loss of income, medical care, and the ability for the government to respond to the disaster. Possible impacts to first responders include airborne debris, downed power lines in response areas, water flooding roadways, injuries, and fatalities.

Possible environmental impacts of tornadoes and high winds stem from human activities. Tornadoes have the potential to damage waste storage/treatment facilities, chemical plants, pipelines, or oil fields. All have the possibility of polluting soil and water areas creating costly cleanup and possible relocation of people and businesses. All future developments will be considered at-risk due to historical events and the unpredictability of tornadoes.

In the event of a tornado or high winds, services to the public could be delayed, leading to a lack of confidence in the local jurisdictions' ability to govern. In the event facilities or access to facilities is compromised, the local jurisdictions' Continuity of Operations Plan needs to be activated. This would insure minimal disruption to public services. At this time, only Pittsburg County and the City of McAlester have a Continuity of Operations Plan to enact. All other participating jurisdictions do not have a plan, and this is considered a vulnerability.

A large concern for Pittsburg County and the City of McAlester includes a lack of public storm shelters. Both jurisdictions hold several outdoor and large-scale events that bring in spectators and participants from other states. An example of this would be the Expo center. It's located in the county but leased to the City of McAlester. It hosts rodeos, craft fairs, and school competitions. Without access to a storm shelter, the participants and spectators are left to shelter in place. The county has identified two separate locations to input shelters: near the Pittsburg County EOC and at the Expo Center.

Another large concern is the fishing tournaments held on Lake Eufala. Portions of the lake are located in the Town of Crowder, Town of Canadian, and the County. When the participants are on the lake and away from the shore, they can't hear the closest tornado sirens. Additionally, some participants come from out of state and aren't familiar with the jurisdictions' hazards. All affected jurisdictions have identified a need for additional sirens and education about how to keep apprised of the weather.

A table outlining each jurisdiction's specific impacts and vulnerabilities is located below.

<b>Table 3-9</b>		
<b>Tornado/High Wind Vulnerabilities</b>		
<b>Jurisdiction</b>	<b>Vulnerabilities</b>	<b>Impacts</b>
Pittsburg County	The jurisdiction has a lack of public storm shelters in the area.	Not having enough public storm shelters leaves the public vulnerable to the effects of this hazard, especially those who are attending activities, like at the Expo. People caught out in the elements without proper shelter can experience severe injury or death.
	The County has several areas where storm sirens can't be heard, especially near the lake.	These areas are mostly rural where signal is spotty. Storm sirens may be the only warning some of the citizens in these areas get before a tornado strikes. Additionally, the lake hosts several fishing tournaments and other events with participants from outside the jurisdiction and state. These individuals are less likely to understand the threat risk in the area and be caught unaware.

	The County has identified several educational needs to lessen the effects of this hazard. Education for this hazard would include hazard education for visitors to the lake, a social media campaign to advise on how to protect citizen's homes and families, and public shelter information when the county is able to install them.	A lack of education can hinder the public's ability to form a plan and delay reaction times in disaster situations that could endanger lives and property.
	There are several critical facilities within the jurisdiction that are lacking generators, including the County Courthouse, several fire departments, and others.	Tornado and high wind events can take out power lines and render the community without power. It is essential for critical facilities to be fully functional during a weather event such as this so that vital services to the public are not delayed.
Town of Alderson	The Town of Alderson does not have a public shelter.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.
	The Alderson Fire Department lacks a generator.	Tornado and high wind events can take out power lines and render the community without power. It is essential for critical facilities to be fully functional during a weather event such as this so that vital services to the public are not delayed.
Town of Ashland	The Town of Ashland doesn't have a public shelter.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.

	The Ashland Fire Department lacks a generator.	Tornado and high wind events can take out power lines and render the community without power. It is essential for critical facilities to be fully functional during a weather event such as this so that vital services to the public are not delayed.
Town of Canadian	The Town of Canadian doesn't have a public shelter.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.
	The Town of Canadian lacks generators at the Town Hall, Lift Station, and several others identified critical facilities.	Tornado and high wind events can take out utilities and render the community without power. If this were to happen, the jurisdiction would not be able to handle a large-scale weather event.
	The Town of Canadian has an area where existing storm sirens cannot be heard.	Storm sirens may be the only warning some of the citizens in this area get before a tornado or high wind event strikes.
	The jurisdiction has identified a lack of education for the public on how to lessen the impacts of this disaster on homes and the public.	Without proper protections, any size of tornado could cause injuries or be fatal to the public and destroy structures.
Carlton Landing	This jurisdiction doesn't have a public shelter.	In the event of a tornado or high wind event, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.

	The Carlton Landing Fire Department and one of their lift stations lack generators.	Tornado and high wind events can take out power lines and render the community without power. It is essential for critical facilities to be fully functional during a weather event such as this so that vital services to the public are not delayed.
	The jurisdiction does not have any storm sirens. They have identified a need for at least one.	Sometimes storm sirens the only form of notification for the public. Without this warning, the public could get caught out in the weather and suffer severe injury or death.
Town of Crowder	This jurisdiction doesn't have a public shelter.	In the event of a tornado or high wind event, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.
	The Crowder Fire Department and Senior Citizen Center lack generators.	Tornado and high wind events can take out power lines and render the community without power. It is essential for critical facilities to be fully functional during a weather event such as this so that vital services to the public are not delayed.
	The Town of Crowder needs additional storm sirens to cover the area.	Storm sirens may be the only warning some of the citizens in this area get before a tornado strikes. Without proper warning, the public could easily be injured or killed while trying to seek shelter.

	The town of Crowder has identified a need to get more education to the public so they can lessen the impacts of this hazard.	Without proper protections, any size of tornado could cause injuries or be fatal to the public and destroy structures.
Town of Indianola	This jurisdiction doesn't have a public shelter.	In the event of a tornado or high wind event, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.
	The Indianola Fire Department lacks a generator.	Tornado and high wind events can take out power lines and render the community without power. It is essential for critical facilities to be fully functional during a weather event such as this so that vital services to the public are not delayed.
Town of Kiowa	This jurisdiction does not have a public shelter.	In the event of a tornado or high wind event, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.
	The jurisdiction has a few storm sirens that need to be replaced. There are also a few areas lacking coverage that need to be addressed.	Storm sirens may be the only warning some of the citizens in this area get before a tornado strikes. Without proper warning, the public could easily be injured or killed while trying to seek shelter.
Town of Pittsburg	This jurisdiction does not have a public shelter.	In the event of a tornado or high wind event, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.

	All of the identified critical facilities for the Town of Pittsburg lack generators.	Tornado and high wind events can take out power lines and render the community without power. It is essential for critical facilities to be fully functional during a weather event such as this so that vital services to the public are not delayed.
	The Town of Pittsburg needs to replace an old siren and purchase an additional one to ensure the public can hear the warnings.	Storm sirens may be the only warning some of the citizens in this area get before a tornado strikes. Without proper warning, the public could easily be injured or killed while trying to seek shelter.
Town of Quinton	This jurisdiction does not have a public shelter.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.
	Quinton's town hall and fire department lack generators.	Tornado and high wind events can take out power lines and render the community without power. It is essential for critical facilities to be fully functional during a weather event such as this so that vital services to the public are not delayed.
Town of Savanna	This jurisdiction does not have a public shelter.	In the event of a tornado or high wind event, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.

	All but two of Savanna's identified critical facilities lack generators.	Tornado and high wind events can take out power lines and render the community without power. It is essential for critical facilities to be fully functional during a weather event such as this so that vital services to the public are not delayed.
City of Haileyville	None of this jurisdiction's critical facilities have generators.	In the event of a tornado or high wind event, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.
	The jurisdiction has a few storm sirens that are in need of being replaced. There are also two areas lacking coverage that need to be addressed.	Storm sirens may be the only warning some of the citizens in this area get before a tornado strikes. Without proper warning, the public could easily be injured or killed while trying to seek shelter.
City of Hartshorne	This jurisdiction does not have a public shelter.	In the event of a tornado or high wind event, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.
	The City Hall does not have a generator.	Tornado and high wind events can take out power lines and render the community without power. It is essential for this critical facility to be fully functional during a weather event such as this so that vital services to the public are not delayed.



	The jurisdiction has a storm siren that needs to be replaced. There are also two areas lacking coverage that need to be addressed.	Storm sirens may be the only warning some of the citizens in this area get before a tornado strikes. Without proper warning, the public could easily be injured or killed while trying to seek shelter.
City of Krebs	This jurisdiction doesn't have a public shelter. One of the main annual festivals is hosted here with a large amount of out of town participation.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.
	The jurisdiction has a few storm sirens in need of being replaced.	Storm sirens may be the only warning some of the citizens in this area get before a tornado strikes. Without proper warning, the public could easily be injured or killed while trying to seek shelter.
City of McAlester	This jurisdiction doesn't have a public shelter and has a large amount of public events where participants may be from out of town and have nowhere else to go.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves the public vulnerable to injury or death.
	There are several fire departments, lift stations, and other critical facilities without generators to keep them going in the event of a tornado.	Tornado and high wind events can take out power lines and render the community without power. It is essential for critical facilities to be fully functional during a weather event such as this so that vital services to the public are not delayed.
	The City of McAlester needs to replace a siren and add a few more to increase coverage of warnings.	Storm sirens may be the only warning some of the citizens in this area get before a tornado strikes. Without proper warning, the public could easily be injured or killed while trying to seek shelter.
McAlester Public Schools	No shelters. Has to shelter in place, will need multiple to keep from bussing from place to place.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves kids vulnerable to injury or death.

	The school district does not have an emergency generator.	Should a tornado occur during school hours, the buildings need to be functional to safely accommodate kids until the event is over.
Quinton Public Schools	While the school district does have a storm shelter, it's not big enough to house the entire school during an incident.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves kids vulnerable to injury or death.
	The school district does not have an emergency generator.	Should a tornado or high wind event occur during school hours, the buildings need to be functional to safely accommodate kids until the event is over.
Crowder Public Schools	The sports complex does not have a shelter. If a tornado were to occur during a game, there wouldn't be a place for the kids, staff, or family members to go.	In the event of a tornado, having a place to seek shelter is crucial. If not, it leaves kids vulnerable to injury or death.
	The school district does not have an emergency generator.	Should a tornado or high wind event occur during school hours, the buildings need to be functional to safely accommodate kids until the event is over.
Haileyville Public Schools	The school district has a storm shelter, but doesn't have adequate space for the population.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves kids vulnerable to injury or death.
	The school district does not have an emergency generator.	Should a tornado or high wind event occur during school hours, the buildings need to be functional to safely accommodate kids until the event is over.
Frink-Chambers Public Schools	The school district doesn't have a storm shelter and has to shelter in place.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves kids vulnerable to injury or death.

	The school district does not have an emergency generator.	Should a tornado or high wind event occur during school hours, the buildings need to be functional to safely accommodate kids until the event is over.
Tannehill Public Schools	The school district does not have an emergency generator.	Should a tornado or high wind event occur during school hours, the buildings need to be functional to safely accommodate kids until the event is over.
	The school district does not have any storm sirens in the area.	In case other warning systems fail, the school district needs adequate warning time to secure students. If the school wasn't warned in time, they wouldn't be able to seek shelter.
Krebs Public Schools	The school district doesn't have adequate storm shelters for students.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves kids vulnerable to injury or death.
Haywood Public Schools	The shelter that's currently in place is an old WPA shelter. It is no longer suitable for the school's needs.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves kids vulnerable to injury or death.
Savanna Public Schools	While the school does educate students on the hazard during drills, they don't believe they adequately cover the other aspects of the hazard, such as at home safety.	Education is extremely important. If students aren't adequately educated about these hazards, they might underestimate the impacts and receive preventable injuries or losses.
Canadian Public Schools	The school doesn't have a generator.	Should a tornado or high wind event occur during school hours, the buildings need to be functional to safely accommodate kids until the event is over.

Pittsburg Public Schools	The school district does not have any storm sirens in the area.	In case other warning systems fail, the school district needs adequate warning time to secure students. If the school wasn't warned in time, they wouldn't be able to seek shelter.
	The school district believes in the power of education and wants to start teaching students about mitigation actions at an early age.	A lack of education can lead to injury and the loss of lives and homes. The school district believes starting education early on the risks and ways to lessen the hazard would benefit the whole community.
	The school district would like to increase the durability of their windows to withstand higher wind speeds.	In case other warning systems fail, the school district needs adequate warning time to secure students. If the school wasn't warned in time, they wouldn't be able to seek shelter.
Hartshorne Public Schools	At the moment, the school has to put kids on busses to reach the shelter which increases their vulnerability.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves kids vulnerable to injury or death.
	The school district does not have an emergency generator.	Should a tornado or high wind event occur during school hours, the buildings need to be functional to safely accommodate kids until the event is over.
Indianola Public Schools	The school district does not have a storm siren nearby.	In case other warning systems fail, the school district needs adequate warning time to secure students. If the school wasn't warned in time, they wouldn't be able to seek shelter.

Kiowa Public Schools	While the school does educate students on the hazard during drills, they don't believe they adequately cover the other aspects of the hazard, such as at home safety.	Education is extremely important. If students aren't adequately educated about these hazards, they might underestimate the impacts and receive preventable injuries or losses.
Carlton Landing Academy	The school district does not have a storm shelter. The kids and teachers must shelter in place.	In the event of a tornado or high winds, having a place to seek shelter is crucial. If not, it leaves kids vulnerable to injury or death.
	The school district does not have a storm siren.	In case other warning systems fail, the school district needs adequate warning time to secure students. If the school wasn't warned in time, they wouldn't be able to seek shelter.
	The school district does not have an emergency generator.	Should a tornado or high wind event occur during school hours, the buildings need to be functional to safely accommodate kids until the event is over.

### 3.4.2 Flood

#### *Description*

Flooding is a natural event that occurs around rivers and streams. This event can affect homes and land closest to the rivers and streams. The Planning Area experiences both riverine and flash flooding. Riverine flooding is responsible for 70% of flooding in the Planning Area due to the numerous bodies of water. The other 30% is attributed to flash flooding scattered throughout the Area. County roads and bridges experience the most substantial damage from flood events.

Riverine flooding is usually a gradual process, with several hours to several days of warning time. This type of event usually remains in flood for a longer period than flash or urban flooding, and often causes more damage due to the length of time structures are inundated, the velocity and depth of water, and floating debris.

Flash flooding in the Planning Area is associated with the large convective thunderstorms that frequent the region and can drop between one and five inches of rain in the space of an hour. When the soil is already saturated, rainfall from such storms can converge in creeks and streams suddenly, with little warning.

#### *Location*

The entire Planning Area is at risk for flooding, with the areas around the waterways being more susceptible to riverine flooding. The Planning Area most often experiences riverine flooding along Brushy Creek, Gaines Creek, Deer Creek and Coal Creek. There are 22,992 housing units in the Planning Area. Less than 1% (59) are in the floodplain.

Flood Depths maps have been included to illustrate the areas of flooding in the Planning Area. These maps are located in Appendix B.

Figures 3-10, 3-11, and 3-12 include roads that frequently flood and are organized by county district. As they are all county roads, they are fixed and maintained on a district-by-district basis.

**Figure 3-10**  
**District One Frequently Flooded Roads**

<b>Roads</b>	<b>Latitude</b>	<b>Longitude</b>
McNally Road	35.22358 35.15442	-95.58106 -95.56013
James Thomas Road	35.14561 35.17463	-95.52558 -95.52566
Dozer Mountain Road	35.22429 35.20014	-95.48601 -95.52837
Ezekial Road	34.92519 34.93163	-95.52663 -95.52692
Nale Road	35.13687 35.13055	-95.68197 -95.71885
L.M. Collier Road	34.85503 34.8694	-95.54703 -95.54711
Etchison Road	35.11724 35.12812	-95.40122 -95.37474
Pryor Lane	35.14596 35.14592	-95.46539 -95.46374
Nitzel Road	35.24515 35.24777	-95.52816 -95.50929
King Road	35.18364 95.18297	-95.62226 -95.62605
Buffalo Mountain Road	34.98533 34.98206	-95.61263 -95.5242
Nolen Road	34.9243 34.92929	-95.56024 -95.56024
Buds Point Road	35.09723 35.11455	-95.63554 -95.62057
Hartshorne Lake Road	34.82319 34.82042	-95.56673 -95.54962
Kiamichi VoTech	34.92413	-95.74582
11 <sup>th</sup> St- Hartshorne (between Pennsylvania and Modoc)	34.83955 34.8444	-95.55662 -95.55447
9 <sup>th</sup> St- Hartshorne (between Pennsylvania and Modoc)	34.84069 34.84544	-95.56019 -95.55809
Kali-Inla St., Hartshorne (Between 8 <sup>th</sup> St to 11 <sup>th</sup> St)	34.84394 34.84234	-95.56088 -95.5555
South 8 <sup>th</sup> St- Hartshorne (From Lehigh to the end of Lehigh)	34.84508 34.845	-95.56043 -95.56045
10 <sup>th</sup> St- Hartshorne From Pennsylvania to Modoc	34.84494 34.84007	-95.55626 -95.55842
Carbon Street- Hartshorne (From 7 <sup>th</sup> St to 9 <sup>th</sup> St)	34.84347 34.84244	-95.56293 -95.55948
Modoc ST- Hartshorne (From 5 <sup>th</sup> St to 10 <sup>th</sup> ST)	34.84267 34.84008	-95.56718 -95.55851

South 6 <sup>th</sup> St- Hartshorne (From LeHigh to the end of 6 <sup>th</sup> Street)	34.84605 34.83748	-95.56405 -95.5678
Comanche St – Hartshorne (From 5 <sup>th</sup> St to 8 <sup>th</sup> St	34.84151 34.84004	-95.56772 -95.56273
7 <sup>th</sup> St – Hartshorne (From Pennsylvania Ave to Barnhill	34.84656 34.83769	-95.56168 -95.56556
Wichita St.- Hartshorne (From 5 <sup>th</sup> St to 6 <sup>th</sup> St)	34.83956 34.83912	-95.56855 -95.56713
15 <sup>th</sup> Street- Hartshorne (From Lehigh to Kali Inla ST)	34.84119 34.84019	-95.54771 -95.54815
City Canal- Hartshorne (From Modoc to 7 <sup>th</sup> ST)	34.83955 34.84162	-95.55668 -95.56372
Comanche St – Hartshorne (from 5 <sup>th</sup> St to 8 <sup>th</sup> St)	34.84151 34.84005	-95.56771 -95.56274
Osage St- Hartshorne (from 11 <sup>th</sup> St to 15 <sup>th</sup> St)	34.84528 34.84315	-95.55401 -95.54693
14 <sup>th</sup> St -Hartshorne (from Pawnee to Pennsylvania)	34.84437 34.84301	-95.54835 -95.54894
15 <sup>th</sup> St – Hartshorne (From Carbon to Pawnee)	34.83925 34.84384	-95.54859 -95.54653

<b>Figure 3-11</b> <b>District Two Frequently Flooded Roads</b>		
<b>Roads</b>	<b>Latitude</b>	<b>Longitude</b>
Shuman Road	34.92756 34.88375	-95.80249 -95.82453
East High Hill Road	34.86951 34.87458	-95.73642 -95.59863



**Figure 3-12**  
**District Three Frequently Flooded Roads**

<b>Roads</b>	<b>Latitude</b>	<b>Longitude</b>
Nale Road	35.13055 35.13106	-95.71885 -95.77177
Rockford Road	35.00018 35.00001	-95.89533 -95.94215
Sunset Road	35.10175 35.10161	-95.84276 -95.878
Lone Oak Road	35.14514 35.14518	-95.77207 -95.86005
East Clearlake Road	35.08711 35.08725	-95.87756 -95.92988
Pecan Road	35.1598 35.17484	-95.83368 -95.83597
Bald Mountain Road	35.14516 35.11612	-95.86014 -95.77203
East Flowery Mounds Road	35.01441 35.01441	-95.68349 -95.67476
West Flowery Mounds Road	35.01441 35.00004	-95.68365 -95.71744
Krebs Lake Road	34.92804 35.02891	-95.71005 -95.68365
Medicine Creek Road	35.17401 35.07593	-95.80721 -95.80427
Hawk Loop	35.11608 35.10166	-95.78949 -95.80697
High Water Road	34.9122 34.91264	-95.94783 -95.94338
Hugh Low Road	35.08727 35.04382	-95.98316 -95.98319
Four Corners Road	35.0869 35.05826	-95.04172 -95.93056
Sunshine Road	35.04364 35.03722	-95.86893 -95.90403
South Mt. Homa Road	35.04371 35.05826	-95.89519 -95.89742
Thain Road	35.00858 35.01654	-95.80249 -95.80437
Yellow Bull Road	35.16814 35.11269	-95.73632 -95.73655
Ulan Road	35.00023 35.11601	-95.8619 -95.88628
McAlester Lake Road	34.98821 35.05025	-95.82501 -95.84221
Double Springs Road	34.94184 34.8695	-95.01858 -96.01865
Ragan Road	35.11617 35.05844	-95.88656 -95.94824

Carl Albert Road	35.02623 35.02894	-95.71042 -95.67637
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#### *Previous Occurrences*

One of the largest floods in the Planning Area's history occurred in 2015. It shut down numerous roads and bridges. This flood significantly disrupted one of the Planning Area's biggest economic drivers of tourism. Lake Eufaula was virtually inaccessible due to flooding of roads and recreation sites. Occurrence data from the National Oceanic and Atmospheric Administration (NOAA) Website is located below.

<b>Figure 3-13</b>		
<b>Flood Previous Occurrences</b>		
From the NOAA National Centers for Environmental Information <a href="https://www.ncdc.noaa.gov/stormevents">https://www.ncdc.noaa.gov/stormevents</a>		
<b>Date</b>	<b>Jurisdiction</b>	<b>Narrative</b>
07/07/2010	Kiowa	Heavy rainfall flooded streets in town and some roadways outside of town.
07/07/2010	Kiowa	Heavy rain flooded streets in town and several rural roads were under water. A house in Kiowa was flooded.
07/08/2010	Quinton	Thunderstorms developed along a slow moving cold front that pushed into the region. Thunderstorms moving repeatedly over the same areas resulted in flash flooding across portions of eastern Oklahoma.
09/09/2010	Indianola	The Pittsburg County Sheriff's Office reported Highway 113 between Canadian and Indianola flooded, as well as Highway 69 in the Canadian area. Numerous other roads in the northern portion of the county were closed due to flooding. Some of those roads, along with tin horns and even a bridge, were washed out.
04/25/2011	Pittsburg County	Periods of showers and thunderstorms resulted in widespread heavy rainfall on the 25th with a frontal boundary extending through eastern Oklahoma and an upper level disturbance approaching the region. These showers and thunderstorms only compounded the already serious flood situation across much of the area. Severe thunderstorms also produced large hail and damaging wind gusts. Many roads in and around town were flooded.
03/20/2012	McAlester	Strong to severe thunderstorms developed along a cold front that pushed into the region during the midday hours of the 19th. The thunderstorms evolved into a line as they pushed eastward and produced damaging wind, large hail

		and a brief tornado over eastern Oklahoma. The slow moving nature of the complex also resulted in widespread flash flooding across the region. Several rural roads were flooded.
03/20/2012	Pittsburg County	Strong to severe thunderstorms developed along a cold front that pushed into the region during the midday hours of the 19th. The thunderstorms evolved into a line as they pushed eastward and produced damaging wind, large hail and a brief tornado over eastern Oklahoma. The slow moving nature of the complex also resulted in widespread flash flooding across the region. Several roads were flooded and closed from McAlester to the south and southeast toward Haileyville and Hartshorne.
09/26/2012	Pittsburg County	Scattered thunderstorms developed near an outflow boundary across east-central Oklahoma during the early afternoon hours of the 26th. These storms drifted south and east during the afternoon. Several of the storms became supercellular, producing large hail, damaging wind, and some flash flooding. Widespread flooding was reported in Crowder.
06/08/2014	Pittsburg County	Widespread thunderstorms moved through southeastern Oklahoma late on the 7th into the morning hours of the 8th. Heavy rainfall resulted in some flash flooding in Pittsburg County.
06/08/2014	Pittsburg County	Widespread thunderstorms moved through southeastern Oklahoma late on the 7th into the morning hours of the 8th. Heavy rainfall resulted in some flash flooding in Pittsburg County. Highway 63 was closed due to high water.
07/31/2014	McAlester	Locally heavy rainfall resulted in several streets becoming flooded in McAlester.
07/31/2014	Pittsburg County	Portions of Highway 31 were closed due to flooding.
04/13/2015	Pittsburg County	Highway 63 was closed due to high water between Bache Road and Haileyville.
04/13/2015	Pittsburg County	High Hill Road was washed out between Alderson and Bache roads.
04/13/2015	Pittsburg County	Highway 31 was closed between Steven Taylor Industrial Park and Haywood, on the southwest side of McAlester.

04/13/2015	Pittsburg County	The Z bridge was completely submerged on Double Springs Road.
04/13/2015	McAlester Muni	Portions of Shuman Road were flooded.
05/09/2015	Pittsburg County	Several roads were severely flooded and impassable.
05/10/2015	Pittsburg County	Highway 270 near the Indian Nation Turnpike was flooded and impassable.
05/17/2015	Pittsburg County	Highway 31 was closed from the Indian Nations Turnpike, west to Haywood due to flooding.
05/20/2015	Haileyville	Highway 63 near Haileyville was closed due to high water.
05/24/2015	Pittsburg County	Several roads were flooded across Pittsburg County. Portions of Highway 270 near Alderson and Highway 69 near Savanna were flooded.
05/24/2015	Pittsburg County	Numerous roads were closed throughout Pittsburg County due to high water. Highway 31 was closed from the Highway 270 junction to Haywood and to Highway 31A. Highway 63 was closed from Haileyville to Kiowa. Highway 270 was closed from west of Indian Nations Turnpike to Arpelar. Highway 69B was closed from McAlester north to Highway 113.
06/18/2015	Pittsburg County	Portions of a county road were washed out.
11/27/2015	Pittsburg County	Portions of Highway 31 were closed due to high water southwest of McAlester.
11/27/2015	Pittsburg County	Portions of Highway 63 were closed between Haileyville and Kiowa.
12/27/2015	Pittsburg County	Portions of Highway 63 were closed northeast of Blanco due to flooding.
12/27/2015	Pittsburg County	Portions of Highway 31 southwest of McAlester were closed due to flooding.
12/27/2015	Pittsburg County	Roads were flooded around Scipio. A man drove a truck into flood waters covering Ragan Road and was drown.
12/27/2015	Pittsburg County	Portions of US 270 east of Arpelar were closed due to flooding.
12/28/2015	Pittsburg County	Portions of Highway 31 southwest of McAlester were closed due to flooding.
12/28/2015	Pittsburg County	Portions of Highway 270 east of the Indian Nation Turnpike to Arpelar were closed due to flooding.

12/28/2015	Pittsburg County	Portions of Highway 270 east of the Indian Nation Turnpike to Arpelar were closed due to flooding.
04/29/2017	Pittsburg County	Numerous roads were flooded and closed.
05/20/2017	Krebs	Severe flooding was reported in Krebs with several roads under water and flood waters threatening homes.
05/20/2017	Pittsburg County	Portions of Highway 63 were flooded and closed from Bache Road to Haileyville.
05/20/2017	Pittsburg County	Portions of Highway 270 were flooded and closed west of the Indian Nation Turnpike.
08/14/2017	Krebs	Portions of some roads were flooded near Krebs, including Highway 270. A swift water rescue was conducted on Krebs Lake Road.
12/26/2018	Pittsburg County	Portions of Highway 31 and Highway 63 were closed due to high water.
09/26/2019	Pittsburg County	Portions of several roads in and around Scipio were flooded.
01/10/2020	McAlester	Multiple vehicles were driven into flood water, where they were stranded.
01/10/2020	Ashland	Portions of several roads were flooded across southwestern Pittsburg County, as a result of three to five inches of rain that fell across the area. A 58 year-old man drove his pickup truck into deep flood water flowing over S Harper Valley Road, where it became inoperable. He exited the vehicle, was swept downstream by the rapidly flowing water, and was drowned.
05/15/2020	McAlester	Multiple roads were flooded and closed in and around McAlester.
05/27/2020	Haileyville	Portions of several roads were flooded in and around Hartshorne.
09/01/2020	McAlester	A vehicle was driven into flood water near Electric Avenue and Main Street, where it stalled. Portions of several roads in McAlester were closed.
09/01/2020	McAlester	Portions of Highway 31 were flooded and closed between Haywood and McAlester.

### *Probability of Future Events*

The probability of flood events occurring is high in the Planning Area.

### *Extent*

The Planning Area uses Flood Depth Maps to determine the extent of flooding. Flood Depths maps have been included to illustrate the Extent of flooding in the Planning Area. These maps are located in Appendix B. There are several locations as outlined in the maps that have the ability to reach up to five feet, but if a flood were to happen, any depth over six inches would put a strain on the Planning Area.

### *Impact and Vulnerability*

The impact of this hazard occurs during times of inundation. Roads become impassible, homes and businesses inaccessible, and response to emergencies limited or impossible. Roads, like the ones listed in Figures 3-10, 3-11, 3-12, create a danger to the public and first responders, as well as a financial and time hardship.

In the event of heavy flooding, services to the public could be delayed, leading to a lack of confidence in the local jurisdictions' Continuity of Operations needs to be activated. This would insure minimal disruption to public services. At the completion of the Plan, only Pittsburg County and the City of McAlester have this capability. All other participating jurisdictions have defined this as a deficiency. Possible environmental impacts to the Planning Area include deposition of sediment and debris, infectious disease transference through flood water to people and animals, destruction of plants, and disruption of the natural balance of the ecosystem, chemicals, and other hazardous substances may result in water contamination.

Pittsburg County and all participating jurisdictions are vulnerable to flooding events. A large concern for the Planning area is the northern section of Lake Eufala where a potential loss of structure could occur. There are many homes along the lake shore that are extremely susceptible to flooding. This could impact approximately 30% of the county.

In 2015, the Planning Area experienced two major floods that impacted roads, bridges, and the economy. The majority of this impact was to county roads and state highways near waterways. While all schools within the planning area faced issues with reaching students on the bus route, Quinton Public Schools, Crowder Public Schools, and Kiowa Public Schools suffered property damage from the floods. Additional issues that all jurisdictions within the planning area face are individuals driving through flooded roadways. When flooding begins to occur, county commissioners try to block off inundated roads as they're reported. These commissioners have a limited supply of barricades and employees to

do the job. As such, not all flooded roads get barricades. A mitigation activity that has been identified to educate the public on the dangers of driving through flooded areas and to purchase more barricades to keep the public safe.

Figure 3-14 outlines each jurisdiction's impacts and vulnerabilities.

<b>Figure 3-14</b>		
<b>Flood Vulnerabilities</b>		
<b>Jurisdiction</b>	<b>Vulnerabilities Needs Narration</b>	<b>Impacts Needs Narration</b>
Pittsburg County	Several county roads have been washed out by heavy rains and flooded waterways. Others flood frequently to the point of being closed until the water has dried up because they are too low.	Flooded roadways pose a danger to travelers. Although the county has tried to purchase barricades and signs, they don't have enough for the amount of roads affected and sometimes travelers ignore these warnings. It also poses an inconvenience to bus routes and citizens who live in the area.
Town of Alderson	The jurisdiction has identified a lack of education for citizens as a vulnerability.	A lack of education can make citizens unnecessarily vulnerable to this hazard.
Town of Ashland	The jurisdiction has identified a lack of education for citizens as a vulnerability.	A lack of education can make citizens unnecessarily vulnerable to this hazard.
Town of Canadian	The Town of Canadian has several roads that flood or have been washed out.	Flooded roadways pose a danger to travelers. It also poses an inconvenience to bus routes and citizens who live in the area.
	The ditches and culverts in this jurisdiction aren't large enough to handle the current intake.	When the intake is higher than the system can handle, the roads flood. Flooded roadways pose a danger to travelers.. It also poses an inconvenience to bus routes and citizens who live in the area.
	Several roads have been washed out by heavy rains and flooded waterways. Others flood frequently to the point of being closed until the water has dried up because they are too low.	Flooded roadways pose a danger to travelers. It also poses an inconvenience to bus routes and citizens who live in the area.

Carlton Landing	Carlton Landing has identified a drainage issue. When it rains, the streets and sidewalks don't drain as they're supposed to.	Drainage issues can cause water to build up and damage roads or impede traffic.
	Several roads have been washed out by heavy rains and flooded waterways. Others flood frequently to the point of being closed until the water has dried up because they're too low.	Flooded roadways pose a danger to travelers. Although the county has tried to purchase barricades and signs, they don't have enough for the amount of roads affected and sometimes travelers ignore these warnings. It also poses an inconvenience to bus routes and citizens who live in the area.
	The city only has one access point.	If that access point were to flood, the city would be completely cut off.
Town of Crowder	The tin horns and culverts in this jurisdiction aren't large enough to handle the current intake.	When the intake is higher than the system can handle, the roads flood. Flooded roadways pose a danger to travelers.. It also poses an inconvenience to bus routes and citizens who live in the area.
	Several roads have been washed out by heavy rains and flooded waterways. Others flood frequently to the point of being closed until the water has dried up because they're too low.	Flooded roadways pose a danger to travelers.. It also poses an inconvenience to bus routes and citizens who live in the area.
Town of Indianola	The jurisdiction has identified a lack of education for citizens as a vulnerability.	A lack of education can make citizens unnecessarily vulnerable to this hazard.
Town of Kiowa	Several roads have been washed out by heavy rains and flooded waterways. Others flood frequently to the point of being closed until the water has dried up because they're too low.	Flooded roadways pose a danger to travelers. It also poses an inconvenience to bus routes and citizens who live in the area.
	The ditches and culverts in this jurisdiction aren't large enough to handle the current intake.	When the intake is higher than the system can handle, the roads flood.



		Flooded roadways pose a danger to travelers. It also poses an inconvenience to bus routes and citizens who live in the area.
Town of Pittsburg	The sewer pump house and pump experience frequent flooding.	This can disrupt the flow of the system and delay services to citizens.
	The ditches and culverts in this jurisdiction aren't large enough to handle the current intake.	When the intake is higher than the system can handle, the roads flood. Flooded roadways pose a danger to travelers. It also poses an inconvenience to bus routes and citizens who live in the area.
Town of Quinton	Several roads have been washed out by heavy rains and flooded waterways. Others flood frequently to the point of being closed until the water has dried up because they're too low.	Flooded roadways pose a danger to travelers. It also poses an inconvenience to bus routes and citizens who live in the area.
Town of Savanna	Several roads have been washed out by heavy rains and flooded waterways. Others flood frequently to the point of being closed until the water has dried up because they're too low.	Flooded roadways pose a danger to travelers. It also poses an inconvenience to bus routes and citizens who live in the area.
City of Haileyville	The WPA ditches in the jurisdiction are full of debris.	If they don't drain properly, it causes backups that create health hazards and additional flooding.
	There are several old culverts and bridges that become useless when it floods.	Flooded roadways pose a danger to travelers. It also poses an inconvenience to bus routes and citizens who live in the area.
City of Hartshorne	Several roads have been washed out by heavy rains and flooded waterways. Others flood frequently to the point of being closed until the water has dried up because they're too low.	Flooded roadways pose a danger to travelers. It also poses an inconvenience to bus routes and citizens who live in the area.
	The ditches and culverts in this jurisdiction aren't large enough to handle the current intake.	When the intake is higher than the system can handle, the roads flood. Flooded roadways pose a

		danger to travelers. It also poses an inconvenience to bus routes and citizens who live in the area.
City of Krebs	The ditches and culverts in this jurisdiction aren't large enough to handle the current intake.	If they don't drain properly, it causes backups that create health hazards and additional flooding.
	Several roads have been washed out by heavy rains and flooded waterways. Others flood frequently to the point of being closed until the water has dried up because they're too low.	When the intake is higher than the system can handle, the roads flood. Flooded roadways pose a danger to travelers. It also poses an inconvenience to bus routes and citizens who live in the area.
City of McAlester	The entire drainage system for the city has issues when it rains.	When the intake is higher than the system can handle, the roads flood. Flooded roadways pose a danger to travelers. It also poses an inconvenience to bus routes and citizens who live in the area.
McAlester Public Schools	Water congregates in front of the building. Pump at Will Rogers	This causes unnecessary flooding that causes wear on the sidewalks and van stand stagnant, creating a health hazard.
Quinton Public Schools	The school's ball complex floods.	When the ball complex floods, they can't have games.
Crowder Public Schools	Drainage near the school gets backed up easily.	When the intake is higher than the system can handle, roads and sidewalks flood, making them unusable.
Haileyville Public Schools	The guttering at the school isn't able to keep up with typical rainfall.	When the intake is higher than the system can handle, roads and sidewalks flood, making them unusable.
Frink-Chambers Public Schools	Drainage near the school gets backed up easily.	When the intake is higher than the system can handle, roads and

		sidewalks flood, making them unusable.
Tannehill Public Schools	Drainage near the school gets backed up easily.	When the intake is higher than the system can handle, roads and sidewalks flood, making them unusable.
Krebs Public Schools	The guttering at the school isn't able to keep up with typical rainfall.	When the intake is higher than the system can handle, roads and sidewalks flood, making them unusable.
Haywood Public Schools	The guttering at the school isn't able to keep up with typical rainfall.	When the intake is higher than the system can handle, roads and sidewalks flood, making them unusable.
	Drainage near the school gets backed up easily.	When the intake is higher than the system can handle, roads and sidewalks flood, making them unusable.
Savanna Public Schools	Drainage near the school gets backed up easily.	When the intake is higher than the system can handle, roads and sidewalks flood, making them unusable.
Canadian Public Schools	The guttering at the school isn't able to keep up with typical rainfall.	When the intake is higher than the system can handle, roads and sidewalks flood, making them unusable.
Pittsburg Public Schools	The guttering at the school isn't able to keep up with typical rainfall.	When the intake is higher than the system can handle, roads and sidewalks flood, making them unusable.
Hartshorne Public Schools	The guttering at the school isn't able to keep up with typical rainfall.	When the intake is higher than the system can handle, roads and sidewalks flood, making them unusable.
Indianola Public Schools	Drainage near the school gets backed up easily.	When the intake is higher than the system can handle, roads and sidewalks flood, making them unusable.

Kiowa Public Schools	The bus routes tend to flood.	When roads on bus routes flood, it creates a time and resource hardship on the school. It can also prevent kids from receiving education.
Carlton Landing Academy	Drainage near the school gets backed up easily.	When the intake is higher than the system can handle, roads and sidewalks flood, making them unusable.

### 3.4.3 Winter Storm

#### *Description*

Winter storm can refer to a combination of winter precipitation, including snow, sleet, and freezing rain. A severe winter storm can range from freezing rain or sleet to moderate snow over a few hours, or to blizzard conditions and extremely cold temperatures that last several days.

Blowing snow is wind-driven snow that reduces visibility and causes significant drifting. Blizzards occur when falling and blowing snow combine with winds of 35 mph or greater, reducing visibility to near zero.

Freezing rain is precipitation that falls, as liquid, into a layer of freezing air near the surface. When the precipitation makes contact with the surface, it forms into a coating or glaze of ice and even a small accumulation can cause a significant hazard.

Sleet is frozen precipitation that has melted by falling through a warm layer of the atmosphere and then refreezes into ice pellets before reaching the ground. Sleet usually bounces when hitting the surface and can accumulate like snow and become a hazard to motorists.

Ice storms are extended freezing rain events, lasting several hours to sometimes days., when the freezing rain accumulates on surfaces and damages trees, utility lines, and roads, Ice loads on overhead power lines, combined with windy conditions, may cause the lines to “gallop”. This forceful motion often causes the lines to break away from the connectors and poles, resulting in widespread power failure.

Wind chill is used to describe the relative discomfort and danger to people from the combination of cold temperatures and wind. The wind chill chart from the National Weather Service shows the apparent temperature derived from both wind speed and temperature.

A severe winter storm in Pittsburg County is defined as a storm that drops four or more inches of snow during a 12-hour period, or six or more inches during a 24-hour span.

#### *Location*

Winter storms affect the entire Planning Area.

#### *Previous Occurrences*

There were 12 of winter storms recorded in the Planning Area between 2009 and 2019. Occurrence data from the National Oceanic and Atmospheric Administration (NOAA) website is located below.

**Figure 3-15****Winter Storm Previous Occurrences  
2010-2020**

From the NOAA National Centers for Environmental Information

<https://www.ncdc.noaa.gov/stormevents>

<b>Date</b>	<b>Jurisdiction</b>	<b>Narrative</b>
01/29/2010	Pittsburg County	Four inches of snow fell across the northern portion of the county.
02/01/2011	Pittsburg County	Four to six inches of snow fell across much of the county.
02/04/2011	Pittsburg County	Four to five inches of snow fell across the county.
02/09/2011	Pittsburg County	Four inches of snow fell across the northern portion of the county.
12/25/2012	Pittsburg County	A strong storm system translated from the Pacific Northwest across the Southern Rockies and into the Southern Plains from the 23rd through the 25th. Rain began across southeastern Oklahoma during the early morning hours of the 25th as this system approached and then transitioned to light freezing rain and a little sleet. The precipitation changed over to snow during the early afternoon of the 25th and fell heavily for several hours before tapering off late in the evening. A swath of heavy snow occurred across much of central and southern Oklahoma with four to eight inches occurring across southeastern and east central Oklahoma.
12/05/2013	Pittsburg County	Arctic air spread across eastern Oklahoma on the 4th as a strong storm system developed across the western United States. Several upper level disturbances moved through the south central part of the country on the 5th through the 6th, resulting in widespread wintry precipitation across the region beginning during the morning hours of the 5th. The precipitation fell as mainly freezing rain across southeastern Oklahoma and as snow and sleet across northeastern Oklahoma. The precipitation changed to all snow by the time it ended on the 6th. By the end of the storm, portions of southeastern Oklahoma received over an inch of ice. Power outages were widespread across Choctaw, Pushmataha, and Le Flore Counties, some of which lasted for up to two weeks in remote areas.

12/20/2013	Pittsburg County	Arctic air spread across all of eastern Oklahoma on the 20th as a strong storm system developed into the Southern Rockies. Precipitation began to increase across northeastern Oklahoma during the evening hours of the 20th and continued through the 21st. Warm air overriding the shallow cold air near the ground resulted in freezing rain. Much of eastern Oklahoma north of a McAlester to Stillwell line received between a quarter and a half inch of ice with locally near three quarters of an inch in some areas of northeastern Oklahoma. Scattered to numerous power outages and widespread tree damage occurred across the region. The freezing rain changed to snow during the evening of the 21st with very light accumulations across portions of northeastern Oklahoma. The ice and snow resulted in slick and hazardous roads. The ice finally melted off trees and power lines on the 24th, when temperatures climbed above freezing for the first time since the storm.
02/02/2014	Pittsburg County	A strong upper level disturbance moved into the Southern Plains from the southwest on February 2nd. Arctic air was already in place across eastern Oklahoma ahead of this system. Precipitation developed during the morning hours and continued into the late afternoon and evening hours. Light freezing rain and sleet fell across portions of southeastern Oklahoma early in the event, otherwise the precipitation fell as snow across the area. Portions of southeastern Oklahoma received between one half and one and a half inches of sleet with up to two tenths of an inch of ice. Four to seven inches of snow occurred across much of east central and northeastern Oklahoma during this event. Roads were snow and ice covered, resulting in numerous automobile accidents.

03/02/2014	Pittsburg County	Arctic air surged south into eastern Oklahoma late on March 1st ahead of a strong upper level disturbance that moved from the Southern Rockies into the Southern Plains. Precipitation developed over the region as this system approached during the late evening of the 1st. Periods of light freezing rain and sleet occurred across much of the area through the morning of the 2nd. Thunderstorms developed over the shallow cold air near the ground and resulted in heavy sleet across a lot of the region through late afternoon. Snow developed into the area during the evening of the 2nd as the strong upper level disturbance finally translated across the area. The precipitation ended during the early morning hours of the 3rd. Several inches of snow and sleet covered much of the region and resulted in travel difficulties.
02/15/2015	Pittsburg County	An arctic cold front moved through eastern Oklahoma late on the 14th and early on the 15th. A strong upper level disturbance moved into the Southern Plains late on the 15th, resulting in widespread precipitation developing across the region as warm and moist air was lifted over the low level cold air.   A brief period of light rain quickly changed to freezing rain and sleet over much of northeastern Oklahoma. Some convection embedded in the precipitation resulted in rapid accumulations of sleet over a light accumulation of glaze. Some areas received between half an inch and an inch of sleet before precipitation changed over to snow during the early morning hours of the 16th. Much of the region received between three and six inches of sleet and snow.  The rain gradually changed over to sleet over east central and southeastern Oklahoma during the late evening of the 15th. Sleet accumulations across this region were also in the half inch to nearly two inch amounts, with some embedded convection responsible for rapid accumulations.
02/23/2015	Pittsburg County	An upper level disturbance moved through the Southern Plains on the 23rd, resulting in widespread precipitation development. Arctic air had already settled into the area, which supported a widespread snowfall. Some portions of east central Oklahoma received between four and five inches of snow during the event.



02/27/2015	Pittsburg County	A series of upper level disturbances moved through the Southern Plains on the 27th and 28th, ahead of a strong low pressure system located over the southwestern United States. Arctic air was already in place ahead of these disturbances, resulting in widespread snow across the region. A swath of snow in the four to five inch category occurred across northeastern Oklahoma and another occurred across portions of southeastern Oklahoma.
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### *Probability of Future Events*

The probability of winter storm events is high for the Planning Area.

### *Extent*

The extent of a winter storm in Oklahoma can vary greatly and is influenced by a variety of factors. The local weather conditions can influence the extent of a storm as can the way ice and snow accumulate. Even a relatively minor winter storm, with ice buildup on elevated roadways and bridges, can become dangerous, impacting the mobility of the public, power company officials, first responders, and emergency management officials due to slick, hazardous and/or impassible roads. Any amount of ice on roads has the ability to negatively affect the Planning Area and the public.

Ice damage to trees and power lines can cause electricity to be out for days, if not weeks, thus greatly expanding the extent of this natural hazard. Power outages caused by the effects of winter storm also creates a health concern of food borne illness in facilities that serve or store food and threaten life sustaining machinery the Planning Area and hospitals rely on. The local jurisdictions within the Planning Area have identified generators to mitigate the issues power outages bring.

All jurisdictions within the Planning Area use the Sperry-Piltz Ice Accumulation (SPIA) Index to measure the extent of winter storms. In the past, all jurisdictions have seen up to a 4 on the scale. They expect to see the same measure of storms in the future. The Planning Area starts to see the effects of winter storms when the scale rises to a one. Anything after that number can potentially start to exhaust the local jurisdictions' resources.

The extent of the impact of a winter storm can be lessened by the identification of at-risk populations, by weather warnings and notifications, by the establishment of warming rooms and utility bill assistance programs, road condition alerts, ensuring there are backup electric power generation for critical facilities, and so forth.

**Figure 3-16**  
**Sperry-Piltz ice Accumulation (SPIA) Index**

**The Sperry-Piltz Ice Accumulation Index, or “SPIA Index” – Copyright, February, 2009**

ICE DAMAGE INDEX	DAMAGE AND IMPACT DESCRIPTIONS
<b>0</b>	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
<b>1</b>	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
<b>2</b>	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
<b>3</b>	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
<b>4</b>	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
<b>5</b>	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

### *Impact and Vulnerability*

The impacts of this hazard can affect a region for weeks. Houses are damaged from the weight of the ice, roads buckle and or become slick and hazardous, electrical poles and lines break, and people lose their electricity and heat, water lines freeze and burst due to the cold weather and people and livestock have no water. Winter storms impact the environment by destroying vegetation with secondary impacts of flooding causing possible water and soil contamination. Possible impacts to first responders include hypothermia, contact with damaged powerlines, hazardous roadways, injuries, and fatalities.

In the event of a winter storm, services to the public could be delayed, leading to a lack of confidence in the local jurisdictions' ability to govern. In the event facilities or access to facilities is compromised, the local jurisdictions' Continuity of Operations needs to be activated. This would insure minimal disruption to public services. At this time, only Pittsburg County and the City of McAlester have a Continuity of Operations Plan to enact. All other participating jurisdictions do not have a plan, and this is considered a vulnerability.

While winter storms occur nearly every year, the public isn't accustomed to driving in the conditions this hazard creates. Every time there is a winter storm, first responders become inundated with traffic accidents and house fire calls. All jurisdictions have identified a need to educate the public on how to handle these conditions and how to keep warm without endangering lives and property.

School districts typically must close schools during winter storm events to keep kids from being out in these conditions. While they may see impacts to buildings and power, they have only identified a need for education to students to show how severe the effects of this hazard can be to those who are not prepared and how to be more prepared.

Figure 3-17		
Winter Storm Vulnerabilities		
Jurisdiction	Vulnerabilities Needs Narration and MI	Impact Needs Narration
Pittsburg County	There are several critical facilities within the jurisdiction that are lacking generators, including the County Courthouse, several fire departments, and others.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Alderson	The Alderson Fire Department lacks a generator.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Ashland	The Ashland Fire Department lacks a generator.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Canadian	The Town of Canadian lacks generators at the Town Hall, Lift Station, and several others identified critical facilities.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.
Carlton Landing	The jurisdiction only has one access route to it.	During winter storms, the jurisdiction only has one way in and out. If that way was to be blocked, they would be cut off.

	The Carlton Landing Fire Department and one of their lift stations lack generators.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Crowder	The Crowder Fire Department and Senior Center lack generators.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Indianola	The Indianola Fire Department lacks a generator.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Kiowa	The jurisdiction has access to a mass notification system but doesn't have enough employees trained in it or policies and procedures in place to know when to use it.	Unreliable messaging could confuse citizens and make cause a delay in preparedness for impending storms.
Town of Pittsburg	All of the identified critical facilities for the Town of Pittsburg lack generators.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.

Town of Quinton	Quinton's town hall and fire department lack generators.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Savanna	All but two of Savanna's identified critical facilities lack generators.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.
City of Haileyville	None of this jurisdiction's critical facilities have generators.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.
	The jurisdiction has access to a mass notification system but doesn't have enough employees trained in it or policies and procedures in place to know when to use it.	Unreliable messaging could confuse citizens and make cause a delay in preparedness for impending storms.
City of Hartshorne	The City Hall does not have a generator.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.
City of Krebs	The jurisdiction doesn't think their citizens understand the hazard or are prepared to handle it when it happens.	A lack of education can cause preventable injuries and impede preparedness.

City of McAlester	There are several critical facilities within the jurisdiction that are lacking generators.	Without generators, critical facilities can't guarantee they will be able to function during winter storms. If these facilities are unable to stay open, essential services to the public could be delayed.
	The city doesn't have enough resources to keep the roads in good condition.	If the roads are impassible, it can cause accidents and creates a time and economic hardship for the city.
McAlester Public Schools	The school district does not have an emergency generator.	Should an outage occur during school hours, the buildings need to be functional to safely accommodate and keep kids warm until the event or the school day is over to prevent injury or sickness.
Quinton Public Schools	The school district does not have an emergency generator.	Should an outage occur during school hours, the buildings need to be functional to safely accommodate and keep kids warm until the event or the school day is over to prevent injury or sickness.
Crowder Public Schools	The school district does not have an emergency generator.	Should an outage occur during school hours, the buildings need to be functional to safely accommodate and keep kids warm until the event or the school day is over to prevent injury or sickness.
Haileyville Public Schools	The school district does not have an emergency generator.	Should an outage occur during school hours, the buildings need to be functional to safely accommodate and keep kids warm until the event or the school day is over to prevent injury or sickness.

Frink-Chambers Public Schools	The school district does not have an emergency generator.	Should an outage occur during school hours, the buildings need to be functional to safely accommodate and keep kids warm until the event or the school day is over to prevent injury or sickness.
Tannehill Public Schools	The school district does not have an emergency generator.	Should an outage occur during school hours, the buildings need to be functional to safely accommodate and keep kids warm until the event or the school day is over to prevent injury or sickness.
	The jurisdiction has access to a mass notification system but doesn't have enough employees trained in it or policies and procedures in place to know when to use it.	Unreliable messaging could confuse citizens and make cause a delay in preparedness for impending storms.
Krebs Public Schools	The school district doesn't have confidence in the student's current knowledge level about winter storm preparedness.	A lack of education can cause preventable injuries and impede preparedness.
Haywood Public Schools	The school district doesn't have confidence in the student's current knowledge level about winter storm preparedness.	A lack of education can cause preventable injuries and impede preparedness.
Savanna Public Schools	The school district doesn't have confidence in the student's current knowledge level about winter storm preparedness.	A lack of education can cause preventable injuries and impede preparedness.
Canadian Public Schools	The school district doesn't have confidence in the student's current knowledge level about winter storm preparedness.	A lack of education can cause preventable injuries and impede preparedness.
Pittsburg Public Schools	The school district doesn't have confidence in the student's current knowledge level about winter storm preparedness.	A lack of education can cause preventable injuries and impede preparedness.
Hartshorne Public Schools	The school district does not have an emergency generator.	Should an outage occur during school hours, the buildings need to be functional to safely accommodate and keep kids warm until the event or the school day is over to prevent injury or sickness.



Indianola Public Schools	The school district doesn't have confidence in the student's current knowledge level about winter storm preparedness.	A lack of education can cause preventable injuries and impede preparedness.
Kiowa Public Schools	The school district doesn't have confidence in the student's current knowledge level about winter storm preparedness.	A lack of education can cause preventable injuries and impede preparedness.
Carlton Landing Academy	The school district does not have an emergency generator.	Should an outage occur during school hours, the buildings need to be functional to safely accommodate and keep kids warm until the event or the school day is over to prevent injury or sickness.

#### 3.4.4 Wildfire

##### *Description*

A wildfire is described as a fire that is uncontrolled in a rural or wilderness area. The typical time for wildfires to occur in Oklahoma is in the late fall through winter and into early spring, which coincides with dormant vegetation and the time when the state receives little to no regular precipitation. A wildfire often goes unnoticed until it grows in size and is harder to control. These fires can be started through a variety of different ways including arson, a campfire not put out thoroughly, a tossed cigarette, burning debris, or lightning. The three different classes of wildfires are surface fires, ground fires, and crown fires.

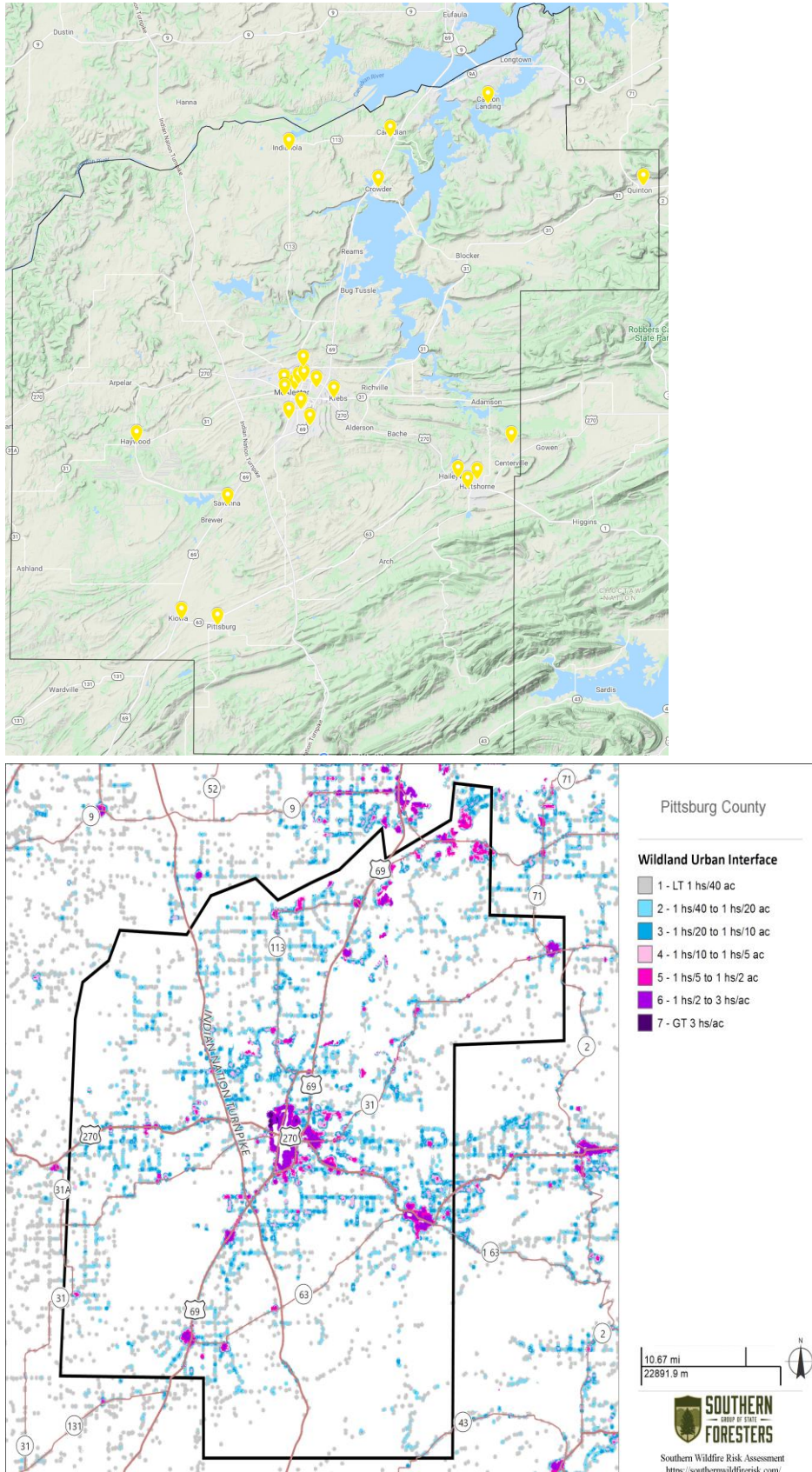
##### *Location*

While Pittsburg County and all jurisdictions in the planning area have the risk of being affected by wildfires, the highest risk areas are located in rural areas where the vegetation provides ample fuel for fires. The northern end of the county near HWY 9 has a greater risk of structure loss due to the close proximity of a large parcel of underdeveloped land with ample fuel for wildfires. Another at risk location within the county is near the Town of Pittsburg where hay meadows and forest lands surround Pittsburg Public Schools.

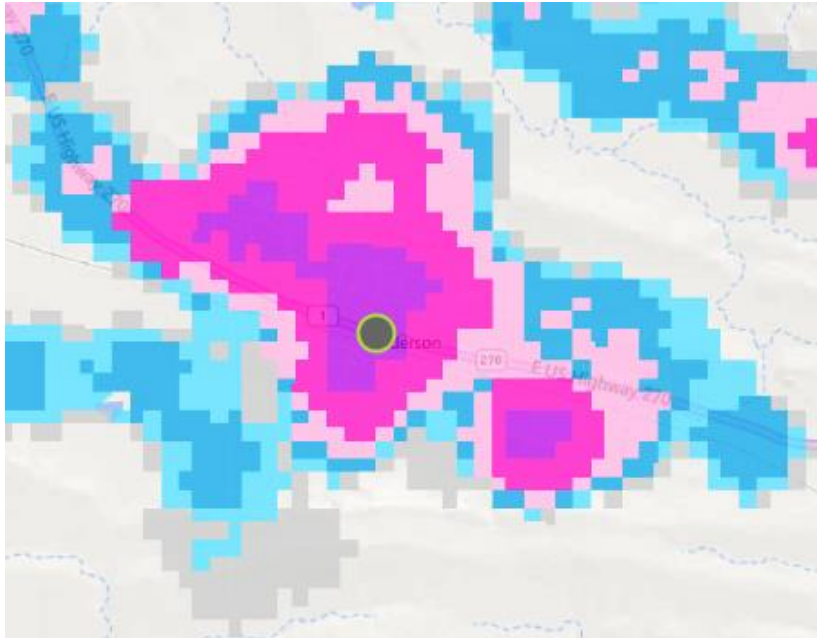
The Wildland Urban Interface (WUI) Map depicts where humans and their structures meet or intermix with wildland fuel. For the Planning Area, it is estimated that 83.9% of the population lives within the WUI. Figure 3-18 shows where these areas are located.

**Figure 3-18**

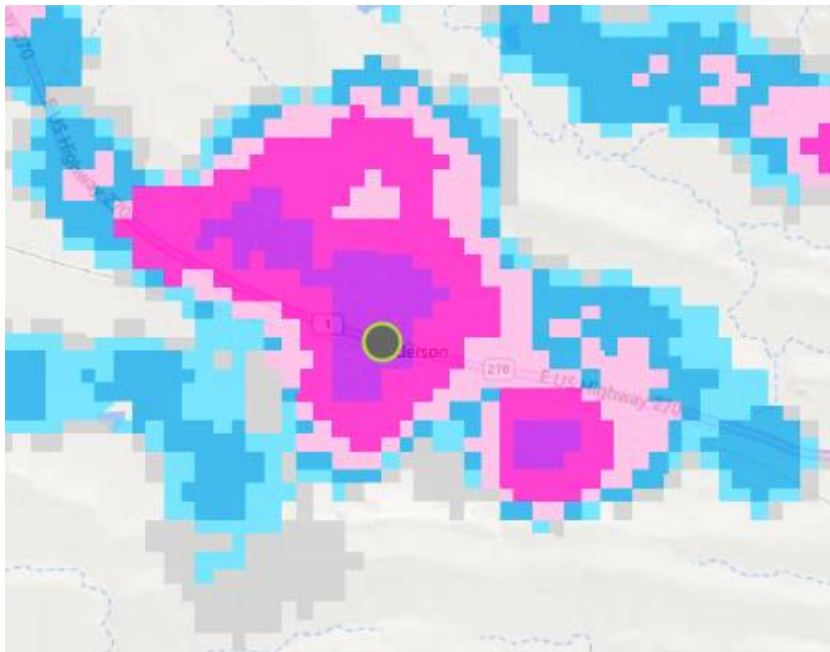
**Map of Planning Area and Wildfire Urban Interface Map**



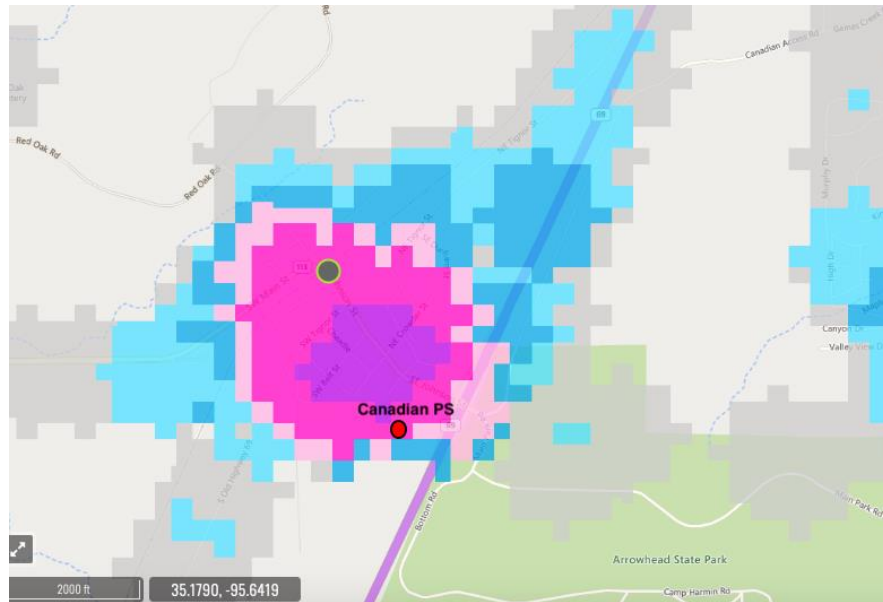
## Alderson



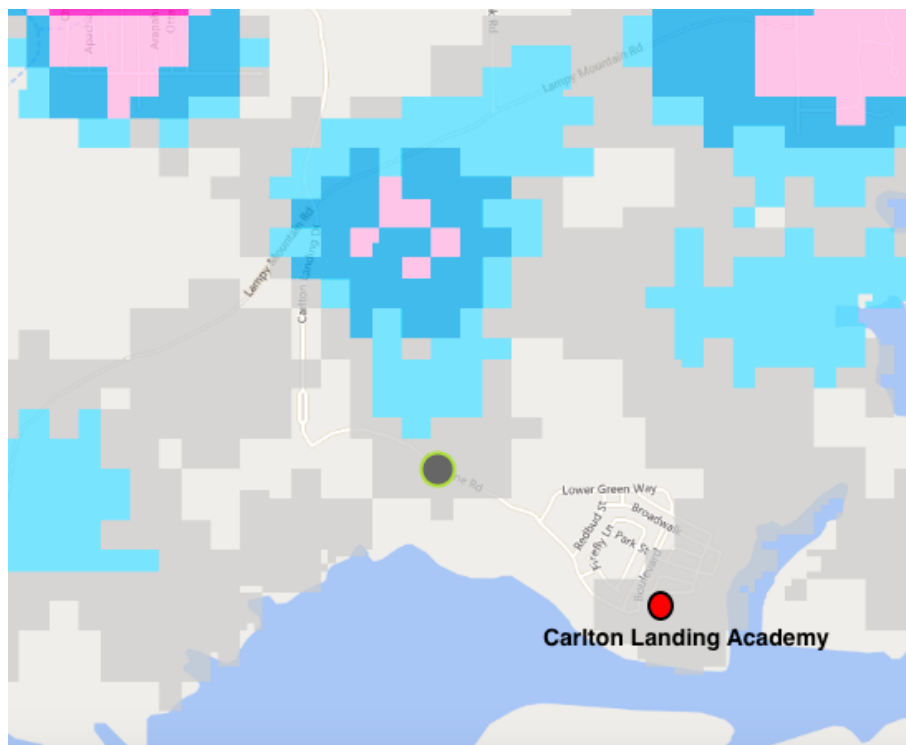
## Ashland



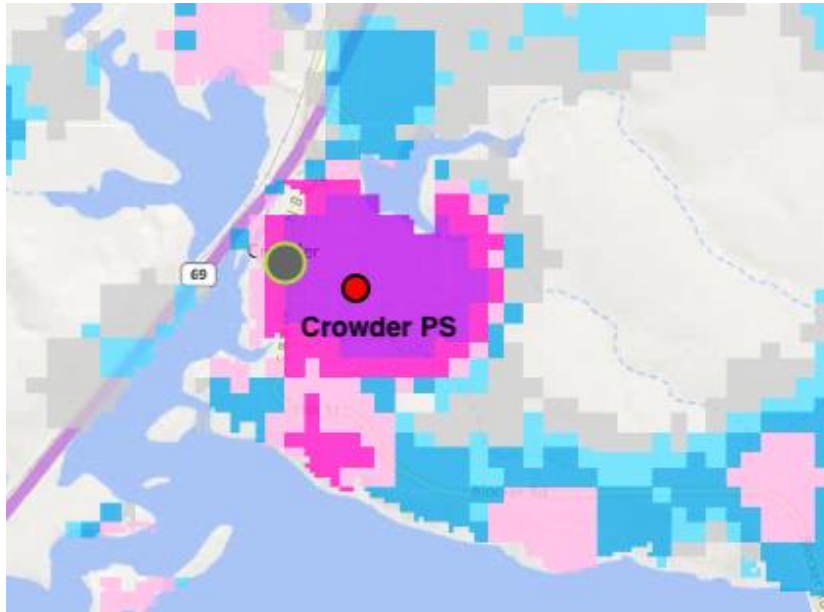
## Canadian/Canadian PS



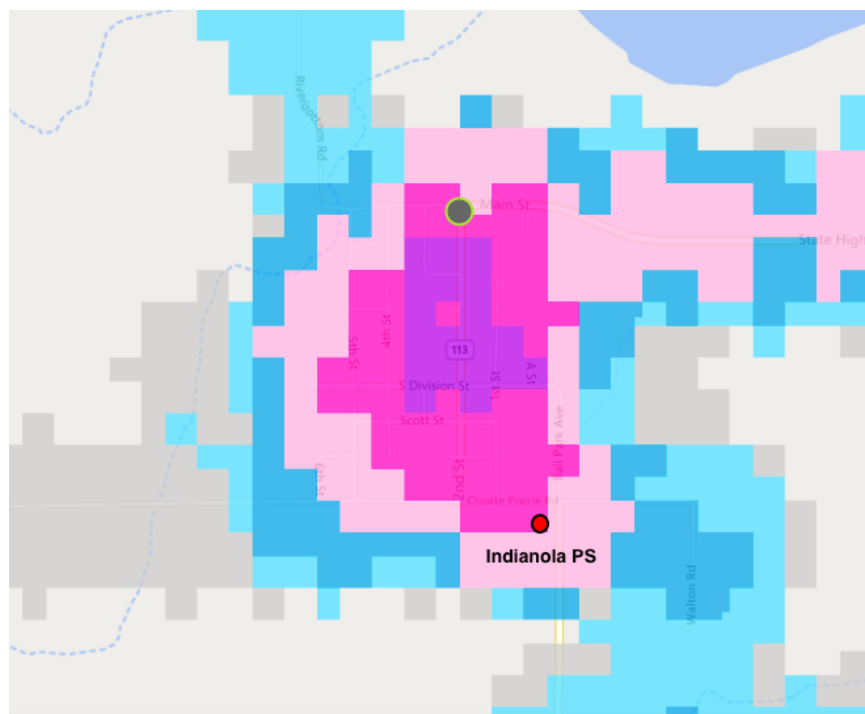
**Carlton Landing/Carlton Landing Academy**



**Crowder/Crowder PS**

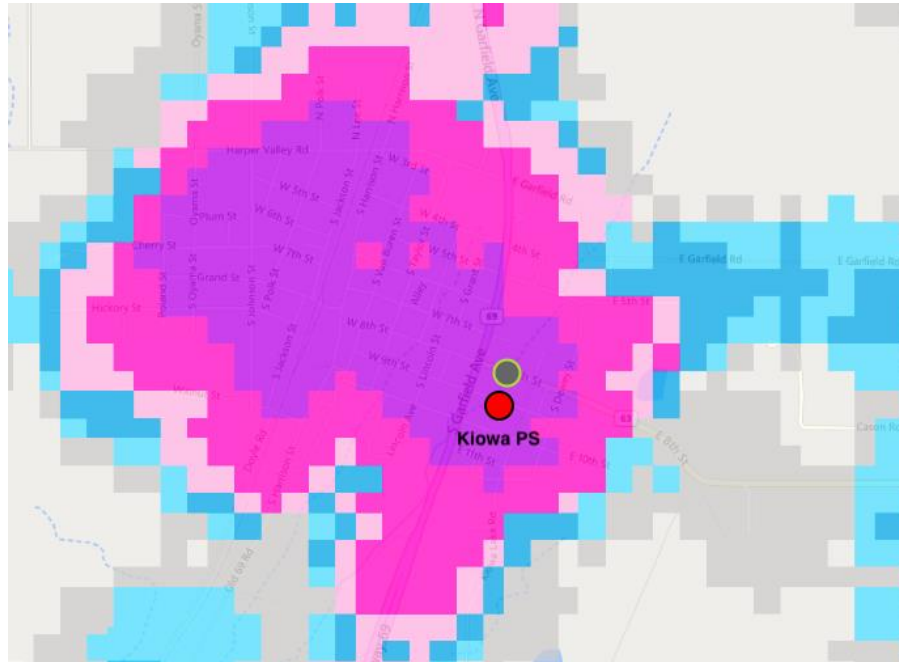


**Indianola/Indianola PS**

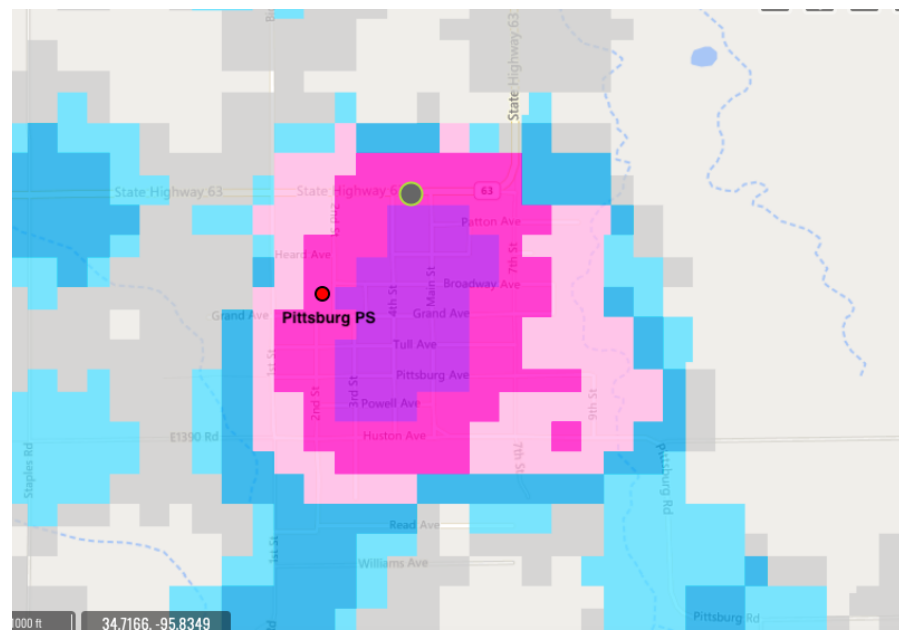


**Kiowa/Kiowa PS**

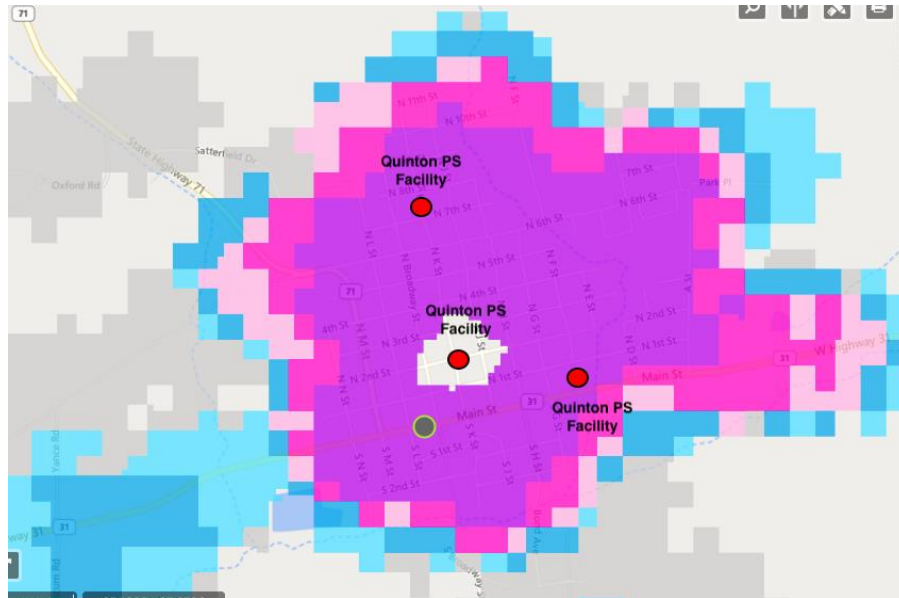
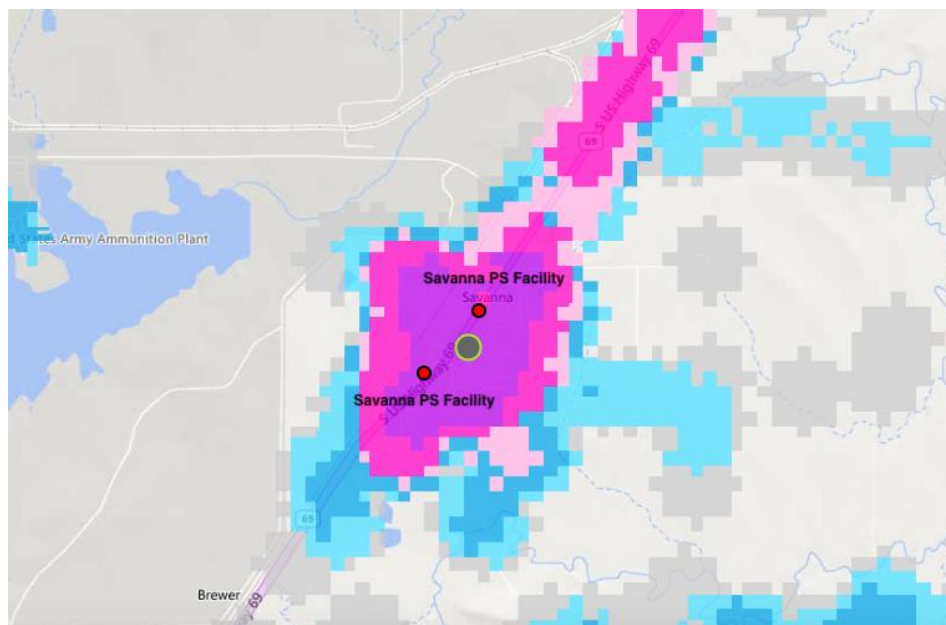




**Pittsburg/Pittsburg PS**

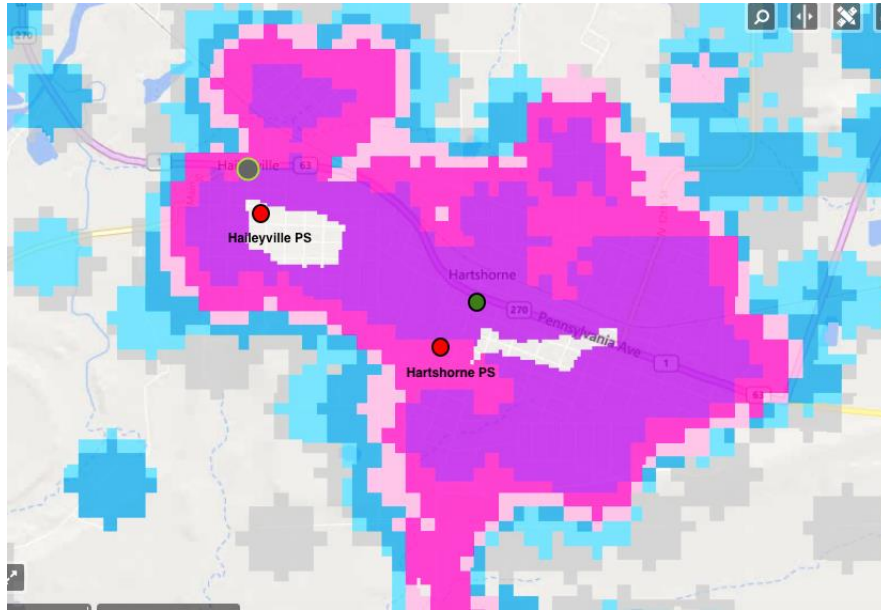


**Quinton/Quinton PS**

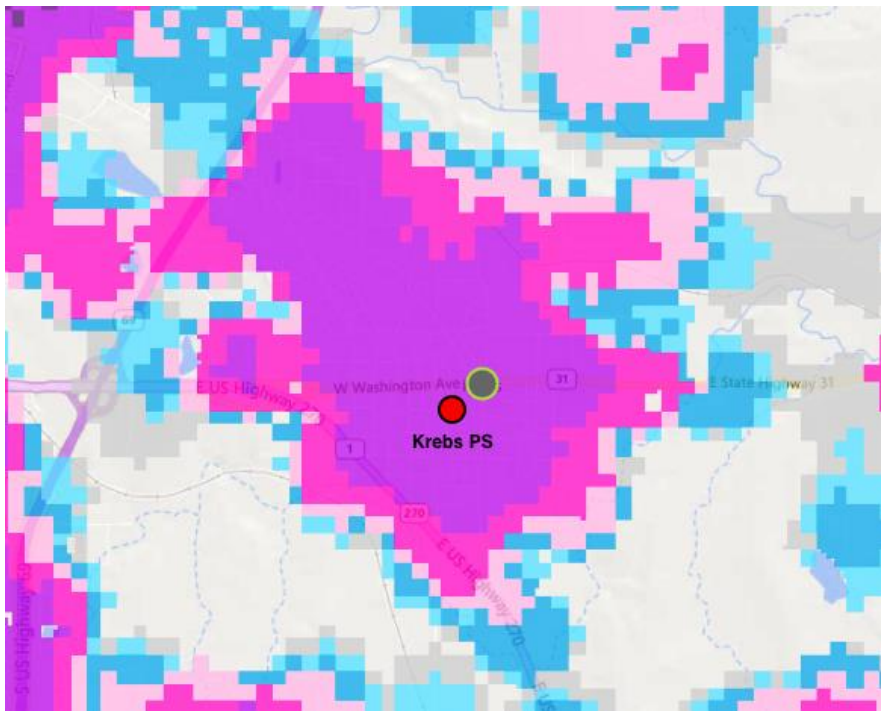
**Savanna/Savanna PS**

**Haileyville/Haileyville PS**  
**Hartshorne/Hartshorne PS**

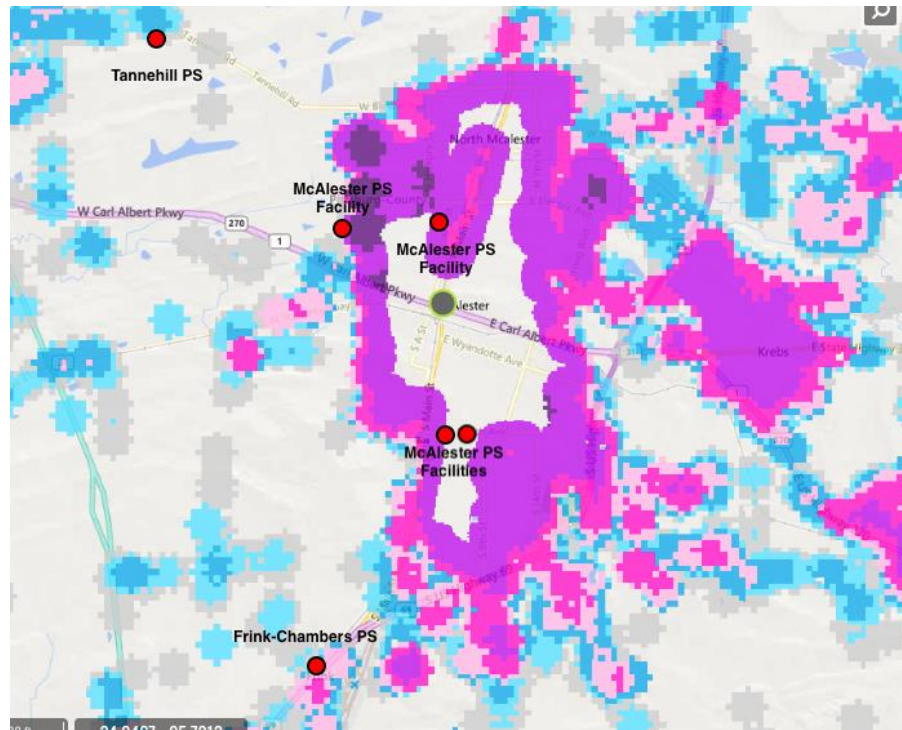




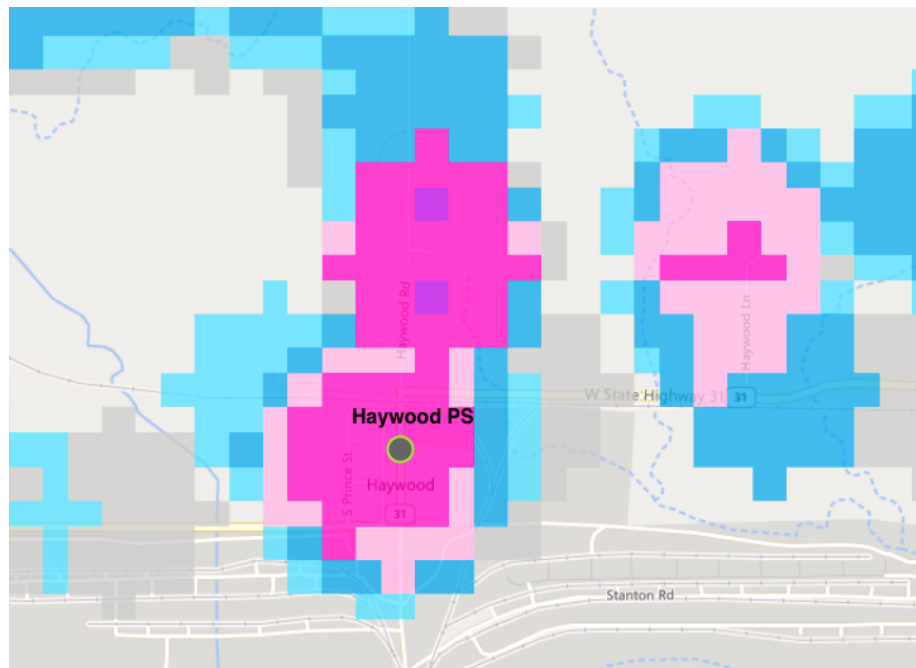
**Krebs/Krebs PS**



**McAlester/McAlester PS/Frink-Chambers PS/Tannehill PS**



## Haywood PS



### *Previous Occurrences*

The Planning Area has experienced nearly 900 wildfire events between 2010 and 2020. Unfortunately, this data is spread across multiple departments with different record keeping systems.

### *Probability of Future Events*

The probability of future events within the Planning Area is high due to previous occurrences.



The WUI Risk (Figures 3-17 and 3-18) represents a rating of the potential impact of a wildfire on people in their homes. The scale starts at -1 Minor Impacts and ends with -9 Major Impacts. The data from Figures 3-19 and 3-20 shows the Planning Area sees the entire scale but has a majority impact of -2.

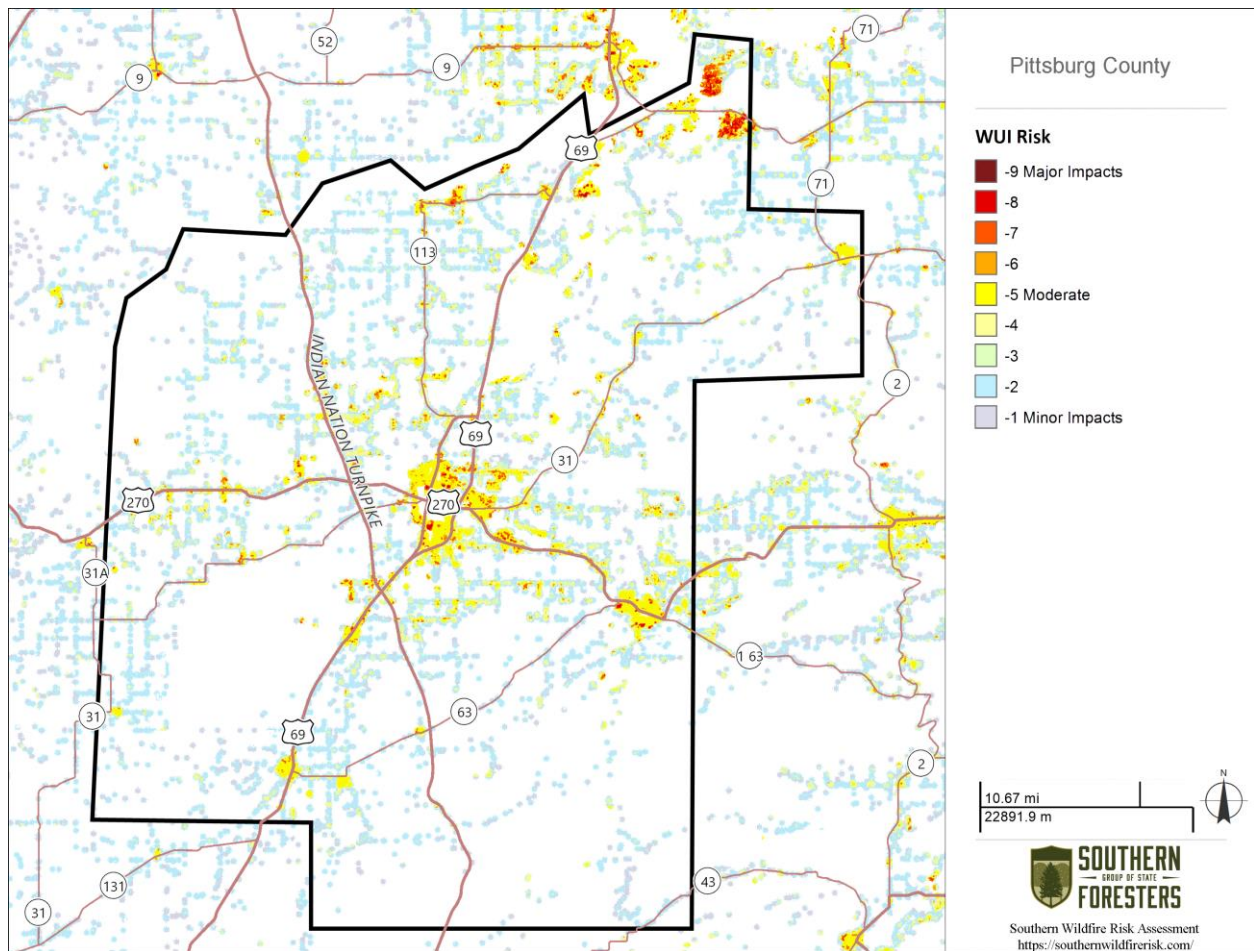
**Figure 3-19**

**WUI Risk**

Class	Acres	Percent
-9 Major Impacts	12	0.0 %
-8	1,035	0.5 %
-7	3,657	1.7 %
-6	3,647	1.7 %
-5 Moderate	25,139	11.6 %
-4	22,446	10.4 %
-3	17,174	7.9 %
-2	110,413	51.0 %
-1 Minor Impacts	33,083	15.3 %
<b>Total</b>	<b>216,606</b>	<b>100.0 %</b>











**Figure 3-20**

**WUI Risk**



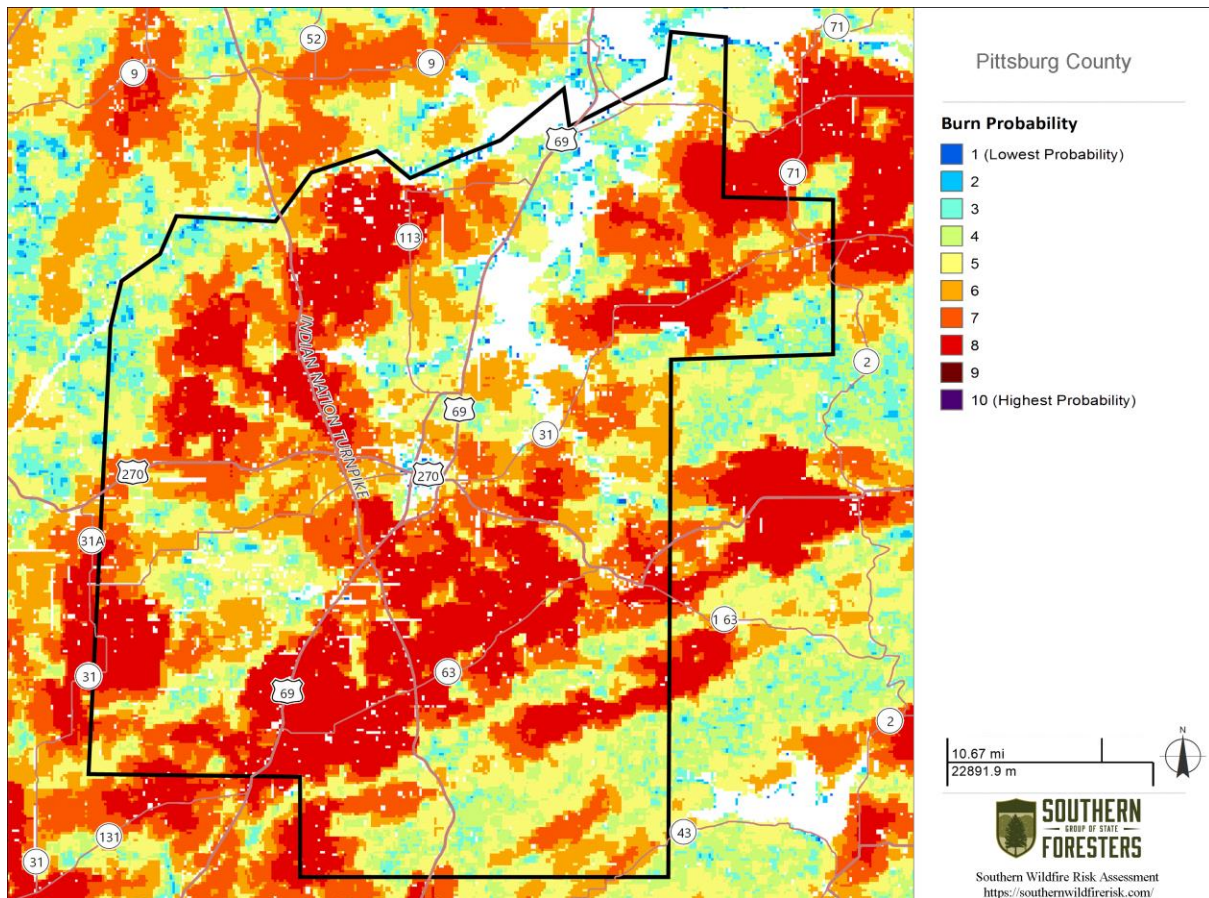
The Burn Probability Map shows the probability of an area burning given current landscape conditions, percentile weather, historical ignition patterns, and historical fire prevention and suppression efforts. Figures 3-21 and 3-22 show where these probabilities are the greatest. The scale shows 1 as the lowest probability and 10 as the highest probability. The Planning Area only sees 1-8 on the scale.

**Figure 3-21**  
**Burn Probability**

	Class	Acres	Percent
	1	1,099	0.1 %
	2	5,476	0.7 %
	3	38,045	4.8 %
	4	84,684	10.7 %
	5	159,387	20.2 %
	6	134,366	17.0 %
	7	162,738	20.6 %
	8	205,197	25.9 %
	9	0	0.0 %
	10	0	0.0 %
<b>Total</b>		<b>790,992</b>	<b>100.0 %</b>



**Figure 3-22**  
**Burn Probability**



#### *Extent*

The Burning Index is a short-term response to meteorological factors. The burning index includes real-time observations of temperature, relative humidity, wind speed and solar radiation. It applies those factors to a vegetation model, which includes the “relative greenness,” (a satellite-derived measure of the health of the vegetation), and fuel models for native vegetation. This vegetation model is comprised of 1-kilometer grids across Oklahoma. The model uses these inputs to produce four indices: Spread Component, Energy Release Component, Ignition Component, and Burning Index. Burning Index is a synthesis of the Spread and Energy Release components and infers fire line intensity and flame length. The higher the number, the more difficult it is to fight a wildfire. The Planning Area starts to see the affects and stress on resources at a Fire Line Intensity of >100 but has seen and expects to continue seeing the full range of the scale.

**Figure 3-23**  
**The Burning Index**

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



### *Impact and Vulnerability*

Possible environmental impacts of wildfires are loss of plant and animal life and the disruption of the natural balance of the ecosystem, chemicals, and other hazardous substances. Environmental impact after a wildfire is considered high.

Impacts to responders include severe burns, heat exhaustion, smoke inhalation, other injuries and fatalities. Roads that become impassable due to smoke or other circumstances related to the hazard create a health risk, financial, and time hardship to the local governments, the public, the school districts and others that must find alternative routes around affected areas.

Smoke from fires can cover roadways, leaving them impassible. Additionally, services to the public could be delayed, leading to a lack of confidence in the jurisdictions' ability to govern. In the event facilities or access to facilities are limited, the local jurisdiction's Continuity of Operations/Government Plan may be activated ensuring minimal disruption to essential services. At this time, only Pittsburg County and the City of McAlester have a Continuity of Operations Plan to enact. All other participating jurisdictions do not have a plan, and this is considered a vulnerability.

Farmers and ranchers who also reside in rural or unincorporated parts of the Planning Area rely on crops and livestock for financial support. Wildfires can burn several hundreds of acres before being stopped, posing a financial and health risk to these citizens.

**Figure 3-24**

<b>Wildfire Vulnerabilities</b>		
<b>Jurisdiction</b>	<b>Vulnerabilities</b>	<b>Impact</b>
Pittsburg County	The county doesn't put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.
Town of Alderson	The jurisdiction doesn't have the proper equipment to keep the city clear from potential fire hazards such as overgrown brush.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Town of Ashland	The Town of Ashland doesn't have the proper equipment to keep the city clear from potential fire hazards such as overgrown brush.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Town of Canadian	The jurisdiction doesn't put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.
	The Town of Canadian doesn't participate in any kind of debris removal or fuel reduction programs.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Carlton Landing	The jurisdiction only has one access point.	If the access point were to be compromised by a wildfire, the citizens would be cut off.
Town of Crowder	The Town of Crowder doesn't have the proper equipment to keep the city clear from potential fire hazards such as overgrown brush.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Town of Indianola	The jurisdiction doesn't have enough fire hydrants or other water sources.	If a wildfire were to happen, the jurisdiction wouldn't have the resources to contain it or put it out completely which would put citizens, homes, livestock, and other buildings in danger.

Town of Kiowa	The jurisdiction doesn't have enough fire hydrants or other water sources.	If a wildfire were to happen, the jurisdiction wouldn't have the resources to contain it or put it out completely which would put citizens, homes, livestock, and other buildings in danger.
	The jurisdiction doesn't have the proper equipment to keep the city clear from potential fire hazards such as overgrown brush.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Town of Pittsburg	The jurisdiction doesn't have a clear or consistent system for keeping the town clear of potential fire fuels.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Town of Quinton	The jurisdiction doesn't put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.
Town of Savanna	The jurisdiction doesn't put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.
City of Haileyville	The jurisdiction doesn't put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.
	The City of Haileyville has several overgrown areas that have increased the jurisdiction fire risk.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
City of Hartshorne	The jurisdiction doesn't participate in any fire fuel reduction programs and doesn't have any clear procedures for clearing debris.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
City of Krebs	The jurisdiction doesn't put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.

	The jurisdiction doesn't have a system to clean potential fire fuels from the area.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
City of McAlester	The city doesn't have the proper equipment to keep the city clear from potential fire hazards such as overgrown brush or to put out fires once they start.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
McAlester Public Schools	McAlester Public Schools doesn't participate in any kind of fire prevention program and believes that's a deficiency for the school district.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Quinton Public Schools	The jurisdiction doesn't have a system to clean potential fire fuels from the grounds.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Crowder Public Schools	The school district doesn't think they put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.
Haileyville Public Schools	Haileyville Public Schools doesn't participate in any kind of fire prevention program and believes that's a deficiency for the school district.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Frink-Chambers Public Schools	Frink-Chambers Public Schools doesn't participate in any kind of fire prevention program and believes that's a deficiency for the school district.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Tannehill Public Schools	Tannehill Public Schools doesn't participate in any kind of fire prevention program and believes that's a deficiency for the school district.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
	The school district doesn't think they put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.
	There isn't a system or program in place to clear potential fire fuels.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.

Krebs Public Schools	The jurisdiction doesn't participate in any fire fuel reduction programs and doesn't have any clear procedures for clearing debris.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Haywood Public Schools	The school district doesn't think they put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.
Savanna Public Schools	The school district doesn't think they put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.
	Savanna Public Schools doesn't participate in any kind of fire prevention program and believes that's a deficiency for the school district.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Canadian Public Schools	Canadian Public Schools doesn't participate in any kind of fire prevention program and believes that's a deficiency for the school district.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Pittsburg Public Schools	The school district doesn't think they put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.
Hartshorne Public Schools	Hartshorne Public Schools doesn't participate in any kind of fire prevention program and believes that's a deficiency for the school district.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.
Indianola Public Schools	The school district doesn't think they put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.

Kiowa Public Schools	The school district doesn't think they put out enough wildfire awareness or education.	A lack of education can cause preventable incidents that could put several people, homes, livestock, and other structures in danger.
Carlton Landing Academy	The jurisdiction doesn't have a system to clean potential fire fuels from the grounds.	Overgrown brush and other potential fire fuels increases the probability of a wildfire event.

### 3.4.5 Lightning

#### *Description*

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.

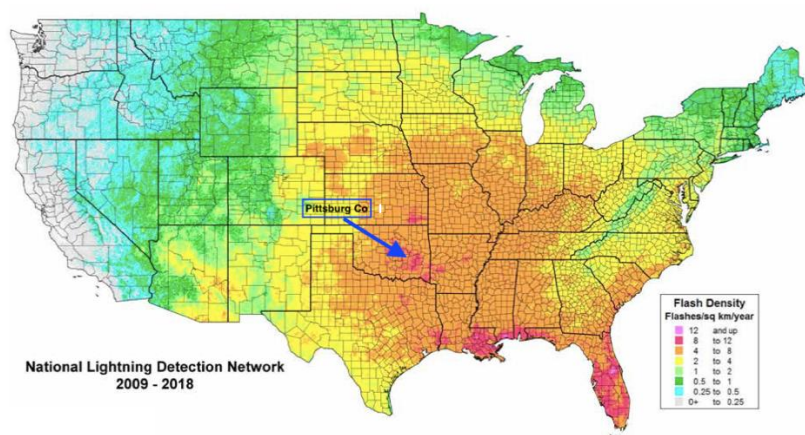
#### *Location*

The entire Planning Area is at risk to lightning, though outdoor events are considered the most at risk to this hazard.

#### *Previous Occurrences*

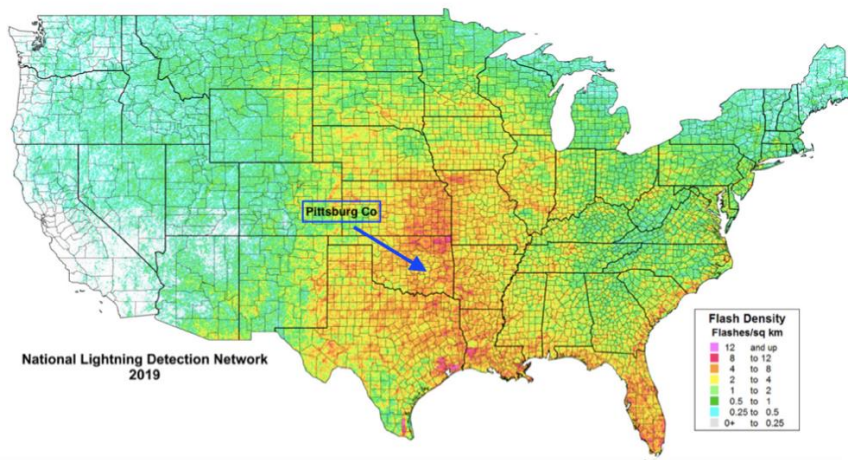
According to Vaisala Lightning Report data, the Planning Area has received 2 - 12 Cloud-to-Ground Lightning flashes per year, per square kilometer between 2009-2020.

### U.S. Cloud-to-Ground Lightning Flash Density Map 2009-2018

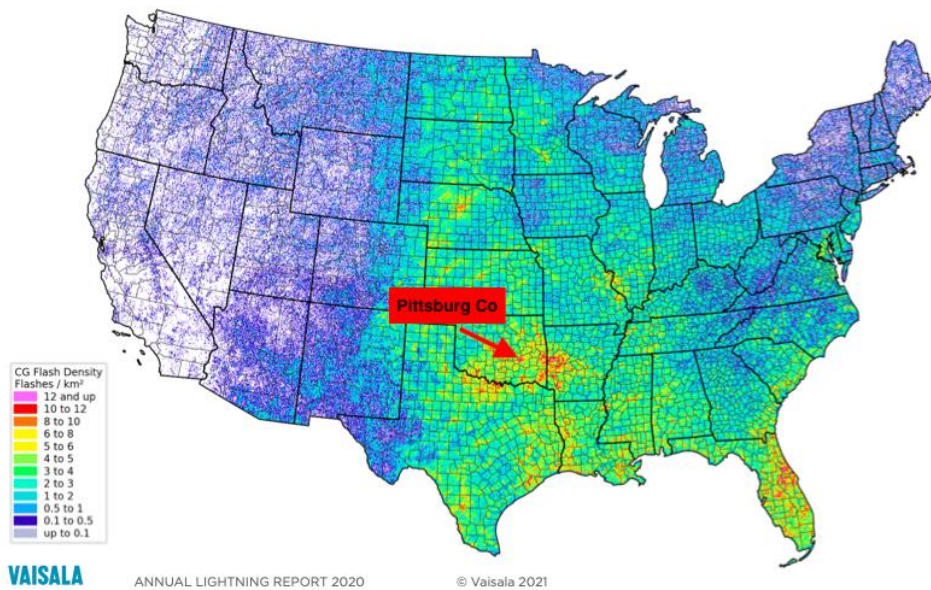




## U.S. Cloud-to-Ground Flash Density in 2019



## U.S. cloud-to-ground flash density in 2020



### *Probability of Future Events*

The probability of future events is considered high.

### *Extent*

There are two different types of lightning—sheet lightning and cloud-to-ground lightning. Cloud-to-ground lightning begins with a step like series of negative or positive charges and then races downward from a storm cloud toward Earth. There is both positive and negative charged cloud-to-ground lightning.



Positive cloud-to-ground lightning flashes make up about 5-10% of all cloud-to-ground lightning. These flashes typically originate in the upper portion of thunderstorms. Due to the location of this type of lightning, it's usually observed approximately 10 or more miles from where it is currently striking along earth's surface. These flashes occur away from the main point of precipitation meaning it has a higher probability of creating wildfires and extra fire danger than negative cloud-to-ground lightning.

The Planning Area uses the Vaisala Lightning Report data to categorizes Lightning extent, and data maps are provided in the Previous Occurrence section. The Planning Area can expect to receive 2 - 12 Cloud-to-Ground Lightning flashes per year, per square kilometer.

### *Impact and Vulnerability*

The impact of lightning occurs during cloud to ground lightning. None of the participating jurisdictions or school districts have ever reported damage to facilities from this hazard but recognizes the potential for future impacts. The main concern for all jurisdictions and school districts is outdoor events. If lightning were to strike during an outdoor event, the potential for loss of life and property is high. Because of this, school districts have guidelines to follow in case of a lightning event that would delay all outdoor activities until it's safe to continue.

Possible environmental impacts from lightning include loss of plant and animal life, wildfires, and disruption of the natural balance of the ecosystem, chemicals, and other hazardous substances. Environmental impact after a lightning event is considered high.

Another large concern are the fishing tournaments held on Lake Eufala. Portions of the lake are located in the Town of Crowder, Town of Canadian, and the County. When the participants are on the lake and away from the shore, they could easily be caught out in the weather and be at risk to lightning. Additionally, some participants come from out of state and aren't familiar with the jurisdictions' hazards, leaving them especially vulnerable.

Figure 3-26		
Lightning Vulnerabilities		
Jurisdiction	Vulnerabilities	Impact
Pittsburg County	The County stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
	The jurisdiction has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	There are several critical facilities within the jurisdiction that are lacking generators, including the County Courthouse, several fire departments, and others.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Alderson	The Alderson Fire Department lacks a generator.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Ashland	The Ashland Fire Department lacks a generator.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Canadian	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.

	The jurisdiction doesn't have a lightning detection or warning system.	Citizens participating in outdoor activities are severely vulnerable to lightning. If struck, lightning can injure or even kill citizens.
	The Town of Canadian lacks generators at the Town Hall, Lift Station, and several others identified critical facilities.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
Carlton Landing	The Carlton Landing Fire Department and one of their lift stations lack generators.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
	The jurisdiction has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
Town of Crowder	The Crowder Fire Department and Senior Citizen Center lack generators.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
	The jurisdiction doesn't have a lightning detection or warning system.	Citizens participating in outdoor activities are severely vulnerable to lightning. If struck, lightning can injure or even kill citizens.

	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
Town of Indianola	The Indianola Fire Department lacks a generator.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Kiowa	The jurisdiction has access to a mass notification system but doesn't have enough employees trained in it or policies and procedures in place to know when to use it.	Unreliable messaging could confuse citizens and make cause a delay in preparedness for impending storms.
	The jurisdiction is worried about citizens not understanding or taking the threat of lightning seriously.	While lightning is a common occurrence in the jurisdiction, it can be deadly.
	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
Town of Pittsburg	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
	All of the identified critical facilities for the Town of Pittsburg lack generators.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
	The jurisdiction has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.

Town of Quinton	Quinton's town hall and fire department lack generators.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Savanna	All but two of Savanna's identified critical facilities lack generators.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
City of Haileyville	The jurisdiction has access to a mass notification system but doesn't have enough employees trained in it or policies and procedures in place to know when to use it.	Unreliable messaging could confuse citizens and make cause a delay in preparedness for impending storms.
	None of this jurisdiction's critical facilities have generators.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
	The jurisdiction doesn't have a lightning detection or warning system.	Citizens participating in outdoor activities are severely vulnerable to lightning. If struck, lightning can injure or even kill citizens.
	The jurisdiction is worried about citizens not understanding or taking the threat of lightning seriously.	While lightning is a common occurrence in the jurisdiction, it can be deadly.
City of Hartshorne	The jurisdiction has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	The school doesn't have a lightning detection or warning system.	Citizens participating in outdoor activities are severely vulnerable to lightning. If struck, lightning can injure or even kill citizens.

	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
	The City Hall does not have a generator.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
City of Krebs	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
	The jurisdiction doesn't have a lightning detection or warning system.	Citizens participating in outdoor activities are severely vulnerable to lightning. If struck, lightning can injure or even kill citizens.
	The jurisdiction has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
City of McAlester	The jurisdiction has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	The jurisdiction doesn't have a lightning detection or warning system.	Citizens participating in outdoor activities are severely vulnerable to lightning. If struck, lightning can injure or even kill citizens.
	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.

	There are several critical facilities within the jurisdiction that are lacking generators.	Without generators, critical facilities can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, essential services to the public could be delayed.
McAlester Public Schools	The school district does not have an emergency generator.	Without generators, the schools can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, parents may have to miss work.
	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.
	The school stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
Quinton Public Schools	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.
	The school has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	The school district does not have an emergency generator.	Without generators, the schools can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, parents may have to miss work.

Crowder Public Schools	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.
	The school has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	The school stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
Haileyville Public Schools	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.
Frink-Chambers Public Schools	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.
	The school has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	The school stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
	The school district does not have an emergency generator.	Without generators, the schools can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, parents may have to miss work.



Tannehill Public Schools	The school has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.
	The school district does not have an emergency generator.	Without generators, the schools can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, parents may have to miss work.
Krebs Public Schools	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.
	The school has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
Haywood Public Schools	The school stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
	The school has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.

Savanna Public Schools	The school is worried about students and families not understanding or taking the threat of lightning seriously.	While lightning is a common occurrence in the jurisdiction, it can be deadly.
	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.
	The school has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	The school is worried about students and families not understanding or taking the threat of lightning seriously.	While lightning is a common occurrence in the jurisdiction, it can be deadly.
	The school stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
Canadian Public Schools	The school is worried about students and families not understanding or taking the threat of lightning seriously.	While lightning is a common occurrence in the jurisdiction, it can be deadly.
Pittsburg Public Schools	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.
	The school has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	The school stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.

Hartshorne Public Schools	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.
	The school stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
	The school has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	The school district does not have an emergency generator.	Without generators, the schools can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, parents may have to miss work.
Indianola Public Schools	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.
	The school stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.
Kiowa Public Schools	The school doesn't have a lightning detection or warning system.	Kids participating in sports or other outdoor activities are left vulnerable without proper warning. A lightning strike has the ability to kill or severely harm children.

Carlton Landing Academy	The school district does not have an emergency generator.	Without generators, the schools can't guarantee they will be able to function during lightning events. If these facilities are unable to stay open, parents may have to miss work.
	The school has several buildings without lightning rods or some other form of lightning protection.	A direct lightning strike can damage or even catch a building on fire, endangering those inside.
	The school stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to lightning strikes. A lightning strike can cause equipment failure.

### 3.4.6 Hail

#### *Description*

Hail 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 hailstorms to grow in size.

#### *Location*

The entire Planning Area is at risk to Hail events, though outdoor event areas are considered at a higher risk.

#### *Previous Occurrences*

<b>Figure 3-27</b>		
<b>Hail Previous Occurrences 2010-2020</b>		
From the NOAA National Centers for Environmental Information <a href="https://www.ncdc.noaa.gov/stormevents">https://www.ncdc.noaa.gov/stormevents</a>		
<b>Date</b>	<b>Jurisdiction</b>	<b>Narrative</b>
05/10/2010	McAlester	Severe thunderstorms developed along and ahead of a dry line over central Oklahoma during the afternoon hours. Very unstable air along with very strong low level wind shear resulted in a number of supercell thunderstorms. These storms produced numerous tornadoes, very large hail, and damaging wind gusts as they moved eastward across eastern Oklahoma during the evening hours.
05/19/2010	Pittsburg County	Severe thunderstorms developed over eastern Oklahoma along and ahead of a northward lifting warm front during the evening of May 19th. The storms produced several tornadoes, along with large hail, damaging winds, and flash flooding.
05/26/2010	Hartshorne	Isolated severe thunderstorms developed in the vicinity of a weak surface boundary that pushed into eastern Oklahoma on the 26th.

06/14/2010	Pittsburg County	Widespread showers and thunderstorms affected much of eastern Oklahoma in response to a stalled frontal boundary and a very moist and unstable atmosphere in place over the area. Strong to severe thunderstorms developed across portions of east-central and southeast Oklahoma where large hail and damaging winds occurred, while heavy rain producing showers and thunderstorms resulted in flash flooding and river flooding for portions of northeast Oklahoma.
03/25/2011	Savanna	Scattered severe thunderstorms developed during the early morning hours over eastern Oklahoma, to the north of a stationary frontal boundary that was located over northern Texas and northern Louisiana.
03/25/2011	Pittsburg County	Scattered severe thunderstorms developed during the early morning hours over eastern Oklahoma, to the north of a stationary frontal boundary that was located over northern Texas and northern Louisiana. The hail from this storm was measured at 2 inches.
04/14/2011	Savanna	Low pressure was centered over southern Kansas during the early afternoon of the 14th with a sharp dryline extending from the low pressure system through central Oklahoma. A moist and very unstable air mass was in place across eastern Oklahoma ahead of the dryline. Severe thunderstorms developed along the dryline during the afternoon and moved into eastern Oklahoma during the early evening hours. Large hail up to grapefruit size, damaging wind gusts, and numerous tornadoes occurred as the storms moved through the region.
04/14/2011	Krebs	Low pressure was centered over southern Kansas during the early afternoon of the 14th with a sharp dryline extending from the low pressure system through central Oklahoma. A moist and very unstable air mass was in place across eastern Oklahoma ahead of the dryline. Severe thunderstorms developed along the dryline during the afternoon and moved into eastern Oklahoma during the early evening hours. Large hail up to grapefruit size, damaging wind gusts, and numerous tornadoes occurred as the storms moved through the region.
04/25/2011	Kiowa	Periods of showers and thunderstorms resulted in widespread heavy rainfall on the 25th with a frontal boundary extending through eastern Oklahoma and an upper level disturbance approaching the region. These showers and thunderstorms only compounded the already serious flood situation across much of the area. Severe thunderstorms also produced large hail and damaging wind gusts.

04/25/2011	Pittsburg County	Periods of showers and thunderstorms resulted in widespread heavy rainfall on the 25th with a frontal boundary extending through eastern Oklahoma and an upper level disturbance approaching the region. These showers and thunderstorms only compounded the already serious flood situation across much of the area. Severe thunderstorms also produced large hail and damaging wind gusts.
04/26/2011	Pittsburg County	On the afternoon of the 26th, a frontal boundary began to lift north out of Texas with surface low pressure developing on the front over southeastern Oklahoma. Severe thunderstorms developed within the moist and unstable air mass near and north of the frontal boundary, producing large hail up to golfball size and a brief tornado.
05/12/2011	Pittsburg County	A cold front moved into and across the region during the afternoon and evening of the 12th. A warm, moist, and unstable air mass existed over eastern Oklahoma ahead of the front. Thunderstorms developed along and ahead of the front during the afternoon and continued to affect eastern Oklahoma through the evening. The stronger storms produced large hail up to baseball size and damaging wind gusts.
05/12/2011	Ashland	A cold front moved into and across the region during the afternoon and evening of the 12th. A warm, moist, and unstable air mass existed over eastern Oklahoma ahead of the front. Thunderstorms developed along and ahead of the front during the afternoon and continued to affect eastern Oklahoma through the evening. The stronger storms produced large hail up to baseball size and damaging wind gusts.
05/22/2011	McAlester	A very moist and very unstable air mass developed across eastern Oklahoma on the afternoon and evening of the 22nd as a dry line moved into the area from the west. Severe thunderstorms, including supercells, developed ahead of the dry line and moved across the area producing tornadoes, large hail up to softball size, and damaging wind gusts.
05/24/2011	Pittsburg County	Severe thunderstorms developed along a dry line over central Oklahoma during the afternoon hours. Very unstable air and strong wind shear east of the dry line supported supercell thunderstorm structures, which persisted as the storms moved into eastern Oklahoma during the evening hours. These severe storms produced tornadoes, large hail to golfball size, and very strong damaging downburst wind across much of eastern Oklahoma.

02/01/2012	Pittsburg County	During the mid to late morning on the 1st, a cold front pushed into southeastern Oklahoma where temperatures were unseasonably warm and deep low level moisture was in place. Thunderstorms occurred in association with this boundary, some of which produced large hail.
05/29/2012	Pittsburg County	Numerous thunderstorms developed along a cold front moving through eastern Oklahoma on the evening of the 29th. These thunderstorms resulted in damaging winds and large hail.
08/07/2012	Quinton	A weak surface boundary provided the focus for afternoon thunderstorm development across southeast Oklahoma on the 7th. The stronger storms produced damaging wind and some hail.
09/26/2012	Crowder	Scattered thunderstorms developed near an outflow boundary across east-central Oklahoma during the early afternoon hours of the 26th. These storms drifted south and east during the afternoon. Several of the storms became supercellular, producing large hail, damaging wind, and some flash flooding.
09/26/2012	McAlester	Scattered thunderstorms developed near an outflow boundary across east-central Oklahoma during the early afternoon hours of the 26th. These storms drifted south and east during the afternoon. Several of the storms became supercellular, producing large hail, damaging wind, and some flash flooding.
09/26/2012	McAlester	Scattered thunderstorms developed near an outflow boundary across east-central Oklahoma during the early afternoon hours of the 26th. These storms drifted south and east during the afternoon. Several of the storms became supercellular, producing large hail, damaging wind, and some flash flooding.
12/19/2012	McAlester	A line of severe thunderstorms developed over eastern Oklahoma during the early evening hours of the 19th as a cold front moved into the region from the west. The thunderstorms moved rapidly eastward, producing damaging wind and large hail across mainly southeastern Oklahoma.
03/30/2013	Ashland	Thunderstorms developed across southeastern Kansas and eastern Oklahoma during the evening hours of the 30th. The combination of instability and wind shear across the area resulted in supercell storm structures as these storms evolved. The storms moved east-southeast across much of eastern Oklahoma during the evening producing large hail



		up to three inches in diameter, damaging wind gusts, and two tornadoes.
03/30/2013	Ashland	Thunderstorms developed across southeastern Kansas and eastern Oklahoma during the evening hours of the 30th. The combination of instability and wind shear across the area resulted in supercell storm structures as these storms evolved. The storms moved east-southeast across much of eastern Oklahoma during the evening producing large hail up to three inches in diameter, damaging wind gusts, and two tornadoes.
07/14/2013	McAlester	Thunderstorms developed during the afternoon hours of the 14th along weak surface boundaries that were in place across the area. Large hail and damaging winds occurred with the stronger storms.
07/14/2013	McAlester	Thunderstorms developed during the afternoon hours of the 14th along weak surface boundaries that were in place across the area. Large hail and damaging winds occurred with the stronger storms.
07/14/2013	Pittsburg County	Thunderstorms developed during the afternoon hours of the 14th along weak surface boundaries that were in place across the area. Large hail and damaging winds occurred with the stronger storms.
07/14/2013	Pittsburg County	Thunderstorms developed during the afternoon hours of the 14th along weak surface boundaries that were in place across the area. Large hail and damaging winds occurred with the stronger storms.
04/13/2014	McAlester	A strong cold front and dry line moved into eastern Oklahoma during the early afternoon hours of the 13th. Severe thunderstorms formed on these boundaries and moved eastward during the afternoon and evening hours. Large hail up to golfball size and damaging wind gusts up to around 80 mph occurred as the storms moved through the region.
04/24/2014	McAlester	Thunderstorms developed along a cold front as it moved into the region during the afternoon of the 24th. The stronger storms produced large hail and damaging wind.
03/25/2015	McAlester	Severe thunderstorms developed during the afternoon hours to the east of a surface low pressure system located over southwestern Oklahoma and near a stationary frontal boundary that was draped across northeastern Oklahoma. Several of these storms developed supercell characteristics due to a very unstable air mass that was in place over the region coupled with strong vertical wind shear. These

		supercells produced several tornadoes, including a strong tornado that resulted in a fatality in Sand Springs. The storms also produced hail up to softball size and wind gusts to around 90 mph. The storms evolved into a line during the evening hours and moved swiftly across eastern Oklahoma producing wind damage and hail to golfball size. Locally heavy rainfall as a result of storms moving repeatedly across the same locations resulted in flash flooding. Two flash flood fatalities occurred in Muskogee County when a vehicle was driven into flood waters and was swept off the road.
04/19/2015	Kiowa	Thunderstorms developed during the mid afternoon of the 19th in response to a strong cold front moving through the region. Large hail up to golfball size occurred with these thunderstorms as they swept across the area.
06/29/2015	Pittsburg County	Scattered thunderstorms developed during the evening hours of June 29th, along a slow-moving cold front that was moving through southeastern Oklahoma. The atmosphere ahead of the front was very unstable, resulting in some severe thunderstorms that produced large hail up to tennis ball size.
06/29/2015	Pittsburg	Scattered thunderstorms developed during the evening hours of June 29th, along a slow-moving cold front that was moving through southeastern Oklahoma. The atmosphere ahead of the front was very unstable, resulting in some severe thunderstorms that produced large hail up to tennis ball size.
06/29/2015	Kiowa	Scattered thunderstorms developed during the evening hours of June 29th, along a slow-moving cold front that was moving through southeastern Oklahoma. The atmosphere ahead of the front was very unstable, resulting in some severe thunderstorms that produced large hail up to tennis ball size.
06/29/2015	Kiowa	Tennis ball size hail damaged homes and vehicles.
03/13/2016	Canadian	Thunderstorms developed across southeastern Oklahoma during the afternoon of March 13th, ahead of a strong upper level disturbance that approached the area from the west. The strongest storms produced large hail.
05/09/2016	Haileyville	Severe thunderstorms developed along and ahead of a dry line across central Oklahoma during the afternoon of May 9th. The storms moved across eastern Oklahoma during the evening hours. Prior to the storms moving into the area, the atmosphere ahead of the dry line in eastern Oklahoma had become very unstable. This instability, combined with very

		strong wind shear associated with a strong trough of low pressure that moved into the Southern Plains from the Southern Rockies, resulted in the development of supercell thunderstorms. One of these supercells produced multiple tornadoes as it tracked along and near an outflow boundary from morning thunderstorms, which had settled across southeastern Oklahoma by the afternoon. One of the tornadoes was long-lived and damaging. In addition to the tornadoes in southeastern Oklahoma, the severe thunderstorms produced hail up to golfball size and damaging wind gusts across other portions of eastern Oklahoma.
09/14/2016	Haileyville	Thunderstorms developed across southeastern Oklahoma on the 14th, along and ahead of a slow moving cold front. The strongest storms produced large hail.
03/01/2017	McAlester	Strong to severe thunderstorms developed over northeastern Oklahoma during the late evening hours of February 28th along and ahead of a cold front that moved into the area. The thunderstorms organized into lines as they moved across eastern Oklahoma during the early morning hours of March 1st. The strongest storms produced hail up to golfball size and damaging wind gusts.
03/01/2017	McAlester	Strong to severe thunderstorms developed over northeastern Oklahoma during the late evening hours of February 28th along and ahead of a cold front that moved into the area. The thunderstorms organized into lines as they moved across eastern Oklahoma during the early morning hours of March 1st. The strongest storms produced hail up to golfball size and damaging wind gusts.
03/01/2017	McAlester	Strong to severe thunderstorms developed over northeastern Oklahoma during the late evening hours of February 28th along and ahead of a cold front that moved into the area. The thunderstorms organized into lines as they moved across eastern Oklahoma during the early morning hours of March 1st. The strongest storms produced hail up to golfball size and damaging wind gusts.
03/26/2017	McAlester	Strong to severe thunderstorms developed across central Oklahoma during the late afternoon hours of the 26th, as a dry line moved into the area from the west. These storms moved into eastern Oklahoma during the evening hours, producing hail up to golfball size and damaging wind.
04/26/2017	Pittsburg	Severe thunderstorms developed along and ahead of a cold front that moved into eastern Oklahoma during the evening of the 25th. The storms moved eastward across the area through the early morning hours of the 26th, resulting in three tornadoes, hail up to baseball size, and damaging

		wind. Locally heavy rainfall of three to four inches resulted in flash flooding.
04/29/2017	Haileyville	<p>Strong to severe thunderstorms developed during the late evening hours of the 28th over portions of eastern Oklahoma, along and north of a warm front that had moved into the area during the day. These storms produced a strong tornado, hail up to baseball size, damaging wind, and locally heavy rainfall through the early morning hours of the 29th.</p> <p>Another round of severe weather developed during the afternoon hours of the 29th, as a cold front moved into the area from the north. These storms produced a tornado, hail up to golf ball size, damaging wind, and locally heavy rainfall.</p>
06/30/2017	Pittsburg County	<p>Strong to severe thunderstorms developed during the evening hours of the 30th, along a cold front that stretched from southwestern Oklahoma into east-central Oklahoma. The strongest storms produced hail up to quarter size and damaging wind gusts.</p>
04/13/2018	Savanna	<p>Severe thunderstorms developed over eastern Oklahoma during the early afternoon hours of the 13th as a cold front moved into the area. The strongest storms produced large hail up to quarter size and damaging wind gusts as they moved east across the area through the early evening hours.</p>
05/15/2018	McAlester	<p>Thunderstorms developed across southeastern Kansas during the evening of the 14th along a nearly stationary frontal boundary. The storms moved southeast across portions of northeastern Oklahoma during the late evening. The strongest storms produced damaging wind and large hail up to quarter size.</p> <p>The frontal boundary across southeastern Kansas began to move southward as a cold front during the early morning hours of the 15th. Thunderstorms formed along this boundary during the early afternoon as it moved into southeastern Oklahoma. The strongest storm produced large hail up to quarter size.</p>
06/24/2018	Pittsburg County	<p>Severe thunderstorms developed along a warm front that stretched across east central Oklahoma during the evening of the 23rd. These storms moved slowly across portions of eastern Oklahoma through the early morning hours of the 24th. The strongest storms produced hail up to two inches in diameter and damaging wind gusts.</p> <p>Other thunderstorms developed over eastern Colorado and northwestern Kansas during the afternoon of the 23rd. These storms became organized and moved southeast across southwestern Kansas and northwestern Oklahoma during the evening of the 23rd and early morning hours of</p>

		the 24th. They moved into eastern Oklahoma during the morning of the 24th, producing widespread damaging wind and some large hail up to half dollar size.
06/24/2018	Krebs	Severe thunderstorms developed along a warm front that stretched across east central Oklahoma during the evening of the 23rd. These storms moved slowly across portions of eastern Oklahoma through the early morning hours of the 24th. The strongest storms produced hail up to two inches in diameter and damaging wind gusts. Other thunderstorms developed over eastern Colorado and northwestern Kansas during the afternoon of the 23rd. These storms became organized and moved southeast across southwestern Kansas and northwestern Oklahoma during the evening of the 23rd and early morning hours of the 24th. They moved into eastern Oklahoma during the morning of the 24th, producing widespread damaging wind and some large hail up to half dollar size.
06/24/2018	Pittsburg County	Severe thunderstorms developed along a warm front that stretched across east central Oklahoma during the evening of the 23rd. These storms moved slowly across portions of eastern Oklahoma through the early morning hours of the 24th. The strongest storms produced hail up to two inches in diameter and damaging wind gusts. Other thunderstorms developed over eastern Colorado and northwestern Kansas during the afternoon of the 23rd. These storms became organized and moved southeast across southwestern Kansas and northwestern Oklahoma during the evening of the 23rd and early morning hours of the 24th. They moved into eastern Oklahoma during the morning of the 24th, producing widespread damaging wind and some large hail up to half dollar size.
06/24/2018	Savanna	Severe thunderstorms developed along a warm front that stretched across east central Oklahoma during the evening of the 23rd. These storms moved slowly across portions of eastern Oklahoma through the early morning hours of the 24th. The strongest storms produced hail up to two inches in diameter and damaging wind gusts. Other thunderstorms developed over eastern Colorado and northwestern Kansas during the afternoon of the 23rd. These storms became organized and moved southeast across southwestern Kansas and northwestern Oklahoma during the evening of the 23rd and early morning hours of the 24th. They moved into eastern Oklahoma during the morning of the 24th, producing widespread damaging wind and some large hail up to half dollar size.
04/24/2020	Indianola	Strong to severe thunderstorms developed across eastern Oklahoma during the afternoon of the 24th, as an upper level disturbance and associated surface low pressure

		system translated across the region from the west. The strongest thunderstorms produced hail up to ping pong ball size and damaging wind gusts as they moved east across the area.
04/24/2020	McAlester	Strong to severe thunderstorms developed across eastern Oklahoma during the afternoon of the 24th, as an upper level disturbance and associated surface low pressure system translated across the region from the west. The strongest thunderstorms produced hail up to ping pong ball size and damaging wind gusts as they moved east across the area.
04/24/2020	Crowder	Strong to severe thunderstorms developed across eastern Oklahoma during the afternoon of the 24th, as an upper level disturbance and associated surface low pressure system translated across the region from the west. The strongest thunderstorms produced hail up to ping pong ball size and damaging wind gusts as they moved east across the area.
04/24/2020	McAlester	Strong to severe thunderstorms developed across eastern Oklahoma during the afternoon of the 24th, as an upper level disturbance and associated surface low pressure system translated across the region from the west. The strongest thunderstorms produced hail up to ping pong ball size and damaging wind gusts as they moved east across the area.
04/24/2020	Hartshorne	Strong to severe thunderstorms developed across eastern Oklahoma during the afternoon of the 24th, as an upper level disturbance and associated surface low pressure system translated across the region from the west. The strongest thunderstorms produced hail up to ping pong ball size and damaging wind gusts as they moved east across the area.
04/28/2020	McAlester	A broken line of severe thunderstorms developed across northeastern Oklahoma during the late afternoon hours of the 28th, as a cold front moved into the area. The line of thunderstorms moved southeast across eastern Oklahoma through the evening hours. Very strong instability and strong deep layer shear developed across eastern Oklahoma ahead of the thunderstorms. These conditions promoted the development of supercell thunderstorms within the line, as well as ahead of the line in southeastern Oklahoma. The strongest storms produced hail up to two inches in diameter, damaging wind gusts, and a tornado. Locally heavy rainfall also resulted in some flash flooding.
04/28/2020	Pittsburg County	Large hail damaged vehicles and the roofs of homes.

04/28/2020	Haileyville	Golf ball size hail damaged vehicles and the roofs of homes.
04/28/2020	Haileyville	Large hail damaged vehicles and the roofs of homes.
04/28/2020	Pittsburg County	Golf ball size hail damaged vehicles and the roofs of homes.
04/28/2020	Pittsburg County	A broken line of severe thunderstorms developed across northeastern Oklahoma during the late afternoon hours of the 28th, as a cold front moved into the area. The line of thunderstorms moved southeast across eastern Oklahoma through the evening hours. Very strong instability and strong deep layer shear developed across eastern Oklahoma ahead of the thunderstorms. These conditions promoted the development of supercell thunderstorms within the line, as well as ahead of the line in southeastern Oklahoma. The strongest storms produced hail up to two inches in diameter, damaging wind gusts, and a tornado. Locally heavy rainfall also resulted in some flash flooding.
04/28/2020	McAlester	A broken line of severe thunderstorms developed across northeastern Oklahoma during the late afternoon hours of the 28th, as a cold front moved into the area. The line of thunderstorms moved southeast across eastern Oklahoma through the evening hours. Very strong instability and strong deep layer shear developed across eastern Oklahoma ahead of the thunderstorms. These conditions promoted the development of supercell thunderstorms within the line, as well as ahead of the line in southeastern Oklahoma. The strongest storms produced hail up to two inches in diameter, damaging wind gusts, and a tornado. Locally heavy rainfall also resulted in some flash flooding.
04/28/2020	Pittsburg County	Golfball size hail damaged vehicles and the roofs of homes.
04/28/2020	Pittsburg County	Golfball size hail damaged vehicles and the roofs of homes.
07/30/2020	Kiowa	Thunderstorms developed across southeastern Oklahoma during the early evening of the 30th, as a cold front moved into the region. The atmosphere had become very unstable ahead of the front, allowing some of the storms to become severe with large hail up to quarter size and damaging wind.
11/24/2020	Pittsburg County	Golf ball size hail damaged vehicles and homes.
11/24/2020	Pittsburg County	Strong to severe thunderstorms developed across western and central Oklahoma during the afternoon of the 24th, along and ahead of an approaching cold front. The thunderstorms intensified as they moved eastward and

		across eastern Oklahoma during the late afternoon and evening hours. The strongest storms produced large hail up to golf ball size, damaging wind gusts, and two tornadoes.
11/24/2020	McAlester	Strong to severe thunderstorms developed across western and central Oklahoma during the afternoon of the 24th, along and ahead of an approaching cold front. The thunderstorms intensified as they moved eastward and across eastern Oklahoma during the late afternoon and evening hours. The strongest storms produced large hail up to golf ball size, damaging wind gusts, and two tornadoes.

### *Probability of Future Events*

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

### *Extent*

The local jurisdictions within the Planning Area have many assets vulnerable to the impacts of hail. Some of those vulnerabilities include facilities, vehicles, agriculture, and the public. The impacts of hail at any size can cause impacts to the Planning Area, but the Planning Area has seen and expects to continue to see up to an H4. Anything above H1 could start to affect the local jurisdictions' ability to function and cause severe damages.

**Figure 3-28**

Hail size and diameter in relation to TORRO Hailstorm Intensity Scale.		
Size code	Maximum Diameter	Description
H0	5-9	Pea
H1	10-15	Mothball
H2	16-20	Grape
H3	21-30	Walnut
H4	31-40	Pigeon's egg > squash ball
H5	41-50	Golf ball > Pullet's egg

### *Impact and Vulnerability*

The impact of this hazard is mainly financial resulting in repairs to cars, roofs, walls, and windows. County, city, town, and school vehicles are particularly vulnerable to this threat.

Hail can also cause considerable damage to crops, buildings, and vehicles, and occasionally death to farm animals. Hail can also strip leaves and small limbs from non-evergreen trees. While large hail poses a threat to people caught outside in a storm, it seldom causes loss of human life.





Costs and losses to agricultural and livestock producers:

- *Reduced yields and crop loss*
- *Injuries or loss of livestock*
- *Damage to barns and other farm buildings*
- *Damage to trees resulting in increased susceptibility to disease*

Urban, residential, and commercial

- *Damage to buildings, possibly critical facilities*
- *Roofs*
- *Windows*
- *Damage to automobiles, trucks, airplanes, etc.*

Disruptions to local utilities and services

- *Power*
- *Communications*
- *Transportation*

Additional vulnerabilities are difficult to evaluate since hail occurs in random locations and creates relatively narrow paths of destruction.

Possible environmental impacts from hail are damaged plants, trees, and crops.

In the event of a hail event, services to the public could be delayed, leading to a lack of confidence in the local jurisdictions' ability to govern. In the event facilities or access to facilities is compromised, the local jurisdictions' Continuity of Operations needs to be activated. This would insure minimal disruption to public services. At this time, only Pittsburg County and the City of McAlester have this capability. All other participating jurisdictions have defined this as a deficiency.

Another large concern are the fishing tournaments held on Lake Eufala. Portions of the lake are located in the Town of Crowder, Town of Canadian, and the County. When the participants are on the lake and away from the shore, they could easily be caught out in the weather and be at risk to hail. Additionally, some participants come from out of state and aren't familiar with the jurisdictions' hazards, leaving them especially vulnerable.

Figure 3-29		
Hail Vulnerabilities		
Jurisdiction	Vulnerabilities MI	Impact MI
Pittsburg County	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
	There are several critical facilities within the jurisdiction that are lacking generators, including the County Courthouse, several fire departments, and others.	Without generators, critical facilities can't guarantee they will be able to function during thunderstorms. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Alderson	The Alderson Fire Department lacks a generator.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Ashland	The Ashland Fire Department lacks a generator.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Canadian	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.

	The Town of Canadian lacks generators at the Town Hall, Lift Station, and several others identified critical facilities.	Without generators, critical facilities can't guarantee they will be able to function during thunderstorms. If these facilities are unable to stay open, essential services to the public could be delayed.
Carlton Landing	The Carlton Landing Fire Department and one of their lift stations lack generators.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, essential services to the public could be delayed.
	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
	The jurisdiction is concerned about the debris a major hail storm can leave behind.	Debris left behind by storms can cause build up that can become fire hazards.
Town of Crowder	The Crowder Fire Department and Senior Citizen Center lack generators.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, essential services to the public could be delayed.
	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.

Town of Indianola	The Indianola Fire Department lacks a generator.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Kiowa	The jurisdiction has access to a mass notification system but doesn't have enough employees trained in it or policies and procedures in place to know when to use it.	Unreliable messaging could confuse citizens and make cause a delay in preparedness for impending storms.
	The jurisdiction is worried about citizens not understanding or taking the threat of hail seriously.	While hail is a common occurrence in the jurisdiction, it can be deadly.
	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
Town of Pittsburg	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
	All of the identified critical facilities for the Town of Pittsburg lack generators.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, essential services to the public could be delayed.
Town of Quinton	Quinton's town hall and fire department lack generators.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, essential services to the public could be delayed.

Town of Savanna	All but two of Savanna's identified critical facilities lack generators.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, essential services to the public could be delayed.
City of Haileyville	None of this jurisdiction's critical facilities have generators.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, essential services to the public could be delayed.
	The jurisdiction is worried about citizens not understanding or taking the threat of hail seriously.	While hail is a common occurrence in the jurisdiction, it can be deadly.
City of Hartshorne	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
	The City Hall does not have a generator.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, essential services to the public could be delayed.
City of Krebs	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.

City of McAlester	The city has several walkways between critical buildings that are uncovered. They see this as a weakness in regards to this hazard.	Uncovered walkways leave necessary foot traffic vulnerable to hail. Should a citizen or city worker be struck by a significant hail event, they may receive serious injuries or even death.
	The jurisdiction stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
	There are several critical facilities within the jurisdiction that are lacking generators.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, essential services to the public could be delayed.
McAlester Public Schools	The school district does not have an emergency generator.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, parents may have to miss work.
	The school has several walkways between buildings that are uncovered. They see this as a weakness in regards to this hazard.	Students using the walkways who are caught in the storm are left vulnerable to this hazard. If they were struck by hail, they may sustain serious injuries or even death.
	The school district stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
Quinton Public Schools	The school has several walkways between buildings that are uncovered. They see this as a weakness in regards to this hazard.	Students using the walkways who are caught in the storm are left vulnerable to this hazard. If they were struck by hail, they may sustain serious injuries or even death.

	The school district does not have an emergency generator.	Without generators, school facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, parents may have to miss work.
Crowder Public Schools	The school district stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
	The school has several walkways between buildings that are uncovered. They see this as a weakness in regards to this hazard.	Students using the walkways who are caught in the storm are left vulnerable to this hazard. If they were struck by hail, they may sustain serious injuries or even death.
Haileyville Public Schools	The school has several walkways between buildings that are uncovered. They see this as a weakness in regards to this hazard.	Students using the walkways who are caught in the storm are left vulnerable to this hazard. If they were struck by hail, they may sustain serious injuries or even death.
Frink-Chambers Public Schools	The school district stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
	The school district does not have an emergency generator.	Without generators, school facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, parents may have to miss work.



Tannehill Public Schools	The school district does not have an emergency generator.	Without generators, critical facilities can't guarantee they will be able to function if a hail event causes a disruption to the power supply. If these facilities are unable to stay open, parents may have to miss work.
Krebs Public Schools	The school district doesn't have adequate covered parking for their busses.	Vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
Haywood Public Schools	The school district stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
Savanna Public Schools	The school district believes they have a deficit in educating students about this hazard.	A lack of education can cause preventable injuries and impede preparedness.
	The school has several walkways between buildings that are uncovered. They see this as a weakness in regards to this hazard.	Students using the walkways who are caught in the storm are left vulnerable to this hazard. If they were struck by hail, they may sustain serious injuries or even death.
	The school district stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.
Canadian Public Schools	The school district stores a large portion of equipment and vehicles uncovered outside that is considered vulnerable to this hazard.	Equipment and vehicles left out in the elements are vulnerable to hail. Hail can dent, damage, and destroy vehicles and equipment.

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

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

#### *Description*

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

#### *Location*

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

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

#### *Previous Occurrence*

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

**Figure 3-30****Extreme Heat Previous Occurrences**

From the NOAA National Centers for Environmental Information

<https://www.ncdc.noaa.gov/stormevents> b

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

06/27/2011	All Participating Jurisdictions	A strong ridge of high pressure in the middle and upper atmosphere developed across the south central United States resulting in strong subsidence over the region. High temperatures climbed into the upper 90s to near 105 under mostly clear skies. This heat combined with fairly high relative humidity values resulted in afternoon heat index values, or apparent temperatures, in the 105 to 110 degree range. Very little relief was realized during the overnight period as temperatures only fell to near 80.
06/30/2011	All Participating Jurisdictions	A strong ridge of high pressure in the middle and upper atmosphere redeveloped across the south central United States resulting in strong subsidence over the region. High temperatures climbed into the mid 90s to near 103 under mostly clear skies. This heat combined with fairly high relative humidity values resulted in afternoon heat index values, or apparent temperatures, in the 105 to 110 degree range. Very little relief was realized during the overnight period as temperatures only fell into the mid to upper 70s. This period of excessive heat continued into July.
07/09/2011	All Participating Jurisdictions	A strong ridge of high pressure in the middle and upper atmosphere redeveloped across the south central United States in mid July resulting in strong subsidence over the region. High temperatures climbed to above 100 degrees on all but two days during the remainder of the month at the Tulsa International Airport and July 2011 went down as the second warmest July on record for that area since records began in 1905. Numerous record temperatures were exceeded this month across eastern Oklahoma. This heat combined with fairly high relative humidity values resulted in afternoon heat index values, or apparent temperatures, in the 105 to 115 degree range. Very little relief was realized during the overnight period as temperatures only fell into the upper 70s to mid 80s. This period of excessive heat continued into August.
08/01/2011	All Participating Jurisdictions	A strong ridge of high pressure that dominated the weather across the south central United States for much of July, continued through the first couple weeks of August. Unseasonably hot weather resulted across the region with official records at the Tulsa International Airport indicating that August 2011 was the 5th hottest August on record since 1905. During this period, the daily temperature exceeded 100 degrees and the hottest all-time temperature in Tulsa came to within two degrees of being broken on August 3rd when the temperature soared to 113 degrees. The humidity combined with this heat resulted in afternoon heat indices in the 105 to 115 degree range. Little relief from the heat was realized at night as temperatures only fell to near 80 degrees.

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

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

### Probability of Future Events

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

### Extent

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

**Figure 3-31**

**Unacclimated and Acclimated Work/Rest and Water Intake Chart**

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

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

### Impact and Vulnerability

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

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

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



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

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

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

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

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

### 3.4.8 Hazardous Materials (Fixed Site/Transportation)

#### *Description*

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

#### *Location*

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

#### *Probability of Future Events*

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

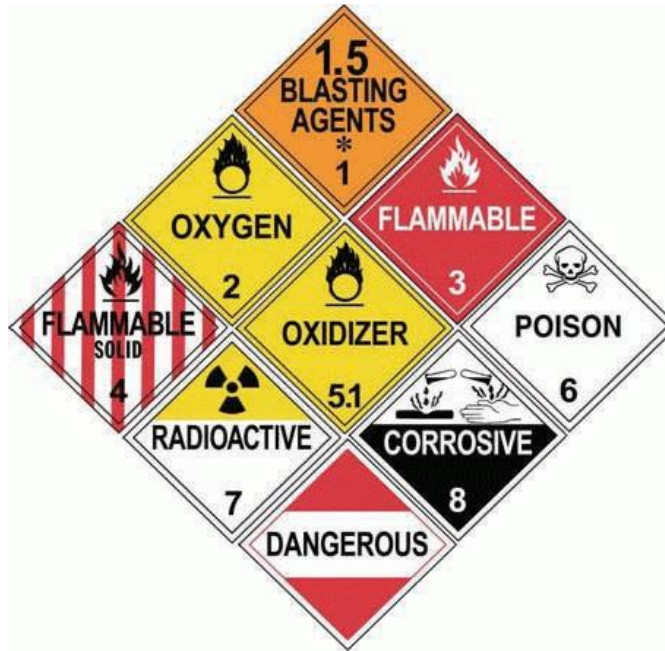
#### *Extent*

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

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

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

**Figure 3-33**



#### *Impact and Vulnerability*

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

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

### 3.4.9 Drought

#### *Description*

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

#### *Location*

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

#### *Previous Occurrences*

<b>Figure 3-34</b>		
<b>Drought Previous Occurrences</b>		
<b>2010-2020</b>		
From the NOAA National Centers for Environmental Information <a href="https://www.ncdc.noaa.gov/stormevents">https://www.ncdc.noaa.gov/stormevents</a>		
<b>Date</b>	<b>Jurisdiction</b>	<b>Narrative</b>
03/08/2011	All Participating Jurisdictions	A prolonged period of unseasonably dry weather resulted in severe to extreme drought conditions to develop across much of east-central and southeastern Oklahoma during the month. During the month of March, the McAlester area received 0.52 inches of precipitation, making this month the driest March on record for the McAlester Regional Airport observing site. Most of southeastern Oklahoma received between five and twenty-five percent of the normal monthly precipitation for March. The unseasonably dry conditions in this part of the state extended back about a year as the past three months, six months, and twelve month periods are all the 2nd or 3rd driest on record, according to the Oklahoma Climatological Survey. The drought conditions contributed to a number of wildfires that occurred across a lot of eastern Oklahoma during the month.



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

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

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

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

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

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

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

### *Extent*

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

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

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

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

Category	Description	Possible Impacts	Ranges				
			Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	Going into drought: <ul style="list-style-type: none"> <li>• short-term dryness slowing planting, growth of crops or pastures</li> </ul> Coming out of drought: <ul style="list-style-type: none"> <li>• some lingering water deficits</li> <li>• pastures or crops not fully recovered</li> </ul>	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	<ul style="list-style-type: none"> <li>• Some damage to crops, pastures</li> <li>• Streams, reservoirs, or wells low, some water shortages developing or imminent</li> <li>• Voluntary water-use restrictions requested</li> </ul>	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	<ul style="list-style-type: none"> <li>• Crop or pasture losses likely</li> <li>• Water shortages common</li> <li>• Water restrictions imposed</li> </ul>	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	<ul style="list-style-type: none"> <li>• Major crop/pasture losses</li> <li>• Widespread water shortages or restrictions</li> </ul>	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	<ul style="list-style-type: none"> <li>• Exceptional and widespread crop/pasture losses</li> <li>• Shortages of water in reservoirs, streams, and wells creating water emergencies</li> </ul>	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

**Figure 3-35**  
**Palmer Drought Severity Index**

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

### *Impact and Vulnerability*

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

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

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

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

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

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



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

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

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

### 3.4.10 Dam Failure

#### *Description*

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

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

#### *Location*

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

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

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

## 5) Pittsburg Lake Dam

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

### **Fin and Feather Lake Dam**

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

**Figure 37**

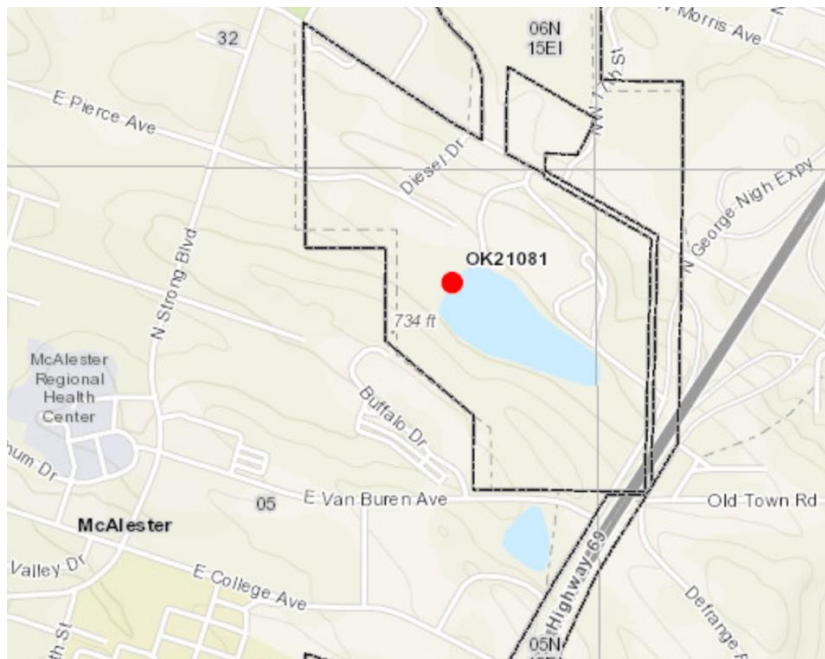
### **Fin and Feather Lake Dam**



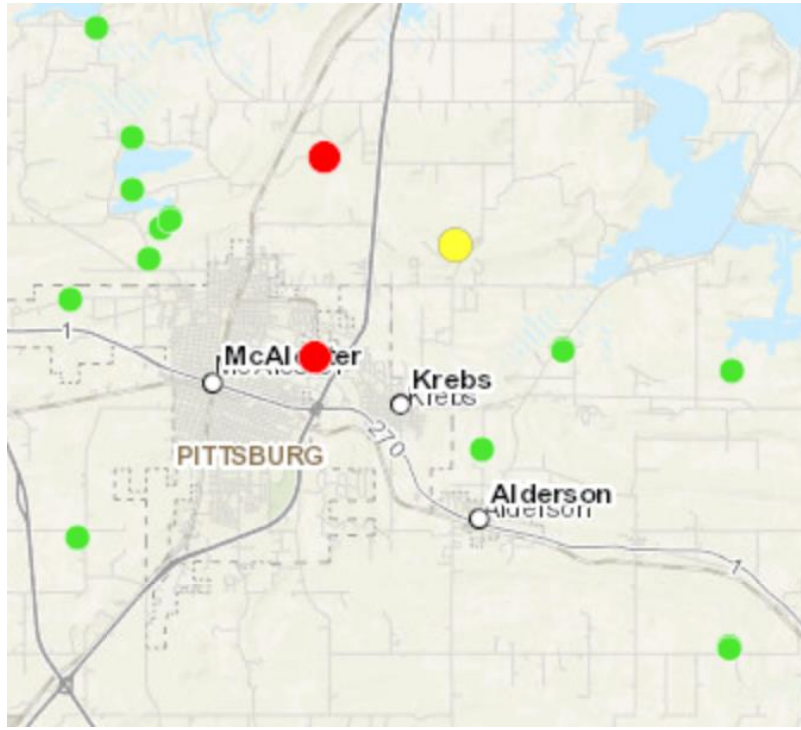
### **Smithson Lake Dam**

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

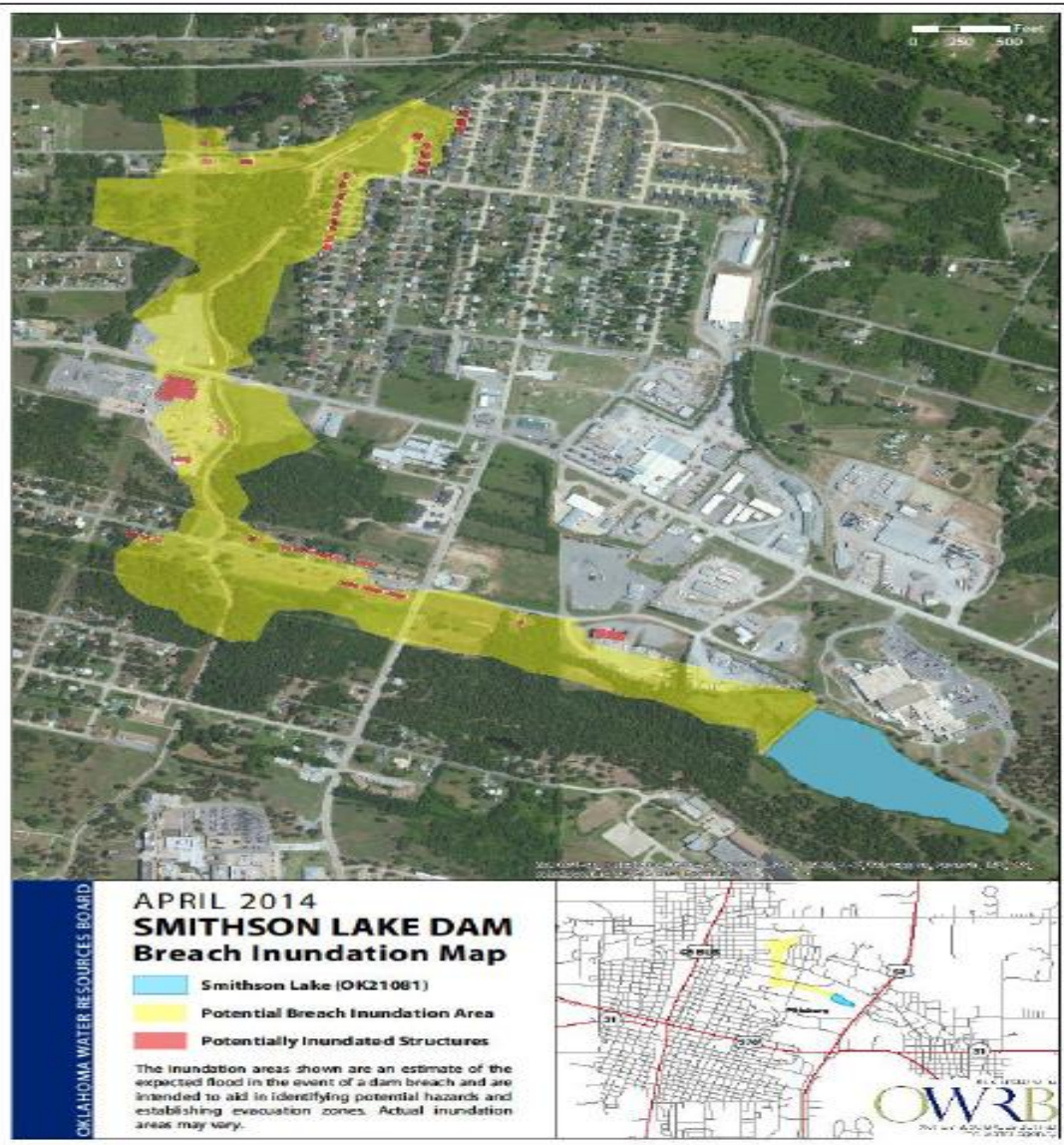
**Figure 38  
Smithson Dam**



**Figure 39  
Smithson Dam**



**Figure 40**  
**Smithson Dam Inundation Map**





### **SCS Brushy Peaceable Creek Site-037**

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

**Figure 41**  
**Site-037**



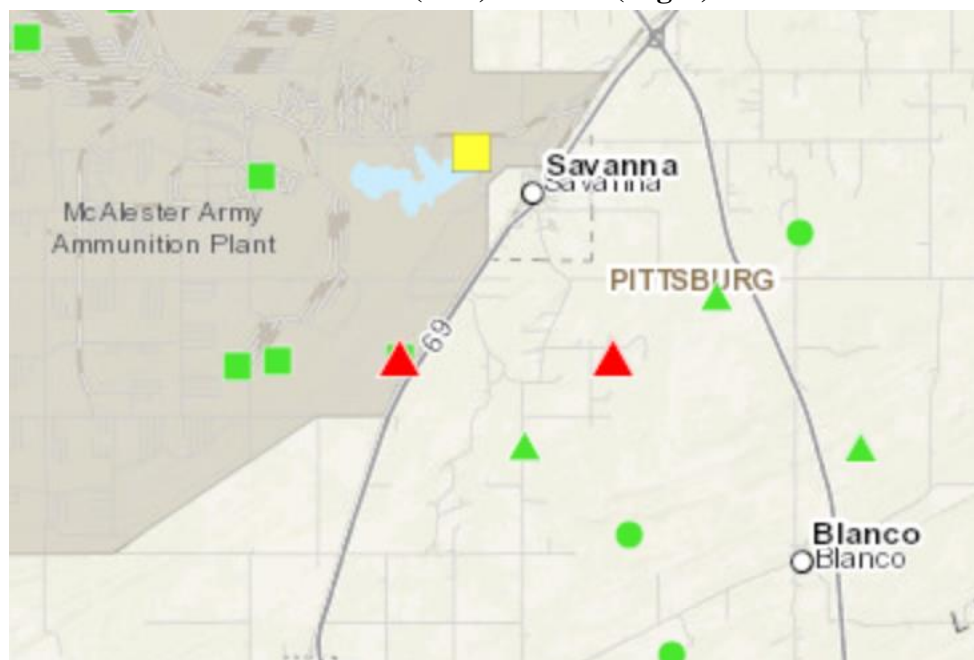
### **SCS Brushy Peaceable Creek Site-032**

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

**Figure 42**  
**Site-032**



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

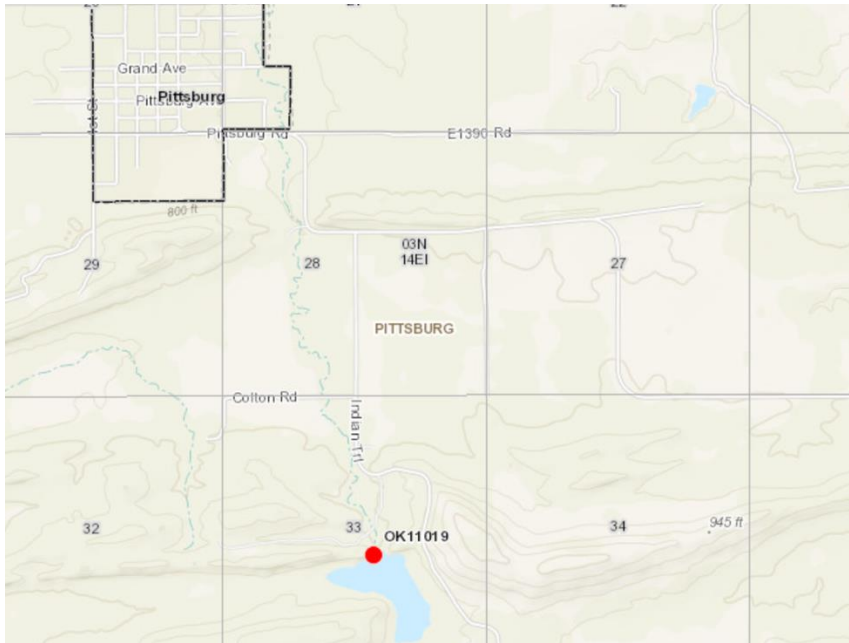




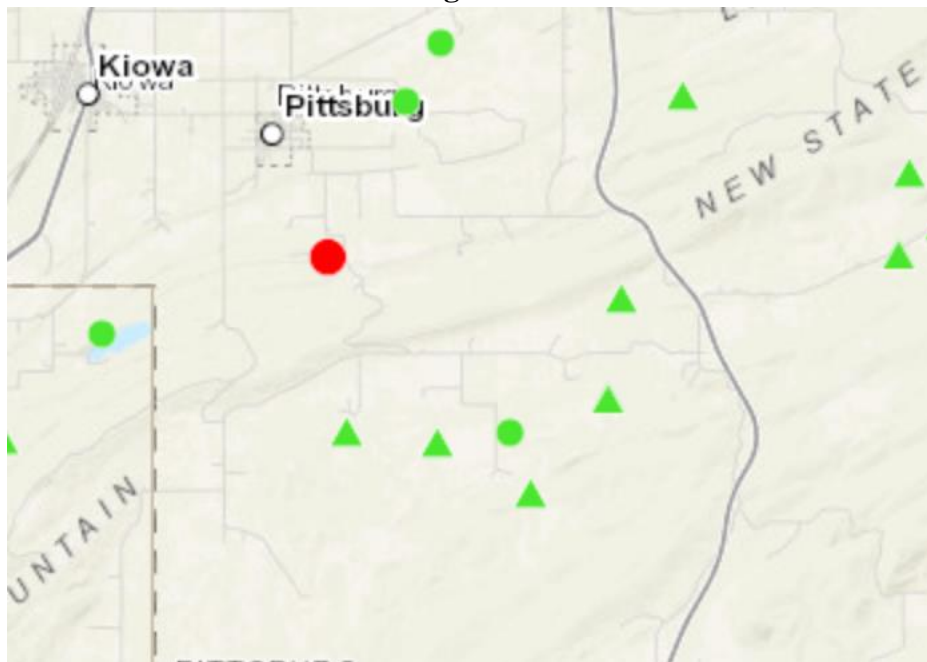
### **Pittsburg Lake Dam**

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

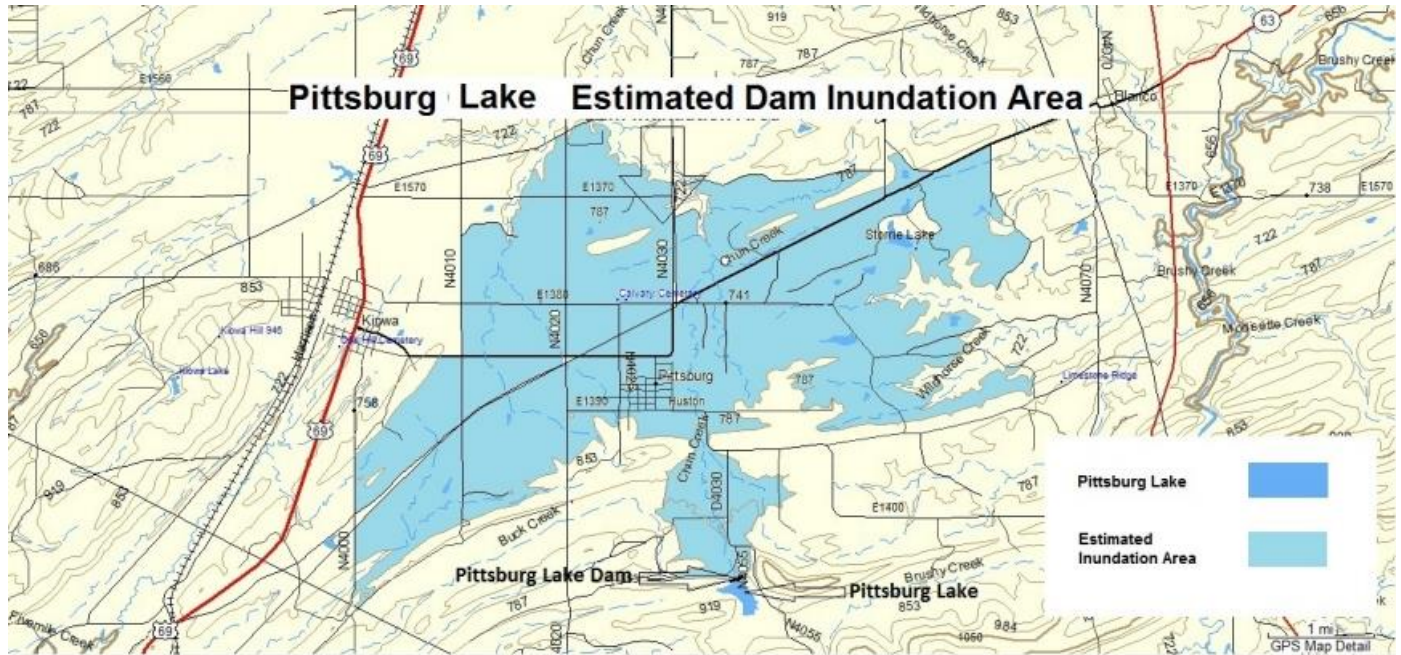
**Figure 44**  
**Pittsburg Lake Dam**



**Figure 45**  
**Pittsburg Lake Dam**



**Figure 46**



#### *Previous Occurrences*

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

#### *Probability of Future Events*

The probability of future events is low.

#### *Extent*

Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream.

Dams assigned the Low Hazard Potential classification are those dams where failure or mis- operation results in no probable loss of human life and low economic and/or environmental losses. Significant Hazard Potential classification are dams that are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure, and where failure or mis-operation results in no probable loss of human life but can cause serious economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. High Hazard Potential classifications are those dams where failure or mis- operation will probably cause loss of human life.

The Oklahoma Water Resources Board defines dam classification as:

**Figure 3-47**

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

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

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

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

#### *Impact and Vulnerability*

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

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

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

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

<b>Figure 3-48</b>		
<b>Dam Failure Impacts and Vulnerabilities</b>		
<b>Jurisdiction</b>	<b>Vulnerabilities</b>	<b>Impact</b>
Pittsburg County	As seen in the location section, there are several high hazard dams located in Pittsburg County.	Flooding from these dams would most likely impact rural areas and farm lands.
Town of Alderson	While the Town of Alderson is within 5 miles of the Smithson Lake Dam, it isn't considered to be threatened by it.	
Town of Ashland	Ashland is not affected by this hazard.	
Town of Canadian	Canadian is not affected by this hazard.	
Carlton Landing	Carlton Landing is not affected by this hazard.	
Town of Crowder	Crowder is not affected by this hazard.	
Town of Indianola	Indianola isn't affected by this hazard.	
Town of Kiowa	Kiowa is just outside of the impact area for Site-037.	
Town of Pittsburg	The Town of Pittsburg is located near a high hazard dam.	If a dam failure were to occur, the Town of Pittsburg would be completely inundated, as shown in Figure 46
Town of Quinton	Quinton is not affected by this hazard.	
Town of Savanna	While Savanna is within the five-mile radius, it is unlikely that the town would experience flooding.	
City of Haileyville	Haileyville is not affected by this hazard.	
City of Hartshorne	Hartshorne is not affected by this hazard.	

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

### 3.4.11 Earthquake

#### Description

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

### *Location*

Earthquakes have the possibility of affecting the entire Planning Area.

### *Previous Occurrences*

#### **Earthquake Data from Oklahoma Geological Survey 2010-2020**

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

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

### *Probability of Future Events*

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

### *Extent*

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



**Figure 3-49**  
**Mercalli Scale**

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

#### *Impact and Vulnerability*

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

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

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

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

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

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

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

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



## CHAPTER FOUR: CAPABILITY ASSESSMENT

### 4.1 Capability Assessment

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Figure 4-15**  
**City of McAlester Capabilities**



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

McAlester can build upon its capabilities by adopting floodplain ordinance.

#### 4.1.1 Opportunities for Public Education and Outreach

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

#### 4.1.2 School District Capability Assessment

##### **McAlester Public Schools**

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

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

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

### **Quinton Public Schools**

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

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

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

### **Crowder Public Schools**

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

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

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

### **Haileyville Public Schools**

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

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

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

### **Frink-Chambers Public Schools**

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

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

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

### **Tannehill Public Schools**

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

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

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

### **Krebs Public Schools**

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

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

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



### **Haywood Public Schools**

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

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

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

### **Savanna Public Schools**

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

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

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

### **Canadian Public Schools**

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

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

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

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

### **Pittsburg Public Schools**

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

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

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

### **Hartshorne Public Schools**

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

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

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

### **Indianola Public Schools**

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

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

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

### **Kiowa Public Schools**

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

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

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

### **Carlton Landing Academy**

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

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

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

#### **4.1.3 NFIP Participation**

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

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



NFIP complainance. Alderson, Canadian, Crowder, Haileyville, Hartshorne, McAlester, Pittsburg, and Quinton will work to improve compliance by the adoption of ordinance.

At this time, there aren't any repetitive loss properties in the Planning Area.

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

#### 4.1.4 Capabilities Conclusion

Mitigation requires capabilities necessary to reduce loss of life and property by lessening the impacts of disasters. Each jurisdiction has demonstrated a set of capabilities unique to their community. The capability assessment finds that Pittsburg County and the participating jurisdictions collectively have a moderate level of legal, technical, and fiscal tools and resources necessary to implement hazard mitigation strategies. All the jurisdictions have the legal capabilities or ordinances and codes in place that might help reduce loss due to a disaster. The jurisdictions including school districts have a range of staff trained or have knowledge about hazards and their impacts.

The Pittsburg County Planning Committee put a significant amount of effort into making this plan a useful document. Because the information in this plan is relevant, and was developed by the Planning Team members directly, the plan will be more easily integrated into the plans and ordinances listed in this section. The Emergency Manager for the county and each jurisdiction, through maintenance of this document, will provide a copy of this plan to parties responsible for other planning processes in the Planning Area. This document can be integrated into other plans when determining future growth areas, capital improvement projects, building code and ordinance proposals, and prioritizing local funds.

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

## 4.2 Changes in Jurisdictional Development

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

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

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

		vulnerability during hazard events.
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## CHAPTER FIVE: ACTION PLAN

### 5.1 Mitigation Goals

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

- Goal 1: Enhance public awareness of disaster preparedness and understanding of hazards specific to Pittsburg County.
- Goal 2: Ensure coordination between local, federal, state, non-profit, and private business to maximize mitigation activities.
- Goal 3: Explore mitigation actions for new construction.
- Goal 4: Educate the public on mitigation and prevention activities.

### 5.2 Integration of Data, Goals, and Action Items

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

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

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

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

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

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

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

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

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

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

### 5.3 Changes in Jurisdictional Priorities

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

### 5.4 Action Items Prioritized

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

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

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

## 5.5 Status of Previous Mitigation Action Items

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

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

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

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

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



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

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

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

<b>Figure 5-9</b>	
<b>Mass Notification System</b>	
Description	Obtain a mass communications system such as or similar to CTY connect for county and communities and Connect Ed for schools to allow for emergency notifications to citizens and to parents of school children in emergency situations.
Hazards Addressed	Dam Failure, Drought, Earthquake, Excessive Heat, Flooding, Hail, Lightning, Sink Holes, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	Yes

<b>Figure 5-10</b>	
<b>Maintain Flood Administrator</b>	
Description	Pittsburg County will continue to maintain a floodplain administrator to oversee and monitor construction in the floodplain.
Hazards Addressed	Dam Failure, Flood
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna
Completed?	Yes

<b>Figure 5-11</b>	
<b>Public Information and Educational Efforts</b>	
Description	Implement a public information and educational program concerning Natural Hazards Mitigation and how to prepare and respond to hazardous conditions.
Hazards Addressed	Dam Failure, Drought, Earthquake, Excessive Heat, Flooding, Hail, Lightning, Sink Holes, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	Yes

<b>Figure 5-12</b>	
<b>School Intercom System</b>	
Description	Install internal intercom system in schools that currently have no system available to allow on-time communications between the main office and classrooms prior to and during hazardous events.
Hazards Addressed	Dam Failure, Extreme Heat, Flood, Hail, Lightning, Tornado, Wildfire, Wind, Winter Storm
Jurisdictions Affected	Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna
Completed?	Partially Completed
Reason if Not Completed	Funding
Still Relevant?	Yes

<b>Figure 5-13</b>	
<b>Ty Valley Road</b>	
Description	Reduce flooding and erosion on Ty Valley Road by raising the road bed and adding tin horn pipe.
Hazards Addressed	Flood
Jurisdictions Affected	Pittsburg County
Completed?	No
Reason if Not Completed	Lack of Funding
Still Relevant?	Yes

<b>Figure 5-14</b>	
<b>All Hazards Booklet</b>	
Description	Design and distribute a booklet specific to Pittsburg County and its jurisdictions detailing what hazards citizens are at risk of, actions they can take to prepare for the hazards, and actions to take following a disaster event.
Hazards Addressed	Dam Failure, Drought, Earthquake, Expansive Soil, Excessive Heat, Flooding, Hail, Lightning, Sink Holes, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	Partially Completed
Reason if Not Completed	Funding
Still Relevant?	No

<b>Figure 5-15</b>	
<b>Floodplain Ordinance Compliance</b>	
Description	Pittsburg County will continue to regulate and force its floodplain regulations and will update said regulations as needed to comply with NFIP requirement.
Hazards Addressed	Dam Failure, Flood
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	Complete

<b>Figure 5-16</b>	
<b>Drainage Ditch Improvements</b>	
Description	Make improvements as needed to drainage ditches along each side of county roads and community streets. This action would mitigate damage from flooding/flash flooding. Removal of limbs that hang over electric power lines and telephone lines would reduce the loss of those services. Additionally, fire hazards would be reduced.
Hazards Addressed	Dam Failure, Flooding, Lightning, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna
Completed?	Partially Complete
Reason if Not Completed	Funding
Still Relevant?	Yes

<b>Figure 5-17</b>	
<b>Dry Hydrants</b>	
Description	As water retention pools are constructed to mitigate flooding problems, dry hydrants should be installed.
Hazards Addressed	Dam Failure, Wildfire, Flooding
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, and Savanna
Completed?	Partially Completed
Reason if Not Completed	Funding
Still Relevant?	Yes

<b>Figure 5-18</b>	
<b>Building Permits</b>	
Description	Implement a building permit process for new construction as well as renovations that will include following a standard such as the BOCA Building Codes and that will discourage construction in flood prone areas.
Hazards Addressed	
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, and Savanna
Completed?	Partially Complete
Reason if Not Completed	Funding
Still Relevant?	Yes

<b>Figure 5-19</b>	
<b>NOAA Weather Radio Program</b>	
Description	Purchase, program, and distribute NOAA weather radios to all critical facilities and the public.
Hazards Addressed	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hail, Lightning, Sink Holes, Tornado, Wildfire, Wind, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	Yes

<b>Figure 5-20</b>	
<b>Portable Information Signs</b>	
Description	Obtain portable lighted information signs that can be posted along highways during and after natural hazard events to warn motorists of hazardous conditions.
Hazards Addressed	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Sink Holes, Tornado, Wildfire, Wind, Winter Storms
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna
Completed?	Yes

<b>Figure 5-21</b>	
<b>Water Storage Towers</b>	
Description	Install water towers to provide short term water supply during power outages and as a source for fighting wildfires.
Hazards Addressed	Dam Failure, Earthquake, Excessive Heat, Flooding, Hail, Lightning, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	No
Reason if Not Completed	Funding
Still Relevant?	Yes

<b>Figure 5-22</b>	
<b>Tannehill Loop</b>	
Description	Reduce or eliminate flooding on Tannehill Loop Road by raising the road bed and installing tin horns.
Hazards Addressed	Flooding
Jurisdictions Affected	Pittsburg County
Completed?	No
Reason if Not Completed	Priorities Changed
Still Relevant?	No

<b>Figure 5-23</b>	
<b>Hail Resistant Roofing</b>	
Description	As roofs are replaced and on new construction the use of hail resistant roofing materials will be encouraged. Education and printed materials will be provided to emphasize the benefits of hail resistant roofing materials.
Hazards Addressed	Dam Failure, Drought, Earthquake, Excessive Heat, Flooding, Hail, Lightning, Sink Holes, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	No
Reason if Not Completed	Funding
Still Relevant?	Yes

<b>Figure 5-24</b>	
<b>Harden/Retrofit Existing Structures</b>	
Description	Harden existing Buildings in smaller communities where possible to provide safe shelter area.
Hazards Addressed	Tornado, High Wind
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna
Completed?	No
Reason if Not Completed	Funding
Still Relevant?	Yes

<b>Figure 5-25</b>	
<b>Lone Oak Road</b>	
Description	Reduce or eliminate flooding on Lone Oak Road by raising the road bed and installing tin horns.
Hazards Addressed	Flooding
Jurisdictions Affected	Pittsburg County
Completed?	No
Reason if Not Completed	Funding
Still Relevant?	Yes

<b>Figure 5-26</b>	
<b>NFIP Public Information</b>	
Description	Produce and distribute public awareness information regarding flooding and the NFIP and flood insurance.
Hazards Addressed	Dam Failure, Flooding
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	Yes

<b>Figure 5-27</b>	
<b>Crab Tree Road</b>	
Description	Reduce flooding and erosion on Crab Tree Road by raising the road bed and adding tin horn pipe.
Hazards Addressed	Flood
Jurisdictions Affected	Pittsburg County
Completed?	No
Reason if Not Completed	Grant Funding Not Available
Still Relevant?	No

<b>Figure 5-28</b>	
<b>Yellow Bull Road</b>	
Description	Reduce or eliminate flooding on Yellow Bull Road by raising the road bed and installing tin horns.
Hazards Addressed	Flood
Jurisdictions Affected	Pittsburg County
Completed?	No
Reason if Not Completed	Grant Funding Not Available
Still Relevant?	Yes

<b>Figure 5-29</b>	
<b>FIRM Maps</b>	
Description	Request current/updated flood insurance rate maps for all participating jurisdictions.
Hazards Addressed	Dam Failure, Flood
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, and Savanna
Completed?	Yes

<b>Figure 5-30</b>	
<b>Fin and Feather Bridge</b>	
Description	Reduce or eliminate repetitive flooding and washout problems by replacing existing wooden bridge with a large pipe and stabilize the roadbed.
Hazards Addressed	Flood
Jurisdictions Affected	Pittsburg County
Completed?	Yes

<b>Figure 5-31</b>
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<b>Develop Digital Maps</b>	
Description	Prepare digital maps of incorporated and un-incorporated jurisdictions of the county denoting critical facilities.
Hazards Addressed	Dam Failure, Drought, Earthquake, Expansive Soil, Excessive Heat, Flood, Hail, Lightning, Sink Holes, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	Yes

<b>Figure 5-32</b>	
<b>Bury Electric Lines</b>	
Description	Upon electric line replacement, local utility providers will be encouraged to bury electric distribution lines to lessen damages and power outages during hazardous weather events.
Hazards Addressed	Dam Failure, Drought, Earthquake, Excessive Heat, Flooding, Hail, Lightning, Sink Holes, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill.
Completed?	No
Reason if Not Completed	Funding
Still Relevant?	No

<b>Figure 5-33</b>	
<b>Rock Pen Road</b>	
Description	Reduce or eliminate flooding by elevating, widening, strengthening, the roadbed, and installing tin horns.
Hazards Addressed	Flooding
Jurisdictions Affected	Pittsburg County
Completed?	No
Reason if Not Completed	Funding
Still Relevant?	Yes

<b>Figure 5-34</b>
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<b>Tom Polanski</b>	
Description	Reduce or eliminate repetitive flooding by strengthening and lining channel with rip rap and installing a tin horn.
Hazards Addressed	Flooding
Jurisdictions Affected	Pittsburg County
Completed?	No
Reason if Not Completed	Funding
Still Relevant?	No. Action item was changed to reflect current needs.

<b>Figure 5-35</b>	
<b>Mapping of Mines</b>	
Description	Map abandoned mines to identify and locate possible sink hole locations.
Hazards Addressed	Sink Holes
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna
Completed?	No
Reason if Not Completed	Another agency has already completed this project.
Still Relevant?	No

<b>Figure 5-36</b>	
<b>Window Film</b>	
Description	Install impact resistant window film on windows of critical facilities to prevent foreign objects from penetrating windows and prevent glass shattering.
Hazards Addressed	Earthquake, Extreme Heat, Hail, Tornado, Wind
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	No
Reason if Not Completed	School could not find the right film.
Still Relevant?	No

<b>Figure 5-37</b>
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<b>Fan Distribution Program</b>	
Description	Develop a program to provide cooling fans to the handicapped, elderly, and other special needs situations that occur in Pittsburg County. These populations are often the most susceptible to the hazards associated with extreme heat.
Hazards Addressed	Extreme Heat
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna
Completed?	No
Reason if Not Completed	Another agency has started a similar program.
Still Relevant?	No

<b>Figure 5-38</b>	
<b>NOAA Weather Repeater</b>	
Description	Install a NOAA weather repeater and tower to allow better access to NOAA broadcasts for citizens throughout the county where reception is currently poor.
Hazards Addressed	Dam Failure, Drought, Earthquake, Extreme Heat, Flood, Hail, Lightning, Sink Holes, Tornado, Wildfire, Wind, Winter Storms
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	No
Reason if Not Completed	The technology has expired.
Still Relevant?	No

<b>Figure 5-39</b>	
<b>Expansive Soil Testing</b>	
Description	Require soil testing for expansive soils on roads and critical facilities and stabilize soil prior to start of construction.
Hazards Addressed	Expansive Soils
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	No
Reason if Not Completed	Priorities Changed
Still Relevant?	No

<b>Figure 5-40</b>	
<b>Lightning Detection</b>	
Description	Purchase lightning detection systems and detectors for use at outdoor facilities and parks for the protection of citizens from possible lightning strikes.
Hazards Addressed	Lightning
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	Partially
Reason if Not Completed	Funding
Still Relevant?	Yes

<b>Figure 5-41</b>	
<b>Stream Water Monitoring Device</b>	
Description	Install stream water level monitors to monitor the level of streams to give warning of fast rising waters that may indicate a possible dam failure or approaching flood conditions
Hazards Addressed	Dam Failure, Flood, Drought, Earthquake, Excessive Heat, Flooding, Hail, Lightning, Sink Holes, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	No
Reason if Not Completed	Funding
Still Relevant?	Yes

<b>Figure 5-42</b>	
<b>Promote Xeriscaping</b>	
Description	Promote the use of vegetation and materials native to the local area when landscaping to reduce the need for outdoor watering promoting water conservation which reduces the need for additional water sources and watering during drought conditions.
Hazards Addressed	Dam Failure, Drought, Earthquake, Expansive Soil, Excessive Heat, Flooding, Hail, Lightning, Sink Holes, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	Complete

<b>Figure 5-43</b>	
<b>Drill Additional Water Wells</b>	
Description	Drill additional water wells where needed to provide additional water sources for communities and as water supply for fire departments to fight wildfire.
Hazards Addressed	Drought, Wildfire
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna, and the Public School Districts of Canadian, Crowder, Frink-Chambers, Haileyville, Hartshorne, Haywood, Indianola, Kiowa, Krebs, McAlester, Pittsburg, Quinton, Savanna, and Tannehill
Completed?	No
Reason if Not Completed	Funding
Still Relevant?	Yes

<b>Figure 5-44</b>	
<b>Hurricane Clips</b>	
Description	Provide education and encourage the use of hurricane clips on new construction projects.
Hazards Addressed	Dam Failure, Drought Earthquake, Excessive Heat, Flooding, Hail, Lightning, Sink Holes, Tornado, High Wind, Wildfire, Winter Storm
Jurisdictions Affected	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, Savanna
Completed?	Partially
Reason if Not Completed	This is an ongoing action.
Still Relevant?	Yes

## 5.6 Action Items

<b>Figure 5-45</b>	
<b>Action Item 1</b>	<b>Erosion Mitigation for Roads</b>
Description	Elevate and improve drainage for the county roads listed in figures 3-10, 3-11, and 3-12.
Hazards Addressed	Flood
Jurisdictions	Pittsburg County
Mitigation Action Type	Structure and Infrastructure Projects
Responsible Party	Pittsburg County Commissioners
Potential Implementation Timeline	4 Years
Estimated Cost	\$500,000
Potential Funding Sources	County Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

<b>Figure 5-46</b>	
<b>Action Item 2</b>	<b>Outdoor Warning Devices</b>
Description	Purchase additional and update or replace existing outdoor warning devices to ensure the entire Planning Area is covered. There are several places within the area without coverage.
Hazards Addressed	Tornado/High Wind
Jurisdictions	All Jurisdictions
Mitigation Action Type	5%
Responsible Party	Pittsburg County and town's Emergency Managers, Pittsburg County Fire Departments, the school boards, and the municipal boards of each city or town.
Potential Implementation Timeline	5 Years
Estimated Cost	\$600,000
Potential Funding Sources	5%, Community Development Block Grants

<b>Figure 5-47</b>	
<b>Action Item 3</b>	<b>Safe Rooms for Critical Facilities</b>
Description	Install safe rooms in critical facilities that either lack them, or are currently utilizing inadequate shelters.
Hazards Addressed	Tornado/High Wind
Jurisdictions	All Jurisdictions
Mitigation Action Type	Structure and Infrastructure
Responsible Party	Pittsburg County Commissioners, the school boards, and the municipal boards of each city or town.
Potential Implementation Timeline	5 Years or More
Estimated Cost	\$20,000,000
Potential Funding Sources	HMGP

<b>Figure 5-48</b>	
<b>Action Item 4</b>	<b>Backup Generators</b>
Description	Purchase and install backup generators for all facilities that don't have one.
Hazards Addressed	Tornado/High Wind, Flood, Winter Storm, Wildfire, Lightning, Hail, Extreme Heat, Earthquake, Dam Failure*
Jurisdictions	All Jurisdictions
Mitigation Action Type	5%
Responsible Party	Pittsburg County Commissioners, the school boards, and the municipal boards of each city or town.
Potential Implementation Timeline	4 Years
Estimated Cost	\$1,000,000
Potential Funding Sources	5% or city, town, or county funds

\* Not all jurisdictions are affected by Dam Failure.

<b>Figure 5-49</b>	
<b>Action Item 5</b>	<b>Drainage</b>
Description	Improve drainage systems around identified critical facility buildings.
Hazards Addressed	Flood
Jurisdictions	All Jurisdictions
Mitigation Action Type	Structure and Infrastructure Projects
Responsible Party	Pittsburg County Commissioners the school boards, public works departments, and the municipal boards of each city or town.
Potential Implementation Timeline	2 Years
Estimated Cost	\$50,000
Potential Funding Sources	HMGP, or county, city, or town funds

<b>Figure 5-50</b>	
<b>Action Item 6</b>	<b>Storm Water Management</b>
Description	Improve storm water management systems throughout the Planning Area to handle more water intake.
Hazards Addressed	Flood
Jurisdictions	All Jurisdictions
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	Pittsburg County, the school boards, public works departments, and the municipal boards of each city or town.
Potential Implementation Timeline	5 Years
Estimated Cost	\$5,000,000
Potential Funding Sources	HMGP, or county, city, or town budgets.



<b>Figure 5-51</b>	
<b>Action Item 7</b>	<b>11<sup>th</sup> Street (Between Pennsylvania and Modoc)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

<b>Figure 5-52</b>	
<b>Action Item 8</b>	<b>9<sup>th</sup> Street (Between Pennsylvania and Modoc)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

<b>Figure 5-53</b>	
<b>Action Item 9</b>	<b>Kili-Inla Street (Between 8<sup>th</sup> and 11<sup>th</sup>)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works

Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

<b>Figure 5-54</b>	
<b>Action Item 10</b>	<b>South 8<sup>th</sup> Street (From Lehigh to the end of Lehigh)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

<b>Figure 5-55</b>	
<b>Action Item 11</b>	<b>10<sup>th</sup> Street (From Pennsylvania and Modoc)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

<b>Figure 5-56</b>	
<b>Action Item 12</b>	<b>Carbon Street (From 7<sup>th</sup> to 9<sup>th</sup> Street)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works

Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

<b>Figure 5-57</b>	
<b>Action Item 13</b>	<b>Modoc Street (From 5<sup>th</sup> to 10<sup>th</sup>)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

<b>Figure 5-58</b>	
<b>Action Item 14</b>	<b>South 6<sup>th</sup> (From Lehigh to the end of 6<sup>th</sup> Street)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

<b>Figure 5-59</b>	
<b>Action Item 15</b>	<b>Comanche Street (From 5<sup>th</sup> to 8<sup>th</sup>)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project

Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

<b>Figure 5-60</b>	
<b>Action Item 16</b>	<b>7<sup>th</sup> Street (From Pennsylvania to Barnhill)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

<b>Figure 5-61</b>	
<b>Action Item 17</b>	<b>Wichita Street (From 5<sup>th</sup> to 6<sup>th</sup> Street)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

<b>Figure 5-62</b>	
<b>Action Item 18</b>	<b>15<sup>th</sup> Street (From Lehigh to Kali-Inla Street)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project

Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

Figure 5-63	
Action Item 19	Deepen and Widen City Canal
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

Figure 5-64	
Action Item 20	Comanche Street (From 5 <sup>th</sup> to 8 <sup>th</sup> Street)
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

Figure 5-65	
Action Item 21	Osage Street (From 11 <sup>th</sup> to 15 <sup>th</sup> )
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project

Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

Figure 5-66	
<b>Action Item 22</b>	<b>14<sup>th</sup> Street (From Pawnee to Pennsylvania Street)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

Figure 5-67	
<b>Action Item 23</b>	<b>15<sup>th</sup> Street (From Cherokee to Cheyenne)</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

Figure 5-68	
<b>Action Item 24</b>	<b>High Hill Road</b>
Description	Elevate and improve drainage.
Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure Project

Responsible Party	City of Hartshorne Public Works
Potential Implementation Timeline	3 Years
Estimated Cost	\$200,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

**Figure 5-69**

<b>Action Item 25</b>	<b>Hospital Water Tower</b>
Description	Install a water tower at the hospital to store more supply.
Hazards Addressed	Drought
Jurisdictions	City of McAlester, Hospital
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	City of McAlester, Hospital Administrator
Potential Implementation Timeline	5 Years
Estimated Cost	\$1,250,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

**Figure 5-70**

<b>Action Item 26</b>	<b>Mass Notification System Education</b>
Description	Get education for city, town, county, and school employees on how and when to utilize the existing notification system.
Hazards Addressed	All Hazards*
Jurisdictions	All Jurisdictions
Mitigation Action Type	Education and Awareness Program
Responsible Party	Pittsburg County Emergency Management, the school boards, and the municipal boards of each city or town.
Potential Implementation Timeline	2 Years
Estimated Cost	\$15,000
Potential Funding Sources	City Funds, Rural Economic Plan (REAP) Funds, Community Development Block Grants (CDBG), HMGP

\* Not all jurisdictions affected by Dam Failure.

**Figure 5-71**

<b>Action Item 27</b>	<b>School Intercom System</b>
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Description	Purchase or upgrade school intercom systems to use for drills and hazard related announcements.
Hazards Addressed	Tornado/High Wind, Flood, Winter Storm, Wildfire, Lightning, Hail, Extreme Heat, Dam Failure*, Earthquake
Jurisdictions	All School District
Mitigation Action Type	5%
Responsible Party	School Superintendents
Potential Implementation Timeline	2 Years
Estimated Cost	\$10,000
Potential Funding Sources	School Funds, HMGP

\* Not all jurisdictions affected by Dam Failure.

<b>Figure 5-73</b>	
<b>Action Item 28</b>	<b>Public Shelters</b>
Description	Install public shelters to ensure the safety of the public during storms.
Hazards Addressed	Tornado/High Wind
Jurisdictions	Pittsburg county and all cities and towns
Mitigation Action Type	Structure and Infrastructure
Responsible Party	Pittsburg County Emergency Management and the municipal boards of each city or town.
Potential Implementation Timeline	3 Years
Estimated Cost	\$2,000,000
Potential Funding Sources	HMGP or city, county, or town budgets



<b>Figure 5-74</b>	
<b>Action Item 29</b>	<b>Tin Horns</b>
Description	Purchase new tin horns to improve drainage.
Hazards Addressed	Flood
Jurisdictions	Pittsburg County and all cities and towns
Mitigation Action Type	Flood
Responsible Party	Pittsburg County Commissioners and the governments of each city or town.
Potential Implementation Timeline	3 Years
Estimated Cost	\$1,000,000
Potential Funding Sources	HMGP or city, county, town budgets.

<b>Figure 5-75</b>	
<b>Action Item 30</b>	<b>Public Education and Awareness</b>
Description	Educate the public on hazards through social media campaigns.
Hazards Addressed	All Hazards*
Jurisdictions	All Jurisdictions
Mitigation Action Type	Education and Awareness
Responsible Party	Pittsburg County Emergency Management, the school boards, and the governments of each city or town.
Potential Implementation Timeline	1 Year
Estimated Cost	\$50,000
Potential Funding Sources	HMGP or county, city, or town budgets

\* Not all jurisdictions affected by Dam Failure.

<b>Figure 5-76</b>	
<b>Action Item 31</b>	<b>Defensible Space</b>
Description	Implement and execute a defensible space program within all jurisdictions.
Hazards Addressed	Wildfire
Jurisdictions	All Jurisdictions

Mitigation Action Type	Local Planning and Regulations, Natural Systems Protection
Responsible Party	Pittsburg County Emergency Management, Fire Departments, the school boards, and the governments of each city or town.
Potential Implementation Timeline	2 Years
Estimated Cost	\$800,000
Potential Funding Sources	HMGP or county, city, or town budgets

Figure 5-77	
Action Item 32	Water Line Update
Description	Update all the old waterlines within the jurisdiction.
Hazards Addressed	Drought, Wildfire
Jurisdictions	All Jurisdiction
Mitigation Action Type	Structure and Infrastructure
Responsible Party	Pittsburg County Commissioners, Water Departments, Public Works Departments, the school boards, and the governments of each city or town.
Potential Implementation Timeline	10-20 Years
Estimated Cost	\$1,250,000
Potential Funding Sources	HMGP or county, city, or town budgets

Figure 5-78	
Action Item 33	Flood Insurance
Description	Promote flood insurance by providing education to the public.
Hazards Addressed	Flood
Jurisdictions	Pittsburg County and all cities and towns
Mitigation Action Type	Education and Awareness

Responsible Party	Pittsburg County Emergency Management, Floodplain Administrators, and the governments of each city or town.
Potential Implementation Timeline	2 Years
Estimated Cost	\$20,000
Potential Funding Sources	HMGP or county, city, or town budgets

<b>Figure 5-79</b>	
<b>Action Item 34</b>	<b>Winter Storm Campaign</b>
Description	Implement “First 72 is on You” program within all jurisdictions to promote 72-hour preparedness following a winter storm.
Hazards Addressed	Winter Storm
Jurisdictions	All Jurisdictions
Mitigation Action Type	Education and Awareness
Responsible Party	Pittsburg County Emergency Management, the school boards, and the municipal boards of each city or town.
Potential Implementation Timeline	6 Months
Estimated Cost	\$20,000
Potential Funding Sources	HMGP or county, city, or town budgets

<b>Figure 5-80</b>	
<b>Action Item 35</b>	<b>Risk Mapping</b>
Description	Map and identify potential risk areas.
Hazards Addressed	All Hazards*
Jurisdictions	All Jurisdictions
Mitigation Action Type	Local Planning and Regulations
Responsible Party	Pittsburg County Emergency Management, the school boards, and the municipal boards of each city or town.
Potential Implementation Timeline	2 Years
Estimated Cost	\$500,000
Potential Funding Sources	HMGP or county, city, or town budgets

\* Not all jurisdictions affected by Dam Failure.

<b>Figure 5-81</b>	
<b>Action Item 36</b>	<b>Communications</b>
Description	Ensure interoperability between jurisdictions by upgrading communication systems to prevent delays in essential services to the public.
Hazards Addressed	All Hazards*
Jurisdictions	All Jurisdictions
Mitigation Action Type	Structure and Infrastructure
Responsible Party	Pittsburg County and town's Emergency Managers, the school Superintendent, and the municipal boards of each city or town.
Potential Implementation Timeline	5 Years
Estimated Cost	\$1,000,000
Potential Funding Sources	HMGP or county, city, or town budgets

\* Not all jurisdictions affected by Dam Failure.

<b>Figure 5-82</b>	
<b>Action Item 37</b>	<b>Wind Retrofit</b>
Description	Purchase building connectors to retrofit critical facilities to handle higher wind loads.
Hazards Addressed	Tornado/High Wind
Jurisdictions	All Jurisdictions
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	Pittsburg County Emergency Management, the School Superintendents, and the municipal boards of each city or town.
Potential Implementation Timeline	5 Years
Estimated Cost	\$1,000,000
Potential Funding Sources	HMGP

<b>Figure 5-83</b>	
<b>Action Item 38</b>	<b>Safe Room Rebate</b>
Description	Provide a safe room rebate program for citizens within the Planning Area.
Hazards Addressed	Tornado/High Winds

Jurisdictions	Pittsburg Co, Alderson, Ashland, Canadian, Carlton Landing, Crowder, Indianola, Kiowa, Pittsburg, Quinton, Savanna, Haileyville, Hartshorne, Krebs, McAlester
Mitigation Action Type	Local Plans and Regulations
Responsible Party	Pittsburg County and town's Emergency Managers.
Potential Implementation Timeline	3 Years
Estimated Cost	\$800,000
Potential Funding Sources	HMGP or county, city, or town budgets

Figure 5-84	
Action Item 39	Repetitive Loss Properties
Description	Identify and track potential repetitive loss properties.
Hazards Addressed	Flood
Jurisdictions	All Jurisdictions
Mitigation Action Type	Local Planning and Regulations
Responsible Party	Pittsburg County and town's Floodplain Managers.
Potential Implementation Timeline	4 Years
Estimated Cost	\$500,000
Potential Funding Sources	HMGP or county, city, or town budgets

Figure 5-85	
Action Item 40	Bank Stabilization
Description	Install Rip Rap as needed to stabilize riverbanks to prevent wash out and loss of homes.
Hazards Addressed	Flood
Jurisdictions	Pittsburg County
Mitigation Action Type	Structure and Infrastructure
Responsible Party	Pittsburg County Commissioners
Potential Implementation Timeline	5 Years
Estimated Cost	\$500,000
Potential Funding Sources	HMGP or county, city, or town budgets

<b>Figure 5-86</b>	
<b>Action Item 41</b>	<b>Lightning and Surge Suppression</b>
Description	Protect critical facilities from surges.
Hazards Addressed	Lightning
Jurisdictions	All Jurisdictions
Mitigation Action Type	5%
Responsible Party	Pittsburg County Emergency Management, the school boards, and the municipal boards of each city or town.
Potential Implementation Timeline	3 Years
Estimated Cost	\$500,000
Potential Funding Sources	HMGP or county, city, or town budgets

<b>Figure 5-87</b>	
<b>Action Item 42</b>	<b>Drainage Ditch Improvements</b>
Description	Improve the load capacity of drainage ditches.
Hazards Addressed	Flood
Jurisdictions	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, and Savanna
Mitigation Action Type	Structure and Infrastructure
Responsible Party	Pittsburg County Commissioners, Public Works Departments, and the municipal boards of each city or town.
Potential Implementation Timeline	3 Years
Estimated Cost	\$800,000
Potential Funding Sources	HMGP or county, city, or town budgets

<b>Figure 5- 88</b>	
<b>Action Item 43</b>	<b>Dry Hydrants</b>
Description	As water retention pools are constructed to mitigate flooding problems, dry hydrants should be installed.
Hazards Addressed	Flood
Jurisdictions	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, and Savanna
Mitigation Action Type	Structure and Infrastructure

Responsible Party	Pittsburg County and the municipal boards of each city or town.
Potential Implementation Timeline	5 Years
Estimated Cost	\$1,000,000
Potential Funding Sources	HMGP or county, city, or town budgets

Figure 5-89	
Action Item 44	Building Permits
Description	Implement a building permit process for new construction as well as renovations that will include following a standard such as the BOCA Building Codes.
Hazards Addressed	Flood
Jurisdictions	Pittsburg County, Alderson, Ashland, Canadian, Crowder, Haileyville, Hartshorne, Indianola, Kiowa, Krebs, Pittsburg, Quinton, and Savanna
Mitigation Action Type	Local Plans and Regulations
Responsible Party	Pittsburg County and the municipal boards of each city or town.
Potential Implementation Timeline	5 Years
Estimated Cost	\$700,000
Potential Funding Sources	HMGP or county, city, or town budgets

Figure 5-90	
Action Item 45	Short Term Water Supply
Description	Install water towers to provide short term water supply as a source for fighting wildfires and to use in times of drought.
Hazards Addressed	Drought, Wildfire
Jurisdictions	All Jurisdictions
Mitigation Action Type	Structure and Infrastructure
Responsible Party	Pittsburg County and the municipal boards of each city or town.
Potential Implementation Timeline	5 Years
Estimated Cost	\$1,000,000
Potential Funding Sources	HMGP or county, city, or town budgets

Figure 5-91	
Action Item 46	Lightning Detection

Description	Purchase lightning detection systems and detectors for use at outdoor facilities and parks for the protection of citizens from possible lightning strikes.
Hazards Addressed	Lightning
Jurisdictions	All Jurisdictions
Mitigation Action Type	Structure and Infrastructure Projects
Responsible Party	Pittsburg County and town's Emergency Managers, and the School Superintendents.
Potential Implementation Timeline	3 Years
Estimated Cost	\$600,000
Potential Funding Sources	HMGP or county, city, or town budgets

Figure 5-92	
Action Item 47	Stream Water Monitoring
Description	Install stream water level monitors to monitor the level of streams to give warning of fast rising waters that may indicate a possible dam failure or approaching flood conditions.
Hazards Addressed	Flood
Jurisdictions	Pittsburg County Floodplain Manager
Mitigation Action Type	Structure and Infrastructure
Responsible Party	Pittsburg County
Potential Implementation Timeline	5 Years
Estimated Cost	\$800,000
Potential Funding Sources	HMGP or county, city, or town budgets

Figure 5-93	
Action Item 48	Access Road
Description	Construct an alternative access road.
Hazards Addressed	Tornado/High Wind, Flood, Winter Storm, Wildfire, Lightning, Hail, Earthquake, Dam Failure*
Jurisdictions	Carlton Landing
Mitigation Action Type	Structure and Infrastructure Projects
Responsible Party	Carlton Landing municipal board.



Potential Implementation Timeline	4 Years
Estimated Cost	\$2,000,000
Potential Funding Sources	HMGP or county, city, or town budgets

\*Not all jurisdictions affected by Dam Failure.

Figure 5-94	
Action Item 49	Winter Roads
Description	Purchase equipment to winterize roads before winter storms.
Hazards Addressed	Winter Storms
Jurisdictions	Pittsburg County and all cities and towns
Mitigation Action Type	5%
Responsible Party	Pittsburg County and the municipal board of each city or town.
Potential Implementation Timeline	4 Years
Estimated Cost	\$400,000
Potential Funding Sources	HMGP or county, city, or town budgets

Figure 5-95	
Action Item 50	Covered Areas
Description	Build covered areas for exposed vehicles and equipment to prevent hail damage.
Hazards Addressed	Hail
Jurisdictions	All Jurisdictions
Mitigation Action Type	Structure and Infrastructure
Responsible Party	Pittsburg County, the school boards, and the municipal board of each city or town.
Potential Implementation Timeline	5 Years
Estimated Cost	\$800,000
Potential Funding Sources	HMGP or county, city, or town budgets

Figure 5-96	
Action Item 51	Vulnerable Populations

Description	Identify and map vulnerable populations to allow emergency personnel to assist those individuals and mitigate the risks of hazard events.
Hazards Addressed	All Hazards
Jurisdictions	All Jurisdictions
Mitigation Action Type	5%
Responsible Party	Pittsburg County and town's Emergency Managers, and the school boards.
Potential Implementation Timeline	2 Years
Estimated Cost	\$100,000
Potential Funding Sources	HMGP or county, city, or town budgets

<b>Figure 5-97</b>	
<b>Action Item 52</b>	<b>Pre-1940's Buildings</b>
Description	Inspect pre-1940's buildings to prevent potential future collapses.
Hazards Addressed	Earthquake, Tornado/High Wind
Jurisdictions	All Jurisdictions
Mitigation Action Type	Local Plans and Regulations
Responsible Party	Pittsburg County, the school boards, and the municipal board of each city or town.
Potential Implementation Timeline	2 Years
Estimated Cost	\$1,000,000
Potential Funding Sources	HMGP or county, city, or town budgets

<b>Figure 5-98</b>	
<b>Action Item 53</b>	<b>Winter Pipe Protection</b>
Description	Reinforce pipes to prevent freezing and busts during severe winter weather.
Hazards Addressed	Winter Storms
Jurisdictions	All Jurisdictions
Mitigation Action Type	Structure and Infrastructure Projects
Responsible Party	Pittsburg County, the school boards, and the municipal board of each city or town.

Potential Implementation Timeline	5 Years
Estimated Cost	\$4,000,000
Potential Funding Sources	HMGP or county, city, or town budgets

<b>Figure 5-99</b>	
<b>Action Item 54</b>	<b>Warning Signs and Barriers</b>
Description	Purchase additional warning signs and barriers for flooded roads to prevent vehicles from driving down them.
Hazards Addressed	Flood
Jurisdictions	Pittsburg County and all cities and towns
Mitigation Action Type	5% and Structure/Infrastructure Projects
Responsible Party	Pittsburg County and each town's Emergency Manager, and municipal boards.
Potential Implementation Timeline	3 Years
Estimated Cost	\$300,000
Potential Funding Sources	HMGP or county, city, or town budgets

<b>Figure 5-100</b>	
<b>Action Item 55</b>	<b>Shelter Locations</b>
Description	Purchase and post seasonal signage that directs citizens to public shelters, warming stations, and cooling stations.
Hazards Addressed	Tornado/High Wind, Winter Storm, and Extreme Heat
Jurisdictions	All Jurisdictions
Mitigation Action Type	Education and Awareness
Responsible Party	Pittsburg County and each town's Emergency Manager, and municipal boards.
Potential Implementation Timeline	2 Years
Estimated Cost	\$20,000
Potential Funding Sources	HMGP or county, city, or town budgets

<b>Figure 5-101</b>	
<b>Action Item 56</b>	<b>Warming Stations</b>
Description	Identify warming stations within each jurisdiction and

Hazards Addressed	Winter Storm
Jurisdictions	All Jurisdictions
Mitigation Action Type	Education and Awareness
Responsible Party	Pittsburg County and each town's Emergency Managers, the school boards, and municipal boards.
Potential Implementation Timeline	3 Years
Estimated Cost	\$500,000
Potential Funding Sources	HMGP or city, town, or county budgets

<b>Figure 5-102</b>	
<b>Action Item 57</b>	<b>Hail Resistant Roofing</b>
Description	Install hazard resistant roofing on critical facilities to prevent storm damages.
Hazards Addressed	Hail
Jurisdictions	All Jurisdictions
Mitigation Action Type	Structure and Infrastructure Project
Responsible Party	Pittsburg County, the school boards, and municipal boards of each jurisdiction.
Potential Implementation Timeline	5 Years
Estimated Cost	\$5,000,000
Potential Funding Sources	HMGP or City, town, or school budgets.

<b>Figure 5-103</b>	
<b>Action Item 58</b>	<b>City Canal</b>
Description	Deepen and widen the city canal from Modoc to 7 <sup>th</sup> Street.

Hazards Addressed	Flood
Jurisdictions	City of Hartshorne
Mitigation Action Type	Structure and Infrastructure
Responsible Party	City of Hartshorne Public Works Department
Potential Implementation Timeline	5 Years
Estimated Cost	\$1,250,000
Potential Funding Sources	HMGP, City Funds

<b>Figure 5-104</b>	
<b>Action Item 59</b>	<b>Improve NFIP Compliance</b>
Description	Enable jurisdictions to improve NFIP compliance by adopting floodplain ordinance and/or having a dedicated Floodplain Manager
Hazards Addressed	Flood
Jurisdictions	Alderson, Canadian, Crowder, Haileyville, Hartshorne, Kiowa, Krebs, McAlester, Pittsburg, and Quinton
Mitigation Action Type	Local Plans and Regs
Responsible Party	Municipal boards of each town/city.
Potential Implementation Timeline	1 Years
Estimated Cost	Unknown
Potential Funding Sources	HMGP, City Funds

<b>Figure 5-105</b>	
<b>Action Item 60</b>	<b>Address Dam Innundation Map Deficiency</b>
Description	Create Innundation Maps for Planning Area to Depict Adequate Extent of Dam Failure
Hazards Addressed	Dam Failure
Jurisdictions	Pittsburg Co, McAlester, Pittsburg, McAlester PS, Pittsburg PS
Mitigation Action Type	Local Plans and Regs
Responsible Party	OWRB
Potential Implementation Timeline	5 Years
Estimated Cost	Unknown

Potential Funding Sources	OWRB Funding
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### 5.7 Conclusion

The Pittsburg County Planning Committee understands that regular evaluation of this plan, to include the action items listed, will guarantee that this plan serves as a useful tool for all participating jurisdictions in the county. The public has a vital role to serve in this process. Continuing to seek public feedback and incorporating it into the evaluation process is a critical step in ensuring our mitigation resources and actions will benefit the highest number of the public.

## APPENDIX A: CRITICAL FACILITIES

<b>Figure A-1</b> <b>Pittsburg County Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>City/Town</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Pittsburg County Courthouse	115 E Carl Albert Parkway	McAlester	34.94333638	- 95.7694128	N
Pittsburg County Sheriff Dept./County Jail	1210 N. West St	McAlester	34.9475456	- 95.7814654	Y
Pittsburg County District 1 County Barn	200 N. Craig	Haileyville	34.8589286	- 95.5770946	N
Pittsburg County District 2 County Barn	692 Pittsburg Road	Pittsburg	34.5918798	- 95.7595683	N
Pittsburg County District 3 County Barn	1906 N. 15 <sup>th</sup>	McAlester	34.9472173	- 95.7425916	Y
Pittsburg County Health Department	1400 College Ave	McAlester	34.9331119	- 95.7464186	Y
Pittsburg County Emergency Operations Center	705 EOC Drive	McAlester	34.948034	-95.779302	Y
Pittsburg County Juvenile Detention Center	1208 North West Street	McAlester	34.948979	-95.780409	N
Blanco Fire Department	6359 North 4070 Road	McAlester	34.74835	-95.77640	N

High Hill Fire Department	4128 High Hill Road	McAlester	34.86943	-95.66332	N
Union Chappell Fire Department	8275 Pounds Valley Road	Pittsburg	34.66640	-95.74357	N
Russellville Fire Department	3085 Russelville Road	Quinton	35.15226	-95.46752	N
Bugtussle Fire Department	2295 Flowery Mound Road	McAlester	35.007490	-95.718350	N
Shady Grove Fire Department	3637State Hwy 113	McAlester	35.000050	-95.742190	Y
Tannehill Fire Department	10679 Tannehill Road	McAlester	34.9998293	- 95.8842811	N
Highway 9 Fire Department	106019 OK-9	Eufaula	35.2411648	- 95.5175614	Y
Haywood-Arpelar Fire Department	67 South Arpelar Road	Arpelar	34.941044	- 95.9652818	N

<b>Figure A-2</b> <b>Town of Alderson Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>City/Town</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Alderson Fire Department	103 Washington Street	Alderson	34.901750	-95.691380	N



<b>Figure A-3</b> <b>Town of Ashland Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>City/Town</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Ashland Fire Department	1329 S Harper Valley Road	Stuart	34.675950	-95.989930	N

<b>Figure A-4</b> <b>Town of Canadian Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>Town/City</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Canadian Town Hall	465 NW Toole Ave	Canadian	35.180900	-95.659300	N
Canadian Sewage/Lift Station	South Wilson St	Canadian	N35 10.3474	W95 39.1426	N
Canadian Water Treatment Plant	West Main Street	Canadian	N35 10.4254	W95 39.8288	N
Arrowhead Estates Fire Department	815 Arrowhead Drive	Canadian	35.174320	-95.618410	N
Canadian Fire Department	302 North Tignor St	Canadian	N35 10.6873	W95 39.1123	Y

<b>Figure A-5</b> <b>Carlton Landing Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>City/Town</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Carlton Landing Fire Department		Carlton Landing	N35-12-13.16	W95-32-38.50	
RW&SD No 20 Carlton Landing Sewage Lift Station	Water Lane	Carlton Landing	N35-12-16.49	W95-32-33.60	Y
RW&SD No 20 Carlton Landing Sewage Lagoons	Water Lane	Carlton Landing	N35-12-32.66	W95-32-24.37	N

<b>Figure A-6</b> <b>Town of Crowder Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>City/Town</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Crowder Fire Department	805 Bond St	Crowder	35.123469	-95.675119	N
Crowder Wastewater	721 Bond St	Crowder	35.132979	-95.674567	Y
Crowder PWA Lift #1	320 South C Ave	Crowder	35.121007	-95.673438	Y
Crowder PWA Lift #2	215 North F Ave	Crowder	35.125217	-95.666556	Y
PCDWA Water Plant	510 2 <sup>nd</sup> St	Crowder	35.126956	-95.671805	Y
PCDWA Pump Station	910 6 <sup>th</sup> St	Crowder	35.122904	-95.676329	Y
Crowder Senior Citizen Center	121 South B St	Crowder	35.122849	-95.674552	N

<b>Figure A-7</b> <b>Town of Indianola Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>City/Town</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Indianola Fire Department	2 <sup>nd</sup> & Walnut	Indianola	35.165890	-95.775170	
Canadian Shores Fire Department	6303 Canadian Shores	Indianola	35.16887	-95.73639	N

<b>Figure A-8</b> <b>Town of Kiowa Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>City/Town</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Kiowa Fire Department	916 south Harrison	Kiowa	34.721618	-95.904915	Y

<b>Figure A-9</b> <b>Town of Pittsburg Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>City/Town</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Pittsburg City Hall	501 Main Street	Pittsburg	34.711068	-95.850928	N
Pittsburg Fire Department	413 Broadway	Pittsburg	34.71440	-95.85083	N
Pittsburg Water Plant	968 Indian Trail	Pittsburg	34.687168	-95.834861	N
Pittsburg Sewer Plant	809 Main Street	Pittsburg	34.716835	-95.844330	N
Pittsburg Pumphouse Intake	968 Indian Trail	Pittsburg	34.686645	-95.836374	N

<b>Figure A-10</b> <b>Town of Quinton Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>City/Town</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Quinton City Hall	1021 Main St.	Quinton	35.123020	-95.368490	N
Quinton Fire Department	700 East Main	Quinton	35.12448	-95.36482	N

<b>Figure A-11</b> <b>Town of Savanna Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>City/Town</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Savanna City Hall/Police Station	10 So Main	Savanna	34.8291	-95.8442	Y
Savanna Public Works/City Barn	10 N. Main	Savanna	34.8294	-95.8437	N
Savanna Civic Center	105 H Avenue	Savanna	34.8324	-95.8389	N
Savanna Water Tower	9418 ½ So. US Highway 69	Savanna	34.8997	-95.8430	Y
Savanna Lift Station	A Ave & Stadia Drive	Savanna	34.8251	-95.8384	N
Savanna Lift Station	End of A Street	Savanna	34.8339	-95.8328	N
Savanna Lift Station	Old Highway South	Savanna	34.8444	-95.8327	N
Savanna Fire Department Station #1	101 H Ave	Savanna	34.8322	-95.8394	Y
Savanna Fire Department Station #2	42 N Washington	Savanna	34.8316	-95.8470	N

<b>Figure A-12</b> <b>City of Haileyville Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>Town/City</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Haileyville Fire Department	110 Main Street	Haileyville	34.85472	-95.58008	N
Haileyville City Hall	110 Main	Haileyville	34.853760	-95.583794	N

<b>Figure A-13</b> <b>City of Hartshorne Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>Town/City</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Hartshorne Fire Department	1101 Pennsylvania Ave	Hartshorne	34.844640	-95.553850	Y
Hartshorne City Hall	1101 Pennsylvania	Hartshorne	34.844640	-95.553850	N

<b>Figure A-14</b> <b>City of Krebs Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>Town/City</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
Krebs Fire Department	10 North Ash	Krebs	34.93085	-95.71556	Y
Krebs City Hall	5 East Washington	Krebs	34.927780	-95.713060	Y

<b>Figure A-15</b> <b>McAlester Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>Town/City</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
McAlester City Hall	28 East Washington	McAlester	34.933991	-95.768304	Y
Frink Chambers Community Center	454 Frink Road	McAlester	34.878055	-95.790084	N
Kiamichi Technology Center	301 Kiamichi Drive	McAlester	34.924445	-95.745674	N
McAlester Regional Hospital	1 Clark Bass Blvd.	McAlester	34.936857	-95.750509	Y
Blue Fire Department	518 Verner Road	McAlester	34.945634	-95.881638	Y
Elm Point Fire Department	6590 East Highway 31	McAlester	35.0017185	-95.6029654	N
McAlester Fire Department Main Station	607 Village Blvd.	McAlester	34.908260	-95.742094	Y
McAlester Fire Department South Station	1313 So. Strong Blvd.	McAlester	34.914967	-95.760008	Y
McAlester Fire Department North Station	2717 N Main	McAlester	34.955752	-95.761324	N
Sams Point Fire Department	205 Kelso Drive	McAlester	35.194230	-95.694290	Y
Steven Taylor Water Tower	New Baker Road	McAlester	34.931511	-95.828191	N

McAlester Public Works Facility	1212 North West Street	McAlester	34.949977	-95.779327	N
McAlester Public Safety Radio Repeater	299 East Adams	McAlester	34.935098	-95.764617	N
McAlester Public Safety Radio Repeater	913 Larue Road	McAlester	34.894724	-95.759730	N
McAlester Softball Complex Lift Station	2500 West Highway 270	McAlester	34.943083	-95.812409	N
McAlester Storm Sewer Lift Station	Railroad & West Electric Ave.	McAlester	34.947322	-95.765513	N
McAlester Landfill Lift Station	2810 North Mitchell Road	McAlester	34.952861	-95.830640	N
McAlester/Walmart Sewer Lift Station	440 South George Nigh Expy	McAlester	34.920080	-95.738252	Y
McAlester/Links Sewer Lift Station	14 Torrey Pines Court	McAlester	34.904385	95.751904	N
McAlester/Katy Sewer Lift Station	2900 North Katy	McAlester	34.958830	-95.761318	N
McAlester/UPS Lift Station	150 Express Lane	McAlester	34.884002	-95.776239	Y
McAlester/Fireside Lift Station	925 Fireside	McAlester	34.891256	-95.758588	N
McAlester Regional Airport	104 Airport Road	McAlester	34.884739	-95.784563	M



McAlester/KFC Water Booster Pump Station	705 South George Nigh Expy	McAlester	34.912410	-95.746308	N
McAlester/Summit Ridge Water Booster Pump	9 Briar Cliff Road	McAlester	34.899710	-95.738853	N
McAlester/West SS Treatment	1305 West Hwy 31	McAlester	34.932019	-95.709270	Y
McAlester/East SS Treatment	1360 East Krebs Lake Road	McAlester	34.954613	-95.745579	Y
McAlester/Skyline Water Tower	3327 North Hickory	McAlester	34.970377	-95.767804	N
McAlester/Buffalo Water Tower	299 East Adams	McAlester	34.935094	-95.764620	N
McAlester/Carl Albert Water Tower	913 Larue Road	McAlester	34.894723	-95.759727	N
McAlester/B & Seminole Water Tower	226 West Seminole	McAlester	34.925841	-95.776449	N
McAlester Water Treatment Plant	5200 Waterworks Road	McAlester	34.993118	-95.797660	Y
McAlester/Airport Lift Station	210 Airport Drive	McAlester	34.884077	-95.786862	N
McAlester/Midway Lodge Lift Station	727 South George Nigh Expy	McAlester	34.909503	-95.746012	N
McAlester/Walnut Grove Lift Station	2301 South 14 <sup>th</sup>	McAlester	34.901072	-95.754350	N

McAlester/Country Club Lift Station	1428 Country Club Road	McAlester	34.909240	-95.750540	N
McAlester/OSP Lift Station	7300 North West St	McAlester	34.956107	-95.780655	N
McAlester/Colony North Lift Station	1 Melissa Lane	Krebs	34.935989	-95.734143	N
JI Stipe Recreation Center	801 North 9 <sup>th</sup> Street	McAlester	34.936949	-95.756381	N
McAlester EXPO	4500 West Highway 270	McAlester	34.944603	-95.824948	N

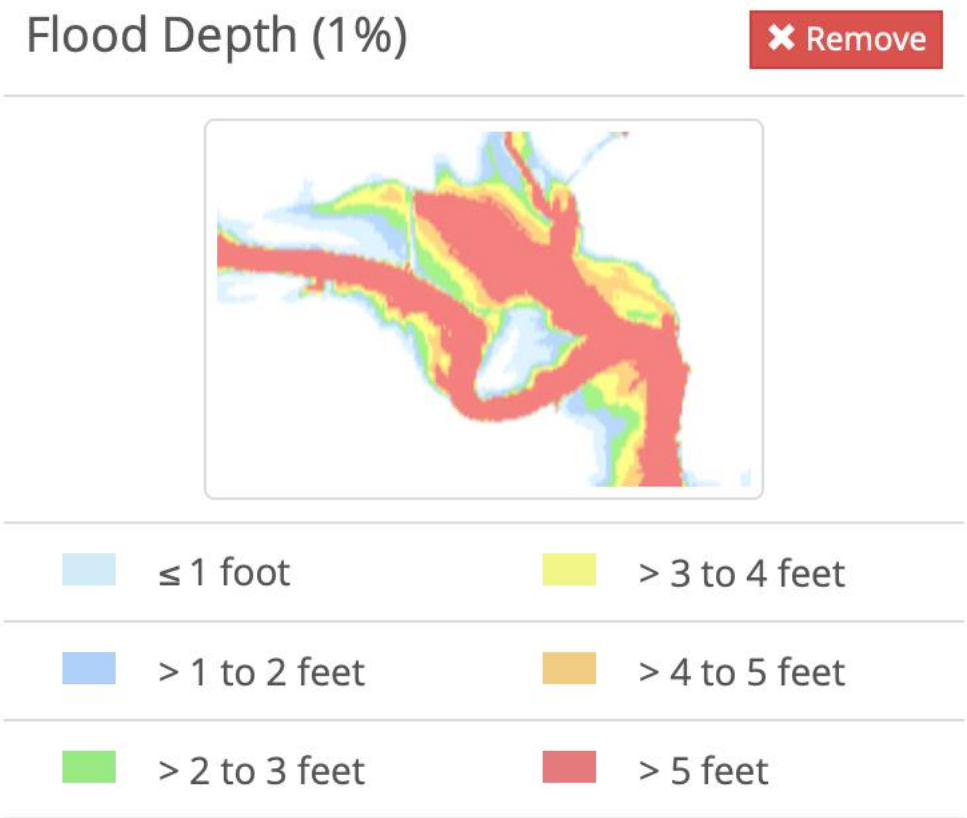
<b>Figure A-16</b> <b>School District Critical Facilities</b>					
<b>Name</b>	<b>Address</b>	<b>Town/City</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Backup Power</b>
McAlester Public Schools Early Childhood Center Jefferson	501 South C St	McAlester	34.929420	-95.777631	N
McAlester Public Schools Early Childhood Center Washington	700 South 6 <sup>th</sup>	McAlester	34.922846	-95.764513	N
McAlester Public Schools Early Childhood Center William Gay	600 W. Madison	McAlester	34.938381	-95.778135	N
Edmond Doyle Elementary School	520 E. Smith	McAlester	34.956074	-95.755917	N
Emerson Elementary School	301 E Van Buren	McAlester	34.940113	-95.761541	N
Parker Intermediate School	1310 N 6 <sup>th</sup>	McAlester	34.942337	-95.755781	N
Will Rogers Elementary School	1200 East South St	McAlester	34.916364	-95.757352	N
Puterbaugh Middle School	1100 East South St	McAlester	34.916156	-95.758893	N
McAlester High School	1 Buffalo Drive	McAlester	34.936773	-95.741124	N
Quinton Public School	210 J St	Quinton	35.884490	-95.367165	N

Crowder Public School	400 Bond Street	Crowder	35.123704	-95.669680	N
Haileyville Public School	205 Riley	Haileyville	34.851672	-95.579524	N
Canadian Public School	Belt St/Rogers Rd	Canadian	N35 10.3286	W95 39.3934	N
Hartshorne Public School Elementary	821 Arapahoe	Hartshorne	34.849656	-95.557436	Y
Hartshorne Junior High School	913 Modoc	Hartshorne			N
Hartshorne High School	520 South 5 <sup>th</sup>	Hartshorne	34.842696	-95.567289	Y
Krebs Public School	20 SW Fifth St	Krebs	34.927379	-95.7065417	Y
Frink-Chambers Public Schools	485 Frink Road	McAlester	34.877558	-95.789215	N
Frink-Chambers Gym	567 Frink Road	McAlester	34.876537	-95.788966	N
Tannehill Public Schools	9283 Tannehill Road	McAlester	35.002824	-95.844201	N
Haywood Public Schools	11461 W State Hwy 31	McAlester	34.884490	-95.947513	N
Savanna Public Schools	9567 South UD Hwy 69	Savanna	34.838141	-95.835140	N
Pittsburg Public Schools	301 W Grand	Pittsburg	34.11417	-95.85366	N
Indianola Public Schools	900 Hwy 113 South	Indianola	35.159340	-95.772318	N

Kiowa Public Schools	406 East 8 <sup>th</sup>	Kiowa	34.7176	-95.8950	N
Carlton Landing Academy	10 Boulevard Unit A	Carlton Landing	N 35-12- 11.79	-95-32-41.64	N

APPENDIX B: FLOOD DEPTH MAPS

Figure B-42



**Comments:** Depicts estimated water depths above land surface during a 1% annual chance storm event (a storm that has a 1/100 chance of occurring in any calendar year).

**Figure B-43**  
**Town of Alderson Flood Depth Levels**

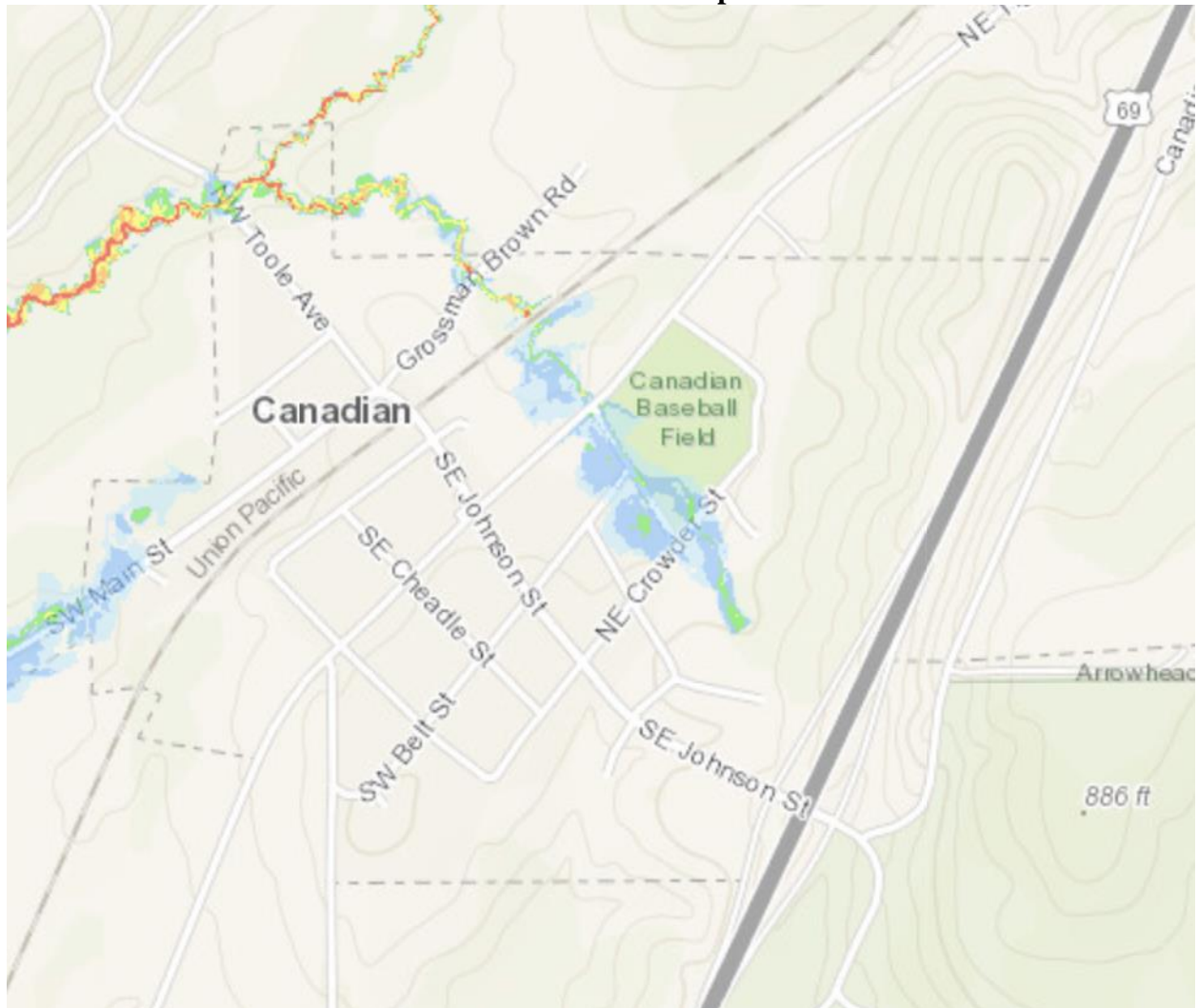


**Figure B-44**  
**Town of Ashland Flood Depth Levels**

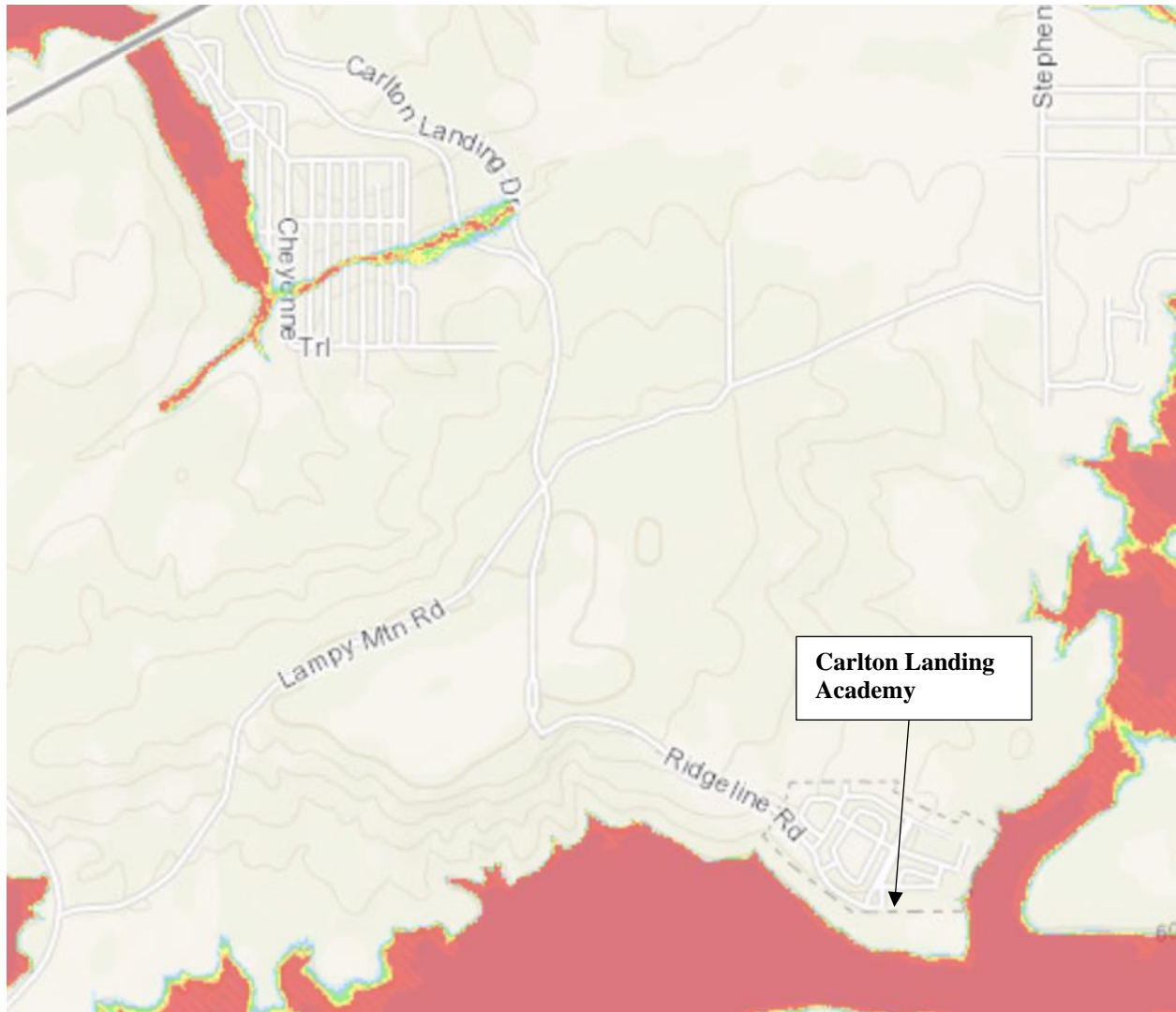




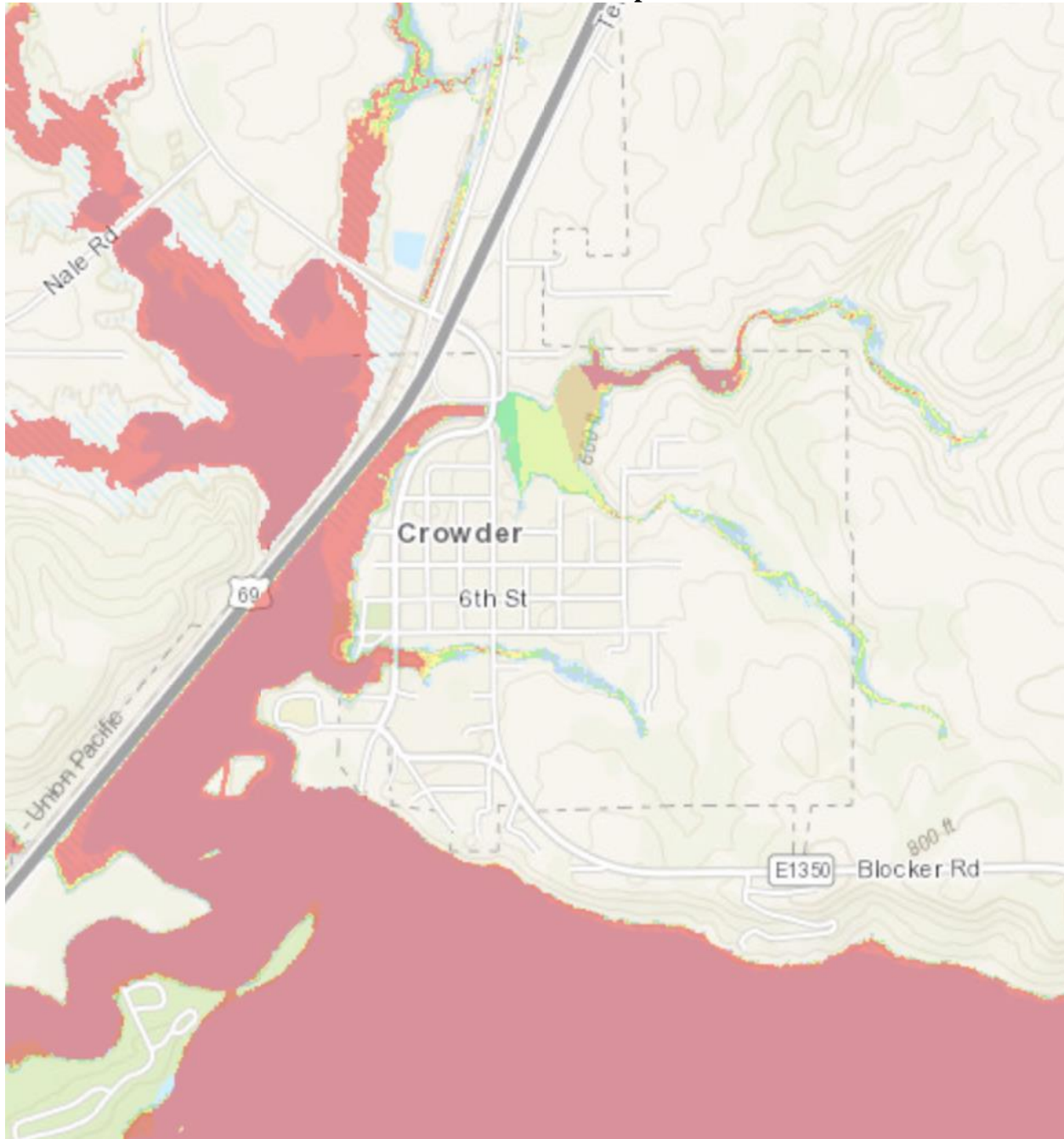
**Figure B-45**  
**Town of Canadian Flood Depth Levels**



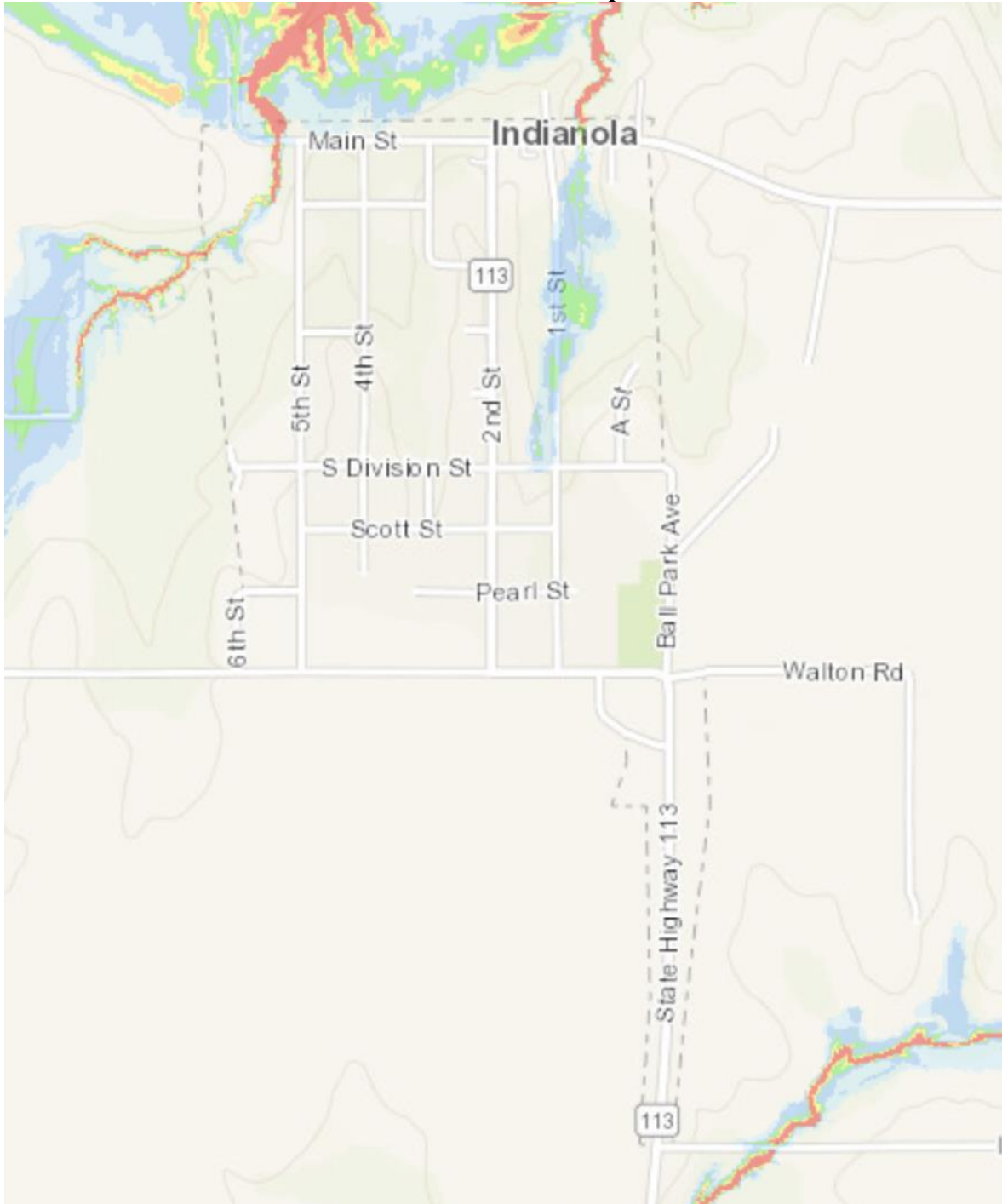
**Figure B-46**  
**Town of Carlton Landing/Carlton Landing Academy Flood Depth Levels**



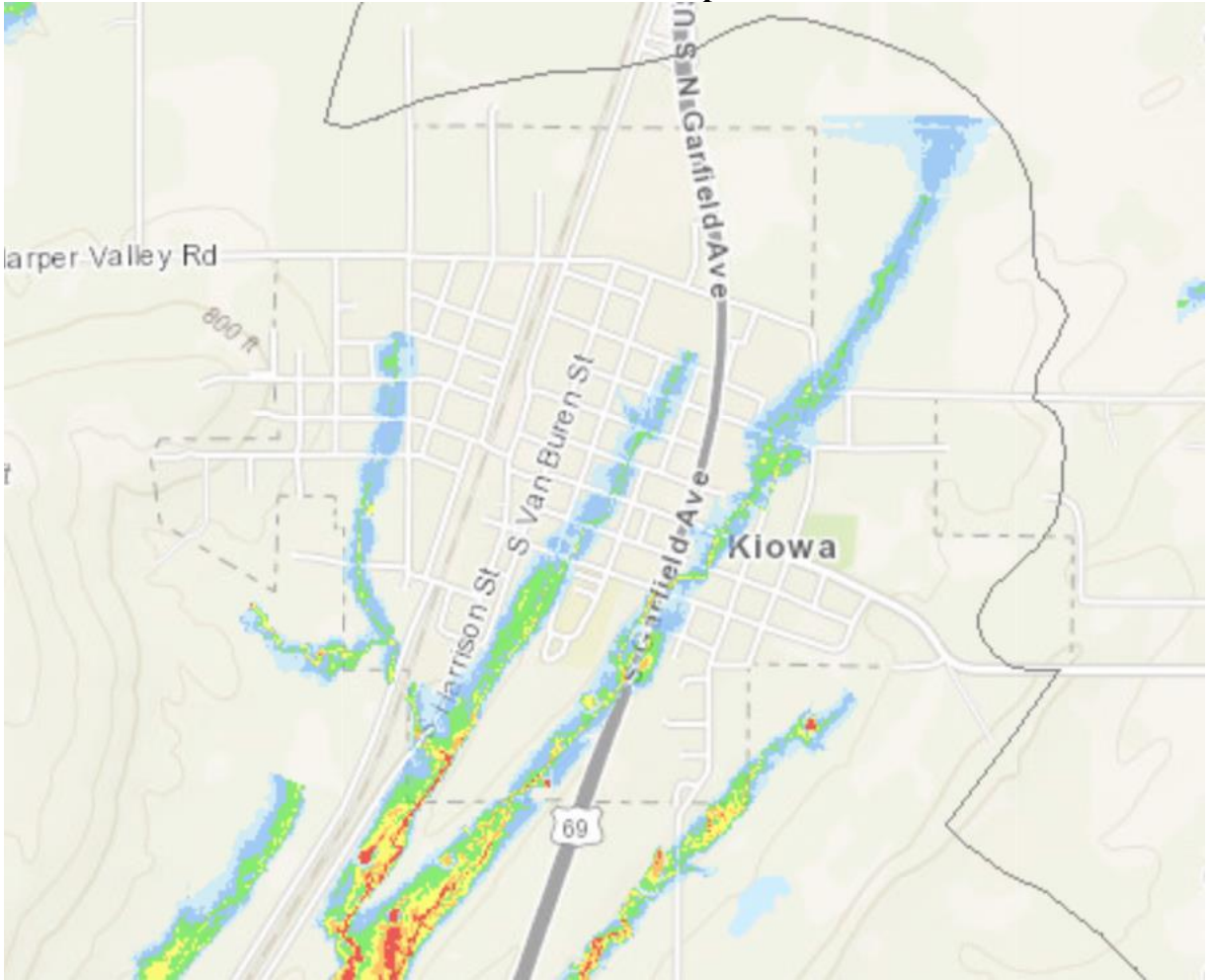
**Figure B-47**  
**Town of Crowder Flood Depth Levels**



**Figure B-48**  
**Town of Indianola Flood Depth Levels**

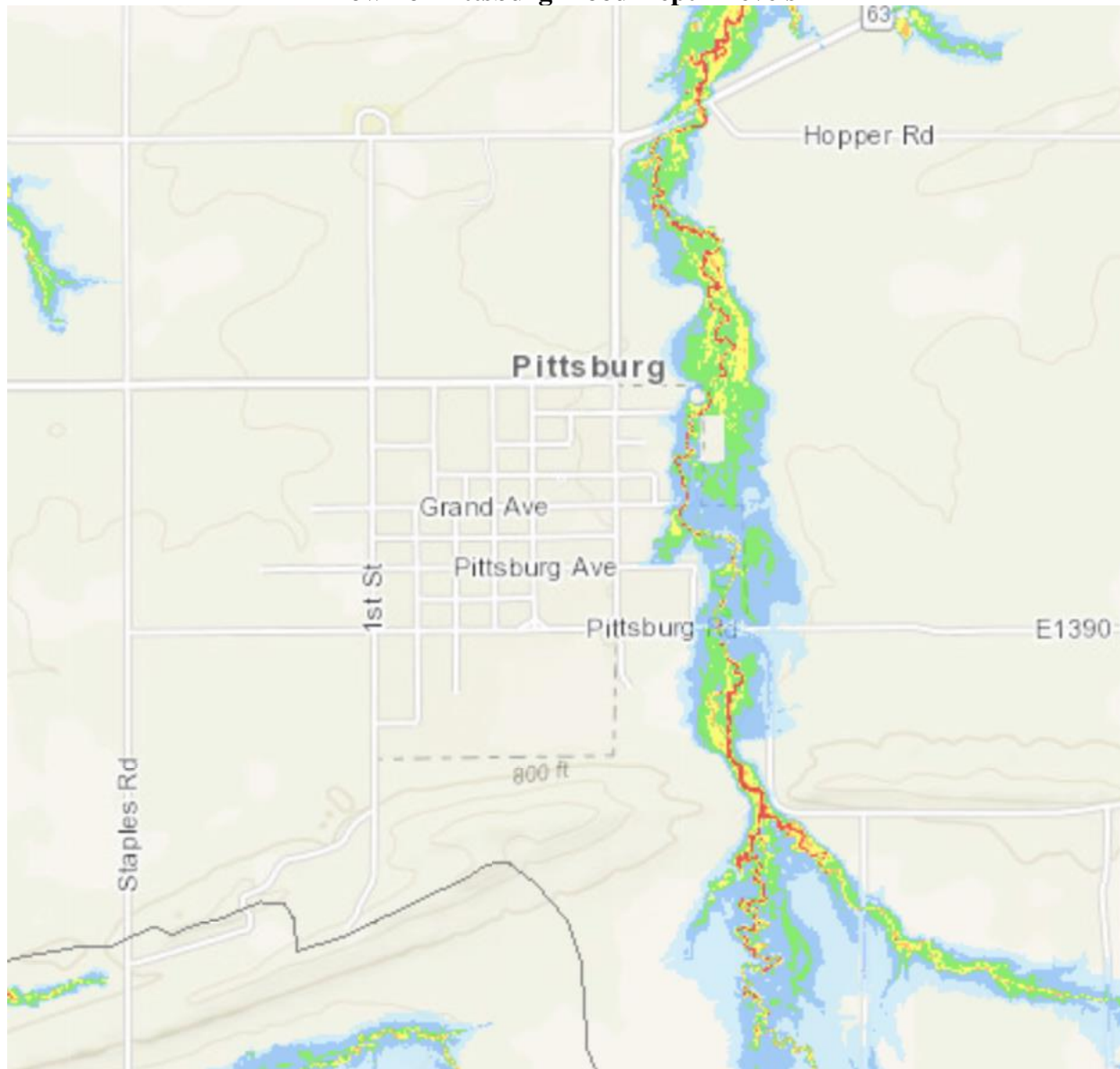


**Figure B-49**  
**Town of Kiowa Flood Depth Levels**

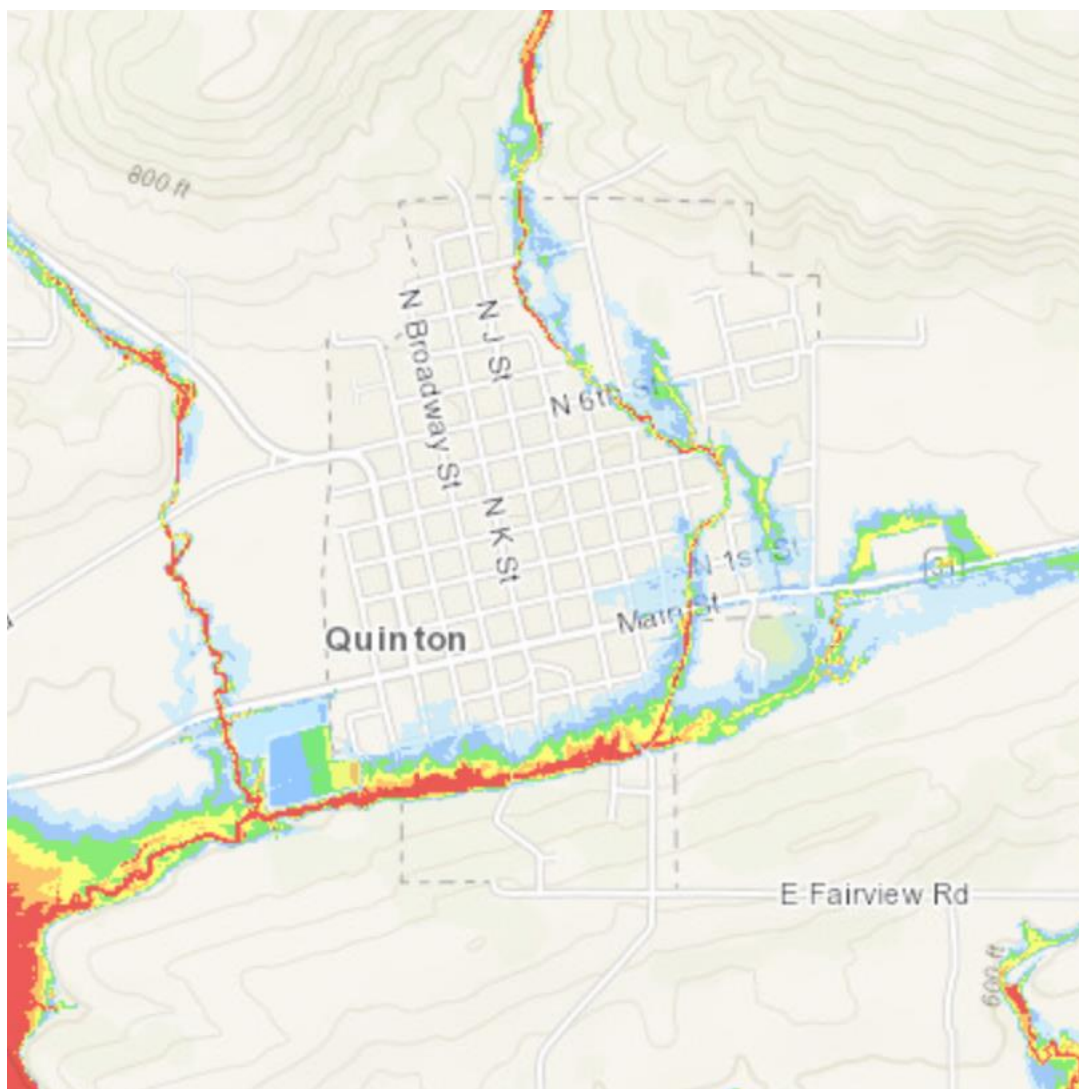




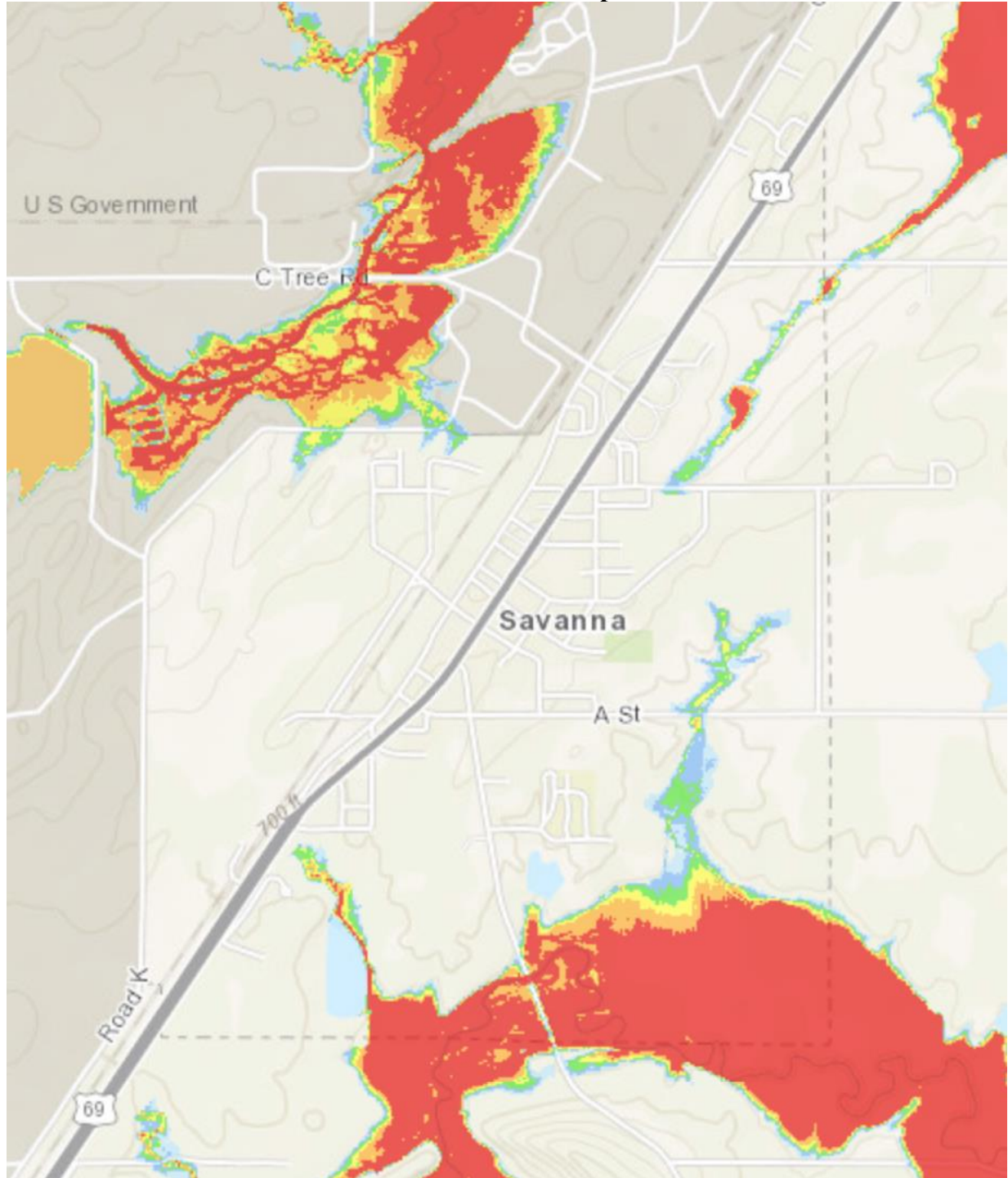
**Figure B-50**  
**Town of Pittsburg Flood Depth Levels**



**Figure B-51**  
**Town of Quinton Flood Depth Levels**

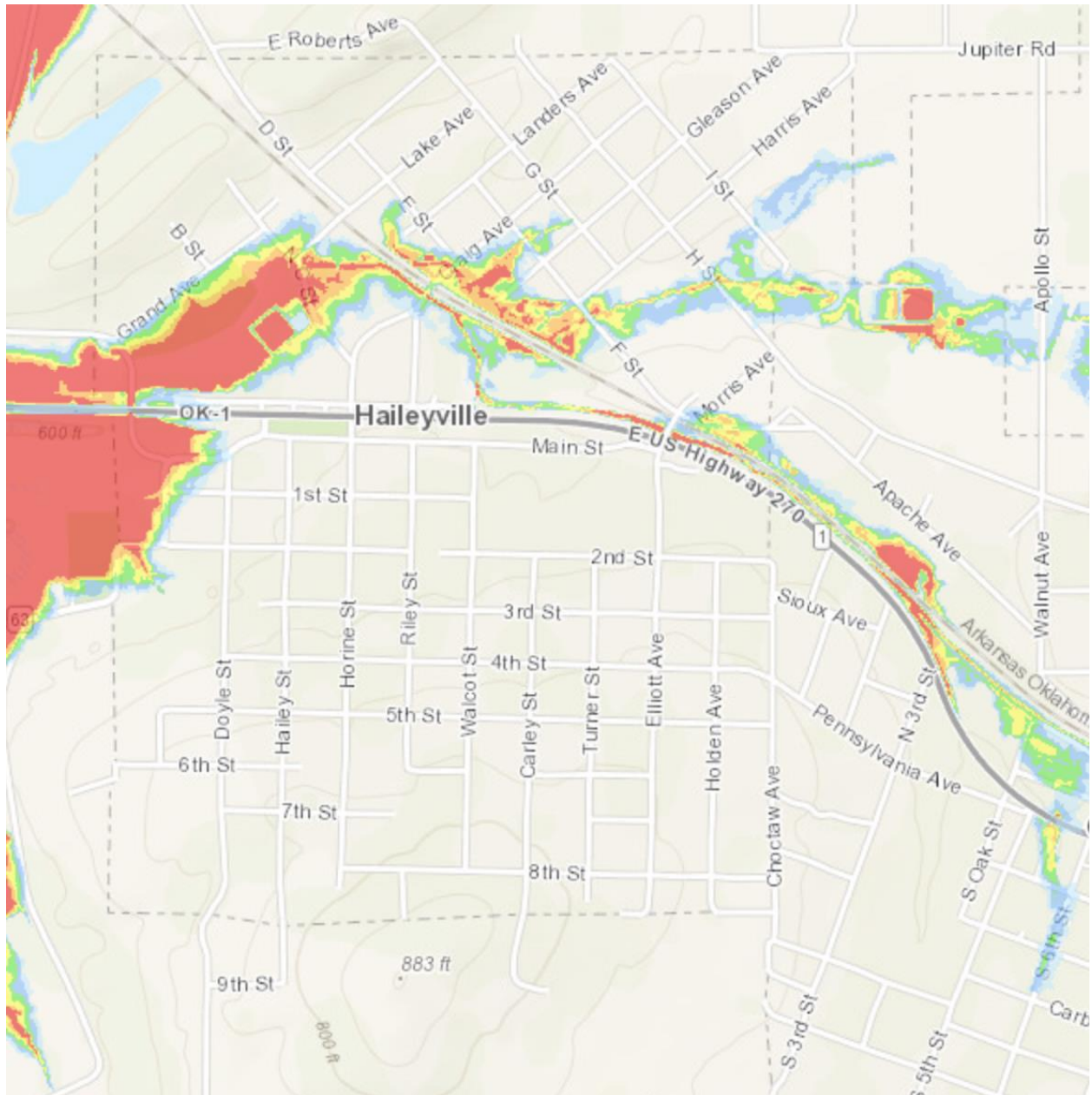


**Figure B-52**  
**Town of Savanna Flood Depth Levels**





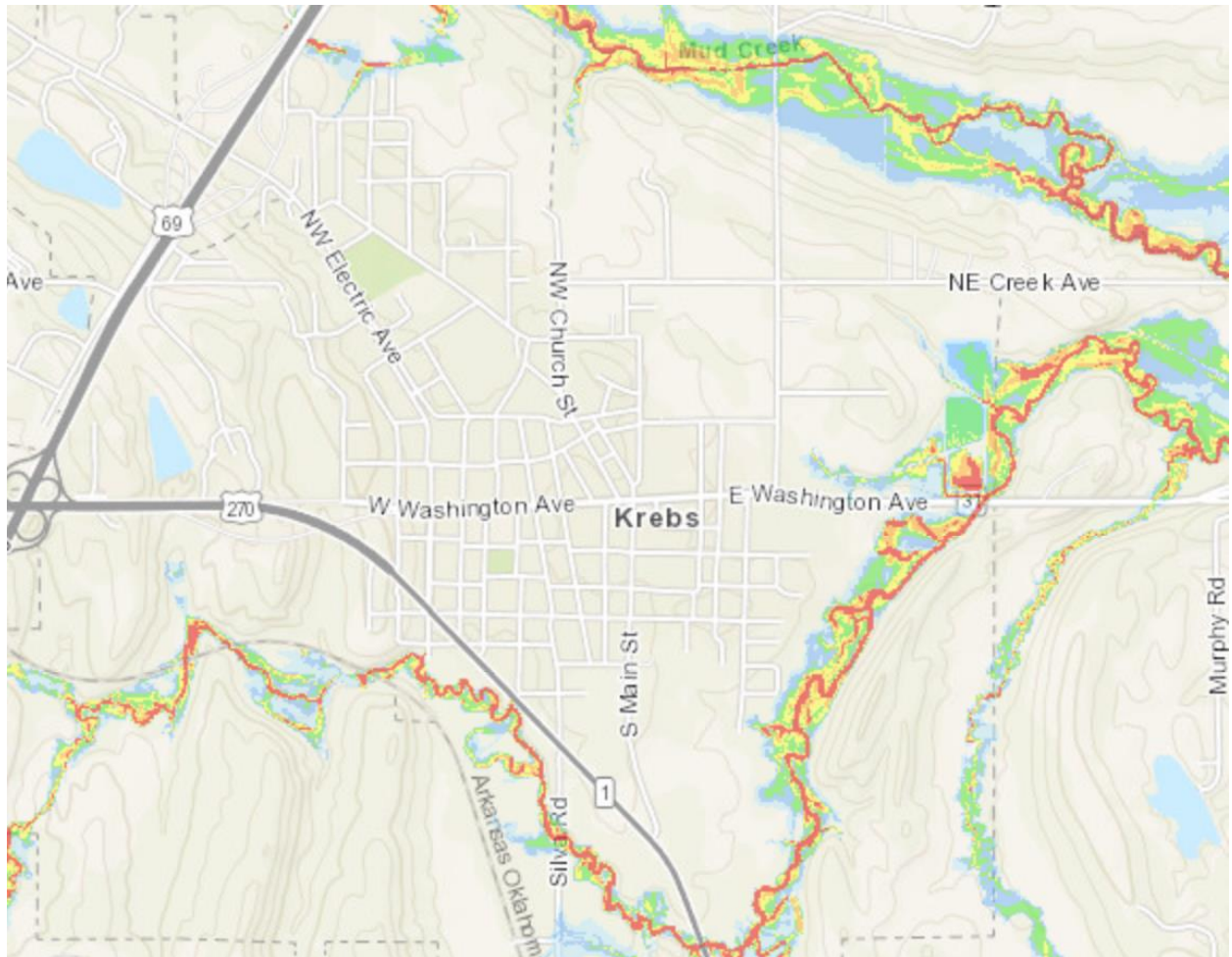
**Figure B-53**  
**City off Haileyville Flood Depth Levels**



**Figure B-54**  
**City of Hartshorne Flood Depth Levels**

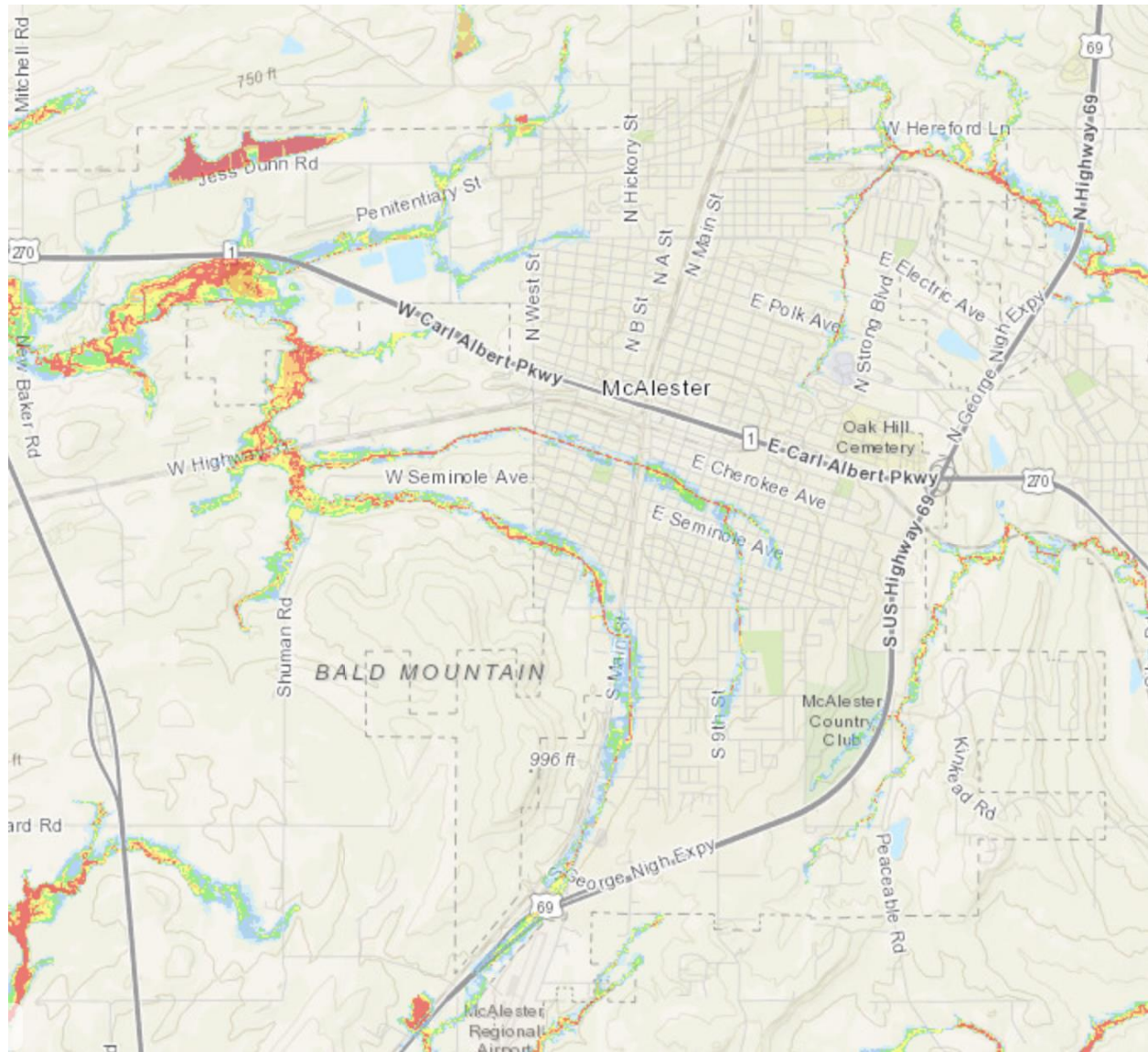


**Figure B-55**  
**City of Krebs Flood Depth Levels**

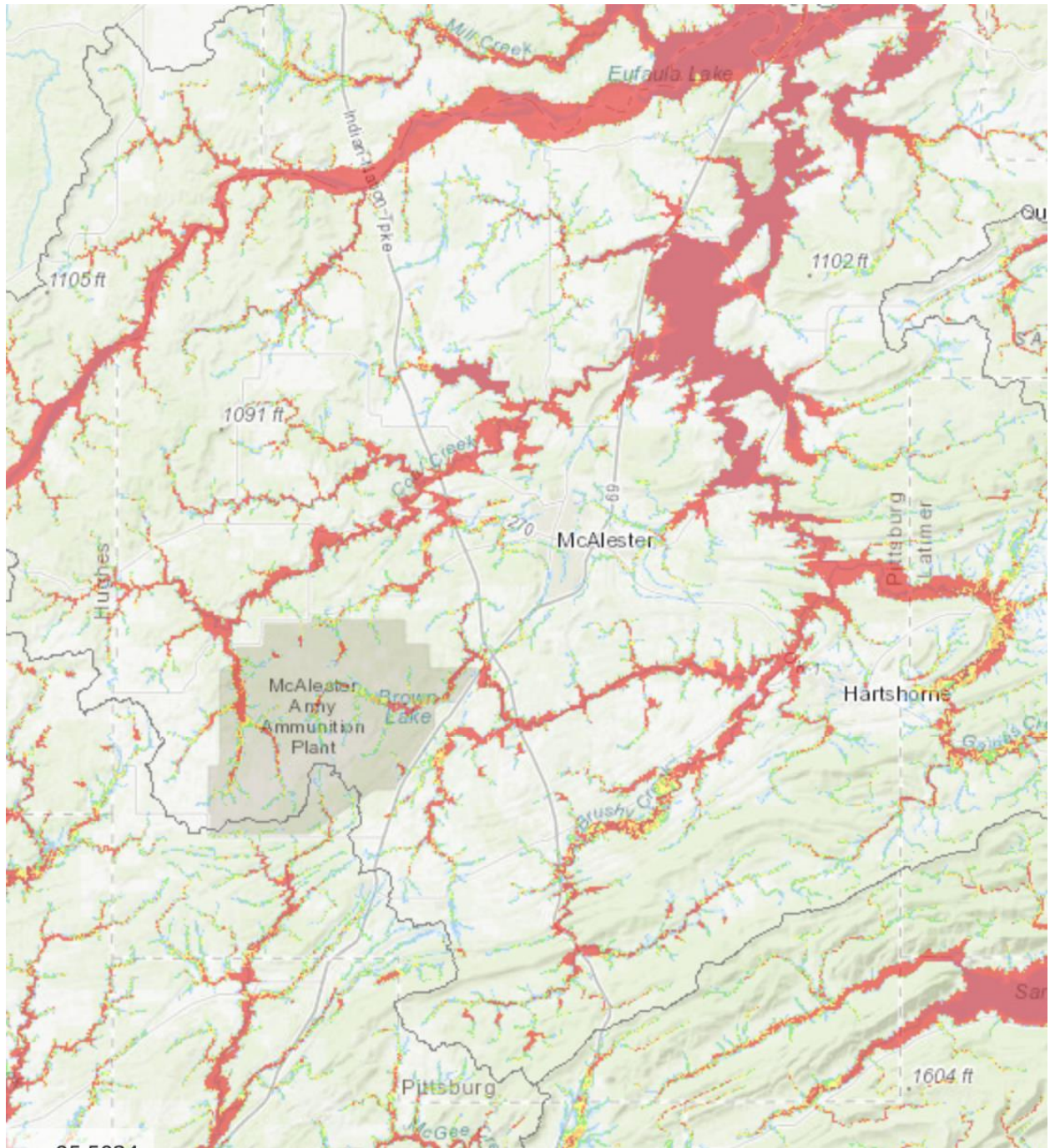




**Figure B-56**  
**City of McAlester Flood Depth Levels**

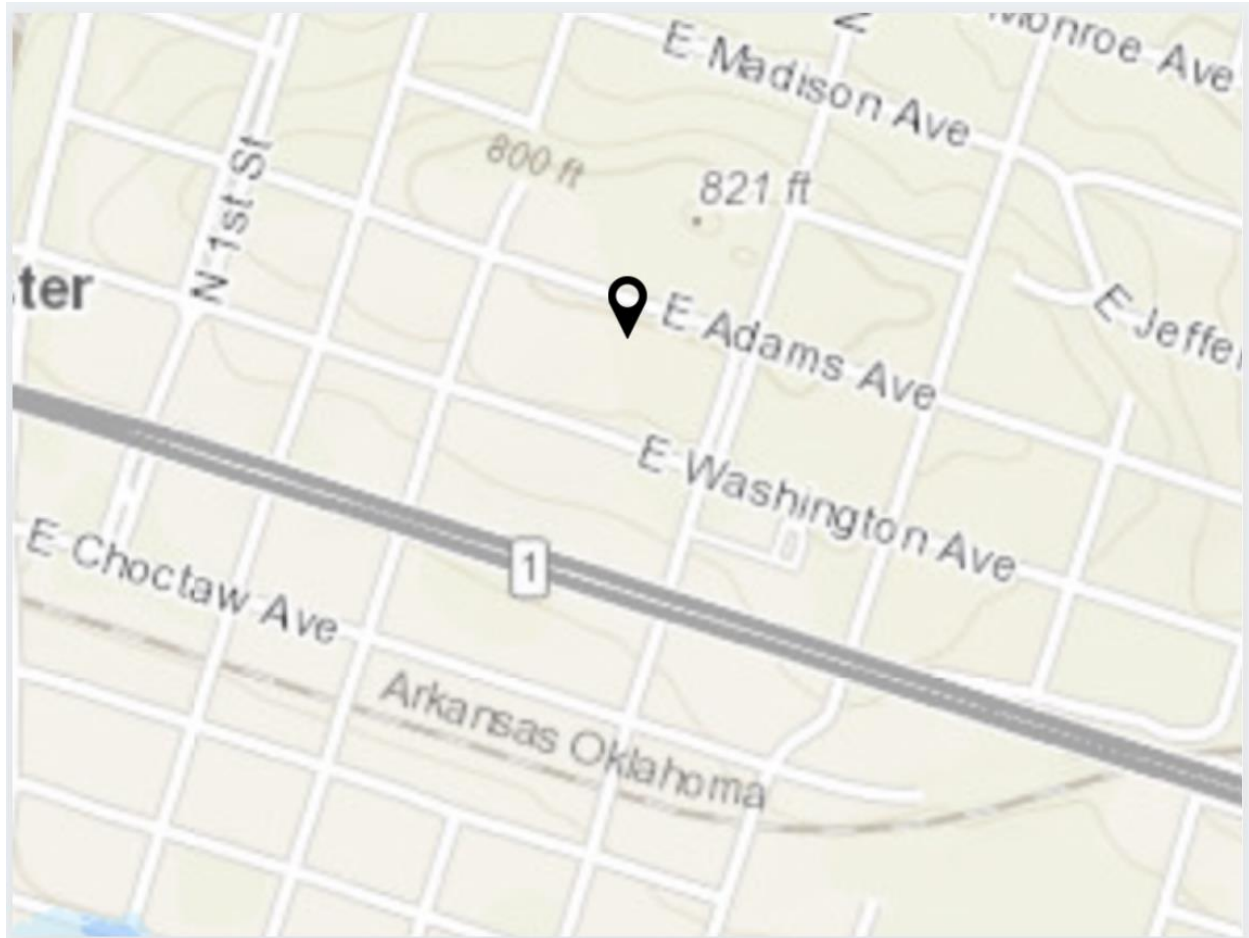


**Figure B-57**  
**Pittsburg County Flood Depth Levels**

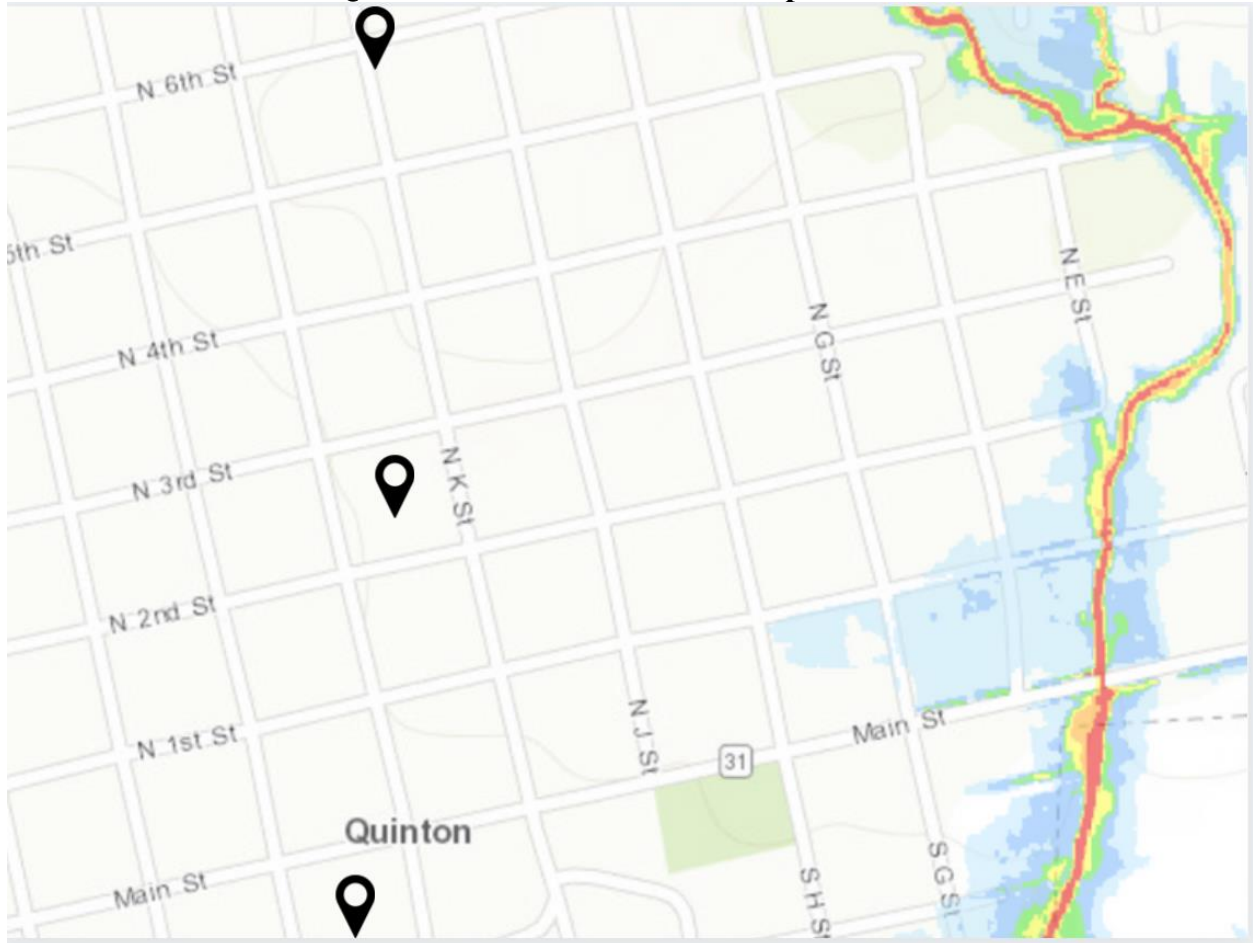




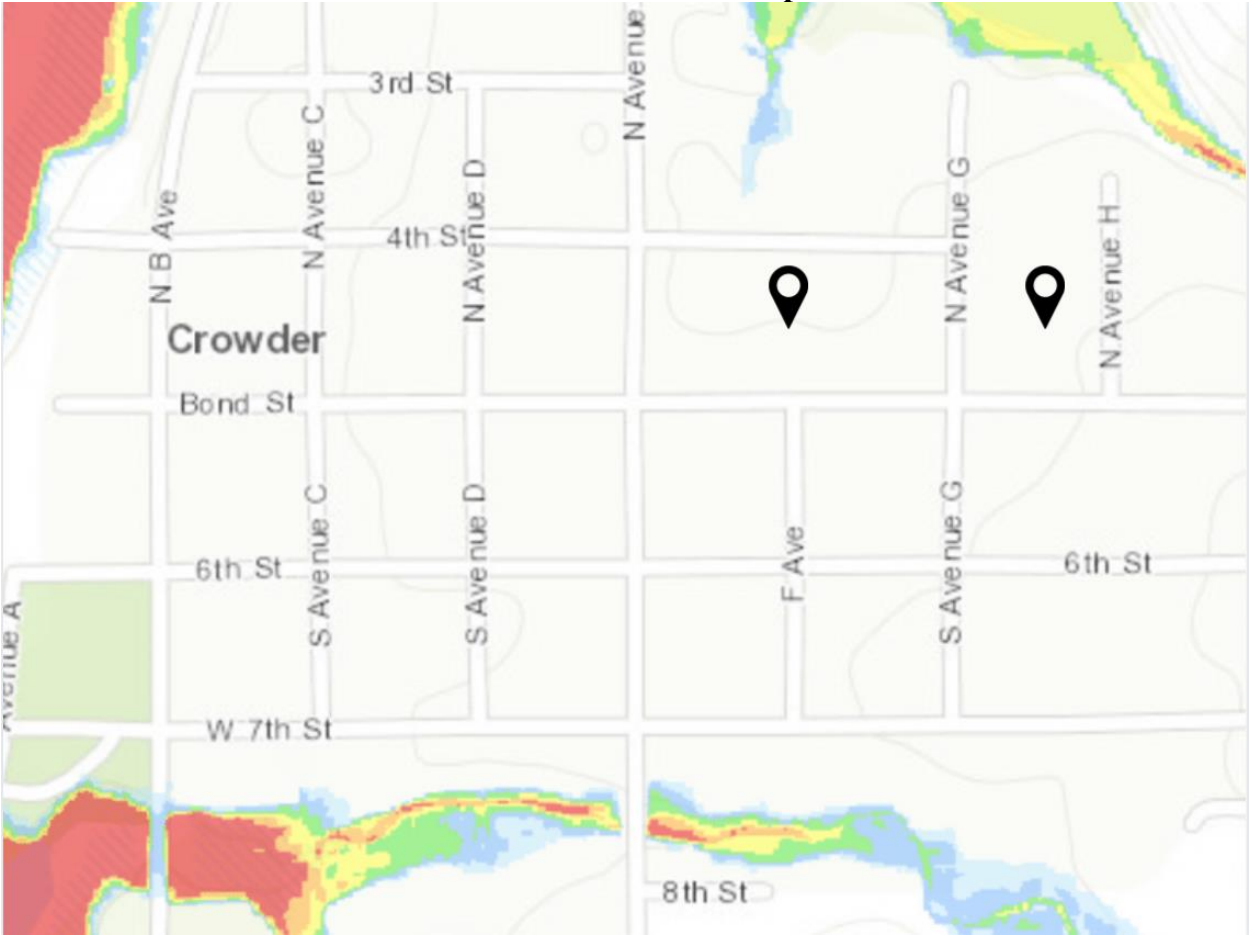
**Figure B-58**  
**McAlester Public Schools**



**Figure B-59**  
**Quinton Public Schools Flood Depth Levels**

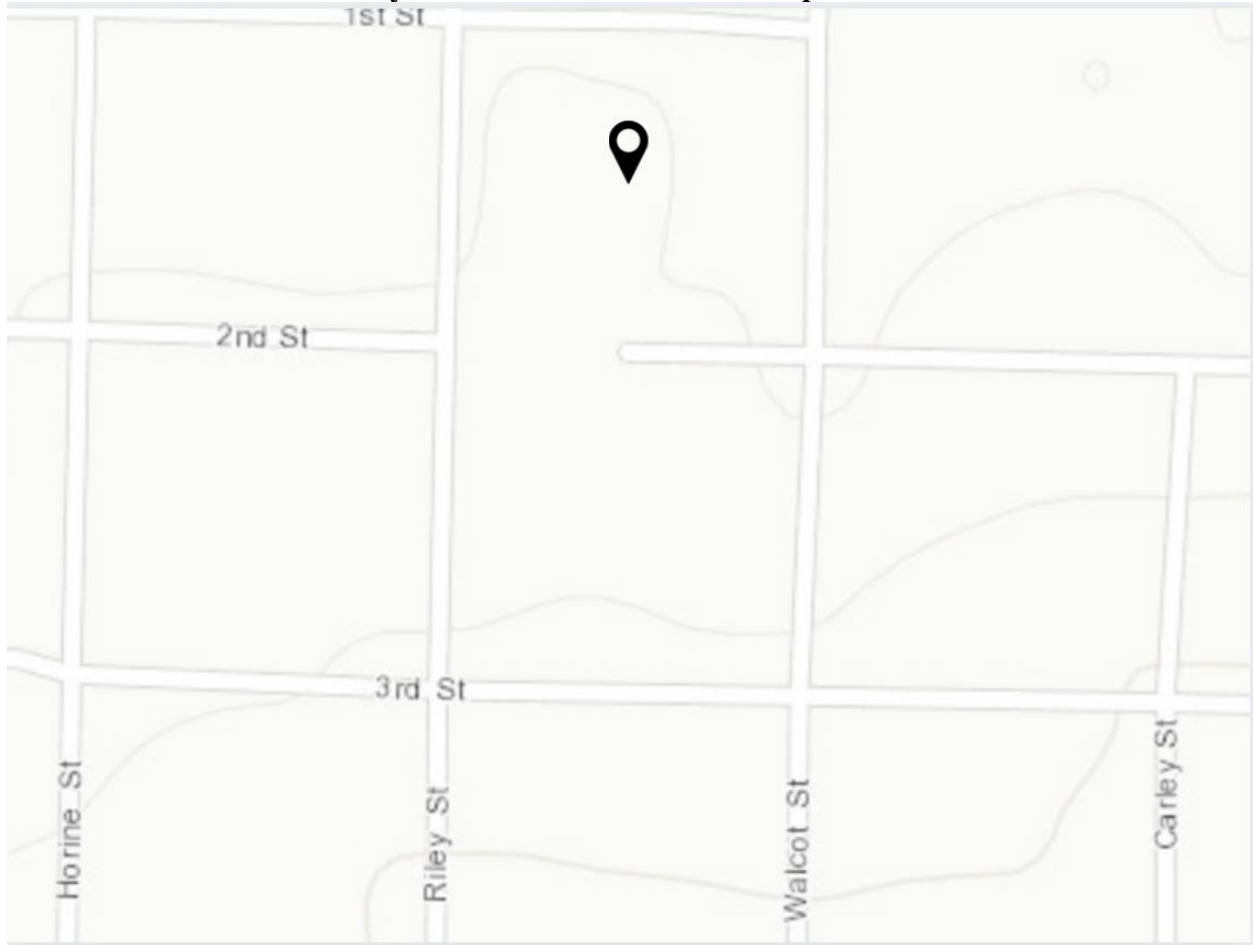


**Figure B-60**  
**Crowder Public Schools Flood Depth Levels**

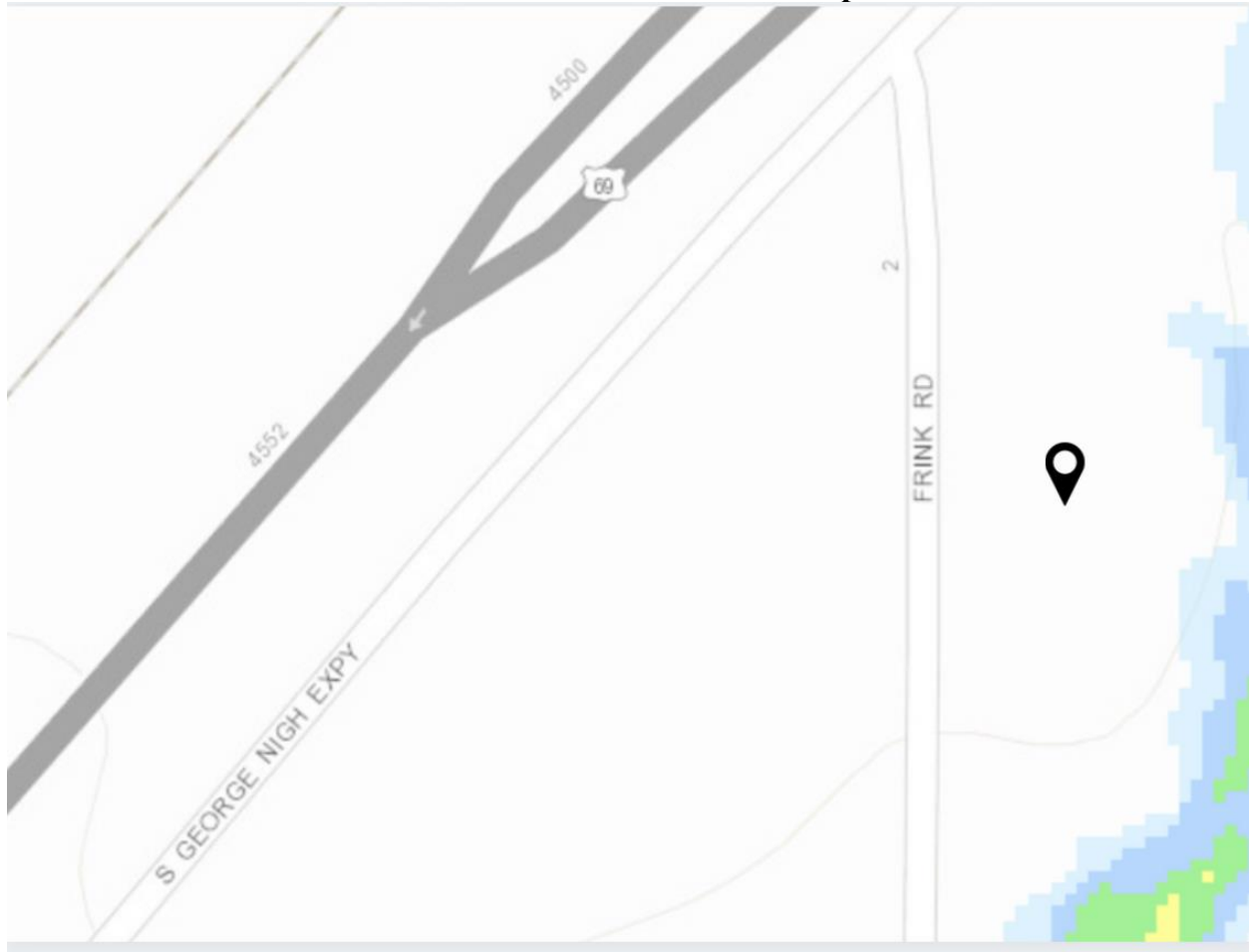




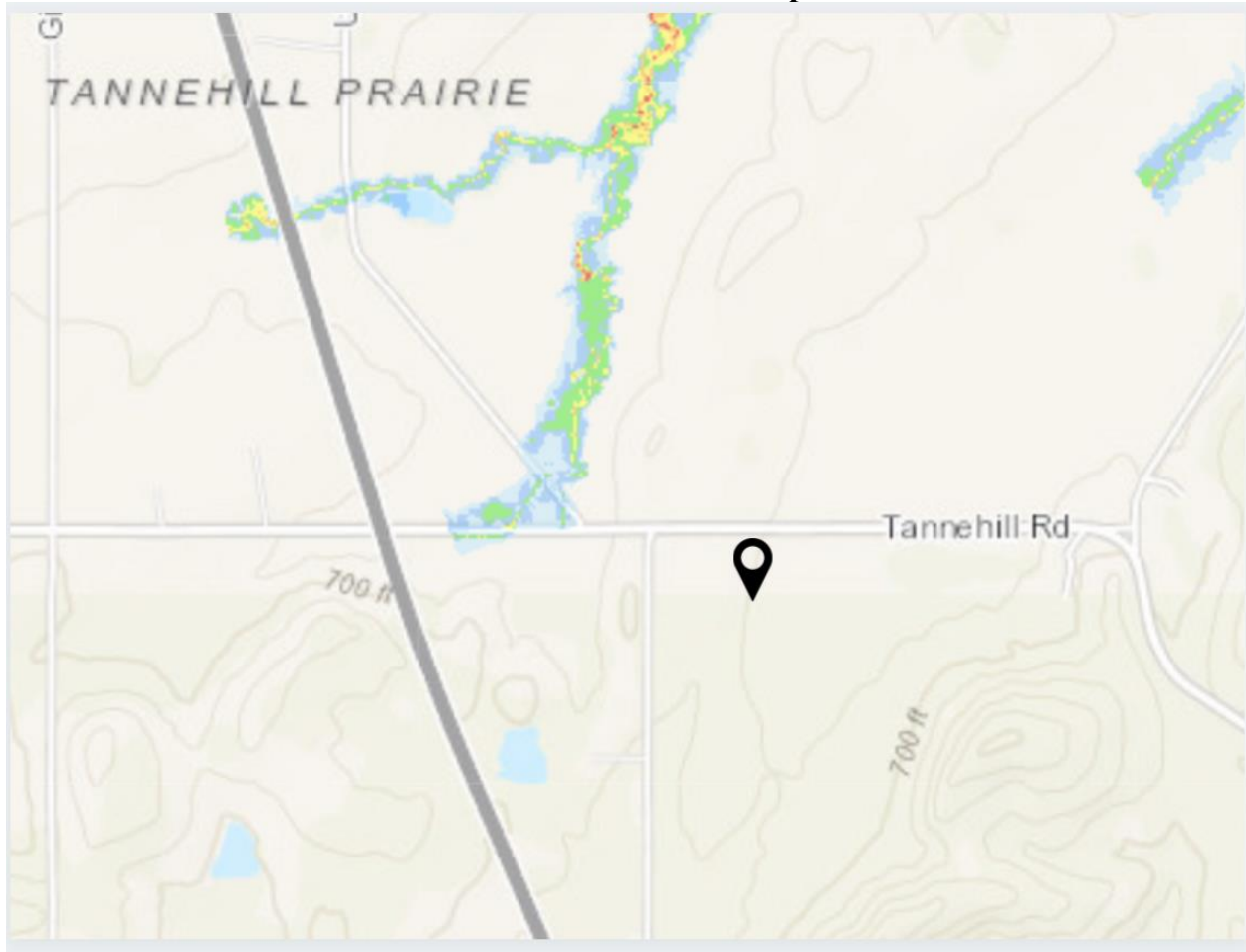
**Figure B-61**  
**Haileyville Public Schools Flood Depth Levels**



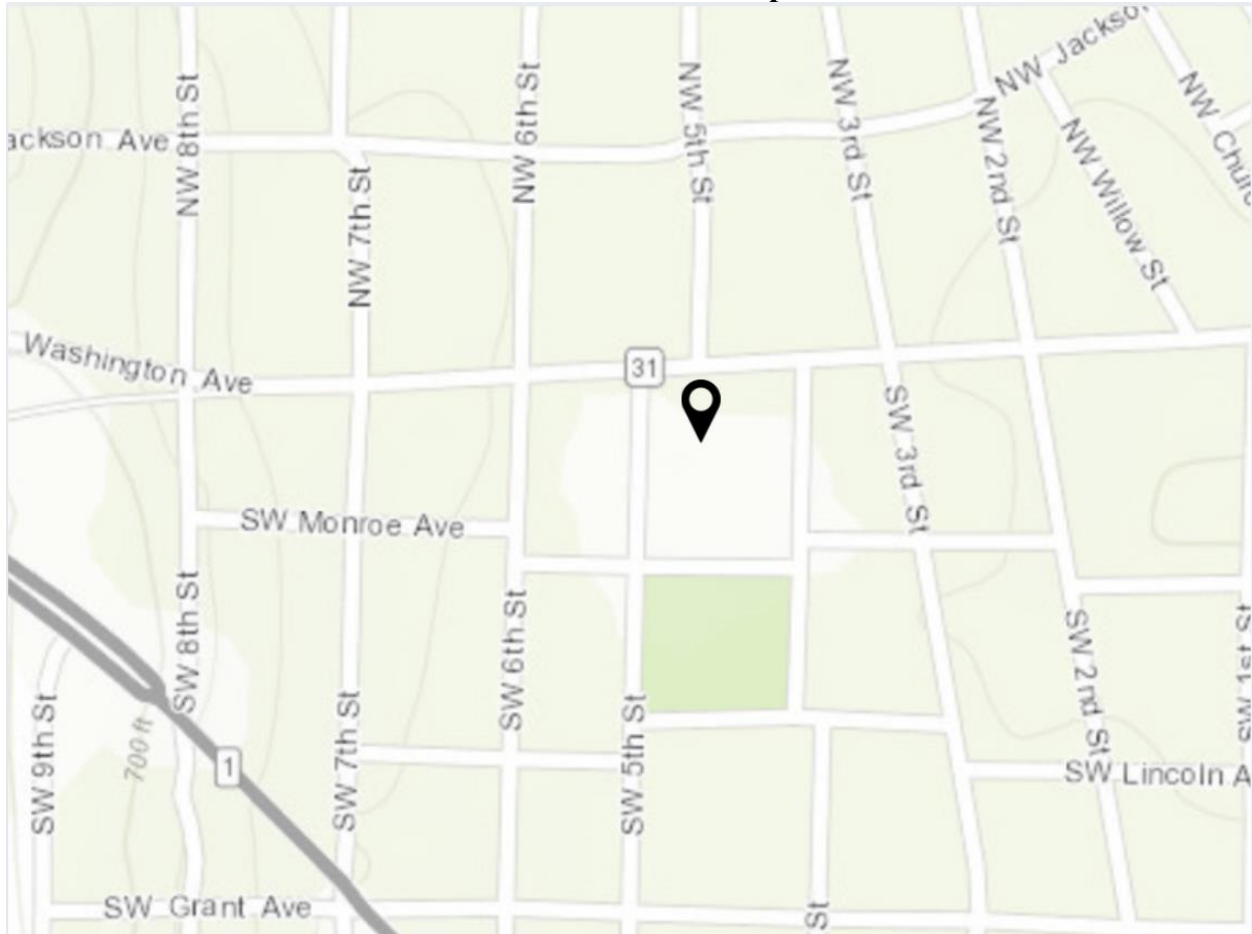
**Figure B-62**  
**Frink-Chambers Public Schools Flood Depth Levels**



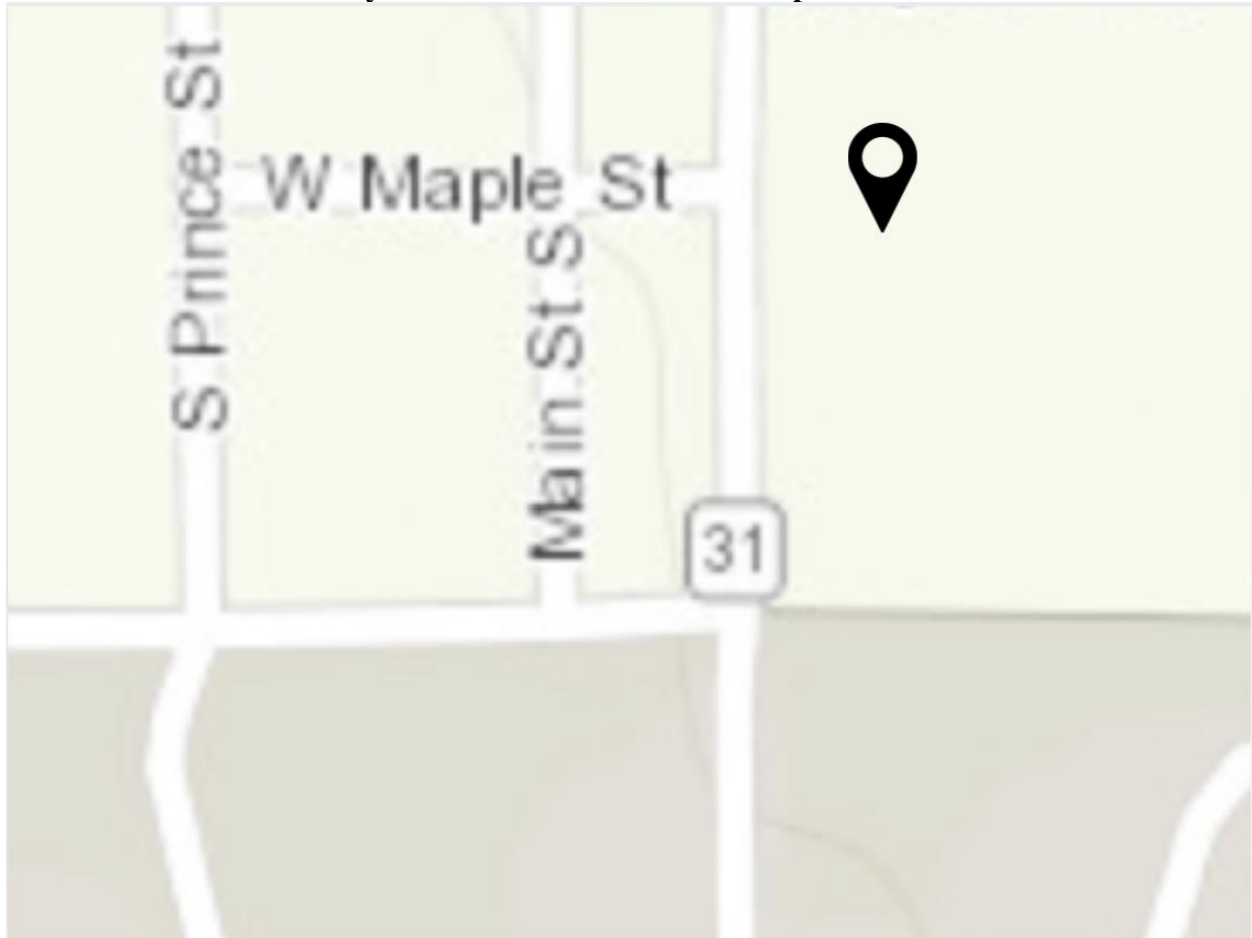
**Figure B-63**  
**Tannehill Public Schools Flood Depth Levels**



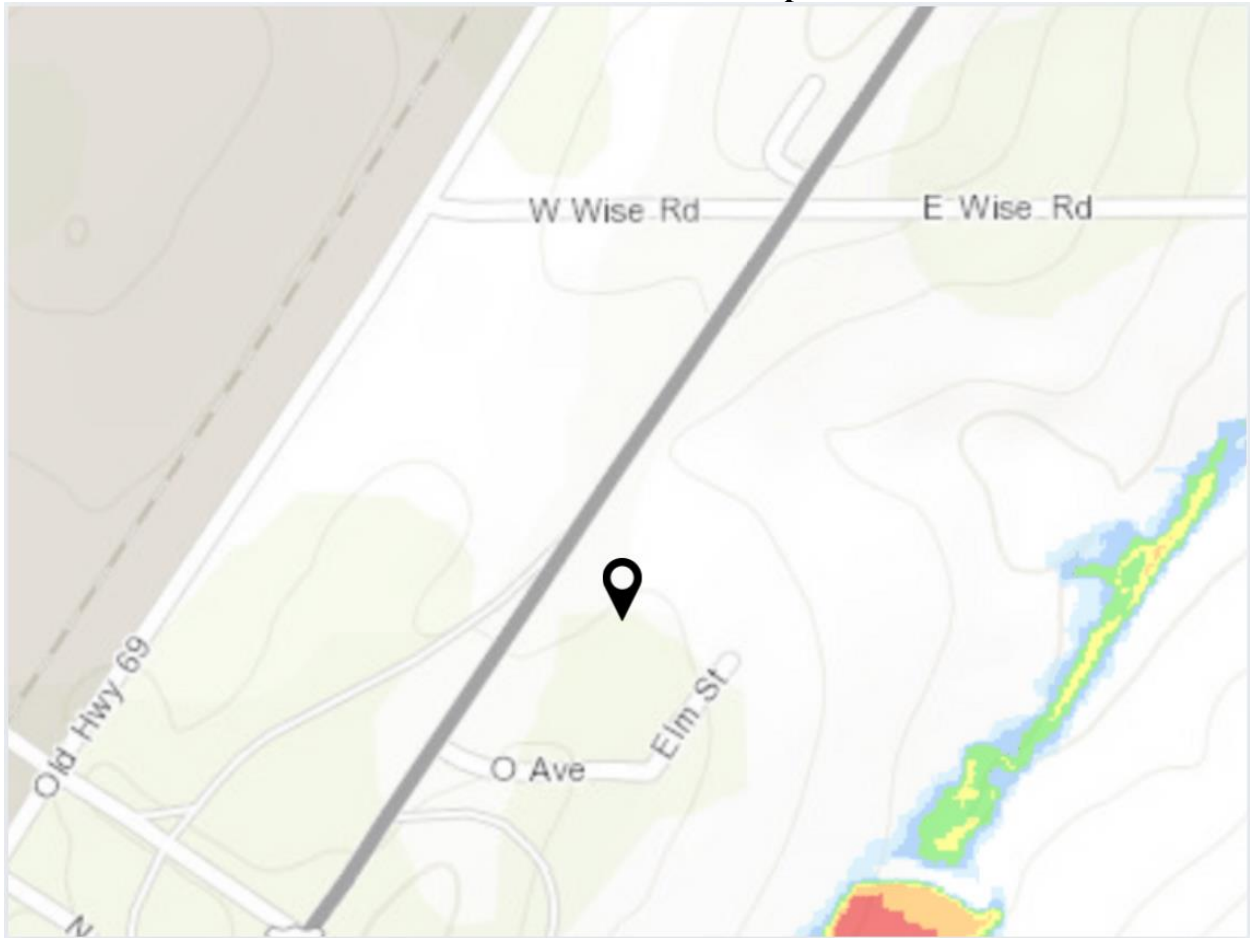
**Figure B-64**  
**Krebs Public Schools Flood Depth Levels**



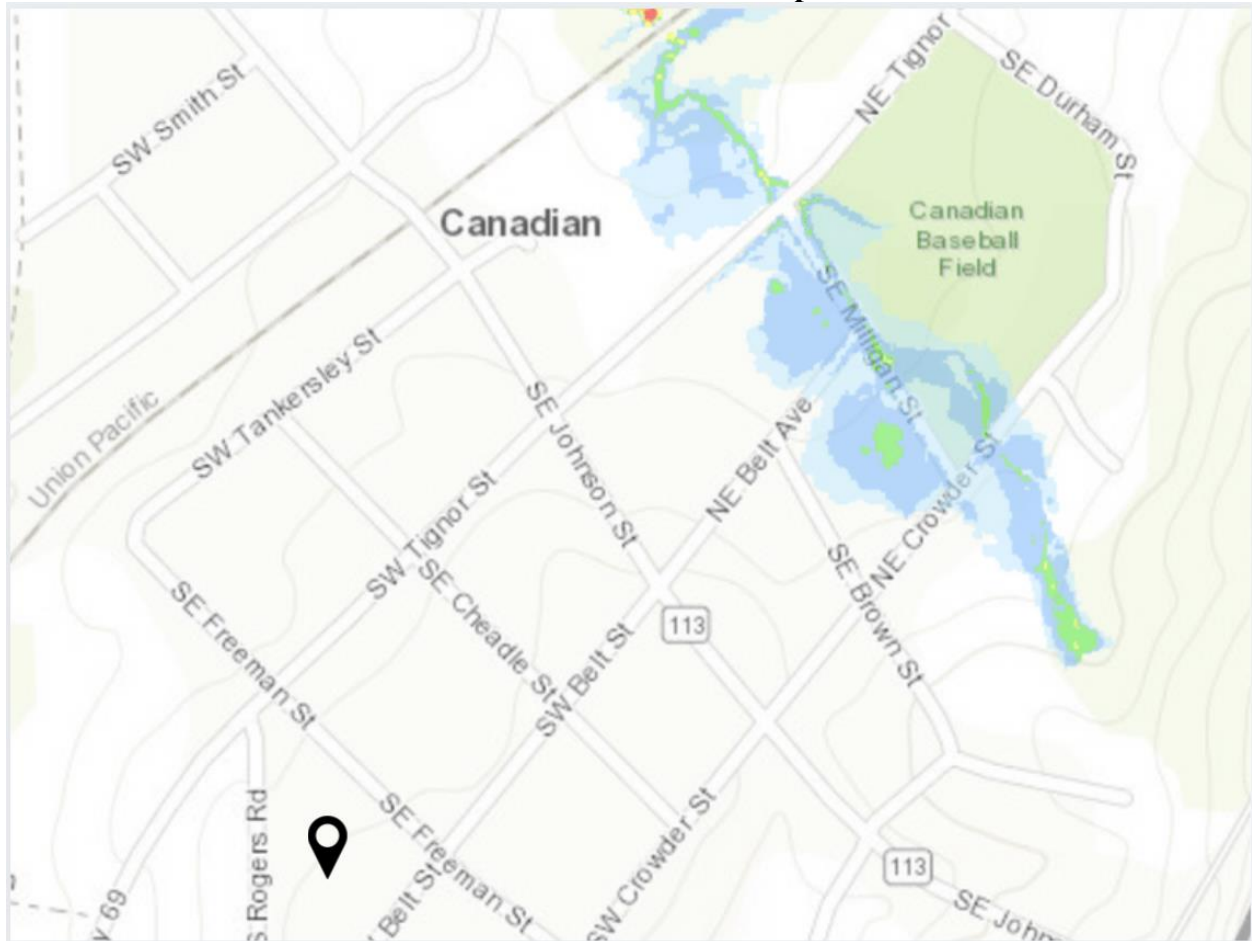
**Figure B-65**  
**Haywood Public Schools Flood Depth Levels**



**Figure B-66**  
**Savanna Public Schools Flood Depth Levels**



**Figure B-67**  
**Canadian Public Schools Flood Depth Levels**

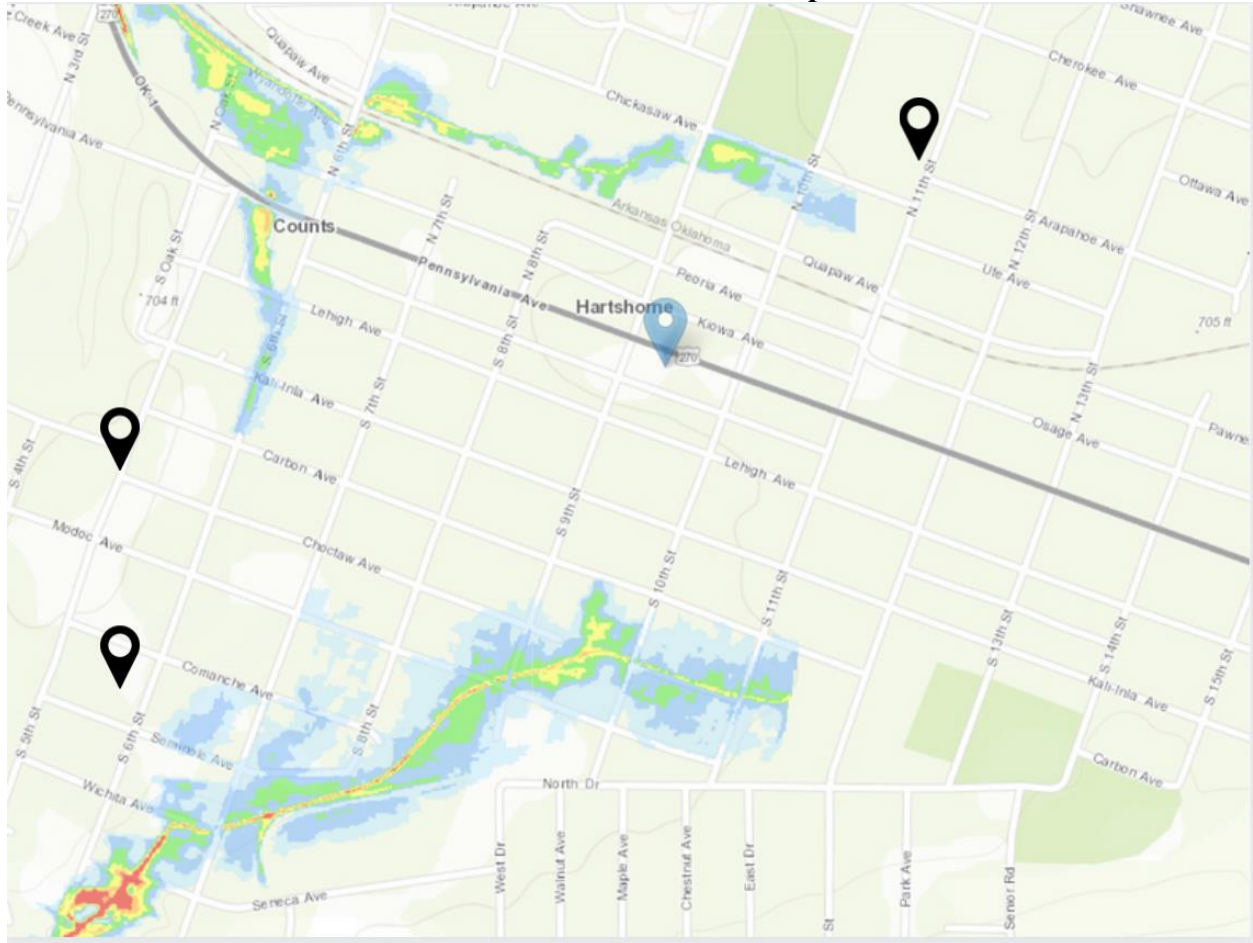


**Figure B-68**  
**Pittsburg Public Schools Flood Depth Levels**

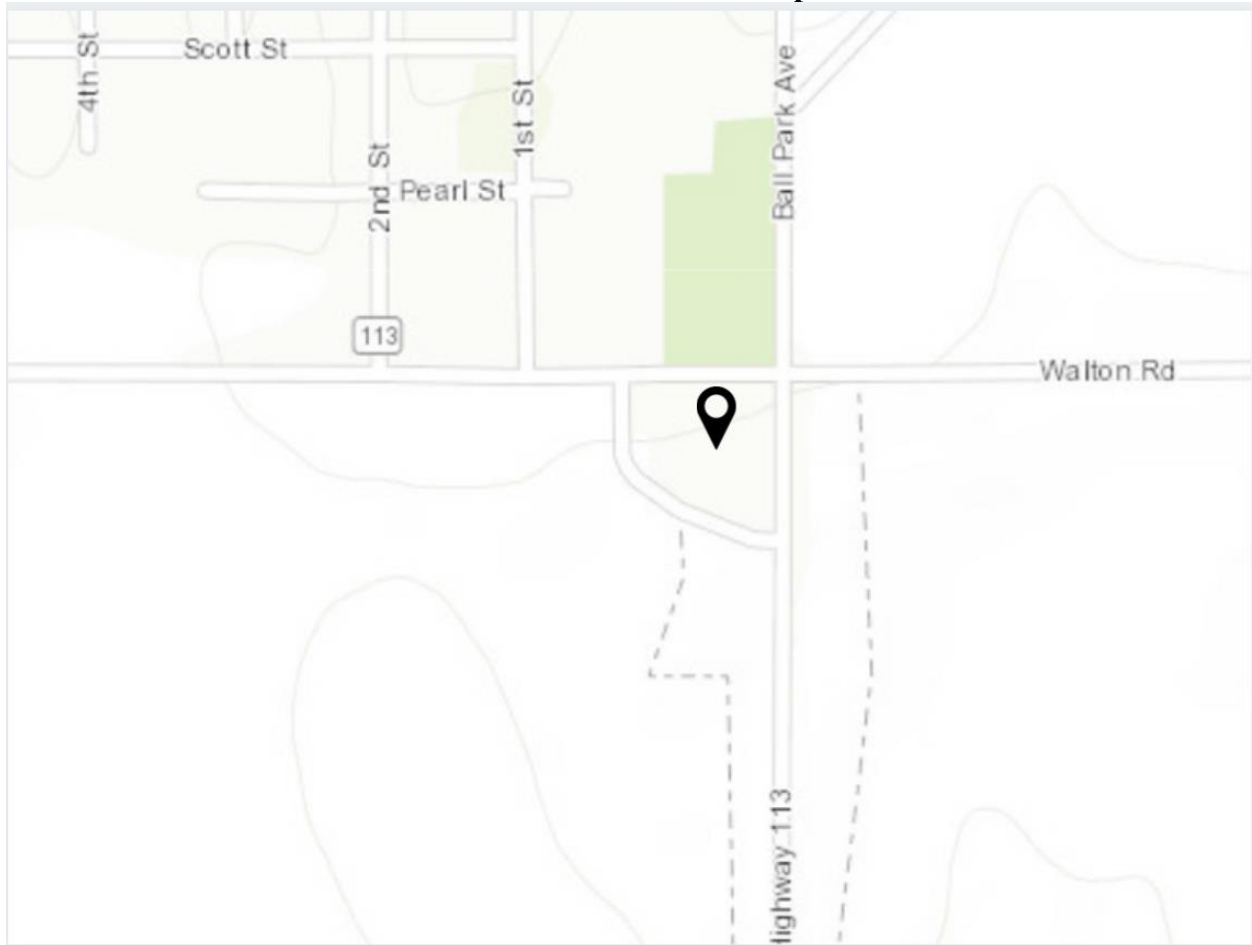




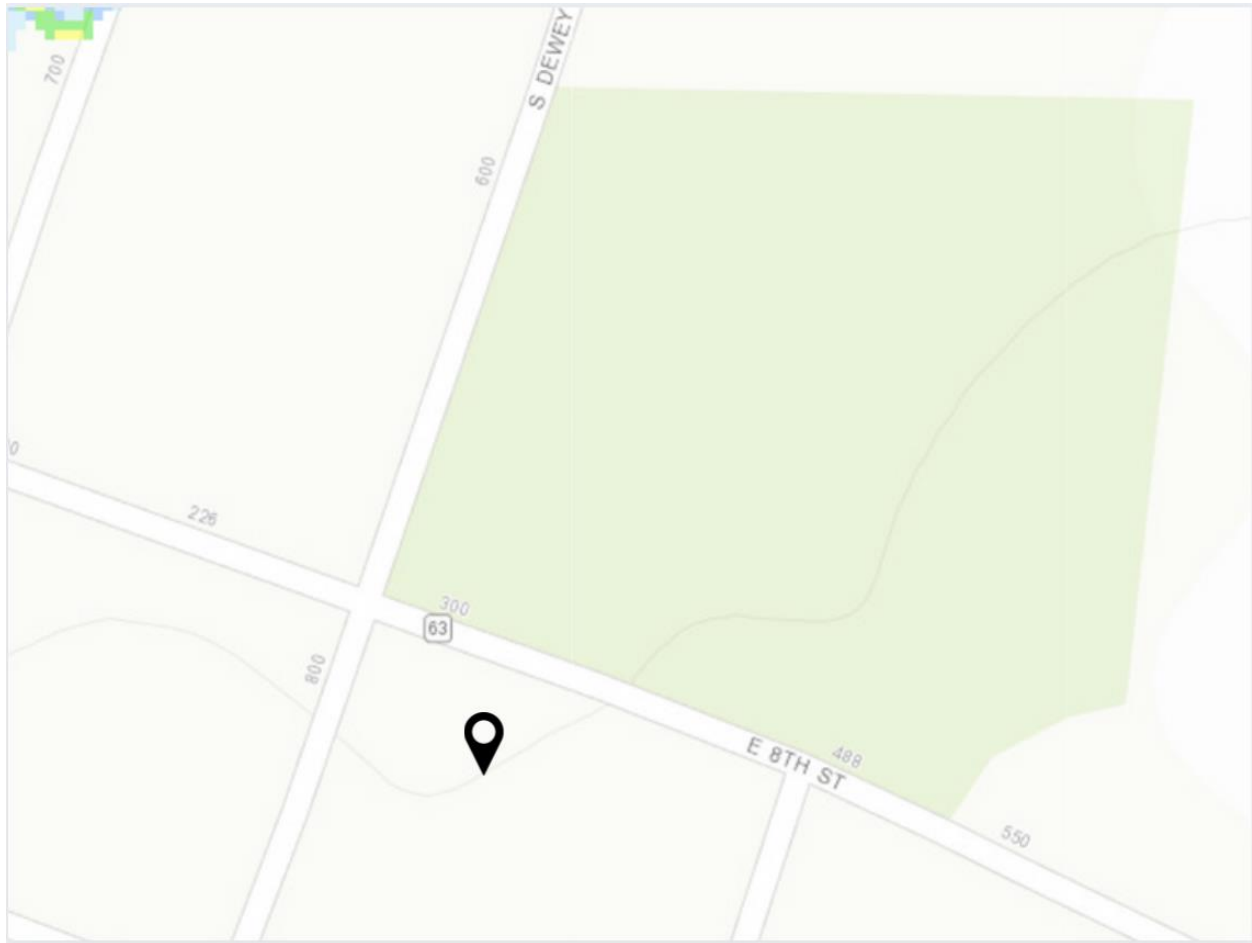
**Figure B-69**  
**Hartshorne Public Schools Flood Depth Levels**



**Figure B-70**  
**Indianola Public Schools Flood Depth Levels**



**Figure B-71**  
**Kiowa Public Schools Flood Depth Levels**



## **AGENDA ITEM COMMENTARY**

**ITEM TITLE:** Consider, discuss, and possibly vote to amend, revise, approve or deny Resolution 2022-04-02 reappointing Sean Waggoner, Board Member #1, and Sarah Partin, Board Member #2 to the Board of Adjustment of the Town of Carlton Landing, Oklahoma, for three-year term ending April 2025, or take any other appropriate action.

**INITIATOR:** Greg Buckley, Town Administrator,

**STAFF INFORMATION SOURCE:** Greg Buckley, Town Administrator

**BACKGROUND:** The Board of Adjustment was reestablished in December 2021 by the Board of Trustee. The appoints were for staggered three (3) year terms. Board Member #1 and #2 were set to expire in April of 2022. Other Board members are staggered for appointment in 2023 and 2024., but as we reviewed the Ordinances for creating the Code of Ordinances, we were unable to find record any members had been appointed to the Board. Under Statute a municipality that exercises zoning power shall provide for a Board of Adjustment. The Board shall consist of five (5) members serving three (3) year terms. The Board of Adjustment shall hold meeting when called by the Chairman, or as needed, and is subject to the Open Meeting Act.

The proposed Resolution reappoints Sean Waggoner and Sarah Partin to the Board of Adjustment for a three (3) year term ending April 2025.

Proposed members of the Board of Adjustment and respective term are:

Board Member #1: Sean Waggoner for a term from April 2022 and ending April 2025

Board Member #2: Sarah Partin for a term from April 2022 and ending April 2025

**FUNDING:** None

**EXHIBITS:** Resolution Confirming Board of Adjustment

**RECOMMENDED ACTION:** Approve Resolution reappointing Sean Waggoner, Board Member #1, and Sarah Partin, Board Member #2 to the Board of Adjustment of the Town of Carlton Landing, Oklahoma, for three-year term ending April 2025.

**RESOLUTION NO. 2022-04-02**

A RESOLUTION OF BOARD OF TRUSTEES OF THE TOWN OF CARLTON LANDING, PITTSBURG COUNTY, OKLAHOMA, WHEREBY THE BOARD OF TRUSTEES OF THE TOWN OF CARLTON LANDING, PITTSBURG COUNTY, OKLAHOMA RESOLVES TO APPOINT THE FOLLOWING PERSONS TO THE BOARD OF ADJUSTMENT OF CARLTON LANDING, PITTSBURG COUNTY, OKLAHOMA.

Whereas, the Board of Trustees of the Town of Carlton Landing, Pittsburg County, Oklahoma, during a Regular Meeting on April 16, 2022, does hereby consider and hereby Resolves to appoint the following persons to the Board of Adjustment of Carlton Landing, Oklahoma:

Board member position #1: Sean Waggoner is hereby reappointed to a three (3) year term, from April, 2022 and ending April, 2025; and,

Board Member Position #3: Sara Partin is hereby re-appointed to a three (3) year term from April, 2022 and ending April, 2025.

NOW THEREFORE, be it resolved that the Board of Trustees of the Town of Carlton Landing, Pittsburg County, Oklahoma, appoints the above-named person to the Board of Adjustment, as above set forth.

Passed and approved this 16<sup>th</sup> day of April, 2022.

Town of Carlton Landing

(SEAL)

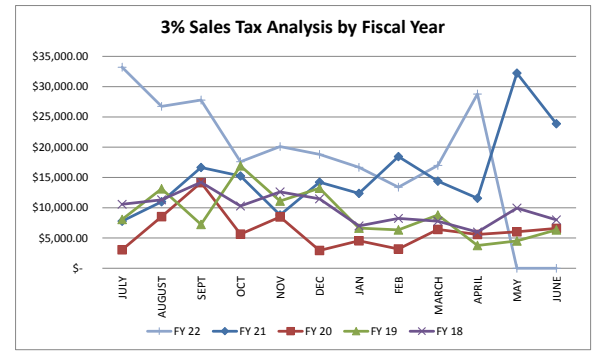
By: \_\_\_\_\_  
Joanne Chinnici, Mayor

ATTEST:

\_\_\_\_\_  
Jan Summers, City Clerk

**TOWN OF CARLTON LANDING  
SALES TAX COLLECTIONS**

	<u>JULY</u>	<u>AUGUST</u>	<u>SEPT</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>JAN</u>	<u>FEB</u>	<u>MARCH</u>	<u>APRIL</u>	<u>MAY</u>	<u>JUNE</u>	<u>TOTALS</u>
<b>FY22</b>	\$ 33,205.30	\$ 26,739.30	\$ 27,778.11	\$ 17,599.62	\$ 20,093.03	\$ 18,805.23	\$ 16,669.69	\$ 13,403.28	\$ 16,978.33	\$ 28,789.33			\$ 220,061.22
<b>FY21</b>	\$ 7,780.42	\$ 10,987.42	\$ 16,659.44	\$ 15,249.30	\$ 8,792.06	\$ 14,225.44	\$ 12,374.07	\$ 18,444.22	\$ 14,390.75	\$ 11,578.57	\$ 32,227.87	\$ 23,870.40	\$ 186,579.96
<b>FY20</b>	\$ 3,067.59	\$ 8,520.10	\$ 14,155.52	\$ 5,628.66	\$ 8,477.29	\$ 2,939.35	\$ 4,537.13	\$ 3,188.78	\$ 6,419.86	\$ 5,595.92	\$ 6,020.78	\$ 6,589.58	\$ 75,140.56
<b>FY19</b>	\$ 8,070.42	\$ 13,116.45	\$ 7,242.33	\$ 16,914.86	\$ 11,104.80	\$ 13,214.80	\$ 6,638.89	\$ 6,335.74	\$ 8,803.50	\$ 3,763.47	\$ 4,516.85	\$ 6,346.49	\$ 106,068.60
<b>FY18</b>	\$ 10,565.93	\$ 11,304.10	\$ 14,205.42	\$ 10,281.23	\$ 12,606.99	\$ 11,481.49	\$ 7,003.16	\$ 8,229.47	\$ 7,767.43	\$ 5,982.22	\$ 9,944.07	\$ 7,985.29	\$ 117,356.80
<b>FY17</b>	\$ 7,479.32	\$ 6,320.67	\$ 9,864.58	\$ 12,332.60	\$ 12,558.21	\$ 13,933.97	\$ 12,932.01	\$ 7,767.94	\$ 17,407.20	\$ 10,848.10	\$ 14,906.00	\$ 7,974.32	\$ 134,324.92



**USE TAX COLLECTIONS**

	<u>JULY</u>	<u>AUGUST</u>	<u>SEPT</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>JAN</u>	<u>FEB</u>	<u>MARCH</u>	<u>APRIL</u>	<u>MAY</u>	<u>JUNE</u>	<u>TOTALS</u>
<b>FY22</b>	\$ 985.86	\$ 1,463.42	\$ 343.94	\$ 1,165.01	\$ 715.56	\$ 1,058.05	\$ 685.52	\$ 1,234.03	\$ 779.74	\$ 1,061.12	\$ -	\$ -	\$ 9,492.25
<b>FY21</b>	\$ 714.83	\$ 569.76	\$ 313.48	\$ 228.44	\$ 424.74	\$ 559.76	\$ 579.16	\$ 957.30	\$ 867.27	\$ 921.44	\$ 711.20	\$ 1,154.16	\$ 8,001.54
<b>FY20</b>								\$ 34.13	\$ 651.90	\$ 788.30	\$ 402.88	\$ 1,877.21	

**LODGING TAX COLLECTIONS**

	<u>JULY</u>	<u>AUGUST</u>	<u>SEPT</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>JAN</u>	<u>FEB</u>	<u>MARCH</u>	<u>APRIL</u>	<u>MAY</u>	<u>JUNE</u>	<u>TOTALS</u>
<b>FY22</b>	\$ 5,672.25	\$ 12,679.63	\$ 15,631.81	\$ 9,357.10	\$ 6,728.90	\$ 6,713.56	\$ 3,463.33	\$ 3,097.16	\$ 1,664.17	\$ 1,858.14	\$ -	\$ -	\$ 66,866.05
<b>FY21</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,753.09	\$ 4,547.48	\$ 1,912.94	\$ 1,856.63	\$ 408.92	\$ 5,277.35	\$ 3,009.90	\$ 22,766.31

General Fund  
Statement of Revenue and Expenditures

		Current Period Mar 2022 Mar 2022 Actual	Year-To-Date Jul 2021 Mar 2022 Actual	Annual Budget Jul 2021 Jun 2022	Annual Budget Jul 2021 Jun 2022 Variance	Jul 2021 Jun 2022 Percent of Budget
Revenue & Expenditures						
Revenue						
Non-Departmental Revenues						
Budget Carryover						
3999	Fund Balance Carryover	0.00	0.00	50,000.00	50,000.00	0.00%
Other Revenue						
4012	Alcohol Beverage Tax	89.67	649.78	600.00	(49.78)	108.30%
4100	Building Permits/Inspection Fe	1,978.51	12,919.38	23,580.00	10,660.62	54.79%
4105	Business License and Permits	0.00	191.76	200.00	8.24	95.88%
4011	Lodging Tax	1,664.17	65,007.91	24,000.00	(41,007.91)	270.87%
4500	Miscellaneous Revenue	0.00	380.60	0.00	(380.60)	0.00%
4015	Pittsburgh County Sinking Fund	268.10	43,769.87	57,190.00	13,420.13	76.53%
4000	Sales Tax	17,065.51	192,896.96	114,800.00	(78,096.96)	168.03%
9002	Transfer IN from TIF	7,534.36	63,674.31	101,989.00	38,314.69	62.43%
4005	Use Tax	779.74	8,431.13	7,200.00	(1,231.13)	117.10%
4010	Utility Tax	0.00	9,482.37	12,000.00	2,517.63	79.02%
4013	Vehicle Gas/Fuel Tax	72.07	465.34	0.00	(465.34)	0.00%
Non-Departmental Revenues Totals		\$29,452.13	\$397,869.41	\$391,559.00	(\$6,310.41)	
Revenue		\$29,452.13	\$397,869.41	\$391,559.00	(\$6,310.41)	
Gross Profit		\$29,452.13	\$397,869.41	\$391,559.00	\$0.00	
Expenses						
Administration						
Personal Services						
5020	Employer Paid Insurance	1,470.66	12,966.34	17,244.00	4,277.66	75.19%
5025	Employer Retirement Contributi	778.64	6,780.74	8,842.00	2,061.26	76.69%
5000	Salaries	10,514.28	67,936.70	88,424.00	20,487.30	76.83%
5010	Social Security	595.67	5,187.20	7,063.00	1,875.80	73.44%
5001	Stipend	0.00	500.00	0.00	(500.00)	0.00%
5015	Unemployment Tax	77.87	219.65	1,846.00	1,626.35	11.90%
5030	Vehicle/Cell Allowance	324.85	2,923.65	3,900.00	976.35	74.97%
Materials & Supplies						
5510	Building Maintenance & Repairs	0.00	160.00	320.00	160.00	50.00%
5530	Miscellaneous	0.00	0.00	100.00	100.00	0.00%
5500	Office Supplies	266.00	376.53	600.00	223.47	62.76%
5520	Software Programs/ Services	0.00	24.95	0.00	(24.95)	0.00%
Other Services						
6035	Dues & Memberships	0.00	1,319.00	1,210.00	(109.00)	109.01%
6015	Insurance	0.00	420.00	350.00	(70.00)	120.00%
6005	Rent	0.00	3,309.34	5,760.00	2,450.66	57.45%
6040	School, Training, Travel	0.00	1,241.51	5,700.00	4,458.49	21.78%
6000	Utilities	52.00	1,627.65	4,339.00	2,711.35	37.51%
Administration Totals		\$14,079.97	\$104,993.26	\$145,698.00	\$40,704.74	
General Government						
Personal Services						
5001	Stipend	0.00	1,000.00	0.00	(1,000.00)	0.00%
Materials & Supplies						
5510	Building Maintenance & Repairs	0.00	1,392.15	2,500.00	1,107.85	55.69%
5530	Miscellaneous	0.00	734.42	1,460.00	725.58	50.30%
5500	Office Supplies	266.00	1,121.90	1,500.00	378.10	74.79%
5505	Posatge	0.00	58.00	600.00	542.00	9.67%

General Fund  
Statement of Revenue and Expenditures

		Current Period Mar 2022 Mar 2022 Actual	Year-To-Date Jul 2021 Mar 2022 Actual	Annual Budget Jul 2021 Jun 2022	Annual Budget Jul 2021 Jun 2022 Variance	Jul 2021 Jun 2022 Percent of Budget
Revenue & Expenditures						
Expenses						
General Government						
Materials & Supplies						
5520	Software Programs/ Services	1,961.00	7,129.06	7,428.00	298.94	95.98%
Other Services						
6030	Community Support Agreements	0.00	0.00	6,000.00	6,000.00	0.00%
6035	Dues & Memberships	0.00	1,579.75	2,830.00	1,250.25	55.82%
6015	Insurance	0.00	2,074.00	1,800.00	(274.00)	115.22%
6800	Office/Gen Administrative Exp	0.00	14,725.84	14,800.00	74.16	99.50%
6020	Professional Services	4,784.30	39,699.05	58,800.00	19,100.95	67.52%
6010	Publication & Notice Expense	0.00	2,221.55	2,500.00	278.45	88.86%
6045	Road Maintenance	600.00	6,468.00	14,400.00	7,932.00	44.92%
6040	School, Training, Travel	0.00	1,284.91	2,000.00	715.09	64.25%
6000	Utilities	0.00	677.00	1,000.00	323.00	67.70%
6050	Website Expense	0.00	1,524.00	2,500.00	976.00	60.96%
Capital Outlay						
7010	Projects	0.00	24,240.84	50,000.00	25,759.16	48.48%
Debt Service						
8000	GO Bond Payments	0.00	0.00	57,190.00	57,190.00	0.00%
8500	Interest Expense	71.99	632.43	0.00	(632.43)	0.00%
General Government Totals		\$7,683.29	\$106,562.90	\$227,308.00	\$120,745.10	
TIF Projects						
Capital Outlay						
7150	2020 Bond - Pavilion	0.00	(4,772.00)	0.00	4,772.00	0.00%
TIF Projects Totals		\$0.00	(\$4,772.00)	\$0.00	\$4,772.00	
Expenses		\$21,763.26	\$206,784.16	\$373,006.00	\$166,221.84	
Revenue Less Expenditures		\$7,688.87	\$191,085.25	\$18,553.00	\$0.00	
Net Change in Fund Balance		\$7,688.87	\$191,085.25	\$18,553.00	\$0.00	
Fund Balances						
Beginning Fund Balance		953,415.06	770,018.68	0.00	0.00	0.00%
Net Change in Fund Balance		7,688.87	191,085.25	18,553.00	0.00	0.00%
Ending Fund Balance		961,103.93	961,103.93	0.00	0.00	0.00%



General Fund  
Bank Register  
3/1/2022 to 3/31/2022

Transaction Date	Transaction Number	Name / Description	Deposit Date	Deposit Number	Receipts & Credits	Checks & Payments	Balance
1000 Town of CL Checking 9683							
		Beginning Balance			0.00	0.00	401,765.79
3/3/2022	1267	OnSolve LLC			0.00	1,725.30	400,040.49
3/3/2022	1266	Oklahoma Uniform Building			0.00	64.00	399,976.49
3/3/2022	1265	Dan Hurd			0.00	2,200.00	397,776.49
3/3/2022	1264	Cross Telephone Co			0.00	52.00	397,724.49
3/3/2022	R-00206	Scissortail Homes			762.91	0.00	398,487.40
3/4/2022	R-00207	Scissortail Homes			236.00	0.00	398,723.40
3/4/2022	A-10054	James G Buckley			0.00	3,052.74	395,670.66
3/7/2022	EFT	RWS Cloud Services			0.00	90.00	395,580.66
3/9/2022	R-00212	Oklahoma Tax Commission			16,978.58	0.00	412,559.24
3/9/2022	R-00211	Oklahoma Tax Commission			1,664.17	0.00	414,223.41
3/9/2022	R-00210	Oklahoma Tax Commission			779.74	0.00	415,003.15
3/10/2022	R-00213	Oklahoma Tax Commission			12.80	0.00	415,015.95
3/10/2022	R-00208	Craig Leonard			132.69	0.00	415,148.64
3/11/2022	R-00214	Oklahoma Tax Commission			86.93	0.00	415,235.57
3/11/2022	GJ-10071	Pittsburg County Clerk			0.00	268.10	414,967.47
3/11/2022	R-00209	Pittsburg County Clerk			417.04	0.00	415,384.51
3/11/2022	1269	Layman's Lawn Care and Tr			0.00	600.00	414,784.51
3/11/2022	1268	CSA Software			0.00	1,305.00	413,479.51
3/14/2022					0.00	71.99	413,407.52
3/14/2022	EFTPS	Oklahoma Tax Commission			0.00	239.00	413,168.52
3/14/2022	EFTPS	EFTPS			0.00	1,661.54	411,506.98
3/18/2022	1270	OPEH&W			0.00	1,470.66	410,036.32
3/18/2022	A-10055	James G Buckley			0.00	2,821.01	407,215.31
3/25/2022	1274	CSA Software			0.00	566.00	406,649.31
3/25/2022	1273	Kay Robbins Wall			0.00	600.00	406,049.31
3/25/2022	1272	Crawford & Associates, P.C.			0.00	195.00	405,854.31
3/25/2022	1271	Oklahoma Correctional Ind			0.00	532.00	405,322.31
3/29/2022	R-00216	Scissortail Homes			762.91	0.00	406,085.22
3/30/2022	GJ-10072	Payroll			0.00	3,052.74	403,032.48
3/30/2022	R-00215	CLEDT			7,534.36	0.00	410,566.84
3/30/2022	1275	OkMRF			0.00	1,063.23	409,503.61
3/31/2022	R-00217	Carlton Landing Enterprises			84.00	0.00	409,587.61
1000 Town of CL Checking 9683 Totals					\$29,452.13	\$21,630.31	\$409,587.61

General Fund  
Bank Register  
3/1/2022 to 3/31/2022

Transaction Date	Transaction Number	Name / Description	Deposit Date	Deposit Number	Receipts & Credits	Checks & Payments	Balance
1010 2018 GO Bond Checking							
		Beginning Balance			0.00	0.00	69,786.67
		1010 2018 GO Bond Checking Totals			\$0.00	\$0.00	\$69,786.67
1020 2020 GO Bond Checking							
		Beginning Balance			0.00	0.00	79,877.47
		1020 2020 GO Bond Checking Totals			\$0.00	\$0.00	\$79,877.47
1030 Sinking Fund Checking 3087							
		Beginning Balance			0.00	0.00	123,565.95
3/11/2022	GJ-10071	Pittsburg County Clerk			268.10	0.00	123,834.05
		1030 Sinking Fund Checking 3087 Totals			\$268.10	\$0.00	\$123,834.05
		Report Totals			\$29,720.23	\$21,630.31	\$683,085.80
Records included in total = 37							

Report Options

Trans Date: 3/1/2022 to 3/31/2022

Fund: General Fund

Display Notation: No

## Town Administrator's Report – April 16, 2022

- Entrance Road – County Road crew cleared out drainage ditch along Ridgeline Road east from outlook.
- Pavilion – Landmark has started the landscaping at the entrance of the Pavilion. Due to possible weather and Easter activities, we are postponing the ribbon cutting ceremony. Worked on obtaining Property Insurance from OMAG to cover Pavilion Structure. Under our Property Management Agreement, the Contractor is Responsible for casualty insurance, but we are responsible for the structure. We have noticed a little pooling of water at the front of the Pavilion, which became noticeable after stone entrance was installed and we started getting rain. Mike is looking into possible solutions.
- Ridgeline Sidewalk/Trail – We have installed the section of trail on the corner of Ridgeline and Lower Greenway. This will allow the property owner to complete their landscaping. There remains one section to complete, which is the greenway belt west of Lower Greenway and Ridgeline Road corner. Chapman construction is using that as access to a home construction project and agreed to pay the cost of the sidewalk for ability to leave open for access to his construction project.
- Pittsburgh County Hazard Mitigation Plan – I reviewed the Pittsburgh County Multi-jurisdictional Hazard Mitigation Plan. The plan review started in 2018. I have updated our contact information with Emergency Management to list me as the Town of Carlton Landing point of contact.
- Code Red – Attended CodeRed webinar on IPAWS system. Trying to understand and learn more about CodeRed and its capabilities and or limitations.
- Corps– The Corp will be here April 28 to perform the annual inspection of the lease area.
- Nature Center Playground – Over the winter months and heavy rains a section of the playground containment area failed. I have contracted with contractor to fix the area. We will need to perform some additional maintenance with the wood chips. Continuing to work on request to Corps to expand play area to include “natural” play elements. The natural play elements are identified with the master lease agreement and meets Corp requirements.

- Other activities – assisted in identifying sidewalk areas for “No Golf Cart” signs, coordinated getting Firefly Lane street swept, prepared Agenda for Planning Commission and had discussion about canceling July meeting due to 4<sup>th</sup> July weekend, working on Budget FY 22-23.

Thank you.

**PROJECT NO.:** CRL21229/CRL22138/CRL22147  
**PROJECTS:** *Street Light Policy and Standards*  
*2022 Alley Paving*  
*Stephens Road*  
**TO:** Greg Buckley  
**FROM:** Keith Beatty, P.E. / Dawn Warrick/ Brandon Huxford  
**DATE** 4/14/2022

## PROJECT UPDATES

### Street Light Policy and Standards – Design Project

#### Phase A – Develop Lighting Policy

- Staff working on Lighting Policy examples - Completed
- Sent to Town Administrator – 5/10/2021
- Board of Trustees Discussion – 5/15/2021
- Anticipated lighting demo – December Trustees meeting – Completed
- Lighting Policy – December Trustees meeting – 12-18-2021
- Waiting on Discussion with Trustees

#### Phase B – Develop Light Standard

- Phase B to follow Phase A
- Received possible light standards from Town Administrator – 5/12/2021
- Board of Trustees Discussion – 5/15/2021
- May have some discussions regarding the standard prior to finish of Phase A
- Anticipated lighting demo – Completed
- Working on Lighting Standards
- Meet to discuss look week of 4/18/2022

#### Phase C – Lighting Plan Production

- Surveyor to complete survey by 3/20/21 weather permitting - Complete
- Survey data to Engineer 3/27/2021 - Complete
- Initial Plan set 5/27/21 – Developing Concept Plan
- Final Plan set anticipated TBD

### Community Center Planning

- FNI developing scope and fee – Completed Scope and fee. Delivered to Town Administrator
- Meeting with City Administrator and Architect – 7/14/2021
- On-Hold

### 2022 Alley Paving

- FNI developing scope and fee
- Board of Trustees – January meeting
- Survey portion of project completed
- Anticipated 30% delivery to City March 22<sup>nd</sup>.

### Stephens Road

- FNI developing scope and fee
- Board of Trustees – January meeting
- Survey portion of project started
- Survey complete
- Anticipated 30% delivery to City March 22<sup>nd</sup>.