Miller County Hazard Mitigation Plan 2018



City of Bagnell, Village of Brumley, City of Eldon, City of Iberia, City of Lake Ozark, City of Olean, Village of St. Elizabeth, Village of Tuscumbia, Eldon R-I School District, Miller County R-II School District, Iberia R-V School District, St. Elizabeth R-IV School District, School of the Osage R-II School District

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Figure 1 Miller County HMP Cover

TABLE OF CONTENTS

CONTRIBUTORS Stakeholder Representatives	iii iv
EXECUTIVE SUMMARY	v
PREREQUISITES Model Resolution	<i>vii</i> viii
1 Introduction And Planning Process	1.1
2 Planning Area Profile And Capabilities	2.1
3 Risk Assessment	
4 Mitigation Strategy	4.1
5 Plan Maintenance Process	5.1
Appendix A: References Appendix B: Planning Process	

Appendix C: Completed/Deleted Mitigation Actions Appendix D: Adoption Resolutions

CONTRIBUTORS

Name	Title	Department	Jurisdiction/Agency /Organization
Tom Wright	Presiding Commissioner	Miller County	Miller County
Barlow Biggers	Emergency Management Director	Miller County	Miller County
Clinton Jenkins	Miller County Clerk	Miller County	Miller County
Jerome Schulte	Chairman	City of Bagnell	City of Bagnell
Paul Bowden	Mayor	Village of Brumley	Village of Brumley
Steve Johnson	Code Enforcer	Miller County	City of Eldon
Jennifer Vernon	Code Enforcer	Miller County	City of Eldon
Aaron Hees	Emergency Management Director	Miller County	City of Eldon
Edith Long	City Clerk	City of Iberia	City of Iberia
Walter Moreland	Mayor	City of Iberia	City of Iberia
Tim Haden	City of Lake Ozark	Building Inspector	City of Lake Ozark
Dave Van Dee	City of Lake Ozark	City Administrator	City of Lake Ozark
Matt Michalik	City of Lake Ozark	Public Works	City of Lake Ozark
Roger Edwards	Chairman	Village of St. Elizabeth	Village of St. Elizabeth
Megan Wright	Secretary	Village of St. Elizabeth	Village of St. Elizabeth
Roger Edwards	Mayor	Village of Tuscumbia	Village of Tuscumbia
Jason Price	Superintendent	Human Resources& Operations	Miller County R-III School District
Toni Taylor	Superintendent	Human Resources& Operations	St. Elizabeth R-IV School District
Brad Yoder	Assistant Superintendent	Human Resources & Operations	School of the Osage R-II School District
Lyndel Whittle	Superintendent	Human Resources & Operations	Iberia R-V School District
Matt Davis	Superintendent	Human Resources & Operations	Eldon R-1 School District
Mark Amsinger	Fire Chief	Fire Dept	Lake Ozark Fire Department
Ron Schlicht	Executive Director	Ambulance District	Miller County Ambulance District
Brenda Gerlach	SEMA	SEMA	SEMA

Stakeholder Representatives

Name	Title	Department	Agency/Organization
Warren Witt	Director of Operations	Bagnell Dam	Ameren Missouri
Sara Richardson	Nurse	Nursing	Eldon Nursing and Rehabilitation
Ryan Richardson	Citizen	Volunteer	Concerned Citizen
Kala Yeary Lent	Director	Developmentally Disabled	Miller County SB 40 Board
Brandon Green	Maintenance	Maintenance Dept	Eldon Nursing and Rehabilitation
Gale Carlson	Citizen	Volunteer	Concerned Citizen

Stakeholders are individuals or groups that are affected by a mitigation action or policy. The group includes businesses, private organizations, and citizens. Unlike planning team members, stakeholders may not be involved in all stages of the planning process, but they inform the planning team on a specific topic or provide input from different points of view in the community.

EXECUTIVE SUMMARY

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. Miller County, participating jurisdictions and school/special districts developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses from hazard events. The plan is an update of a plan that was approved in 2013. The plan and the update were prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 to result in eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance Grant Programs.

The Miller County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following 13 jurisdictions that participated in the planning process:

- Miller County
- City of Bagnell
- Village of Brumley
- City of Eldon
- City of Iberia
- City of Lake Ozark
- Village of St. Elizabeth
- Village of Tuscumbia
- Eldon R-I School District
- Iberia R-IV School District
- Miller County R-III School District
- St. Elizabeth R-IV School District
- School of the Osage School District

Ameren Missouri solely owns the City of Lakeside. There are not any residential properties in that area.

Miller County and the entities listed above developed a Multi-Jurisdictional Hazard Mitigation Plan that was previously approved by FEMA in 2013. This current planning effort serves to update that previously approved plan.

The plan update process followed a methodology prescribed by Federal Emergency Management Agency (FEMA), which began with the formation of a Mitigation Planning Committee (MPC) comprised of representatives from Miller County and participating jurisdictions. Through the planning process, it was the consensus among the members of the planning team that Land Subsidence/Sinkholes and Levee Failure had no impact on the county and should not be included as a natural hazard in the plan. The MPC updated the risk assessment that identified and profiled hazards that pose a risk to Miller County and analyzed jurisdictional vulnerability to these hazards. The MPC also examined the capabilities in place to mitigate the hazard damages, with emphasis on changes that have occurred since the previously approved plan was adopted. The MPC determined that the planning area is vulnerable to several hazards that are identified, profiled, and analyzed in this plan. The Miller County plan profiles 11 natural hazards Dam Failure, Drought, Earthquakes, Extreme Heat, Fires (Urban/Structural and Wild), Hailstorm, Flooding, Land Thunderstorm/High Winds/Lightening, Tornado, and Winter Weather/Snow/Ice/Severe Cold.

All hazards were evaluated about previous occurrences, probability, and severity of future occurrences, existing mitigation strategies, and potential impact on each jurisdiction.

An overall mitigation strategy has been developed through the evaluation of potential threats and available resources with careful consideration to the long-term effectiveness of the mitigation strategy.

Based upon the risk assessment, the MPC maintained the goals identified in the 2013 plan developed to reduce the risks from these hazards. The goals are listed below:

- 1. Mitigation Planning Mitigate the effects of potential natural hazards in Miller County.
- 2. Mitigation Programs Protect Miller County's assets and populace through cost-effective and tangible mitigation projects whenever financially feasible.
- 3. Mitigation Procedures Encourage continuity of operations of government and emergency services in a disaster.
- 4. Mitigation Public Awareness Increase public awareness of natural hazards that have the potential to impact Miller County

To advance the identified goals, the MPC developed recommended mitigation actions, which are detailed in Chapter 4 of this plan. The MPC developed an implementation plan for each action, which identifies priority level, background information, and ideas for implementation, responsible agency, timeline, cost estimate, potential funding sources, and more.

Mitigation action items have been developed to enhance the established goals and further the implementation of mitigation strategies throughout our region.

The Miller County Hazard Mitigation Plan will be formally adopted by each of the participating jurisdictions prior to the approved by the Federal Emergency Management Agency (FEMA). Participation in and formal adoption of the plan qualifies a jurisdiction to apply for FEMA predisaster mitigation grants and the mitigation portion of post-disaster mitigation grants.

FEMA requires the plan to be updated every five years. Miller County will evaluate and maintain the Hazard Mitigation Plan on an annual basis prior to the five-year update.

PREREQUISITES

44 CFR requirements 201.6(c) (5): The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

This plan has been reviewed by and adopted with resolutions or other documentation of adoption by all participating jurisdictions and schools/special districts. The documentation of each adoption is included in Appendix D, and a model resolution is included on the following page.

The following jurisdictions participated in the development of this plan and have adopted the multi-jurisdictional plan.

- Miller County
- City of Bagnell
- Village of Brumley
- City of Eldon
- City of Iberia
- City of Lake Ozark
- Village of St. Elizabeth
- Village of Tuscumbia
- Eldon R-I School District
- Iberia R-IV School District
- Miller County R-III School District
- St. Elizabeth R-IV School District
- School of the Osage School District

Model Resolution

(LOCAL GOVERNING BODY/SCHOOL DISTRICT), Missouri RESOLUTION NO.

A RESOLUTION OF THE (LOCAL GOVERNING BODY /SCHOOL DISTRICT) ADOPTING THE (PLAN NAME)

WHEREAS the (*local governing body/school district*) recognizes the threat that natural hazards pose to people and property within the (local governing body/school district); and

WHEREAS the (*local governing body/school district*) has participated in the preparation of a multijurisdictional local hazard mitigation plan, hereby known as the (*plan name*), hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the *(local governing body/school district)* from the impacts of future hazards and disasters; and

WHEREAS the (*local governing body*) recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the (*local governing body/school district*) will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the (*local governing body/school district*) demonstrates their commitment to hazard, mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE (*LOCAL GOVERNMENT/SCHOOL DISTRICT*), in the State of Missouri, THAT:

In accordance with (*local rule for adopting resolutions*), the (*local governing body/school district*) adopts the final *FEMA-approved Plan*.

ADOPTED by a vote of _____in favor and __against, and __abstaining, this _____day of

_____,____.

Bv (Sia):			
Drint nomo:			
Finit name.			

ATTEST: By (Sig.): ______ Print name: _____

APPROVED AS TO FORM:	
By (Sig.):	
Print name:	

1 INTRODUCTION AND PLANNING PROCESS

1 INT	RODUCTION AND PLANNING PROCESS	1.1
1.1	Purpose	1.2
1.2	Background and Scope	1.3
1.3	Plan Organization	1.4
1.4 Stak	Planning Process	
1.4.1 Mu	Iti-Jurisdictional Participation	1.6
Tabl Tabl	le 1.2.Jurisdictional Participation in Planning Processle 1.3.Requested Documentation Status	
1.4.2 The	Planning Steps	1.8
Tabl Tabl Tabl	le 1.4.Miller County Mitigation Plan Update Processle 1.5.Schedule of MPC Meetingsle 1.6.Special Districts Participants	

1.1 PURPOSE

The Miller County Hazard Mitigation plan was developed to be a resource for local governments, residents, developers, organizations and anyone interested in controlling the potentially devastating effects of natural hazards within Miller County. The United States of America has had the most natural disasters of any other nation on earth. Missouri has felt the intensity and the damage from many of these disasters. Missouri is susceptible to natural hazards, including, Droughts, Extreme Heat, Floods, Hail, Tornadoes, Severe Winter Weather, Windstorms, and Wildfires. With each of these disasters, there are frequently physical and emotional consequences. Often times these are coupled with economic fatigue as recovery takes time and money. Hazard mitigation is a fundamentally important part of community development and planning. Therefore, developing a strategy and mitigation process is important to protecting lives and property within Miller County. With the participation of our local community leaders, concerned citizens and public officials, we identified each natural hazard and the potential impact of each hazard while discussing probable mitigation actions that could be effectively implemented. Understanding that extreme devastation and often excessive financial costs that are associated with a natural hazard event has increased our need to take action before a natural hazard event happens.

This multi-jurisdictional plan was developed in accordance with FEMA's Mitigation Planning guidelines and in compliance with federal regulations. With the contribution of numerous jurisdictions within Miller County, we have helped our local communities understand the vulnerabilities of each potential natural hazard as well as focus on mitigation opportunities.

It is imperative for each county to have an approved hazard mitigation plan in place. Furthermore, each community within that county must adopt the plan in order to be eligible for FEMA pre-disaster mitigation grants and the mitigation portion of post-disaster funding opportunities.

The Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the *Federal Registry* on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act or DMA.) The regulations established the requirements for locals hazard mitigation plans are into the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288).

1.2 BACKGROUND AND SCOPE

This is the 5-year update of the current 2013 Miller County Hazard Mitigation Plan. Mitigating for a natural disaster has been a subject of increased focus for the federal government for the past decades.

The jurisdictions and school districts that participated in the 2018 approved plan are as follows.

- Miller County
- City of Bagnell
- Village of Brumley
- City of Eldon
- City of Iberia
- City of Lake Ozark
- Village of St. Elizabeth
- Village of Tuscumbia
- Eldon R-I School District
- Iberia R-IV School District
- Miller County R-III School District
- St. Elizabeth R-IV School District
- School of the Osage School District

In 1993, FEMA created the Mitigation Directorate to oversee hazard mitigation; they are directly responsible for grants and programs for mitigation purposes before a disaster.

The Emergency Management Agency (FEMA) defines *Mitigation* as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event.

The goal of mitigation is to save lives and reduce property damage. Mitigation can accomplish this, and mitigation actions should be cost-effective and environmentally sound. Mitigation can reduce the cost of disasters to property owners and all levels of government. Mitigation can protect critical community facilities, reduce exposure to liability, and minimize disruption of community services. Examples of mitigation actions include land-use planning, adoption of building codes, elevation of homes, acquisition and demolition of structures in hazard-prone areas, or relocation of homes away from hazard-prone areas.

History of Miller County Hazard Mitigation Plan

The original planning process for our local multi-jurisdictional hazard mitigation plan began in 2004. The plan was approved by FEMA and adopted by the participating jurisdictions in the year 2006. All jurisdictions were encouraged to participate in the planning process, and then were asked to approve and formally adopt the plan. Communities, school districts, institutes of higher learning, and other special districts in Miller County could decide to participate or not to participate in the plan. Participating jurisdictions that formally adopted the plan became eligible to apply for FEMA mitigation grants.

The second update to the original Miller County Hazard Mitigation Plan started in 2012 and completed in 2013 with the participating jurisdictions adopting the update plan 2013.

In 2017 Lake of the Ozarks Council of Local Governments through a memorandum of agreement with SEMA has been updating and redeveloping Miller County's current multi-jurisdictional hazard mitigation plan. FEMA requires the plans be updated every five years.

Along with the update there have been some new requirements that needed to be incorporated into the redevelopment of the plan.

The purpose of this hazard mitigation plan is to provide guidance and to coordinate mitigation activities and decisions for local land use policies in the future.

1.3 PLAN ORGANIZATION

The 2018 Miller County Hazard Mitigation Plan followed the same format as the 2013 as outlined below.

- Chapter 1: Introduction and Planning Process
- Chapter 2: Planning Area Profile and Capabilities
- Chapter 3: Risk Assessment
- Chapter 4: Mitigation Strategy
- Chapter 5: Plan Implementation and Maintenance
- Appendices

1.4 PLANNING PROCESS

44 CFR Requirement 201.6(c) (1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

The Mitigation Planning Committee with the assistance of LOCLG staff and members of each participating jurisdiction the plan was updated using the following process.

- Assist in establishing the Mitigation Planning Committee (MPC) as defined by the Disaster Mitigation Act (DMA)
- Organization of Planning Committee Meeting locations and times.
- Follow up with MPC interim meetings IAW the DMAC requirements as established by the federal regulations and follows the most current planning guidance for the Federal Emergency Management Agency (FEMA)
- Facilitate the entire plan development.
- Participation in the planning process by providing requested information
- Conduct research and documentation necessary to augment the data
- Assist in soliciting the public input
- Produce and review of draft and final copies of the plan update
- Coordinate with the Missouri State Emergency Management Agency and Federal Emergency Management Agency for the plan review and approval
- Assist jurisdictions with the formal adoption of the plan prior to submitting to FEMA

Table 1.1.	Jurisdictional	Representatives	Miller	County	Mitigation	Planning
Committe	e				-	-

Name	Title	Department	Jurisdiction/Agency /Organization	
Tom Wright	Presiding Commissioner	Miller County	Miller County	
Barlow Biggers	Emergency Management Director	Miller County	Miller County	
Clinton Jenkins	Miller County Clerk	Miller County	Miller County	
Jerome Schulte	Chairman	City of Bagnell	City of Bagnell	
Paul Bowden	Mayor	Village of Brumley	Village of Brumley	
Steve Johnson	Code Enforcer	Miller County	City of Eldon	
Jennifer Vernon	Code Enforcer	Miller County	City of Eldon	
Aaron Hees	Emergency Management Director	Miller County	City of Eldon	
Edith Long	City Clerk	City of Iberia	City of Iberia	
Walter Moreland	Mayor	City of Iberia	City of Iberia	
Tim Haden	City of Lake Ozark	Building Inspector	City of Lake Ozark	
Dave Van Dee	City of Lake Ozark	City Administrator	City of Lake Ozark	
Matt Michalik	City of Lake Ozark	Public Works	City of Lake Ozark	
Roger Edwards	Chairman	Village of St. Elizabeth	Village of St. Elizabeth	
Megan Wright	Secretary	Village of St. Elizabeth	Village of St. Elizabeth	
Roger Edwards	Mayor	Village of Tuscumbia	Village of Tuscumbia	
Jason Price	Superintendent	Human Resources& Operations	Miller County R-III School District	
Toni Taylor	Superintendent	Human Resources& Operations	St. Elizabeth R-IV School District	
Brad Yoder	Assistant Superintendent	Human Resources & Operations	School of the Osage R-II School District	
Lyndel Whittle	Superintendent	Human Resources & Operations	Iberia R-V School District	
Matt Davis	Superintendent	Human Resources & Operations	Eldon R-1 School District	
Mark Amsinger	Fire Chief	Fire Dept	Lake Ozark Fire Department	
Ron Schlicht	Executive Director	Ambulance District	Miller County Ambulance District	
Brenda Gerlach	SEMA	SEMA	SEMA	

Stakeholder Representatives

Name	Title	Department	Agency/Organization
Warren Witt	Director of Operations	Bagnell Dam	Ameren Missouri
Sara Richardson	Nurse	Nursing	Eldon Nursing and Rehabilitation
Ryan Richardson	Citizen	Volunteer	Concerned Citizen
Kala Yeary Lent	Director	Developmentally Disabled	Miller County SB 40 Board
Brandon Green	Maintenance	Maintenance Dept	Eldon Nursing and Rehabilitation
Gale Carlson	Citizen	Volunteer	Concerned Citizen

1.4.1 MULTI-JURISDICTIONAL PARTICIPATION

44 CFR Requirement §201.6(a)(3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

Development of mitigation requires the active participation and leadership of the jurisdictions involved.

DMA requires each jurisdiction to participate in the planning process and officially adopt the plan. The minimum criteria for participation that each jurisdiction must be meet in order to be considered a "participant." As these are smaller communities with limited government positions, the below criteria was established by the LOCLG and the MPC: These plan participation requirements were defined as:

- Representation from each participating jurisdiction to participate in the planning process. Attendance to public meetings was not required as long as the participating jurisdiction met with the project planner and provided the necessary information to be included in the plan.
- Participation in by jurisdiction designated representative, scheduled MPC meetings, emails, conference calls, one on one meetings, including centralized, planning area wide MPC meetings, by either direct participation or authorized representation;
- Each participating jurisdiction must provide to the MPC sufficient information to support plan development by completion and return of Data Collection Questionnaires and validating/correcting critical facility inventories;
- For plan updates, eliminate from further consideration those actions from the previously approved plan that were not implemented because they were impractical, inappropriate, not cost-effective, or were otherwise not feasible;
- Review and comment on plan drafts; by final review meeting or online review
- Actively solicit input from the public, local officials, and other interested parties about the planning process and provide an opportunity for them to comment on the plan;
- Provide documentation to show time donated to the planning effort (if a FEMA planning grant was awarded to the County); and
- All participants should formally adopt the mitigation plan prior to submittal to SEMA and FEMA for final approval. Note that an "approvable pending adoption" designation can be given without submittal of adoption documents. However, submittal of all adoption documentation with the final plan is the preferred methodology.

Jurisdiction	Meeting Attended Either Public Meeting or Individual Meetings	Provided Requested Information and completed survey data	Provided Identified Action Items with Action Worksheet	HMP Draft Review
Miller County	6	\checkmark	\checkmark	\checkmark
City of Bagnell	1	\checkmark	\checkmark	\checkmark
Village of Brumley	1	√	*	\checkmark
City of Eldon	1	\checkmark	\checkmark	\checkmark
City of Iberia	5	\checkmark	\checkmark	\checkmark
City of Lake Ozark	6	\checkmark	\checkmark	\checkmark
City of Olean	0	NA	NA	NA
Village of St. Elizabeth	1	\checkmark	\checkmark	\checkmark
Village of Tuscumbia	1	\checkmark	\checkmark	\checkmark
Eldon R-1 School	5	\checkmark	\checkmark	\checkmark
Miller County R-III School	5	\checkmark	\checkmark	\checkmark
St. Elizabeth R-IV School	5	\checkmark	\checkmark	\checkmark
School of the Osage School District	5	✓	\checkmark	\checkmark
Iberia R-V School District	1	\checkmark	\checkmark	\checkmark

	Table 1.2.	Jurisdictional	Participation	in Planning	Process
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* The Village of Brumley has participated and provided a signed resolution, however they were not able to identify a FEMA funded project and complete the required action worksheet. LOCLG emphasized the need for the FEMA action and action worksheet and the Village of Brumley is aware that this is a requirement to be a participant in the HMP.

Table 1.3. Requested Documentation Status

	Community	School Data	Insurance	Adopted
Jurisdictions	Assessment Survey	Questionnaire	Documents	Resolution
Miller County	\checkmark	NA	\checkmark	\checkmark
City of Bagnell	\checkmark	NA	\checkmark	\checkmark
Village of Brumley	\checkmark	NA	\checkmark	\checkmark
City of Eldon	\checkmark	NA	\checkmark	\checkmark
City of Iberia	\checkmark	NA	\checkmark	\checkmark
City of Lake Ozark	\checkmark	NA	\checkmark	\checkmark
City of Olean	NA	NA	NA	NA
Village of St. Elizabeth	\checkmark	NA	\checkmark	\checkmark
Village of Tuscumbia	\checkmark	NA		\checkmark
Eldon R-1 School District	\checkmark	\checkmark	\checkmark	\checkmark
Miller County R-III School District	NA	\checkmark	\checkmark	\checkmark
St. Elizabeth R-IV School District	NA	\checkmark	\checkmark	\checkmark
School of the Osage School District	NA	✓	\checkmark	\checkmark
Iberia R-V School District	\checkmark	✓	\checkmark	\checkmark

1.4.2 THE PLANNING STEPS

FEMA requires the Hazard Mitigation Plan be updated on a five-year cycle in order to remain relevant and current. Lake of the Ozarks Council of Local Governments began the updating process in June 2017 with all staff members contributing to the overall plan update in accordance with our memorandum of agreement with SEMA.

Lake of the Ozarks Council of Local Governments started out the planning process with the online training available at <u>http://sema.dps.mo.gov/programs/mitigation_management.php</u>.

Collecting the necessary technical data became the next area of focus as we developed the base of which we would present the materials for the updating and redevelopment process. Databases were created to incorporate as many community organizations and individuals who would benefit from their participation in the planning process. Our databases consisted of Human Services Agencies, Public Schools, Private Schools, Colleges, Churches, Daycares, Cities and Municipalities, Humanities Organizations, Special Designated Districts, Fire Protection Districts, Ambulance Districts, Emergency Management, Veterans Groups, Insurance Companies, Communications Networks and Economic Development Partners.

Upon completion of a draft copy, we presented the updated Miller County Hazard Mitigation Plan 2018 at a public meeting encouraging comments and insight on how to make the plan more functional and helpful for all participating jurisdictions.

Lake of the Ozarks Council of Local Governments presented a draft copy to SEMA according to our memorandum of agreement.

Adoptions of the final draft were encouraged, and SEMA indicated that all participating jurisdictions needed to have it adopted prior to submitting to FEMA for the final approval.

The following resources were utilized for the plan update:

- FEMA's Local Mitigation Planning Handbook (March 2013), Local Mitigation Plan Review Guide (October 1, 2011), and Integrating Hazard Mitigation into Local Planning: Case Studies and Tools for Community Officials (March 1, 2013).
- Tools provided by SEMA, we tested the validity of the plan and made revisions as needed
- The plan followed the 10-step planning process adapted from FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. The 10-step process allowed the plan to meet funding eligibility requirements of the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Community Rating System, and Flood Mitigation Assistance Program. Insert the following table showing how the CRS process aligns with the Nine Task Process outlined in the 2013 *Local Mitigation Planning Handbook*.

Community Rating System (CRS) Planning Steps (Activity 510)	Local Mitigation Planning Handbook Tasks (44 CFR Part 201)	
Step 1. Organize	Task 1: Determine the Planning Area and Resources	
	Task 2: Build the Planning Team 44 CFR 201.6(c)(1)	
Step 2. Involve the public	Task 3: Create an Outreach Strategy 44 CFR 201.6(b)(1)	
Step 3. Coordinate	Task 4: Review Community Capabilities 44 CFR 201.6(b)(2) & (3)	
Step 4. Assess the hazard	Task 5: Conduct a Risk Assessment 44 CFR 201.6(c)(2)(i) 44 CFR 201.6(c)(2)(ii) & (iii)	
Step 5. Assess the problem		
Step 6. Set goals	Task 6: Develop a Mitigation Strategy 44 CFR 201.6(c)(3)(i);	
Step 7. Review possible activities	44 CFR 201.6(c)(3)(ii); and 44 CFR 201.6(c)(3)(iii)	
Step 8. Draft an action plan		
Step 9. Adopt the plan	Task 8: Review and Adopt the Plan	
Step 10. Implement, evaluate, revise	Task 7: Keep the Plan Current	
	Task 9: Create a Safe and Resilient Community 44 CFR 201.6(c)(4)	

Table 1.4. Miller County Mitigation Plan Update Process

Kick-Off Meeting Brief Summary

At the August 31, 2017 Kick-Off Meeting at the Eldon Community Center in Eldon, MO. Mr. Warren Witt the Director of Hydro Operations Ameren Missouri was the guest speaker. Mr. Witt gave a power point presentation on mitigation activities that are currently being done on Bagnell Dam. The presentation included updated pictures of the progress of the project along with details of how the anchors are being installed and the status of the project. Ameren has traveled to other countries to conduct research on deconstructed dams with similar anchors to Bagnell Dam. Mr. Witt provided detail as the size of the anchors; installation procedures and the process of removal of the algae build up.

Lake of the Ozarks Council of Local Governments (LOCLG) also provided a power point presentation on the purpose and importance of Hazard Mitigation. The presentation also included the important changes in the new SEMA template and the requirements for adoption of plan by the communities. The jurisdictions were informed that their participation is critical to the success of their plan. LOCLG explained that hazard mitigation is essential in the reduction of loss of lives, property damage, loss of essential services, loss of critical facilities, economic disruption, elimination of cycles of repetitive losses and recovery time. The result saves lives, time, and money.

The Multi-Jurisdictional Planning Committee asked several questions about the hazards and if man-made hazards could be added to the plan. Participants for fully engaged in the planning process and provided valuable input to help with the plan development.

Jurisdictions were informed also of the importance of Community Assessment Surveys and the different types of FEMA mitigation funding.

We had fifteen representatives in attendance for the meeting. We also corresponded with another eight citizens by telephone and email messaging.

Second Meeting Hazard History and Risk Assessment

The Lake of the Ozarks Council of Local Governments provided a presentation on risk assessment-measures of Probability and Severity to the public. The jurisdictions met at the Eldon Community Center in Eldon, MO on September 26, 2017. The presentation also in included a status update of the communities who have returned the Community Assessment Surveys, Insurance Documentation, and the School District Data Collection Questionnaire. Seventeen representatives attended this meeting. During the month, we also conducted telephone and email assistance to Iberia School District Superintendent Mr. Lyndel Whittle and seven concerned citizen representatives. We asked the attendees, friends, family, and neighbors to participate in the Public Miller County Hazard Mitigation Plan Survey. Paper copies of the survey were handed out as well as the Survey Monkey Link to the survey was provided.

The jurisdiction representatives reviewed the 2013 previous plan information. This included the review of all the hazard that impact Miller County as well as some new hazards such as Terrorism, Civil Disorder, Attack (Nuclear, Conventional, Chemical, and Biological), and Cyber Disruption for review. Handouts that addressed web based information for review were provided. This included Disaster Declarations, Insurance Indemnities payments, Census information, and NCDC and NOAA disaster events for their review to make informed opinions and decision on each natural hazard threat. The Technical Steering Committee were also briefed on the measure of probability, measure of severity, potential on existing structures, and measure of vulnerability. A review was also conducted on the 2013 Hazard Mitigation Plan of probability of future occurrences and possible impacts.

Representatives were provided with the 2013 mitigation goals and objectives in a hand out to review over the month until the next meeting on October 26, 2017. Also provided was a blank table to add in any new mitigation action ideas that could be discussed.

Third Meeting Mitigation Actions Review

The Lake of the Ozarks Council of Local Governments held a Mitigation Action Review Meeting at the Eldon High School. Jurisdictions met to discuss current, completed, and new mitigation actions. Handouts of the current mitigation actions were received along with the current FEMA guidance. The jurisdictions were provided with the current FEMA Hazard Mitigation Ideas Guide Book to use as a reference tool. Each mitigation goal and objective in sections 1 and 2 were reviewed. Jurisdictions discussed if the goals and objectives were completed, no longer required, and status. New ideas were presented and discussed.

Jurisdictions were provided with the status of jurisdictions that have completed the Community Assessment Surveys, School District Questionnaires, and received Insurance Documents.

The meeting lasted approximately two and half hours with everyone, in agreement that another meeting is necessary.

Fourth Meeting Mitigation Actions Review

The Lake of the Ozarks Council of Local Governments held a Mitigation Action Review Meeting at the Eldon High School. Jurisdictions met to discuss current, completed, and new mitigation actions. Handouts of the current mitigation actions were received along with the current FEMA guidance. The jurisdictions were provided with the current FEMA Hazard Mitigation Ideas Guide Book to use as a reference tool. Jurisdictions discussed if the goals and objectives were completed, no longer required, and status. New ideas were presented and discussed.

The meeting lasted approximately one hour. The next meeting everyone agreed will be a review of the rough draft and make final comments and decisions on Tuesday January 30, 2018. Each school superintendent made a commitment to meet with their respective boards in February 2018 to gain approval to sigh the resolution adoption forms.

Fifth Meeting Miller County Hazard Mitigation Plan Draft Review

The Lake of the Ozarks Council of Local Governments held a meeting to review the draft copy of Hazard Mitigation Plan at the Eldon Community Center in Eldon, Missouri. Jurisdictions meet to review their sections of the plan and to make corrections to their respective areas. The jurisdictions were provided with draft copies of the plan to review. The sections of the Miller County Hazard Mitigation Plan were reviewed for accuracy and jurisdictions were provided the opportunity discuss any changes among themselves and the LOCLG staff. New information was provided and notes were taken to make the necessary changes.

The meeting lasted approximately an hour. The MPC agreed to continue to update the plan with maps when made available. The draft plan was made available for the public review on the Lake of the Ozarks Council of Local Governments webpage. The draft plan was made available for changes for thirty full days and the final Miller Hazard Mitigation Plan was sent to SEMA for review on March 2, 2018.

Sixth Meeting Miller County Hazard Mitigation Actions and New Draft Review

Lake of the Ozarks Council of Local Governments held another meeting on May 23, 2018 to review the comments that were submitted and finalize the Mitigation Actions, with a Action Worksheet for each Action that will continue to be in the 2018 Hazard Mitigation Plan. SEMA indicated that each participating jurisdiction must have at least one FEMA funded action

included in the plan. SEMA also indicated that an Action Worksheet must be completed by each jurisdiction that will be adopting said action. The committee carefully reviewed the Action items again and determined which Actions they wanted to adopt and completed the Action worksheets for those actions.

The meeting lasted approximately an hour. The LOCLG staff agreed to meet with each individual jurisdiction to help them complete the Action worksheets if needed. The second draft will be submitted to SEMA on May 31, 2018.

Table 1.5.	Schedule of MPC Meetings

Meeting	Торіс	Date
Kick-Off Meeting #1	 Discuss Purpose of Plan Discuss Current Plan Why Update Plan Community Involvement Technical Steering Committee Review the Planning Process Review the Adoption Process 	August 31, 2017
Hazard History & Risk Assessment #2	 Evaluate Natural Hazards Risk Assessment Discuss Probability and Severity Community Assessment Survey Timelines and Deadlines 	September 26, 2017
Current & New Action Items #3	 Review Current Goals & Objectives Section 1 & 2 Evaluate Newly Proposed Goals & Objectives as Well as Action Items Community Participation Review Planning Process and Deadlines and Expectations 	October 26, 2017
Current & New Action Items #4	 Review Current Goals & Objectives Sections 3 & 4 Evaluate Newly Proposed Goals & Objectives as Well as Action Items Community Participation Review Planning Process and Deadlines and Expectations 	December 12, 2017
Presentation of Draft 2013 Miller County Hazard Mitigation Plan #5	 Presentation of Current Draft Plan Questions and Comment Period Discussion on Plan Maintenance Discussion on Adoption Process 	January 30, 2018
Comments Submitted, SEMA Review and Action Items with Action Worksheets # 6	 Updated Items Identified in the 2018 HMP Revisiting the Action Items and Completing the Action Worksheets for each participating Jurisdiction Second Draft to SEMA May 31, 2018 	May 23, 2018

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

Planning Participation

Participants were engaged in the planning process. With small rural communities the resources are limited and often times individual meetings and calls are necessary to facilitate the participation of those communities. The MPC members were engaged throughout the entire update and provided valuable insight to the concerns in Miller County. The planning team set out to understand the concerns and the potential natural hazards within the planning area, so that mitigation strategies could be developed that would have the most benefit to Miller County.

In addition to the planning partners listed in the table located on page 1.5, the staff of Lake of the Ozarks Council of Local Governments participated extensively in the planning process.

Name	Title	Jurisdiction or Agency
Mark Amsinger	Fire Chief	Lake Ozarks Fire Protection District
Aaron Hess	Emergency Management Eldon Police Department	
No Participation		Iberia Rural Fire District
Ron Schlicht	Executive Director	Miller County Ambulance District
No Participation		Bagnell Special Road District
No Participation		City of Eldon Fire Department
Matt Michalik	Public Works Department	City of Lake Ozark
No Participation		Kaiser Special Road District

Table 1.6. Special Districts Participant
--

Our planning partners play a very important role in the development of the plan, while not all our planning partners were able to attend the public meetings; every effort was made to keep them engaged throughout the planning process. Efforts included personal letters, emails, and phone calls.

Public Participation

Requirement §201.6(b):	In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
Requirement §201.6(b):	In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non- profit interests to be involved in the planning process;

All of our planning meetings were posted as public meetings and were posted in accordance with Missouri's Sunshine Law (RSMo 610.010, 610.020, 610.023, and 610.024).

To encourage participation from surrounding communities and counties, all information in regard to the Miller County Hazard Mitigation update was distributed to our entire region of Camden, Laclede, Miller and Morgan counties.

During the planning process, we had considerable media coverage with press representation at all our planning meetings and several radio interviews with both KRMS and KJEL. Copies of the newspaper articles can be found in Appendix B.

A draft copy of the updated Miller County Hazard Mitigation Plan was posted on our website in late January 2018. Press releases were sent to all media partners encouraging public review and soliciting comments on the updated plan.

A notification of the availability of the draft copy of the Miller County Hazard Mitigation Plan 2018 was distributed through email, fax, direct mail, and all media outlets.

A draft copy of the updated Miller County Hazard Mitigation Plan was publicly presented at our meeting January 30, 2018.

An updated draft copy was presented at the meeting on May 23, 2018 with additional Actions Worksheets being completed.

Structural Changes in Updated Miller County Hazard Mitigation Plan 2018

The structure of the 2018 Miller County Hazard Mitigation Plan remained the same as the 2013. However the MPC integrated all of the FEMA requirements into the updated plan.

Miller County Hazard Mitigation Plan 2013 structured as:

Table of Contents Executive Summary Prerequisites Section 1: Introduction and Planning Process Section 2: Planning Area Profile Section 3: Risk Assessment Section 4: Mitigation Strategy Section 5: Plan Maintenance Appendices

Miller County Hazard Mitigation Plan 2018 structured as:

Table of Contents Executive Summary Prerequisites Section 1: Introduction and Planning Process Section 2: Planning Area Profile Section 3: Risk Assessment Section 4: Mitigation Strategy Section 5: Plan Maintenance Appendices

The Miller County Hazard Mitigation Plan update was complicated in regard to the limited amount of data that is available for Miller County. The original plan from 2013 had severe limitations and the data that was provided was often inconclusive. We also found that the data collections during the 2018 update proved to be more difficult than anticipated as there is limited data collected within the planning area. There were often cases where the only data available was considerably outdated and ineffectual.

Source Materials

Requirement §201.6(b):	In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
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During the planning and redevelopment of the Miller County Hazard Mitigation Plan, other source materials were consulted and or referenced within the plan itself.

- Mitigation Ideas A Resource For Reducing Risk to Natural Hazards-FEMA (2013)
- Multi-Jurisdictional Natural Hazard Mitigation Plan for Missouri's Electric Cooperatives-MACOG (2012)
- The Missouri State Hazard Mitigation Plan-SEMA (2016)
- The Missouri Hazard Analysis-SEMA (2016)
- The Comprehensive Economic Development Strategy for Lake of the Ozarks Council of Local Governments (2017)
- The Community Demographic Profile for Lake of the Ozarks Council of Local Governments (2018)
- The Long-Range Transportation Plan Missouri Department of Transportation (2018)
- The Regional Transportation Plan for Lake of the Ozarks Council of Local Governments (2014)

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process. (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Coordination with FEMA Risk MAP Project

- Miller County is still in the process of receiving flood risk products. A small northern part of the state has flood risk products available.
- Lake of the Ozarks Council of Local Governments (LOCLG) has attended a State Emergency Management Agency (SEMA) Class in Springfield Missouri. This class was an overview of products that will be available in the flood risk map once FEMA is completed with the mapping development. LOCLG also attended a conference call that also provided the below status on the counties in Missouri and project progress.



Figure 7 FEMA FIRM Map Study Status

Integration of Other Data, Reports, Studies, and Plans

- The plan also includes information solicited form insurance agencies and varies approved SEMA websites.
- Documentation was retrieved from the mitigation plans of the state, reports from university extensions, Flood Insurance Studies (FIS), Flood Insurance Rate Maps (FIRMs), State Department of Natural Resources (DNR) dam information, the National Inventory of Dams (NID), dam inspection reports. State fire reports, Wildland/Urban Interface and Intermix areas from the SILVIS Lab - Department of Forest Ecology and Management - University of Wisconsin, local comprehensive plans, economic development plans, capital improvement plans, US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics, and local budgets are all departments that were utilized to retrieve information.
- The Multi-Jurisdictional Planning Committee (MPC) identified and profiled their hazard in the second meeting on September 26, 2017. Hand outs were provided (See Appendix B) which included the below:
 - Previous disaster declarations in Miller County
 - o Hazards in the most recent State Hazard Mitigation Plan 2016
 - Hazards identified in the previously approved 2013 hazard mitigation plan.
- The following jurisdictions provided their Community Assessment Surveys.
 - Miller County
 - City of Bagnell
 - City of Eldon
 - City of Iberia
 - City of Lake Ozark
 - Village of St. Elizabeth
 - Village of Tuscumbia
- The following jurisdictions did not respond after several attempts. Letters were sent to these jurisdictions and the Community Assessment Survey was provided in two different mailings. Phone calls were placed into the local Chairman.
 - City of Olean
- The following jurisdictions filled out the Data Collection Questionnaire for their respective school districts:
 - Eldon R-I School District
 - Miller County R-III School District
 - St. Elizabeth R-IV School District
 - Iberia R-V School District
 - School of the Osage School District
- The School Districts take common safety precautions. That appears to be due to the Superintendents are assigned the roles of Emergency Manager, Grant Writers, and Public information Officers. They are also the authors of plans such as the Master Plan,

Capital Improvement Plans, School Emergency Plans, and Shelter in Place Plans, and Weapons Policies. See the Risk Assessment chapter of the plan for additional detail on conclusions drawn from the data reviewed.

- Each jurisdiction provided a listing of assets that included the building number, square footage, replacement values, contents values, and hazards that would affect those buildings.
- The asset determinations were determines from the Data Collection Questionnaire and Insurance Documentation from the jurisdictions.
- The only losses that were identified to the MPC were from St. Elizabeth School District. One August 2-14, 2013 severe storms, straight-line winds, and flooding resulted in damage to the school district. Floodwaters entered through the exterior walls (stone and mortar), wood window frames, and exterior doors (metal door and framing). Flooding caused damages to acoustical ceiling tiles, carpet, band uniforms, and a bookcase. Lightening struck a bus CB antenna, intercom systems, and shorted out the phone systems. The Emergency Management Office in Jefferson City, MO managed the FEMA grant plan. Total cost of the project was \$120,161.43.
- Vulnerability estimates were taken from the 2016 State Plan, as the best and most recent data available.

During the second and third meetings, the MPC reviewed the goals from the previously approved plan. The MPC agreed to keep the goals as the same. Each objective was reviewed and agreed to. The state mitigation action instructions were utilized to ensure that the objectives meet the criteria of SMART. Each objective was evaluated to remove words such as considering ensuring encouraging, and continuing were removed and replaced with objectives that would be measurable. Goals include the below:

- 1. Mitigation Planning Mitigate the effects of potential natural hazards in Miller County.
- 2. Mitigation Programs Protect Miller County's assets and populace through cost-effective and tangible mitigation projects whenever financially feasible.
- 3. Mitigation Procedures-encourage continuity of operations of government and emergency services in a disaster.
- 4. Mitigation Public Awareness-Increase public awareness of natural hazards that have the potential to impact Miller County.
- During the meetings, we discussed many ideas for updating procedures. Progress report forms were provided in the final review meeting on January 30, 2018.
- The FEMA publication *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013)* was used as a reference in the development of action projects. Five copies were available and referenced during the second and third meetings. A few people in the planning team opted to take the copies provided for the meetings to utilize in their own agencies.
- The MPC did discuss the costs and long-term planning needed for some projects. The modified STAPLEE method was discussed and considered when determining the objectives.

2		REA PROFILE AND CAPABILITIES	
	2.1. Miller Coun	ty Planning Area Profile	2.4
(County Populati	ions and Projections	2.6
	Table 2.1.	County Populations and Projections	2.6
	Table 2.2.	County Populations by Income Estimates (2010 & 2015)	2.6
	Table 2.3.	Median House Value Estimates National (2015)	2.7
2	2.1.2 Geography	y, Geology and Topography	2.7
2	2 1 3 Climate		2 11
-	Table 2.4.	Average High Temperature	
	Table 2.5.	Average Low Temperature	
	Table 2.6.	Average Precipitation	2.11
2.1	4 Population/I	Demographics	
	Table 2.7.	Population by Age Demographic	2.13
	Table 2.8.	Miller County Populations and Projections	2.14
	Table 2.9.	Miller County Population 2010 & 2015 by Community	2.14
	Table 2.10.	County Populations by Housing	2.14
	Table 2.11.	Household & Family % Ranking	2.15
	Household ar	nd Family	2.15
F	Population by R	ace and Ethnicity	
	Table 2.12.	County Populations by Race and Ethnicity	2.15
	Table 2.13.	Unemployment, Poverty, Education, and Language Percentage Demograph 2.16	nics, Miller County, Missouri
2.1.	5 History		
2.1 . ک	5 History		2.17 2.18
2.1 .	5 History School Districts 2.1.6 Occupatio	ns	
2.1 .	5 History School Districts 2.1.6 Occupatio Table 2.15.	<i>ns</i> Occupation Statistics, Miller County, Missouri	2.17 2.18 2.19 2.19 2.19
2.1 .	5 History School Districts 2.1.6 Occupatio Table 2.15. 2.1.7 Agriculture	ns Occupation Statistics, Miller County, Missouri	2.17 2.18 2.19 2.19 2.19 2.20
2.1 .	5 History School Districts 2.1.6 Occupatio Table 2.15. 2.1.7 Agriculture 2.1.8 FEMA Haze	ns Occupation Statistics, Miller County, Missouri e ard Mitigation Assistance Grants in Planning Area	2.17 2.18 2.19 2.19 2.19 2.20 2.20
2.1. 2 2 2 2 2.2.	 5 History 5 Chool Districts 2.1.6 Occupatio Table 2.15. 2.1.7 Agriculture 2.1.8 FEMA Haze 2 Jurisdictiona 	ns Occupation Statistics, Miller County, Missouri e ard Mitigation Assistance Grants in Planning Area I Profiles and Mitigation Capabilities	2.17 2.18 2.19 2.19 2.19 2.20 2.20 2.20 2.20
2.1. 3 2 2 2 2.2.	 5 History 5 Chool Districts 2.1.6 Occupatio Table 2.15. 2.1.7 Agriculture 2.1.8 FEMA Haze 2 Jurisdictiona Miller County 	ns Occupation Statistics, Miller County, Missouri e ard Mitigation Assistance Grants in Planning Area I Profiles and Mitigation Capabilities	2.17 2.18 2.19 2.19 2.20 2.20 2.20 2.20 2.21
2.1. 2 2 2 2.2.	 5 History 5 Chool Districts 5.1.6 Occupatio Table 2.15. 2.1.7 Agriculture 2.1.8 FEMA Haze 2 Jurisdictiona Miller County 5 Transportation of 	ns Occupation Statistics, Miller County, Missouri e ard Mitigation Assistance Grants in Planning Area I Profiles and Mitigation Capabilities I and Commuting Patterns	2.17 2.18 2.19 2.19 2.20 2.20 2.20 2.20 2.21 2.21 2.21
2.1. 5 2 2 2 2 2.2.	5 History School Districts 2.1.6 Occupatio Table 2.15. 2.1.7 Agriculture 2.1.8 FEMA Haze 2 Jurisdictiona Miller County Transportation of 2.1.2 Road	ns Occupation Statistics, Miller County, Missouri e ard Mitigation Assistance Grants in Planning Area I Profiles and Mitigation Capabilities I and Commuting Patterns	2.17 2.18 2.19 2.19 2.20 2.20 2.20 2.20 2.21 2.21 2.22 2.22
2.1. 5 2 2 2.2. 7	 5 History 5 Chool Districts 6 Occupatio Table 2.15. 7.1.7 Agriculture 2.1.8 FEMA Haze 2 Jurisdictiona Miller County 5 Transportation of 2.1.2 Road 1.12 Road 	ns Occupation Statistics, Miller County, Missouri e ard Mitigation Assistance Grants in Planning Area I Profiles and Mitigation Capabilities / and Commuting Patterns	2.17 2.18 2.19 2.19 2.20 2.20 2.20 2.20 2.21 2.21 2.21 2.22 2.22
2.1. 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	 5 History 5 History 5 chool Districts 2.1.6 Occupatio Table 2.15. 2.1.7 Agriculture 2.1.7 Agriculture 2.1.8 FEMA Haze 2 Jurisdictiona Miller County Transportation of 2.1.2 Road urisdictional Pr Table 2.19. 	ns Occupation Statistics, Miller County, Missouri e ard Mitigation Assistance Grants in Planning Area I Profiles and Mitigation Capabilities and Commuting Patterns ways	2.17 2.18 2.19 2.19 2.20 2.20 2.20 2.20 2.20 2.21 2.21 2.21
2.1. 5 2 2 2 2 2.2. 7 3 5	 5 History 5 Chool Districts 5 Chool Districts 2 Chool Districts 2 Chool Districts 2 Chool Districtiona 2 Chool Districtional 2 Chool Districtional Print Comparison Comparison Comparison 	ns Occupation Statistics, Miller County, Missouri e ard Mitigation Assistance Grants in Planning Area I Profiles and Mitigation Capabilities	2.17 2.18 2.19 2.19 2.20 2.20 2.20 2.20 2.21 2.21 2.22 2.22
2.1. 5 2 2 2 2 2.2. 7 <i>J</i>	 5 History 5 Chool Districts 5 Chool Districts 2 Construction 2 Construction	ns Occupation Statistics, Miller County, Missouri e ard Mitigation Assistance Grants in Planning Area I Profiles and Mitigation Capabilities and Commuting Patterns ways ofiles and Mitigation Capabilities Miller County Profile 2015 Estimates Media Coverage in Miller County Miller County Mitigation Capabilities	2.17 2.18 2.19 2.19 2.20 2.20 2.20 2.20 2.20 2.21 2.21 2.21
2.1. 5 2 2 2 2.2. 7 7 9 2.2.	 5 History 5 Chool Districts 5 Chool Districts 6 Occupatio Table 2.15. 7 Agriculture 2.1.7 Agriculture 2.1.8 FEMA Haze 2 Jurisdictiona Miller County 7 ansportation of 2.1.2 Road urisdictional Pr Table 2.19. Table 2.20. Table 2.21. 3 Special Distriction 	ns Occupation Statistics, Miller County, Missouri e ard Mitigation Assistance Grants in Planning Area I Profiles and Mitigation Capabilities /	2.17 2.18 2.19 2.19 2.20 2.20 2.20 2.20 2.20 2.21 2.21 2.21
2.1. 5 2 2 2 2 2.2. 7 <i>J</i> 2.2.	 5 History 5 Chool Districts 5 Chool Districts 6 Occupatio Table 2.15. 7 Agriculture 7 Agriculture 2 Jurisdictiona 2 Jurisdictiona Miller County 7 ransportation of 2.1.2 Road urisdictional Pr Table 2.19. Table 2.20. Table 2.21. 3 Special Districulture 	ns Occupation Statistics, Miller County, Missouri e ard Mitigation Assistance Grants in Planning Area I Profiles and Mitigation Capabilities and Commuting Patterns	2.17 2.18 2.19 2.19 2.20 2.20 2.20 2.20 2.21 2.21 2.22 2.22 2.22 2.22 2.26 2.26 2.30 2.30 2.32
2.1. 3 2 2 2 2.2. 7 <i>J</i> <i>J</i> 2.2.	 5 History 5 History 5 chool Districts 2.1.6 Occupatio Table 2.15. 2.1.7 Agriculture 2.1.7 Agriculture 2.1.8 FEMA Haze 2 Jurisdictiona Miller County 7 ansportation of 2.1.2 Road 1.12 Road 	ns Occupation Statistics, Miller County, Missouri e ard Mitigation Assistance Grants in Planning Area I Profiles and Mitigation Capabilities	2.17 2.18 2.19 2.19 2.20 2.20 2.20 2.20 2.21 2.21 2.22 2.22

Table 2.26. Table 2.27.	Day Care Facilities Shelter Names and Locations	2.42
Historical Sites		
Dublic Land		2.44
Table 2.28	Public Access Points	2.44
Table 2.20.		
Parks		2.46
Community Part	nerships	2.46
Community Part	icipation	2.46
City of Bagnell		2.47
Table 2.30.	City of Bagnell 2016 Assessed Values	
Table 2.31.	City of Bagnell Mitigation Capabilities	2.51
Village of Brumle	27	
Table 2.32.	2015 Village of Brumley Profile 2015 Estimates	
Table 2.33.	Village of Brumley 2016 Assessed Values	2.54
Table 2.34.	Village of Brumley Mitigation Capabilities	2.56
City of Eldon		
Table 2.35.	City of Eldon Profile 2015 Estimates	
Table 2.37.	City of Eldon 2016 Assessed Values	2.59
Table 2.38.	City of Eldon Mitigation Capabilities	2.62
Citv of Iberia		
Table 2.39.	City of Iberia Profile 2015 Estimates	
Table 2.41.	City of Iberia 2016 Assessed Values	2.65
Table 2.42.	City of Iberia Mitigation Capabilities	2.67
City of Lake Ozai	⁻ k	
Table 2.43.	City of Lake Ozark Profile 2015 Estimates	2.69
Table 2.44.	City of Lake Ozark Building Count and Insurance Replacement Values	2.69
Table 2.45.	City of Lake Ozark 2016 Assessed Values	2.70
Table 2.46.	City of Lake Ozark Mitigation Capabilities	2.72
Village of Olean		2.74
Table 2.47.	Village of Olean Profile 2015 Estimates	2.74
Table 2.48.	Village of Olean 2016 Assessed Values	2.75
Table 2.49.	City of Olean Mitigation Capabilities	2.77
Village of St. Eliz	abeth	
Table 2.50.	Village of St. Elizabeth Profile 2015 Estimates	2.79
Table 2.51.	Village of St. Elizabeth Building Count and Insurance Replacement Values	
Table 2.52.	Village of St. Elizabeth 2016 Assessed Values	
Table 2.53.	Village of St. Elizabeth Mitigation Capabilities	2.82
Village of Tuscur	nbia	
Table 2.54.	Village of Tuscumbia Profile 2015 Estimates	
Table 2.55. Table 2.55.	Village of Tuscumbia 2016 Assessed Values	2.85
School Districts .		
Eldon R-I School	District	2.91
Table 2.57.	Eldon R-I School District	2.91
Miller County R-	III School District	
Table 2.58.	Miller County R-III School District	2.93
St. Elizabeth R-IV	/ District	2.95

Table 2.59.	St. Elizabeth R-IV School District	2.95
School of the Os	age School District	2.97
Table 2.60.	School of the Osage School District	2.97
Iberia R-V Schoo	l District	2.99
Table 2.61.	Iberia R-V School District	
Table 2.62.	Miller County Capabilities Summary	2.101
2.2.4 Public School	District Profiles and Mitigation Capabilities	2.105
Table 2.63.	School Districts Buildings and Enrollment Data, Preliminary 7/21/2017	2.107

Table of Figures

Figure 1 Miller County Area Profile Map	2.4
Figure 2 Generalized Geologic Map of Missouri	2.8
Figure 3 Miller County Watershed Map	2.9
Figure 4 Missouri DFIRM Study Map	2.10
Figure 5 Miller County Airports Map	2.24
Figure 6 Workers Commute Outside County Map	2.25
Figure 7 Miller County Floodplains Map	2.27
Figure 8 NOAA Weather Radio Map	2.31
Figure 9 Miller County Fire Districts Maps	2.35
Figure 10 Miller County Ambulance Districts Map	2.37
Figure 11 Special Road Districts Map	2.40
Figure 12 City of Bagnell Floodplains Map	2.49
Figure 13 Structures with FEMA 1% Annual Flood Zone	2.50
Figure 14 Village of Brumley Floodplains Map	2.55
Figure 15 City of Eldon Floodplains Map	2.61
Figure 16 City of Iberia Floodplains Map	
Figure 17 Lake Ozark Floodplains Map	2.71
Figure 18 Village of Olean Floodplains Map	2.76
Figure 19 Village of St. Elizabeth Floodplains Map	2.81
Figure 20 Village of Tuscumbia Floodplains Map	
Figure 21 School Districts Floodplain Map	2.90
Figure 22 Eldon R-I School District Boundary and Floodplain Map	2.92
Figure 23 Miller County R-III School District Boundaries and Floodplain Map	2.94
Figure 24 St. Elizabeth R-IV District Boundaries and Floodplain Map	
Figure 25 School of the Osage School District Boundary and Floodplain Map	2.98
Figure 26 Iberia R-V School District Boundaries and Floodplain Map	2.100
Figure 27 Miller County Public School District Boundary Map	
Figure 28 School Districts 100 year Floodplain Map	2.106



2.1. Miller County Planning Area Profile

Figure 1 Miller County Area Profile Map

Miller County is centrally located in Missouri and split down the middle by the Osage River, covers an area of approximately 380,000 acres, or 593 sq. miles of land. The territory was originally established as the southern part of Cole County in 1820, but on February 6, 1837, a legislative act reorganized the territory and recognized the formation of Miller County, named in honor of Missouri Governor John Miller, 1826-28.

Miller County is defined by the history and value it holds to the Lake of the Ozarks area. With the Osage River running directly through the county, the geographical design alone can be viewed as the foundation of the flourishing industry that the area has developed.

The landmark success for the county was the damming of the Osage River. In 1931, Bagnell Dam was completed and was a major influence in the arrival of thousands of new settlers to the county. From the beginning of the study to completion of the dam, The Great Osage Project took over 19 years, but it became the center of attention for decades later. The area was on the map as home of the nation's largest man-made lake. However, the population of permanent residence began to decline; the newly generated traffic to the area had spawned a new industry of tourism.

The territory's original name of Lake Benton was given by an Act of the General Assembly of Missouri; however, the local builders dubbed it the Lake of the Ozarks. The local lake, with the local name, that ends at the edge of Miller County also began at Miller County.

Historical significance and quality of life contribute to this thriving county, with a population of 24,748 (2010 Census). Miller County is currently ranked 31 in the fastest-growing counties in Missouri. Due to the many resources of Miller County such as, prime central location and a plethora of outdoor recreational activities - the county continues to provide essential growth to the Lake of the Ozarks.

Incorporated areas in Miller County and their dates of incorporation are the City of Bagnell 1926, Village of Brumley 1926, City of Eldon 1904, City of Iberia 1875, City of Lake Ozark 1966, Village of Olean 1900, Village of St. Elizabeth 1948, and Village of Tuscumbia 1857.

County Populations and Projections

With a population 25,206, the 2016 (ACS) shows Miller County grew 2% from its population of 24,727 in 2013 (ACS). Miller County is also estimated to have a 15% increase by 2030 in overall population.

Table 2.1. County Populations and Projections

	2010 Census	2016 (est)	2020 (est)	2030 (est)	% Change '10-'30	
Miller	24,748	25,206	27,277	28,404	15	
Source: As of 05/28/2008 http://oa.mo.gov/bp/projections/TotalPop.pdf						

https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2014_PEPANNRES&prodType=table

Table 2.2. County Populations by Income Estimates (2010 & 2015)

2010 (est)		2015 (est)
10,410	Total Households	9,452
9.9%	< \$10,000	10.0%
8.4%	\$10,000-\$14,999	7.2%
15.5%	\$15,000-\$24,999	15.9%
14.9%	\$25,000-\$34,000	12.3%
17.7%	\$35,000-\$49,.999	17.3%
20.1%	\$50,000-\$74,999	15.7%
8.0%	\$75,000-\$99,999	8.9%
4.2%	\$100,.000 - \$149,999	8.9%
0.8%	\$150,000 - \$199,999	1.3%
0.6%	\$200,000>	2.5%
30,977		36,411
County	Median Household Income (2010& 2015)	National
46,262	Income	51,914
Unknown	Growth	3.95%

Source: https://datausa.io/profile/geo/miller-county-mo/?compare=united-states https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_S1901&prodType=table Table 2.3. Median House Value Estimates National (2015)

Property Value	\$120,800	\$194,500
Percentage Growth	4.32%	7.32%

Source: https://datausa.io/profile/geo/miller-county-mo/?compare=united-states

2.1.2 Geography, Geology and Topography

Miller County is situated in central Missouri. The county is bordered on the north by Cole and Moniteau counties. It is also bordered on the east by Maries and Osage Counties, and on the south by Camden and Pulaski counties.

Miller County is a part of the Ozark Plateau, which is characterized in most sections by highly dissected plateaus. Missouri has some of the most diverse geology in the nation. On the map below, the colors that tend toward orange and red represent the oldest geologic formations. The youngest tend toward blue and green. Miller County's geologic formations are from the Ordovician Period, which occurred 505 to 441 million years ago.

The Moreau River Basin, a sub basin of the Missouri River, lies in the central Missouri counties of Cole, Miller, Moniteau, and Morgan. South Moreau Creek originates near Eldon and flows to the Northeast.

Sources of Data:

- FEMA Flood Insurance Study, accessed from the FEMA Flood Map Service Center, https://msc.fema.gov/portal
- Environmental Protection Agency Website for watershed details, <u>http://cfpub.epa.gov/surf/locate/index.cfm</u>




Figure 3 Miller County Watershed Map



Figure 4 Missouri DFIRM Study Map

2.1.3 Climate

While severe weather can occur in Miller County, for the most part, Miller County experiences relatively mild weather. The data reflected in the tables below was collected from the Weather station in **Eldon, Missouri in Miller County, which** is located at approximately 38.35°N 92.58°W, height about 283m / 928 feet above sea level. The data reflects information collected at this station from 1961-1990.

Table 2.4.Average High Temperature

	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Νον	Dec	Year
°F	40	47	58	68	76	83	89	87	79	70	56	44	66.4

Table 2.5. Average Low Temperature

	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
°F	19	24	33	43	52	61	89	64	56	45	34	24	43.4

Table 2.6.Average Precipitation

	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
inches	1.77	2.17	3.35	4.25	5.08	4.13	4.06	3.78	3.9	3.94	3.82	2.56	42.81
-													

Sources: http://www.usclimatedata.com/climate/versailles/missouri/united-states/usmo0897

Accumulated average yearly precipitation reflects 42.18 inches; the data collected represents all precipitation, including rain and snow.

Natural Hazards History

Miller County's location on the Ozark Plateau is the root factor to the number of different hazards that are natural to the area, as well as the frequency. This beloved location is both tranquil and invigorating, so noted by the generations of families who reside within the area, as well as, the thriving tourism industry.

However, the natural appeal of Miller County has endured numerous hazards, including Winter Storms, Flooding, Thunderstorms, Tornado, Hailstorms, Extreme Heat, and other FEMA identified natural hazards. The county is divided by the deep valley of the Osage River, yet is bordered on the north and south by rolling terrain. The location at the edge of the plateau with the varying geography makes the county susceptible to a variety of storms and atmospheric changes.

Severe Winter Storms and Flooding have been the most difficult hazards that the county has experienced. Since 1990, Miller County has had seven (17) Presidential Declared Major Disasters and three (5) Emergency Declared Disasters; all declared as, either Severe Winter Storm, Straight - Line Winds, Tornado, or Severe Storm and Flooding. Winter Storms are nearly an annual event for the county. The ice and heavy wet snow, which accumulates, has been known to collapse roofs, pull-down power lines, and snap towering trees.

The National Weather Service has recorded "nuisance" flooding occurring every year, and multiple times a year, from 1993 to 2002; however, major flooding has also occurred at least every other year since the early 1990s, and more often recently with six (6) of the county's 11 historical major floods being in the last 20 years. According to the National Weather Service, rainfall amounts to as little as two inches can cause streets and ditches to flood in some Miller County towns, and over four inches can cause "significant flooding that can affect most of the county." Data collected for the Miller County Natural Disasters and Weather Extremes, distributed by USA.com, shows the total number of all floods recorded in the county from 1950 to 2013 to be 1,843. Because of the terrain, the county has more land area that is prone to flooding, which aligns with the many waterways that encompass the county.

Miller County is no stranger to the likeliness of tornadoes either. There have been 17 F1 category tornadoes reported since 1950, three (3) F2, and (6) F0. There has only been one (1) F4 reported for the county, which dated back to April 18, 1880. There have been no F3 or F5 tornadoes reported for the county. Because of the terrain, tornadoes are not as probable in the county as flooding.

Extreme Heat is another hazard that occasionally surfaces in Miller County. Often defined as excessive heat (typically temps exceeding 10° above the average high) that lasts for more than two days, extreme heat affects Miller County as harshly as floods. The agriculture of the county is a large portion of revenue, employment, and land use. The National Drought Mitigation Center was a major supporter of the USDA in June 2012, when extreme heat and drought caused Miller County to be designated as one of the counties in need of assistance to producers.

Other recorded natural hazards for the county include .8% of wildfires started by lightning, the rest were fabricated. There has been one earthquake occur within the county's borders in 1992, and another one 15 miles from the border in 2005.

2.1.4 Population/Demographics

With a population of 24,748, the 2010 Census shows Miller County grew 5% from its population of 23,564 in 2000. Miller County is also estimated to have a 15% increase by 2030 in overall population.

			Minner	Mi	Miller	Miller
Ages	United States	United States	Missouri	Missouri	County, Missouri	County, Missouri
					2010	2015
	2010 (EST)	2015 (EST)	2010 (EST)	2015 (EST)	(EST)	(EST)
Population	303,965,272	316,515,021	5,922,314	6,045,448	24,805	24,805
Under 5						
years	6.60%	6.30%	6.50%	6.20%	6.40%	6.40%
5 to 9 years	6.60%	6.50%	6.50%	6.50%	6.80%	6.80%
10 to 14						
years	6.80%	6.50%	6.80%	6.50%	7.00%	7.00%
15 to 19						
years	7.30%	6.70%	7.30%	6.70%	6.60%	6.60%
20 to 24	7 000/	7 400/	7.000/	7 4 0 9 /	F 0.00/	E 0.0%
years	7.00%	7.10%	7.00%	7.10%	5.80%	5.80%
25 to 29	6 900/	6 00%	6 700/	6 60%	E 0.00/	E 909/
years	0.60%	0.90%	0.70%	0.00%	5.60%	5.00%
Vears	6 40%	6 70%	6 10%	6 60%	5 40%	5 40%
35 to 39	0.4070	0.1070	0.1070	0.0070	0.4070	0.4070
vears	6.80%	6.30%	6.40%	6.00%	6.00%	6.00%
40 to 44						
years	7.10%	6.60%	6.80%	6.10%	7.20%	7.20%
45 to 49						
years	7.50%	6.80%	7.60%	6.50%	7.70%	7.70%
50 to 54						
years	7.10%	7.10%	7.20%	7.30%	7.30%	7.30%
55 to 59						
years	6.20%	6.20%	6.30%	6.90%	7.00%	7.00%
60 to 64	F 400/	E 900/	F 200/	6.00%	F 200/	E 20%
years	5.10%	5.80%	5.30%	6.00%	5.30%	5.30%
00 10 09 Vears	3 80%	4 60%	4 10%	4 70%	4 90%	4 90%
70 to 74	5.0070	4.00 /0	4.1076	4.7070	4.9078	4.30 /8
vears	3.00%	3.30%	3.20%	3.20%	3.70%	3.70%
75 to 79	0.0070	2.5070	0.2070	0.2070	0070	0070
years	2.40%	2.40%	2.60%	2.60%	2.80%	2.80%
80 to 84	- / -					
years	1.90%	1.90%	2.00%	2.00%	1.70%	1.70%
85 years and						
over	1.70%	1.70%	1.90%	2.00%	2.70%	2.70%

Table 2.7. Population by Age Demographic

Source: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_S0101&prodType=table

Miller County encompasses several miles of shoreline on Lake of the Ozarks; many of these homeowners are second homeowners. These homeowners often plan to retire at the lake once they reach retirement age. This will significantly increase our elderly population. While many of these homeowners are more affluent, Miller County also has a large number of permanent residences that live and work below the poverty level. This population often lives in inadequate housing, including manufactured homes and modular homes. They are also often uninsured or underinsured, which makes this population of homeowners at a much higher risk in the event of a natural hazard.

Table 2.8.	Miller County	y Population	ns and Pro	jections

	2010	2025	2020 (est)	2030 (est)	% Change '10- '30
Miller County	23,564	24,748	25,550	28,404	21%

Source: http://archive.oa.mo.gov/bp/projections/dataMF/MillerMF.pdf

While a few cities in Miller County have experienced small increases in population, some of the smaller more rural communities have experienced a decline in population over the past 10 years.

Table 2.9.Miller County Population 2010 & 2015 by Community

Jurisdiction	2010 Population	2015 Population	2000-2010 # Change	2010-2015 % Change
Miller County	24,805	24,956	151	6
City of Bagnell	82	52	8	-12
Village of Brumley	108	65	43	-39
City of Eldon	4,685	4,617	-68	-1
City of Iberia	991	693	-298	-30
City of Lake Ozark	1,214	1,626	412	34
City of Olean	195	99	-96	-49
Village of St. Elizabeth	331	319	-12	-4
Village of Tuscumbia	246	252	-6	-2

Source:

https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=AC S_15_5YR_B01003&prodType=table

All natural hazards have the potential to affect the lives of all within the path of destruction. Several identified groups of the population are considerably more vulnerable. These groups are identified as the elderly, children, and the poor. The chart below reflects the age of the population in Miller County, while there has been a slight decline in the younger population between 2000 and 2010 there has been an increase in the 60-80+ year old population.

Table 2.10. County Populations by Housing

	2010	2015
Total Housing Units	12,758*	12,739**
Occupied Housing Units	9,917*	9,452**
Owner-Occupied Units	7,341 *	7,334**
Renter-Occupied Units	2,576 *	2,118**
Ave. Household Size	2.50	2.47
Ave. Family Size	3.00	2.97

Source: *https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_SF1_QTH1&prodType=table

Table 2.11. Household & Family % Ranking

Household and Family	Miller C Ranking	Miller County % Ranking In Missouri			U.S.
Total Households	9,710			2,361,232	116,211,092
Average Household Size	2.53		#39	2.48	2.63
1 Person Households	2,793	28.76%	#44	29.09%	27.57%
2 or More Person Households	6,917	71.24%	#72	70.91%	72.43%
Family Households (Families)	6,610	68.07%	#50	64.92%	66.22%
Average Family Size	3.18		#33	3.15	3.32
Married-Couple Family	5,099	52.51%	#61	48.54%	48.42%
Nonfamily Households	3,100	31.93%	#66	35.08%	33.78%

*Based on 2010-2014 data._Source: http://www.usa.com/miller-county-mo-population-and-races.htm#PopulationbyAge

Miller County remains predominately white with no significant increase in any other race or ethnicity according to the 2015 ACS data.

Population by Race and Ethnicity

Table 2.12. County Populations by Race and Ethnicity

Race and Ethnicity	2010	2015
White	24,086	24,001
Black African American	155	110
American Indian/Alaska Native	102	251
Asian	77	85
Native Hawaiian/Pacific Islander	0	0
Hispanic/Latino /other	55	199

Source: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_B02001&prodType=table

Table 2.13. Unemployment, Poverty, Education, and Language Percentage Demographics, Miller County, Missouri

Jurisdiction	Total in Labor Force	Percent of Population Unemployed	Percent of Families Below the Poverty Level	Percentage of Population (High School graduate)	Percentage of Population (Bachelor's degree or higher)	Percentage of population (spoken language other than English)
Miller County	19,756	8.1%	15.2%	35.4%	4.6%	2.2%
City of Bagnell	49	9.5%	25.0%	100%	0.0%	0.0%
Village of Brumley	55	16.7%	15.0%	100%	0.0%	16.9%
City of Eldon	3,496	12.2%	34.8%	51.6%	10.6%	1.6%
City of Iberia	535	6.8%	10.6%	42.9%	7.1%	4.5%
City of Lake Ozark	1,322	10.3%	11.7%	54.3%	3.2%	2.0%
City of Olean	80	6.8%	33.3%	37.5%	0.0%	0.0%
Village of St. Elizabeth	246	2.7%	4.3%	46.2%	23.1%	2.0%
Village of Tuscumbia	205	2.3%	11.1%	66.7%	33.3%	8.5%
State of Missouri	4,851,761	5.3%	10.2%	29.8%	9.6%	6.0%
United States	256,167,758	6.3%	10.6%	29.7%	9.8%	21.5%

Source: U.S. Census, 2015 American Community Survey, 5-year Estimates. (18 to 24 years, Education) https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_5YR_S2301&prodType=table

2.1.5 History

Here in Missouri's central Ozarks, Miller County was originated 1837, and named for Missouri Governor John Miller. In territory ceded by Osage (French pronunciation for Wazhazhe Indians) 1808, the county was first settled 1807, by William West. Early pioneers were from Kentucky., Tennessee, and Virginia. Two major Indian trails ran through the county.

Tuscumbia, the county seat, was laid out 1837, and named for Tuscumbia (Chickasaw for Warrior Who Kills), Alabama. The town site, given by J. B. and J. P. Harrison, had been an Indian trading camp. On scenic Osage River bluffs, below Bagnell dam, the town was once a noted Osage River port and a number of steamboats were built there. In the Civil War, minor skirmishes and guerrilla raids halted county growth. From the 1870's to early 1900's, lead mining first begun in 1850's, was carried on and the vast timber resources were harvested. In 1882, a branch of the Missouri Pacific Railroad was built to Bagnell, then a leading railroad tie shipping point. In 1903, today's Chicago, Rock Island, and Pacific Railroad were built through northern Miller County.

Miller County, through which flows the Osage River, is a resort, farm, and lumber area. Frenchman Charles Du Tisane, on an exploring trip in 1719, crossed the county south of the Osage, and in 1806, Zebulon M. Pike's Southwest expedition camped along the river. Bagnell Dam, forming Lake of the Ozarks, was built on the Osage in the county by Union Electric Company of Missouri, 1929-1931. Iberia, south of the Osage, laid out 1860, was the home of Iberia (Congregational) Academy, later a junior college. 1890-1951 established by G. Byron and Mable (White) Smith.

Other county towns include Ulman, settled in 1840's; Brumley and Saint Elizabeth, founded in 1870's; Olean and Eldon, resort town and railroad center, 1882; Etterville and Kaiser, early 1900's; Lake Ozark 1932. Early schools were Miller County Institute at Spring Garden, 1870; Miller County Academy at Aurora Springs, 1881; Eldon Academy, 1886. Of interest are Bagnell Dam, Lake of the Ozarks State Park in Miller and Camden counties, found 1935; Aurora Springs, noted Spa of late 1800's and Stark Caverns, near Eldon; and Wilson's Cave near Iberia.

School Districts

Miller County has five public school districts within the planning area. All five of the school districts have agreed to participate in the Miller County Hazard Mitigation plan update 2018.

Miller County Districts	Graduation Rate 2016	Dropout Rate 2016	Student/ Teacher 2016	# of Students 2016	# of Teachers 2016
Eldon R-I	95.6%	1.2	16	1833	192
Miller Co. R-III	95.65%	1.1	19	562	39
Iberia R-V	96.55%	0	13	714	68
St. Elizabeth R-IV	100%	0	12	247	39
School of the Osage	98.33%	.7	14	1859	175

Table 2.14.	Graduation	Rates &	Student to	Teacher Ratio	s
-------------	------------	---------	------------	----------------------	---

Sources: District Report Cards;

Incorporating mitigation actions specific for the student population into the Miller County plan update is vitally important, as these students are a vulnerable population. Reliant on the teachers and staff to help protect the students in the event of a natural hazard during the school hours it is important that the school districts participate and incorporate the action items into their planning process. With the participation of these schools (Eldon R-I, Miller County R-III, Iberia R-V, St. Elizabeth R-IV and School of the Osage) they have indicated their willingness to incorporate the identified action items into their emergency planning process.

Sources:

Miller County http://millercountymissouri.org/history.html

- Eldon http://eldonmustangs.org
- Tuscumbia http://www.tuscumbialions.k12.mo.us

Iberia http://www.iberia.k12.mo.us/education/district/district.php?sectionid=1

St. Elizabeth http://www.ste.k12.mo.us

School of the Osage http://www.osageschools.org

2.1.6 Occupations

Table 2.15.	Occupation	Statistics,	Miller County,	Missouri
-------------	------------	-------------	----------------	----------

Place	Management, Business, Science, and Arts Occupations	Service Occupations	Sales and Office Occupations	Natural Resources, Construction, and Maintenance Occupations	Production, Transportation and Material Moving Occupations
Miller County	25.4%	21.9%	27.0%	10.4%	14.9%
City of Bagnell	10.5%	26.3%	15.8%	10.5%	36.8%
Village of Brumley	16.0%	28.0%	36.0%	8.0%	12.0%
City of Eldon	16.2%	19.8%	41.6%	12.2%	10.2%
City of Iberia	17.6%	30.6%	17.6%	13.9%	20.4%
City of Lake Ozark	30.0%	23.1%	27.1%	13.1%	6.7%
City of Olean	19.0%	21.4%	33.3%	4.8%	21.4%
Village of St. Elizabeth	35.6%	5.5%	30.8%	10.3%	17.8%
Village of Tuscumbia	35.3%	24.7%	22.4%	11.8%	5.9%

Source: U.S. Census, 2011 American Community Survey, 5-year Estimates. Source: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_S2405&prodType=table

2.1.7 Agriculture

Miller County as of the 2012 Census of Agriculture has 1,013 farms. There is a change of -6% loss of the number of farms from 2007. The average size of farms is 245 acres and increase of 8% from 2007. Land usage of farm acreage is 248. The 460 acres is an increase of 8% from 2007. Market value of products sold in 2012 was \$102,981,000, an increase of 8% from 2007. Average sales per farm were \$101,659 in 2012, an increase of 15% from 2007. Miller County ranking is 28 in the Missouri State ranking (114 counties) and 1,140 in U.S. ranking (3,079 counties) for market value products sold.

Top crops sold are Grains, oilseeds, dry beans, and dry peas.

Government Payments for loss of crops to farms were \$549,000 in 2012, an increase of 55% from 2007. Average payments for crop loss to farms were \$3,949 in 2012, an increase of 75% from 2007.

Miller County as of 2015 Census of Agriculture, total work force is estimated at 3.06 % in the area of agriculture, fishing, and hunting, and mining.

Sources: https://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Missouri/cp29131.pdf http://www.agcensus.usda.gov/Publications/2012/Full_Report/Census_by_State/Missouri/index.asp http://mcdc.missouri.edu/othersites.shtml

2.1.8 FEMA Hazard Mitigation Assistance Grants in Planning Area

Project Type	Sub applicant	Award Date	Project Total
Tornado Safe Room	Iberia R-V School District	07/21/2015	\$1,505,843
Tornado Safe Room	Eldon R-I School District	05/21/2015	\$1,573,399
Total			\$3,079,242

Table 2.16. FEMA HMA Grants in Miller County from 1993-2017

Source: Missouri State Emergency Management Agency

https:/www.fema.gov/openfema-dataset-hazard-mitigation-grants-v1

2.2.2 Jurisdictional Profiles and Mitigation Capabilities

Miller County

Local Government

Miller County remains a third class county, governed by a three member County Commission, comprised of a Presiding Commissioner, representing all the county's population and elected for a four year term with additional representation by the two associate commissioners representing the rest of the county's population also elected on a four year term. The commission is responsible for these key aspects of Miller County:

- establishing Miller County policies
- approving and adopting an annual budget for all county operations
- approving expenditures for each county department
- supervising daily operations of Miller County
- ensuring compliance with all statutory requirements
- to work in partnership with County Boards, Commissions and other Local and Regional Governmental parties

Miller County supports the following departments:

- Assessor
- Circuit Court
- Collector
- County Clerk
- Coroner
- County Commissioner
- Emergency Management
- E-911 Emergency
- Juvenile Office
- Prosecuting Attorney
- Public Administrator
- Recorder of Deeds
- Sheriff
- Treasurer
- Public Works

Table 2.17. Miller County Building Count and Insurance Replacement Values

Building Count	28
Replacement Value – Building and Contents	\$ 16,197,453

Table 2.18. Miller County 2016 Assessed Values

	Agricultural	\$ 9,496,600
	Residential	\$119,813,810
Real Estate Property	Commercial	\$ 14,569,570
	Total	\$143,879,980
	Locally Assessed	\$267,931,803
	Local Assessed: Railroad & Utility	\$ 17,813,600
	State Assessed: Railroad & Utility	\$ 28,115,816
	Real Estate Property Total	\$313,861,219
	County Locally Assessed Personal Property	\$ 86,304,949
Personal Property	Local Assessed: Railroad & Utility	\$ 1,384,040
	State Assessed: Railroad & Utility	\$ 4,951,128
	Personal Property Total	\$ 92,640,117
	Tax Increment Financing	\$ 16,346,996
	Grand Total	\$422,848,332

Source: Miller County Assessor's Office 2016

Transportation and Commuting Patterns

2.1.2 Roadways

Miller County has six major roadways that connect the county, including US 54 being classified as a Principal Arterial and Route 17, Route 42, Route 52, Route 87 and Route 242 all being classified as Minor Collectors as classified by Missouri Department of Transportation (MoDOT). MoDOT maintains the state and federal roads in the county. Miller County's Road Commission takes care of the remaining roads that are not already maintained by incorporated communities or special road districts. According to Miller County Presiding Commission, Tom Wright, there is over 600 miles of roadways that the County maintains.

Public Transportation

Miller County residents are almost completely dependent on personal vehicles, as public transportation is virtually non-existent. During our recent study conducted for MoDOT in the Public Transit-Human Services Transportation Plan 2018, we inventoried the organizations that offer public transportation within our four-county region. The limited number of public providers became apparent, as OATS, Inc. is the only provider that offered public transportation opportunities. While there are a number of other organizations that have access to buses, vans and cars they are often specifically for either the residents of the care center or the workshop that owns the vehicles.

Airports

We have two identified airports within Miller County. The Eldon Model Airpark (Airport code H79) and Lee C. Fine Memorial (Airport code A1Z) located in the State Park in Kaiser, Missouri. The runway at the Lee C. Fine Memorial is capable of landing large jetliners, which at this time it does not have any scheduled commercial airline flights.

There are several other small airports within our four county region, including: Camdenton Memorial (Airport code H21) in Camden County, Floyd W. Jones (Airport code LBO) in Laclede County, Grand Glaize (Airport code K15) in Osage Beach, Camden County and Roy Otten Memorial (Airport code 3VS) in Versailles, Morgan County. Within a 100-mile radius, we have 26 small regional airports.

Major airports with commercial airline flights are available anywhere from a 47 to 239 mile commuting distance from Miller County (county seat of Tuscumbia, MO 65082).

Branson Airport (BKG) 161 miles Cape Girardeau Regional Airport (CGI) 239 miles Columbia Regional Airport (COU) 51 miles Joplin Regional Airport (JLN) 188 miles Kansas City International Airport (MCI) 176 miles Lambert – St. Louis International Airport (STL) 150 miles Springfield – Branson National Airport (SGF) 121 miles Waynesville Regional Airport (TBN) 47 miles



Figure 5 Miller County Airports Map

Railroads

There are 19 operating Railroads within the state of Missouri, none of which service Miller County.

Commuting Patterns



Figure 6 Workers Commute Outside County Map

The average daily commute time for residents of Miller County is 27.4 minutes according to 2015 ACS data. The map above reflects those who travel 45 or more minutes.

Jurisdictional Profiles and Mitigation Capabilities

In this section, we will discuss the planning area and the authority in which the local government is permitted to operate with a focus on the capabilities that will have a positive impact on our hazard mitigation efforts.

ClassificationInite Class CountyTotal Population24,956Median Household Income38,094Median Owner-Occupied Housing Value120,800Total Housing Units12,739Water ServiceCity Water Systems: Eldon, Iberia, Lake Ozark and St. ElizabethElectric ServiceAmeren Missouri, Gasosage Electric Coop, Three Rivers Electric Coop and Sho- Me Power CorpNatural GasAmeren Missouri, Summit Natural GasAmbulance ServiceMiller County Ambulance, and Lake Ozark Fire Protection DistrictFire ServiceRural and City DepartmentsMaster PlanNoEmergency Operations PlanYesBuilding RegulationsNoStorm Water RegulationsNoStorm Water RegulationsNoNoStorm Water RegulationsNoNoStorm Water RegulationsNoNFIP ParticipationYesFloodplain RegulationsYes		
Total Population24,956Median Household Income38,094Median Owner-Occupied Housing Value120,800Total Housing Units12,739Water ServiceCity Water Systems: Eldon, Iberia, Lake Ozark and St. ElizabethElectric ServiceAmeren Missouri, Gasosage Electric Coop, Three Rivers Electric Coop and Sho- Me Power CorpNatural GasAmeren Missouri, Summit Natural GasAmbulance ServiceMiller County Ambulance, and Lake Ozark Fire Protection DistrictFire ServiceRural and City DepartmentsMaster PlanNoBuilding RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoStorm Water RegulationsNoNFIP ParticipationYesFloodplain RegulationsNo	Classification	Third Class County
Median Household Income38,094Median Owner-Occupied Housing Value120,800Total Housing Units12,739Water ServiceCity Water Systems: Eldon, Iberia, Lake Ozark and St. ElizabethElectric ServiceAmeren Missouri, Gasosage Electric Coop, Three Rivers Electric Coop and Sho- Me Power CorpNatural GasAmeren Missouri, Summit Natural GasAmbulance ServiceMiller County Ambulance, and Lake Ozark Fire Protection DistrictFire ServiceRural and City DepartmentsMaster PlanNoBuilding RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoStorm Water RegulationsNoNFIP ParticipationYesFloodplain RegulationsNo	Total Population	24,956
Median Owner-Occupied Housing Value120,800Total Housing Units12,739Water ServiceCity Water Systems: Eldon, Iberia, Lake Ozark and St. ElizabethElectric ServiceAmeren Missouri, Gasosage Electric Coop, Three Rivers Electric Coop and Sho- Me Power CorpNatural GasAmeren Missouri, Summit Natural GasAmbulance ServiceMiller County Ambulance, and Lake Ozark Fire Protection DistrictFire ServiceRural and City DepartmentsMaster PlanNoBuilding RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoStorm Water RegulationsNoFile ParticipationYesFloodplain RegulationsNo	Median Household Income	38,094
Total Housing Units12,739Water ServiceCity Water Systems: Eldon, Iberia, Lake Ozark and St. ElizabethElectric ServiceAmeren Missouri, Gasosage Electric Coop, Three Rivers Electric Coop and Sho- Me Power CorpNatural GasAmeren Missouri, Summit Natural GasAmbulance ServiceMiller County Ambulance, and Lake Ozark Fire Protection DistrictFire ServiceRural and City DepartmentsMaster PlanNoEmergency Operations PlanYesBuilding RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoNFIP ParticipationYesFloodplain RegulationsYes	Median Owner-Occupied Housing Value	120,800
Water ServiceCity Water Systems: Eldon, Iberia, Lake Ozark and St. ElizabethElectric ServiceAmeren Missouri, Gasosage Electric Coop, Three Rivers Electric Coop and Sho- Me Power CorpNatural GasAmeren Missouri, Summit Natural GasAmbulance ServiceMiller County Ambulance, and Lake Ozark Fire Protection DistrictFire ServiceRural and City DepartmentsMaster PlanNoBuilding RegulationsNoSubdivision RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoNFIP ParticipationYesFloodplain RegulationsYes	Total Housing Units	12,739
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Electric ServiceAmeren Missouri, Gasosage Electric Coop, Three Rivers Electric Coop and Sho- Me Power CorpNatural GasAmeren Missouri, Summit Natural GasAmbulance ServiceMiller County Ambulance, and Lake Ozark Fire Protection DistrictFire ServiceRural and City DepartmentsMaster PlanNoEmergency Operations PlanYesBuilding RegulationsNoZoning RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoStorm Water RegulationsNoFile ParticipationYesFloodplain RegulationsYes		Elizabeth
Natural GasElectric Coop and Sho- Me Power CorpNatural GasAmeren Missouri, Summit Natural GasAmbulance ServiceMiller County Ambulance, and Lake Ozark Fire Protection DistrictFire ServiceRural and City DepartmentsMaster PlanNoEmergency Operations PlanYesBuilding RegulationsNoZoning RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoStorm Water RegulationsNoNFIP ParticipationYesFloodplain RegulationsYes	Electric Service	Ameren Missouri, Gasosage Electric Coop, Three Rivers
Natural GasAmeren Missouri, Summit Natural GasAmbulance ServiceMiller County Ambulance, and Lake Ozark Fire Protection DistrictFire ServiceRural and City DepartmentsMaster PlanNoEmergency Operations PlanYesBuilding RegulationsNoZoning RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoStorm Water RegulationsNoFloodplain RegulationsYes		Electric Coop and Sho- Me Power Corp
Ambulance ServiceMiller County Ambulance, and Lake Ozark Fire Protection DistrictFire ServiceRural and City DepartmentsMaster PlanNoEmergency Operations PlanYesBuilding RegulationsNoZoning RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoNFIP ParticipationYesFloodplain RegulationsYes	Natural Gas	Ameren Missouri, Summit Natural Gas
Protection DistrictFire ServiceRural and City DepartmentsMaster PlanNoEmergency Operations PlanYesBuilding RegulationsNoZoning RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoNFIP ParticipationYesFloodplain RegulationsYes	Ambulance Service	Miller County Ambulance, and Lake Ozark Fire
Fire ServiceRural and City DepartmentsMaster PlanNoEmergency Operations PlanYesBuilding RegulationsNoZoning RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoNFIP ParticipationYesFloodplain RegulationsYes		Protection District
Master PlanNoEmergency Operations PlanYesBuilding RegulationsNoZoning RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoStorm Water RegulationsNoNFIP ParticipationYesFloodplain RegulationsYes	Fire Service	Rural and City Departments
Emergency Operations PlanYesBuilding RegulationsNoZoning RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoNFIP ParticipationYesFloodplain RegulationsYes	Master Plan	No
Building RegulationsNoZoning RegulationsNoSubdivision RegulationsNoStorm Water RegulationsNoNFIP ParticipationYesFloodplain RegulationsYes	Emergency Operations Plan	Yes
Zoning Regulations No Subdivision Regulations No Storm Water Regulations No NFIP Participation Yes Floodplain Regulations Yes	Building Regulations	No
Subdivision Regulations No Storm Water Regulations No NFIP Participation Yes Floodplain Regulations Yes	Zoning Regulations	No
Storm Water Regulations No NFIP Participation Yes Floodplain Regulations Yes	Subdivision Regulations	No
NFIP Participation Yes Floodplain Regulations Yes	Storm Water Regulations	No
Floodplain Regulations Yes	NFIP Participation	Yes
	Floodplain Regulations	Yes

Table 2.19.Miller County Profile 2015 Estimates

Source: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_SPT_B01003&prodType=table

Building Codes

Miller County has no building or zoning regulations for the planning area. As a third class county, they do not have the regulatory authority to implement any planning and zoning regulations.

The City of Eldon and the City of Lake Ozarks have building codes within the city limits about residential and commercial building regulations. Additional building code regulations are in effect for all areas within the county that are serviced by the Lake Ozark Fire Protection District.

Fire Codes

The City of Eldon and the City of Lake Ozark enforce a fire code within their city limits.

Emergency Operations Plan

The Miller County Emergency Operations Plan is a comprehensive plan covering all aspects of emergency management within the entire county. In order to maintain relevant and most up-to-date information Miller County consistently updates their EOP, the latest version was last updated in 2015.



Communications

Communication is critical during an emergency, and this is the case for a potential natural hazard. Being able to communicate effectively before, during and after an event helps guide people in ways to stay safe, what actions need to be taken and warns them of the potential dangers. The communication networks available today in our planning area does an excellent job in communicating and have well established communication procedures already in place.

Miller County has an E-911 department that provides critical communication efforts through the E-911 communications center located at 1999 Hwy 52 Tuscumbia, MO 65082. Miller County E-911 dispatches for Miller County Sheriff, Iberia Police Department, Miller County Ambulance District, Moreau Fire Department, Tuscumbia Fire Department, Iberia Fire Department, St. Elizabeth Fire Department, Brumley Fire Department, and Rocky Mount Fire Department.

The Miller County E-911 department receives 100% of all E-911 calls and dispatches all calls with the expectation of police and fire calls for the Lake Ozark Fire Protection District, City of Lake Ozark and the City of Eldon those calls are transferred directly to the local communications departments for dispatch.

Initial warning information is received from the National Warning System (NAWAS). As a backup system to the NAWAS, Miller County also uses the Schneider Electric radar system, which is radar observation system, is used to analyze radar data with pre-programmed parameters.

Miller County E-911 has six MULES terminals; the MULES are a law enforcement computer networks, used by the Missouri Highway Patrol. In addition to its primary law enforcement focus, it is used to disseminate emergencies such as severe weather events and road conditions.

Miller County E-911 supports and maintains three early-warning sirens at the following locations:

- Village of Tuscumbia at the Miller County R-III School District
- City of Iberia at the Iberia R-V School District
- Village of Brumley located on North C Hwy

The City of Eldon also has a system of early-warning sirens, which they maintain and operate. The City of Lake Ozark warning sirens trigger the Ameren warning sirens, which sound all the way to Osage Beach warning sirens. The locations of these sirens are as follows:

- Hwy CC & Salem
- Newton & Grand
- Grand & 10th Street
- 8th Street and Maple
- Industrial Drive
- Linda Lane

The City of Lake Ozark also has a system of early-warning sirens, which they maintain and operate. The locations of these sirens are as follows:

- 13 Welsh Road
- 1767 Bagnell Dam Blvd

The City of Bagnell also has an early-warning siren that is owned and operated by Ameren.

In an effort to ensure, the systems are functional and operating at all times, all the warning sirens within Miller County are tested on the first Wednesday of each month at noon.

Miller County E-911 employs a variety of methods of notifications in the event of an emergency; including pagers, texting, emails, and facebook as well as traditional methods of contact by calling vulnerable facilities such as schools, nursing homes, daycares, and businesses and direct notification to media outlets.

Radio equipment is available in both the Miller County EMD and the E-911 dispatch locations. Amateur radio networks are another backup, which can be utilized for communications in an emergency.

Miller County E-911 maintains a network of trained weather spotters, including all Dispatchers, the Sheriff and Sheriff Deputies, Emergency Management Director and Volunteer Firemen.

Miller County Emergency Management is equipped with emergency radios, generators and other emergency equipment. Mass care supply trailers are available in each county in the region and easily transported in the event of a natural disaster. Miller County has a CERT trailer equipped as a command center.

Media

Local media outlets are linked with the government agencies monitoring potential hazards and emergencies through the nationwide Emergency Alert System (EAS). The EAS is jointly coordinated by the Federal Communications Commission (FCC), Federal Emergency Management Agency (FEMA), and the National Weather Service (NWS). Miller County is located in the Springfield, MO EAS Operational Area.

In addition to providing, the much-needed emergency information at the critical point in time using these media partners as an educational tool has been beneficial with the use of Public Service Announcements (PSA) concerning mitigation education and strategies.

Radio Station	Frequency	Location
KCRL-FM	98.7	Osage Beach (Camden County)
KIRL-FM	89.3	Osage Beach (Camden County)
KRMS-AM	1150	Osage Beach (Camden County)
KRMS-FM	97.5	Osage Beach (Camden County)
KRMS-FM	93.5	Osage Beach (Camden County)
KZWV-FM	101.9	Osage Beach (Camden County)
WENG-FM	107.5	Osage Beach (Camden County)
KJEL-FM	103.7	Lebanon (Laclede County)
KWOS-AM	950	Jefferson City (Cole County)
KZWV-FM	101.9	Eldon (Miller County)
KLOZ-FM	92.7	Eldon (Miller County)
KTKS-FM	95.1	Versailles (Morgan County)
KQUL-FM	102.7	Lake Ozark (Miller County)
KCLQ-FM	107.9	Camdenton (Camden County)
WENG-FM	107.5	
KCRL-FM	90.3	Sunrise Beach (Camden County)
Television Station	Channel	Location
KMIZ (ABC)	17	Columbia (Boone County)
KYTV (NBC)	3	Springfield (Greene County)
KMOS (PBS)	6	Warrensburg (Johnson County)
KOMU (NBC)	8 (36)	Columbia (Boone County)
KSPR (ABC)	33 or 19	Springfield (Greene County)
KOLR (CBS)	10	Springfield (Greene County)
KRCG (FOX)	13	Jefferson City (Cole County)
KRKB (FOX)	49	Lake Ozark (Camden County)
KNLJ (ABC)	20 or 25	Jefferson City (Cole County)
K38II	38	Jefferson City (Cole County)
Lake TV	32	Osage Beach (Camden County)
K15CZ (CW)	15	Springfield (Greene County)
KOZL	28	Springfield (Greene County)
Cable Services		Osage Beach (Camden County)
Charter Communications		
News Papers		
Eldon Advertiser		Eldon (Miller County)
Miller County Autogram-Sentinel		Eldon (Miller County)
Lake Sun Leader		Camdenton (Camden County)
Focus		Osage Beach (Camden County)
Westside Star		Camdenton (Camden County)

Table 2.20. Media Coverage in Miller County

http://www.tvtv.us/mo/osage-beach

NOAA Weather Radio

The planning area is covered by NOAA (National Oceanic and Atmospheric Administration) Weather Radio transmission from a tower site and transmitter in Camdenton (Camden County) WXJ90 (162.55). NOAA Radio provides warnings, watches, forecasts, and other hazard information 24-7. Special NOAA weather radios are automatically activated in the event of a severe weather bulletin is broadcasted. NOAA Radios are widely available for purchase at most retail stores. NOAA Radios that are equipped with the SAME (Specific Area Message Encoding) can be programmed to receive messages for only the geographical areas programmed into the unit. Source: https://www.weather.gov/sgf/nwr_osagebeach



Source: http://www.nws.noaa.gov/nwr/Maps/PDF/WXJ90.pdf Figure 8 NOAA Weather Radio Map

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Emergency Operations Plan	11/30/15
Continuity of Operations Plan	11/30/15
Disaster Recovery Plan	11/30/15
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	No
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Miller County Hazard Mitigation Plan 2018
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Miller County Hazard Mitigation Plan 2018
Economic Development Plan	2017 CEDS through LOCLG
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	Yes
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas	No
Conservation Plan	
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP)	Yes 10/19/98 entry
Participant	
NFIP Community Rating System (CRS)	No
Participating Community	
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	No

Capabilities	Status Including Date of Document or Policy
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams	No
(Local/County/Regional)	
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	Miller County Hazard Mitigation Plan 2018
Flood Insurance Maps	05/18/09
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	Contracted as needed
Development Planner	No
Public Works Official	No
Emergency Management Director	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	LOCLG
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	No
Local Funding Availability	
Ability to apply for Community Development Block Grants	Yes

Ability to fund projects through Capital Improvements funding	Yes	
Capabilities	Status Including Date of Document or Policy	
Authority to levy taxes for a specific purpose	No	
Fees for water, sewer, gas, or electric services	No	
Impact fees for new development	No	
Ability to incur debt through general obligation bonds	Yes	
Ability to incur debt through special tax bonds	Yes	
Ability to incur debt through private activities	No	
Ability to withhold spending in hazard prone areas	No	

Source: Data Collection Questionnaire, 2018

2.2.3 Special Districts

Miller County also supports several Special Districts that provide critical health and safety services to the residents within the county. During the planning process, many of the personnel of these Special Districts participated in the planning process and offer valuable information that have been included in the Miller County Hazard Mitigation.

Fire Protection Districts

There are nine rural fire departments or fire protection districts within the planning area. They respond to fires, accidents, and other emergencies. Mutual aid agreements exist between all the departments and surrounding county departments. The fire districts have been proactive in educational materials, safety training and community awareness and support. Mary's Home is served by Cole County Fire Protection District (<u>http://www.ccfpd.net</u>)

Table 2.22.	Miller Count	y Fire Departments and Fire Protection Districts
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Department/District	Type	# of Stations
Eldon Fire Department	Mostly Volunteer	3
Brumley Fire Department	Volunteer	1
Iberia Fire Department	Volunteer	3
St. Elizabeth Fire Department	Volunteer	1
Tuscumbia Fire Department	Volunteer	1
Moreau Fire Protection District	Volunteer	7
Rocky Mount Fire Protection District*	Mostly Volunteer	4
Lake Ozark Fire Protection District*	Mostly Career	4
Osage Beach Fire Protection District*	Mostly Paid	4
Cole County Fire Protection District	All Volunteer	7
Meta Fire Department	All Volunteer	1

Sources:

Eldon; https://www.cityofeldonmissouri.com/fire

Brumley; https://www.facebook.com/BrumleyFireDistrict/?ref=page_internal&hc_ref=PAGES_TIMELINE

Iberia; <u>http://iberiafire.org/index.php?p=1_6_ABOUT-US</u>

St. Elizabeth; http://www.firedepartment.net/directory/missouri/miller-county/st--elizabeth/st-elizabeth-fire-protection-district

Moreau; http://www.firedepartment.net/directory/missouri/miller-county/eldon/moreau-fire-protection-district

Rocky Mount: http://www.firedepartment.net/directory/missouri/morgan-county/rocky-mount/rocky-mount-fire-protection-district Lake Ozark; http://www.lofpd.com

Osage Beach; http://obfire.com

Cole County: <u>http://www.c</u>cfpd.net





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/18/17



Figure 9 Miller County Fire Districts Maps

Ambulance Districts

Miller County Ambulance District has been serving Miller County since 1974, covering the planning area with the exception of the Lake Ozark Fire Protection District with provides service within their district. Miller County Ambulance district has six base locations.

Table 2.23. Miller County Ambulance District Base Locations

Eldon Unit 1	1304 South Aurora Eldon, MO 65026	
Kaiser Unit 2	3680 Kaiser Road Kaiser, MO 65047	
Iberia Unit 3	303 State Road Iberia, MO 65086	
Tuscumbia Unit 5	1830 Highway 17 Tuscumbia, MO 65082	
St. Elizabeth Unit 7	314 Vine Street St. Elizabeth, MO 65075	
Osage Beach	100 City Parkway Osage Beach, MO 65065	





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7 / 18 / 17



Figure 10 Miller County Ambulance Districts Map

Law Enforcement

Law enforcement in Miller County is provided primarily by the Miller County Sheriff's Department located at 1999 Hwy 52 Tuscumbia, MO. The cities of Eldon, Iberia, and Lake Ozark maintain their own local law enforcement teams and the locations of their facilities are:

- Miller County Sheriff Department 1999 MO-52 Tuscumbia, MO 65082
- Eldon Police Department 111 S. Oak Street Eldon, MO 65026
- Iberia Police Department 803 Hwy 42 Iberia, MO 65486
- Lake Ozark Police Department 3162 Bagnell Dam Blvd Lake Ozark, MO 65049

Source: Miller County; www.millercountysheriffmo.org Eldon; https://www.cityofeldonmissouri.com/police Iberia; https://www.policeone.com/police-departments/iberia-police-dept-iberia-mo/ Lake Ozark; http://lakeozarkpolice.com/home

Public Water Supply Districts

There are no Public Water Supply Districts found within the planning area. In Miller County, four municipalities provide city water and sewer: the City of Eldon, the City of Lake Ozark, the City of Iberia, and the Village of St. Elizabeth. There are also several subdivisions and or mobile home parks that have their own water supply systems in place.

City Water Systems

ELDON

System ID Number County Location: MO3010240 MILLER-1921

• IBERIA

System ID Number County Location: MO3010396 MILLER-1952

LAKE OZARK

System ID Number County Location: MO3010441 MILLER-1968

• ST ELIZABETH

System ID Number County Location: MO3010709 MILLER-1969

Subdivision, Mobile Home Park, Institution, Miscellaneous Water Systems

• BEACH CLUB CONDO ASSN

System ID Number County Location: MO3302314 MILLER-1997

BROOKVIEW APARTMENTS

System ID Number County Location: MO3079510 MILLER-1984

DOOLITTLE MHP

System ID Number County Location: MO3048097 MILLER-1975

• EAGLE MHP

System ID Number County Location: MO3048243 MILLER-1962

• LOOKOUT POINT SUBD

System ID Number County Location: MO3036018 MILLER-1947

MILLER COUNTY CARE CENTER

System ID Number County Location: MO3069010 MILLER-1991

- OAK HILL FOREST SUBDIVISION
- System ID Number County Location: MO3031381 MILLER-2011

OSAGE RIDGE APTS

System ID Number County Location: MO3079537 MILLER-1986

• PALACE LANE ESTATES

System ID Number County Location: MO3048277 MILLER-1973

SUNSET MHP •

System ID Number County Location: MO5031430 MILLER-2004 Source: http://dnr.mo.gov/geology/wrc/docs/nwmo-waterstudy/2008%20Census-Water%20Systems.pdf

Road and Bridge Districts

Miller County has three identified road districts within the planning area:

- Miller County Road District
- **Bagnell Special Road District** •
- Kaiser Special Road District





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/18/17



Figure 11 Special Road Districts Map

Critical Facilities

FEMA defines "critical facilities" as all manmade structures or other improvements that, because of their function, size, service area, or uniqueness, have the potential to cause serious bodily harm, extensive property damage, or disruption or vital socioeconomic activities if they are destroyed, damaged, or if their functionality it impaired.

Critical facilities generally provide essential services, and the need for these services is often times escalated in the time of an emergency or a natural disaster. These facilities include all public and private facilities that provide a community with the fundamental services that encourage the health and safety of the community. The potential impact of these critical facilities goes beyond the potential physical damage to any infrastructure but to the disruption of essential services. Disrupted or limited availability of heath care, fire protection, and police services, can all have a significant impact on the entire planning area and the well-being of the community as a whole.

Table 2.24. Human Service Agencies

	Miller County Health Center2125 HWY 52Tuscumbia, MO 65082
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Source: http://www.millercountyhealth.com

Elderly Care Facilities		
Bristol Manor	1201 E North	Eldon, MO 65026
Eldon Healthcare, Inc.	1001 North St	Eldon, MO 65026
Lee House, LLC	105 N Mill St	Eldon, MO 65026
Rock Island Village	619 East 8th Street	Eldon, MO 65026
Miller County Care & Rehabilitation Center	1157 Highway 17	Tuscumbia, MO 65082
St. Elizabeth Care Center	649 S. Walnut	St. Elizabeth, MO 65075
Lakeside Meadows	872 College Blvd	Osage Beach, MO

Source:

Lee House; http://www.leehouseofeldon.org

Miller County Care; http://millercountycare.com

St. Elizabeth Care; http://reliantcaremgmt.com/homes/st-elizabeth-care-center

Table 2.25. Special Care Facilities

Missouri Schools for the Severely Disabled

114 North Spruce

Eldon, MO 65026

Health Care Facilities		
Lake Regional Health Care Clinics	304 E 4th St	Eldon, MO 65026
Capital Region Medical	103 N Business 54	Eldon, MO 65026
Lake Regional Health Care Clinics	1870 Bagnell Dam Blvd	Lake Ozark, MO 65049
St. Mary's Medical Clinic - Lake Ozark	2265 Bagnell Dam Blvd Suite 103	Lake Ozark, MO 65049
Miller County Health Center	2125 Hwy. 52	Tuscumbia, MO
Iberia Medical Center	2336 Missouri 17	Iberia, MO 65486
Lake Regional Health Care Clinics	2333 Highway 17	Iberia, MO 65486

Sources: Lake Regional Eldon; https://www.lakeregional.com/locations/urgent-care/default.aspx

Capital Region Medical; https://www.crmc.org/services/family-practice

Lake Regional Health Care Clinics; https://www.lakeregional.com/locations/primarycare/default.aspx

St. Mary's Medical Clinic; http://www.ssmhealthmidmo.com/locations/walk-in-clinic-lake-ozark

Table 2.26. Day Care Facilities

First Baptist Church of Eldon Daycare	209 S. Aurora Street	Eldon, MO 65026
Kids Corner	402 S. Sundance Lane	Eldon, MO 65026
Montessori Children's House	1110 Jones Avenue	Eldon, MO 65026
Kids Castle Play Center	131 W. 7th Street	Eldon, MO 65026
Lil Discovery Learning Center LLC	50 Admire Road	Eldon, MO 65026
Mother Goose Daycare	404 S. Ava Avenue	Eldon, MO 65026
Kradle to Krayon	81 N. Shore Drive	Lake Ozark, MO 60549
Rainbow Academy	2881 Bagnell Dam Blvd	Lake Ozark, MO 60549
Rainbow Academy II	1390 School Road	Lake Ozark, MO 60549
Dickneite Daycare	355 Vine Street	St. Elizabeth, MO 65075

Sources: First Baptist; https://www.first-baptist-church-eldon.org

Montessori Children's House; http://eldonmontessori.embargspace.com

Kradle to Krayon http://www.kradletokrayon.com/lake-ozark.asp

Bright Beginning http://www.brightbeginningsatshcc.com

When considering the critical facilities within our planning area, we also considered the most vulnerable populations within the planning region. Hospitals and care facilities that are essential to health and safety of a majority of the population were evident. The elder care facilities house a more vulnerable population as do the day care facilities and were considered equally important and listed as critical facilities

Non-Governmental and Volunteer Organizations

There is a network of organizations and volunteers that coordinate actions with the local community. They offer assistance through church organizations as well as community organizations. This network has established several of the local churches, community centers and schools as Red Cross Shelters should the need arise.

Location	Shelter Name	Address	Capacity
Brumlev	Community Center	Hwy C	50
Eldon	Community Center	312 E 2nd Street	100
Eldon	Moreau Fire Department # 1	1 Industrial Park Dr	-
Lidon			
Eldon	VFW American Legion	2442 50 VFW Road	-
Eldon	Eldon High School	101 South Pine St.	261
Eldon	Eldon Middle School	1400 North Grand Ave	233
Eldon	Eldon South Elementary	1210 South Maple St.	195
Eldon	Eldon Upper Elementary	409 East 15th St	300
Eldon	Ninth St. Christian Church	1009 McKinley Dr.	125
Eldon	First Baptist Church	209 South Aurora	125
Eldon	Sacred Heart Catholic Church	540 N. Mill	81
Eldon	Eldon First Christian Church	1035 Aurora St., Eldon, MO	62
Eldon	Church of the Nazarene	1024 E. Lawson	27
Eldon	Church of the Nazarene Family Life Center	1024 E. Lawson	195
Iberia	VFW American Legion	Hwy 42	-
Iberia	School	201 Pemberton Dr.	100
Iberia	Iberia Church of the Nazarene	201 N. Main St.	58
Lake Ozark	Christ the King Lutheran	1700 Bagnell Dam Blvd.	300

Table 2.27	Shelter Names and Locations

Source: Region F Regional Homeland Security Oversight Committee (RHSOC)

Historical Sites

Miller County has several historical sites as listed on the Missouri Department of Natural Resources Website.

- Bagnell Dam and Osage Power Plant, 617 River Rd., Lake Ozark (8/27/08)
- Boeckman Bridge, SE of St. Elizabeth over Big Tavern Creek (3/19/79)
- Iberia Academy and Junior College, SR 17 and SR 42, Iberia (9/04/80)
- Lake of the Ozarks State Park Highway 134 Historic District (ECW Architecture in Missouri State Parks 1933-1942 TR; Lake of the Ozarks State Park) (2/26/85)
- Olean Railroad Depot, Main St. E of jct. with California St., Olean (12/23/93)
- Sanning, P. A., Store, 256 MO H, Mary's Home (6/16/05)
- Union Electric Administration Building Lakeside, 1 Willmore Ln., Lakeside vicinity (4/13/98)
- <u>Union Electric Administration Building Lakeside</u> (boundary increase), 1 Willmore Ln., Lakeside vicinity (6/23/11)

Source: https://dnr.mo.gov/shpo/miller.htm

Public Land

In 1946, the State of Missouri acquired some 17,500 acres for a state park. Lake of the Ozarks State Park is the largest state park in Missouri. The land encompassing the park and its access points are all public lands. There are a number of public access points to both the park and the lake within Miller County. These are the listed access points:

- Bagnell Dam Access
- Boeckman Bridge Access
- Brays Access
- Kings Bluff Access
- Madden Ford Access
- Osage-Tavern Access
- Rocky Mount Towersite
- Saline Valley Conservation Area
- Tuscumbia Access
- Wilson Camp Access
Table 2.28. Public Access Points

Bagnell Dam Access – Bagnell Dam Access is at the base of Bagnell Dam on the Osage River, immediately north of the Osage River Bridge on Highway 54, go west on the Osage River Bridge Road approximately 0.4 mile to the access. This area offers access to the Osage River just below Bagnell Dam, which impounds the Lake of the Ozarks. There is a two-lane boat ramp and a picnic area and is a popular bank fishing area. The area is leased.

Boeckman Bridge Access – Located southeast of St. Elizabeth on Highway 52. Turn left at the cantilever sign and follow additional signs into the area. This forest and old fields area offers access to Big Tavern Creek, owned by Missouri Department of Conservation (MDC).

Brays Access – Go east of Iberia on Highway 42 about two miles to the second gravel road to the north (Groves Road) and go 0.75 mile to Tavern Creek. Access requires a 0.25-mile hike down a steep grade (no trail). Access requires a 0.25 mile hike down a steep grade (no trail), and is owned by Missouri Department of Conservation (MDC).

Kings Bluff Access – Take Highway 17 south from Eugene to Route H. Take Route H to Marys Home and continue straight on a gravel road for 0.75 mile. Watch for signs to the area and turn south on the designated gravel road. This access is located 60.5 river miles above the mouth of the Osage River. This area offers access to the Osage River. There is a boat ramp and it is owned by Missouri Department of Conservation (MDC).

Madden Ford Access – Located south of Iberia off Highway 17, and west on County Road 17-42 (Madden Ford Road). Stay on this road, cross two low-water bridges, and watch for boundary signs. This area of old fields and forest offers access to Tavern Creek and is owned by Missouri Department of Conservation (MDC).

Osage-Tavern Access – Osage-Tavern Access is north of St. Elizabeth, take Route E to end, go north on Hoecker Road about one mile. This access is located 50 river miles above the mouth of the Osage River. This area offers a one-lane boat ramp with access to the Osage River and lower Big Tavern Creek and is owned by Missouri Department of Conservation (MDC).

Rocky Mount Towersite – Off Route Z west of Eldon, turn left from Route Z onto the gravel road marked with signs for Dooley Cemetery. At the T intersection, turn left and continue 0.5 mile to the area. The area is owned by Missouri Department of Conservation (MDC).

Saline Valley Conservation Area – Saline Valley Conservation Area is 2.3 miles southeast of Eldon on Route M off Highway 54. This area is mostly forest. Facilities/features: a few fishable ponds and five permanent streams (Jack Buster Creek, Big Saline Creek, Little Saline Creek, Jim Henry Creek, and the Osage River). It is owned by Missouri Department of Conservation (MDC).

Tuscumbia Access – the access is marked by a cantilever sign on Highway 52, just west of the junction of Highway 17 and Highway 52. This access is located 66.1 river miles above the mouth of the Osage River. This area offers access to the Osage River. There is a one-lane, concrete boat ramp. Area is leased.

Wilson Camp Access – Travel 4.2 miles southeast of Tuscumbia on Highway 17; then east on Route A for 4.4 miles; then look for a cantilever sign on the south side of the gravel road and follow the gravel road 0.5 mile to Wilson Camp Access. This area offers access to Tavern Creek and is owned by Missouri Department of Conservation (MDC).

Lake of the Ozarks State Park – Located in the Ozark Highlands, just 3.5 miles from Osage Beach on Hwy 42, is the largest park in the state system and it is shared by neighboring counties Miller and Camden. The park offers excellent opportunities for water recreation. Two free public swimming beaches include bathhouses and shady picnic areas nearby. Boats can be rented for either fishing or skiing at the park's two marinas. Paved boat ramps are available. It is owned by Missouri State Park, and is on the Historical Sites National Register.

Source: Missouri Department of Natural Resources, <u>http://www.dnr.mo.gov/shpo/miller.htm</u>; Missouri Department of Conservation, <u>https://mdc.mo.gov</u>

Parks

Miller County communities have also established a number of park areas within their city limits for their residents to enjoy.

- Brumley Village Park
- Eldon City Park
- Iberia City Park
- Tuscumbia Village Park
- Osage Beach City Park

Community Partnerships

Miller County and the cities therein cooperate on a wide range of issues, including issues such as infrastructure, law enforcement, road maintenance, and emergency services. In collaboration with Lake of the Ozarks Council of Local Governments planning efforts, include regional service and support initiatives designed to work in partnership with each other among our four counties of Camden, Laclede, Miller and Morgan counties.

Community Participation

With the support of Miller County governmental authorities and the participation of the local communities, the planning of the Miller County Hazard Mitigation plan 2018 has created a high degree of awareness and desire to continue supporting and advancing the mitigation strategies outlined for the planning area.

City of Bagnell

History

The City of Bagnell is known best for the dam that was named after it, Bagnell Dam. However, before there was a dam, Bagnell was the river port of the Osage because of its location. Originally surveyed and named in 1883, by William Bagnell of the Missouri Pacific Railway, the incorporated City of Bagnell was the last stop for the railway from Jefferson City. From the 1880's to the 1930's, Bagnell was considered a booming town, since it was the hub of transportation for the majority of all resources to and from the area. It had earned the nickname Railroad Tie Capitol of the World by 1903.

In 1924, Bagnell was granted a preliminary permit, issued to Ralph Street and Walter Cravens, for the implementation of a concept to dam the Osage River in order to harness some of the river's massive potential energy, which was claimed by skeptics as too large in scale to be successful. During this year, the first road was built connecting the City of Bagnell and the dam. In 1929, the land was sold by Missouri Hydro-Electric Power Company to St. Louis based Union Electric and Power Company (Ameren UE), completing financing for the largest power contract negotiated to date. Some 20,500 people rushed to the central Missouri lakes area to gain employment during the middle of this Great Depression era, though thousands were still turned away. In 1931, the dam was completed and electric service began to local citizens late that year.

After the dam was completed, Bagnell's population began to dwindle, but many people enjoy learning the history of the quaint little town, and the beginning of the success that followed it, while visiting the Bagnell Dam, one of the area's main attractions. Source: Bagnell Community History http://www.millercountymuseum.org/communities/bagnell.html

Table 2.29. City of Bagnell Profile 2015 Estimate	es
Classification	Fourth Class City
Government	Mayor and Board of Alderman
Total Population	89
Median Household Income	20,417
Median Owner-Occupied Housing Value	Less than 50,000
Total Housing Units	54
Water Service	Private Wells
Electric Service	Ameren Missouri
Ambulance Service	Lake Ozark Fire Protection District and Miller County Ambulance
Fire Service	Lake Ozark Fire Protection District
Master Plan	No
Emergency Operations Plan	Covered under Miller County Plan
Building Regulations	Yes
Zoning Regulations	No
Subdivision Regulations	No
Storm Water Regulations	No
NFIP Participation	No
Floodplain Regulations	No
Homes older than 1939	71 of 279
Percentage of Mobile/Manufactured Homes	9.6%
Number of Non-English speaking people	3
Number of Handicapped Individuals	16
Sources: https://factfinder.census.gov/faces/tableservices/jsf/pages/	/productview.xhtml?pid=ACS_15_5YR_DP04&prodType=table

Table 2.30. City of Bagnell 2016 Assessed Values

	Agricultural	\$ 2,490
	Residential	\$ 348,750
Real Estate	Commercial	\$ 114,990
Property	Total	\$ 466,230
	Local Assessed: Railroad & Utility	\$ 0
	State Assessed: Railroad & Utility	\$ 99,098
	Real Estate Property Total	\$ 565,328
_	County Assessed Personal Property	\$ 58,960
Personal Property	Local Assessed: Railroad & Utility	\$ 0
	State Assessed: Railroad & Utility	\$ 13,810
	Personal Property Total	\$ 72,770
	Grand Total	\$ 638,098

Source: Miller County Assessor's Office

Development Changes

The City of Bagnell has experienced no expansion or development during the time from the original Miller County Hazard Mitigation Plan, and the current update of the plan 2018. City does not own any buildings or properties.

Development Trends

The City of Bagnell is experiencing no expansion or development at this time, and there is no projected future development expressed by the City. The City of Bagnell only maintains a few streets.





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/10/17



Structures in Floodplain (117) Bagenll City Limits 100 Year Floodplain

Figure 12 City of Bagnell Floodplains Map





Table 2.31. City of Bagnell Mitigation Capabilities

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Building Code Effectiveness Grading (BCEGs) No ISO Fire Rating No Economic Development Program No Land Use Program No Public Education/Awareness No Property Acquisition No Planning/Zoning Boards No Stream Maintenance Program No Tree Trimming Program No	National Weather Service (NW/S) Storm Ready	No
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Property Acquisition No Planning/Zoning Boards No Stream Maintenance Program No Tree Trimming Program No	Public Education/Awareness	No
Planning/Zoning Boards No Stream Maintenance Program No Tree Trimming Program No	Property Acquisition	No
Stream Maintenance Program No Tree Trimming Program No	Planning/Zoning Boards	No
Tree Trimming Program No	Stream Maintenance Program	No
	Tree Trimming Program	No

Engineering Studies for Streams	No
(Local/County/Regional)	
Mutual Aid Agreements	
Studies/Reports/Maps	Status Including Date of Document or Policy
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	Miller County Hazard Mitigation Plan 2018
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	Status Including Date of Document or Policy
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Coordinator	No
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	Outsourced
Emergency Response Team	Outsourced
Hazardous Materials Expert	Outsourced
Local Emergency Planning Committee	Outsourced
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	LOCLG
Historic Preservation	No
Non-Governmental Organizations (NGOs)	Status Including Date of Document or Policy
American Red Cross	No
Salvation Army	No
Capability	Status Including Date of Document or Policy
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	No
Local Funding Availability	Status Including Date of Document or Policy
Ability to apply for Community Development Block	No
Grants	
Ability to fund projects through Capital Improvements	No
funding	
Authority to levy taxes for a specific purpose	No
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	No
Ability to incur dept through general obligation bonds	No
Ability to incur debt through special tax bonds	No
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire

Village of Brumley

History

The Village of Brumley, which is located about 12 miles south of the county seat of Tuscumbia, is another small piece of the county that has historical significance. This township was a recognized point of commerce and entrepreneurship. It was popular during much of the same timeline as was Bagnell. This period of steady growth for the county proved Brumley to be more profitable than locals were aware.

The Village of Brumley was the hot spot crossroads of the area by exporting many locally grown products like grains, livestock, minerals, and dried fruit. Many businesses developed and prospered throughout the community.

Since the completion of the Bagnell Dam and improvements in transportation, like better highways, which eventually removed Brumley from the passing through point, and most of these merchants have since sold or closed down their businesses. Brumley is still viewed as a town of deep historical significance to the community. The modest little town, with a population of less than 100, is less than 10 miles to the main access highway, Hwy 54, at the Lake and it has the privilege of sitting on the border of one of the most widely utilized state parks of central Missouri, Lake of the Ozarks State Park.

Source: Brumley History http://www.millercountymuseum.org/communities/brumley.html

GovernmentBoard of TrusteesTotal Population65Median Household Income58,333Median Owner-Occupied Housing Value35,000Total Housing Units75Water ServicePrivate WellsElectric ServiceGasosage Electric CoopAmbulance ServiceMiller County AmbulanceFire ServiceBrumley Fire Protection DistrictMaster PlanNo
Total Population65Median Household Income58,333Median Owner-Occupied Housing Value35,000Total Housing Units75Water ServicePrivate WellsElectric ServiceGasosage Electric CoopAmbulance ServiceMiller County AmbulanceFire ServiceBrumley Fire Protection DistrictMaster PlanNo
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Ambulance Service Miller County Ambulance Fire Service Brumley Fire Protection District Master Plan No
Fire Service Brumley Fire Protection District Master Plan No
Master Plan No
Emergency Operations Plan Covered under Miller County Plan
Building Regulations No
Zoning Regulations No
Subdivision Regulations No
Storm Water Regulations No
NFIP Participation No
Floodplain Regulations No
Homes older than 1939 28.6%
Percentage of Mobile/Manufactured Homes 10.7%
Number of Non-English speaking people 0
Number of Handicapped Individuals 18

Table 2.32. 2015 Village of Brumley Profile 2015 Estimates

Source: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_DP05&prodType=table

Table 2.33. Village of Brumley 2016 Assessed Values

	Agricultural	\$ 4220
	Residential	\$ 254,520
Real Estate Property	Commercial	\$ 92,170
	Total	\$ 350,910
	Local Assessed: Railroad & Utility	\$ 0
	State Assessed: Railroad & Utility	\$ 2,341
	Real Estate Property Total	\$ 353,251
	County Assessed Personal Property	\$ 109,120
Personal Property	Local Assessed: Railroad & Utility	\$ 0
	State Assessed: Railroad & Utility	\$ 2,403
	Personal Property Total	\$ 111,523
	Grand Total	\$ 464,774

Source: Miller County Assessor's Office

Development Changes

The Village of Brumley has recently had a Dollar General Store built on Hwy 54 in 2018. There has also been a small motorcycle shop open on Hwy C in Brumley.

Development Trends

The Village of Brumley is not expecting any significant development in the next 5 years.





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/10/17



100 Year Floodplain

Figure 14 Village of Brumley Floodplains Map

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	No
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Miller County Hazard Mitigation Plan 2018
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Miller County Hazard Mitigation Plan 2018
Economic Development Plan	2017 CEDS through LOCLG
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
	No
(Mitigation/Response/Resource)	INO
(Willigation/Response/Recovery	
Policies/Ordinance	Status Including Date of Document or Policy
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	No
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	Status Including Date of Document or Policy
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	Status Including Date of Document or Policy
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	No
NFIP Community Rating System (CRS) Participating	No
Community	
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	No
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
	Na
I ree Trimming Program	INO

Engineering Studies for Streams	No
(Local/County/Regional)	
Mutual Aid Agreements	No
Studies/Reports/Maps	Status Including Date of Document or Policy
Lienend Anglyzia/Digly Approximent (Loogl)	Ni-
Hazard Analysis/Risk Assessment (Local)	N0 Miller County Hozard Mitigation Dian 2018
Flood Industrisk Assessment (County)	Millier County Hazard Milligation Plan 2018
FINA Flood Insurance Study (Detailed)	No
FEMA Flood Insurance Study (Detailed)	NO
Critical Excilition Inventory	NO NO
Vulnerable Population Inventory	No
Land Lise Man	No
Staff/Department	Status Including Date of Document or Policy
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Coordinator	No
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	Outsourced
Emergency Response Team	Outsourced
Hazardous Materials Expert	Outsourced
Local Emergency Planning Committee	Outsourced
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	LOCLG
Historic Preservation	No
Non-Governmental Organizations (NGOs)	Status Including Date of Document or Policy
American Red Cross	No
Salvation Army	NO
	Status including Date of Document of Policy
Veterans Groups	NO No
Environmental Organization	NO NO
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions Kiwanis etc.	No
Local Funding Availability	Status Including Date of Document or Policy
Ability to apply for Community Development Block Grants	No
Ability to fund projects through Capital Improvements	No
Authority to levy taxes for a specific purpose	No
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	No
Ability to incur dept through general obligation bonds	No
Ability to incur debt through special tax bonds	No
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No No

Source: Data Collection Questionnaire

City of Eldon

History

The City of Eldon, locally known as the Gateway to the Lake and in the prime location of the county, is a very convenient 15 minutes to the popular vacation destination, Lake of the Ozarks. This fast growing city is also a short 30-minute commute to the ever-growing communities surrounding Jefferson City.

In 1882, the Missouri Pacific Railroad made the decision for the railroad to be run through this territory, as opposed to the previously considered Aurora Springs, and the design for the City of Eldon was filed.

A Vermont settler, George Riley Weeks, owned the land that current day Eldon rests on when the railroad began to lay its tracks. Weeks donated acres of land to the railroad and a depot location. He also designed the plat for the town. By 1905, Eldon would become the main attraction for community imports and exports for the next several decades. Not only did it house a roundhouse for the main railway depots, it also had the advantage of two major roads, Hwy 54 and Hwy 52. The original businesspersons to the city were determined to keep the community modern with the industrial advancements.

From 1903 to 1905, the population had grown from 379 to over 1500 permanent residents. These numbers did not include the dozens of commuters who traveled from Tuscumbia, Bagnell, Aurora Springs, and other surrounding towns to take advantage of the employment and commodities that the booming town could offer. These founding entrepreneurs invested in the town's success from the beginning. In just three short years, the City of Eldon went from a primitive town with no buildings, no public amenities, and just 109 blocks to a full service destination location with every good imaginable.

By 1904, the incorporated city was allowed to apply for, and was granted, a franchise for a secured telephone system. It was in this same year that the city's council also granted an ordinance for a light and power franchise. Shortly after, a 50-foot water tower was built and pipes ran to make Eldon the first in the area to have running water. City officials came to include a mayor, city clerk, collector, council members, a Board of Health and Road Commissioners.

The thriving community has continued to update its streets with modern conveniences that assist in maintaining loyalty and commitment from generations of residences. The City of Eldon has recently completed the Missouri Assessment Community Program and has earned the state designation as an "All Missouri Certified City." With a current population of about 4,570, Eldon's diverse economy is supported by many industries, including agriculture, manufacturing, retail, and professional services. Source: www.millercountymuseum.org/communities/eldon.html

Table 2.35.City of Eldon Profile 2015 Estimates

Classification	Fourth Class City
Government	Mayor and City Council
Total Population	4617
Median Household Income	24,852
Median Owner-Occupied Housing Value	58,400
Total Housing Units	2096
Water Service	City of Eldon
Electric Service	Ameren Missouri and Three Rivers Electric Coop
Natural Gas	Ameren Missouri and Three Rivers Electric Coop
Ambulance Service	Miller County Ambulance
Fire Service	Eldon Fire Department
Master Plan	Yes
Emergency Operations Plan	Covered under Miller County Plan
Building Regulations	Yes
Zoning Regulations	Yes
Subdivision Regulations	No
Storm Water Regulations	No
NFIP Participation	Yes
Floodplain Regulations	Yes
Homes older than 1939	15.4%
Percentage of Mobile/Manufactured Homes	10.3%
Number of Non-English speaking people	0
Number of Handicapped Individuals	1,091
Source: https://factfinder.census.gov/faces/tableservices/isf/pages/productviev	w xhtml?pid=ACS_15_SPT_B19013&prodType=table

Table 2.36. City of Eldon Building Count and Insurance Replacement Values

Building Count	34
Replacement Value – Building and Contents	\$ 916,300

Table 2.37. City of Eldon 2016 Assessed Values

	Agricultural	\$ 48,870
	Residential	\$ 23,609,340
Real Estate	Commercial	\$ 12,935,880
Property	Total	\$ 36,594,090
	Local Assessed: Railroad & Utility	\$ 36,579,630
	State Assessed: Railroad & Utility	\$ 86,750
	Real Estate Property Total	\$ 36,666,380
_	County Assessed Personal Property	\$ 14,546,759
Personal Property	Local Assessed: Railroad & Utility	\$ 75,100
	State Assessed: Railroad & Utility	\$0
	Personal Property Total	\$ 14,621,859
	Grand Total	\$ 51,288,239

Source: Miller County Assessor's Office

Development Changes

The City of Eldon has upgraded their wastewater treatment facility on both the north side and south side of town with two new lift stations during the time from the original Miller County Hazard Mitigation Plan, and the current update of the plan 2018.

The City of Eldon purchased a new storm siren, which covers almost all of the City of Eldon. There are still sirens in use for the outlying areas that cannot be heard that well. In 2015 and 2016, the city did a major wastewater upgrade project. In 2017, storms upgrade to stop flooding areas of 10th Street, 12th Street, Walnut Street, Godfrey Street, and Chestnut Street. The City will also be starting a major storm drain improvement project that will initially fun from Third Street to Business Highway 54. A recently completed infrastructure and road repairs project for Lake Regional Clinic expansion was completed. In 2014 a complete rebuild, re-pavement of 8th Street and in 2015 and 2016 a complete rebuild of South Chestnut Street was completed. The City recently purchased some property within the city limits. These parcels will possible be used for a dog park, an RV parking site, additional parking for the fairground and additional parking for Apperson Park.

Development Trends

The City of Eldon continues to review the street improvements that are needed. The City also plans to make improvements to the sidewalks and the Rock Island Trail when funding becomes available.





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/10/17



] 100 Year Floodplain] Eldon City Limits

Figure 15 City of Eldon Floodplains Map

Table 2.38. City of Eldon Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	Yes
Builder's Plan	Yes
Capital Improvement Plan	Yes
Local Emergency Plan	No
County Emergency Plan	Yes
Local Recovery Plan	Yes
County Recovery Plan	Yes
Local Mitigation Plan	No
County Mitigation Plan	Miller County Hazard Mitigation Plan 2018
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Miller County Hazard Mitigation Plan 2018
Economic Development Plan	2017 CEDS through LOCLG
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	Miller Hazard Mitigation Plan 2018
Critical Facilities Plan	Yes
(Mitigation/Response/Recovery)	
Policies/Ordinance	Status Including Date of Document or Policy
Zoning Ordinance	Yes
Building Code	Yes
Floodplain Ordinance	Yes
Subdivision Ordinance	Yes
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Canability	Status Including Date of Document or Policy
Site Plan Review Requirements	No
Historic Preservation Ordinance	Yes
Landscape Ordinance	Ves
Iowa Wetlands and Rinarian Areas Conservation Plan	No
Debris Management Plan	No
Program	Status Including Date of Document or Policy
Zoning/Land Lise Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating	No
Community	
Hazard Awareness Program	Νο
National Weather Service (NWS) Storm Ready	Yes
Building Code Effectiveness Grading (BCEGs)	Yes
ISO Fire Rating	Yes
Economic Development Program	Yes
	Voc
Public Education/Awareness	Voc
Proporty Acquisition	No
Planning/Zoning Boards	
Stroom Maintonanaa Dragram	No.
Tree Trimming Drogrom	INO Na
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Studies/Reports/Maps Status Including Date of Document or Policy Hazard Analysis/Risk Assessment (Local) No Hazard Analysis/Risk Assessment (County) Miller County Hazard Mitigation Plan 2018 Flood Insurance Maps No Flood Insurance Maps No Critical Facilities Inventory No Vulnerable Population Inventory No Statif/Dopartment Status Including Date of Document or Policy Building Code Official Yes Building Code Official	Mutual Aid Agreements	No
Hazard Analysis/Risk Assessment (Local) No Flood Insurance Maps No Flood Insurance Maps No FEMA Flood Insurance Study (Detailed) No Evacuation Route Map No Critical Facilities Inventory No Vulnerable Population Inventory No Ead Use Map Status Including Date of Document or Policy Building Code Official Yes Building Specialist (GIS) No Engineer Contracted as Needed Development Planner Yes Public Works Official Yes Building Inspector No NFIP Floodplain Administrator Yes Borb and/or Ason Squad No Emergency Response Team No Local Emergency Maragement Coordinator No Emergency Response Team No Local Emergency Maragement Commission No County Emergency Maragement Commission No Santation Department No Flaoning Consultant No Flaoning Consultant No Heaz	Studies/Reports/Maps	Status Including Date of Document or Policy
Hazard Anajvis/Risk Assessment (County) Miller County Hazard Mitigation Plan 2018 Fibod Insurance Maps No FEMA Flood insurance Study (Detailed) No Evacuation Route Map No Critical Facilities Inventory No Vulnerable Population Inventory No Staff/Department Status Including Date of Document or Policy Building Code Official Yes Burgenzy Management Coordinator No FIFP Floodplain Administrator Yes Borb and/or Arson Squad No Emergency Management Committee No County Emergency Management Commission No Statustion Department No County Emergency Management Commission No Status Including Date of Document or Policy Management Commission<	Hazard Analysis/Risk Assessment (Local)	No
Flood Insurance Maps No FEMA Flood Insurance Study (Detailed) No FEMA Flood Insurance Study (Detailed) No Critical Facilities Inventory No Carlical Facilities Inventory No Land Use Map Status Including Date of Document or Policy Building Code Official Yes Building Inspector Yes Mapping Specialist (GIS) No Engineer Contracted as Needed Development Planner Yes Public Works Official Yes Bord Arson Squad No Interpret Wanagement Coordinator No Emergency Management Coordinator No Emergency Response Team No Hazardous Materials Expert No Local Emergency Management Cormission No County Emergency Management Cormission No Transportation Department No Teopartment No Regional Planning Agencies LOCLG Hazardous Materials Expert No County Emergency Management Cormission No	Hazard Analysis/Risk Assessment (County)	Miller County Hazard Mitigation Plan 2018
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Ability to withhold spending in hazard prone areas	Ability to incur debt through private activities	No
	Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire

City of Iberia

History

The City of Iberia is located about 23 miles east of Osage Beach, and about 14 miles southeast of the county seat of Tuscumbia. The first documented use of the name appears in an 1840 petition for a new county road from the newly established Post Office of Iberia to the Davis Ferry located in Tuscumbia. The number of residents was beginning to expand in the area and trade was picking up. Iberia had grown enough by the 1880's to develop several local businesses to accommodate the extremely diverse settlers of the area. Much of Iberia is defined by events that took place during the Civil War era. Like much of Missouri, the small community was divided on its position during the Civil War, hence the building of a fort in the center of town. Iberia became a hub of action for the growing county.

Iberia is credited to being the second largest town in Miller County. It maintains its diversity and rising population with over 40 local businesses and local employment varying in industries such as retail trades, construction, manufacturing, educational services, and public administration. Many of the original settlers to Iberia have generations of families who are proud to call this community home.

Source: Iberia History http://www.millercountymuseum.org/communities/iberia.html

Classification	Fourth Class City
Government	Mayor and City Council
Total Population	693
Median Household Income	27,214
Median Owner-Occupied Housing Value	45,400
Total Housing Units	693
Water Service	City of Iberia
Electric Service	Gasosage Electric Cooperative
Ambulance Service	Miller County Ambulance
Fire Service	Iberia Fire Protection District
Master Plan	No
Emergency Operations Plan	Covered under Miller County Plan
Building Regulations	No
Zoning Regulations	No
Subdivision Regulations	No
Storm Water Regulations	No
NFIP Participation	No
Floodplain Regulations	No
Homes older than 1939	11.4%
Percentage of Mobile/Manufactured Homes	9.1%
Number of Non-English speaking people	0
Number of Handicapped Individuals	145

Table 2.39.City of Iberia Profile 2015 Estimates

Source: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_B01003&prodType=table

Table 2.40. City of Iberia Building Count and Insurance Replacement Values

Building Count	13
Replacement Value – Building and Contents	\$ 963,013

Table 2.41. City of Iberia 2016 Assessed Values

	Agricultural	\$ 4,240
	Residential	\$ 2,576,970
Real Estate	Commercial	\$ 1,379,530
Property	Total	\$ 3,960,740
	Local Assessed: Railroad & Utility	\$ 18,660
	State Assessed: Railroad & Utility	\$ 6,789
	Real Estate Property Total	\$ 3,984,999
_	County Assessed Personal Property	\$ 1,175,770
Personal Property	Local Assessed: Railroad & Utility	\$ 1,020
	State Assessed: Railroad & Utility	\$ 5,193
	Personal Property Total	\$ 1,181,983
	Grand Total	\$ 5,166,982

Source: Miller County Assessor's Office

Development Changes

The City of Iberia has experienced no expansion or development during the time from the original Miller County Hazard Mitigation Plan, and the current update of the plan 2018.

Development Trends

The City of Iberia indicated that currently there are no plans for future developments or purchase of equipment.





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/10/17



100 Year Floodplain Iberia City Limits

Figure 16 City of Iberia Floodplains Map

Table 2.42.	City of Iberia Mit	igation Capabilities
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Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	No
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Miller County Hazard Mitigation Plan 2018
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Miller County Hazard Mitigation Plan 2018
Economic Development Plan	2017 CEDS through LOCLG
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan	No
(Mitigation/Response/Recovery)	
(
Policies/Ordinance	Status Including Date of Document or Policy
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	No
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	Status Including Date of Document or Policy
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	Status Including Date of Document or Policy
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	No
NFIP Community Rating System (CRS) Participating	No
Community	
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	No
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No

(Local/County/Regional) Mutual Aid Agreements Studies/Reports/Maps Status Including Date of Document or Policy Hazard Analysis/Risk Assessment (Local) No FEMA Flood Insurance Study (Detailed) Evacuation Route Map Critical Facilities Inventory Vulnerable Papulation Inventory Vulnerable Papulation Status Including Date of Document or Policy Building Code Official Building Inspector No Engineer Development Planner Building Inspector No Engineer Development Planner Development Planner Development Planner Development Planner Development Planner Development Planner Public Works Official Emergency Management Coordinator No Emergency Management Coordinator No Status Including Department No Econneic Development Opartment No Status Including Department No R	Engineering Studies for Streams	No
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Ability to incur dept through general obligation bondsYesAbility to incur debt through special tax bondsYesAbility to incur debt through private activitiesNoAbility to withhold spending in hazard prone areasNo	Impact fees for new development	No
Ability to incur debt through special tax bondsYesAbility to incur debt through private activitiesNoAbility to withhold spending in hazard prone areasNo	Ability to incur dept through general obligation bonds	Yes
Ability to incur debt through private activities No Ability to withhold spending in hazard prone areas No	Ability to incur debt through special tax bonds	Yes
Ability to withhold spending in hazard prone areas No	Ability to incur debt through private activities	No
	Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire

City of Lake Ozark

History

The City of Lake Ozark, incorporated in 1966, is nestled over the adjacent counties of Miller and Camden. With a population of 1,626 (ACS 2015), The City of Lake Ozark has grown considerably since its conception shortly after the Bagnell Dam was competed in 1931.

The Bagnell Dam was essentially the driving factor for the necessity to establish the town that encompasses the land south of the dam. This late-bloomer city of the area kicked off shortly after Bagnell Dam was completed; however, in the 80+ years that this location has been thriving, it has steadily increased in population, public interests, and economic development. The City of Lake Ozark has effectively developed into the 21st century hub of attention for Miller County. It shows promise and leadership for the development of the Lake of the Ozarks. Source: Lake Ozark History http://www.millercountymuseum.org/communities/othercomm.html

Classification	Fourth Class City
Government	Mayor and City Council
Total Population	1,626
Median Household Income	43,875
Median Owner-Occupied Housing Value	217,100
Total Housing Units	1804
Water Service	City of Lake Ozark
Electric Service	Ameren Missouri
Natural Gas	Ameren Missouri and Summit Natural Gas
Ambulance Service	Lake Ozark Fire Protection District
Fire Service	Lake Ozark Fire Protection District
Master Plan	Yes
Emergency Operations Plan	Covered under Miller County Plan
Building Regulations	Yes
Zoning Regulations	Yes
Subdivision Regulations	Yes
Storm Water Regulations	No
NFIP Participation	Yes
Floodplain Regulations	Yes
Homes older than 1939	2.1%
Percentage of Mobile/Manufactured Homes	7.6%
Number of Non-English speaking people	0
Number of Handicapped Individuals	256
Source: https://factfinder.census.gov/faces/tableservices/isf/pages/productvi	ew.xhtml?pid=ACS_15_SPT_B01003&prodType=table

Table 2.43. City of Lake Ozark Profile 2015 Estimates

Table 2.44. City of Lake Ozark Building Count and Insurance Replacement Values

Building Count	28
Replacement Value – Building and Contents	\$ 5,403,300

	Agricultural	\$ 35,374
	Residential	\$ 51,893,640
Real Estate	Commercial	\$ 14,582,525
Property	Total	\$ 66,511,537
	Local Assessed: Railroad & Utility	\$ 8,080,080
	State Assessed: Railroad & Utility	\$ 2,441,225
	Real Estate Property Total	\$ 77,038,264
	County Assessed Personal Property	\$ 11,348,650
Personal	Local Assessed: Railroad & Utility	\$ 47,570
Property	State Assessed: Railroad & Utility	\$ 342,107
	Personal Property Total	\$ 11,738,327
	Tax Increment Financing	\$ 6,330841
	Grand Total	\$ 95,107,432

Table 2.45. City of Lake Ozark 2016 Assessed Values

Source: Miller County Assessor's Office

Development Changes

The City of Lake has experienced some expansion and development during the time from the original Miller County Hazard Mitigation Plan, and the current update of the plan 2018 with the building of the Eagles Landing Shopping Center. The shopping center houses Menards, Kohls, and CVS. The development while high on a bluff was built with extensive storm water drainage systems as well as wastewater sewer systems to accommodate additional growth in the future.

Lake Ozark has completed a 10" water main extension along Bagnell Dam a cost of \$300,000 and received approval of the project of a Regional Lift Station on 242 on September 26, 2017 a cost of \$990,000.

Development Trends

The City of Lake Ozark indicated that the city is planning to add three more sirens in the next five years, and that they are trying to implement a policy whereby sirens would be installed at the time of any new development.

The City Administrator also shared his growth initiatives as:

"The City is in the process of upgrading our water supply system to our core and oldest commercial area (the Strip) to provide improved flows to enhance our fire protection capabilities. We are also upgrading our building codes to a more current code that should provide additional protection to our residents. We are expecting significant increases in the number of housing units and new commercial development and we will encourage the use of safe rooms and other viable means of protecting the citizens of our community from natural disasters."

Dave Van Dee City Administrator City of Lake Ozark





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/10/17

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Structures in Floodplain (102)

Lake Ozark City Limits

100 Year Floodplain

Figure 17 Lake Ozark Floodplains Map

Table 2.46. City of Lake Ozark Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	Lake Ozark Comprehensive Plan 2016
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	No
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	Yes
County Mitigation Plan	Miller County Hazard Mitigation Plan 2018
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Miller County Hazard Mitigation Plan 2018
Economic Development Plan	2017 CEDS through LOCLG
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan	No
(Mitigation/Response/Recovery)	
(
Policies/Ordinance	Status Including Date of Document or Policy
Zoning Ordinance	405.010 5/10/1994
Building Code	Chapter 515 5/12/09, Last Revised on 11/26/13
Floodplain Ordinance	415.020 5/12/09
Subdivision Ordinance	410.010 5/10/1994
Tree Trimming Ordinance	
Nuisance Ordinance	210.010 4/5/09. Last Revised on 3/23/04
Storm Water Ordinance	700.360 5/27/08
Drainage Ordinance	700.360 5/27/08
Capability	Status Including Date of Document or Policy
Site Plan Review Requirements	405.730 5/10/94
Historic Preservation Ordinance	405.730 5/10/94
Landscape Ordinance	405.730 5/10/94
Iowa Wetlands and Riparian Areas Conservation Plan	
Debris Management Plan	
Program	Status Including Date of Document or Policy
Zoning/Land Use Restrictions	405.010 5/10/94
Codes Building Site/Design	Chapter 515 5/12/09, Last Revised 11/26/13
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating	No
Community	
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	4 Commercial, 5 Residential, 2017
ISO Fire Rating	4 Commercial, 5 Residential
Economic Development Program	
Land Use Program	Chapter 400, 10/20/92
Public Education/Awareness	
Property Acquisition	
Planning/Zoning Boards	Chapter 400, 10/20/92
Stream Maintenance Program	
Tree Trimming Program	No

Engineering Studies for Streams	No		
(Local/County/Regional)			
Mutual Aid Agraementa	Na		
Mutual Aid Agreements	NO Status Including Data of Decument or Boliov		
Studies/Reports/Maps	Status including Date of Document of Policy		
Hazard Analysis/Risk Assessment (County)	INO Miller County Llogard Mitigation Diag 2010		
Flood Industrisk Assessment (County)			
FIDUU IIISulance Maps	Yes		
FEMA Flood Insurance Study (Detailed)	Yes		
Evacuation Route Map	No		
Critical Facilities Inventory	NO		
	NO		
Land Use Map	Yes Status Including Data of Decument or Policy		
Stan/Department	Status including Date of Document of Policy		
Building Code Official	Yes		
Building Inspector	Yes		
Mapping Specialist (GIS)	NO Outeeureed en n eensededheele		
Engineer Development Plenner			
Development Planner	NO		
Public Works Official	Yes		
NEID Electricity Management Coordinator	NU		
REPERIOD	Tes Out sourced		
Bornd and/of Alson Squad	Out sourced		
Emergency Response Team	Out sourced		
Hazardous Materials Expert	Out sourced		
Local Emergency Planning Committee	Out sourced		
County Emergency Management Commission	Yes		
Samalion Department	i tes		
Fransportation Department	NO		
Economic Development Department	NO		
Rousing Department	No		
Historic Procentation	LOCEG		
Non-Governmental Organizations (NGOs)	Status Including Data of Document or Policy		
American Red Cross	Status including bate of bocument of Policy		
Salvation Army	No		
Canability	Status Including Date of Document or Policy		
Veterans Groups			
Environmental Organization	No		
Homeowner Associations	Ves		
Neighborhood Associations	Voc		
Chamber of Commerce	Vac		
Community Organizations (Lions Kiwanis etc.			
Local Funding Availability	Status Including Date of Document or Policy		
Ability to apply for Community Development Block			
Grants	163		
Ability to fund projects through Capital Improvements	No		
funding	NO		
Authority to levy taxes for a specific purpose	Yes with voter approval		
Fees for water, sewer, gas, or electric services	Yes		
Impact fees for new development	No		
Ability to incur dept through general obligation bonds	Yes with voter approval		
Ability to incur debt through special tax bonds	No		
Ability to incur debt through private activities	No		
Ability to withhold spending in hazard prone areas	No		
Courses Date Collection Ouestionnaire	1		

Source: Data Collection Questionnaire

Village of Olean

History

The Village of Olean is located near the northern-most border of Miller County. The small town has a modest population of 128, some of whom are original descendents of the community's founding organizers.

The village has been documented with three different names before the Missouri Pacific Railroad and the U.S. Post Office could agree on Olean. After much debate, and many designs for the layout of the town, a plat was finally filed for the township in 1891, almost 10 years after the railroad's first trip through the town depot.

Olean, like many of the towns of Miller County in the late 1800s, started out with a booming trend following the construction of the railroads to the area. An 1889 census shows Olean had a population of 225 a few years after its discovery. Whereas, the population has somewhat downsized, the historical value of the community and the endearing memories which are still told today certainly impress the impact this small town and its original railroad depot had upon the advancement of the county.

Source: Olean History http://www.millercountymuseum.org/communities/olean.html

Classification	Village
Government	Board of Trustees
Total Population	87
Median Household Income	31,875
Median Owner-Occupied Housing Value	77,500
Total Housing Units	69
Water Service	Private Wells
Electric Service	Three Rivers Cooperative
Ambulance Service	Miller County Ambulance
Fire Service	Moreau Fire Protection District
Master Plan	No
Emergency Operations Plan	Covered under Miller County Plan
Building Regulations	No
Zoning Regulations	No
Subdivision Regulations	No
Storm Water Regulations	No
NFIP Participation	No
Floodplain Regulations	No
Homes older than 1939	48.8%
Percentage of Mobile/Manufactured Homes	25.6%
Number of Non-English speaking people	0
Number of Handicapped Individuals	36

Table 2.47. Village of Olean Profile 2015 Estimates

Source: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_DP05&prodType=table

Table 2.48. Village of Olean 2016 Assessed Values

	Agricultural	\$	1,020
	Residential	\$	321,160
Real Estate	Commercial	\$	47,390
Property	Total	\$	369,570
	Local Assessed: Railroad & Utility	\$	0
	State Assessed: Railroad & Utility	\$	131,540
	Real Estate Property Total	\$	501,110
_	County Assessed Personal Property	\$	104,630
Personal Property	Local Assessed: Railroad & Utility	\$	0
	State Assessed: Railroad & Utility	\$	28,512
	Personal Property Total		133,142
	Grand Total	\$	634,252

Source: Miller County Assessor's Office

Development Changes

The Village of Olean has experienced no expansion or development during the time from the original Miller County Hazard Mitigation Plan, and the current update of the plan 2018.

Development Trends

The Village of Olean did not provide any development trends for the 2018 plan update.





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/10/17

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Olean Village Limits 100 Year Floodplain

Figure 18 Village of Olean Floodplains Map

Table 2.49. City of Olean Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No Participation
Builder's Plan	No Participation
Capital Improvement Plan	No Participation
Local Emergency Plan	No Participation
County Emergency Plan	No Participation
Local Recovery Plan	No Participation
County Recovery Plan	No Participation
Local Mitigation Plan	No Participation
County Mitigation Plan	No Participation
Local Mitigation Plan (PDM)	No Participation
County Mitigation Plan (PDM)	No Participation
Economic Development Plan	No Participation
Transportation Plan	No Participation
Land-use Plan	No Participation
Flood Mitigation Assistance (FMA) Plan	No Participation
Watershed Plan	No Participation
Firewise or other fire mitigation plan	No Participation
School Mitigation Plan	No Participation
Critical Facilities Plan	No Participation
(Mitigation/Response/Recovery)	
(Willigation/Response/Recovery)	
Policies/Ordinance	Status Including Date of Document or Policy
Zoning Ordinance	No Participation
Building Code	No Participation
Floodplain Ordinance	No Participation
Subdivision Ordinance	No Participation
Tree Trimming Ordinance	No Participation
Nuisance Ordinance	No Participation
Storm Water Ordinance	No Participation
Drainage Ordinance	No Participation
Drainage Ordinance Capability	No Participation Status Including Date of Document or Policy
Drainage Ordinance Capability Site Plan Review Requirements	No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance	No Participation Status Including Date of Document or Policy No Participation No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance	No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan	No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan	No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance lowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program	No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance lowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions	No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation No Participation No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design	No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance lowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant	No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance lowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NEID Community Define Outloop (OBC) Participant	No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance lowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community	No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community	No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community	No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program	No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready	No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs)	No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation No Participation No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating	No Participation Status Including Date of Document or Policy No Participation No Participation No Participation No Participation No Participation No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program	No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program	No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness	No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance Iowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness Property Acquisition	No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance lowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness Property Acquisition Planning/Zoning Boards	No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance lowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness Property Acquisition Planning/Zoning Boards	No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance lowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness Property Acquisition Planning/Zoning Boards Stream Maintenance Program	No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation No Parti
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance lowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness Property Acquisition Planning/Zoning Boards Stream Maintenance Program Tree Trimming Program Engineering Studies for Streams	No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation No Parti
Drainage Ordinance Capability Site Plan Review Requirements Historic Preservation Ordinance Landscape Ordinance lowa Wetlands and Riparian Areas Conservation Plan Debris Management Plan Program Zoning/Land Use Restrictions Codes Building Site/Design National Flood Insurance Program (NFIP) Participant NFIP Community Rating System (CRS) Participating Community Hazard Awareness Program National Weather Service (NWS) Storm Ready Building Code Effectiveness Grading (BCEGs) ISO Fire Rating Economic Development Program Land Use Program Public Education/Awareness Property Acquisition Planning/Zoning Boards Stream Maintenance Program Tree Trimming Program Engineering Studies for Streams (Local/County/Regional)	No Participation Status Including Date of Document or Policy No Participation Status Including Date of Document or Policy No Participation No Parti

Mutual Aid Agreements			
Studies/Reports/Maps	Status Including Date of Document or Policy		
Hazard Analysis/Risk Assessment (Local)	No Participation		
Hazard Analysis/Risk Assessment (County)	No Participation		
Flood Insurance Maps	No Participation		
FEMA Flood Insurance Study (Detailed)	No Participation		
Evacuation Route Map	No Participation		
Critical Facilities Inventory	No Participation		
Vulnerable Population Inventory	No Participation		
Land Use Man	No Participation		
Staff/Department	Status Including Date of Document or Policy		
Building Code Official	No Participation		
Building Inspector	No Participation		
Manning Specialist (GIS)	No Participation		
Engineer	No Participation		
Development Planner	No Participation		
Public Works Official	No Participation		
Emergency Management Coordinator	No Participation		
NEIP Eloodolain Administrator	No Participation		
Bomb and/or Arson Squad	No Participation		
Emorgonov Posponso Toom	No Participation		
Hazardous Materials Export	No Participation		
Local Emorgonov Planning Committee	No Participation		
County Emergency Management Commission	No Participation		
Sopitation Department	No Participation		
Transportation Department			
Fransportation Department	No Participation		
Economic Development Department	No Participation		
Housing Department	No Participation		
Planning Consultant	No Participation		
Regional Planning Agencies	No Participation		
Histolic Preservation	No Participation		
American Red Cross	Status including Date of Document of Policy		
American Red Cross	No Participation		
	No Participation		
	Status including Date of Document of Policy		
Environmental Organization	No Participation		
	No Participation		
Noineowner Associations	No Participation		
Chamber of Commerce	No Participation		
Chambel of Commerce	No Participation		
Community Organizations (Lions, Kiwanis, etc.	No Participation		
Ability to each for Community Development Disely	Status including Date of Document of Policy		
Ability to apply for Community Development Block	No Participation		
Ability to fund any is starthy with Operital Incompany and	No Doution ation		
Ability to fund projects through Capital improvements	No Participation		
runding			
Authority to low taxos for a apositic purpose	No Porticipation		
Food for water, now an appendix purpose	No Participation		
Impost food for now development	No Participation		
Ability to include don't through concrete obligation has de	No Participation		
Ability to incur dept through general obligation bonds	No Participation		
Ability to incur debt through special tax bonds	No Participation		
Ability to incur debit infough private activities	No Participation		
Administration within the spending in nazard prone areas	ino Participation		

Source: Data Collection Questionnaire

Village of St. Elizabeth

History

The Village of St. Elizabeth is located just a few miles southeast of the Osage River in the northeast corner of Miller County. However, this historical addition to the county has not always been located on its current site.

The old township was established as a community in 1869, where the river was the largest support for local commerce of that time; however, it had not been recorded as a township. Upon the death and sale of the estate of the original founder, the land that made up the community was sold to Charles Holschneider in 1880. At this time the town was relocated, surveyed and filed for record to its current site about 3 miles inland. The newly established village was also renamed to Charlestown, until 1961 when persistence of local residents had officially changed the name to St. Elizabeth.

The population was recorded as a mere 60 residents in 1874, but has grown to 336 by 2010. The thriving community is supported by the industries of construction, educational services, and health care.

Source: St. Elizabeth History http://www.millercountymuseum.org/communities/stelizabeth.html

Classification	Village
Government	Board of Trustees
Total Population	319
Median Household Income	67,500
Median Owner-Occupied Housing Value	125,000
Total Housing Units	131
Water Service	Village of St. Elizabeth
Electric Service	Three Rivers Cooperative
Ambulance Service	Miller County Ambulance
Fire Service	St. Elizabeth Fire Department
Master Plan	No
Emergency Operations Plan	Covered under Miller County Plan
Building Regulations	No
Zoning Regulations	No
Subdivision Regulations	No
Storm Water Regulations	No
NFIP Participation	No
Floodplain Regulations	No
Homes older than 1939	5.2%
Percentage of Mobile/Manufactured Homes	0.0%
Number of Non-English speaking people	0
Number of Handicapped Individuals	29

Table 2.50. Village of St. Elizabeth Profile 2015 Estimates

Source: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_DP04&prodType=table

Table 2.51. Village of St. Elizabeth Building Count and Insurance Replacement Values

Building Count	6
Replacement Value – Building and Contents	\$324,425

Table 2.52. Village of St. Elizabeth 2016 Assessed Values

Agricultural	\$ 11,940	
Residential	\$ 2,715,700	
Commercial	\$ 686,160	
Total	\$ 3,413,800	
Local Assessed: Railroad & Utility	\$ 7,150	
State Assessed: Railroad & Utility	\$ 243,933	
Real Estate Property Total	\$ 3,664,883	
County Assessed Personal Property	\$ 960,900	
Local Assessed: Railroad & Utility	\$ 1,310	
State Assessed: Railroad & Utility	\$ 27,086	
Personal Property Total	\$ 989,296	
Grand Total	\$ 4,654,179	

Source: Miller County Assessor's Office

Development Changes

The Village of St. Elizabeth has recently completed the installation of a Village wide sewer system, which was completed in early 2012.

Development Trends

The Village of St. Elizabeth stated that other than the regular overlays on the roads, they would not be entertaining any future developments until the sewer project loan has been paid off. The Village also indicated that his main concentration is to pay off that loan, and they will not be planning or purchasing anything further until that goal is met.




Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/10/17

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100 Year Floodplain
Village of St. Elizabeth

Figure 19 Village of St. Elizabeth Floodplains Map

Table 2.53.	Village of St.	Elizabeth Mit	tigation Ca	pabilities
-------------	----------------	---------------	-------------	------------

Capability	Status Including Date of Document or Policy		
Planning Capabilities			
Comprehensive Plan	No		
Builder's Plan	No		
Capital Improvement Plan	No		
Local Emergency Plan	No		
County Emergency Plan	No		
Local Recovery Plan	No		
County Recovery Plan	No		
Local Mitigation Plan	Yes		
County Mitigation Plan	Miller County Hazard Mitigation Plan 2018		
Local Mitigation Plan (PDM)	No		
County Mitigation Plan (PDM)	Miller County Hazard Mitigation Plan 2018		
Economic Development Plan	2017 CEDS through LOCLG		
Transportation Plan	No No		
	No		
Elood Mitigation Assistance (EMA) Plan	No		
Metershed Dian	No		
Firewise or other fire mitigation plan	No		
School Mitigation Dian	NO		
	NO NI-		
(Mitigation (Decourse)	NO		
(Mitigation/Response/Recovery)			
Policies/Ordinance	Status Including Date of Document or Policy		
Zoning Ordinance	No		
Building Code	No		
Floodplain Ordinance	No		
Subdivision Ordinance	No		
Tree Trimming Ordinance	No		
Nuisance Ordinance	No		
Storm Water Ordinance	No		
Drainage Ordinance			
Canability	Status Including Date of Document or Policy		
Site Plan Review Requirements	No		
Historic Preservation Ordinance	No		
Landscape Ordinance	No		
Iowa Wetlands and Riparian Areas Conservation Plan	No		
Debris Management Plan	No		
Brogram	Status Including Date of Document or Policy		
Zoning/Land Lico Postrictions			
Codes Building Site/Design	No		
Notional Flood Insurance Drogram (NEID) Derticipant	No		
National Flood Insurance Program (NFIP) Participant	INO		
NEID Community Poting System (CBS) Dertising	No		
Community Rating System (CRS) Fanicipating	INU		
Community			
	NI-		
Avaluation And the second	INO NI-		
National Weather Service (NWS) Storm Ready	NO		
	INO NI		
	NO NI-		
Economic Development Program	NO		
Land Use Program	No		
Public Education/Awareness	No		
Property Acquisition	No		
Planning/Zoning Boards	No		
Stream Maintenance Program	No		
Tree Trimming Program	No		

Engineering Studies for Streams	No	
(Local/County/Regional)		
Mutual Aid Agreements	No	
Studies/Reports/Maps	Status including Date of Document of Policy	
Hazard Analysis/Risk Assessment (County)	NO Miller County Herord Mitigation Plan 2010	
Flood Insurance Maps	Miller County Hazard Milligation Plan 2018	
FINA Flood Insurance Study (Detailed)	No	
Fema Flood Insurance Study (Detailed)	NU NI	
Critical Eacilities Inventory	NO	
Vulperable Reputation Inventory	No	
Land Lise Man	No	
Staff/Department	Status Including Date of Document or Policy	
Building Code Official	No	
Building Inspector	No	
Mapping Specialist (GIS)	No	
Engineer	No	
Development Planner	No	
Public Works Official	No	
Emergency Management Coordinator	No	
NFIP Floodplain Administrator	No	
Bomb and/or Arson Squad	No	
Emergency Response Team	No	
Hazardous Materials Expert	No	
Local Emergency Planning Committee	No	
County Emergency Management Commission	No	
Sanitation Department	No	
Transportation Department	No	
Economic Development Department	No	
Housing Department	No	
Planning Consultant	No	
Regional Planning Agencies	LOCLG	
Historic Preservation	No	
Non-Governmental Organizations (NGOs)	Status Including Date of Document or Policy	
American Red Cross	No	
Salvation Army	No	
Capability	Status Including Date of Document or Policy	
veterans Groups	No	
Environmental Organization	No	
	NO NE	
	NO NE	
Champer of Commerce	NO Na	
Local Funding Availability	INO Status Including Data of Desument or Delieur	
Ability to apply for Community Development Pleak		
Grants	INC	
Ability to fund projects through Capital Improvements	No	
funding		
-		
Authority to levy taxes for a specific purpose	No	
Fees for water sewer has or electric services	No	
Impact fees for new development	No	
Ability to incur dent through general obligation bonds	No	
Ability to incur debt through special tax bonds	No	
Ability to incur debt through private activities	No	
Ability to withhold spending in hazard prone areas	No	

Source: Data Collection Questionnaire

Village of Tuscumbia

History

The Village of Tuscumbia, which was built up alongside the Osage River, is located almost in the center of the county and is the Miller County seat. In 1837, when Miller County was recognized as an organized territory, a county seat also had to be established, therefore, Tuscumbia came into existence as well. A handful of local enterprisers donated land and buildings, and were also determined some of the county's first public officials.

Though the town began with very few residents, it quickly became a focal point of the county. Within a few years after some of Tuscumbia's landmark features were built; such as, the first ferry to cross the Osage, the county's first jail, and the county's first post office – then, the town began to develop a business district environment. Due to the convenience, the ferry brought to many locals in crossing the Osage, many merchants and artisans built up the lower areas of the town, building along the banks of the river. However, unlike other booming towns of the county, Tuscumbia did not have merchants alone. This multi-functional town housed public and government necessities like a public notary, a state appointed counselor at law, and a state educated official of the county and circuit clerk. By the 1880's, it became evident that official county and legal interests were to be resolved in the county seat, Tuscumbia.

By the early 1900s, the town had grown so much that expansion inevitably spread in the only direction allowed by the topographical layout of the area. The town geographically centered around four regions from the bluff to the river's edge. Since, so much activity took place at the courthouse on the bluff, and the river port had developed so much commerce at the river's edge, then the town's officials built a set of 17 flights of steps paving the easiest access from the port to the county buildings. The steps are hardly used today, but are still there and remain a piece of discussion and memory for many who have spent time in the town.

By 2010, Tuscumbia had a population of 203, with improvements to the area, including Hwy. 17 and 52, building of the free steel bridge that crosses the Osage, updated buildings, and a flourishing fishing and camping industry. The town is supported dominantly by employment in construction and public administration with a combined 50% of the work force in those industries. The convenient access to both the Lake and the capitol, Jefferson City, broaden the options for locally desired employment.

Source: Tuscumbia History http://www.millercountymuseum.org/communities/tuscumbia.html

Table 2.54.Village of Tuscumbia Profile 2015 Estimates

Classification	Village	
Government	Board of Trustees	
Total Population	252	
Median Household Income	43,750	
Median Owner-Occupied Housing Value	86,700	
Total Housing Units	83	
Water Service	Private Wells	
Electric Service	Ameren Missouri, Gasosage, and Three Rivers	
	Cooperative	
Ambulance Service	Miller County Ambulance	
Fire Service	Tuscumbia Fire Department	
Master Plan	No	
Emergency Operations Plan	Covered under Miller County Plan	
Building Regulations	No	
Zoning Regulations	No	
Subdivision Regulations	No	
Storm Water Regulations	No	
NFIP Participation	Yes	
Floodplain Regulations	Yes	
Homes older than 1939	27.1%	
Percentage of Mobile/Manufactured Homes	1.7%	
Number of Non-English speaking people	0	
Number of Handicapped Individuals	45	
Source: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_DP05&prodType=table		

 Table 2.55.
 Village of Tuscumbia 2016 Assessed Values

	Agricultural	\$ 650
	Residential	\$ 576,150
Real Estate	Commercial	\$ 187,380
Property	Total	\$ 764,180
	Local Assessed: Railroad & Utility	\$ 0
	State Assessed: Railroad & Utility	\$ 246,435
		\$ 1,014,035
	County Assessed Personal Property	\$ 215,100
Personal	Local Assessed: Railroad & Utility	\$ 3,020
Property	State Assessed: Railroad & Utility	\$ 34,396
	Personal Property Total	\$ 252,516
	Grand Total	\$ 1,266,551

Source: Miller County Assessor's Office 2016

Development Change

The Village of Tuscumbia has not experienced and development at this time.

Development Trends

The Village of Tuscumbia does not have any plans for future development at this time.





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/10/17

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Structures in Floodplain (88)
 Tuscumbia Village Limits
 100 Year Floodplain

Figure 20 Village of Tuscumbia Floodplains Map

Capability	Status Including Date of Document or Policy		
Planning Capabilities	No		
Comprehensive Plan	No		
Builder's Plan	No		
Capital Improvement Plan	No		
Local Emergency Plan	No		
County Emergency Plan	No		
Local Recovery Plan	No		
County Recovery Plan	No		
Local Mitigation Plan	No		
County Mitigation Plan	Miller County Hazard Mitigation Plan 2018		
Local Mitigation Plan (PDM)	No		
County Mitigation Plan (PDM)	Miller County Hazard Mitigation Plan 2018		
Economic Development Plan	2017 CEDS through LOCLG		
Transportation Plan	No		
Land-use Plan	No		
Flood Mitigation Assistance (FMA) Plan	No		
Watershed Plan	No		
Firewise or other fire mitigation plan	No		
School Mitigation Plan	No		
Critical Facilities Plan	No		
(Mitigation/Response/Recovery)			
Policies/Ordinance	Status Including Date of Document or Policy		
Zoning Ordinance	No		
Building Code	No		
Floodplain Ordinance	Yes		
Subdivision Ordinance	No		
Tree Trimming Ordinance	No		
Nuisance Ordinance	No		
Storm Water Ordinance	No		
Drainage Ordinance	No		
Capability	Status Including Date of Document or Policy		
Site Plan Review Requirements	No		
Historic Preservation Ordinance	No		
Landscape Ordinance	No		
Iowa Wetlands and Riparian Areas Conservation Plan	No		
Debris Management Plan	No		
Program	Status Including Date of Document or Policy		
Zoning/Land Use Restrictions	No		
Codes Building Site/Design	No		
National Flood Insurance Program (NFIP) Participant	Yes		
5 () 1			
NFIP Community Rating System (CRS) Participating	No		
Community			
Hazard Awareness Program	No		
National Weather Service (NWS) Storm Ready	No		
Building Code Effectiveness Grading (BCEGs)	No		
ISO Fire Rating	No		
Economic Development Program	No		
Land Use Program	No		
Public Education/Awareness	No		
Property Acquisition	No		
Planning/Zoning Boards	No		
Stream Maintenance Program	No		
Tree Trimming Program	No		
Engineering Studies for Streams	No		
(Local/County/Regional)			
Mutual Aid Agreements	No		
Studies/Reports/Maps	Status Including Date of Document or Policy		

Hazard Analysis/Risk Assessment (Local)	No		
Hazard Analysis/Risk Assessment (County)	Miller County Hazard Mitigation Plan 2018		
Flood Insurance Maps	No		
FEMA Flood Insurance Study (Detailed)	No		
Evacuation Route Map	No		
Critical Facilities Inventory	No		
Vulnerable Population Inventory	No		
Land Use Map	No		
Staff/Department	Status Including Date of Document or Policy		
Building Code Official	No		
Building Inspector	No		
Mapping Specialist (GIS)	No		
Engineer	No		
Development Planner	No		
Public Works Official	No		
Emergency Management Coordinator	No		
NEIP Floodplain Administrator	Yes		
Bomb and/or Arson Squad	No		
Emergency Response Team	No		
Hazardous Materials Expert	No		
Local Emergency Planning Committee	No		
County Emergency Management Commission	No		
Sanitation Department	No		
Transportation Department	No		
Economic Development Department	No		
Housing Department	No		
Planning Consultant	No		
Regional Planning Agencies			
Historic Preservation	LOCEG		
Non-Governmental Organizations (NGOs)	Status Including Date of Document or Policy		
American Red Cross	No.		
Salvation Army	No		
Canability	Status Including Date of Document or Policy		
Veterans Groups	No		
Environmental Organization	No		
Homeowner Associations	No		
Neighborhood Associations	No		
Chamber of Commerce	No		
Community Organizations (Lions Kiwanis etc.	No		
Local Funding Availability	Status Including Date of Document or Policy		
Ability to apply for Community Development Block	No		
Grants			
Ability to fund projects through Capital Improvements	No		
funding	NO		
Authority to leve taxes for a specific purpose	No		
Fees for water sewer gas or electric services	No		
Impact fees for new development	No		
Ability to incur dept through general obligation hands	No.		
Ability to incur debt through special tax bonds	No.		
Ability to incur debt through private activities	UVI		
	No		
Ability to withhold spending in hazard propa areas	No		

Source: Data Collection Questionnaire

School Districts

Miller County has five school districts within the planning area. Only four of the school districts have elected to participate in the Miller County Hazard Mitigation Plan. The map below reflects all the school districts in the planning area.

Sources:

Miller County http://millercountymissouri.org/history.html

Eldon http://eldonmustangs.org

Tuscumbia http://www.tuscumbialions.k12.mo.us

Iberia http://www.iberia.k12.mo.us/education/district/district.php?sectionid=1

St. Elizabeth <u>http://www.ste.k12.mo.us</u> School of the Osage <u>http://www.osageschools.org/pages/Osage</u>



Figure 21 School Districts Floodplain Map

Eldon R-I School District

The Eldon R-I School District has five schools within the district all located in the City of Eldon. <u>http://eldonmustangs.org</u>

The district serves a student population of 1,191 students in the 2016 school year with 152 Teachers.

Table 2.57. Eldon R-I School District

Building Count		21	
Replacement Value – Building and Contents		\$ 65,210,222	
Vehicle Count	50		
Source: School District Staff, Insurance Statement, and Report Card			

Eldon https://mcds.dese.mo.gov/guidedinquiry/School%20Report%20Card/District%20Report%20Card.aspx

Development Change

The Eldon R-I School District Superintendent Matt Davis indicated that the FEMA 361 Safe Room has been completed and the total cost for this improvement was \$1,573,399. The Eldon R-I School has also recently updated the fire alarm system in the South Elementary School. The Performing Arts Center has also been completely renovated.

Development Trends

In the next five years the Eldon R-I School district has plans to add a multipurpose facility that will include a gymnasium, restrooms and three classrooms at the elementary campus. The School District is projecting a 0-1 percent increase in enrollment in the next five years.





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/18/17



Figure 22 Eldon R-I School District Boundary and Floodplain Map

Miller County R-III School District

The Miller County R-III District has one school within the district located in the Village of Tuscumbia. http://millercountymissouri.org/history.html

The district serves a student population of 562 students in the 2016 school year with 23 Teachers.

Table 2.58. Miller County R-III School District

Building Count	1		
Replacement Value – Building and Contents	\$ 7,862,775		
Vehicle Count	6		
Source: School District Staff, Insurance Statement, and District Report Card			

Miller https://mcds.dese.mo.gov/guidedinguiry/School%20Report%20Card/District%20Report%20Card.aspx

Development Change

Miller County R-III Schools has recently acquired a lease of Marshall Fields. Recent improvements include the reconstruction of the ADA walkways near the High School Gymnasium. Additional playground equipment have been installed. Additional security measures were also completed including parking lot safety lights, exterior security entryways, and updated and added surveillance video equipment. Technology and devices have an improved network infrastructure. The water treatment facility access and filtration systems have been improved.

Development Trends

In the next five years, the school district intends to improve the water well supply. Facility expansion is being considered. The Miller County R-III would like to incorporate a safe room in the facility expansion.



Figure 23 Miller County R-III School District Boundaries and Floodplain Map

St. Elizabeth R-IV District

The St. Elizabeth R-IV District has four schools within the district all located in the Village of St. Elizabeth.

http://www.ste.k12.mo.us

The district serves a student population of 247 students in the 2011-2012 school years with 23 Teachers.

Table 2.59. St. Elizabeth R-IV School District

Building Count	7
Replacement Value – Building and Contents	\$9,206,151
Vehicle Count	11

Source: School District Staff, Insurance Statement, and District Report Card St. Elizabeth https://mcds.dese.mo.gov/guidedinguiry/School%20Report%20Card/District%20Report%20Card.aspx

Development Change

Superintendent Toni W. Taylor reported St. Elizabeth R-IV School District has begun to transition from flat TPO roofing systems to Metal Roofing Systems. This will result in less water mitigation issues. The district has also added blocking bars to the front of the building to help with accidental and purposeful dangerous driving. For security purposes, the district has initiated a technology audit. Safety locks were installed to protect servers and equipment and a regular safety checks are conducted. The district utilizes insurance program checklists to evaluate the building several times year to avoid unnecessary insurance losses and hazards.

St. Elizabeth R-IV School District has replaced flooring and walls to mitigation possible losses from fire and flood. Dilapidated awning in front of the building has been replaced. Playground equipment has been relocated away from the highway to a safer location on campus. The HVAC units have been upgraded in almost every campus. The track and field house have been equipped with handicapped bathroom access and is utilized as an emergency community connection. Cooperation from the township has resulted in the school zone reduction in teenage driver speeding. Fire alarms are installed in every building as a precautionary measure. The new cafeteria ceiling tiles have reduced the amount of dust and debris that could contaminate food sources

Historic Hazard Event FEMA 4144-DR Period August 2-14, 2013 No deaths, no injuries Property Damage-\$120,161.53 Public Assistance Funds School closed for several days. One-third of the campus was closed for several months. Insured losses-Federal Disaster relief funds received-Not likely to occur again.

Development Trends

The St. Elizabethe R-IV School District is currently collaborating with the Environmental Protection Agency in the "old playground" area side of the building to locate a possible underground leak.

St. Elizabeth R-IV School District expects that future enrollment will remain constant.



Figure 24 St. Elizabeth R-IV District Boundaries and Floodplain Map

School of the Osage School District

The School of the Osage School District has four schools within the district; three are located in Osage Beach and one in the City of Lake Ozark.

The district serves a student population of 1859 students in the 2016 school year with 134 Teachers.

Table 2.60. School of the Osage School District

Building Count		13	
Replacement Value – Building and Contents		\$ 776,265,425	
Vehicle Count	45		
Source: School District Staff, Insurance Statement, and District Report Card			
School of the Osage https://mcds.dese.mo.gov/guidedinguiry/School%20Report%20Card/District%20Report%20Card.aspx			

Development Change

Assistant Superintendent Brad Yoder reported the School of the Osage made many improvements. A \$20 million renovation and addition of the Heritage Elementary School building 1501 School Road, Lake Ozark which was completed in 2014. The Mills Elementary school was removed in Lake Ozark in 2013. A new Press Box was added to the Athletic Stadium at the High School on 635 HWY 42, Osage Beach in 2017.

Development Trends

The parking lots and driveways improvements and re-surfacing projects include Lake Ozark and Osage Beach campuses have started and are ongoing at this time. The district conducts yearly emergency drills. A long-range facility plan, which includes a storm shelter, is in process. Project completion is estimated in 2019.

Currently and addition to the High School, New Field House, Storm Shelter at the Athletic Field, Stadium, Early Childhood Center are in stages of planning. A renovation and an addition were added to the Heritage Building.

School of the Osage School District is anticipating a 2-3% increase in enrollment in the next five years.





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/14/17



Figure 25 School of the Osage School District Boundary and Floodplain Map

Iberia R-V School District

The Iberia R-V School District has two schools within the district all located in the City of Iberia. <u>http://www.iberia.k12.mo.us/</u>

The district serves a student population of 714 students in the 2016 school year with 58 Teachers. The Red Cross and the Miller County Care and Rehabilitation Center have agreements with the school district to provide support. The support will include temporary refuge to clients and staff if there is a need to evacuate the care center in an emergency.

Table 2.61.Iberia R-V School District

Building Count		16	
Replacement Value – Building and Contents	\$28,381,626		
Vehicle Count		15	
	· 0 · 1	-	

Source: School District Staff, Insurance Statement, and District Report Card

Iberia https://mcds.dese.mo.gov/guidedinguiry/School%20Report%20Card/District%20Report%20Card.aspx

Development Change

The Iberia R-V School now has a FEMA Safe Room 361 at the cost of \$1,505,843. Mr. Lyndel Whittle the Superintendent of Iberia R-V School District stated that school is currently installing safer doors. The School District has completed the roof repair and replace project in 2016. He also mentions there are several projects that will begin in the summer of 2018.

Some of these projects include new doors to the classrooms, removal of glass panels in the hallways, and safety improvements to the high school and elementary offices. A new HVAC system has been installed in the gymnasium. Upgrades also include a new fire alarm in the main structure, new camera system, electrical upgrades, and classroom upgrades. New bleachers have also been installed.

Development Trends

The kitchen expansion project will be completed in 2018. This includes new interior doors, safety modifications to high school and elementary offices.

The School District has an approved 2017 crisis plan, which is in the process of being implemented.

Mr. Whittle projects that the school population will remain steady over the next five years.



Figure 26 Iberia R-V School District Boundaries and Floodplain Map

Table 2.62. Miller County Capabilities Summary

CAPABILITIES	Miller County	City of Bagnell	Village of Brumley	City of Eldon	City of Iberia	City of Lake Ozark	City of Olean	Village of St. Elizabeth	Village of Tuscumbia
Planning Capabilities									
Comprehensive Plan	No	No	No	Yes	No	Lake Ozark Comprehensive Plan 2016	No	No	No
Builder's Plan	No	No	No	Yes	No	No	No	No	No
Capital	No	No	No	Yes	No	No	No	No	No
Local Emergency Plan	No	No	No	No	No	No	No	No	No
County Emergency Plan	No	No	No	Yes	No	No	No	No	No
Local Recovery Plan	No	No	No	Yes	No	No	No	No	No
County Recovery Plan	No	No	No	Yes	No	No	No	No	No
Local Mitigation Plan	No	No	No	No	No	No	No	No	No
County Mitigation Plan	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigatio n Plan 2018	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigation Plan 2018
Local Mitigation Plan (PDM)	No	No	No	No	No	No	No	No	No
County Mitigation Plan (PDM)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Debris Management Plan	No	No	No	No	No	No	No	No	No
Economic Development Plan	2017 CEDS through LOCLG	2017 CEDS through LOCLG	2017 CEDS through LOCLG	2017 CEDS through LOCLG	2017 CEDS through LOCLG	2017 CEDS through LOCLG	2017 CEDS through LOCLG	2017 CEDS through LOCLG	2017 CEDS through LOCLG
Transportation Plan	No	No	No	No	No	No	No	No	No
Land-use Plan	No	No	No	No	No	No	No	No	No
Flood Mitigation Assistance (FMA) Plan	No	No	No	No	No	No	No	No	No
Watershed Plan	No	No	No	No	No	No	No	No	No
Fire wise or other fire mitigation plan	No	No	No		No	No	No	No	No
School Mitigation Plan	Miller Hazard Mitigation Plan 2018	Miller Hazard Mitigation Plan 2018	Miller Hazard Mitigation Plan 2018	Miller Hazard Mitigatio n Plan 2018	Miller Hazard Mitigation Plan 2018	Miller Hazard Mitigation Plan 2018	Miller Hazard Mitigation Plan 2018	Miller Hazard Mitigation Plan 2018	Miller Hazard Mitigation Plan 2018
Critical Facilities Plan (Mitigation/Respo nse/Recovery)	No	No	No	Yes	Future	No	No	No	No
Policies/Ordinan								No	
Zoning Ordinance	No	No	No	Yes	Low	405.010 5/10/1994	No	No	No
Building Code	No	No	No	Yes	Low	Chapter 515 5/12/09, Last Revised on 11/26/13	No	No	No
Floodplain Ordinance	Yes	No	No	Yes	No	Yes 415.020 5/12/09	No	No	Yes
Subdivision Ordinance	No	No	No	Yes	No	410.010 5/10/1994	No	No	No
Tree Trimming Ordinance	No	No	No	No	No	No	No	No	No
Orundrice	1	1	I	1	1	1	I	·	101

Nuisance Ordinance	No	No	No	No	No	210.010 4/5/09, Last Revised on	No	No	No
Storm Water Ordinance	No	No	No	No	No	700.360 5/27/08	No	No	No
Drainage Ordinance	No	No	No	No	No	700.360 5/27/08	No	No	No
Site Plan Review Requirements	No	No	No	No	No	405.730 5/10/94	No	No	No
Historic Preservation Ordinance	No	No	No	Yes	No	405.730 5/10/94	No	No	No
Landscape Ordinance	No	No	No	Yes	No	405.730 5/10/94	No	No	No
lowa Wetlands and Riparian Areas Conservation Plan	No	No	No	No	No	No	No	No	No
Zoning/Land Use	No	No	No	Yes	Low	405.010	No	No	No
Restrictions	N	N				5/10/94	N		N
Codes Building Site/Design	NO	NO	NO	Yes	Low	Chapter 515 5/12/09, Last Revised 11/26/13	ΝΟ	NO	NO
National Flood Insurance Program (NFIP) Participant	Yes	No	No	Yes	No	Yes 415.020 5/12/09	No	No	Yes
NFIP Community Rating System (CRS) Participating Community	No	No	No	No	No	No	No	No	No
Hazard Awareness Program	No	No	No	No	No	No	No	No	No
National Weather Service (NWS) Storm Ready	No	No	No	Yes	No	No	No	No	No
Building Code Effectiveness Grading (BCEGs)	No	No	No	Yes	No	4 Commercial, 5 Residential, 2017	No	No	No
ISO Fire Rating	No	No	No	Yes	No	4 Commercial, 5 Residential	No	No	No
Land Use Program	No	No	No	Yes	No		No	No	No
Public Education/Awaren ess	No	No	No	Yes	No	Chapter 400, 10/20/92	No	No	No
Property Acquisition	No	No	No		No	No	No	No	No
Planning/Zoning Boards	No	No	No	Yes	No	No	No	No	No
Stream Maintenance Program	No	No	No		No	Chapter 400, 10/20/92	No	No	No
Tree Trimming Program	No	No	No	No	No	No	No	No	No
Engineering Studies for Streams (Local/County/Re gional)	No	No	No		No	No	No	No	No
Mutual Aid Agreements	No	No	No	No	No	No	No	No	No
Studies/Reports/ Maps								No	
Hazard Analysis/Risk Assessment (Local)	No	No	No	No	No	No	No	No	No

Hazard Analysis/Risk Assessment (County)	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigatio n Plan 2018	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigation Plan 2018	Miller County Hazard Mitigation Plan 2018
Flood Insurance Maps	No	No	No	No	No	Yes	No	No	No
FEMA Flood Insurance Study (Detailed)	No	No	No	No	No	Yes	No	No	No
Evacuation Route Map	No	No	No	Future Develop ment	No	No	No	No	No
Critical Facilities Inventory	No	No	No	No	No	No	No	No	No
Vulnerable Population Inventory	No	No	No	No	No	No	No	No	No
Land Use Map	No	No	No		No	Yes	No	No	No
Staff/Department	No	No	No	Vaa	No	Vaa	No	No	No
Official	110	110	110	res	INO	res	110	110	110
Building Inspector	No	No	No	Yes	No	Yes	No	No	No
Mapping Specialist (GIS)	No	No	No	No	No		No	No	No
Engineer	No	No	No	Yes	No	Outsourced on n as needed basis	No	No	No
Development Planner	No	No	No	Yes	No		No	No	No
Public Works Official	No	No	No	Yes	Yes	Yes	No	No	No
Emergency Management Coordinator	No	No	No	No	No	Yes	No	No	No
NFIP Floodplain Administrator	Yes	No	No	Yes	No	Yes	No	No	Yes
Bomb and/or Arson Squad	No	No	No	No	No	No	No	No	No
Emergency Response Team	No	No	No	No	No	No	No	No	No
Hazardous Materials Expert	No	No	No	No	No	No	No	No	No
Local Emergency Planning Committee	No	No	No	No	No	No	No	No	No
County Emergency Management Commission	No	No	No	No	No	Yes	No	No	No
Sanitation Department	No	No	No	No	No	Yes	No	No	No
Transportation Department	No	No	No	No	No	No	No	No	No
Economic Development Department	No	No	No	No	No	No	No	No	No
Housing Department	No	No	No	No	No	No	No	No	No
Planning Consultant	No	No	No	No	No	No	No	No	No
Regional Planning Agencies	LOCLG	LOCLG	LOCLG	LOCLG	LOCLG	LOCLG	LOCLG	LOCLG	LOCLG
Historic Preservation	No	No	No	No	No	Yes	No	No	No
Non- Governmental Organizations (NGOs)								No	
American Red Cross	No	No	No	No	No	No	No	No	No
Salvation Army	No	No	No	No	No	No	No	No	No
Veterans Groups	No	No	No	No	No	No	No	No	No
Organization	INU	INU	INU	INU	INU	INU	INU	INU	INU
Homeowner Associations	No	No	No	No	No	Yes	No	No	No

Neighborhood Associations	No	No	No	No	No	Yes	No	No	No
Chamber of Commerce	No	No	No	No	No	Yes	No	No	No
Community Organizations (Lions, Kiwanis, etc.	No	No	No	No	No	Yes	No	No	No
Financial Resources								No	
Apply for Community Development Block Grants	No	No	No	No	Yes	Yes	No	No	No
Fund projects through Capital Improvements funding	No	No	No	Yes	Yes	No	No	No	No
Authority to levy taxes for specific purposes	No	No	No	No	No	Yes with voter approval	No	No	No
Fees for water, sewer, gas, or electric services	No	No	No	Yes	Yes	Yes	No	No	No
Impact fees for new development	No	No	No	No	No	No	No	No	No
Incur dept through general obligation bonds	No	No	No	Yes	Yes	Yes with voter approval	No	Yes	No
Incur debt through special tax bonds	No	No	No	Yes	Yes	No	No	Yes	No
Incur debt through private activities	No	No	No	No	No	No	No	No	No
Withhold spending in hazard prone areas	No	No	No	No	No	No	No	No	No

2.2.4 Public School District Profiles and Mitigation Capabilities

Miller County has five school districts within the planning area. All school districts have elected to participate in the Miller County Hazard Mitigation Plan. The map below reflects all the school districts in the planning area.



Figure 27 Miller County Public School District Boundary Map





Created by: Taylor Schlueter Lake of the Ozarks Council of Local Governments Source: MSDIS 2014 Created: 7/14/17

100 Year Floodplain

Figure 28 School Districts 100 year Floodplain Map

District Name	Building Name	Building Enrollment	Bldg Square Feet	Replacement Value Dollars (Insured)	Contents Value Dollars
Eldon R-1 School District	Eldon High School 101 South Pine Eldon, MO 65026	590	60,596	8,594,641	10,181,371
	Eldon Junior High School 1400 North Grand, Eldon Mo 65026	282	67,234	8,223,359	830,689
	Eldon South Elementary School 1210 South Maple Eldon, MO 65026	604	74,360	9,794,219	1,303,133
	Eldon Upper Elementary School 409 East 15th Eldon, MO 65026	439	72,027	9,064,968	642,148
	West Eldon Career Center 112 South Pine Eldon, MO 65026	Varie s	16,616	2,320,096	270,421
	East Eldon Career Center 112 South Pine Eldon, MO 65026	Varie s	13,479	1,929,093	190,519
	Central Building (High School "C") 113 South Pine Eldon, MO 65026	Varie s	37,423	4,981,097	314,019
	Industrial Tech Building 310 West First Eldon, MO 65026	Varie s	6,532	745,832	91,601
	New Gym 211 West First Eldon, MO 65026	Varie s	25,920	3,041,866	307,266
	Power Sports 320 West First Eldon, MO 65026	Varie s	6,380	752,825	454,218
	PAC Building 211 West First Eldon, MO 65026	Varie s	36,145	4,255,159	244,402
	HS-Football Field Concession STD 300 W. First Street Eldon, MO 65070	Varie s	728	24,895	0
	High School Field Press Box W. North Street Eldon, 65026	Varie s	193	10,288	0
	Green House Building 409 East 15thStreet Eldon, MO 65026	Varie s	1,104	33,210	12,458
	Bus Barn 924 South Maple Eldon, MO 65026	Varie s	7,200	414,334	151,406
	AG Education Building 290 West First Street Eldon, MO 65026	Varie s	14,575	1,629,958	352,790
	Elementary Pavilion Rear of 409 East 15th Street Eldon, Mo 65026	Varie s	3,264	64,466	0
	Junior High Sports Field House 1400 North Grand Ave Eldon, MO 65026	Varie s	6,400	786,750	0
	Middle School Press Box 1400 North Grand Eldon, MO 65026	Varie s	1,740	92,240	0
	Concession & R.R.@ Bus Barn 924 South Maple Eldon, MO 65026	Varie s	909	51,295	0
	Early Learning Center 1210 South Maple Street Eldon, Mo 65026	Varie s	9,000	1,870,479	51,352

Eldon School District Totals			460,268	58,680,070	6,530,152
Miller County R-III District	Tuscumbia High School	60			
St. Elizabeth School R-IV School District	St. Elizabeth High School 240 Church Street St. Elizabeth, MO 65075	110	27,986	3,495,694	764,408
	St. Elizabeth Elementary School 240 Church Street St. Elizabeth, MO 65075	164			
	Shop/ Classrooms 240 Church Street St. Elizabeth, MO 65075	Varie s	8,976	1,336,899	182,398
	Gym/Cafeteria/Stage 240 Church Street St. Elizabeth, MO 65075	Varie s	18,165	2,453,934	256,195
	Auto Mechanic 240 Church Street St. Elizabeth, MO 65075	Varie s	1,900	123,938	16,929
	Bus Shed 240 Church Street St. Elizabeth, MO 65075	Varie s	3,384	124,873	348,089
	Track/Field House Mill Street St. Elizabeth, MO 65075	Varie s	1,600	71,366	31,428
School of the Osage School District	Osage High School 636 Highway 42 Osage Beach, MO 65065	67	133,466	192,721,135	3,028,122
	Alternative School & Field House 646 highway 42 Osage Beach, MO 65065	0	6,720	782,949	133,664
	Osage Middle School 635 Highway 42 Osage Beach, MO 65065	56	13,196	20,790,198	302,281,122
	Osage Upper Elementary School 626 Highway 42 Osage Beach, MO 65065	59	97,277	12,434,468	1,949,303
	Heritage Elementary School 1501 School Road Lake Ozark, MO 65049	232	132,808	209,029,948	1,933,987
	Concession/Dressing Room 646 Highway 42 Osage Beach, Mo 65065	0	1,878	159,171	34,809
	Metal Storage 636 Highway 42 Osage Beach, MO 65065	0	2000	105,567	20,885
	Press Box 646 Highway 42 Osage Beach, MO 65065	0	3,170	52,374	9,745
	Bus Storage Garage 1253 School Road lake Ozark, 65049	0	6,300	232,139	36,617
	Scoreboard/B.B & FB Filed Lights & FB Field Turf 646 Highway 42 Osage Beach, MO 65065	0	0	1,464,868	0
	Football/Track Storage Building 646 Highway 42 Osage Beach, MO 65065	0	2,400	39,412	0
	Softball Field Lights 636 Highway 42 Osage Beach, MO 65065	0	0	0	54,960
	Bus Barn 10 Sandra Street Kaiser, MO 65047	23	6,000	326,661	33,415

		-	1 1		-
	Tennis Courts 636 Highway 42 Osage Beach, MO 65065	0	0	212,280	0
	Bus Parking Area 13 Brooklyn Drive Kaiser, MO 65074	0	0	6,000	10,000
Iberia R-V School District	Iberia High School Annex 201 Pemberton Rd, Iberia, MO 65486	317	9,648	1,341,130	338,250
	High School 201 Pemberton Rd, Iberia, MO 65486	317	44,382	6,173,310	1,537,500
	Elementary School 201 Pemberton Rd, Iberia, MO 65486	408	36,58/2	5,059,883	1,281,250
	Industrial Tech. Building 201 Pemberton Rd, Iberia, MO 65486	1	7,320	9,256,515	205,000
	Bus Barn #1 201 Pemberton Rd, Iberia, MO 65486	11	2,400	65,092	61,500
	Bus Barn #2 201 Pemberton Rd, Iberia, MO 65486	0	1,200	48,439	30,750
	Block House 201 Pemberton Rd, Iberia, MO 65486	0	1,000	58,098	20,500
	Business School (Media Center) 201 Pemberton Rd, Iberia, MO 65486	1	3,750	446,389	200,000
	Casey House 201 Pemberton Rd, Iberia, MO 65486	0	1,800	110,980	5,125
	Glawson House 201 Pemberton Rd, Iberia, MO 65486	0	1,800	10,000	\$0
	Concession Stand 201 Pemberton Rd, Iberia, MO 65486	0	4,032	70,662	30,750
	FEMA Tornado Shelter 201 Pemberton Rd, Iberia, MO 65486	0	7,580	1,312,129	30,750
	Arts Building 201 Pemberton Rd, Iberia, MO 65486	2	2,400	407,600	80,000
	Greenhouse 201 Pemberton Rd, Iberia, MO 65486	0	1,519	101,900	20,500
	Outback Shed 201 Pemberton Rd, Iberia, MO 65486	0	600	30,570	25,625
	Ball field Shed 201 Pemberton Rd, Iberia, MO 65486	0	320	16,304	5,125

Source: http://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx

Table 2.64. Summary of Capabilities-School Districts

Capability	Eldon R-1	Miller County R-III	St. Elizabeth R-IV	School of the Osage	Iberia R-V
Planning Elements					
Master Plan/ Date	9/17/2017	No	No	2017	June 22, 2017
Capital Improvement Plan/Date	No	2017	2017	2017	2012 In Process of updating
School Emergency Plan / Date	8/1/2017	2017	2017	2017	2017
Weapons Policy/Date	Yes-2017	2017	2017	2017	July 1, 2012 Considering the use of School Protection Officers
Personnel Resources					
Full-Time Building Official (Principal, Assistant Superintendent & Superintendent)	Yes	Yes Superintende nt	Yes Superintendent	Yes Assistant Superintendent	Yes High School Principal & Elementary Principal
Emergency Manager	No	Yes Superintende nt	Yes Superintendent	Yes Assistant Superintendent	Yes Superintendent & SRO
Grant Writer	No	Yes Superintende nt	Yes Superintendent	Yes Assistant Superintendent	No
Public Information Officer	No	Yes Superintende nt	Yes Superintendent	Yes Assistant Superintendent	Yes Superintendent
Financial Resources					
Capital Improvements Project Funding	Yes	No	No	Yes	Yes
Local Funds	Yes	Yes	Yes	Yes	Yes
General Obligation Bonds	Yes	No	No	Yes	Yes-If approved by vote
Special Tax Bonds	Yes	No	No	No	Yes-If approved by vote

Private Activities/Donations	Yes	Yes	Yes	No	Yes
State And Federal Funds/Grants	Yes	Yes	Yes	Yes	Yes
Other					
Public Education Programs	Yes	Yes	Yes	Yes	Yes
Privately Or Self- Insured?	MUSIC	MUSIC	MUSIC	MUSIC	MUSIC
Fire Evacuation Training	Yes Fire, Tornado, earthquake drills regularly	Yes	Yes Fire, Tornado, earthquake drills regularly	Yes Fire, Tornado, earthquake drills regularly	Yes Conduct fire drills regularly
Tornado Sheltering Exercises	Yes	No	No	No	Yes Regularly conduct sheltering drills
Public Address/Emergency Alert System	Yes Fire & Tornado Alarms	Yes	Yes	Yes Intercoms, Fire, Tornado	Yes-Speakers throughout schools and phones in each room
NOAA Weather Radios	Yes	Yes	No	Yes	Yes-District Office
Lock-Down Security Training	No	Yes	Yes	No	Yes conducted regularly
Shelter In Place Drills	No	Yes	Yes	No	Yes conducted regularly
Active Intruder/Shooter Situation Drills	No	Yes	Yes-Emphasize HIDE, RUN & FIGHT options	No	Yes conducted regularly and staff receives additional training
Mitigation Programs	No	No	No	No	No
Full Evacuation Drills	No	No	Yes- to neighboring location	No	Yes conducted regularly
Tornado Shelter/Safe room	Yes-FEMA Certified	No	No	No	Yes-FEMA Certified
Campus Police	No- Call Eldon Police Depart ment	No	No Rely on the Miller County Sheriff Department for assistance	Yes School pays for a Resource Officer in cooperation with Miller County Sheriff Department	No SRO-Iberia Police Department and Miller County Sheriff Department Considering School Protection Officers

Summary of Mitigation Capabilities Data Collection Questionnaires, 2018

3 RISK ASSESSMENT

3.1	Hazard Identi	fication	6
3	1.1 Review	of Existing Mitigation Plans	7
3	12 Review	Disaster Declaration History	7
	Table 3.1.FEN	A Disaster Declarations that included Miller County, Missouri, 1990-Present	8
3	.1.3 Researd	h Additional Sources	9
3	14 Hazards	Identified	10
	Table 3.2. Mill	er County Hazard Vulnerability Analysis	11
3	8.1.5 Multi-Ju	risdictional Risk Assessment	12
3.2	Assets at Risk		12
3	.2.1 Total Ex	posure of Population and Structures	20
	Table 3.3. Max	imum Population and Building Exposure by Jurisdiction	20
	Table 3.4.Pop	ulation and Building Exposure by Jurisdiction-Public School Districts	20
-	· · · · · · · · · · · · · · · · · · · ·	and Eccential Eccilities and Infrastructure	21
3	Table 2 E Inve	ntory of Critical /Eccential Eacilities and Infrastructure by Jurisdiction	21 21
	Table 3.7 Thre	nitory of Childay Essential Facilities and initiast ucture by Junsuiction	21
	Table 3.8 Con	servation Areas in Miller County	55
	Table 3.9 Park	s in Miller County	35
	Table 3.10.	Miller County Properties on the National Register of Historic Places	38
	Table 3.11.	Major Non-Government Employers in Miller County	39
	Table 3.12.	Agriculture-Related Jobs in Miller County	41
3.3	Land Use and	Development	42
3	.3.1 Develop	ment since Previous Plan Update	43
	, Table 3.13.	Miller County Population Growth, 2000-2015 (Estimated)	43
	Table 3.14.	Change in Housing Units, 2000-2015 (Estimated)	43
3	8.3.2 Future L	and Use and Development	44
3	8.3.3 Hazard P	rofiles, Vulnerability, and Problem Statements	45
	Hazard Profile	s	45
	Disclaimer of	_iability	46
	Disclaimer of	Endorsement	46
	Disclaimer for	External Links	46
	More on our l	nking policy:	47
	VulnerabilityA	ssessments	48
З	8.3.4 Dam Fail	Jre	49
	Hazard Profile		49
	Table 3.15.	MDNR Dam Hazard Classification Definitions	52
	Table 3.16.	High & Significant Hazard Dams in the Miller County Planning Area	54
	Vulnerability		62
	Table 3.17.	Contents Extracted for Miller County, Missouri-County-by-County Vulnerability Analysis for	
	Failu	re of State Regulated Dams in Missouri 2013	62

Problem Statement	64
3.3.5 Drought Hazard Profile Table 3.18. Previous Occurrences 2012-2017	65 65 70
Vulnerability Table 3.20. SEMA Hazard Mitigation Plan Analysis of Historical Losses Problem Statement	72 72 72
3.3.6 Earthquakes Hazard Profile	73 73 77 82
Vulnerability Problem Statement	82 83
Hazard Profile	
Table 3.23. Insurance Indemnity Payments Years 2006-2016 Table 3.24. Typical Health Impacts of Extreme Heat Table 3.25. Extreme Event Number of Days Above 95* and 100* (Years 1901-2016) Vulnerability.	85
Table 3.26. County Population under Age 5 and Over Age 65, 2015 ACS Data Problem Statement	
 3.3.8 Fires (Urban/Structural and Wild)	91 91 96 96 96 96 97 97
3.3.9 Flooding (Flash and River) Profile 98 Table 3.30. Miller County NCEL Flood Events by Location, 1995-2015	
Table 3.31.Miller County NCEI Flash Flood Events by Location, 2017-1995Table 3.32.NFIP Participation in Miller County 2016Table 3.33.NFIP Policy and Claim Statistics as of 7/31/2017Table 3.34.Miller County Repetitive Loss Properties	101 107 108 108
Table 3.35.NCEI Miller County Flood Events Summary, 1995 to 2015Table 3.36.NCEI Miller County Riverine Flood Events Summary, 1995 to 2015VulnerabilityProblem Statement	109 109 110 111
3.3.10 Land Subsidence/Sinkholes Hazard Profile Table 3.37. Mines in Miller County 2006-2017 Vulnerability Problem Statement	<i>112</i> 112 114 116 117
3.3.11 Levee Failure	<i>118</i> 3. 2

Hazard Profi	le	118
Table 3.38.	Definitions of the Three Levee System Ratings	120
Vulnerability	/	121
Problem Sta	tement	121
3.3.12 Thund	erstorm/High Winds/Lightning/Hail	122
Hazard Profi	le	122
Table 3.39.	Tornado and Storm Research Organization Hailstorm Intensity Scale	126
Table 3.40.	Crop Insurance Claims Paid in Miller County from Thunderstorms, 2016-2006	127
Table 3.41.	Crop Insurance Claims Paid in Miller County from High Winds, 2006-2016	128
Table 3.42.	Crop Insurance Claims Paid in Miller County from Lightening, 2006-2016	128
Table 3.43.	Crop Insurance Claims Paid in Miller County from Hail, 2006-2016	128
Table 3.44.	Thunderstorms Events 2006-2016	129
Table 3.45.	High Winds (No record of any Events) 2006-2016	130
Table 3.46.	Lightening (No record of any Events) 2006-2016	130
Table 3.34 Hail Events 2006-2016		131
Vulnerability	/	133
Table 3.47.	Vulnerability Hail Overview	133
Table 3.48.	Homes Built 1939 & Earlier (2015 Estimates)	133
Problem Sta	tement	
3.3.13 Tornad	10	135
Hazard Profi	le	135
Table 3.49.	Enhanced F Scale for Tornado Damage	136
Table 3.50.	Enhanced Fujita Scale with Potential Damage	137
Table 3.51.	NCEI Recorded Tornadoes in Miller County Present -1993	138
Vulnerability		141
Table 3.53.	Tornadoes in LOCLG Region, 1950 – 2017	142
Table 3.54.	Miller County & Jurisdictions Percentages of 9,452 Mobile/ Manufactured Homes	143
Problem Sta	tement	
3.3.14 Winter	Weather/Snow/Ice/Severe Cold	145
Hazard Profi	le	145
Table 3.55.	Crop Insurance Claims Miller County due to Cold Conditions and Snow 2006- 2016	
Table 3.56.	NCEI Miller County Winter Weather Events Summary, 2007-2017	149
Table 3.57.	FEMA Disaster Declarations that included Miller County, Missouri 2007-2017	150
Vulnerability	/	151
Problem Statement		

Figure 1 Hazard Vulnerability Analysis	11
Figure 2 MoDOT Bridge Condition Codes	11
Figure 3 Scour Conditions of Non-State Bridges	22
Figure 4 Scour Conditions of State Bridges	2/
Figure 5 Miller County Bridges Man	24
Figure 6 Miller County Bridges Map Bagnell Area	20
Figure 7 Miller County Bridges Map Bagnell Area	27 20
Figure 8 Miller County Bridges Map Eldon Area	20
Figure 9 Miller County Bridges Map Lidon Area	20
Figure 10 Miller County Bridges Map Lake Ozark Area	
Figure 11 Miller County Bridges Map Lake Ozak Area	
Figure 12 Miller County Bridges Map St. Elizabeth Area	52
Figure 12 Miller County Bridges Map St. Elizabeti TAlea	
Figure 14 Land Lice Chart	54 40
Figure 14 Lanu USE Chant	4Z
Figure 16 Miller County Domo Mon	
Figure 10 Miller County Dams Map	
Figure 17 Lake Ja-Ha Dalli Map	
Figure 10 Multisul-Dille Lake Dam Man	
Figure 19 Town & Country Lake Dam Map	58
Figure 20 Hellon Lake Dam Map	59
Figure 21 Groit Lake Dam Map	60
Figure 22 Dams with School Districts Map	63
Figure 23 U.S. Drought Monitor 2012	66
Figure 24 U.S. Drought Monitor January 2018	67
Figure 25 Drought Severity Index	68
Figure 26 Drought Susceptibility	69
Figure 27 Impact Zones for Earthquakes Along the New Madrid Fault	74
Figure 28 Modified Mercalli Intensity Scale	75
Figure 29 United States Seismic Hazard Map	76
Figure 30 Probability of Earthquakes within 50 years between 5.0 and 9.2	//
Figure 31 Area Map of Previous Earthquake	79
Figure 32 Area Map of Previous Earthquake	80
Figure 33 Probability of Earthquakes within 50 years between 5.0 and 9.2	81
Figure 34 Heat Index Chart	85
Figure 35 Heat Related Deaths in Missouri 2000-2013	88
Figure 36 Miller County Wildland-Urban Interface and Intermix Map	93
Figure 37 Wildland-Urban Interface (WUI) Map	94
Figure 38 Types of Flooding in Miller County	.110
Figure 39 Miller County Sinkholes	.113
Figure 40 Elevated Risk of Ground Collapse Map	.115
Figure 41 Lightening Frequencies in Missouri and Miller County Map	.124
Figure 42 Locations and Frequency of Lightening Map	.125
Figure 43 Annual Hailstorm Probability (2"diameter and large) 1980-1994	.132
Figure 44 Historic Tornado Events Map	.140
Figure 45 Tornado Alley in the United States Map	.143
Figure 46 Yearly Average of Freezing Rain	.146
Figure 47 Wind Chill Chart	.148

44 CFR Requirement §201.6(c) (2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

The goal of the risk assessment is to estimate the potential loss in the planning area, including loss of life, personal injury, property damage, and economic loss, from a hazard event. The risk assessment process allows communities and school/special districts in the planning area to have a better understanding of the potential risk to the identified hazards. It will provide a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events. A clearly defined risk assessment can lead to successful risk management and mitigation opportunities. Creating a comprehensive and accurate assessment within the planning area was the goal of the planning team. The risk assessment for Miller County consists of the following:

- Section 3.1 Hazard Identification identifies the hazards that threaten the planning area and provides a factual basis for elimination of hazards from further consideration;
- Section 3.2 Assets at Risk provides the planning area's total exposure to natural hazards, considering critical facilities and other community assets at risk;
- Section 3.3 Future Land Use and Development discusses areas of planned future development
- Section 3.4 Hazard Profiles and Vulnerability Analysis provides more detailed information about the hazards affecting the planning area. For each hazard, there are three sections:
- 1) <u>Hazard Profile</u> provides a general description and discusses the threat to the planning area, the geographic location at risk, potential severity/magnitude/extent, previous occurrences of hazard events, probability of future occurrence, risk summary by jurisdiction, impact of future development on the risk;
- 2) <u>Vulnerability Assessment</u> further defines and quantifies populations, buildings, critical facilities, and other community/school or special district assets at risk to natural hazards; and
- 3) <u>Problem Statement</u> briefly summarizes the problem and develops possible solutions.
3.1 Hazard Identification

Requirement §201.6(c) (2) (i): [The risk assessment shall include a] description of the type...of all natural hazards that can affect the jurisdiction.

With the participation of each jurisdiction, we asked for vital input during the planning process to ensure that we have clearly identified all potential risks. As part of this planning process, each participating jurisdiction was asked to evaluate twelve natural hazards that can occur within their community. Each event is then analyzed and evaluated for both the probability of each hazard's occurrence and the severity of damage (both physical damage and economic impact) to assess their jurisdiction's vulnerability. With the consensus of the planning team, these natural hazards have been identified as a likely risk to the planning area:

- Dam Failure
- Drought
- Earthquake
- Extreme Heat
- Fires (Urban/Structural and Wild)
- Flooding (River and Flash Flood)
- Hail Storms
- Land Subsidence/Sinkholes
- Levee Failure
- Thunderstorms/High Winds/Lightening/
- Tornado
- Winter Weather/Snow/Ice/Severe Cold

Analysis of Hazards

Upon the completion of the identification stage, the planning team studied and analyzed the defined natural hazards that have the potential to affect the planning area. In this section, you will find a brief synopsis of each of the identified natural hazards, and an overview of the potential impact of these hazards will have on Miller County. Historical data is included as a reference to the future probability and severity of the impact felt by Miller County about these natural hazards in the past. In conjunction with each hazard, we have identified general mitigation opportunities about the hazard.

3.1.1 Review of Existing Mitigation Plans

In regard to the remaining two natural hazards that the planning team was asked to evaluate Levee Failure and Land Subsidence/Sinkholes, the overall consensus was that there are no identified Levees in the planning area and further discussion on the Land Subsidence/Sinkholes also indicated that there was not enough data available relevant to known Sinkholes in Miller County. These two natural hazards were not addressed in the original Miller County Hazard Mitigation Plan 2006. These two natural hazards were not addressed in the updated plan in 2013 either. The planning team agreed to follow the guidance of the previous plans.

According to the Missouri State Hazard Mitigation Plan 2013 expansive soils, landslides, and rockfalls are identified as a natural hazard that can occur in Missouri but the frequency and impact are limited so they are not addressed in the State Plan. The planning team agreed with the finding of the State Plan and opted to follow the lead of the State.

Miller County Missouri is centrally located in the Midwest and is not affected by Coastal Erosion, Coastal Storms, Hurricanes, or Tsunamis so these natural hazards are not addressed in the Miller County Hazard Mitigation Plan. About Avalanches and Volcanoes, they also are not a threat to the planning area and not included in the assessment and or discussion.

In Missouri, local plans customarily include only natural hazards, as only natural hazards are required by federal regulations to be included. At this time, the MPC determined there were not any previous events of any man-made hazards such as terrorism, cyber threat, or active shooter hazards to mitigate.

3.1.2 Review Disaster Declaration History

Federal and/or state declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. If the disaster is so severe that both the local and state governments' capacities are exceeded; a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

FEMA also issues emergency declarations, which are more limited in scope and do not include the long-term federal recovery programs of major disaster declarations. Determinations for declaration type are based on scale and type of damages and institutions or industrial sectors affected.

Table	3.1. FEMA Disaster Declarations th	at included Miller County, Missouri	, 1990-Pres	ent
DR#	Incident Period	Incident	Declared	Individual Assistance (IA) or Public Assistance (PA)
4317	April 28, 2017 - May 11, 2017	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding	2-Jun-17	PA
3374	December 22, 2015 - January 09, 2016	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding	2-Jan-16	PA
4238	May 15, 2015 - July 27, 2015	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding	7-Aug-15	PA
4144	August 02, 2013 - August 14, 2013	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding	6-Sep-13	PA
4130	May 29, 2013 - June 11, 2013	Straight-line Winds, and Flooding	18-Jul-13	PA
1980	April 19, 2011 - June 06, 2011	Missouri Severe Storms, Tornadoes, and Flooding	9-May-11	PA
1961	January 31, 2011 - February 05, 2011	Missouri Severe Winter Storm and Snowstorm	23-Mar-11	PA
3317	January 31, 2011 - February 05, 2011	Missouri Severe Winter Storm	3-Feb-11	PA
1847	May 08, 2009 - May 16, 2009	Missouri Severe Storms, Tornadoes, and Flooding	19-Jun-09	PA
3303	January 26, 2009 - January 28, 2009	Missouri Severe Winter Storm	30-Jan-09	PA
1809	September 11, 2008 - September 24, 2008	Missouri Severe Storms, Flooding, and a Tornado	13-Nov-08	PA
1773	June 01, 2008 - August 13, 2008	Missouri Severe Storms and Flooding	25-Jun-08	PA
1749	March 17, 2008 - May 09, 2008	Missouri Severe Storms and Flooding	19-Mar-08	PA
1736	December 06, 2007 - December 15, 2007	Missouri Severe Winter Storms	27-Dec-07	PA
3281	December 08, 2007 - December 15, 2007	Missouri Severe Winter Storms	12-Dec-07	PA
1676	January 12, 2007 - January 22, 2007	Missouri Severe Winter Storms and Flooding	15-Jan-07	PA
1673	November 30, 2006 - December 02, 2006	Missouri Severe Winter Storms	29-Dec-06	PA
3232	August 29, 2005 - October 01, 2005	Missouri Hurricane Katrina Evacuation	10-Sep-05	PA
1412	April 24, 2002 - June 10, 2002	Missouri Severe Storms, Tornadoes	6May-02	PA
1463	May 04, 2003 - May 30, 2003	Missouri Severe Storms, Tornadoes and Flooding	6-May-03	PA
1253	October 04, 1998 - October 11, 1998	Missouri Severe Storms, Flooding And Tornadoes	14-Oct-98	PA
1054	May 13, 1995 - June 23, 1995	Missouri Severe Storm, Tornadoes, Hail, Flooding	2-Jun-95	PA

Source: Federal Emergency Management Agency http://www.fema.gov/disasters

3.1.3 Research Additional Sources

List the additional sources of data on locations and past impacts of hazards in the planning area:

- Missouri Hazard Mitigation Plans 2013
- Previously approved planning area Hazard Mitigation Plan (2006 & 2013)
- Federal Emergency Management Agency (FEMA)
- Missouri Department of Natural Resources (MDNR)
- National Drought Mitigation Center Drought Reporter
- US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics
- National Agricultural Statistics Service (Agriculture production/losses)
- Data Collection Questionnaires completed by each jurisdiction
- State of Missouri GIS data
- Environmental Protection Agency
- Flood Insurance Administration
- Hazards US (HAZUS)
- Missouri Department of Transportation
- Missouri Division of Fire Marshal Safety
- Missouri Public Service Commission
- National Fire Incident Reporting System (NFIRS)
- National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCEI);
- Pipeline and Hazardous Materials Safety Administration
- County and local Comprehensive Plans to the extent available
- County Emergency Management
- County Flood Insurance Rate Map, FEMA
- Flood Insurance Study, FEMA
- SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin
- U.S. Army Corps of Engineers
- U.S. Department of Transportation
- United States Geological Survey (USGS)
- Various articles and publications available on the internet (source has been identified next to specific article or publication throughout the planning document)

3.1.4 Hazards Identified

It is important to have an understanding how each community is susceptible to a natural hazard in both the likelihood that an event will happen (probability) and the lasting effects of an event (severity) was the underlying basis for the vulnerability rating for each jurisdiction as well as the entire planning area. When developing the vulnerability rating the planning team considered the geographic location within the planning area, the historical data, and the measures of probability and severity for each hazard about each jurisdiction.

Further consideration was given to how the impact would outweigh the number of natural hazard events. Repeated low severity events could ultimately have a much higher impact on the region as a whole. For the most part, the planning team agreed that the severity of any event would take precedence in the rating scale.

	Impacted area	Probability = # of events/ # of years	Severity = total costs/ total years	Vulnerability ranking				
Dam Failure	county wide	Unlikely	No Data Available	L				
Drought*	county wide	5 events recorded in 20 yr period = 25% probability	\$760,000 in 20 years = \$38,000 a year	Н				
Earthquakes	county wide	Unlikely	NA	L				
Extreme Heat*	county wide	0 events recorded in 20 yr period = 0% probability	\$15,163.00 in 20 years= \$758.15 a year	L				
Fires (Urban/Structure/Wild)**	County wide	603 events recorded in 20 yr period =100 % probability	\$20,000 in 20 years =\$1,000 a year (insurance costs used)	Н				
Flooding (Flash & River)*	county wide	52 events recorded in 20 yr period = 100% probability	\$4.75M in 20 years = \$237,500 a year	н				
Land Subsidence/ Sinkholes/ Caves/Mines	county wide	Unlikely	No Data Available	L				
Levee Failure	county wide	Unlikely	No Data Available	L				
Thunderstorm/ High Winds/ Lightening/ Hail*	county wide	88 events recorded in 20 yr period = 100% probability	\$155,000 in 20 years = \$ 7,750 a year	М				
Tornado*	county wide	1 events recorded in 20 yr period = probability	\$50,000 in 20 years = \$2,500 a year	М				
Winter Weather/ Snow/Ice/ Severe Cold/Frost/Freeze*	county wide	14 events recorded in 20 yr period = 70% probability	\$5.58M in 20 years = \$279,000 a year	н				
	Vulne	erability ranking key						
H ranking =	> 75% Probabi	lity, or > \$25,000/year	Severity					
M ranking =	25 - 75% Prob	ability, or \$2500 - \$25,	000/year Severity					
L ranking =	< 25% Probabi	< 25% Probability, or < \$2500/year Severity						

Table 3.2.	Miller County H	lazard Vulnerability	y Analysis
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* Source: <u>https://www.ncdc.noaa.gov/stormevents/listevents.jsp?</u> ** Source: <u>https://mdc6.mdc.mo.gov/Applications/MDCFireReportIng/Home/FireReportSearch</u>

Figure 1 Hazard Vulnerability Analysis

Following the summary section of each natural hazard there will be the final measure of probability and severity emphasized. It will also define the areas within the overall planning area that are affected, known and the vulnerable areas and the vulnerability rating will be reiterated.

3.1.5 Multi-Jurisdictional Risk Assessment

The original Miller County Hazard Mitigation Plan 2013 reviewed all the data about the probability by taking the total number of events divided by the total number of years creating a percentage of probability. The planning team 2013 initially took this approach in order to compare to the current data available. However, when it came to considering the severity, there was limited data to the cost of an event in the older data available; it appeared as if the data was simply not collected during that time. Therefore, we reevaluated the probability and severity with a closer look at the data available to analyze. This plan is an update to the 2013 Miller County Hazard Mitigation Plan. Discussion of variations is included in each profile.

The planning area is uniform in terms of climate, topography, and building constrictions characteristics.

Following the summary section of each natural hazard there will be the final measure of probability and severity emphasized. It will also define the areas within the overall planning area that are affected, known and the vulnerable areas and the vulnerability rating will be reiterated.

3.2 Assets at Risk

This section assesses the planning area population, structures, critical facilities and infrastructure, and other important assets that may be at risk to hazards. A natural hazard event has the potential to cause loss of life, property damages, loss of essential services, loss of critical facilities and economic disruption. To help understand the full impact of a natural hazard event it is necessary to identify the assets that could be affected within the planning area. Knowing the value of those assets will help each jurisdiction comprehend the economic impact that a natural hazard event may cost each jurisdiction. Assets can include but are not limited to buildings, equipment, infrastructure, and furnishings.

Lake of the Ozarks Council of Local Governments worked to include the HAZUS information into this plan update. There were some serious issues with the integration of the HAZUS Software with our computer system. The latest version of ESRI 10.6 is not completely compatible with the new version of HAZUS. Our GIS Specialist worked with ESRI and HAZUS to find a work around. The data collected is presented below. However additional work to make both software components work together needs to be considered by both software development teams. HAZUS data was available for Miller County, Village of Brumley, City of Eldon, City of Iberia, Village of St. Elizabeth and Village of Tuscumbia.



Miller County Replacement Costs as identified by HAZUS.

Village of Brumley Replacement Costs as identified by HAZUS.



5 Eldon 7 Р HHH þ Total Replacement Value by Census Block 3 -The second Eldon P 7 7 Legend City Boundary **Replacement Value** TotalExposure by Thousand 0.00 to 1288.00 1288.00 to 4598.00 5 4598.00 to 11022.00 11022.00 to 27224.00 27224.00 to 93040.00 County Boundary 11

City of Eldon Replacement Costs as identified by HAZUS.

City of Iberia Replacement Costs as identified by HAZUS.



Village of St. Elizabeth Replacement Costs as identified by HAZUS.





City of Lake Ozark Replacement Costs as identified by HAZUS.

Village of Tuscumbia Replacement Costs as identified by HAZUS.



3.2.1 Total Exposure of Population and Structures

Table 3.3. Maximum Population and Building Exposure by Jurisdiction

Jurisdiction	2016 Population	Building Count	Building Exposure (\$)	Contents Exposure (\$)	Total Exposure (\$)
Miller County	25,011	8	\$ 16,197,453	\$638,436	\$16,835,889
City of Bagnell	82				
Village of Brumley	64				
City of Eldon	4,611	34	\$ 16, 550,601	\$916,300	\$17,466,901
City of Iberia	688				
City of Lake Ozark	1,696	28	\$ 5,403,500	\$760,355	\$6,163,855
City of Olean	87				
Village of St. Elizabeth	306		Village does not ov	wn any buildings or conte	ents
Village of Tuscumbia	235				

Source: Missouri GIS Database, http://sema.dps.mo.gov/programs/mitigation_management.php;

Table 3.4. Population and Building Exposure by Jurisdiction-Public School Districts

School Districts	2017 Population	Enrollment 2017 (Est)	Building Count	Building Exposure (\$)	Contents Exposure (\$)	Total Exposure (\$)
Eldon R-1 School District	1,834	1915	21	58,680,070	6,530,152	\$65,210,222
Miller County R-III School District	189	190	1	\$6,333,752	\$1,529,023	\$7,862,775
St. Elizabeth R-IV School District	250	274	7	\$7,606,704	\$1,599,447	\$9,206,151
School of the Osage School District	1,914	2015	13	\$462,866,171	\$313,399,254	\$776,265,425
Iberia R-V School District	708	725	16	\$24,509,001	\$3,872,625	\$28,381,626
Totals for Cities	32,780		70	\$21,600,953	\$2,315,091	\$40,466,645
Totals School	4,895		42	\$535,486,697	\$323,057,876	\$858544573
Totals All Buildings	NA		112	\$557,087,650	\$325,372,967	\$80,943,080

Sources: Population, 2010 U.S. Census; Building Count and Building Exposure, Missouri GIS Database: http://sema.dps.mo.gov/programs/mitigation_management.php; https://mcds.dese.mo.gov, Source: http://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx.

3.2.2 Critical and Essential Facilities and Infrastructure

Jurisdiction	Airport Facility	Bus Facility	Childcare Facility	Electric Power Facility	Fire Service	Government	Housing	Shelters	Highway Bridge	Hospital/Health Care	Military	Natural Gas Facility	Nursing Homes	Police Station	Potable Water Facility	Rail	Sanitary Pump Stations	School Facilities	Storm water Pump Stations	Tier II Chemical Facility	Wastewater Facility	Total
City of Bagnell	0	0	0	1	0	1	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56
Village of Brumley	0	0	0	1	0	1	75	1	1	0	0	1	0	0	0	0	0	0	0	0	0	80
City of Eldon	0	0	4	1	1	1	2096	13	0	1	0	1	5	1	0	0	0	21	0	0	1	2144
City of Iberia	0	0	1	1	1	1	693	3	0	0	0	1	0	1	1	0	0	5	0	0	0	708
City of Lake Ozark	0	0	2	1	5	1	1804	1	0	0	0	11	0	1	1	0	0	11	0	0	1	1839
City of Olean	0	0	0	1	0	0	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70
Village of St. Elizabeth	0	0	1	1	0	0	131	0	1	0	0	1	1	0	1	0	0	7	0	0	0	144
Village of Tuscumbia	0	0	1	1	0	1	83	0	0	1	0	0	1	0	0	0	0	1	0	0	0	88
Totals	1	0	9	8	7	6	5005	18	2	2	0	5	7	4	0	0	0	56	0	0	0	5130

Table 3.5. Inventory of Critical/Essential Facilities and Infrastructure by Jurisdiction

Source: Data Collection Questionnaires; HAZUS, and Insurance Documents.

<u>Bridges:</u> Scour is a term refers to one of the database elements in the National Bridge Inventory. This element is quantified using a "scour index", which is a number indicating the vulnerability of a bridge to scour during a flood. Bridges with a scour index between 1 and 3 are considered "scour critical", or a bridge with a foundation determined to be unstable for the observed or evaluated scour condition.

-		
9 – Excellent	excellent Condition	
8 – Very Good	no problems noted	
7 – Good	some minor problems	Not Deficient
6 – Satisfactory	structural elements show some minor deterioration	Hot Dendene
5 – Fair	all primary structural elements are sound but may have minor section loss, cracking, spalling or scour	
4 - Poor	advanced section loss, deterioration, spalling or scour	
3 – Serious	loss of section, deterioration, spalling or scour have seriously affected primary structural members. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.	
2 – Critical	advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.	Structurally Deficient
1 – Imminent Failure	major deterioration or section loss present in critical structural members or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic until corrective action is completed.	
0 – Failed	out of service - beyond corrective action	

Below in Figure 2 is the MoDOT Bridge Condition Codes.

Source: MoDOT Bridge Conditions - http://www.modot.org/Bridges/

Figure 2 MoDOT Bridge Condition Codes



Source Hazus, National Bridge Inventory Data, Regional Transportation Plan Bridges Figure 3 Scour Conditions of Non-State Bridges



Source Hazus, National Bridge Inventory Data, Regional Transportation Plan Bridges Figure 4 Scour Conditions of State Bridges

An interactive website developed by Transportation for America allows users to locate and map structurally deficient bridges in their area. Transportation for America is an alliance of elected, business, and civic leaders from communities across the country, united to ensure that states and the federal government step up to invest in smart, homegrown, locally-driven transportation solutions. To use the interactive map, click the following link:

• http://t4america.org/maps-tools/bridges/

The figures below represent the 135 bridges in Miller County. Miller County as of 2016 has 23 Deficient Bridges of which 12 are rated as poor condition. Below are the bridge locations by jurisdictions.

Table 3.6. Miller County Bridges Status										
Total #	Good #	Fair #	Poor #	Structurally Deficient #	Total Area	Good Area	Fair Area	Poor Area	Structurally Deficient Area	
135	46	77	12	23	51,675	24,166	22,543	4,966	5,665	

Source https://www.fhwa.dot.gov/bridge/nbi/no10/county16.cfm



Source http://t4america.org/maps-tools/bridges/ Figure 5 Miller County Bridges Map



Source http://t4america.org/maps-tools/bridges/ Figure 6 Miller County Bridges Map Bagnell Area



Source http://t4america.org/maps-tools/bridges/ Figure 7 Miller County Bridges Map Brumley Area



Source http://t4america.org/maps-tools/bridges/ Figure 8 Miller County Bridges Map Eldon Area



Source http://t4america.org/maps-tools/bridges/ Figure 9 Miller County Bridges Map Iberia Area





Source http://t4america.org/maps-tools/bridges/ Figure 11 Miller County Bridges Olean Area



Source http://t4america.org/maps-tools/bridges/ Figure 12 Miller County Bridges Map St. Elizabeth Area



Figure 13 Miller County Bridges Map Tuscumbia Area

Table 3.7.	Threatened and Endangered Species in Miller Co	ounty
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Common Name	Scientific Name	Status
Gray bat	Myotis grisescens	Endangered
Indiana bat	Myotis sodalis	Endangered
Northern long	Myotis septentrionalis	Threatened
Niangua darter	Etheostoma nianguae	Threatened & Critical Habitat
Pink mucket	Lampsilis abrupta	Endangered

Source: U.S. Fish and Wildlife Service, https://www.fws.gov/midwest/Endangered/lists/pdf/MissouriCtyListApril2015.pdf

Natural Resources:

In 1946, the State of Missouri acquired some 17,500 acres for a state park. Lake of the Ozarks State Park is the largest state park in Missouri. The land encompassing the park and its access points are all public lands. There are a number of public access points to both the park and the lake within Miller County. These are the listed access points:

Area Name	Address & Information	City
Bagnell Dam Access	North Highway 54 .40 miles. This area offers access to the Osage River just below the Bagnell Dam, which impounds the Lake of the Ozarks. There is a two- lane boat ramp and a picnic area and is a popular bank fishing area. The area is leased.	Bagnell
Boeckman Bridge Access	From St. Elizabeth, take Highway 52 south 1.20 miles, then east on Brushy Creek Road, then take second right to stay on Brushy Creek Road for 0.50 mile, and left on Boeckman Bridge Road for 1.30 miles, access is across bridge on left This forest and old fields area offers access to Big Tavern Creek, owned by MDC	St. Elizabeth
Brays Access	From Iberia, take Highway 42 east about 2 miles, then on the second gravel road (Groves Road) north 0.75 miles. This are offers access to the Osage River. There is a boat ramp and it is owned by MDC	Iberia
Kings Bluff Access	From Eugene, take Highway 17 south, take Route H east to Mary's Home, continue on gravel (Old 10 Mile Road/H- 8) south, then take gravel (Kings Bluff Drive/H-8A) west to the access. This access is located 60.50 river miles above the mouth of the Osage River. This areas offers access to the Osage River. There is a boat ramp and it is owned by MDC.	Eugene

Madden Ford Access	From Iberia, take Highway 17 south, then County Road 17-4 (Madden Ford Road) west, cross two low-water bridges, and watch for boundary signs. This area of old fields and forest offers access to Tavern Creek and is owned by MDC	Iberia
Osage-Tavern Access	From St. Elizabeth, take Route E north to the end, then Hoecker Road north about 1 mile. This access is located 50 river miles above the mouth of the Osage River. This area offers access to Tavern Creek and is owned by MDC	Osage Beach
Rocky Mount Towersite	From Eldon, take Route Y west, then Route Z south, then take the gravel road marked with signs for Dooley Cemetery (Glenwood Road/Z-2) east, then at the T intersection (Gensert Road/Z-6) north 0.50 mile to the area. This area is owned by MDC	Eldon
Saline Valley Conservation Area	From Eldon, take Route M, 2.3 miles. This area is mostly forest. Facilities/features a few fishable ponds and five permanent streams. I Jack Busters Creek, Big Saline Creek, Little Saline Creek, Jim Henry Creek, and the Osage River. It is owned by MDC.	Eldon
Tuscumbia Access	From Tuscumbia at the Highways 52/17 junction, take Highway 52 west 0.10 mile to access entrance road. This access is located 66.10 river miles above the mouth of the Osage River. This area offers access to the Osage River. There is a one-lane, concrete boat ramp. This area is leased.	Tuscumbia
Wilson Camp Access	From Tuscumbia, take Highway 17 southeast 4.20 miles, then Route A east 4.40 miles, then Kliethermes Bridge Road/County Road A-6 south 0.50 miles to the bridge. This is the largest park in the state system and is shared by neighboring counties of Morgan and Camden. This park offers excellent opportunities for water recreation. Two free public swimming beaches include bathhouses and shady picnic areas nearby. Boats can be rented for either fishing or skiing at the parks' two marinas. Paved boat ramps are available. It is owned by Missouri State Parks, and is on the Historical Sites Nation Resister.	Tuscumbia

Source: http://mdc7.mdc.mo.gov/applications/moatlas/AreaList.aspx

Miller County communities have also established a number of park areas within their city limits for their residents to enjoy.

Park Name	Address	City
Eldon City Park	101 S Oak Street	Eldon, MO 65026
Iberia City Park	2363 MO-17	Iberia, MO 65486
Brumley Village Park	202 Lions Club Road	Brumley, MO 65017
Tuscumbia Ball Park	10 Ball Park Road	Tuscumbia, MO 65082
Osage Beach City Park	950 Hatchery Road	Osage Beach, MO 65065
Peanick Park	800 HWY 42	Osage Beach, MO 65065
Ball Park	Ball Park Road	St. Elizabeth, MO 65075

Source:

Eldon https://www.cityofeldonmissouri.com/parks-and-recreation Iberia https://www.facebook.com/pages/Iberia-City-Park/148447625260039

Tuscumbia No available website

Osage Beach & Peanick http://www.osagebeach-mo.gov/index.aspx?nid=253

<u>Historic Resources</u>: The National Register of Historic Places is the official list of registered cultural resources worthy of preservation. It was authorized under the National Historic Preservation Act of 1966 as part of a national program. The purpose of the program is to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. The National Register is administered by the National Park Service under the Secretary of the Interior. Properties listed in the National Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture.

A good article resource discussing why historic preservation needs to be part of disaster planning is available at the following link:

• <u>http://www.citylab.com/housing/2016/04/why-historic-preservation-needs-to-be-part-of-disaster-planning/477318/?utm_source=nl_link5_041116</u>.

Additional historic preservation resources are below:

- National Park Service's Certified Local Government Program https://www.nps.gov/clg/
- <u>National Main Street Program</u> <u>http://www.preservationnation.org/main-street/about-main-street/</u>

The above are both partnerships between national and state agencies and local governments that focus on historic preservation. Communities that have these programs in place already have a good infrastructure to protect historic sites.

Table 3.10. Miller County Properties on the National Register of Historic Places

Property	Address	City	Date Listed
Boeckman Bridge	2 Miles east of MO HWY 52 on County Road 181	St. Elizabeth 65075	8/27/08
Iberia Academy and Junior College	Highways 17 & 42	Iberia 65486	3/19/79
Emergency Conservation Work (ECW) Architecture in Missouri State Parks, 1933-1942 Thematic Resources	West of Brumley along MO 134	Brumley 65017	2/26/85
Olean Railroad Depot	Main Street (1/2 block east of California Street	Olean 65064	12/23/93
Sanning, P.A. Store	256 HWY H	Mary's Home 65032	6/16/05
Union Electric Administration Building - Lakeside	1 Willmore Lane	Lakeside 65049	4/13/98

Source: Missouri Department of natural Resources – Missouri National Register Listings by County http://dnr.mo.gov/shpo/mnrlist.htm Boeckman Bridge http://dnr.mo.gov/shpo/nps-nr/79001382.pdf

Iberia Academy Junior College <u>http://dnr.mo.gov/shpo/nps-nr/80002379.pdf</u> State Parks <u>http://dnr.mo.gov/shpo/nps-nr/64000392.pdf</u>

Olean Railroad Depot http://dnr.mo.gov/shpo/nps-nr/93001452.pdf

Sanning http://dnr.mo.gov/shpo/nps-nr/05000613.pdf

Union Electric Building http://dnr.mo.gov/shpo/nps-nr/98000364.pdf

Employer Name	Main Locations	Product or Service
Central Bank	3848 Osage Beach Parkway P.O. Box 207 Osage Beach, MO 65065 (573)-348-2761 https://www.centralbank.net/central-bank-of-lake- of-the-ozarks	Finance/Banking
Charter Communications	(877)-906-9121 https://www.spectrum.com/cable-tv- service/missouri/miller-county	Communications
cvs	300 Kestrel Lane Lake Ozark, MO 65049 (573)-365-7298 <u>https://www.cvs.com/store-</u> locator/cvs-pharmacy-locations/Missouri	Retail
Dollar General	27505 HWY. W Rocky Mount, MO 65072 (573) 392-5317 http://www2.dollargeneral.com/About- Us/pages/storelocator.aspx	Retail
Innovative Procurement	124, Opportunity Rd, Camdenton, MO 65020 (573) 346-7447	Manufacturing
Adient	1101 E 8th St, Eldon, MO 65026 (573) 392-2700	Manufacturing
Kohls	2455 Goldie Prewitt Memorial Pkwy, Lake Ozark, MO 65049 (573) 365-2004 https://www.kohls.com/stores/mo/lakeozark- 1421.shtml?utm_source=google&utm_medium=o rganic&utm_campaign=local	Retail
Lowes	950 Highway 42 Osage Beach, MO 65065, Store #1147 (573) 302-8808 https://www.lowes.com/store/MO- Osage%20Beach/1147	Retail
Menards	1015 Barred Owl Lane, Lake Ozark, MO 65049 (573) 365-7604 https://www.menards.com/main/storedetails.html ?store=3288	Retail
Miller County	2001 Highway 52, Tuscumbia, Missouri 65082 (573)-369-1900 http://millercountymissouri.org	City/Government
Miller County School Districts	P.O. Box 1 526 School Road Tuscumbia, MO 65082 (573) 369-2375 http://www.tuscumbialions.k12.mo.us	Education

Table 3.11. Major Non-Government Employers in Miller County

Opies	21 Hwy FF, Eldon, MO 65026 (573) 392-6525 http://www.opiestransport.com	Transportation
Target	919 Hwy D, Osage Beach, MO 65065 (573) 302-7969 https://www.target.com/sl/osage-beach/1914	Retail
UPS	4655 Osage Beach Pkwy A, Osage Beach, MO 65065 (573) 365-6991 https://osagebeach-mo- 2772.theupsstorelocal.com/?utm_source=Yext&u tm_medium=organic&utm	Logistics
Walgreens	3938 Osage Beach Pkwy, Osage Beach, MO 65065 (573) 348-5081 <u>https://www.walgreens.com/locator/walgreens- 3938+osage+beach+pkwy</u>	Retail
Walmart	4252 US-54, Osage Beach, MO 65065 (573) 348-6445 https://www.walmart.com/store/815/osage- beach-mo	Retail

Source: Data Collection Questionnaires; local Economic Development Commissions

Agriculture

- <u>http://www.missourieconomy.org/pdfs/missouri_farms_and_agribusiness.pdf;</u>
- <u>http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1, Chapter_2_County</u> _Level/Missouri/ - see Table 7, Hired Farm Labor – Workers and Payroll;
- <u>http://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Missouri</u>
 <u>/</u>;

Table 3.12. Agriculture-Related Jobs in Miller County	
Item	Number of Workers
Hired Farm Labor (2012)	162
Farms with 1 worker	48
Farms with 2 workers	51
Farms with 3 or 4 workers	37
Farms with 5 to 9 workers	25
Farms with 10 workers or more	1
Total Migrant Workers	1
Agriculture, forestry, fishing , hunting, and mining (2012-2016)	262
Management, business, science, and arts occupations	172
Service occupations	0
Sales and office occupations	5
Natural resources, construction, and maintenance occupations	85
Production, transportation, and material moving occupations	0

Source: https://factfinder.census.gov
3.3 Land Use and Development

Current land use reflects that 65% or 245,500 acres of all land within Miller County is used in some form of agricultural production. There is limited and often no mapping about commercial, residential, and other development within the county. Much of the commercial developments are in areas that are located near major highways. Of the farmland identified within Miller County, there is a relatively consistent share between usages as demonstrated in the chart below.



Source: https://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Missouri/cp29131.pdf

Figure 14 Land Use Chart

3.3.1 Development since Previous Plan Update

While a few cities in Miller County have experienced small increases in population, some of the smaller more rural communities have experienced a decline in population over the past 10 years.

Table 3.13. Miller	Table 3.13. Miller County Population Growth, 2000-2015 (Estimated)											
Jurisdiction	2010 Population	2015 Population	2010-2015 # Change	2010-2015 % Change								
Miller County	24,805	24,956	151	6								
City of Bagnell	82	52	-30	-12								
City of Brumley	108	65	-43	-37								
City of Eldon	4,685	4,617	-68	-1								
City of Iberia	991	693	-298	-30								
City of Lake Ozark	1,214	1,626	412	34								
City of Olean 1		99	-96	-49								
City of St. Elizabeth	331	319	-12	-4								
City of Tuscumbia	246	252	6	2								

Source:

https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=AC S_15_5YR_B01003&prodType=table

Population growth or decline is generally accompanied by increases or decreases in the number of housing units.

Table 3.14.	Change in Housing Units,	2000-2015 (Estimated)

Jurisdiction	Housing Units 2010	Housing Units 2015	2010-2015 # Change	2010-2015 % change
Miller County	12,649	12,739	90	7
City of Bagnell	68	54	-18	-26
City of Brumley	60	47	-13	-22
City of Eldon	2,484	2,096	-388	-16
City of Iberia	507	360	-147	-29
City of Lake Ozark	1,346	1,804	458	34
City of Olean	150	69	-81	-54
City of St. Elizabeth	163	131	-32	-20
City of Tuscumbia	71	83	12	17

Source: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

3.3.2 Future Land Use and Development

Community Future Development

In this section we discuss the details regarding future growth, land use, and development of the planning area. The information and details was provided through the community responses to the Data Collection Questionnaire, from information provided by each of the participating jurisdictions, and other Web based searches.

School District Future Development

In this section, we summarize future development trends for the participating school districts, including information on any proposed construction, bonds, renovation, student growth or decline, employment growth or decline, and facilities improvement plans.

The remaining discussion in this section provides future growth and development information, where available, relative to each participating jurisdiction, based on the format used above for the county information.

Miller County City of Bagnell Village of Brumley City of Eldon City of Iberia City of Lake Ozark Village of St. Elizabeth Village of Tuscumbia Eldon R-I School District Miller County R-III School District St. Elizabeth R-IV School District School of the Osage School District Iberia R-V School District

3.3.3 Hazard Profiles, Vulnerability, and Problem Statements

Each hazard will be analyzed individually in a hazard profile. The profile will consist of a general hazard description, location, severity/magnitude/extent, previous events, future probability, a discussion of risk variations between jurisdictions, and how anticipated development could affect risk. At the end of each hazard, profile will be a vulnerability assessment, followed by a summary problem statement.

Hazard Profiles

Requirement §201.6(c) (2) (i): [The risk assessment shall include a] description of the...location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Each hazard identified in Section **3.1.4** will be profiled individually in this section in alphabetical order. The level of information presented in the profiles will vary by hazard based on the information available. With each update of this plan, new information will be incorporated to provide better evaluation and prioritization of the hazards that affect the planning area. Detailed profiles for each of the identified hazards include information categorized as follows:

Hazard Description: This section consists of a general description of the hazard and the types of impacts it may have on a community or school/special district.

Geographic Location: This section describes the geographic location of the hazard in the planning area. Where available maps where used to indicate the specific locations of the planning area that are vulnerable to the subject hazard. For some hazards, the entire planning area is at risk.

Severity/Magnitude/Extent: This includes information about the severity, magnitude, and extent of a hazard. For some hazards, this is accomplished with description of a value on an established scientific scale or measurement system, such as an EF2 tornado on the Enhanced Fujita Scale. Severity, magnitude, and extent can also include the speed of onset and the duration of hazard events. Describing the severity/magnitude/extent of a hazard is not the same as describing its potential impacts on a community. Severity/magnitude/extent defines the characteristics of the hazard regardless of the people and property it affects.

Previous Occurrences: This section includes available information on historic incidents and their impacts.

Probability of Future Occurrence: The frequency of recorded past events is used to estimate the likelihood of future occurrences. Probability was determined by dividing the number of recorded events by the number of years and multiplying by 100. This gives the percent chance of the event happening in any given year. For events, occurring more than once annually, the probability will be reported 100% in any given year, with a statement of the average number of events annually.

National Oceanic and Atmospheric Administration & National Centers for Environmental Information NOAA/NCEI

The discussion on the probablity of future ocuurence should also consider changing furture conditions, including the effects of longer-term changes in weather patterns and climate on the identified hazards. The National Oceanographic Data Center and Atomospheric Administration/National Centers for Environmental Information (NOAA/NCEI) has a new tool that can porvide useful information for this purpose.

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Source: https://www.nodc.noaa.gov/about/disclaimer.html

Vulnerability Assessments

Requirement §201.6(c) (2) (ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c) (2) (i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Requirement §201.6(c) (2) (ii) (A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.6(c) (2) (ii) (B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c) (2) (i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Requirement §201.6(c) (2) (ii): (As of October 1, 2008) [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged in floods.

Following the hazard profile for each hazard will be the vulnerability assessment. The vulnerability assessment further defines and quantifies populations, buildings, critical facilities, and other community assets at risk to damages from natural hazards. The vulnerability assessments will be based on the best available county-level data, which is in the Missouri Hazard Mitigation Plan (2013). The county-level assessments in the State Plan were based on the following sources:

- Statewide GIS data sets compiled by state and federal agencies; and
- FEMA's HAZUS-MH loss estimation software.

The vulnerability assessments in the Miller County plan will also be based on:

- Written descriptions of assets and risks provided by participating jurisdictions;
- Existing plans and reports;
- Personal interviews with planning committee members and other stakeholders; and
- Other sources as cited.

3.3.4 Dam Failure

Some specific sources for this hazard are:

- Missouri Department of Natural Resources, Dam and Reservoir Safety, <u>http://dnr.mo.gov/env/wrc/dam-safety/statemap.htm</u>
- Stanford University's National Performance of Dams Program; http://npdp.stanford.edu/index.html
- National Inventory of Dams, http://geo.usace.army.mil/
- MO DNR Dam & Reservoir Safety Program;
- National Resources Conservation Service http://www.nrcs.usda.gov
- DamSafetyAction.org, <u>http://www.damsafetyaction.org/MO/</u>

Hazard Profile

Hazard Description

A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams are typically constructed of earth, rock, concrete, or mine tailings. Dam failure is the uncontrolled release of impounded water resulting in downstream flooding, affecting both life and property. Dam failure can be caused by any of the following:

1. Overtopping - inadequate spillway design, debris blockage of spillways or settlement of the dam crest.

2. Piping: internal erosion caused by embankment leakage, foundation leakage and deterioration of pertinent structures appended to the dam.

3. Erosion: inadequate spillway capacity causing overtopping of the dam, flow erosion, and inadequate slope protection.

4. Structural Failure: caused by an earthquake, slope instability or faulty construction.

Information can be obtained from the National Resources Conservation Service at http://www.nrcs.usda.gov and an organization called DamSafetyAction.org, with the following Website: http://www.damsafetyaction.org/MO/



October 2009 Osage (Bagnell) Dam

The Osage (Bagnell) Dam is also regulated by the Federal Energy Regulatory Commission (FERC) as it is a hydroelectric dam.

According to the Emergency Management Director of Miller County, the Osage (Bagnell) Dam is monitored on a daily basis by Ameren Missouri. Additional safety measures have also been added in the way of anchor cables implanted into the bedrock.

There are currently no known dam failures within the planning area of Miller County.

To evaluate the impact on Miller County from Dam Failure the planning team elected to review all dams within our surrounding counties to consider any impact of dam failures from outside our planning area. Reviewing the data provided both within the planning area and the surrounding areas the planning team still felt that the impact would be relatively low to Miller County.



Missouri Dam Report by County



MILLER		Vear	Height	Length	Drainage	Lake Area	Hazard	Permit
ID Number	Location	Complete	(ft)	(ft)	Area (acre)	(acre)	Class	Number
BITTLE LAI MO30227	KE DAM S27 T42N R14W	1973	28.00	Unknown	100.00	17.00	2	
BUTZER LA MO30953	AKE DAM S29 T41N R13W	1950	20.00	Unknown	180.00	9.00	3	
GROFF LA	KE DAM S29 T39N R12W	1960	43.00	400.00	622.00	21.00	3	Ag Exempt
GROFF UP MO30140	PER DAM S29 T39N R12W	1959	27.00	Unknown	77.00	4.00	3	
HELTON LA MO31061	AKE DAM S01 T39N R14W	1978	30.00	Unknown	88.00	15.00	3	
HELTON LA MO31688	AKE DAM S05 T39N R14W	0	30.00	Unknown	240.00	5.00	2	
LAKE JA-H MO30251	A DAM S34 T42N R15W	1967	22.00	Unknown	40.00	8.00	1	
MUNSON D MO30239	AM S33 T42N R14W	1971	30.00	Unknown	35.00	6.00	2	
ORTMEYER MO30250	S03 T41N R12W	1960	25.00	Unknown	242.00	12.00	2	
OSAGE DA MO30014	M S19 T40N R15W	1931	148.00	Unknown	8,960,000.00	55,342.00	1	
PROCK'S D MO31686	AM S17 T40N R13W	1949	25.00	Unknown	120.00	3.00	3	
SCHELL-K	AMPETER DAM S02 T41N R12W	19940	45.00	500.00	302.00	31.00	2	S-055
TOWN & CO MO30247	OUNTRY LAKE DA S27 T41N R15W	AM 1969	33.00	Unknown	1,526.00	36.00	1	
TRUMAN H MO30249	ELTON DAM S22 T40N R14W	1970	21.00	Unknown	100.00	2.00	3	
WILDE MO50863		1998	29.00	400.00	0.00	6.00		
SUMMARY								
Regulated Tota	Dams: 2 Dams: 15	Total: Average:	37.07		8,963,672.00 597,578.13	55,517.00 3,701.13		

3/9/2007

Page 180 of 288

Figure 15 Missouri Dam Report by County

Table 3.15. MDNR Dam Hazard Classification Definitions											
Federal	and State Dam Cla	ssification and Ins	spection								
Federal Classifications	State Classifications	Downstream Environments	State Inspections								
High Hazard Loss of human life – probable, one or more expected	Class I	10 or more permanent dwellings; or any public building	Every 2 years								
Loss of economic, environmental, lifeline – Yes, (but not necessary for this classification)	Class 2	1-9 permanent dwellings: or one or more campgrounds with permanent water, sewer/electrical services; or one or more industrial buildings	Every 3 years								
Significant Hazard Loss of human life – none expected Loss of economic, environmental, lifeline – Yes Low Hazard Loss of human life – none expected Loss of economic, environmental, lifeline – low and generally limited to owner	Class 3	Everything else	Every 5 years								

Source: Missouri Department of Natural Resources, http://dnr.mo.gov/env/wrc/docs/rules_reg_94.pdf

*The Hazard Mitigation Plan requires a listing of HIGH hazard potential classification dams. SIGNIFICANT hazard potential dams where failure or mis-operation may result in no probable loss of human life can cause economic loss, environmental damage, disruption of lifeline facilities, or can affect other concerns.

The individual maps below are enhanced versions of high hazard dams that show the flow of water in the event of a breach. These maps identify any structures such as residential homes, commercial structures, or school districts that would be affected in the event of a breach.



Figure 16 Miller County Dams Map

Table 3.16	High & Significant Hazard Dams in the Miller County	Planning Area
	right a orginiteant hazara banto in the minor ocunty	/ 1 100 11 11 19 / 1 00

Dam Name	NID ID #	Hazard Class	Main Purpose
Lake Ja Ha Dam	MO30251	High	Recreation
Bittle Lake Dam	MO30227	High	Recreation
Town & Country Lake Dam	MO30247	High	Recreation
Munson Dam	MO30239	High	Recreation
Bagnell Dam	MO30014	High	Hydroelectric
Ortmeyer Lake Dam	MO30250	High	Recreation
Helton Lake Dam	MO31688	High	Recreation

Sources: National Inventory of Dams http://nid.usace.army.mil/cm_apex/f?p=838:12

The Osage (Bagnell) Dam is also regulated by the Federal Energy Regulatory Commission (FERC) as it is a hydroelectric dam.

According to the Emergency Management Director of Miller County, the Osage (Bagnell) Dam is monitored on a daily basis by Ameren Missouri. Additional safety measures have also been added in the way of anchor cables implanted into the bedrock.

There are currently no known dam failures within the planning area of Miller County.

In order to adequately evaluate the impact on Miller County from Dam Failure the planning team elected to review all dams within our surrounding counties to consider any impact of dam failures from outside our planning area. Reviewing the data provided both within the planning area and the surrounding areas the planning team still felt that the impact would be relatively low to Miller County.



Farmland and trees surround the Ortmeyer & Schell-Kampeter Lake Dam; there are no residents in the breach area according to the Census data. The projected flow the Ortmeyer Dam would be straight into the Osage River. The Schell-Kampeter Dam would effect has a more dense area of trees and other dense vegetation that would most likely slow the water flow considerably.

The Lake Ja-Ha Dam is located 755 ft from the Waste Water Treatment Facility, which would flood in the event of a breach. The mobile home park is 1400ft to the nearest home, which would result in eastern portion of the area flooding due to the creek, would overflow. Census information estimates that 59 to 83 residents live in the mobile home park. The area of trees and other dense vegetation that would likely slow the water flow. Evacuation would be possible on Business Route 54 South.



The Munson-Bittle Lake Dam is surrounded by farmland and trees. The projected flow to the southeast has a more dense area of trees and other dense vegetation that would most likely slow the water flow considerably. There is one small creek within 1.15 miles and would most likely flood the home within 40 ft of the creek. The locations of the structures that may be in the path of the breach are all close to County Road MM 4, a roadway, so evacuation is possible. While loss of property may happen if the dam were to breach, it is unlikely that loss of life would happen based on the ability to evacuate



Figure 18 Munson-Bittle Lake Dam Map

The Town & Country Lake Dam is surrounded by farmland and trees. The projected flow to the south into structures around 700 ft. Homes in the path of breach include homes from Midway to Allen Road would be effected. This could potential effect ten homes with a population of 15 residents. Several of these homes will have to travel west on Midway but it is a possible risk of loss of life and property.



Figure 19 Town & Country Lake Dam Map

Farmland and trees surround the Helton Lake Dam. The projected flow to the northeast has a more dense area of trees and other dense vegetation that would most likely slow the water flow considerably. The locations of the structures that may be in the path of the breach are all close to a roadway, so evacuation is possible. While loss of property may happen if the dam were to breach, it is unlikely that loss of life would happen based on the ability to evacuate.



Figure 20 Helton Lake Dam Map

The Groff Lake Dam is surrounded by farmland and trees. The projected flow to the northeast and northwest has a more dense area of trees and other dense vegetation that would most likely slow the water flow considerably. The locations of the structures that may be in the path of the breach are all close to a Highway 42 for evacuation. While loss of property may happen if the dam were to breach, it is unlikely that loss of life would happen based on the ability to evacuate.



Figure 21 Groff Lake Dam Map

Severity/Magnitude/Extent

Reviewing the data provided both within the planning area and the surrounding areas the planning team still felt that potential of a dam failure would be low and the impact would be relatively low to Miller County. Please reverence the Table 3.2 on page 3.11 where the vulnerability analysis reflects data collected and analyzed.

Measure of Probability: Low

There are no incidents of dam failure in Miller County. Of all the dams identified in the Miller County region, including high and low dams, looking at the potential flood areas large area of vegetation and limited population would be impacted. Where populations were present there was a clear accessible potential evacuation accessible. The impact of Dam Failure will have a direct correlation to the Dam itself and the buildings that lay in the path of the water and debris. The high hazard dams within Miller County are inspected and regulated. Bagnell Dam has an Emergency Response plan in place and significant improvements have been incorporated into the maintenance and up keep of the dam. The Planning team felt that the probability of a dam failure in Miller County was low.

Measure of Severity: Moderate

The severity/magnitude of dam failure would be similar in some cases to the impacts associated with flood events (see the flood hazard vulnerability analysis and discussion). Based on the hazard class definitions, failure of any of the High Hazard/Class I & 2 dams could result in a serious threat of loss of human life, serious damage to residential, industrial or commercial areas, public utilities, public buildings, or major transportation facilities. Catastrophic failure of any high hazard dams has the potential to result in greater destruction due to the potential speed of onset and greater depth, extent, and velocity of flooding. Note that for this reason, dam failures could flood areas outside of mapped flood hazards.

Measure of Vulnerability: Low

Potential Impact of Existing Structures

There have been no reported Dam Failures in Miller County, unable to rely on historical data within our region we took into account the amount of potential water and debris that would flow downstream. The impact of Dam Failure will have a direct correlation to the Dam itself and the buildings that lay in the path of the water and debris. In all cases of complete Dam Failure there will be considerable amount of devastation that will be associated with any incident including destroying all Existing Structures in the path of water and debris.

Previous Occurrences

A thorough search in the National Performance of Dams Program with Stanford University was preformed. There were no incidents recorded in the Dams Program. This was also verified with the Missouri State 2013 Hazard Mitigation Plan pages 3.70 – 3.73.

Stanford University http://npdp.stanford.edu Missouri State Hazard Mitigation Plan http://sema.dps.mo.gov/docs/programs/LRMF/mitigation/MO_Hazard_Mitigation_Plan_2013.pdf

Probability of Future Occurrence

All the Hazard Mitigation Plans within our region reflect little concern over dam failure. There is much public awareness and community involvement on behalf of Ameren Missouri, the current owner of Osage (Bagnell) Dam and safety is a priority.

<u>Vulnerability</u>

Vulnerability Overview

Based on the data presented in the Missouri State Hazard Mitigation Plan 2013 the vulnerability for Miller County in regard to dam failure is low with estimated building loss and potential exposure both at zero.

Measure of Vulnerability: Low

Potential Losses to Existing Development:

Table 3.17. Contents Extracted for Miller County, Missouri-County-by-County Vulnerability Analysis for Failure of State Regulated Dams in Missouri 2013



Missouri State Hazard Mitigation Plan 2013

http://sema.dps.mo.gov/docs/programs/LRMF/mitigation/MO_Hazard_Mitigation_Plan_2013.pdf



Impact of Previous and Future Development

There have been no reported Dam Failures in Miller County, unable to rely on historical data within our region we took into account the amount of potential water and debris that would flow downstream. The impact of Dam Failure will have a direct correlation to the Dam itself and the buildings that lay in the path of the water and debris. In all cases of complete Dam Failure, there will be considerable amount of devastation that will be associated with any incident including destroying all Existing Structures in the path of water and debris.

Problem Statement

Unregulated dams could potentially become a problem as they age.

Mitigation: Missouri Department of Natural Resources is the primary resource for state regulated dams. Their website provides information, templates, and guidance in creating the required Emergency Action Plans for all regulated dams. These plans are to help save lives and reduce property damage concerning dam failures. Planning is an important mitigation tool as it often saves lives, lessens property damage, and shortens recovery time. http://www.dnr.mo.gov/env/wrc/damsft/eap.htm

Increasing the number of dams that are regulated may become necessary, as these older unregulated dams become more of a hazard.

Missouri State Emergency Management has preparedness tips for before, during, and after a dam failure at http://sema.dps.mo.gov/plan_and_prepare/dam_failure.asp

3.3.5 Drought

Some specific sources for this hazard are:

- Maps of effects of drought, National Drought Mitigation Center (NDMC) located at the University of Nebraska in Lincoln; <u>http://www.drought.unl.edu/</u>.
- Historical drought impacts, National Drought Mitigation Center (NDMC) located at the University
 of Nebraska in Lincoln; at http://droughtreporter.unl.edu/.
- Recorded low precipitation, NOAA Regional Climate Center, (<u>http://www.hprcc.unl.edu</u>).
- Water shortages, Missouri's Drought Response Plan, Missouri Department of Natural Resources, <u>http://dnr.mo.gov/pubs/WR69.pdf</u>
- Populations served by groundwater by county, USGS-NWIS, <u>http://maps.waterdata.usgs.gov/mapper/index.html</u>
- Census of Agriculture, <u>http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1, Chapter_2 County_Le_vel/Missouri/and_</u>
 <u>http://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Missouri/</u>
- USDA Risk Management Agency, Insurance Claims, <u>http://www.rma.usda.gov/data/cause.htm</u>
- Natural Resources Defense Council, <u>http://www.nrdc.org/globalWarming/watersustainability/</u>

Hazard Profile

Hazard Description

Drought is generally defined as a condition of moisture levels significantly below normal for an extended period over a large area that adversely affects plants, animal life, and humans. A drought period can last for months, years, or even decades. There are four types of drought conditions relevant to Missouri, according to the State Plan, which are as follows.

- <u>Meteorological</u> drought is defined in terms of the basis of the degree of dryness (in comparison to some "normal" or average amount) and the duration of the dry period. A meteorological drought must be considered as region-specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region.
- <u>Hydrological</u> drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (e.g., streamflow, reservoir, and lake levels, ground water). The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow, and ground water and reservoir levels. As a result, these impacts also are out of phase with impacts in other economic sectors.
- <u>Agricultural</u> drought focus is on soil moisture deficiencies, differences between actual and potential evaporation, reduced ground water or reservoir levels, etc. Plant demand for water depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil.
- **Socioeconomic** drought refers to when physical water shortage begins to affect people.

Geographic Location

Missouri has faced an extremely severe drought in 2012. The drought has impacted every aspect of Missouri's agriculture and related industries. The economic impact to the drought is being felt by all Missourians, and has the potential to affect the food prices in the near future.

Missouri currently faces its worst drought in 30 years with all 114 counties declared primary natural disaster areas by Secretary of Agriculture Tom Vilsack on July 17, 2012. Numerous portions of the state are experiencing severe to extreme drought resulting in poor site conditions for the establishment and installation of conservation practices.

As of 2010, current use of 248,460 acres of land is reserved for farmlands. Cropland represents 75%, and the remaining 25% is utilized by livestock. There is limited and often no mapping about commercial, residential, and other development within the county. Much of the commercial developments are in areas that are located near major highways. Sources:

USDA https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Missouri https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1, Chapter_2 County_Level/Missouri/st29_2_001_001.pdf



Released Thursday, August 30, 2012 Brian Fuchs, National Drought Mitigation Center

Local conditions may vary. See accompanying text summary for forecast statements

http://droughtmonitor.unl.edu

Figure 23 U.S. Drought Monitor 2012

Severity/Magnitude/Extent

Drought can create economic impacts on agriculture and related sectors, including forestry and fisheries, because of the reliance of these sectors on surface and subsurface water supplies. In addition to losses in yields in crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and disease to forests and reduce growth. The incidence of forest and range fires increases substantially during extended droughts, which in turn place both human and wildlife populations at higher levels of risk. Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected. Finally, while drought is rarely a direct cause of death, the associated heat, dust and stress can all contribute to increased mortality.



January 2, 2018 (Released Thursday, Jan. 4, 2018) Valid 7 a.m. EST



	Drought Conditions (Percent Area)								
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4			
Current	1.49	98.51	46.34	23.68	1.29	0.00			
Last Week 12-26-2017	3.25	96.75	40.74	23.50	1.29	0.00			
3 Month s Ago 10-03-2017	30. <mark>5</mark> 6	69.44	22.17	0.00	0.00	0.00			
Start of Calendar Year 01-02-2018	1.49	98.51	46.34	23.68	1.29	0.00			
Start of Water Year 09-26-2017	35.49	64.51	8.80	0.00	0.00	0.00			
One Year Ago 01-03-2017	10.49	89.51	26.62	0.00	0.00	0.00			

Intensity:

D0 Abnormally Dry

D3 Extreme Drought D1 Moderate Drought D4 Exceptional Drought

D2 Severe Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author: Eric Luebehusen U.S. Department of Agriculture



http://droughtmonitor.unl.edu/

Source: U.S. Drought Monitor, http://droughtmonitor.unl.edu/Home/StateDroughtMonitor.aspx?MO Figure 24 U.S. Drought Monitor January 2018

The Palmer Drought Index

The Palmer Drought Indices measure dryness based on recent precipitation and temperature. The indices are based on a "supply-and-demand model" of soil moisture. Calculation of supply is relatively straightforward, using temperature and the amount of moisture in the soil. However, demand is more complicated as it depends on a variety of factors, such as evapotranspiration and recharge rates. These rates are harder to calculate. Palmer tried to overcome these difficulties by developing an algorithm that approximated these rates, and based the algorithm on the most readily available data — precipitation and temperature.

The Palmer Index has proven most effective in identifying long-term drought of more than several months. However, the Palmer Index has been less effective in determining conditions over a matter of weeks. It uses a "0" as normal, and drought is shown in terms of negative numbers; for example, negative 2 is moderate drought, negative 3 is severe drought, and negative 4 is extreme drought. Palmer's algorithm also is used to describe wet spells, using corresponding positive numbers.

Palmer also developed a formula for standardizing drought calculations for each individual location based on the variability of precipitation and temperature at that location. The Palmer index can therefore be applied to any site for which sufficient precipitation and temperature data is available.



Figure 25 Drought Severity Index

Drought Susceptibility



Figure 26 Drought Susceptibility

Miller County is located in Region B and has a moderate susceptibility rating. The planning area has sufficient groundwater resources to meet residential and municipal water needs both now and for future growth.

The agriculture industry within Miller County relies heavily on private wells and ponds to water livestock, poultry and for crop irrigation. There does not appear to be any variations between the jurisdictions. In cities, the drought conditions would be the same as those experienced in rural areas, but the magnitude would be different with only lawns and local gardens impacted. In addition, building foundations could be weakened due to shrinking and expanding soils.

Previous Occurrences

Table 3.18. Previous Occurrences 2012-2017								
Impact ID/Title	Start Date	End Date	Message	Categories				
39485 Missouri farmers cautioned about toxic fescue	4/16/2017	TBD	Missouri farmers were warned that forages under stress from the winter drought and warm spring might set seed heads early this year. If the rain continues and the temperatures are good, forages may respond well. If rains cease to fall, pastures may be all stems and seeds rather than leaves. While grass stems are not particularly nourishing for grazing herds, Kentucky 31 tall fescue stems can produce toxic alkaloid concentrate in stems and seeds. High Plains Journal (Kan.), April 16, 2017	Agriculture, Plants & Wildlife				
28492 Drought-related USDA disaster declarations in 2013	1/9/2013	5/16/2013	The U.S. Department of Agriculture began declaring counties as primary and secondary disaster areas related to drought in January, for the 2013 growing season. Farmers in affected counties have eight months from the date of the declaration to apply for low-interest emergency loans. For more information, agricultural producers should contact their Farm Service Agency office. From Farm Service Agency, press releases, beginning Jan. 9, 2013.	Agriculture, Relief, Response & Restrictions				
27510 Cattle sales in southern Missouri higher than usual	8/30/2012	Unknown	Cattle sales in southern Missouri from Joplin to Farmington were higher than usual as ranchers held out as long as they could before selling cattle. Observers noted that cattle were 10 to 15 percent lighter than usual because the countryside held no grass or much in the way of water for the livestock. The landscape in central Missouri was tan as drought dried up everything. Raleigh News & Observer (N.C.), Aug. 30, 2012	Agriculture				
26997 Missouri state parks and historic sites under fire ban	6/29/2012	7/2/2012	A statewide fire ban at Missouri state parks and historic sites is in effect because of dry and excessively hot weather. From a National Weather Service employee in Saint Charles, Missouri, on July 2, 2012	Fire, Relief, Response & Restrictions				
27107 USDA Designates 97 Counties in Missouri as Primary Natural Disaster Areas with Assistance to Producers in Surrounding States	4/1/2012	Unknown	The U.S. Department of Agriculture (USDA) on July 17, 2012, designated 97 counties in Missouri as primary natural disaster areas due to damage and losses caused by drought and excessive heat that began in April 1, 2012	Agriculture, Relief, Response & Restrictions				

Source http://droughtreporter.unl.edu

Commodity Year	State Code	State	County Code	County Name	Commodity Name	Insurance Plan Code	Insurance Plan Abbreviation	Stage Code	Damage Cause Code	Damage Cause Description	Determined Acres	Indemnity Amount
2016	29	МО	131	Miller	NA							
2015	29	МО	131	Miller	NA							
2014	29	МО	131	Miller	Corn	2	RP	UH	11	Drought	184	\$ 28,124.00
2014	29	МО	131	Miller	Soybeans	2	RP	R	11	Drought	8	\$ 273.00
2013	29	МО	131	Miller	Sorghum	2	YP	Н	11	Drought	10.12	\$ 116.00
2013	29	МО	131	Miller	Soybeans	2	RP	Н	11	Drought	128.45	\$ 7,859.00
2012	29	МО	131	Miller	Corn	1	YP	н	11	Drought	88.9	\$ 20,179.00
2012	29	МО	131	Miller	Corn	2	RP	UH	11	Drought	7.6	\$ 2,792.00
2012	29	МО	131	Miller	Corn	1	YP	UH	11	Drought	74.6	\$ 17,150.00
2012	29	МО	131	Miller	Corn	2	RP	н	11	Drought	296.05	\$ 52,588.00
2012	29	МО	131	Miller	Corn	1	YP	UH	11	Drought	15	\$ 610.00
2012	29	МО	131	Miller	Corn	2	RP	R	31	Drought	56	\$ 2,544.00
2012	29	МО	131	Miller	Grain	1	YP	UH	11	Drought	25.66	\$ 5,777.00
2012	29	МО	131	Miller	Grain	1	YP	н	11	Drought	85.9	\$ 11,631.00
2012	29	МО	131	Miller	Soybeans	2	RP	R	11	Drought	197.3	\$ 7,428.00
2012	29	МО	131	Miller	Soybeans	2	RP	R	11	Drought	1654.02	\$ 41,660.00
2012	29	МО	131	Miller	Soybeans	1	YP	R	11	Drought	83.3	\$ 3,134.00
2012	29	МО	131	Miller	Soybeans	2	RP	UH	11	Drought	35.4	\$ 18,216.00
2012	29	МО	131	Miller	Soybeans	1	YP	н	11	Drought	411.9	\$ 88,079.00
Total											3362.20	\$508,160.00

Table 3.19.Insurance Payments 2012-2016

Source: https://www.rma.usda.gov/data/cause.html

Probability of Future Occurrence

Based on the vulnerability analysis Table 3.2 on page 3.11 drought based on a 20 year overview predicts a 25% probability factor of future occurrence of moderate to severe drought. Although drought is not predictable, long-range outlooks as well as historical data could indicate an increased chance of drought.

Source: Palmer Drought Severity Index January 1999-June2017

https://www.ncei.noaa.gov/temp-and-precip/drought/historical-palmers/psi/199701-201706

Vulnerability

Vulnerability Overview

Drought has impacted Miller County with most of the impact being felt by the agriculture industry. Drought has little or no impact on buildings and structures. The impact to human life can happen if proper precautions are not taken by individuals to conserve and protect water sources.

Vulnerability: High

Potential Impact of Existing Structures

Drought similar to Extreme Heat does not necessarily have a direct impact on Existing Structures. Prolonged Drought can have an impact on the stability of the earth beneath a structure. However, with limited data there is little evidence that drought will have any significant impact or damage to any Existing Structures.

Potential Losses to Existing Development

Rural Missouri's economy is deeply reliant on agriculture and agriculture-related industries. This makes Missouri, particularly economically vulnerable when acts of nature and natural hazards affect a primary source of earnings. An analysis of the data for crop loss claims due to drought will help mitigate a course of action.

County	Total Crop Insurance Paid for Drought Damage 1998- 2012	Crop Claims Ration Rating	Annualized Crop Insurance Claims/ Drought Damage	Crop Exposure (2007 Census of Agriculture)	Annual Crop Claims Ratio	Crop Loss Ration Rating
Miller	\$535,786	1	\$35,719	\$3,820,000	0.94%	1

https://sema.dps.mo.gov/docs/programs/LRMF/mitigation/MO_Hazard_Mitigation_Plan_2013.pdf

Impact of Previous and Future Development

The potential impact on previous and future development in Miller County by drought is not significant.

Problem Statement

The largest impact will be on the agriculture industry within the region and that would be in regard to crops and the economy of the region based on crop loss if impacted by severe drought.

Mitigation:

Crop Insurance: Crop insurance protects farmers from losses due to natural disasters, including drought. Crop insurance can be purchased through private insurance companies or agents.

Drought Tolerant Crops: With the increase of genetically engineered crops such as corn and soybean, there are many drought tolerant hybrids on the market today. Educating farmers on the new products and advantages of these hybrid seeds can increase resiliency of our farming communities.

3.3.6 Earthquakes

Hazard Profile

Hazard Description

An earthquake is a sudden motion or trembling that is caused by a release of energy accumulated within or along the edge of the earth's tectonic plates. Earthquakes occur primarily along fault zones and tears in the earth's crust. Along these faults and tears in the crust, stresses can build until one side of the fault slips, generating compressive, and shear energy that produces the shaking and damage to the built environment. Heaviest damage generally occurs nearest the earthquake epicenter, which is that point on the earth's surface directly above the point of fault movement. The composition of geologic materials between these points is a major factor in transmitting the energy to buildings and other structures on the earth's surface.

Geographic Location

The New Madrid Seismic Zone, sometimes called the New Madrid Fault Line, is a major seismic zone and a prolific source of intraplate earthquakes (earthquakes within a tectonic plate) in northern Arkansas through southeast Missouri and western Tennessee and Kentucky to the Illinois side of the Ohio River Valley. This is the most active zone east of the Rocky Mountains. This area is considered equally high risk to the tremors in the seismic zones of California. New Madrid Fault Line makes earthquakes probable and may have the potential to produce large earthquakes in the future. Source: SEMA Hazard Mitigation Plan 2013

http://sema.dps.mo.gov/docs/programs/LRMF/mitigation/MO_Hazard_Mitigation_Plan_2013.pdf

There has been much research into the New Madrid Seismic Zone. The potential impact it would have on the region as well as the State of Missouri. Within our region alone, it has been forecasted to have a minimal impact, as the rock structure in our area will shield us from a direct impact. It is also predicted that because of our unique location and many residents from the St. Louis and surrounding areas own second homes at the lake it is possible that we would see an influx of homeowners seeking refuge in a safe and familiar location. There would also be a positive economic impact as we are slated to serve in a supporting role for emergency and recovery assistance to areas that have experienced damage and catastrophic disaster.

Figure 27 below illustrates the highest projected Modified Mercalli intensities by county from a potential magnitude 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid Seismic Zone. The secondary maps in Figure 3.6 on page 3.98 show the same regional intensities for 6.7 and 8.6 earthquake, respectively.



This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude - 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.



This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude – 6.7 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.

> This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude - 8.6 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.



Source:

http://sema.dps.mo.gov/docs/programs/Planning,%20Disaster%20&%20Recovery/State%20of%20Missouri%20Hazard%20Analysis/201 2-State-Hazard-Analysis/Annex_F_Earthquakes.pdf

Figure 27 Impact Zones for Earthquakes Along the New Madrid Fault

PROJECTED EARTHQUAKE INTENSITIES

MODIFIED MERCALLI INTENSITY SCALE

x

- People do not feel any Earth movement.
- II A few people might notice movement.
- III Many people indoors feel movement. Hanging objects swing.
- IV Most people indoors feel movement. Dishes, windows, and doors rattle. Walls and frames of structures creak. Liquids in open vessels are slightly disturbed. Parked cars rock.
 - Almost everyone feels movement. Most people are awakened. Doors swing open or closed. Dishes are broken. Pictures on the wall move. Windows crack in some cases. Small objects move or are turned over. Liquids might spill out of open containers.
 - Everyone feels movement. Poorly built buildings are damaged slightly. Considerable quantities of dishes and glassware, and some windows are broken. People have trouble walking. Pictures fall off walls. Objects fall from shelves. Plaster in walls might crack. Some furniture is overturned. Small bells in churches, chapels and schools ring.
 - People have difficulty standing. Considerable damage in poorly built or badly designed buildings, adobe houses, old walls, spires and others. Damage is slight to moderate in well-built buildings. Numerous windows are broken. Weak chimneys break at roof lines. Cornices from towers and high buildings fall. Loose bricks fall from buildings. Heavy furniture is overturned and damaged. Some sand and gravel stream banks cave in.
- VIII Drivers have trouble steering. Poorly built structures suffer severe damage. Ordinary substantial buildings partially collapse. Damage slight in structures especially built to withstand earthquakes. Tree branches break. Houses not bolted down might shift on their foundations. Tall structures such as towers and chimneys might twist and fall. Temporary or permanent changes in springs and wells. Sand and mud is ejected in small amounts.

Figure 28 Modified Mercalli Intensity Scale

- IX Most buildings suffer damage. Houses that are not bolted down move off their foundations. Some underground pipes are broken. The ground cracks conspicuously. Reservoirs suffer severe damage.
 - Well-built wooden structures are severely damaged and some destroyed. Most masonry and frame structures are destroyed, including their foundations. Some bridges are destroyed. Dams are seriously damaged. Large landslides occur. Water is thrown on the banks of canals, rivers, and lakes. Railroad tracks are bent slightly. Cracks are opened in cement pavements and asphalt road surfaces.
- XI Few if any masonry structures remain standing. Large, well-built bridges are destroyed. Wood frame structures are severely damaged, especially near epicenters. Buried pipelines are rendered completely useless. Railroad tracks are badly bent. Water mixed with sand, and mud is ejected in large amounts.
- XII Damage is total, and nearly all works of construction are damaged greatly or destroyed. Objects are thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move. Lakes are dammed, waterfalls formed and rivers are deflected.

Intensity is a numerical index describing the effects of an earthquake on the surface of the Earth, on man, and on structures built by man. The intensities shown in these maps are the highest likely under the most adverse geologic conditions. There will actually be a range in intensities within any small area such as a town or county, with the highest intensity generally occurring at only a few sites. Earthquakes of all three magnitudes represented in these maps occurred during the 1811 - 1812 "New Madrid earthquakes." The isoseismal patterns shown here, however, were simulated based on actual patterns of somewhat smaller but damaging earthquakes that occurred in the New Madrid seismic zone in 1843 and 1895.

> Prepared and distributed by THE MISSOURI STATE EMERGENCY MANAGEMENT AGENCY P.O. BOX 116 JEFFERSON CITY, MO 65102 Telephone: 573-526-9100

This map illustrates the same regional intensities for 6.7 and 8.6 earthquakes, respectively.



Source: United States Geological Survey at <u>http://earthquake.usgs.gov/hazards/products/conterminous/2014/HazardMap2014_lg.jpg</u> Figure 29 United States Seismic Hazard Map

Measure of Probability: Low

The probability of a 5.0 earthquake happening in Miller County is .46%. These probability decreases over the next 50 years as the magnitude rises. Homes built prior to 1939 are especially vulnerable to earthquakes. See the figure and the table below.



Figure 30 Probability of Earthquakes within 50 years between 5.0 and 9.2

Source: https://www.homefacts.com

Table 3.2 [°]	1. Homes	Built 1939	& Earlier					
Miller County	Bagnell	Brumley	Eldon	Iberia	Lake Ozark	Olean	St. Elizabeth	Tuscumbia
Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
1,421	0	8	359	75	18	21	11	30

Source: https://factfinder.census.gov
Severity/Magnitude/Extent

The extent or severity of earthquakes is generally measured in two ways: 1) the Richter Magnitude Scale is a measure of earthquake magnitude; and 2) the Modified Mercalli Intensity Scale is a measure of earthquake severity. The two scales are defined a follows. The MPC decided that even though the probability for an earthquake is low and reduced in risk over the next 50 years, the magnitude could be moderate as there may be considerable damage and loss of life. The buildings and homes are not constructed with earthquake building codes.

Richter Magnitude Scale

The Richter Magnitude Scale was developed in 1935 as a device to compare the size of earthquakes. The magnitude of an earthquake is measured using a logarithm of the maximum extent of waves recorded by seismographs. Adjustments are made to reflect the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter scale, magnitude is expressed in whole numbers and decimal fractions. For example, comparing a 5.3 and a 6.3 earthquake shows that the 6.3 quake is ten times bigger in magnitude. Each whole number increase in magnitude represents a tenfold increase in measured amplitude because of the logarithm. Each whole number step in the magnitude scale represents a release of approximately 31 times more energy.

Modified Mercalli Intensity Scale

The intensity of an earthquake is measured by the effect of the earthquake on the earth's surface. The intensity scale is based on the responses to the quake, such as people awakening, movement of furniture, damage to chimneys, etc. The intensity scale currently used in the United States is the Modified Mercalli (MM) Intensity Scale. It was developed in 1931 and composed of 12 increasing levels of intensity. They range from imperceptible shaking to catastrophic destruction, and each of the twelve levels is denoted by a Roman numeral. The scale is not a mathematical basis, but is based on observed effects. Its use gives the nonprofessionals a more meaningful idea of the severity.

Previous Occurrences

Brumley Missouri experienced a 3.1 magnitude, 5.0mi depth earthquake 1/21/1992. Eldon, Missouri experienced a 3.3 magnitude, 5.0mi depth earthquake 7/31/2005 No damages noted for either event. Sources: Home Facts.com www.homefacts.com



Figure 31 Area Map of Previous Earthquake



Figure 32 Area Map of Previous Earthquake

Probability of Future Occurrence

Probability of magnitude 5.0 or greater within 100 Years is .46%, United States Geological Survey. Source: https://pubs.usgs.gov/fs/2009/3071/pdf/FS09-3071.pdf

Probability of Earthquakes Within the Next 50 Years For Magnitudes Between 5.0 and 9.2



Figure 33 Probability of Earthquakes within 50 years between 5.0 and 9.2

Source: https://www.homefacts.com

Table 3.22. P	rojected Earth	quake Haz	ards		
	Proje	cted Earthqu	lake Ha	zard for LOCLG F	Region
Magnitude at	Probability	Intensity in I	Region	MM Scale	Expected Experience and Damage
NMSZ (Richter)	(2003 – 2053)	(MM Sca	ale)	Descriptor	
6.7	25 40%	Camden	V	Dothor Strong	
0.7	23 - 4070	Laclede	V	Rather Strong	Felt by most; damage minimal to none.
		Miller	V		
		Morgan	V		
7.6	25 - 40%	Camden	VI		
7.0	23 - 40 %	Laclede	VI	Strong	Felt by all; damage slight.
		Miller	VI		
		Morgan	VI		
8.6	7 – 10%	Camden	VII	Very Strong	Difficult to stand; damage negligible in building of good design and
		Laclede	VII		poorly built or badly designed structures.
		Miller	VII		
		Morgan	VII		

Source:http://sema.dps.mo.gov/docs/programs/Planning,%20Disaster%20&%20Recovery/State%20of%20Missouri%20Hazard%20Analysis/2011%20State%20Hazard%20Analysis/Annex_F_Earthquakes.pdf

Vulnerability

Vulnerability Overview

The potential for an earthquake of any significant magnitude is low, as there have been only two documented earthquakes felt in the region at 3.1 and 3.3 and no damages reported.

Measure of Vulnerability: Low

Damages from earthquakes could cause many types of ground failures including landslides and rockslides. Ground failures also include lateral spreading and ground subsidence by soil liquefaction along rivers and lakes. Roadways in Arkansas and Missouri areas such as Highway 54 could become impassable because of fissuring road surfaces. Liquefaction of large quantities of water, sand, and mud could flood fields and roads disrupting agriculture for weeks or months. Flooding areas where farm contaminates are stored could contaminate rivers and streams. Source: U.S. Geological Survey https://pubs.usgs.gov/fs/2009/3071/pdf/FS09-3071.pdf

Potential Losses to Existing Development

Potential loss within Miller County due to an earthquake is limited; as a rural county and most of the structures are a single story the impact will be minimal. Residences built prior to 1939 are likely to experience higher damages.

Impact of Previous and Future Development

Future development is not expected to increase the risk other than contributing to the overall exposure of what could become damaged because of an event.

Problem Statement

Earthquake was not considered by the MPC as a treat to life of property. The MPC thought it would be a good idea to encourage public awareness in the event that an earthquake should happen.

Mitigation: The Emergency Management Director of Miller County participates in an exercise to replicate a severe earthquake called the Great Central U.S. Shakeout Earthquake Drill.

The School District participates in the Great Shakeout Earthquake Drills each year.

3.3.7 Extreme Heat

Hazard Profile

Some specific sources for this hazard are:

- National Climatic Data Center, Storm Events Database, <u>http://www.ncei.noaa.gov/stormevents/</u>
- Heat Index Chart & typical health impacts from heat, National Weather Service; National Weather Service Heat Index Program, <u>www.weather.gov/os/heat/index.shtml</u>;
- Daily temperatures averages and extremes, High Plains Regional Climate Summary, <u>http://www.hprcc.unl.edu/data/historical/index.php?state=ia&action=select_state&submit=Select+State;</u>
- Hyperthermia mortality, Missouri; Missouri Department of Health and Senior Service, <u>http://health.mo.gov/living/healthcondiseases/hyperthermia/pdf/hyper1.pdf;</u>
- Hyperthermia mortality by Geographic area, Missouri Department of Health and Senior Services,
- http://health.mo.gov/living/healthcondiseases/hyperthermia/pdf/hyper2.pdf;

Hazard Description

Extreme temperature events, both hot and cold, can affect human health and mortality, natural ecosystems, agriculture and other economic sectors. The remainder of this section profiles extreme heat. Extreme cold events are profiled in combination with Winter Storm in **Section 3.4.11**. According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Ambient air temperature is one component of heat conditions, with relative humidity being the other. The relationship of these factors creates what is known as the apparent temperature. The Heat Index chart as shown in Figure 26 uses both of these factors. It is used as a guide for the apparent temperature or relative intensity of heat conditions.

	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	1.30	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	1.26	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Temperature (°F)

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution Extreme Caution Zonger Extreme Danger

Source: National Weather Service (NWS)

Note: Exposure to direct sun can increase Heat Index values by as much as 15°F. The shaded zone above 105°F corresponds to a HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity. Figure 34 Heat Index Chart

Commodity Year	Location State Code	Location State Abbreviation Code	Location County Code	Location County Name	Commodity Code	Commodity Name	Insurance Plan Code	Insurance Plan Abbreviation	Stage Code	Damage Cause Code	Damage Cause Description	Determined Acres	Indemnity Amount
2012	29	МО	131	Miller	41	Corn	1	ΥP	UH	12	Heat	15	\$610.00
2012	29	МО	131	Miller	81	Soybeans	2	RP	н	12	Heat	26.24	\$5,992.00
2011	29	МО	131	Miller	41	Corn	2	RP	н	12	Heat	54.9	\$8,493.00
2011	29	мо	131	Miller	81	Soybeans	2	RP	н	12	Heat	20	\$49.00
2006	29	мо	131	Miller	41	Corn	90	APH	UH	12	Heat	8.7	\$19.00
Total												124.84	\$15,163.00

Table 3.23. Insurance Indemnity Payments Years 2006-2016

Source https://www.rma.usda.gov/data/cause.html

Extreme heat can cause stress to crops and animals. According to USDA Risk Management Agency, losses to insurable crops during the 10-year time period from 2006 to 2016 were \$15,163.00. Extreme heat can also strain electricity delivery infrastructure overloaded during peak use of air conditioning during extreme heat events. Another type of infrastructure damage from extreme heat is road damage. When asphalt is exposed to prolonged extreme heat, it can cause buckling of asphalt-paved roads, driveways, and parking lots.

From 1988-2011, there were 3,496 fatalities in the U.S. attributed to summer heat. This translates to an annual national average of 146 deaths. During the same period, 0 deaths were recorded in the planning area, according to NCEI data. The National Weather Service stated that among natural hazards, no other natural disaster—not lightning, hurricanes, tornadoes, floods, or earthquakes—causes more deaths.

Those at greatest risk for heat-related illness include infants and children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. However, even young and healthy individuals are susceptible if they participate in strenuous physical activities during hot weather. In agricultural areas, the exposure of farm workers, as well as livestock, to extreme temperatures is a major concern.

https://www.ncei.noaa.gov/stormevents

Table 3.24. Typical Health Impacts of Extreme Heat

Heat Index (HI)	Disorder
80-90° F (HI)	Fatigue possible with prolonged exposure and/or physical activity
90-105° F (HI)	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105-130° F (HI)	Heatstroke/sunstroke highly likely with continued exposure

Source: National Weather Service Heat Index Program, www.weather.gov/os/heat/index.shtml

The National Weather Service has an alert system in place (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for issuing excessive heat alerts is when for two or more consecutive days : (1) when the maximum daytime Heat Index is expected to equal or exceed 105 degrees Fahrenheit (°F); and the night time minimum Heat Index is 80°F or above. A heat advisory is issued when temperatures reach 105 degrees and a warning is issued at 115 degrees.

Previous Occurrences

Research in the National Centers for Environmental Information of NOAA resulted in no recorded events.

Source: NOAA

https://www.ncei.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Excessive+Heat&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=1950&endDate_mm=04&endDate_dd=30&endDate_yyyy=2017&county=MILLER%3A131&hailfilter=0.00&tornfilter=0&windfilter=0.00&sort=DT&submitbutton=Search&statefips=29%2CMISSOURI

The Table below is research form the National Weather Service Natural Hazard Risk Assessment Information for Miller County Missouri provided by the WFO Springfield, MO 2009 Update.

Table 3.25. Extreme Event Number of Days Above 95* and 100* (Years 1901-2016)

Year	Days above 95 *	Days above 100*	Days in a row
1901	53	4	9
1913	62	0	5
1921	45	0	0
1953	59	5	10
1980	50	21	15
1983	42	9	9
Normal # of Days	18	2	Above 95*

Source: https://www.weather.gov/media/sgf/hazard_book/Hazard_Book_Miller.pdf

The National Weather Service (NWS) defines a heat wave as three consecutive days of temperatures of 90 degrees Fahrenheit (°F) and above. These high temperatures generally occur from June through September, but are most prevalent in the months of July and August. Missouri experiences about 40 days per year above 90°F, based on a 30-year average compiled by the NWS from 1961 through 1990. July leads this statewide mean with 15 days above 90°F, followed by August with an average of 12 days over 90°F. June and September average 6 days in addition, 4 days, respectively, for temperatures above 90°F. The 30-year climatic data is from NWS stations at Kansas City, Columbia, Springfield, and St. Louis. As these regional locations indicate, all of Missouri is subject to heat wave during the summer months.

Source: Missouri State Hazard Mitigation Plan 2013 https://archive.org/stream/2013MOHazardMitigationPlan/2013MOHazardMitigationPlan_djvu.txt



Figure 35 Heat Related Deaths in Missouri 2000-2013

Probability of Future Occurrence: High

The data available did not give a specific number of extreme heat events during the past 20 years. The probability factor throughout the plan has been determined by the number of events divided by 20 years to determine the probability factor. See page 3.11 Table 3.2 for more details. Without the necessary data to make that calculation the MPC decided it would be necessary to look closely at the severity over the 20 year period to determine the probability. Source:

https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Excessive+Heat&beginDate_mm=01&beginD ate_dd=01&beginDate_yyyy=2000&endDate_mm=03&endDate_dd=31&endDate_yyyy=2018&county=MILLER%3A131&ha ilfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=29%2CMISSOURI

The National Centers for Environmental Information of NOAA searches provided little data, leading to the possibility that may heat events go unreported to the NCEI.

Geographic Location

Extreme heat is an area-wide hazard event, and that the risk of extreme heat does not vary across the planning area.

Severity/Magnitude/Extent

Missourians are used to heat events during the summer months; taken precaution to help the most vulnerable populations is important and limit the risk associated with extreme heat.

Measure of Severity: Moderate

Based on the costs associated with extreme heat the MPC thought that the severity within Missouri was moderate.

Measure of Probability: High

Summer comes every year and high heat is expected so the probability of some extreme heat during the summer months is expected.

Vulnerability

Vulnerability Overview

While the probability that Miller County will experience heat related events based on the impact to the communities and the population as Miller County has experienced zero heat related deaths between 2000-2013.

Measure of Vulnerability: Low

Although, research has not shown any deaths in Miller County to date, particularly vulnerable are children, the elderly, and those with respiratory problems. Storm events can cause many households and businesses to be without power for extended period. These outages can have profound effects on individuals and the local economy. Animals such as pets, cattle and other farm animals can be adversely affected by the heat reducing their food and water intake, increased respiration rates, and increased body temperature.

Source: Missouri State Hazard Mitigation Plan 2013 https://archive.org/stream/2013MOHazardMitigationPlan/2013MOHazardMitigationPlan_djvu.txt

Potential Losses to Existing Development

No heat-related deaths reported in Miller County. The historical USDA Crop Insurance payments, yearly crop losses can be estimated at \$5,000 to \$8,500 annually if there is an extreme heat event.

Population growth can result in increases in the age groups that are most vulnerable to extreme heat. Population growth also increases the strain on electricity infrastructure, as more electricity is needed to accommodate the growing population.

Impact of Previous and Future Development

The MPC did not feel that there were any previous impact and no potential impacts on future development.

Hazard Summary by Jurisdiction

Those at greatest risk for heat-related illness and deaths include children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain

medications. To determine jurisdictions within the planning area with populations more vulnerable to extreme heat, demographic data was obtained from the 2010 census on population percentages in each jurisdiction comprised of those under age 5 and over age 65. Data was not available for overweight individuals and those on medications vulnerable to extreme heat. **Table 3.21** below summarizes vulnerable populations in the participating jurisdictions. Note that school and special districts are not included in the table because students and those working for the special districts are not customarily in these age groups.

Table 3.26.	County Population	under Age 5 and	Over Age 65, 2015	ACS Data
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Jurisdiction	Population of Jurisdiction	Percent of Population Under 5 yrs	Percent of Population 65 yrs and over
Miller County	24,956	6.2%	17.3%
City of Bagnell	52	1.9%	26.90%
Village of Brumley	65	5.3%	26.2%
City of Eldon	4,617	6.8%	18.5%
City of Iberia	693	6.3%	17.9%
City of Lake Ozark	1,626	5.2%	23.2%
City of Olean	99	10.1%	15.2%
Village of St. Elizabeth	319	6.6%	25.7%
Village of Tuscumbia	252	2.4%	13.1%

Source: U.S. Census Bureau, (*) includes entire population of each city or county https://factfinder.census.gov

All school districts have air-conditioning.

Problem Statement

Potential Impact of Existing Structures: Extreme Heat does not necessarily have a direct impact on existing structures, while extended periods of Extreme Heat can fatigue aging air conditioning systems and electrical systems there is no data available to demonstrate that Extreme Heat has a direct impact on either of systems.

Mitigation: In an effort to mitigate Extreme Heat, there are several options in which our planning organization facilitates to lessen the effects of extreme heat. Educating the public about the concerns, hazards, and potential health risks from extreme heat has been a priority.

The Missouri Department of Health and Human Services maintains a list of cooling centers throughout the state. In the planning area there are several locations provided.

Eldon Community Center 309 E 2nd St Eldon 65026 Phone: 573-392-8937 Eldon Public Library 308 E 1st St Eldon 65026 Phone: 573-392-6657 Eldon Senior Center 926 E North St Eldon 65026 Phone: 573-392-6102 Friendship Hall 205 E Main St Iberia 65486 Phone: 573-793-2747 Source: http://gis.dhss.mo.gov/Website/coolingCenter/coolingCenter.html

The Missouri State High School Activities Association (MSHSAA) provides education information to coaches and students concerned about heat related issues. http://www.mshsaa.org/SportsMedicine/. The Springfield Office of the National Weather Service covers our planning area. There is an established early-warning system to help the public prepare for pending severe weather, including Extreme Heat. Refer to Section 2.9 in reference to the early-warning systems currently in place, shelters available, and the public notifications that are used within the planning area

3.3.8 Fires (Urban/Structural and Wild)

The specific sources for this hazard are:

- Missouri Department of Conversation Wildfire Data Search at <u>http://mdc4.mdc.mo.gov/applications/FireReporting/Report.aspx</u>
- Statistics, Missouri Division of Fire Safety;
- National Statistics, US Fire Administration;
- Fire/Rescue Mutual Aid Regions in Missouri;
- Forestry Division of the Missouri Dept of Conservation;
- National Fire Incident Reporting System (NFIRS), <u>http://www.dfs.dps.mo.gov/programs/resources/fire-incident-reporting-system.asp</u>
- Firewise Missouri, <u>http://www.firewisemissouri.org/wildfire-in-missouri.html</u>
- University of Wisconsin Silvis Lab, <u>http://silvis.forest.wisc.edu/maps/wui_main</u>

Hazard Profile

Hazard Description

The incident types considered for urban/structural fire include all fires in the following categories: 1) general fires, 2) structure fire, 3) fire in mobile property used as a fixed structure, and 4) mobile property (vehicle) fire. The fire incident types for wildfires include: 1) natural vegetation fire, 2) outside rubbish fire, 3) special outside fire, and 4) cultivated vegetation, crop fire.

The Missouri Division of Fire Safety (MDFS) indicates that approximately 80 percent of the fire departments in Missouri are staffed with volunteers. Whether paid or volunteer, these departments are often limited by lack of resources and financial assistance. The impact of a fire to a single-story building in a small community may be as great as that of a larger fire to a multi-story building in a large city.

The Forestry Division of the Missouri Department of Conservation (MDC) is responsible for protecting privately owned and state-owned forests and grasslands from wildfires. To accomplish this task, eight forestry regions have been established in Missouri for fire suppression. The Forestry Division works closely with volunteer fire departments and federal partners to assist with fire suppression activities. Currently, more than 900 rural fire departments in Missouri have mutual aid agreements with the Forestry Division to obtain assistance in wildfire protection if needed.

Most of Missouri fires occur during the spring season between February and May. The length and severity of both structural and wild land fires depend largely on weather conditions. Spring in Missouri is usually characterized by low humidity and high winds. These conditions result in higher fire danger. In addition, due to the recent lack of moisture throughout many areas of the state, conditions are likely to increase the risk of wildfires. Drought conditions can also hamper firefighting

efforts, as decreasing water supplies may not prove adequate for firefighting. It is common for rural residents burn their garden spots, brush piles, and other areas in the spring. Some landowners also believe it is necessary to burn their forests in the spring to promote grass growth, kill ticks, and reduce brush. Therefore, spring months are the most dangerous for wildfires. The second most critical period of the year is fall. Depending on the weather conditions, a sizeable number of fires may occur between mid-October and late November.

Geographic Location

Absent demographic information indicating otherwise, the risk of structural fire probably does not vary widely across the planning area. However, damages due to wildfires would be higher in communities with wilder land–urban interface (WUI) areas. The term refers to the zone of transition between unoccupied land and human development and needs to be defined in the plan. Within the WUI, there are two specific areas identified: 1) Interface and 2) Intermix. The interface areas are those areas that about wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas.



Source

Figure 36 Miller County Wildland-Urban Interface and Intermix Map

Missouri

2010



Conservation Biology Institute Protected Areas Database (PAD) version 2

Source http://silvis.forest.wisc.edu/data/wui_change Figure 37 Wildland-Urban Interface (WUI) Map

<figure><figure>

The City of Bagnell has 67 acres of interface and 171 acres of intermix in the medium density rating. The City f Brumley has 26 acres of interface and 252 acres of intermix with low to medium density rating. The City of Eldon has 40 acres of interface and 9 acres of intermix with a low-density rating. The City of Iberia has 0 acres of interface and 51 acres of intermix with a medium density rating. Lake Ozark has 923 acres of interface and 3,368 acres of intermix with a medium-high density intermix and a high density interface. These homes and condominiums are located along the coastline of the lake in the area of mile markers 1 and 2, Lighthouse Landing, and the Lotell Hollow Cove areas.

Severity/Magnitude/Extent

Structural and urban fires are a daily occurrence throughout the State. Statewide, approximately 100 fatalities occur annually, as well as numerous injuries affecting the lives of the victims, their families, and many others—especially those involved in fire and medical services. Unlike other disasters, structural fires can be caused by human criminal activity: arson. All citizens pay the costs of arson whether through increased insurance rates, higher costs to maintain fire and medical services, or the costs of supporting the criminal justice system.

Wildfires damage the environment, killing some plants and occasionally animals. Firefighters have been injured or killed, and structures can be damaged or destroyed. The loss of plants can heighten the risk of soil erosion and landslides. Although Missouri wildfires are not the size and intensity of those in the Western United States, they could affect recreation and tourism in and near the fires.

Wildland fires in Missouri have been mostly a result of human activity rather than lightning or some other natural event. Wildfires in Missouri are usually surface fires, burning the dead leaves on the ground or dried grasses. They do sometimes "torch" or "crown" out in certain dense evergreen stands like eastern red cedar and shortleaf pine. However, Missouri does not have the extensive stands of evergreens found in the western US that fuel the large fire storms seen on television news stories.

While very unusual, crown fires can and do occur in Missouri native hardwood forests during prolonged periods of drought combined with extreme heat, low relative humidity, and high wind. Tornadoes, high winds, wet snow, and ice storms in recent years have placed a large amount of woody material on the forest floor that causes wildfires to burn hotter and longer. These conditions also make it more difficult for fire fighters suppress fires safely. See below links.

http://www.firewisemissouri.org/wildfire-in-missouri.html http://www.firewise.org/wildfire-preparedness.aspx

Often wildfires in Missouri go unnoticed by the public because the sensational fire behavior that captures the attention of television viewers is rare in the state. Yet, from the standpoint of destroying homes and other property, Missouri wildfires can be quite destructive.

Previous Occurrences

Within Miller County from 2007-2018, there was a total of 602 fires report by MDC. There was 11 arson fires reported or 2 percent of all fires reported. Fires started by human interaction, including arson, campfires, children and smoking made up 5.5 percent of all fires reported. Debris fires were reported at 247 or 41 percent of all fires reported. There a large number of fires that are reported as miscellaneous, unknown and not reported with a total of 298 fires for 49.5 percent of all fires with not clear reason for the fire. Lightning was reported to start 4 fires during the time period which is less than one percent of all fires reported. Equipment-related fires reported were 20 or 3.32 percent of all fires reported.

 Table 3.27.
 Previous Occurrences Wildland Fires 2012-2017

Damages from Wildfires in Miller County 2003 – 2017										
		Threatened			Damaged			Destroyed		
County	Acres Burnt R O C R O C R O							с		
Miller	10212.01	13	13	1	244	146	14	9	19	3
Key: R = Residential Buildings, O = Outbuildings, C = Commercial Buildings										
Source: http://md	lc4.mdc.mo.g	ov/applica	tions/FireRe	eporting/F	Report.asp	X				

Probability of Future Occurrence: High

Burning trash and debris is a common practice in the rural areas of the County, there is also a large number of state parks that have campers year round, and agriculture activities use equipment, all these activities can cause fires and do. Therefore the probability is high.

Measure of Probability: High

With some 602 events in a 20-year period of time that is nearly 30 fires on an annualized basis. There were over 10,212 acres burned and numerous homes and outbuilding destroyed or damaged. This is a large number in comparison to the population in the rural areas of the county. Reference the Table 3.2 on page 3.11 that show the probability at 100 percent and the vulnerability as high.

The primary source of the fire data was collected from MDC as there are no recorded events in the NCEI/NOAA.

<u>Vulnerability</u>

Vulnerability Overview

Table 3.28. Ranges for Wildfire Vulnerability Factor Ratings in Missouri

Factors Considered	Low (1)	Medium-Low (2)	Medium (3)	Medium-High (4)	High (5)				
	Level 1	Level 2 Range	Level 3 Range	Level 4 Range	Level 5 Range				
	Range								
Likelihood Rating	<29.56	29.56 – 59.11	59.12 - 88.67	88.68 – 118.23	>118.23				
Annualized Acres									
Burned Rating	<100	100 – 199	200 - 499	500 - 999	>999				
Source:http://sema.dps.mo.gov/docs/programs/Logistics,%20Resources,%20Mitigation%20&%20Floodplain/mitigation/local									
-multi-jurisdictional-haza	rd-mitigation-plan	-update.pdf			-				

At this time, research determined the fire departments in Miller County, Missouri are in the National Fire Incident Reporting System (NFIRS) but does not report fire events to the FIRS website. Source https://www.nfirs.fema.gov

Potential Losses to Existing Development

The MDC compiled statistics to determine the factor values for each county and divided them into 5 ranges with 5 being the highest and 1 being the lowest.

 Table 3.29.
 Wildfire Vulnerability Factor Ratings for Miller County 2004 – 2008

County	Wildfires 2004 - 2008	Ave. Annual # Wildfires	Likelihood Rating 1-5	Acres Burned	Ave. Annual Acres Burned	Ave. Acres Burned Rating	Total Buildings Damaged
Miller	248	49.6	2	1457.16	291	3	5
Source: <u>http://</u> -multi-jurisdic	/sema.dps.mo.go tional-hazard-mi	ov/docs/programs	s/Logistics,%20Res late.pdf	sources,%20Mi	tigation%20&9	%20Floodplain	/mitigation/local

Impact of Previous and Future Development

In a four-year timeframe, the average number of acres that burned was three. There are no indications of future development that would be at risk due to wildfires.

Potential Impact of Existing Structures: Wildfires can have an enormous impact on Existing Structures that may be in the path of the Wildfire. Little can be done to protect a structure that is made of flammable materials. There is limited data available on the costs associated with Wildfires in Miller County; therefore, it is hard to determine the potential impact on Existing Structures other than it can have a devastating impact about property damage that is unsalvageable.

Problem Statement

Mitigation: Operation Forest Arson is a toll-free hotline that allows concerned citizens to call in anonymously, and report arson related fires and any information that may be available on any suspected arson. (800) 392-1111

Crop Insurance: Crop insurance protects farmers from losses due to natural disasters, including drought. Crop insurance can be purchased through private insurance companies or agents.

Miller County collaborates with local fire departments, fire protection districts, and community groups to conduct special public education events, such as Fire Safety and Awareness Day.

Public awareness of burn bans is particularly important when unsafe burn conditions exist. Miller County works with local fire departments, fire protection districts, and local media to create public service announcements that reflect burn ban restrictions. Ozarks First.Com also provides and updated listing on all Burn Bans in the Ozarks.

Source http://www.ozarksfirst.com/news/updated-list-burn-bans-in-the-ozarks/66982600

3.3.9 Flooding (Flash and River)

Some specific sources for this hazard are:

- Watershed map, Environmental Protection Agency, <u>http://cfpub.epa.gov/surf/county.cfm?fips_code=19169</u>
- FEMA Map Service Center, Digital Flood Insurance Rate Maps (DFIRM) for all jurisdictions, if available, <u>msc.fema.gov/portal</u>
- NFIP Community Status Book, <u>http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book</u>
- NFIP claims status, BureauNet, <u>http://bsa.nfipstat.fema.gov/reports/reports.html</u>
- Flood Insurance Administration—Repetitive Loss List (this must be requested from the State Floodplain Management agency or FEMA)
- National Climatic Data Center, Storm Events Database, <u>http://www.ncei.noaa.gov/stormevents/</u>
- USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm

Profile

Hazard Description

Lake of the Ozarks is distinctive in the fact that it is one of the largest fabricated lakes. Camden, Miller, and Morgan Counties all have shoreline along Lake of the Ozarks. The lake surface elevation is regulated by Osage (Bagnell) Dam, with normal elevation at 660 above sea level there is a relatively stable surface elevation for the lake region. Flooding along the shoreline in minimal as the Dam regulates the flow of water and Ameren Missouri draws down the lake water level several times during the year when flooding could be an issue, thus avoiding the potential of flooding on the shorelines around the lake.

Miller County does have its share of flooding. Characteristically, flooding in Miller County is associated with heavy rainfall. With these rural communities, low water crossings are common and when heavy rainfall is experienced, these roadways become impassable. Significant rainfall will also cause streets and ditches to flood. Flooding often causes severe damage to the counties roadway system as Miller County has over 600 miles of gravel roads.

A flood is partial or complete inundation of normally dry land areas. Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt, or ice. There are several types of riverine floods, including headwater, backwater, interior drainage, and flash flooding. Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt, or ice melt. The areas adjacent to rivers and stream banks that carry excess floodwater during rapid runoff are called floodplains. A floodplain is defined as the lowland and relatively flat area adjoining a river or stream. The terms "base flood" and "100- year flood" refer to the area in the floodplain that is subject to a one percent or greater chance of flooding in any given year. Floodplains are part of a larger entity called a basin, which is defined as all the land drained by a river and its branches.

A flash flood occurs when water levels rise at an extremely fast rate because of intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil, or impermeable surfaces. Flash flooding can happen in Special Flood Hazard Areas (SFHAs) as delineated by the National Flood Insurance Program (NFIP), and can happen in areas not associated with floodplains.

Ice jam flooding is a form of flash flooding that occurs when ice breaks up in moving waterways, and then stacks on itself where channels narrow. This creates a natural dam, often causing flooding within minutes of the dam formation.

In some cases, flooding may not be directly attributable to a river, stream, or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall or snowmelt, saturated ground, and inadequate drainage. With no place to go, the water will find the lowest elevations – areas that are often not in a floodplain. This type of flooding, often referred to as sheet flooding, is becoming increasingly prevalent as development outstrips the ability of the drainage infrastructure to properly carry and disburse the water flow.

Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area. Flash flooding is a dangerous form of flooding which can reach full peak in only a few minutes. Rapid onset allows little or no time for protective measures. Flash flood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding can result in higher loss of life, both human and animal, than slower developing river and stream flooding.

In certain areas, aging storm sewer systems are not designed to carry the capacity currently needed to handle the increased storm runoff. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns. This combined with rainfall trends and rainfall extremes all demonstrate the high probability, yet generally unpredictable nature of flash flooding in the planning area.

Although flash floods are somewhat unpredictable, there are factors that can point to the likelihood of flash floods occurring. Weather surveillance radar is being used to improve monitoring capabilities of intense rainfall. This, along with knowledge of the watershed characteristics, modeling techniques, monitoring, and advanced warning systems has increased the warning time for flash floods.

Miller County has experienced 38 incidents of severe flooding since 1990 including five Presidential Disaster Declarations. As reflected in the chart below, a majority of all incidents occurred countywide about flooding and flash flooding. 63% of all flooding occurrences had an impact on the entire planning area. The remaining 37% of all incidents are relatively evenly shared between the communities of St. Elizabeth with (3) incidents, Iberia with (8) incidents, Eldon with (16) incidents, Tuscumbia with (13) incidents and only (5) for the City of Bagnell. As the planning team reviewed the numbers, it was the overwhelming consensus that the overall impact about flooding is by far a countywide issue based on historical data.

Source: Miller County Hazard Mitigation Plan 2006

https://www.ncei.noaa.gov/stormevents/listevents.jsp?eventType=ALL&beginDate mm=01&beginDate dd=01&beginDate yyyy=1990&end Date mm=04&endDate dd=30&endDate yyyy=2017&county=MILLER%3A131&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&subm itbutton=Search&statefips=29%2CMISSOURI

Geographic Location

Table 3.30.	Miller Co	unty NCEI Flood Events by Location, 1995	5-2015			
Location	Date	Flooded	# of Events	Property Damage	Crop Damage	Deaths/Injur ies
City of Iberia	3/17/2013	Route K closed due to high waters		0	0	0/0
City of Iberia	4/14/2012	Route K closed due to high waters		0	0	0/0
City of Iberia	2/24/2011	localized Route K was flooded at Tavern Creek	3	0	0	0/0
City of Bagnell	9/3/2008	Blue Spring Creek flooded a section of HWY Z	1	0	0	0/0
City of Eldon	3/19/2008	Poor drainage areas, flooded roadways and low areas near rivers and creeks.	1	0	0	0/0
Miller County	1/12/2005	(Unspecified) low water crossings, low lying areas of Tavern Creek significant flooding, HWY 52 two miles east of St. Elizabeth		20K	0	0/0
Miller County	1/5/2005	(Unspecified) widespread numerous roads and low lying areas impassable		300K	0	0/0
Miller County	5/8/2002	(Unspecified) Bridges blocked by debris		0/0		
Miller County	4/19/2002	(Unspecified) county roads and low water crossings		0	0	0/0
Miller County	7/26/1998	(Unspecified) Widespread damage to roads, low water bridges, Excessive damage to farm equipment, Crop/Cattle Losses, Poultry Losses	13	456K	4.2M	0/0

Source: *Includes Communities Not in Plan

NCEI/NOAA

https://www.ncei.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Flood&beginDate_mm=01&beginDate_dd=01&beginDate_yy yy=1995&endDate_mm=07&endDate_dd=30&endDate_yyy=2015&county=MILLER%3A131&hailfilter=0.00&tornfilter=0&windfilter=000&s ort=DT&submitbutton=Search&statefips=29%2CMISSOURI

Table 3.31.	Miller Cou	nty NCEI Flash Flood Events by	y Locatio	n, 2017	-1995	j	
Location	<u>Date</u>	Flooded Areas	# of Events	Death	<u>Injuries</u>	Property Damage	<u>Crop Damage</u>
BAGNELL	4/29/2017- 4/30/2017	Heavy rainfall over several days led to historic and devastating flash floods, record-breaking river levels, Car Rock Road just east of Highway 54 near Eldon was flooded along with Blue Springs Drive at Little Gravois Creek.	1	0	0	2M	0
BAGNELL	8/5/2016	Two feet of flowing water flooded HWY Z at Blue Springs Creek	1	0	0	0	0
MARY"S HOME	12/28/201 5	Nearly all low water crossings were flooded. Several rural roads suffered flood damage. Several homes and properties sustained flood water damage.	1	0	0	500K	0
WEST AURORA	12/26/201 5	Highway Z was impassable and closed due to flooding.	1	0	0	0	0
TUSCUMBIA	8/7/2013	Several homes around Tuscumbia were flooded and some residents were rescued from high water. Several low water crossings and roadways were damaged due to the water.	1	0	0	2M	0
	9/7/2012	Highway 42 was flooded and impassable near the Maries and Miller County line. A high water rescue was ongoing at the time of the report. No injuries occurred	1	0	0	0	0
STANTHONY	8/7/2013	Route C, near Deane Creek was	1	0	0	0	0
BRUMLEY	8/6/2013	closed due to floodwaters. Up to 20 inches of rainfall in several days.	1	0	0	0	0
IBERIA	8/6/2013	Route K near Little Tavern Creek was closed to traffic due to flooding. Some localized areas receiving up to 20 inches of rainfall in several days. This caused devastating floods and flash floods with some rivers reaching all time record levels.	1	0	0	10K	0
ELDON	5/31/2013	Here was widespread flooding of roadways in the Eldon area.	1	0	0	0	0
ARURORA	6/1/2013	A teen was near a storm drain culvert and was swept away by quickly rising water. His body was later recovered along a creek about half a mile from the original location	1	1	0	0	0

	-						
AURORA SPRINGS	4/10/2013	Low water crossings flooded	1	0	0	0	0
	4/15/2012	Law enforcement reported several low water crossings impassable due	1	0	0	0	0
	4/15/2012		I	0	0	0	0
TUSCUMBIA	6/19/2011	Road, near Woods Road, was flooded and impassable.	1	0	0	0	0
MARY"S HOME	5/25/2011	Highway H was flooded and impassable.	1	0	0	0	0
MARY"S HOME	5/26/2011	Highway M near the Saline Valley Conservation Area was flooded and impassable.	1	0	0	0	0
TUSCUMBIA	5/25/2011	Numerous low water crossings were flooded.	1	0	0	0	0
BAGNELL	5/19/2011	Several other low water crossings were reported to be flooded across western Miller County. Highway Z and Highway Y-19 was reported to have around a foot of water over the roadway.	1	0	0	0	0
TUSCUMBIA	7/11/2010	Numerous low water crossings were flooded.	1	0	0	0	0
WEST AURORA	7/11/2010	The intersection of Highways Y and Z was flooded and closed.	1	0	0	0	0
ST ANTHONY	7/11/2010	State Highway A was flooded and the road surface was damaged.	1	0	0	1K	0
BRUMLEY	5/16/2010	Water was reported flowing across Highway C a quarter mile north of Highway 42.	1	0	0	0	0
IBERIA	5/12/2010	Numerous roads and low water crossings were flooded and impassable	1	0	0	0	0
MOUNT PLEASANT	2/21/2010	Numerous low water crossings were flooded near the Mt. Pleasant area.	1	0	0	0	0
ELDON	11/15/200 9	Several low water roads and bridges were flooded across the county.	1	0	0	0	0
TUSCUMBIA	10/8/2009	Several low water crossings were flooded across the county.	1	0	0	0	0
ELDON	6/15/2009	Three to five inches of rain fell over Miller County. This excessive rainfall caused flooding of creeks and small streams. Several roadways became impassable. Highway 17 and Highway KK, a low water crossing along Allan Road, and a section of Highway Z.	1	0	0	0	0

WEST AURORA	5/25/2009	of Highway W and Lakeland Road along with a section of Blue Spring Drive at its intersection with the Little Gravois Creek.	1	0	0	0	0
MOUNT PLEASANT	12/27/200 8	Two bridges were washed out from swift moving flood water.	1	1	1	5K	0
TUSCUMBIA	7/3/2008	Excessive rainfall caused several low water crossings to become impassable to motorists across much of central and southwest sections of the county.	1	0	0	0	0
ELDON	6/4/2008 9/14/2008	Several low water crossings across the county became impassable	1	0	0	0	0
MOUNT PLEASANT	12/27/200 8	Excessive rain caused widespread flooding across portions of Miller County. Two bridges were washed out from swift moving flood water.	1	0	0	5k	0
TUSCUMBIA	5/25/2008	Excessive rainfall caused several low water crossings to become impassable to motorists across much of central and southwest sections of the county.	1	0	0	0	0
ELDON	6/30/2008	Excessive rainfall caused flooding of low water crossing and low-lying areas across much of the county. The intersection of Highway 52 and Highway Y experienced flooding.	1	0	0	0	0
ELDON	4/10/2008	Southeast of Iberia and along Highway K, two low water crossings became impassable to motorists.	1	0	0	0	0
ELDON	3/18/2008	Areas that typically flood due to excessive rainfall were flooded. Several secondary roads experienced damage.	1	0	0	250K	0
HOECKER	1/8/2008	Excessive rainfall caused several areas of Miller County to experience flash flooding.	1	0	0	0	0
ELDON	6/30/2007	Excessive rainfall caused a few low water crossings and secondary roads to become flooded and impassable to motorists.	1	0	0	0	0
BRUMLEY	5/27/2007	Excessive rainfall caused the Mill and Wolf creeks near Brumley to flood into low lying areas.	1	0	0	0	0
ELDON	5/10/2007	The intersection of Highway 52 and Highway Y experienced flooding.	1	0	0	0	0

			-				
ST. ELIZABETH	5/2/2007	Highway 42 between Brumley and Iberia became impassable to motorists for a few hours due to high water. Cat Rock Road near Highway 54 south of Eldon was also flooded and impassable to motorists.	1	0	0	0	0
TUSCUMBIA	4/13/2007	Heavy rain caused several low water crossings across Miller County to become impassable. One car was washed off Mill Creek Road.	1	0	0	0	0
	4/20/2005	Several bridges and low water crossings along the Tavern Creek and Little Tavern Creek were	4	0	0	0	0
ST.	4/20/2005	Water was reported over Highway	I	0	0	0	0
ELIZABETH	1/12/2005	52 2 miles east of St. Elizabeth.	1	0	0	0	0
MILLER COUNTY	1/5/2005	Several periods of heavy rain, numerous roads and low lying areas were inundated and impassable	1	0	0	0	0
ELDON	8/23/2004	Two gravel roads were briefly flooded over from heavy thunderstorms. One vehicle was stranded in the flooding.	1	0	0	0	0
EL DON	5/26/2004	Two gravel roads were briefly flooded over from heavy thunderstorms. One vehicle was stranded in the flooding	1	0	0	10K	0
ELDON	9/1/2003	Heavy rainfall of between two and three inches caused flooding in low	1	0	0	0	0
ELDON	7/18/2003	Heavy rainfall of between two and three inches caused flooding in low water crossings	1	0	0	0	0
ELDON	6/10/2003	Heavy rainfall of between two and three inches caused flooding in low water crossings	1	0	0	0	0
LAKE OZARK	6/10/2003	Flash flooding induced from thunderstorms inundated a section of a road that eventually washed away.	1	0	0	0	0
TUSCUMBIA	5/19/2002	A flash flood along the Saline Creek swept away 2 girls while they were camping along the creek.	1	0	0	0	0
IBERIA	5/12/2002	Highway 17 was briefly flooded near the intersection of Highway K.	1	0	0	0	0
TUSCUMBIA	5/9/2002	Extensive flooding of small streams and creeks, county roads, low water crossings and other low-lying areas. Major highways were also affected. The widespread flooding forced evacuations in several communities and the closing of some schools.	1	0	0	0	0

			-				
MILLER	4/19/2002	Two to four inches fell around the six to eight inch band, which allowed for significant flooding to occur. Big Tavern Creek and Little Tavern Creek flooded causing considerable damage to roads and bridges, St. Elizabeth where the Creeks cross Highway 52. The roads had chunks of concrete shattered and missing from the bridge's floor. Near Iberia, an unofficial report of eight inches of rain fell in less than one hour. Fences were also flattened by rushing water in a few places. One creek crossing had debris caught up in trees a good five or six feet above ground	1	0	0	100k	0
000111	4/10/2002	giouna.		0	0	TOOK	0
MILLER COUNTY	4/3/2001	Significant street flooding occurred around the Eldon area.	1	0	0	0	0
MILLER COUNTY	7/28/2000	State Highway 87 north of Eldon was also flooded for a brief time.	1	0	0	0	0
MILLER COUNTY	5/4/1999	2 to 6 inch rainfall over central, Numerous low-lying roads and low water crossings were closed due to the flooding.	1	0	0	0	0
MILLER COUNTY	6/20/1998	Rainfall in excess of one inch in three hours caused flooding of low water crossings	1	0	0	0	0
MILLER COUNTY	6/8/1998	Rainfall in excess of one inch in three hours caused flooding of low water crossings	1	0	0	0	0
NORTHERN MILLER COUNTY	6/4/1998	Area producing the flooding of numerous low water crossings across the area. Both secondary and some state highways were affected.	1	0	0	0	0
MILLER COUNTY	3/19/1998	Highway 52, 2 miles east of St. Elizabeth, was closed for nearly 24 hours.	1	0	0	0	0
MILLER COUNTY	3/17/1998	Rainfall in excess of one inch in three hours caused flooding of low water crossings	1	0	0	0	0
MILLER COUNTY	2/26/1998	Rainfall in excess of one inch in three hours caused flooding of low water County roads along Highway 17 and Highway 52 north and east of Tuscumbia was most impacted. Highway 52, 2 miles east of St. Elizabeth, was closed during the evening.	1	0	0	0	0
ELDON	8/19/1997	Highway 17 was briefly flooded near the intersection of Highway K.	1	0	0	0	0

		Three inches of rain caused street flooding in Eldon and a bridge was washed out on a county road north					
ELDON	6/28/1997	of Eldon.	1	0	0	10K	0
TUSCUMBIA	5/26/1997	Up to two inches of rain, falling on saturated grounds caused many low water crossings to be underwater throughout the county.	1	2	0	0	0
ELDON	11/6/1996	One to three inches of rain caused flooding along County Highway Y just southwest of Eldon.	1	0	0	0	0
ELDON	6/6/1996	One to three inches of rain caused flooding along County Highway Y just southwest of Eldon.	1	0	0	0	0
TUSCUMBIA	5/7/1996	Up to three inches of rain, causing localized flooding. Water was reported over Highway 52 2 miles east of St. Elizabeth.	1	0	0	0	0
ST. ELIZABETH	5/5/1996	Up to three inches of rain, causing localized flooding. Water was reported over Highway 52 2 miles east of St. Elizabeth.	1	0	0	0	0
*Countywide Totals:			69	4	0	5M	0

* Includes Communities Not in Plan

Source: NCFI/NOAA

https://www.ncei.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Flood&beginDate_mm=01&beginDate_dd=01&beginDate_yy yy=1995&endDate_mm=01&endDate_dd=01&endDate_yyyy=2015&county=MILLER%3A131&hailfilter=0.00&tornfilter=0&windfilter=000&s ort=DT&submitbutton=Search&statefips=29%2CMISSOURI

Severity/Magnitude/Extent

Missouri has a long and active history of flooding over the past century, according to the 2013 State Hazard Mitigation Plan. Flooding along Missouri's major rivers generally results in slow-moving disasters. River crest levels are forecast several days in advance, allowing communities' downstream sufficient time to take protective measures, such as sandbagging and evacuations. Nevertheless, floods exact a heavy toll in terms of human suffering and losses to public and private property. By contrast, flash flood events in recent years have caused a higher number of deaths and major property damage in many areas of Missouri.

Flooding presents a danger to life and property, often resulting in injuries, and in some cases, fatalities. Floodwaters themselves can interact with hazardous materials. Hazardous materials stored in large containers could break loose or puncture because of flood activity. Examples are bulk propane tanks. When this happens, evacuation of citizens is necessary.

Public health concerns may result from flooding, requiring disease and injury surveillance. Community sanitation to evaluate flood-affected food supplies may also be necessary. Private water and sewage sanitation could be impacted, and vector control (for mosquitoes and other entomology concerns) may be necessary. When roads and bridges are inundated by water, damage can occur as the water scours materials around bridge abutments and gravel roads. Floodwaters can also cause erosion undermining roadbeds. In some instances, steep slopes that are saturated with water may cause mud or rock slides onto roadways. These damages can cause costly repairs for state, county, and city road and bridge maintenance departments. When sewer back-up occurs, this can result in costly clean-up for home and business owners as well as present a health hazard.

National Flood Insurance Program (NFIP) Participation

Figure 3.32. NFIP Participation in Miller County 2016									
Community ID #	Community Name	NFIP Participant (Y/N)	Current Effective Map Date	Regular- Emergency Program Entry Date					
290226	Miller County	Y	05/18/09	10/19/98					
290496	City of Bagnell	Ν	05/18/09	NA					
290984	Village of Brumley	Ν	05/18/09	NA					
290227	City of Eldon	Y	05/18/09(M) 05/18/09(M)	12/12/78					
290719	City of Iberia	Ν	5/18/09	NA					
290698	City of Lake Ozark	Y	5/18/09	08/01/05					
290985	City of Olean	Ν	5/18/09	NA					
290982	Village of St. Elizabeth	Ν	5/18/09	NA					
290228	Village of Tuscumbia	Y	05/18/09(M)	03/01/87					

Source: NFIP Community Status Book, <u>https://www.ferna.gov/cis/MO.html</u> BureauNet, M= No elevation determined – all Zone A, C, and X: NSFHA = No Special Flood Hazard Area; E=Emergency Program

When a community is identified as a flood-prone and does not join the NFIP it will face sanctions. The following sanctions apply if a community does not take the necessary steps to qualify for the NFIP within one year of being identified as a flood-prone area by FEMA. Non-participating communities that are not identified as a flood-prone area will not be impacted by these sanctions. Sanctions that have been identified by FEMA include:

- Property owners will not be able to purchase flood insurance policies.
- Federal grants and loans will not be available in flood hazard areas under programs that are available from HUD, EPA or SBA.
- Federal assistance will not be available for building located in a flood hazard area.
- Mortgage loans from FHA and VA will not be available to homeowners in a flood hazard area.
- Conventional lending is available, but many lending institutions opt to not loan in a flood hazard area, and if they do decide to loan in that area they must notify the homeowners that they are not eligible for federal disaster assistance in the event of a flood event.

There are four communities in Miller County that currently fall under the status of sanctions including City of BagenII (5/18/2010) the Village of Brumley (5/18/2010) the City of Iberia (5/28/1977) and the Village of St. Elizabeth (5/18/2010).

Figure 1.33. NFIP Policy and Claim Statistics as of 7/31/2017									
Community Name	Policies in Force	Insurance in Force	Written Premium In-Force						
Miller County	25	\$3,895,900	17, 802						
City of Bagnell									
Village of Brumley									
City of Eldon	1	\$556,000	3,493						
City of Iberia									
City of Lake Ozark									
City of Olean									
Village of St. Elizabeth									
Village of Tuscumbia	2	\$127, 700	1,616						

Source: NFIP Community Status Book; BureauNet, https://bsa.nfipstat.fema.gov/reports/1011.htm#MOT

Repetitive Loss/Severe Repetitive Loss Properties

Repetitive Loss Properties are those properties with at least two flood insurance payments of \$5,000 or more in a 10-year period. According to the Flood Insurance Administration, jurisdictions included in the planning area have a combined two repetitive loss properties. There is no record of any of these properties being mitigated. Additional information was not available.

Table 3.34.	Miller County Repetitive Loss Properties
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Jurisdiction	# of Properties	Type of Property	# Mitigated	Building Payments	Content Payments	Total Payments	Average Payment	# of Losses
Miller County								
City of Bagnell								
Village of Brumley								
City of Eldon	1	Res	1	15,662.94	71,013.07	86,676.01	8,667.60	10
City of Iberia								
City of Lake Ozark								
City of Olean								
Village of St. Elizabeth								
Village of Tuscumbia	1	Res	1	6,872.20	4,832.25	11,704.45	5,852.23	2

Source: Flood Insurance Administration as of 6/30/2017

Severe Repetitive Loss (SRL): A SRL property is defined it as a single-family property (consisting of one-to-four residences) that is covered under flood insurance by the NFIP. It has (1) incurred flood-related damage for which four or more separate claims payments have been paid under flood insurance coverage. The amount of each claim payment exceeds \$5,000 and with cumulative amounts of such claims payments exceeding \$20,000; or (2) for which at least two separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.

Date	# of Events	# of Death	# of Injuries	Property Damage	Crop Damage
1996	3	0	0	0.00K	0.00K
1997	3	2	0	10K	0.00K
1998	4	0	0	0.00K	0.00K
1999	1	0	0	0.00K	0.00K
2000	0	0	0	0.00K	0.00K
2001	1	0	0	0.00K	0.00K
2002	3	0	0	1M	0.00K
2003	4	0	0	0.00K	0.00K
2004	2	0	0	10K	0.00K
2005	2	0	0	10K	0.00K
2007	2	0	0	0.00K	0.00K
2008	4	0	0	0.00K	0.00K
2009	3	0	0	0.00K	0.00K
2010	3	0	0	0.0K	0.00K
2011	5	0	0	0.00K	0.00K
2012	1	0	0	0.00K	0.00K
2013	3	0	0	10K	0.00K
2016	1	0	0	0.00K	0.00K
2017	1	0	0	2M	0.00K
Planning Area	46	2	0	5M+	0.00K

Table 3.35. NCEI Miller County Flood Events Summary, 1995 to 2015

Source NCEI data accessed August 2017

Table 3.36. NCEI Miller County Riverine Flood Events Summary, 1995 to 2015

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
	No records	s of any Riverine Flo	od Events		

Source: NCEI, data accessed June 2018

The website <u>https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=29%2CMISSOURI</u> has two categories of flooding (Flood and Flashflood) both have incidents listed. There is no specific category for Riverine Flood events. Upon further research as to the definition of Riverine Flooding which is "when excessive rainfall over and extended period of time causes a river to exceed its capacity". Additional resources for this type of flooding were also researched and no Riverine flooding could identified in Miller County.

Probability of Future Occurrence

Miller County has experienced some 62 incidents of severe flooding from 1995 to 2017. This includes eleven Presidential Disaster Declarations. As reflected in the charts above, a majority of all incidents occurred countywide about flooding. 63% of all flooding occurrences had an impact on the entire planning area. The remaining 37% of all incidents are relatively evenly shared between the communities of St. Elizabeth with (5) incidents, Iberia with (8) incidents, Eldon with (16) incidents, Tuscumbia with (11) incidents, Brumley with (4), City of Bagnell with (3), and Lake Ozark with (1). As the planning team reviewed the numbers, it was the overwhelming consensus that the overall impact about flooding is by far a countywide issue based on historical data.

There is a 100% probability of future flash flooding and flooding occurrence using data from 1995-2017.

There are several types of flooding that are prevalent in Miller County, defining them helps us understand the impact that each can have on the planning area.

Flood	For NFIP purposes, a partial or complete inundation of normally dry land areas from: Overland flow of a lake, river, stream, creek, slough, or ditch. The unusual and rapid accumulation of rainfall runoff or snowmelt. Mudflows or the collapse of shoreline land.
Riverine Flood	Flooding that occurs along a river, stream, or other non-coastal watercourses.
Flash Flood	A flood in hilly areas that arrives at a location very quickly (minutes instead of hours) after a heavy rain. This can also occur in urban areas where pavement and drainage improvements speed rainfall runoff to a stream
Source: http://v	vww.bchelpline.com/BCAToolkit/glossary.html

Figure 38 Types of Flooding in Miller County

Flooding in Miller County can happen throughout the year, as the charts reflect an incident of flooding in nearly every month of the year.

<u>Vulnerability</u>

Vulnerability Overview

Measure of Vulnerability: High

Miller County can expect Flooding to damage structures throughout the entire planning area. It is difficult to predict if the damage will be total destruction or just water damage that can be mitigated and the structure can still be used once the building is repaired. There is inconsistent data concerning the costs associated with the historical information available. Another factor to consider when flooding occurs is how much time and money that will be invested in the mold remediation of a flooded property. Miller County experiences relatively high humidity, which can cause a property that has water damage to be enveloped with Black Mold in a very short period. If this occurs, health issues also become a factor.

Potential Losses to Existing Development

There is a chance of loss of life and damages to property.

Hazard Summary by Jurisdiction

In this section, we have discussed Flooding (including riverine flooding, flash flooding, and storm water flooding) all of which affect the entire planning area within Miller County. The potential adverse impact of flooding is hard to predict and often times there is little that can be done to protect against structural and property damages, except to avoid building in vulnerable areas.

Problem Statement

Mitigation: Floodplain mapping and participation in the National Flood Insurance Program (NFIP) both play a major role in flood mitigation. The objectives of flood mitigation are to keep people, property, and possessions out of the floodplain area where reasonably achievable.

Participation in the NFIP requires that floodplain ordinances, which regulate development in the floodplain, be adopted and enforced by each community. The standard regulations require that buildings be constructed at least 1 foot above the Base Flood Elevation (BFE). [The BFE is the flood level associated with the 1% flood (formerly known as the "100 year flood").]

3.3.10 Land Subsidence/Sinkholes

Some specific sources for this hazard are:

- <u>http://www.dnr.mo.gov/geology/geosrv/envgeo/sinkholes.htm</u>
 <u>http://strangesounds.org/2013/07/us-sinkhole-map-these-maps-show-that-around-40-of-the-u-s-lies-in-areas-prone-to-sinkholes.html</u>
- http://www.businessinsider.com/where-youll-be-swallowed-by-a-sinkhole-2013-3
- http://water.usgs.gov/edu/sinkholes.html
- http://pubs.usgs.gov/fs/2007/3060/

Hazard Profile

Hazard Description

The Miller County Hazard Mitigation Plan 2013 reflects no concern for Land Subsidence and or Sinkholes, however, the Missouri State Hazard Mitigation Plan 2013 considered Land Subsidence/Sinkholes as a potential risk. After further research to define what and where sinkholes are most prevalent, the planning team decided to include the research but not to continue on with further risk assessment of this natural hazard

Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that naturally can be dissolved by ground water circulating through them. As the rock dissolves, spaces and caverns develop underground. The collapse of the land surface above them can be dramatic and range in size from broad, regional lowering of the land surface to localized collapse. However, the primary causes of most subsidence are human activities: underground mining of coal, groundwater, or petroleum withdrawal, and drainage of organic soils. In addition, sinkholes can develop because of subsurface void spaces created over time due to the erosion of subsurface limestone (karst).

Land subsidence occurs slowly and continuously over time, as a rule. On occasion, it can occur abruptly, as in the sudden formation of sinkholes. Sinkhole formation can be aggravated by flooding.

In the case of sinkholes, the rock below the surface is rock that has been dissolving by circulating groundwater. As the rock dissolves, spaces and caverns form, and ultimately the land above the spaces collapse. In Missouri, sinkhole problems are usually a result of surface materials above openings into bedrock caves eroding and collapsing into the cave opening. These collapses are called "cover collapses" and geologic information can be applied to predict the general regions where collapse will occur. Sinkholes range in size from several square yards to hundreds of acres and may be quite shallow or hundreds of feet deep.

According to the U.S. Geological Survey (USGS), the most damage from sinkholes tends to occur in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania. Fifty-nine percent of Missouri is underlain by thick, carbonate rock that makes Missouri vulnerable to sinkholes. Sinkholes occur in Missouri on a frequent basis. Most of Missouri's sinkholes occur naturally in the State's karst regions (areas with soluble bedrock). They are a common geologic hazard in southern Missouri, but also occur in the central and northeastern parts of the State. Missouri sinkholes have varied from a few feet to hundreds of acres and from less than one to more than 100 feet deep. The largest known sinkhole in Missouri encompasses about 700 acres in western Boone County southeast of where Interstate 70 crosses the Missouri River. Sinkholes can also vary is shape like shallow bowls or saucers whereas other have vertical walls. Some hold water and form natural ponds.

Geographic Location



Figure 39 Miller County Sinkholes
Miller County has current and past history of mines and the ones listed here are only those in the planning area. The mines listed above are those were active form 2006-2017. The citation of 104 (a) is a violation of a standard, regulation, or section of the Mine Act. The citation 104 (g) is an order to withdrawal due to untrained miners. The citation 107 (a) is Imminent danger is defined in the Mine Act as "the existence of any condition or practice in a coal or other mine which could reasonably be expected to cause death or serious physical harm before such condition or practice can be abated." There are numbers mineral mines in the area.

The following jurisdictions have numerous closed mineral mines. These are the ones that could be verified by the Mine Safety and Health Administration. Brumley has one closed iron mine. Eldon has one zinc mine and one lead mine. Iberia has one iron mine. Olean has one copper mine. St. Elizabeth has one lead mine. Tuscumbia having the most confirmed mines of one barium, one iron and six lead and zinc mines. According to the Mine and Safety Administration these closed mines are safe and properly closed.

	0.07. 1			<u>, 2000 2011</u>					
	Mine		Current	Controller					
Mine ID:	Name	Operator	Controller	Start Date	Mine Status	Material	Citations	Penalties	City
while ib.	Hume	operator	Mike K	Start Bate	White Status	Wateria	citations	1 chances	city
			Farmer:						
	Bagnell		Elliott						
	12	Capital	(Rud)		Activo 1	Crushod	27(104 a)		lofforcon
2202202		Matorials	(Buu) Earmor	5/12/2016		Limostono	$\frac{37}{104}$ (104 a)	\$5,000,00	City
2302303	Quarry	Waterials	Faimer	5/12/2010	nijury	Linestone	1 (107.0)	\$3,999.00	City
	Clyde I		Clyde						
	Wilson	Clyde I	lyony		Not	Broken			
2202418	Fyc	Wilson Exc	Wilson	5/7/2011	specified	Stone NEC	4(104.5)	\$424.00	Iberia
2302418	LAC	WIISON LAC	WIISOIT	5/7/2011	specified	Stone NEC	4 (104 a)	5424.00	прена
			Kevin						
	PLANT	Helton Exc	Layne			Broken	12 (104 a)		
2302154	#1	& Dev. Co.	Helton	3/6/2014	Active	Stone NEC	1 (107 b)	\$1,378.00	Eldon
	Mote					Construction			
	Sand &	Mote Sand	Lyndon D			Sand and			
2302394	Gravel	& Gravel	Mote	3/16/2009	Intermittent	Gravel	29 (104 a)	\$2,310.00	Iberia
	Tavern	Tavern							
	Creek	Creek	Richard A			Crushed			St.
2302426	Quarry	Quarry	Otto	11/21/2011	Intermittent	Limestone	3 (104 a)	\$316.00	Elizabeth
			Barbara				4 (104 a)		
	Rip Rap		"Tracy"			Dimension	1 (104 (g)		Lake
2302472	Plant 1	HSBD&RRS	Bachelier	5/22/2014	Abandoned	Stone NEC	(1))	\$770.00	Ozark
	Lake								
	Ozark	Lake Ozark				Construction			
	Sand &	Sand &	Tim			Sand and	12 (104 a)		
2302228	Gravel	Gravel	Duncan	2/1/2001	Abandoned	Gravel	1 (107 a)	\$1,256.00	Eldon
			Vaughn	,,,			(- <i></i>	. ,	
	Vaughn		Dev.			Construction			
	Gravel	Vaughn Dev.	Company			Sand and			
2301741	Pit	Company Inc	Inc	3/1/1979	Abandoned	Gravel	NA	\$0.00	Eldon

Table 3.37. Mines in Miller County 2006-2017

Source https://arlweb.msha.gov/drs/DRSextendedSearch.asp

The below illustrates potential areas for sinkholes and ground collapse. This map provides a general representation where sinkholes tend to begin. Ground collapse correlates with underground mining data. Our Lady of Snows, private school is located 276 Highway H, Eugene MO (northwestern part of the county) in a ground collapse area. Although sinkholes are not a current problem for Miller County as elevated risk of ground collapse potential for many to develop as illustrated by the map below. Especially notable are the areas of Eldon and Lake Ozark.



Figure 40 Elevated Risk of Ground Collapse Map

Severity/Magnitude/Extent

Severity: Low

Sinkholes vary in size and location, and these variances will determine the impact of the hazard. A sinkhole could result in the loss of a personal vehicle, a building collapse, or damage to infrastructure such as roads, water, or sewer lines. Groundwater contamination is also possible from a sinkhole. Because of the relationship of sinkholes to groundwater, pollutants captured or dumped in sinkholes could affect a community's groundwater system. Sinkhole collapse could be triggered by large earthquakes. Sinkholes located in floodplains can absorb floodwaters but make detailed flood hazard studies difficult to model.

The 2013 State Plan included only seven documented sinkhole "notable events". The plan stated that sinkholes are common to Missouri and the probability is high that they will occur in the future. To date, Missouri sinkholes have historically not had major impacts on development nor have they caused serious damage. Thus, the severity of future events is likely to be low.

http://www.foundation-repair-guide.com/expansive-soil.html http://www.ehow.com/list_6880295_properties-expansive-soils.html

Previous Occurrences

Miller County has not had any notable sinkholes issues. As discussed in the 2013 State Plan sinkholes are a regular occurrence in Missouri, but that they are rarely are the events of any significance. Research was conducted and any information on any possible previous events has not been found.

Probability of Future Occurrence

Probability: Low

There are no records of previous event dates in the planning area so the probabilities cannot be calculated.

<u>Vulnerability</u>

Vulnerability Overview

Potential Losses to Existing Development

At this time, there are no know hazard areas to estimate future losses based on lack of historical losses information.

Impact of Previous and Future Development

Sinkholes vary in size and location. These factors will determine the impact of the hazard, which could manifest as the loss of a personal vehicle, a building collapse, or damage to infrastructure such as roads, water, or sewer lines. Groundwater contamination is also a possible impact of a sinkhole. Because of the relationship of sinkholes to groundwater, pollutants captured in sinkholes (or dumped) can affect a community's groundwater system. Sinkhole collapse could be triggered by large earthquakes, which could be particularly problematic for the Miller County area in the event the risk level should increase. Sinkholes located in floodplains can absorb floodwaters but make detailed flood hazard studies difficult to model.

Source: Missouri State Hazard Mitigation Plan 2013 http://sema.dps.mo.gov/docs/programs/LRMF/mitigation/MO_Hazard_Mitigation_Plan_2013.pdf

Hazard Summary by Jurisdiction

The risk is uniform throughout the planning area. Data limitations prevent an analysis specific enough to indicate risk to the school and special district assets. To date sinkholes have not historically had major impacts on the jurisdictions in Miller County. This could change as the county increases in growth.

Problem Statement

Sinkholes in Missouri are a common feature where limestone and dolomite outcrop. Dolomite is a rock similar to limestone with magnesium as an additional element. Calcium is normally present. in the minerals that form the rocks. While some sinkholes maybe considered a slow changing nuisance; other more sudden, catastrophic collapses can destroy property, delay construction projects, and contaminate ground water resources.

There are not any statistics on the number of voids present in the subsurface, which will collapse in the future to form new surface sinkholes, however, areas have been identified that have the greatest potential for future sinkholes and land subsidence. Source: Missouri State Hazard Mitigation Plan 2013

http://sema.dps.mo.gov/docs/programs/LRMF/mitigation/MO_Hazard_Mitigation_Plan_2013.pdf

Mitigation: The U.S. Geological Survey (USGS) recommends identification, prediction, and mitigation of sinkhole hazards in evaporates karst areas. Identification techniques include field surveys and geomorphologic mapping combined with accounts from local people and historical sources. Detailed sinkhole maps can be constructed from sequential historical maps, recent topographical maps, and digital elevation models (DEMs) complemented with building-damage surveying, remote sensing, and high-resolution geodetic surveys. Sinkhole distribution can be investigated by spatial distribution analysis techniques including studies of preferential elongation, alignment, and nearest neighbor analysis. Source USGS

https://pubs.er.usgs.gov/publication/70033261

3.3.11 Levee Failure

Some sources of data for this hazard include:

- National Levee Database, <u>http://nld.usace.army.mil/egis/f?p=471:1:0::NO</u>
- FEMA Map Service Center for Flood Insurance Rate Maps and Flood Insurance Studies, msc.fema.gov/portal
- https://www.fema.gov/fema-levee-resources-library

Hazard Profile

Hazard Description

Levees are earth embankments constructed along rivers and coastlines to protect adjacent lands from flooding. Floodwalls are concrete structures, often components of levee systems, designed for urban areas where there is insufficient room for earthen levees. When levees and floodwalls and their appurtenant structures are stressed beyond their capabilities to withstand floods, levee failure can result in injuries and loss of life, as well as damages to property, the environment, and the economy.

Levees can be small agricultural levees that protect farmland from high frequency flooding. Levees can also be larger, designed to protect people and property in larger urban areas from less frequent flooding events such as the 100-year and 500-year flood levels. For purposes of this discussion, levee failure will refer to both overtopping and breach as defined in FEMA's Publication "So You Live Behind a Levee" (<u>http://content.asce.org/ASCELeveeGuide.html</u>). Following are the FEMA publication descriptions of different kinds of levee failure.

Overtopping: When a Flood Is Too Big

Overtopping occurs when floodwaters exceed the height of a levee and flow over its crown. As the water passes over the top, it may erode the levee, worsening the flooding and potentially causing an opening, or breach, in the levee.

Breaching: When a Levee Gives Way

A levee breach occurs when part of a levee gives way, creating an opening through which floodwaters may pass. A breach may occur gradually or suddenly. The most dangerous breaches happen quickly during periods of high water. The resulting torrent can quickly swamp a large area behind the failed levee with little or no warning.

Earthen levees can be damaged in several ways. For instance, strong river currents and waves can erode the surface. Debris and ice carried by floodwaters—and even large objects such as boats or barges—can collide with and gouge the levee. Trees growing on a levee can blow over, leaving a hole where the root wad and soil used to be. Burrowing animals can create holes that enable water to pass through a levee. If severe enough, any of these situations can lead to a zone of weakness that could cause a levee breach. In seismically active areas, earthquakes and ground shaking can cause a loss of soil strength, weakening a levee and possibly resulting in failure. Seismic activity can also cause levees to slide or slump, both of which can lead to failure.

Geographic Location

Missouri is a state with many levees. Currently, there is no single comprehensive inventory of levee systems in the state. Levees have been constructed across the state by public entities and private entities with varying levels of protection, inspection oversight, and maintenance. The lack of a comprehensive levee inventory is not unique to Missouri.

There are two concurrent nation-wide levee inventory development efforts, one led by the United State Army Corps of Engineers (USACE), and one led by Federal Emergency Management Agency (FEMA). The National Levee Database (NLD), developed by USACE, captures all USACE related levee projects, regardless of design levels of protection. The Midterm Levee Inventory (MLI), developed by FEMA, captures all levee data (USACE and non-USACE) but primarily focuses on levees that provide 1% annual-chance flood protection on FEMA Flood Insurance Rate Maps (FIRMs).

It is likely that agricultural levee and other non-regulated levees within the planning area are not inventoried or inspected. The levees that are not designed to provide protection from the 1-percent annual chance flood would overtop or fail in the 1-percent annual chance flood scenario. Therefore, any associated losses would be taken into account in the loss estimates provided in the Flood Hazard Section.

For purposes of the levee failure profile and risk assessment, those levees indicated on the Preliminary DFIRM as providing protection from at least the 1-percent annual chance flood will be discussed and further analyzed. It is noted that increased discharges are being taken into account in revision of the flood maps as part of the RiskMap efforts. This may result in changes to the flood protection level that existing levees are certified as providing.

It may be the case that none of the levee databases include information on levees in the county. In this situation, consult local officials who would know about levee locations. It would be atypical for a Missouri county to lack levees of any sort. However, it could be the case that levees in the subject county are low-head agricultural levees, the breach of which would not cause widespread damages. Statements to this effect can be included in the plan narrative.

Severity/Magnitude/Extent

Levee failure is typically an additional or secondary impact of another disaster such as flooding or earthquake. The main difference between levee failure and losses associated with riverine flooding is magnitude. Levee failure often occurs during a flood event, causing destruction in addition to what would have been caused by flooding alone. In addition, there would be an increased potential for loss of life due to the speed of onset and greater depth, extent, and velocity of flooding due to levee breach.

As previously, mentioned, agricultural levees and levees that are not designed to provide flood protection from at least the 1-percent annual chance flood likely do exist in the planning area. However, none of these levees is shown on the Preliminary DFIRM, nor are they enrolled in the USACE Levee Safety Program. As a result, an inventory of these types of levees is not available for analysis. Additionally, since these types of levees do not provide protection from the 1-percent annual chance flood, losses associated with overtopping or failure are captured in the Flood Section of this plan.

The USACE regularly inspects levees within its Levee Safety Program to monitor their overall condition, identify deficiencies, verify that maintenance is taking place, determine eligibility for federal rehabilitation assistance (in accordance with P.L. 84-99), and provide information about the levees on which the public relies. Inspection information also contributes to effective risk assessments and supports levee accreditation decisions for the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA).

The USACE now conducts two types of levee inspections. Routine Inspection is a visual inspection to verify and rate levee system operation and maintenance. It is typically conducted each year for all levees in the USACE Levee Safety Program. Periodic Inspection is a comprehensive inspection led by a professional engineer and conducted by a USACE multidisciplinary team that includes the levee sponsor. The USACE typically conducts this inspection every five years on the federally authorized levees in the USACE Levee Safety Program.

Both Routine and Periodic Inspections result in a rating for operation and maintenance. Each levee segment receives an overall segment inspection rating of Acceptable, Minimally Acceptable, or Unacceptable. Figure 3.10 below defines the three ratings.

Levee System Inspection Ratings						
Acceptable	All inspection items are rated as Acceptable.					
Minimally Acceptable	One or more levee segment inspection items are rated as Minimally Acceptable or one or more items are rated as Unacceptable and an engineering determination concludes that the Unacceptable inspection items would not prevent the segment/system from performing as intended during the next flood event.					
Unacceptable	One or more levee segment inspection items are rated as Unacceptable and would prevent the segment/system from performing as intended, or a serious deficiency noted in past inspections (previous Unacceptable items in a Minimally Acceptable overall rating) has not been corrected within the established timeframe, not to exceed two years.					

Table 3.38.	Definitions of the Three Levee System Rating	gs
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As requested by SEMA a careful review of the US Army Corps of Engineers (U.S.A.C.E.) website was conducted again on 1 August 2017. We verified with each zip code of all communities located in the planning area (Brumley 65017, Eldon 65026, Iberia 65486, Kaiser 65047, Lake Ozark 65049, St. Elizabeth 65075, and Tuscumbia 65082) and the planning committee's research revealed no records of levees found in the planning area. The National Levee Database, maintained by the U.S.A.C.E., shows no federal levees located in Miller County. While there is a possibility that levees may exist, such as low-head agricultural levees, no records indicated that the breach or overtopping of these levees should affect any other property other than that of the levee owner. Damage to residential structures is unlikely. The planning team agreed with the original plan so no further risk assessment has been done on this natural hazard.

Source USACE

http://nld.usace.army.mil/egis/f?p=471:69:1582928006607501::NO:69

Previous Occurrences

The 2013 State Plans for Miller County have been researched and there have been no instances of levee breach in the county. Neither plan mentions Miller County.

Probability of Future Occurrence

Data limitations, such as the lack of a centralized database for Missouri levees make it impossible to calculate probability.

<u>Vulnerability</u>

Vulnerability Overview

No further mitigation is required at this time.

Potential Losses to Existing Development

Data limitations, such as the lack of a centralized database for Missouri levees make it impossible to consider possible losses.

Impact of Previous and Future Development

No development planned at this time.

Hazard Summary by Jurisdiction

No levees are located near any school districts.

Problem Statement

No issues at this time.

3.3.12 Thunderstorm/High Winds/Lightning/Hail

Some Specific Sources for this hazard are:

- FEMA 320, Taking Shelter from the Storm, 3rd edition,
 <u>http://www.weather.gov/media/bis/FEMA_SafeRoom.pdf</u> Lightning Map, National Weather Service, <u>http://www.lightningsafety.noaa.gov/stats/08 Vaisala NLDN Poster.pdf</u> National Weather Service, <u>http://www.lightningsafety.noaa.gov/stats/08 Vaisala NLDN Poster.pdf</u>
- Death and injury statistics from lightning strikes, National Weather Service.
- Wind Zones in the U.S. map, FEMA, <u>http://www.fema.gov/plan/prevent/saferoom/tsfs02_wind_zones.shtm;</u>
- Annual Windstorm Probability (65+knots) map U.S. 1980-1994, NSSL, http://www.nssl.noaa.gov/users/brooks/public_html/bigwind.gif
- Hailstorm intensity scale, The Tornado and Storm Research Organization (TORRO), <u>http://www.torro.org.uk/site/hscale.php;</u>
- NCEI data;
- USDA Risk Management Agency, Insurance Claims, <u>http://www.rma.usda.gov/data/cause.htm</u>
- National Severe Storms Laboratory hail map, http://www.nssl.noaa.gov/users/brooks/public_html/bighail.gif

Hazard Profile

Hazard Description

A thunderstorm is defined as a storm that contains lightning and thunder, which is caused by unstable atmospheric conditions. When cold upper air sinks and warm moist air rises, storm clouds or 'thunderheads' develop resulting in thunderstorms. This can occur singularly, as well as in clusters or lines. The National Weather Service defines a thunderstorm as "severe" if it includes hail that is one inch or more, or wind gusts that are at 58 miles per hour or higher. At any given moment across the world, there are about 1,800 thunderstorms occurring. Severe thunderstorms most often occur in Missouri in the spring and summer, during the afternoon and evenings, but can occur at any time. Other hazards associated with thunderstorms are heavy rains resulting in flooding are discussed separately.

High Winds

A severe thunderstorm can produce winds causing as much damage as a weak tornado. The damaging winds of thunderstorms include downbursts, microbursts, and straight-line winds. Downbursts are localized currents of air blasting down from a thunderstorm, which induce an outward burst of damaging wind on or near the ground. Microbursts are minimized downbursts covering an area of less than 2.5 miles across. They include a strong wind shear (a rapid change in the direction of wind over a short distance) near the surface. Microbursts may or may not include precipitation and can produce winds at speeds of more than 150 miles per hour. Damaging straight-line winds are high winds across a wide area that can reach speeds of 140 miles per hour.

Lightning

All thunderstorms produce lightning which can strike outside of the area where it is raining and is has been known to fall more than 10 miles away from the rainfall area. Thunder is simply the sound that lightning makes. Lightning is a huge discharge of electricity that shoots through the air causing vibrations and creating the sound of thunder.

Hail

According to the National Oceanic and Atmospheric Administration (NOAA), hail is precipitation that is formed when thunderstorm updrafts carry raindrops upward into extremely cold atmosphere causing them to freeze. The raindrops form into small frozen droplets. They continue to grow as they meet super-cooled water, which will freeze, on contact with the frozen rain droplet. This frozen droplet can continue to grow and form hail. As long as the updraft forces can support or suspend the weight of the hailstone, hail can continue to grow before it hits the earth.

At the time when the updraft can no longer support the hailstone, it will fall down to the earth. For example, a $\frac{1}{4}$ " diameter or pea sized hail requires updrafts of 24 miles per hour, while a 2 $\frac{3}{4}$ " diameter or baseball sized hail requires an updraft of 81 miles per hour. According to the NOAA, the largest hailstone in diameter recorded in the United States was found in Vivian, South Dakota on July 23, 2010. It was eight inches in diameter, almost the size of a soccer ball. Soccer-ball-sized hail is the exception, but even small pea-sized hail can do damage.

Geographic Location

Thunderstorms, high winds, hail, and lightning events are an area-wide hazard that can happen anywhere in the county. Although these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. In addition, damages are more likely to occur in more densely developed urban areas.



Figure 41 Lightening Frequencies in Missouri and Miller County Map



Source: National Weather Service,

http://www.lightningsafety.noaa.gov/stats/08 Vaisala NLDN Poster.pdf. Note: indicate location of planning area with a colored square or arrow. Figure 42 Locations and Frequency of Lightening Map

Severity/Magnitude/Extent

Severe thunderstorm losses are usually attributed to the associated hazards of hail, downburst winds, lightning and heavy rains. Losses due to hail and high wind are typically insured losses that are localized and do not result in presidential disaster declarations. However, in some cases, impacts are severe and widespread and assistance outside state capabilities is necessary. Hail and wind also can have devastating impacts on crops. Severe thunderstorms/heavy rains that lead to flooding are discussed in the flooding hazard profile. Hailstorms cause damage to property, crops, and the environment, and can injure and even kill livestock. In the United States, hail causes more than \$1 billion in damage to property and crops each year. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are also commonly damaged by hail. Hail has been known to cause injury to humans, occasionally fatal injury.

In general, assets in the County vulnerable to thunderstorms with lightning, high winds, and hail include people, crops, vehicles, and built structures. Although this hazard results in high annual losses, private property insurance and crop insurance usually cover the majority of losses. Considering insurance coverage as a recovery capability, the overall impact on jurisdictions is reduced.

Most lightning damages occur to electronic equipment located inside buildings. However, structural damage can also occur when a lightning strike causes a building fire. In addition, lightning strikes can cause damages to crops if fields or forested lands are set on fire. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes. Source http://www.lightningsafety.noaa.gov/stats/08_Vaisala_NLDN_Poster.pdf and http://www.lightningsafety.noaa.gov/

Based on information provided by the Tornado and Storm Research Organization (TORRO), Table 3.39 below describes typical damage impacts of the various sizes of hail.

Table 3.39.	Tornado and Storm Research Organization Hailstorm Intensity S	Scale
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Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	5-9	0.2-0.4	Pea	No damage
Potentially	10-15	0.4-0.6	Mothball	Slight general damage to plants, crops
Damaging				
Significant	16-20	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	21-30	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and
				plastic structures, paint and wood scored
Severe	31-40	1.2-1.6	Pigeon's egg >	Widespread glass damage, vehicle bodywork damage
			squash ball	
Destructive	41-50	1.6-2.0	Golf ball >	Wholesale destruction of glass, damage to tiled roofs,
			Pullet's egg	significant risk of injuries
Destructive	51-60	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	61-75	2.4-3.0	Tennis ball >	Severe roof damage, risk of serious injuries
			cricket ball	
Destructive	76-90	3.0-3.5	Large orange	Severe damage to aircraft bodywork
			> Soft ball	
Super	91-100	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even
Hailstorms				fatal injuries to persons caught in the open
Super	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even
Hailstorms				fatal injuries to persons caught in the open

Source: Tornado and Storm Research Organization (TORRO), Department of Geography, Oxford Brookes University Notes: In addition to hail diameter, factors including number and density of hailstones, hail fall speed and surface wind speeds affect severity. <u>http://www.torro.org.uk/site/hscale.php</u> Straight-line winds are defined as any thunderstorm wind that is not associated with rotation (i.e., is not a tornado). It is these winds, which can exceed 100 miles per hour, which represent the most common type of severe weather. They are responsible for most wind damage related to thunderstorms. Since thunderstorms do not have narrow tracks like tornadoes, the associated wind damage can be extensive and affect entire (and multiple) counties. Objects like trees, barns, outbuildings, high-profile vehicles, and power lines/poles can be toppled or destroyed, and roofs, windows, and homes can be damaged as wind speeds increase.

The tables below (**Tables 3.22** through **Table 3.30**) summarize past crop damages as indicated by crop insurance claims. The tables illustrate the magnitude of the impact on the planning area's agricultural economy.

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2016	Soybeans	Excess Precipitation	\$7,116.00
2016	Corn	Excess Precipitation	\$8,948.00
2015	Corn	Excess Precipitation	\$70,142.00
2015	Soybeans	Excess Precipitation	\$108,408.21
2014	Soybeans	Excess Precipitation	\$1,308.00
2013	Corn	Excess Precipitation	\$36,269.00
2013	Soybeans	Excess Precipitation	\$67,289.00
2011	Corn	Excess Precipitation	\$7,553.00
2011	Soybeans	Excess Precipitation	\$542.00
2010	Soybeans	Excess Precipitation	\$6,900.00
2009	Corn	Excess Precipitation	\$3,332.00
2009	Soybean	Excess Precipitation	\$6,974.00
2008	Wheat	Excess Precipitation	\$2,728.00
2008	Corn	Excess Precipitation	\$716.00
2008	Soybeans	Excess Precipitation	\$5,410.00
2007	Soybeans	Excess Precipitation	\$554.00
Total			\$334,189.21

Table 3.40. Crop Insurance Claims Paid in Miller County from Thunderstorms, 2016-2006

Source: USDA Risk Management Agency, Insurance Claims, https://www.rma.usda.gov/data/cause.html

Table 3.41. Crop insurance Claims Paid in Miller County from High Winds, 2006-2016								
No record	No record of payments							
Crop Year	Crop Name	Cause of Loss Description	Insurance Paid					
Total			0					
Source: LISDA	Dick Monogoment Agency	Incurance Claime https://www.rma	undo anuldata/anuna html					

Crop Insurance Claims Baid in Miller County from High Winds 2006-2016 Table 2.44

Source: USDA Risk Management Agency, Insurance Claims, https://www.rma.usda.gov/data/cause.html

Table 3.42. Crop Insurance Claims Paid in Miller County from Lightening, 2006-2016 No record of payments

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
Total			0

Source USDA Risk Management Agency, Insurance Claims, https://www.rma.usda.gov/data/cause.html

Table 3.43. Crop Insurance Claims Paid in Miller County from Hail, 2006-2016 No record of payments

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
Total			0

Source USDA Risk Management Agency, Insurance Claims, https://www.rma.usda.gov/data/cause.html

The onset of thunderstorms with lightning, high wind, and hail is generally rapid. Duration is less than six hours and warning time is generally six to twelve hours. Nationwide, lightning kills 75 to 100 people each year. Lightning strikes can also start structural and wildland fires, as well as damage electrical systems and equipment.

These storms produced high winds, straight-line winds, and small tornadoes. Damage included downed trees and power lines.

Previous Occurrences

Table 3.44.	Thunderstorms	Events	2006-2016
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LOCATION	DATE	MAGNITUDE	DEATHS	INJURIES	DAMAGE PROPERTY	DAMAGE CROPS
ELDON	5/27/2017	52	0	0	0	0
ELDON	5/19/2017	52	0	0	0	0
TUSCUMBIA	3/6/2017	52	0	0	1000	0
MARYS HOME	3/6/2017	52	0	0	1000	0
BAGNELL	8/1/2016	52	0	0	0	0
ULMAN	7/13/2016	52	0	0	10000	0
ST ELIZABETH	6/26/2016	52	0	0	10000	0
ETTERVILLE	5/26/2016	52	0	0	5000	0
ELDON	8/9/2015	52	0	0	0	0
ST ELIZABETH	8/9/2015	52	0	0	0	0
WEST AURORA	7/1/2015	52	0	0	0	0
MARYS HOME	7/1/2015	52	0	0	0	0
BAGNELL	7/1/2015	51	0	0	0	0
IBERIA	7/1/2015	52	0	0	0	0
AURORA SPGS	5/17/2015	52	0	0	5000	0
ELDON	7/7/2014	52	0	0	5000	0
TUSCUMBIA	4/3/2014	52	0	0	0	0
ULMAN	4/3/2014	52	0	0	0	0
BAGNELL	9/1/2013	61	0	0	25000	0
ELDON	6/28/2013	52	0	0	0	0
IBERIA	6/28/2013	52	0	0	0	0
TUSCUMBIA	5/31/2013	52	0	0	10000	0
WEST AURORA	9/6/2012	52	0	0	0	0
ST ANTHONY	7/8/2012	52	0	0	0	0
BAGNELL	8/20/2011	52	0	0	2000	0
IBERIA	8/20/2011	52	0	0	1000	0
BAGNELL	8/19/2011	52	0	0	1000	0
TUSCUMBIA	8/19/2011	52	0	0	0	0
WEST AURORA	7/12/2011	52	0	0	1000	0
ETTERVILLE	7/12/2011	78	0	0	10000	0
ETTERVILLE	5/25/2011	52	0	0	0	0
TUSCUMBIA	5/25/2011	52	0	0	1000	0
ELDON	5/23/2011	52	0	0	1000	0
MT PLEASANT	4/19/2011	50	0	0	1000	0
MARYS HOME	2/27/2011	52	0	0	5000	0

TUSCUMBIA	10/26/2010	52	0	0	2000	0
BAGNELL	7/11/2010	55	0	0	3000	0
IBERIA	3/10/2010	50	0	0	5000	0
BAGNELL	6/24/2009	52	0	0	0	0
IBERIA	8/5/2008	52	0	0	0	0
BRUMLEY	8/5/2008	52	0	0	0	0
ELDON	7/25/2008	50	0	0	5000	0
AURORA SPGS	7/25/2008	52	0	0	0	0
KAISER LAKE OZARK						
AR	7/8/2008	50	0	0	0	0
BRUMLEY	7/3/2008	50	0	0	0	0
BAGNELL	6/19/2008	50	0	0	0	0
BAGNELL	6/4/2008	50	0	0	0	0
BRUMLEY	8/6/2006	50	0	0	0	0
ELDON	8/2/2006	50	0	0	5000	0
ELDON	6/22/2006	55	0	0	5000	0
ELDON	4/2/2006	50	0	0	5000	0
TUSCUMBIA	4/2/2006	50	0	0	0	0
TOTALS:			0	0	125000	0

Table 3.45.	le 3.45. High Winds (No record of any Events) 2006-2016											
Location	Date	Туре	Magnitude	Deaths	Injuries	Property Damage	Crop Damage					
Totals:				0	0	0.00K	0.00K					

Table 3.46. Lightening (No record of any Events) 2006-2016

Location	Date	Туре	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Totals:				0	0	0.00K	0.00K

Hail

Hail is frozen precipitation created by thunderstorms that contain large amounts of moisture, strong upward winds, and freezing temperatures. The moisture freezes in irregular sizes and shapes. Within the planning area, the sizes range from 0.75 inches to 2.75 inches. Falling hailstones can cause damage to:

- Homes (Roofs, Siding, Glass Windows and Doors)
- Automobiles
- Airplanes
- Crop Damage
- Livestock
- Humans

Table 3.34 Hail Events 2006-2016												
Location	Date	Туре	Magnitude	Deaths	Injuries	Property Damage	Crop Damage					
TOTALS:						\$45,000.00	\$0.00					
BAGNELL	4/3/2007	Hail	1.25	0	0	\$0.00	\$0.00					
BAGNELL	4/19/2011	Hail	0.88	0	0	\$0.00	\$0.00					
BAGNELL	5/25/2011	Hail	1	0	0	\$0.00	\$0.00					
BAGNELL	6/18/2011	Hail	1.75	0	0	\$0.00	\$0.00					
BRUMLEY	3/30/2006	Hail	1	0	0	\$0.00	\$0.00					
BRUMLEY	4/3/2007	Hail	1	0	0	\$0.00	\$0.00					
BRUMLEY	4/22/2008	Hail	1	0	0	\$0.00	\$0.00					
BRUMLEY	1/17/2012	Hail	1	0	0	\$0.00	\$0.00					
ELDON	5/3/2006	Hail	0.88	0	0	\$0.00	\$0.00					
ELDON	4/3/2007	Hail	0.75	0	0	\$0.00	\$0.00					
ELDON	5/25/2011	Hail	0.88	0	0	\$0.00	\$0.00					
ELDON	6/18/2011	Hail	1	0	0	\$0.00	\$0.00					
ELDON	3/2/2012	Hail	0.88	0	0	\$0.00	\$0.00					
ELDON	4/26/2016	Hail	1	0	0	\$0.00	\$0.00					
ELDON	2/27/2014	Hail	4 75	0	0	00 0 4	¢0.00					
	5/27/2014		1.75	0	0	\$0.00	\$0.00 \$0.00					
	5/1/2006		1	0	0	\$0.00	\$0.00					
	4/3/2007		1.05	0	0	\$0.00	\$0.00					
	4/3/2007	Hall	1.20	0	0	\$0.00	\$0.00					
	4/23/2008	Hall	1.25	0	0	\$0.00	\$0.00					
	8/5/2008	Hall	0.75	0	0	\$0.00	\$0.00					
	1/16/2012	Hall	1	0	0	\$0.00	\$0.00					
	1/17/2012	Hall	1.25	0	0	\$0.00	\$0.00					
	3/15/2012	Hall	1 05	0	0	\$0.00	\$0.00					
	3/17/2012	Hall	1.25	0	0	\$0.00	\$0.00					
	5/20/2013	Hall	1.5	0	0	\$0.00	\$0.00					
	3/26/2008		0.75	0	0	\$0.00	\$0.00					
OLEAN	5/25/2011	Hail	1.75	0	0	\$10,000.00	\$0.00					
ST	5/25/2011	Hail	1.75	0	0	\$10,000.00	\$0.00					
ELIZABETH	3/22/2007	Hail	0.75	0	0	\$0.00	\$0.00					
ELIZABETH	3/26/2008	Hail	1	0	0	\$0.00	\$0.00					
TUSCUMBIA	3/26/2008	Hail	1	0	0	\$0.00	\$0.00					
TUSCUMBIA	7/11/2010	Hail	1.75	0	0	\$25,000.00	\$0.00					
TUSCUMBIA	7/11/2010	Hail	1.75	0	0	\$0.00	\$0.00					
TUSCUMBIA	3/2/2012	Hail	1	0	0	\$0.00	\$0.00					

Probability of Future Occurrence

The below probability figures are supported by the recorded events in the last 20 years, tracked by the National Oceanic and Atmospheric Administration (NOAA) formally the National Climatic Data Center (NCEI).

Thunderstorms- Moderate- 100% Lightening- Moderate- 100% High Wind- Moderate- 100% Hail- Moderate- 100%

There have been 88 events over 20 years including thunderstorms, lightening, high wind, and hail. This indicates an average of four events a year with a 100% probability of future occurrences.

The hailstorm data below is from 1980-1994. It shows the probability of hailstorm occurrence (2" diameter or larger) based on number of days per year. Miller County is in the .75 blue zones. The highest recorded hail size has been 1.75 inches on 7/11/2010 in Tuscumbia and on 05/25/2011 in Olean from 2006 -2016.



Source: NSSL, http://www.nssl.noaa.gov/users/brooks/public_html/bighail.gif_Note: Figure 43 Annual Hailstorm Probability (2"diameter and large) 1980-1994

<u>Vulnerability</u>

Vulnerability Overview

	Miller County, MO Hazard Vulnerability by Jurisdiction													
	Miller County	City of Bagnell	Village of Brumley	City of Eldon	City of Iberia	City of Lake Ozark	Village of Olean	Village of St. Elizabeth	Village of Tuscumbia	Eldon R-I	Miller County R-III	St. Elizabeth R-IV	Iberia R-V	Bagnell Special Road District
Hailstorm	н	L	Н	М	М	М	Н	н	Н	М	Н	L	М	м

Table 3.47. Vulnerability Hail Overview

Potential Losses to Existing Development

Miller County can expect hail to damage structures throughout the entire planning area. There is inconsistent data concerning the costs associated with the historical information available. It is difficult to estimate the potential impact on both the number of structures and the cost of any given natural hazard, as they are completely unpredictable.

Previous and Future Development

Hail is frozen precipitation created by thunderstorms that contain large amounts of moisture, strong upward winds, and freezing temperatures. The moisture freezes in irregular sizes and shapes. Within the planning area, the sizes range from 0.75 inches to 2.75 inches. Falling hailstones can cause damage to:

- Homes (Roofs, Siding, Glass Windows and Doors)
- Automobiles
- Airplanes
- Crop Damage
- Livestock
- Humans

Hazard Summary by Jurisdiction

According to the census information there are 1,421 homes built before 1939 in Miller County.

Table 3.4	Table 3.48. Homes Built 1939 & Earlier (2015 Estimates)											
Miller County	Bagnell Brumley Eldon Iberia Lake Ozark		Lake Ozark	Olean	St. Elizabeth	Tuscumbia						
Estimate	Estimate	Estimate	Estimate	Estimate	te Estimate Estimate		Estimate	Estimate				
1,421	0	8	359	75	18	21	11	30				

Source: https://factfinder.census.gov

Problem Statement

Mitigation: Early-warning systems and public information increase the safety and lessen the loss of life in the event of Severe Thunderstorms, Tornadoes, Windstorms, and Hailstorms. Increased public awareness and education in conjunction with the early-warning systems have helped mitigate disasters from these severe weather threats.

3.3.13 Tornado

Some specific sources for this hazard are:

- Enhanced F Scale for Tornado Damage, NWS, <u>www.spc.noaa.gov/faq/tornado/ef-scale.html;</u>
- Enhanced Fujita Scale's damage indicators and degrees of damage table, NOAA Storm Prediction Center, <u>www.spc.noaa.gov/efscale/ef-scale.html</u>;
- Tornado Activity in the U.S. map (1950-2006), FEMA 320, Taking Shelter from the Storm, 3rd edition;
- Tornado Alley in the U.S. map, <u>http://www.tornadochaser.net/tornalley.html</u>
- Enhanced Fujita Scale, <u>www.spc.noaa.gov/efscale/ef-scale.html</u>
- National Climatic Data Center, http://www.ncei.noaa.gov/stormevents/
- Tornado History Project, map of tornado events, <u>http://www.tornadohistoryproject.com/tornado/Missouri</u>

Hazard Profile

Hazard Description

The NWS defines a tornado as "a violently rotating column of air extending from a thunderstorm to the ground." It is usually spawned by a thunderstorm and produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. Often, vortices remain suspended in the atmosphere as funnel clouds. When the lower tip of a vortex touches the ground, it becomes a tornado.

High winds are not associated with tornadoes in this section and are profiled separately in this document.

Essentially, tornadoes are a vortex storm with two components of winds. The first is the rotational winds that can measure up to 500 miles per hour, and the second is an uplifting current of great strength. The dynamic strength of both these currents can cause vacuums that can overpressure structures from the inside.

Although tornadoes have been documented in all 50 states, most of them occur in the central United States due to its unique geography and presence of the jet stream. The jet stream is a high-velocity stream of air that separates the cold air of the north from the warm air of the south. During the winter, the jet stream flows west to east from Texas to the Carolina coast. As the sun moves north, so does the jet stream, which at summer solstice flows from Canada across Lake Superior to Maine. During its move northward in the spring and its recession south during the fall, the jet stream crosses Missouri, causing the large thunderstorms that breed tornadoes.

A typical tornado can be described as a funnel-shaped cloud in contact with the earth's surface that is "anchored" to a cloud, usually a cumulonimbus. This contact on average lasts 30 minutes and covers an average distance of 15 miles. The width of the tornado (and its path of destruction) is usually about 300 yards. However, tornadoes can stay on the ground for upward of 300 miles and can be up to a mile wide. The National Weather Service, in reviewing tornadoes occurring in Missouri between 1950 and 1996, calculated the mean path length at 2.27 miles and the mean path area at 0.14 square mile.

The average forward speed of a tornado is 30 miles per hour but may vary from nearly stationary to

70 miles per hour. The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Tornadoes are most likely to occur in the afternoon and evening, but have been known to occur at all hours of the day and night.

Geographic Location

Tornadoes can occur anywhere in the planning area.

Severity/Magnitude/Extent

Tornadoes are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour and damage paths can be more than one mile wide and 50 miles long. Tornadoes have been known to lift and move objects weighing more than 300 tons a distance of 30 feet, toss homes more than 300 feet from their foundations, and siphon millions of tons of water from water bodies. Tornadoes also can generate a tremendous amount of flying debris or "missiles," which often become airborne shrapnel that causes additional damage. If wind speeds are high enough, missiles can be thrown at a building with enough force to penetrate windows, roofs, and walls. However, the less spectacular damage is much more common.

Tornado magnitude is classified according to the EF- Scale (or the Enhance Fujita Scale, based on the original Fujita Scale developed by Dr. Theodore Fujita, a renowned severe storm researcher). The EF- Scale (see **Table 3.49**6) attempts to rank tornadoes according to wind speed based on the damage caused. This update to the original F Scale was implemented in the U.S. on February 1, 2007.

FUJITA S	CALE		DE	RIVED	EF SCALE	OPERA	TIO	IONAL EF SCALE		
F	Fastest ¼-mile	3 Second Gust	EF		3 Second Gust	EF		3 Second Gust		
Number	(mph)	(mph)	Nu		(mph)	Number		(mph)		
0	40-72	45-78		0	65-85		0	65-85		
1	73-112	79-117		1	86-109		1	86-110		
2	113-157	118-161		2	110-137		2	111-135		
3	158-207	162-209		3	138-167		3	136-165		
4	208-260	210-261		4	168-199		4	166-200		
5	261-318	262-317		5	200-234		5	Over 200		

Table 3.49. Enhanced F Scale for Tornado Damage

Source: The National Weather Service, www.spc.noaa.gov/faq/tornado/ef-scale.html

The wind speeds for the EF scale and damage descriptions are based on information on the NOAA Storm Prediction Center as listed above. The damage descriptions are summaries. For the actual EF scale it is necessary to look up the damage indicator (type of structure damaged) and refer to the degrees of damage associated with that indicator. Information on the Enhanced Fujita Scale's damage indicators and degrees or damage is located online at www.spc.noaa.gov/efscale/ef-scale.html.

Enhance	d Fujita Scale		
Scale	Wind Speed (mph)	Relative Frequency	Potential Damage
EF0	65-85	53.5%	Light. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e. those that remain in open fields) are always rated EF0).
EF1	86-110	31.6%	Moderate. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	10.7%	Considerable. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes complete destroyed; large trees snapped or uprooted; light object missiles generated; cars lifted off ground.
EF3	136-165	3.4%	Severe. Entire stores of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	0.7%	Devastating. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	<0.1%	Explosive. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 300 ft.; steel reinforced concrete structure badly damaged; high rise buildings have significant structural deformation; incredible phenomena will occur.

 Table 3.50.
 Enhanced Fujita Scale with Potential Damage

Source: NOAA Storm Prediction Center, http://www.spc.noaa.gov/efscale/ef-scale.html

Enhanced weather forecasting has provided the ability to predict severe weather likely to produce tornadoes days in advance. Tornado watches can be delivered to those in the path of these storms several hours in advance. Lead-time for actual tornado warnings is about 30 minutes. Tornadoes have been known to change paths very rapidly, thus limiting the time in which to take shelter. Tornadoes may not be visible on the ground if they occur after sundown or due to blowing dust or driving rain and hail.

Previous Occurrences

One tornado may contain multiple segments as it moves geographically. A tornado that crosses a county line or state line is considered a separate segment for the purposes of reporting to the NCEI. In addition, a tornado that lifts off the ground for less than 5 minutes or 2.5 miles is considered a separate segment. If the tornado lifts off the ground for greater than 5 minutes or 2.5 miles, it is considered a separate tornado. Tornadoes reported in Storm Data and the Storm Events Database is in segments. Tables 3.46 and 3.47 reflect data from the NCEI and the Tornado History Project. The MPC was unable to determine which site contained information that is more accurate. There has not been any crop losses due to tornadoes reported.

Date/Time (CST)	Beginning Location	Beginning Time	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Dth Inj		Property Damage	Crop Damages
2009-06-10	3ESE FAITH 38.0304/- 92.3206	19.05-10:06	3ESE FAITH 38.034/-92.3105	.6 miles	200 yards	F1			50K	
2004-07-05	4 SE Eldon 38.32/-92.53	06:34-06:35	4 SE Eldon 38.32/-92.53	.2 miles	125 yards	F1			50K	
2004-07-05	5ESE Eldon 38.32/-92.50	06:37-06:38	5ESE Eldon 38.32/-92.50	.2 miles	125 yards	F1			10K	
2004-07-05	6E Eldon 38.35/-92.47	06:40-06:41	6E Eldon 38.35/-92.47	.2miles	.2 miles	F1			10K	
2003-05-06	3 W Eldon 38.35/-92.63	15:50-15:50	Eldon 38.35/-92.58	.2 miles	20 yards	F0			0	
2003-05-06	3 W Eldon 38.35/-92.63	15:45-15:42	Eldon 38.35/-92.58	.3 miles	100 yards	F0			0	
2003-05-04	1 S Iberia 38.07/-92.32	19:30- 19:30	1 S Iberia 38.07/-92.32	.2 miles	20 yards	F0	1		0	
2001-10-23	15 SW Eldon 38.18/-92.78	15:30-16:05	3 S Eldon 38.30/-92.58	15 miles	300 yards	F1		1	100K	
2001-08-29	1SE Iberia 38.07/-92.30	15:00-15:05	2 SE Iberia 38.07/-92.30	.5 mile	100 Yards	F0			10K	
	Total:								230K	

Table 3.51. NCEI Recorded Tornadoes in Miller County Present -1993

Source: National Climatic Data Center, <u>http://www.ncei.noaa.gov/stormevents/</u>

Table 3.52	Table 3.52. Tornado History Project.com Miller County Tornados 2017-1993											
Date	Time	Fatalities	Injuries	Width	Length	County 1	County 2	Damage				
6/10/2009	19:05:00	0	0	200	0.6	Miller	-					
7/5/2004	6:34:00	0	0	125	0.2	Miller	-					
7/5/2004	6:37:00	0	0	125	0.2	Miller	-					
7/5/2004	6:40:00	0	0	125	0.2	Miller	-					
5/6/2003	15:27:00	0	0	100	13	Morgan	Miller					
5/6/2003	15:50:00	0	0	20	0.2	Miller	-					
5/4/2003	19:30:00	0	0	20	0.2	Miller	-					
10/23/2001	15:25:00	0	1	300	15.5	Morgan	Miller					
8/29/2001	15:00:00	0	0	100	0.5	Miller	-					
7/7/1993	11:30:00	0	0	23	0.1	Miller	-	\$500-\$5000				
6/8/1993	5:35:00	0	0	50	0.4	Miller	-	\$500-\$5000				

Source http://www.tornadohistoryproject.com/tornado/Missouri



Figure 44 below indicates the EF rating and the paths of previous tornadoes in the County area.

Figure 44 Historic Tornado Events Map

There are limitations to the use of NCEI tornado data that must be noted. For example, one tornado may contain multiple segments as it moves geographically. A tornado that crosses a county line or state line is considered a separate segment for the purposes of reporting to the NCEI. In addition, a tornado that lifts off the ground for less than 5 minutes or 2.5 miles is considered a separate segment. If the tornado lifts off the ground for greater than 5 minutes or 2.5 miles, it is considered a separate tornado. Tornadoes reported in Storm Data and the Storm Events Database is in segments.

To date the USDA Risk Management Agency has no records of crop damages for the tornadoes that occurred in Miller County.

Probability of Future Occurrence Low

Miller County is no stranger to the likeliness of tornadoes either. There have been 22 F1 category tornadoes reported since 1950 and three (3) F2. There has only been one (1) F4 reported for the county, which dated back to April 18, 1880. There have been no F3 or F5 tornadoes reported for the county. Because of the terrain, tornadoes are not as probable in the county as flooding. There is a 37% probability of future occurrence of tornadoes based on the NCEI statistics.

<u>Vulnerability</u>

Vulnerability Overview

Miller County is located on the Ozark Plateau along the eastern edge of tornado alley. Due to its location, Miller County is subjected to severe thunderstorms, heavy rainfall, and tornadoes. Historical data reflects that Miller County from 1950 to 2017 has experienced 26 tornado events. Miller County has not experienced any tornadoes above an F2 since 1880, and a majority of the tornadoes 22 have been an F0 to F1 within the Fujita scale. There has been 3 F2 tornadoes in the years 1996 (2) and in 1986 (1).

The tornado events of May 4 and May 6, 2003 were a compilation of over 30 tornadoes to touchdown during the three-day period in Missouri. The City of Eldon and the City of Iberia each had an F0 tornado touchdown on May 4, 2003. Miller County was included in a Presidential Disaster Declaration in connection with the May 6, 2003 tornadoes.



Table 3.53. Tornadoes in LOCLG Region, 1950 – 2017

A comparison of our entire region of Camden, Laclede, and Miller and Morgan counties was used to give us a better understanding of the local impact that Miller County has experienced with Tornadoes in our planning area. Miller County has experienced several Presidential Disaster Declarations for tornadoes.

June 19, 2009 – Major Disaster (Presidential) Declared (DR-1847) *Incident Period: May 8, 2009 to May 16, 2009* November 13, 2008 – Major Disaster (Presidential) Declared (DR-1809) *Incident Period: September 11, 2008 to September 24, 2008*

Tornado Alley in the U.S.



Figure 45 Tornado Alley in the United States Map

Source: http://www.tornadochaser.net/tornalley.html

Potential Losses to Existing Development

In the most recent years of 2001 and 2004 that Miller County experienced financial loses, the two years averaged at 90K. It should also be considered that the cost of 2001 was 110K in the City of Iberia and in 2004; the cost was 70K in the City of Eldon. The most common F-Scale Tornadoes in Miller County are F1 (17), F0 (6), F2 (3) and no F4 nor F5.

Hazard Summary by Jurisdiction

Table 3.54.	Miller County & Jurisdictions Percentages of 9,452 Mobile/ Manufactured Homes												
Miller County	Bagnell	Bagnell Brumley		Brumley Eldon Iberia			Lake Ozark	Olean	St. Elizabeth	Tuscumbia			
13.40%	17.20%	10.70%	7.50%	6.80%	5.30%	25.60%	0.00%	0.00%					
Courses Consults Bureau https://footfinder.consult.com/													

Source: Census Bureau https://factfinder.census.gov

No damages were reported to School Districts due to tornadoes.

Problem Statement

Miller County can expect Tornadoes to damage structures throughout the entire planning area. There is inconsistent data concerning the costs associated with the historical information available. It is difficult to estimate the potential impact on both the number of structures and the cost of any given natural hazard, as they are completely unpredictable.

Tornado safe rooms have become a priority for many of our local school districts in the wake of the Joplin, Missouri tornadoes. While many of these projects are still in the design phase, both FEMA and SEMA have been instrumental in the funding of these projects. All the school districts have expressed an interest in building safety-related infrastructure, including safe rooms. All the communities have expressed interest in upgrading or installing additional early-warning equipment to cover more of the planning area.

The Springfield Office of the National Weather Service covers our planning area. An established early-warning system is utilized to help the public prepare for pending severe weather.

3.3.14 Winter Weather/Snow/Ice/Severe Cold

Some specific sources for this hazard are:

- Wind chill chart, National Weather Service, http://www.nws.noaa.gov/om/winter/windchill.shtml;
- Average Number of House per year with Freezing Rain, American Meteorological Society.
 "Freezing Rain Events in the United States." <u>http://ams.confex.com/ams/pdfpapers/71872.pdf;</u>
- USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm
- Any local Road Department data on the cost of winter storm response efforts.
- National Climatic Data Center, Storm Events Database, <u>http://www.neic.noaa.gov/stormevents/</u>

Hazard Profile

Hazard Description

A major winter storm sometimes continues for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows.

- **Blizzard**—Winds of 35 miles per hour or more with snow and blowing snow reducing visibility to less than ¼ mile for at least three hours.
- **Blowing Snow**—Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- **Snow Squalls**—Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- **Snow Showers**—Snow falling at varying intensities for brief periods. Some accumulation is possible.
- **Freezing Rain**—Measurable rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coating or glaze of ice. Most freezing-rain events do not last long and occur near sunrise between the months of December and March.
- **Sleet**—Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects.

Geographic Location

The entire county is vulnerable to heavy snow, ice, extreme cold temperatures, and freezing rain.NWS Statewide Average Number of Hours per Year with Freezing Rain



Figure 46 Yearly Average of Freezing Rain

Source: American Meteorological Society. "Freezing Rain Events in the United States." http://ams.confex.com/ams/pdfpapers/71872.pdf

Severity/Magnitude/Extent

Severe winter storms include extreme cold, heavy snowfall, ice, and strong winds, which can push the wind, chill well below zero degrees in the planning area. Heavy snow can bring a community to a standstill by inhibiting transportation (in whiteout conditions), weighing down utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the snow. Repair and snow removal costs can be significant. Ice buildup can collapse utility lines and communication towers, as well as make transportation difficult and hazardous. Ice can also become a problem on roadways if the air temperature is high enough that precipitation falls as freezing rain rather than snow.

Extreme cold often accompanies severe winter storms and can lead to hypothermia and frostbite in people without adequate clothing protection. Cold can cause fuel to congeal in storage tanks and supply lines, stopping electric generators. Cold temperatures can also overpower a building's heating system and cause water and sewer pipes to freeze and rupture. Extreme cold also increases the likelihood for ice jams on flat rivers or streams. When combined with high winds from winter storms, extreme cold becomes extreme wind chill, which is hazardous to health and safety.

The National Institute on Aging estimates that more than 2.5 million Americans are elderly is especially vulnerable to hypothermia, with the isolated elders being most at risk. About 10 percent of people over the age of 65 have some kind of bodily temperature-regulating defect, and 3-4 percent of all hospital patients over 65 are hypothermic.

Also at risk are those without shelter, those who are stranded, or who live in a home that is poorly insulated or without heat. Other impacts of extreme cold include asphyxiation (unconsciousness or death from a lack of oxygen) from toxic fumes from emergency heaters; household fires, which can be caused by fireplaces and emergency heaters; and frozen/burst pipes.

Buildings with overhanging tree limbs are more vulnerable to damage during winter storms when limbs fall. Businesses experience loss of income as a result of closure during power outages. In general heavy winter storms increase wear and tear on roadways though the cost of such damages is difficult to determine. Businesses can experience loss of income as a result of closure during winter storms.

Overhead power lines and infrastructure are also vulnerable to damages from winter storms. In particular, ice accumulation during winter storm events damage power lines due to the ice weight on the lines and equipment. Damages also occur to lines and equipment from falling trees and tree limbs weighted down by ice. Potential losses could include cost of repair or replacement of damaged facilities, and lost economic opportunities for businesses.

Secondary effects from loss of power could include burst water pipes in homes without electricity during winter storms. Public safety hazards include risk of electrocution from downed power lines. Specific amounts of estimated losses are not available due to the complexity and multiple variables associated with this hazard. Standard values for loss of service for utilities reported in FEMA's 2009 BCA Reference Guide, the economic impact as a result of loss of power is \$126 per person per day of lost service.

Wind can greatly amplify the impact of cold ambient air temperatures. Provided by the National Weather Service, Figure 47 is a display of the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite.

Wind Chill Chart

_																			
									Tem	pera	ture	(°F)							
	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
(H	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
Ë	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
P	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
iM	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55 25 18 11 4 -3 -11 -18 -25 -32 -39 -46 -54 -61 -68 -75 -82 -89 -97																		
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98
	Frostbite Times 30 minutes 10 minutes 5 minutes																		
			w	ind (Chill	(°F) =	= 35.	74 +	0.62	15T	- 35.	75(V	0.16) -	+ 0.4	275	Γ(V ^{0.1}	16)		
						Whe	ere, T=	Air Ter	npera	ture (°	F) V=	Wind 9	Speed	(mph)			Effe	ctive 1	1/01/01

Figure 47 Wind Chill Chart

Source: National Weather Service, http://www.nws.noaa.gov/om/winter/windchill.shtml

Table 3.55. Crop Insurance Claims Miller County due to Cold Conditions and Snow 2006-2016

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2013	Soybeans	Cold Wet Weather	\$ 1197.00

Source: USDA Risk Management Agency, http://www.rma.usda.gov/data/cause.htm

Previous Occurrences

Winter weather in the Midwest can be unpredictable and can create challenges for Missourians. Winter storms can be sleet, ice, snow, and wind chilling cold. Ice storms are often the most devastating as it cripples the entire region, including roads, utilities, and critical infrastructure. The severe cold that inevitably follows a storm can and often times is relentless. Especially if there was, an ice storm that knocked out essential power used to heat a majority of homes throughout the area.

Inclusive Dates		# of		Property	Crop
Dates	Magnitude	Injuries	Damages	Damages	Damages
			Sleet around 1/2 inch, snow one to two		
March 2, 2014	Winter Storm	0	inches	0	0
			Power outages latest 3 weeks, historic		
January 12-14,	Ice Storm Freezing		event, carbon monoxide poisoning from		
2007	Rain, Sleet	0	generations	3M	0
January 5,					
2014	Winter Storm	0	Heavy Snowfall, six to twelve inches	0	0
March 24,					
2013	Winter Storm	0	Heavy Snowfall, four to seven inches	0	0
F 1 05					
February 25,	Minter Cterre	0	Heavy Snowfall, four to eight inches to	0	0
2013	winter Storm	0		0	0
February 21			One to two inches of sleet, downed trees		
2013	Winter Storm	0	power outages	0	0
2010		0		Ŭ	Ŭ
February 01.	Ice Storm Freezing				
2013	Rain, Sleet	0	Power Outages, trees down, tree damage	0	0
			.		
February 01,					
2011	Heavy Snow	0	10-20 inches/Blizzard Treacherous roads	0	0
December 9-	Ice Storm Freezing		Heavy Ice Accumulation, .25 inch to 1	1014	
10, 2012	Rain, Sleet	0	INCH SIZE	10K	0
February 28,	Minter Cterre	0		0	0
2009	Winter Storm	0	Heavy Snowfall	0	0
February 21	Ice Storm Freezing		Heavy Ice Accumulation 25 inch to 1		
2008	Rain Sleet	0	inch size	0	0
2000		Ů	Heavy Ice Accumulation 25 inch to 1	Ŭ	Ŭ
February 11	Ice Storm Freezing		inch size, power outages as many as		
2008	Rain, Sleet	0	34,000	0	0
January 20	, , , , , , , , , , , , , , , , , , ,				
January 20,			Freezing Rain, sleets and snow, .25 inch		
2007	Winter Storm	0	to 1 inch	0	0

Table 3 56	NCEL Miller County	Winter Weather Ev	onts Summary 2007-2017

Source: NCEI, https://www.ncei.noaa.gov
Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
	Severe Winter Storm		
1736		December 06, 2007 - December 15, 2007	PA
	Severe Winter Storm		
3281		December 08, 2007 - December 15, 2007	PA-A & PA-B
	Severe Winter Storm		
1676		January 12, 2007 - January 22, 2007	PA
	Severe Winter Storm		
3303		January 26, 2009 - January 28, 2009	PA-B
	Severe Winter Storm		
1961		January 31, 2011 - February 05, 2011	PA
	Severe Winter Storm		
3317		January 31, 2011 - February 05, 2011	PA

 Table 3.57.
 FEMA Disaster Declarations that included Miller County, Missouri 2007-2017

Source: Missouri State Hazard Mitigation Plan 2013 https://www.fema.gov

Winter weather affects each community within our planning area. While the impact is different in each of these communities, the consequences are similar. Miller County has experienced some 13 incidents of severe winter weather since 2017. These natural hazard events have affected the entire planning area.

The frost and freeze that occurred on April 7, 2007 continued until April 9, 2007, causing extensive crop damage. Prior to this date, Missouri was experiencing a mild March with unseasonably warm temperatures causing early seasonal growth on a variety of crops all across Missouri. Hay, wheat and other crops began to bud and during the nights on these dates, the temperatures dropped into the teens and low 20s causing a hard freeze on the maturing vegetation. The wheat crop was just about 90% damaged. Miller County's estimated crop damage was 2.48M. Miller County has on average 1-2 events annually.

Snowstorms and ice storms cripple our rural communities as most of the secondary gravel roads are hard to clear and often times the last to be addressed during a storm. Schools often face additional days off because of the rural communities and those students who cannot be picked up by the school bus. This also has an impact on the working population in these rural areas as they will have to miss work in the event they are unable to gain access to the main routes that have been cleared.

Probability of Future Occurrence

Blizzard- High Cold/Wind Chill- High Extreme Cold/Wind Chill- High Heavy Snow- High Ice Storm- High Sleet- High Winter Storm- High Winter Weather- High There have been more than 13 severe winter weather events in Missouri from 2007-2017. The severity of these storms varied.

Vulnerability

Vulnerability Overview

The economic impact felt by Miller County has increased in the past few years as several of the lakefront communities have had considerable damage to boats and boat docks that were damaged by severe ice storms. The buildup of ice on the boat docks can cause the roof to buckle under the weight and fall onto the boat, and in some cases sink the entire dock into the lake.

Potential Losses to Existing Development

Miller County has experienced a considerable amount of Severe Winter Weather and the damages are high for both structural damages, and infrastructure damages to utility lines, and roads. Lake front properties have experienced extensive damage to boats and boat docks. Estimating the overall costs is difficult as many of these items are personal property and claims are filed individually with each insurance company and that data is not collectively shared. The information on the NOAA website does not reflect the overall costs associated with the Severe Winter Weather that Miller County has experienced.

Previous and Future Development

No previous or future development noted.

Hazard Summary by Jurisdiction

No reports of damages caused to schools.

Problem Statement

Mitigation: Preservation of critical power sources is essential in rural areas to ensure that people are not stranded in homes with no heat and no access to the main roads. Many of the local power companies spend considerable time during the summer months trimming trees along the power lines to help minimize the impact closest to those power lines. The cost to bury the utility lines has often been discussed but the cost factor has limited many projects from being feasible and therefore, left undone. A Multi-Jurisdictional Hazard Mitigation Plan for Missouri's Electric Cooperatives was developed and submitted to FEMA and approved in 2012. Within the LOCLG region, all the Rural Electric Cooperatives serving our area participated in the planning process; this will enable the electric cooperatives to be eligible for FEMA mitigation funds, which could be used to help offset the cost of some of these improvements.

The Springfield Office of the National Weather Service covers our planning area; An established early-warning system is utilized to help the public prepare for pending severe weather.

4 MITIGATION STRATEGY

4	MI	TIGATIO	N STRATEGY	4.1
	4.1	Goals		
	4.2	Identij	fication and Analysis of Mitigation Actions	
	Tab	ble 4.1.	Action Status Summary	
	Tab	ole 4.2.	Summary of Completed and Deleted Actions from the Previous Plan	4.4
	4.3	Implei	mentation of Mitigation Actions	
	Tab	ole 4.3.	STAPALEE 2018	

44 CFR Requirement §201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section presents the mitigation strategy updated by the Mitigation Planning Committee (MPC) based on the updated risk assessment. Initially the actions from the 2013 plan were reviewed and discussed on whether the MPC wanted to keep them in the 2018 plan this was at the third and fourth planning meetings. After the initial review the team was informed that an Action Worksheet would need to be completed by each jurisdiction that was willing to adopt that action. So when the planning team learned that they would have to complete an Action Worksheet for "each" action they took a further look on how feasible some of these actions really were and with one more public engagement meeting and specific meetings with each jurisdiction the Action Items were more clearly defined and the list below reflect real actions and some real projects that will effectively mitigate some of the hazards within Miller County. The final determining factor as to whether to continue the Action into the 2018 Miller County Hazard Mitigation plan was solely dependent on a jurisdiction willing to take responsibility for that action and commit to that action with the Action Worksheet. The process included review of updated general goal statements to guide the jurisdictions in lessening disaster impacts as well as specific mitigation actions to directly reduce vulnerability to hazards and losses. The following definitions are taken from FEMA's Local Hazard Mitigation Review Guide (October 1, 2012).

- **Mitigation Goals** are general guidelines that explain what you want to achieve. Goals are long-term policy statements and global visions that support the mitigation strategy. The goals address the risk of hazards identified in the plan.
- **Mitigation Actions** are specific actions, projects, activities, or processes taken to reduce or eliminate long-term risk to people and property from hazards and their impacts. Implementing mitigation actions helps achieve the plan's mission and goals.

4.1 Goals

44 CFR Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

This planning effort is an update to Miller County's existing hazard mitigation plan approved by FEMA in 2013. Therefore, the goals from the 2013 Miller County Hazard Mitigation Plan were reviewed to see if they were still valid, feasible, practical, and applicable to the defined hazard

impacts. The MPC conducted a discussion session during their second meeting to review and update the plan goals. To ensure that the goals developed for this update were comprehensive and supported State goals, the 2015 State Hazard Mitigation Plan goals were reviewed. The MPC also reviewed the goals from current surrounding county plans.

4.2 Identification and Analysis of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Some specific sources for mitigation action ideas include the following:

- FEMA's Mitigation Action Ideas Publication, <u>https://www.fema.gov/media-library/assets/documents/30627</u>
- FEMA's Climate Resilient Activities for Hazard Mitigation Assistance, https://www.fema.gov/media-library/assets/documents/110202
- EPA's Hazard Mitigation for Natural Disasters Publication, https://www.epa.gov/waterutilityresponse/hazard-mitigation-natural-disasters
- EPAs Planning for an Emergency Drinking Water Supply Publication, <u>https://www.epa.gov/waterutilityresponse/water-utility-planning-emergency-drinking-water-supply</u>

As the MPC and the individual jurisdictions reviewed each action, to determine which actions they were willing to adopt and complete the necessary "Action Worksheet" the planning team looked for actions that were SMART actions.

- Specific
- Measurable
- Achievable
- Relevant
- Time Bound

During the second and third MPC meetings, the results of the risk assessment update were provided to the MPC members for review and the key issues were identified for specific hazards. Changes in risk since adoption of the previously approved plan were discussed. The meetings concluded with the distribution of a list of possible mitigation actions to prompt discussions within and among the jurisdictions. The discussions occurred during jurisdictional breakout meetings. The list included possible new mitigation actions, as well as actions from the previously approved plan. Actions from the previous plan included completed actions, on-going actions, and actions upon which progress had not been made. The MPC discussed SEMA's identified funding priorities and the types of mitigation actions generally recognized by FEMA.

The MPC determined to continue including the problem statements in the plan update at the end of each hazard profile. The problem statements summarize the risk to the planning area presented by each hazard, and include possible methods to reduce that risk. Use of the problem statements allowed the MPC to recognize new and innovative strategies for mitigate risks in the planning area.

The focus of the second, third and sixth meeting as well as individual jurisdictional meetings was update of the mitigation strategies that those jurisdictions were willing to complete the Action

Worksheet on. For a comprehensive range of mitigation actions to consider, the MPC reviewed the following information during those meetings.

- A list of actions proposed in the previous mitigation plan, the current State Plan, and approved plans in surrounding counties,
- Key issues from the risk assessments, including the Problem Statements concluding each hazard profile and vulnerability analysis,
- State priorities established for Hazard Mitigation Assistance grants, and
- Public input during meetings, responses to Data Collection Questionnaires, and other efforts to involve the public in the plan development process.

In the meetings, individual jurisdictions, including school and special districts, developed final mitigation strategy for submission to the MPC. They were encouraged to review the details of the risk assessment vulnerability analysis specific to their jurisdiction. They were also provided a link to the FEMA's publication, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013).* This document was developed by FEMA as a resource for identification of a range of potential mitigation actions for reducing risk to natural hazards and disasters.

The MPC reviewed the actions from the previously approved plan for progress made since the plan had been adopted, using the previous STAPLEE worksheets below. Prior to Meeting # 3, the list of actions for each jurisdiction was emailed to that jurisdiction's MPC representative along with the worksheets. During the meetings, # 3, # 4 and # 6 each action was reviewed in accordance with criteria below.

- Completed, with description on who completed and how
- Not Started/but a jurisdiction has identified this action as an action they are will to take responsibility for and do by completing an Action Worksheet
- In Progress/Continue in Plan Update, with the completion of an Action Worksheet by a specific jurisdiction
- Deleted, with a discussion of the reasons for deletion, and lack of support by any jurisdiction

Table 4.1.	Action Status Summary
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Jurisdictions	Completed Actions	Deleted Actions	Continuing Actions	New Actions
All	6	37	13	14

Table 4.2. Summary of Completed and Deleted Actions from the Previous Plan

Completed Actions	Completion Details
	(date, amount, funding source)
2.1.7 LOCLG mapped all low water crossings	Completed 5/27/2016 with funding from CDBG Disaster Planning Grant it was part of several projects. Exact \$ not specific to just this data collection.
2.1.8 With the help of LOCLG purchase, ESRI and HAZUS flood software to improve flood hazard assessments and flood mapping.	Completed 5/27/2016 with funding from CDBG Disaster Planning Grant it was part of several projects. Exact \$ not specific to just this data collection.
2.1.9 With the help of LOCLG coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS flood software program and GIS systems.	Completed 5/27/2016 with funding from CDBG Disaster Planning Grant it was part of several projects. Exact \$ not specific to just this data collection.
2.1.10 With the help of LOCLG conduct an in-depth flood risk analysis utilizing HAZUS data and create detailed maps to identify areas of high risk for flooding.	Completed 5/27/2016 with funding from CDBG Disaster Planning Grant it was part of several projects. Exact \$ not specific to just this data collection.
2.1.18 In collaboration with LOCLG purchase the HAZUS software and coordinate the collection of data to populate the HAZUS software on earthquake risk information.	Completed 5/27/2016 with funding from CDBG Disaster Planning Grant it was part of several projects. Exact \$ not specific to just this data collection.
3.1.3 Analyze the data collected from LOCLG in the HAZUS software.	Completed 5/27/2016 with funding from CDBG Disaster Planning Grant it was part of several projects. Exact \$ not specific to just this data collection.
Deleted Actions	Reason for Deletion
1.1.1 Encourage public facilities to have shelters to accommodate staff and visitors during tornadoes and any other natural hazard.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.2 Evaluate existing facilities for shelter options. Develop a plan to clearly identify shelter locations for both visitors and employees within all public buildings.	Combined with 1.1.3 and changed to specific jurisdiction actions.
1.1.3 Seek funding to add shelters to existing public facilities to ensure adequate protection from tornadoes and strong winds.	Changed to School of the Osage 1.1.3, Miller County R-III 1.1.3 and St. Elizabeth 1.1.3
1.1.4 Seek funding for communities interested in upgrading or installing early warning systems.	Changed to City of Lake Ozark 1.1.4 and St. Elizabeth 1.1.4
1.1.5 Seek funding to initiate a storm water drainage study for the communities of City of Eldon, City of Iberia, City of Lake Ozark, Village of St. Elizabeth, and Village of Tuscumbia.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.6 Examine repetitive flood loss properties to determine feasible and practical mitigation opportunities.	Not feasible as no jurisdiction completed an Action Worksheet for this action.

1.1.7 Encourage homeowners and businesses that are located in high flood areas to elevate all mechanical equipment within their homes and or facilities, including furnaces hot water heaters, electrical panels, freezers and other electrically run equipment.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.8 Coordinate with community service organizations to provide assistance and volunteer labor to help low-income residents and elderly winterize their homes.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.9 Create a network of community partners, including public health agencies, emergency management agencies, volunteer organizations, to designate community locations with adequate air conditioning that can be used as heat emergency shelters during a heat wave.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.10 Encourage additional facilities to become a part of the heat shelter network.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.11 Develop drought plans and water conservation programs.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.12 Increase hazard assessment information on dams within Miller County	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.13 Maintain mapping on all dams that are not currently regulated by MDNR.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.1 Increase public awareness and understanding of the benefits of a FEMA Safe Room 361 and seek funding for the building of Safe Rooms wherever needed.	Changed to School of the Osage 1.1.3, Miller County R-III 1.1.3 and St. Elizabeth 1.1.3
2.1.2 Collaborate with trade organizations, engineers, and school districts to conduct Safe Room seminars.	Changed to School of the Osage 1.1.3, Miller County R-III 1.1.3 and St. Elizabeth R-IV 1.1.3
2.1.3 Encourage construction of community tornado shelters in office buildings, manufacturing facilities, multi-family rental units, schools, mobile home parks, and other large population congregation centers.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.4 As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.5 Participate in and ensure compliance with, flood mitigation and floodplain management programs.	Same as action 2.1.6 elected to stay with 2.1.6 all action worksheets will reflect the 2.1.6 action
2.1.6 Participate in the National Flood Insurance Program (NFIP)	Changed to Miller County 2.1.6, City of Eldon 2.1.6, City of Lake Ozark 2.1.6, Village of Tuscumbia 2.1.6
2.1.11 Encourage local governments, local businesses to develop a snow day policy that will only require essential personal to be on the road during severe winter weather events.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.12 Make the public aware of the Miller County Emergency Operations Plan in regard to heat-related mitigation.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.13 Work with community groups to sponsor a program to encourage neighbors to check on at risk people within their communities. Such as neighborhood watch or CERT.	Miller County decided that the CERT Team efforts would support this action. See Action 4.1.6

2.1.14 Temporarily reduce or eliminate fees for swimming pools during extended periods of extreme heat and humidity, applicable only to communities with swimming pools.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.15 Review the Missouri Drought Plan and local drought plans available a Missouri Department of Natural Resources incorporate into local Emergency Management plan.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.16 Incorporate GIS Mapping into Miller County Emergency Management Operations, with regard to wildfire history and potential high risk areas for wildfires.	tNot feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.17 Use of burn bans during high-risk conditions such as high winds, dry conditions, and drought.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.19 Identify facilities within Miller County that have generators or emergency power in the event of an earthquake.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.20 Maintain mapping in the Miller County Emergency Operations Plan for Dam Failure.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.21 For dams that are not regulated by MDNR encourage dam owners to inspect their dams and identify all repairs needed. Encourage repairs be made for the protection of lives and property in the inundation pathway.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
3.1.1 Encourage the use of tempered or shatter-resistant glass in the windows and doors of new public and private facilities where large numbers of people may congregate.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
3.1.2 Develop a plan for upgrading and or prioritize low water crossing based on findings from LOCLG.	Action Changed to projects identified under Miller County 2.1.22, 2.1.23, 2.1.24, 2.1.25, and 2.1.26
 3.1.2 Develop a plan for upgrading and or prioritize low water crossing based on findings from LOCLG. 3.1.4 Encourage Fire Department, Fire Districts, and Ambulance Districts to have alternate routes developed in the event a low water crossing is impassable. 	Action Changed to projects identified under Miller County 2.1.22, 2.1.23, 2.1.24, 2.1.25, and 2.1.26 Not feasible as no jurisdiction completed an Action Worksheet for this action.
 3.1.2 Develop a plan for upgrading and or prioritize low water crossing based on findings from LOCLG. 3.1.4 Encourage Fire Department, Fire Districts, and Ambulance Districts to have alternate routes developed in the event a low water crossing is impassable. 3.1.5 Create a telecommute environment for employees that have access to computers at home for days where driving can be dangerous. 	Action Changed to projects identified under Miller County 2.1.22, 2.1.23, 2.1.24, 2.1.25, and 2.1.26 Not feasible as no jurisdiction completed an Action Worksheet for this action.
 3.1.2 Develop a plan for upgrading and or prioritize low water crossing based on findings from LOCLG. 3.1.4 Encourage Fire Department, Fire Districts, and Ambulance Districts to have alternate routes developed in the event a low water crossing is impassable. 3.1.5 Create a telecommute environment for employees that have access to computers at home for days where driving can be dangerous. 3.1.6 Encourage both government agencies and businesses that have employees that must work outside during the day to have an alternate start and end time during the extreme heat. 	Action Changed to projects identified under Miller County 2.1.22, 2.1.23, 2.1.24, 2.1.25, and 2.1.26 Not feasible as no jurisdiction completed an Action Worksheet for this action. Not feasible as no jurisdiction completed an Action Worksheet for this action.
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 3.1.2 Develop a plan for upgrading and or prioritize low water crossing based on findings from LOCLG. 3.1.4 Encourage Fire Department, Fire Districts, and Ambulance Districts to have alternate routes developed in the event a low water crossing is impassable. 3.1.5 Create a telecommute environment for employees that have access to computers at home for days where driving can be dangerous. 3.1.6 Encourage both government agencies and businesses that have employees that must work outside during the day to have an alternate start and end time during the extreme heat. 3.1.7 Encourage local governments and businesses to have a water conservation plan. 3.1.8 Encourage local governments and local businesses to participate in the annual shakeout earthquake drill. 4.1.1 Work with our Chamber of Commerce, school districts, builders associations, and communities in educating our communities on the potentia natural hazards and promoting the benefits of Safe Rooms. 	Action Changed to projects identified under Miller County 2.1.22, 2.1.23, 2.1.24, 2.1.25, and 2.1.26 Not feasible as no jurisdiction completed an Action Worksheet for this action. Not feasible as no jurisdiction completed an Action Worksheet for this action. Not feasible as no jurisdiction completed an Action Worksheet for this action. Not feasible as no jurisdiction completed an Action Worksheet for this action. Not feasible as no jurisdiction completed an Action Worksheet for this action. Not feasible as no jurisdiction completed an Action Worksheet for this action. Not feasible as no jurisdiction completed an Action Worksheet for this action. Section has been address with specific actions by School of the Osage, Miller R-III and St. Elizabeth R-IV See Action 1.1.3

4.1.3 Work with builders, developers, and manufacturers of building materials that are tornado and wind damage resistant to demonstrate the benefits o these materials as well as building techniques that have been proven affective.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.4 Coordinate public awareness and education in regard to flooding.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.5 With brochures provided by both FEMA and SEMA concerning floor mitigation, flood preparedness, and Flood Response and Recovery work with local volunteers and civic organizations to distribute them to current homeowners and businesses in the area.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.6 CERT Training to be offered by Miller County Emergency Management at least four times per year.	Changed to Miller County CERT 4.1.6
4.1.7 Educational materials in regard to low water crossing and the dangers of driving over them during a flooding incident, distributed through the school districts for new drivers who may not be aware of the dangers.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.8 Distribute educational materials to increase awareness of severe winter weather dangers.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.9 Distribute 211 Emergency call information.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.10 Work with local builders association and developers to create a public workshop on how to effectively winterize your home.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.11 Coordinate public awareness and education in regard to flooding.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.12 Disseminate information to the public as to locations for heat relief, and heat shelters available within the region.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.13 Provide educational materials that help businesses, schools and homeowners recognize the hazards within their business, school or home that can be of potential dangers such as unsecured bookcases, filing cabinets, tal furniture, and other items that would have the probability of falling over in the event of an earthquake.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.14 Miller County Emergency Management in collaboration with other public safety agencies to conduct emergency response exercises.	Miller County decided that the CERT Team efforts would support this action. See Action 4.1.6
4.1.15 Miller County Emergency Management to present at least six community awareness presentation annually	Miller County decided that the CERT Team efforts would support this action. See Action 4.1.6

Source: Previously approved County Hazard Mitigation Plans; Data Collection Questionnaires, Meeting with each Jurisdiction on the Action Worksheets

4.3 Implementation of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include an action strategy describing how the actions identified in paragraph (c)(2)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefits review of the proposed projects and their associated costs.

Jurisdictional MPC members were encouraged to meet with others in their community to finalize the actions to be submitted for the updated mitigation strategy. Throughout the MPC consideration and discussion, emphasis was placed on the importance of a benefit-cost analysis in determining project priority. The Disaster Mitigation Act requires benefit-cost review as the primary method by which mitigation projects should be prioritized. The MPC decided to pursue implementation according to when and where damage occurs, available funding, political will, jurisdictional priority, and priorities identified in the Missouri State Hazard Mitigation Plan. The benefit/cost review at the planning stage primarily consisted of a qualitative analysis, and was not the detailed process required grant funding application. For each action, the plan sets forth a narrative describing the types of benefits that could be realized from action implementation. The cost was estimated as closely as possible, with further refinement to be supplied as project development occurs.

FEMA's suggested STAPLEE methodology is used follows: FEMA's STAPLEE methodology was used to assess the costs and benefits, overall feasibility of mitigation actions, and other issues affecting project. During the prioritization process, the MPC used worksheets to assign scores. The worksheets posed questions based on the STAPLEE elements as well as the potential mitigation effectiveness of each action. Scores were based on the responses to the questions as follows:

Definitely yes = 3 points Maybe yes = 2 points Probably no = 1 Definitely no = 0

The following questions were asked for each proposed action.

S: Is the action socially acceptable?

- T: Is the action technically feasible and potentially successful?
- A: Does the jurisdiction have the administrative capability to successfully implement this action?
- P: Is the action politically acceptable?
- L: Does the jurisdiction have the legal authority to implement the action?
- E: Is the action economically beneficial?

E: Will the project have an environmental impact that is either beneficial or neutral? (Score "2" if positive and "1" if neutral)

Will the implemented action result in lives saved? Will the implanted action result in a reduction of disaster damage?

Adoption and enforcement of floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs);Floodplain identification and mapping, including any local requests for map updates; or Description of community assistance and monitoring activities.

Action 1.1.3: Seek funding to add a FEMA 361 Safe Room-Storm Shelter at the School District

Action Worksheet			
Name of Jurisdiction:	School of the Osage School District		
	Risk / Vulnerability		
Problem being Mitigated:	Safety of school staff and students, as well as residents of Lake Ozark, Osage Beach the local residents of the community.		
Hazard(s) Addressed:	Severe Weather and Tornado		
	Action or Project		
Action/Project Number:	School of the Osage School District Safe Room Project		
Name of Action or Project:	School of the Osage School District Safe Room Project		
Action or Project Description:	Build Safe Room at the School of the Osage School Campus		
Applicable Goal Statement:	Mitigation Planning-Mitigate the effects of potential natural hazards in Miller County		
Estimated Cost:	\$1,500,000 - \$2,000,000		
Benefits:	Ensure the safety of the students and facility during a storm event or tornado. Providing a shelter for the residents of the community.		
	Plan for Implementation		
Responsible Organization/Department:	School of the Osage School District		
Action/Project Priority:	STAPLEE 12-H		
Timeline for Completion:	1-5 years		
Potential Fund Sources:	Mitigation funding, and School Bond funding		
Local Planning Mechanisms to	School District Capital Investment Plan		
be Used in Implementation, if			
any:			
	Progress Report		
Action Status	New		
Report of Progress			

Action 1.1.3: Seek funding to add a FEMA 361 Safe Room-Storm Shelter at the School District

Action Worksheet		
Name of Jurisdiction:	St. Elizabeth R-IV School District	
	Risk / Vulnerability	
Problem being Mitigated:	Safety of school staff and students, as well as residents of St. Elizabeth the local	
	residents of the community.	
Hazard(s) Addressed:	Severe Weather and Tornado	
	Action or Project	
Action/Project Number:	St. Elizabeth R-IV School District Safe Room Project	
Name of Action or Project:	St. Elizabeth R-IV School District Safe Room Project	
	Build Safe Room at the St. Elizabeth R-IV School Campus	
Action or Project Description:		
Applicable Goal Statement:	Mitigation Planning-Mitigate the effects of potential natural hazards in Miller	
	County	
Estimated Cost:	\$1,500,000 - \$2,000,000	
Benefits:	Ensure the safety of the students and facility during a storm event or tornado.	
	Providing a shelter for the residents of the community.	
	Plan for Implementation	
Responsible	St. Elizabeth R-IV School District	
Organization/Department:		
Action/Project Priority:	STAPLEE 12-H	
Timeline for Completion:	1-5 years	
Potential Fund Sources:	Mitigation funding, and School Bond funding	
Local Planning Mechanisms to	School District Capital Investment Plan	
be Used in Implementation, if		
any:		
Progress Report		
Action Status	New	
Report of Progress		

Action 1.1.3: Seek funding to add a FEMA 361 Safe Room-Storm Shelter at the School District

Action Worksheet		
Name of Jurisdiction:	Miller County R-III School District	
	Risk / Vulnerability	
Problem being Mitigated:	Safety of school staff and students, as well as residents of Tuscumbia and staff at Miller County Courthouse	
Hazard(s) Addressed:	Severe Weather and Tornado	
	Action or Project	
Action/Project Number:	Miller County R-III School District Safe Room Project	
Name of Action or Project:	Miller County R-III District Safe Room Project	
Action or Project Description:	Build Safe Room at the Tuscumbia Campus of Miller County R-III School District	
Applicable Goal Statement:	Mitigation Planning-Mitigate the effects of potential natural hazards in Miller County	
Estimated Cost:	\$1,500,000 - \$2,000,000	
Benefits:	Ensure the safety of the students and facility during a storm event or tornado. Providing a shelter for the residents of the community and the staff at the Miller County Courthouse.	
	Plan for Implementation	
Responsible Organization/Department:	Miller County R-III School District	
Action/Project Priority:	STAPLEE 12-H	
Timeline for Completion:	1-5 years	
Potential Fund Sources:	Mitigation funding, and School Bond funding	
Local Planning Mechanisms to be Used in Implementation, if any:	School District Capital Investment Plan	
	Progress Report	
Action Status	New	
Report of Progress		

Action 1.1.4: Seek funding for communities interested in upgrading or installing early warning systems

Action Worksheet		
Name of Jurisdiction:	City of Lake Ozark	
	Risk / Vulnerability	
Problem being Mitigated:	All Hazards –Early Warning	
Hazard(s) Addressed:	All Hazards – Early Warning	
	Action or Project	
Action/Project Number:	City of Lake Ozark 1.1.4	
Name of Action or Project:	Seek funding for communities interested in upgrading or installing early warning systems	
Action or Project Description:	Increase the number of early warning sirens within the City of Lake Ozark when funding is available	
Applicable Goal Statement:	Mitigation Planning-Mitigate the effects of potential natural hazards in Miller County	
Estimated Cost:	\$20,000 - \$50,000	
Benefits:	Additional coverage or early warning siren increases the safety of the local residents as well as the tourist that visit the Lake Ozark area.	
	Plan for Implementation	
Responsible	City of Lake Ozark Floodplain Manager	
Organization/Department:		
Action/Project Priority:	STAPLEE 13-H	
Timeline for Completion:	1-5 years	
Potential Fund Sources:	Mitigation funding, and City funding	
Local Planning Mechanisms to be Used in Implementation, if any:	Flood plain Management	
	Progress Report	
Action Status	Continuing	
Report of Progress	The City of Lake Ozark has installed warning sirens when funding was available and would like to continue to add them when funding becomes available and the terms are within the City's financial ability.	

Action 1.1.4: Seek funding for communities interested in upgrading or installing early warning systems

	Action Worksheet
Name of Jurisdiction:	Village of St. Elizabeth
	Risk / Vulnerability
Problem being Mitigated:	All Hazards –Early Warning
Hazard(s) Addressed:	All Hazards – Early Warning
	Action or Project
Action/Project Number:	Village of St. Elizabeth 1.1.4
Name of Action or Project:	Seek funding for communities interested in upgrading or installing early warning systems
Action or Project Description:	Increase the number of early warning sirens within the Village of St. Elizabeth when funding is available
Applicable Goal Statement:	Mitigation Planning-Mitigate the effects of potential natural hazards in Miller County
Estimated Cost:	\$20,000 - \$50,000
Benefits:	Additional coverage or early warning siren increases the safety of the local residents.
	Plan for Implementation
Responsible	Village of St. Elizabeth
Organization/Department:	
Action/Project Priority:	STAPLEE 13-H
Timeline for Completion:	1-5 years
Potential Fund Sources:	Mitigation funding, and City funding
Local Planning Mechanisms to be Used in Implementation, if	Village of St. Elizabeth
any:	
	Progress Report
Action Status	Continuing
Report of Progress	The Village of St. Elizabeth currently does not have any warning sirens in place and would like to seek funding to identify and install sirens that will protect the Village in the event of a natural disaster.

	Action Worksheet
Name of Jurisdiction:	City of Eldon
	Risk / Vulnerability
Problem being Mitigated:	Potential Flooding and Access to Flood Insurance
Hazard(s) Addressed:	Flooding
	Action or Project
Action/Project Number:	City of Eldon 2.1.6
Name of Action or Project:	National Flood Insurance Program (NFIP)
Action or Project Description:	Continue to participate in the NFIP and comply with the requirements of the program
Applicable Goal Statement:	Mitigation Planning-Mitigate the effects of potential natural hazards in Miller County
Estimated Cost:	\$0-\$1,000
Benefits:	Allowing our residents access to flood insurance is an important way for us to provide security to our county residents. Not allowing them to build in a floodplain or floodway is also a preventative measure to ensure the safety of our county residents.
	Plan for Implementation
Responsible	City of Eldon Floodplain Manager
Organization/Department:	
Action/Project Priority:	STAPLEE 11-M
Timeline for Completion:	On-going
Potential Fund Sources:	Part of the City's Annual Budget
Local Planning Mechanisms to	Flood plain Management
be Used in Implementation, if	
any:	
	Progress Report
Action Status	Continuing
Report of Progress	The City of Eldon's Floodplain Manager has continued to do the necessary actions needed to maintain the NFIP within the City.

	Action Worksheet
Name of Jurisdiction:	City of Lake Ozark
	Risk / Vulnerability
Problem being Mitigated:	Potential Flooding and Access to Flood Insurance
Hazard(s) Addressed:	Flooding
	Action or Project
Action/Project Number:	City of Lake Ozark 2.1.6
Name of Action or Project:	National Flood Insurance Program (NFIP)
Action or Project Description:	Continue to participate in the NFIP and comply with the requirements of the program
Applicable Goal Statement:	Mitigation Planning-Mitigate the effects of potential natural hazards in Miller County
Estimated Cost:	\$0-\$1,000
Benefits:	Allowing our residents access to flood insurance is an important way for us to provide security to our county residents. Not allowing them to build in a floodplain or floodway is also a preventative measure to ensure the safety of our county residents.
	Plan for Implementation
Responsible Organization/Department:	City of Lake Ozark Floodplain Manager
Action/Project Priority:	STAPLEF 11-M
Timeline for Completion:	On-going
Potential Fund Sources:	Part of the City's Annual Budget
Local Planning Mechanisms to	Flood plain Management
be Used in Implementation, if	
any:	
	Progress Report
Action Status	Continuing
Report of Progress	The City of Lake Ozark's Floodplain Manager has continued to do the necessary actions needed to maintain the NFIP within the City.

Action Worksheet Name of Jurisdiction: Miller County **Risk / Vulnerability Problem being Mitigated:** Potential Flooding and Access to Flood Insurance Flooding Hazard(s) Addressed: **Action or Project** Miller County 2.1.6 **Action/Project Number:** National Flood Insurance Program (NFIP) Name of Action or Project: Continue to participate in the NFIP and comply with the requirements of the **Action or Project Description:** program Mitigation Planning-Mitigate the effects of potential natural hazards in Miller **Applicable Goal Statement:** County \$0-\$1,000 **Estimated Cost: Benefits:** Allowing our residents access to flood insurance is an important way for us to provide security to our county residents. Discouraging them from build in a floodplain or floodway is also a preventative measure to ensure the safety of our county residents. **Plan for Implementation** Miller County Floodplain Manager Responsible **Organization/Department:** STAPLEE 11-M **Action/Project Priority: Timeline for Completion:** On-going Part of the County Annual Budget **Potential Fund Sources:** Local Planning Mechanisms to Flood plain Management be Used in Implementation, if any: **Progress Report Action Status** Continuing The Miller County Floodplain Manager has continued to do the necessary **Report of Progress** actions needed to maintain the NFIP within the county.

Action Worksheet Name of Jurisdiction: Village of Tuscumbia **Risk / Vulnerability Problem being Mitigated:** Potential Flooding and Access to Flood Insurance Flooding Hazard(s) Addressed: **Action or Project** Village of Tuscumbia 2.1.6 **Action/Project Number:** National Flood Insurance Program (NFIP) Name of Action or Project: Continue to participate in the NFIP and comply with the requirements of the **Action or Project Description:** program Mitigation Planning-Mitigate the effects of potential natural hazards in Miller **Applicable Goal Statement:** County \$0-\$1,000 **Estimated Cost: Benefits:** Allowing our residents access to flood insurance is an important way for us to provide security to our county residents. Not allowing them to build in a floodplain or floodway is also a preventative measure to ensure the safety of our county residents. **Plan for Implementation** Village of Tuscumbia Floodplain Manager Responsible **Organization/Department:** STAPLEE 12-M **Action/Project Priority: Timeline for Completion:** On-going Part of the City's Annual Budget **Potential Fund Sources:** Local Planning Mechanisms to Flood plain Management be Used in Implementation, if any: **Progress Report Action Status** Continuing The Village of Tuscumbia's Floodplain Manager has continued to do the **Report of Progress** necessary actions needed to maintain the NFIP within the City.

Action 2.1.22: Repair or replace Saline Valley Bridge

	Action Worksheet
Name of Jurisdiction:	Miller County
	Risk / Vulnerability
Problem being Mitigated:	Bridge repairs are needed for the safety of the those who travel over this bridge
Hazard(s) Addressed:	Flooding
	Action or Project
Action/Project Number:	Miller County 2.1.22
Name of Action or Project:	Saline Valley Bridge Repair or Replacement
Action or Project Description:	Saline Valley Bridge Repair or Replacement
Action of 1 roject Description.	
Applicable Goal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost-
	effective and tangible mitigation projects when financially feasible.
Estimated Cost:	\$150,000 - \$200,000
Benefits:	Full replacement would be best as it will allow the bridge to be built higher and
	less likely to have future problems
	Plan for Implementation
Responsible	Miller County
Organization/Department:	
Action/Project Priority:	STAPLEE II-M
Timeline for Completion:	1-5 years
Potential Fund Sources:	Mitigation lunding, BRO lunding, and County lunding
Local Planning Mechanisms to	County Road and Bridge Priorities
be Used in Implementation, if	
any:	
	Progress Report
Action Status	New
Report of Progress	

Action 2.1.23: Repair or replace Martin Bridge

	Action Worksheet
Name of Jurisdiction:	Miller County
	Risk / Vulnerability
Problem being Mitigated:	Bridge repairs are needed for the safety of the those who travel over this bridge
Hazard(s) Addressed:	Flooding
	Action or Project
Action/Project Number:	Miller County 2.1.23
Name of Action or Project:	Martin Bridge Repair or Replacement
	Martin Bridge Repair or Replacement
Action or Project Description:	
Applicable Goal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost-
	effective and tangible mitigation projects when financially feasible.
Estimated Cost:	\$50,000 - \$60,000
Benefits:	Full replacement would be best as it will allow the bridge to be built higher and
	less likely to have future problems
	Plan for Implementation
Responsible	Miller County
Organization/Department:	
Action/Project Priority:	STAPLEE 11-M
Timeline for Completion:	1-5 years
Potential Fund Sources:	Mitigation funding, and County funding
Local Planning Mechanisms to	County Road and Bridge Priorities
be Used in Implementation, if	
any:	
	Progress Report
Action Status	New
Report of Progress	

Action 2.1.24: Repair of Brockman Springs Bridge

	Action Worksheet
Name of Jurisdiction:	Miller County
	Risk / Vulnerability
Problem being Mitigated:	Bridge repairs are needed for the safety of the those who travel over this bridge
Hazard(s) Addressed:	Flooding
	Action or Project
Action/Project Number:	Miller County 2.1.24
Name of Action or Project:	Brockman Springs Bridge Repairs
Action or Project Description:	Brockman Springs Bridge Repairs which includes removing the 3' whistle that is currently in place and replace is with a larger 4' whistle to allow additional water flow through
Applicable Goal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost- effective and tangible mitigation projects when financially feasible.
Estimated Cost:	\$3,000 - \$3,500
Benefits:	Repairs will increase the likeliness that the flooding will not come over the bridge but rather go through the larger waterway that will be installed
	Plan for Implementation
Responsible	Miller County
Organization/Department:	
Action/Project Priority:	STAPLEE 13-H
Timeline for Completion:	1-5 years
Potential Fund Sources:	Mitigation funding, and County funding
Local Planning Mechanisms to	County Road and Bridge Priorities
be Used in Implementation, if	
any:	
	Progress Report
Action Status	New
Report of Progress	

Action 2.1.25: Repair of Catfish Road Bridge

	Action Worksheet
Name of Jurisdiction:	Miller County
	Risk / Vulnerability
Problem being Mitigated:	Bridge repairs are needed for the safety of the those who travel over this bridge
Hazard(s) Addressed:	Flooding
	Action or Project
Action/Project Number:	Miller County 2.1.25
Name of Action or Project:	Catfish Road Bridge Repairs
	Catfish Road Bridge Repairs will be to remove the 2' whistle and replace it with
Action or Project Description:	a 42" whistle. There is repeated wash out at this location and the larger whistle
Applicable Coal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost-
Applicable Goal Statement.	effective and tangible mitigation projects when financially feasible.
Estimated Cost:	\$2,600 - \$3,000
Benefits:	Repairs will increase the likeliness that the flooding will not come over the
	bridge but rather go through the larger waterway that will be installed
	Plan for Implementation
Responsible	Miller County
Organization/Department:	
Action/Project Priority:	STAPLEE 13-H
Timeline for Completion:	1-5 years
Potential Fund Sources:	Mitigation funding, and County funding
Local Planning Mechanisms to	County Road and Bridge Priorities
be Used in Implementation, if	
any:	
	Progress Report
Action Status	New
Report of Progress	

Action 2.1.26: Repair of Pear Orchard Road Bridge

	Action Worksheet
Name of Jurisdiction:	Miller County
	Risk / Vulnerability
Problem being Mitigated:	Bridge repairs are needed for the safety of the those who travel over this bridge
Hazard(s) Addressed:	Flooding
	Action or Project
Action/Project Number:	Miller County 2.1.26
Name of Action or Project:	Pear Orchard Road Bridge Repairs
Action or Project Description:	Pear Orchard Road Bridge Repairs will be to removed the old concrete box culvert that is decaying with age and replace it with the installation of a 4' whistle.
Applicable Goal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost- effective and tangible mitigation projects when financially feasible.
Estimated Cost:	\$2,000-\$2,500
Benefits:	Repairs will increase the likeliness that the flooding will not come over the bridge but rather go through the larger waterway that will be installed
	Plan for Implementation
Responsible Organization/Department:	Miller County
Action/Project Priority:	STAPLEE 13-H
Timeline for Completion:	1-5 years
Potential Fund Sources:	Mitigation funding, and County funding
Local Planning Mechanisms to	County Road and Bridge Priorities
be Used in Implementation, if	
any.	Progress Report
Action Status	New
Report of Progress	
report of rightsb	

<u>Action 2.1.27A:</u> A partnership between the City of Eldon and the Eldon School District to repair the storm water runoff and flooding issues that are impacting the School facilities.

	Action Worksheet
Name of Jurisdiction:	Eldon School District
	Risk / Vulnerability
Problem being Mitigated:	City of Eldon Storm Water Runoff and Flooding
Hazard(s) Addressed:	Flooding
	Action or Project
Action/Project Number:	Eldon School District R-I and City of Eldon 2.1.27A-B
Name of Action or Project:	City of Eldon Storm Water Improvements
Action or Project Description:	A partnership between the City of Eldon and the Eldon School District to repair the storm water runoff and flooding issues that are impacting the School facilities.
Applicable Goal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost- effective and tangible mitigation projects when financially feasible.
Estimated Cost:	\$750,000 - \$850,000
Benefits:	Repairs will increase the likeliness that the flooding will not impact the school facilities
	Plan for Implementation
Responsible Organization/Department:	Eldon School District R-I and the City of Eldon
Action/Project Priority:	STAPLEE 11-M
Timeline for Completion:	1-5 years
Potential Fund Sources:	Mitigation funding, City funding and School funding
Local Planning Mechanisms to be Used in Implementation, if any:	City of Eldon and the Eldon School District R-I
	Progress Report
Action Status	New
Report of Progress	

<u>Action 2.1.27B</u>: A partnership between the City of Eldon and the Eldon School District to repair the storm water runoff and flooding issues that are impacting the School facilities.

	Action Worksheet
Name of Jurisdiction:	City of Eldon
	Risk / Vulnerability
Problem being Mitigated:	City of Eldon Storm Water Runoff and Flooding
Hazard(s) Addressed:	Flooding
	Action or Project
Action/Project Number:	Eldon School District R-I and City of Eldon 2.1.27A-B
Name of Action or Project:	City of Eldon Storm Water Improvements
Action or Project Description:	A partnership between the City of Eldon and the Eldon School District to repair the storm water runoff and flooding issues that are impacting the School facilities.
Applicable Goal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost- effective and tangible mitigation projects when financially feasible.
Estimated Cost:	\$750,000 - \$850,000
Benefits:	Repairs will increase the likeliness that the flooding will not impact the school facilities
	Plan for Implementation
Responsible	Eldon School District R-I and the City of Eldon
Organization/Department:	
Action/Project Priority:	STAPLEE 11-M
Timeline for Completion:	1-5 years
Potential Fund Sources:	Mitigation funding, City funding and School funding
Local Planning Mechanisms to be Used in Implementation, if any:	City of Eldon and the Eldon School District R-I
	Progress Report
Action Status	New
Report of Progress	

Action 2.1.28: Repair or replace West Main Street Lift Station

	Action Worksheet
Name of Jurisdiction:	City of Iberia
	Disl. / Value and bility
	Risk / vulnerability
Problem being Mitigated:	The west Main Street Lift Station is located up the nill from a nearby creek.
	Anytime there is a large rainfall the lift station fills with water and overflows to
	a hearby mannole. The current holding tank is not deep enough and overflows.
Hazard(s) Addressed:	
	Action or Project
Action/Project Number:	City of Iberia 2.1.28
Name of Action or Project:	West Main Street Lift Station Repair or Replacement
	West Main Street Lift Station Repair or Replacement
Action or Project Description:	
Applicable Coal Statements	Mitigation Programs Protect Miller Country's assets and nonvious through asst
Applicable Goal Statement:	effective and tangible mitigation projects when financially feasible
Estimated Cost:	\$500,000 to \$600,000
Estimated Cost:	The current lift station does not have the canacity to contain all the water
Denemus.	needed. Repairing or replacing the lift station and designing and overflow or
	secondary tank will stop the constant flooding that is currently happening every
	time there is a heavy rainfall
	Plan for Implementation
Responsible	City of Iberia
Organization/Department	
Action/Project Priority:	STAPLEE 11-M
Timeline for Completion:	3-5 years
Potential Fund Sources:	Mitigation funding, and Other grant funds needed for match, some limited City
	funding
Local Planning Mechanisms to	City Capital Improvement Plans
be Used in Implementation, if	
any:	
	Progress Report
Action Status	New
Report of Progress	

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Action Worksheet									
Name of Jurisdiction:	Village of St. Elizabeth								
Traine of guristiction.	Vinage of St. Enzadedi								
	Risk / Vulnerability								
Problem being Mitigated:	Whalen Creek Road drainage improvements to alleviate flooding and erosion								
Hazard(s) Addressed:	Flooding								
	Action or Project								
Action/Project Number:	Village of St. Elizabeth 2.1.29								
Name of Action or Project:	Whalen Creek Road drainage improvements								
Action or Project Description:	Whalen Creek Road drainage improvements to alleviate flooding and erosion.								
Applicable Goal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost- effective and tangible mitigation projects when financially feasible.								
Estimated Cost:	\$35,000 - \$75,000								
Benefits:	The current cost to maintain and make repairs to Whalen Creek Road are								
	consistent and improvements will improve the safety and security of the drivers								
	and pedestrians that use the roadway.								
	Plan for Implementation								
Responsible	Village of St. Elizabeth								
Organization/Department:									
Action/Project Priority:	STAPLEE II-M								
Timeline for Completion:	3-5 years								
Potential Fund Sources:	Mitigation funding, and Other grant funds needed for match, some limited								
	Village's survey and immersion and								
Local Planning Mechanisms to	vinage s'annual road improvements								
any.									
any.	Progress Papart								
Action Status	Naw								
Report of Progress									
Report of Flogress									

Action 2.1.30: Repair or replace fire alarm warning system.

Action Worksheet									
Name of Jurisdiction:	Iberia R-V School District								
	Risk / Vulnerability								
Problem being Mitigated:	The current fire alarm systems is not working in one of the school buildings, the school district would like to integrate the fire alarm systems with the other building so that the clerm will function properly and elect all students at the								
	same time.								
Hazard(s) Addressed:	Fire								
	Action or Project								
Action/Project Number:	Iberia R-V School District 2.1.30								
Name of Action or Project:	Fire Alarm System Improvements								
Action or Project Description:	Repair or replace the fire alarm warning system in the Iberia School buildings								
Applicable Goal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost- effective and tangible mitigation projects when financially feasible.								
Estimated Cost:	\$30,000 -\$40,000 if repairs can be done \$100,000-\$200,000 if new system needs to be installed								
Benefits:	Improve the safety of the students and facility working in the buildings that currently no warning system will create a better and safer environment for all.								
	Plan for Implementation								
Responsible	Iberia R-V School District								
Organization/Department:									
Action/Project Priority:	STAPLEE 14-H								
Timeline for Completion:	1-5 years								
Potential Fund Sources:	Mitigation Funding, School Annual Repair Budget								
Local Planning Mechanisms to be Used in Implementation, if any:	School facilities plan								
	Progress Report								
Action Status	New								
Report of Progress									

Action 2.1.31: Village park drainage improvements

Action Worksheet									
Name of Jurisdiction:	Village of Tuscumbia								
	Risk / Vulnerability								
Problem being Mitigated:	Village park improvements to help improve the water drainage within the park.								
	Including repairing and replacing drainage pipes and slopes of the natural								
	ground to increase water flow during heavy rains. Replace the current 3" drain								
Hazard(s) Addressed.	Flooding								
Hazaru(s) Aduresseu.	Action or Project								
Action/Project Number:	Village of Tuscumbia 2.1.31								
Name of Action or Project:	Village park drainage improvements								
	Install larger drainage pipes to increase the water flow during heavy rains. Move								
Action or Project Description:	the slope swall away from the playground area.								
Applicable Goal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost-								
	effective and tangible mitigation projects when financially feasible.								
Estimated Cost:	\$4,000 -\$5,000								
Benefits:	Improving the water flow will limit the water damage during heavy rains.								
	Plan for Implementation								
Responsible	Village of Tuscumbia								
Organization/Department:									
Action/Project Priority:	STAPLEE II-M								
Potential Fund Sources:	1-5 years Mitigation funding and other grant funding needed to make this project happen								
i otentiai i unu sources.	initigation funding, and other grant funding needed to make this project happen.								
Local Planning Mechanisms to									
be Used in Implementation, if									
any:									
	Progress Report								
Action Status	New								
Report of Progress									

Action 2.1.32: River Road drainage and erosion improvements

Action Worksheet								
Name of Jurisdiction:	Village of Tuscumbia							
	Risk / Vulnerability							
Problem being Mitigated:	River Road drainage and erosion improvements							
Hazard(s) Addressed:	Flooding							
	Action or Project							
Action/Project Number:	Village of Tuscumbia 2.1.32							
Name of Action or Project:	River Road drainage and erosion improvement							
Action or Project Description:	The current roadway is full of potholes and edge of pavement cracked and broken. The ditch and drainage systems are clogged and need to be replaced. To remove and improve the drainage system will require the roadway to be excavated which means the roadway would need to be paved after repairs are made to the drainage system.							
Applicable Goal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost- effective and tangible mitigation projects when financially feasible.							
Estimated Cost:	\$70,000 -\$80,000							
Benefits:	Improving the water flow will limit the water damage during heavy rains.							
	Plan for Implementation							
Responsible Organization/Department:	Village of Tuscumbia							
Action/Project Priority:	STAPLEE 11-M							
Timeline for Completion:	1-5 years							
Potential Fund Sources:	Mitigation funding, and other grant funding needed to make project happen.							
Local Planning Mechanisms to be Used in Implementation, if any:								
	Progress Report							
Action Status	New							
Report of Progress								

Action 2.1.33: Rt V culvert replacement under roadway.

	Action Worksheet
Name of Jurisdiction:	City of Bagnell
	Risk / Vulnerability
Problem being Mitigated:	During a flooding event, the City of Bagnell has a culvert that overflows. The culvert goes under Hwy V the culvert needs to be cleaned out or replaced
Hazard(s) Addressed:	Flooding
	Action or Project
Action/Project Number:	City of Bagnell 2.1.33
Name of Action or Project:	Repair or replace the existing culvert under Rt V in the City of Bagnell.
Action or Project Description:	Repair or replace the existing culvert under Rt V in the City of Bagnell.
Applicable Goal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost effect and tangible mitigation projects when financially feasible.
Estimated Cost:	TBD
Benefits:	It would limit the backup of water in the nearby residents and business location that are close to the culvert.
	Plan for Implementation
Responsible	TBD
Organization/Department:	
Action/Project Priority:	STAPLEE 10-M
Timeline for Completion:	1-5 years
Potential Fund Sources:	TBD
Local Planning Mechanisms to	TBD
be Used in Implementation, if	
any:	
	Progress Report
Action Status	New
Report of Progress	

Action 2.1.34: Rt V elevate of alternate route developed

Action Worksheet									
Name of Jurisdiction:	City of Bagnell								
	Risk / Vulnerability								
Problem being Mitigated:	During a flooding event, the City of Bagnell can be stranded if the Rt V floods in the low lying areas between Hwy 54 and Front Street								
Hazard(s) Addressed:	Flooding								
	Action or Project								
Action/Project Number:	City of Bagnell 2.1.34								
Name of Action or Project:	Elevate Rt V or find or develop and alternate route from the Camp Ground in the City Bagnell								
Action or Project Description:	Elevate Rt V or find or develop and alternate route from the Camp Ground in the City Bagnell								
Applicable Goal Statement:	Mitigation Programs-Protect Miller County's assets and populace through cost effect and tangible mitigation projects when financially feasible.								
Estimated Cost:	TBD								
Benefits:	It would provide a way to evacuate the camp ground if flooding impacts that								
	Plan for Implementation								
Responsible									
Organization/Department:									
Action/Project Priority:	STAPLEE 10-M								
Timeline for Completion:	1-5 years								
Potential Fund Sources:	TBD								
Local Planning Mechanisms to	TBD								
be Used in Implementation, if									
any:									
	Progress Report								
Action Status	New								
Report of Progress									

Goal 4: Mitigation Public Awareness – Increase public awareness of natural hazards that have the potential to impact Miller County

<u>Action 4.1.6:</u> CERT Training to be offered by Miller County Emergency Management at least four times per year.

	Action Worksheet
Name of Jurisdiction:	Miller County EMD
	Risk / Vulnerability
Problem being Mitigated:	Training to volunteers to be a part of the CERT program
Hazard(s) Addressed:	All hazards
	Action or Project
Action/Project Number:	Miller County 4.1.6
Name of Action or Project:	CERT Training
Action or Project Description:	CERT Training will be offered by Miller County Emergency Management at least four times per year.
Applicable Goal Statement:	Mitigation Procedures-Encourage continuity of operations of government and emergency services in a disaster.
Estimated Cost:	\$1,500
Benefits:	Education helps the county attract volunteers and it also helps the overall preparedness of the county
	Plan for Implementation
Responsible	Miller County EMD
Organization/Department:	
Action/Project Priority:	STAPLEE 13-H
Timeline for Completion:	1-5 years
Potential Fund Sources:	Mitigation funding, and County funding
Local Planning Mechanisms to	EMD priority
be Used in Implementation, if	
any:	
	Progress Report
Action Status	On-going
Report of Progress	During 2017-2018 the Miller County EMD offered the CERT training a total of four times.

Table 4.3.STAPALEE 2018

Mil	ler County Actions (2018)			+				-					
	Mitigation Actions + Favorable = (2) - Less Favorable = (1) N Not Applicable = (0) All Hazards	Social	Technical	Administrative	Political	Legal	Economic	Environmental	Staplee Totals	Benefit	Cost	Totals Staplee and B/C	Priority
School of the	Seek funding to add FEMA funded storm	•	-		•	-	_	_					
Osage 1.1.3	shelter at the School District	2	2	2	2	0	1	2	11	2	-1	12	Н
Miller County	Seek funding to add FEMA funded storm												
R-III 1.1.3	shelter at the School District	2	2	2	2	0	1	2	11	2	-1	12	Н
St. Elizabeth	Seek funding to add FEMA funded storm												
R-IV 1.1.3	shelter at the School District	2	2	2	2	0	1	2	11	2	-1	12	н
City of Lake	Seek funding for communities interested												
Ozark 1.1.4	in upgrading or installing early warning systems	2	2	2	2	0	2	2	12	2	-1	13	Н
Village of St.	Seek funding for communities interested												
Elizabeth 1.1.4	in upgrading or installing early warning systems	2	2	2	2	0	2	2	12	2	-1	13	н
Miller County 2.1.6	Participate in the National Flood Insurance Program (NFIP)	1	2	1	1	0	2	2	9	2	0	11	м
City of Eldon	Participate in the National Flood	1	2	1	1	0	2	2	a	2	0	11	м
2.1.6	Insurance Program (NFIP)	1	2	1	•	0	2	2	9	2	0		141
City of Lake Ozark 2.1.6	Participate in the National Flood Insurance Program (NFIP)	1	2	1	1	0	2	2	9	2	0	11	м
Village of	Participate in the National Flood	1	2	1	1	0	2	2	9	2	0	11	м
Luscumbia 2.1.6	Insurance Program (NFIP)				-	-			-		-		
2.1.22	Replacement	2	2	1	2	0	1	2	10	2	-1	11	М
Miller County	Martin Bridge Repair or Replacement	2	2	1	2	0	1	2	10	2	-1	11	м
2.1.23		_	_		_	ů	•	_		_	•		
2.1.24	Brockman Springs Bridge Repairs	2	2	1	2	0	2	2	11	2	0	13	н
Miller County	Catfish Road Bridge Repairs	2	2	1	2	0	2	2	11	2	0	13	н
2.1.25	Paar Orahard Bridge Danaira												
2.1.26	rear Orchard Bridge Repairs	2	2	1	2	0	2	2	11	2	0	13	н

Mil	ler County Actions (2018)			7				ш					
	Mitigation Actions + Favorable = (2) - Less Favorable = (1) N Not Applicable = (0)	Social	Technical	Administrative	Political	Legal	Economic	Invironmental	Staplee Totals	Benefit	Cost	Totals Staplee and B/C	Priority
	All Hazards	S	Т	Α	Р	L	E	E					
Eldon R-I School District 2.1.27A	A partnership between the City of Eldon and the Eldon R-I School District to repair the storm water runoff and flooding issues that are impacting the School facilities	2	2	2	2	0	2	2	12	2	-3	11	М
City of Eldon 2.1.27B	A partnership between the City of Eldon and the Eldon R-I School District to repair the storm water runoff and flooding issues that are impacting the School facilities	2	2	2	2	0	2	2	12	2	-3	11	м
City of Iberia 2.1.28	Repair or replace the West Main Street Lift Station.	2	2	1	1	0	2	2	10	2	-1	11	М
Village of St. Elizabeth 2.1.29	Whalen Creek Road Drainage Improvements.	1	2	1	1	0	2	2	9	2	0	11	м
Iberia R-V School District 2.1.30	Repair or replace fire warning system.	2	2	2	2	0	2	2	12	2	-1	14	н
Village of Tuscumbia 2.1.31	Village park drainage improvements.	2	1	1	1	0	2	2	9	2	0	11	М
Village of Tuscumbia 2.1.32	River Road drainage and erosion improvements.	2	1	1	2	0	2	2	10	2	-1	11	м
City of Bagnell 2.1.33	Rt V culvert replacement under roadway	1	1	1	1	0	2	2	8	2	0	10	м
City of Bagnell 2.1.34	Rt V elevate or alternate route developed	1	1	1	1	0	2	2	8	2	0	10	М
Miller County CERT 4.1.6	CERT Training to be offered by Miller County Emergency Management at least four times per year.	1	2	1	1	0	2	2	9	2	0	11	м
5 PLAN MAINTENANCE PROCESS

5 PLAN MAINTENANCE PROCESS	5.1
5.1 Monitoring, Evaluating, and Updating the Plan	5.2
5.1.1 Responsibility for Plan Maintenance	
5.1.2 Plan Maintenance Schedule	
5.1.3 Plan Maintenance Process	5.3
5.2 Incorporation into Existing Planning Mechanisms	
5.3 Continued Public Involvement	

This chapter provides an overview of the overall strategy for plan maintenance and outlines the method and schedule for monitoring, updating, and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms. It is intended to address continued public involvement.

5.1 Monitoring, Evaluating, and Updating the Plan

44 CFR Requirement 201.6(c)(4): The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

5.1.1 Responsibility for Plan Maintenance

The Mitigation Planning Committee (MPC) has served as an advisory committee during the plan update process, but is not a standing committee. Many MPC representatives and stakeholders are also representing their own jurisdictions within Miller County. Oversight responsibility could fall to such entities as the county emergency management agency, each jurisdictions identified representative, LOCLG staff, and Local Emergency Operations Committee members. The MPC is not a standing committee; responsibility for maintenance is delegated to local emergency management officials and the Miller County Emergency Management Director.

The maintenance agreement is the responsibility of the participating jurisdictions, including school districts and special districts, to:

- Meet annually, and after a disaster event, to monitor and evaluate the implementation of the plan;
- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high priority, low- or no-cost recommended actions;
- Maintain vigilant monitoring of multi-objective, cost-share, and other funding opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;
- Report on plan progress and recommended changes to the governing bodies of participating jurisdictions; and
- Inform and solicit input from the public.

The MPC is an advisory body and can only make recommendations to county, city, town, or district elected officials. Its primary duty is to see the plan successfully carried out and to report to the community governing bodies and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, hearing stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information in areas accessible to the public.

5.1.2 Plan Maintenance Schedule

The Multi-Jurisdictional Planning Committee (MPC) agrees to meet annually and after a state or federally declared hazard event as appropriate to monitor progress and update the mitigation strategy. The Miller County Emergency Management Director will be responsible for initiating the plan reviews and will invite members of the MPC to the meeting.

In coordination with all participating jurisdictions, a five-year written update of the plan will be submitted to the Missouri State Emergency Management Agency (SEMA) and FEMA Region VII per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule.

5.1.3 Plan Maintenance Process

Progress on the proposed actions can be monitored by evaluating changes in vulnerabilities identified in the plan. The MPC during the annual meeting should review changes in vulnerability identified as follows:

- Decreased vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions,
- Increased vulnerability due to hazard events, and/or
- Increased vulnerability because of new development (and/or annexation).

Future 5-year updates to this plan will include the following activities:

- Consideration of changes in vulnerability due to action implementation,
- Documentation of success stories where mitigation efforts have proven effective,
- Documentation of unsuccessful mitigation actions and why the actions were not effective,
- Documentation of previously overlooked hazard events that may have occurred since the previous plan approval,
- Incorporation of new data or studies with information on hazard risks,
- Incorporation of new capabilities or changes in capabilities,
- Incorporation of growth data and changes to inventories, and
- Incorporation of ideas for new actions and changes in action prioritization.

In order to best evaluate any changes in vulnerability because of plan implementation, the participating jurisdictions will adopt the following process:

- Each proposed action in the plan identified an individual, office, or agency responsible for action implementation. This entity will track and report on an annual basis to the jurisdictional MPC member on action status. The entity will provide input on whether the action as implemented meets the defined objectives and is likely to be successful in reducing risk.
- If the action does not meet identified objectives, the jurisdictional MPC member will determine necessary remedial action, making any required modifications to the plan.

Changes will be made to the plan to remedy actions that have failed or are not considered feasible. Feasibility will be determined after a review of action consistency with established criteria, period, community priorities, and/or funding resources. Actions that were not ranked high but were identified as potential mitigation activities will be reviewed as well during the monitoring of this plan. Updating of the plan will be accomplished by written changes and submissions, as the MPC deems appropriate and necessary. Changes will be approved by Miller County and the governing boards of the other participating jurisdictions.

5.2 Incorporation into Existing Planning Mechanisms

44 CFR Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Where possible, plan participants, including school and special districts, will use existing plans and/or programs to implement hazard mitigation actions. Those existing plans and programs were described in Section 2.2 of this plan. Based on the capability assessments of the participating jurisdictions, communities in Miller County will continue to plan and implement programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through the following plans:

- General or master plans of participating jurisdictions;
- Ordinances of participating jurisdictions;
- Miller County Emergency Operations Plan;
- Capital improvement plans and budgets;
- School and Special District Plans and budgets; and
- Other plans and policies outlined in the capability assessment sections for each jurisdiction in Chapter 2 of this plan.

Jurisdictional representatives involved in updating these existing planning mechanisms will be responsible for integrating the findings and actions of the mitigation plan, as appropriate. The MPC is also responsible for monitoring this integration and incorporation of the appropriate information into the five-year update of the multi-jurisdictional hazard mitigation plan.

Additionally, after the annual review of the Hazard Mitigation Plan, Miller County Emergency Management Director will provide the updated Mitigation Strategy with status of each mitigation action to the Miller County as well as all Mayors, City Clerks, and School District Superintendents. The Emergency Management Director will request that the mitigation strategy be incorporated, where appropriate, in other planning mechanisms.

Jurisdiction	Planning Mechanisms	Integration Process for	Integration Process for
		Previous Plan	Current Plan
Unincorporated Miller	Emergency Operations	N/A	Emergency Operations
County	Plan		Plan
	Local Emergency Planning		Local Emergency Planning
	Committee		Committee
	Floodplain Management		Floodplain Management
	County Annual Budget		County Annual Budget
City of Bagnell	City Annual Budget	N/A	City Annual Budget
Village of Brumley	N/A	N/A	N/A
City of Eldon	City Annual Budget	N/A	City Annual Budget
	Floodplain		Floodplain
	Ordinance/Management		Ordinance/Management
City of Iberia	City Annual Budget	N/A	City Annual Budget
	Public Works Department		Public Works Department
City of Lake Ozark	City Annual Budget	N/A	City Annual Budget
	Floodplain		Floodplain
	Ordinance/Management		Ordinance/Management
Village of St. Elizabeth	Village Annual Budget	N/A	Village Annual Budget
	Floodplain Management		Floodplain Management
Village of Tuscumbia	Village Annual Budget	N/A	Village Annual Budget
	Floodplain Management		Floodplain Management
Eldon R-I School District	School District Strategic	N/A	School District Strategic
	Plan		Plan
Miller County R-II School	School District Strategic	N/A	School District Strategic
District	Plan		Plan
St. Elizabeth R-IV School	School District Strategic	N/A	School District Strategic
District	Plan		Plan
School of the Osage	School District Strategic	N/A	School District Strategic
School District	Plan		Plan
Iberia R-V School District	School District Strategic	N/A	School District Strategic
	Plan		Plan

Table 5.1 Planning Mechanisms Identified for Integration of Hazard Mitigation Plan

5.3 Continued Public Involvement

44 CFR Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

The hazard mitigation plan update process provides an opportunity to publicize success stories resulting from the plan's implementation and seek additional public comment. Information about the annual reviews will be posted in the local newspaper following each annual review of the mitigation plan.

When the MPC reconvenes for the five-year update, it will coordinate with all stakeholders participating in the planning process. Included in this group will be those who joined the MPC after the initial effort, to update and revise the plan. Public notice will be posted and public participation will be actively solicited, at a minimum, through available website postings and press releases to local media outlets, primarily newspapers.



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Appendix B

Planning Meetings

Press Releases

Media Coverage

Agendas

Sign-In Sheet

Presentation Materials



SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

LAKE OF THE OZARKS COUNCIL OF LOCAL GOVERNMENTS MILLER COUNTY HAZARD MITIGATION PLAN UPDATE MEETING NOTICE AND AGENDA

> Thursday August 31, 2017 6:00 pm Eldon Community Center 309 East 2nd Street Eldon, MO 65026

<u>AGENDA</u>

- I. CALL TO ORDER
- II. INTORDUCTION AND SIGN-IN SHEET
- III. HAZARD MITIGATION PLAN
 - a. Mr. Warren A. Witt, Director Hydro Operations Ameren Missouri i. Upgrades on the Dam.
 - b. Purpose of the Hazard Mitigation Plan
 - i. What is Hazard Mitigation
 - ii. Why the plan is necessary
 - iii. Important changes from previous planning process
 - c. Involvement in the plan
 - i. Why community involvement is important
 - ii. Technical Steering Committee
 - iii. What will be included in the plan
 - d. Review of the planning process
 - i. Community assessments
 - ii. Asset assessments
 - iii. Mitigation actions
 - iv. Draft plan
 - v. Adoption process
 - **IV. OPEN DISCUSSION**
 - V. CONCLUSION
 - VI. ADJOURN



SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

August 15, 2017

Lake of the Ozarks Council of Local Governments is facilitating the planning process for the update and redevelopment of the local multi-jurisdictional hazard mitigation plan for Miller County. Your participation in the planning process is imperative to the success and final adoption of the Miller County Hazard Mitigation Plan 2018.

This plan provides a guide for the next five years for projects that are designed to reduce or eliminate the effects of natural disasters on the citizens of Miller County. The individuals on the team will be comprised of community leaders who can provide the necessary data and provide critical local information toward the success of your plan and project development. Upon completion and approval of this plan by the Missouri State Emergency Management Agency (SEMA) and The Federal Emergency Management Agency (FEMA), the participating jurisdictions and special districts in Miller County will be eligible to receive federal hazard mitigation funding for mitigation projects. This will assist the county with completing the necessary projects to make our communities safer and more resilient.

This planning meeting will involve participation from different areas of the county which will ensure that all sections of the population will have input into the plan. We expect to hold a series of four meetings over the next few months. The first meeting will be held on August 31, 2017 at 6:00 p.m. at the Eldon Community Center, 309 East 2nd Street, Eldon, MO 65026.

If you or your designated representative is willing to participate in this very important planning process, please make sure to attend our first planning meeting. Thank you for consideration in becoming a valuable member of this planning team.

I look forward to meeting you at the August 31, 2017 meeting!

Sincerely,

Nancy A. Crall Planner I

Miller County Multi-Jurisdictional Hazard Mitigation Plan 2018

Jurisdictions

- Miller County
- City of BagnellVillage of Brumley
- City of Eldon
- City of Iberia
- City of Lake Ozark
 City of Olean
- City of Olean
 Village of St. Elizabeth
- Village of Tuscumbia
- Eldon R-I School District
- Miller County R-III School District
 St. Elizabeth R-IV School District
- St. Elizabeth R-IV School District
 School of the Osage R-II School District
- Iberia R-V School District

Our Current Plan

- The current Miller County Hazard Mitigation Plan will expire on September 23, 2018.
- We have experienced 23 natural disaster declarations in the past 20 years

What is Hazard Mitigation

Hazard mitigation is the effort to reduce loss of life and property by lessening the impact of disasters. Mitigation is taking action now—through analyzing risk, reducing risk, or insuring against risk—to reduce the human and financial consequences of future disasters. Effective mitigation requires understanding of local risks, addressing hard choices, and investing in long-term community well-being. Not taking mitigation action jeopardizes our safety, financial security, and self-reliance.

As defined by FEMA

Why Update

- In order to be eligible to apply for grant opportunities from SEMA and FEMA, there must be an approved plan in place.
- □ Plan is required to be update every 5 years.
- Plan must be re-approved by SEMA and FEMA.
- Plan must be re-adopted by communities to maintain eligibility for grant opportunities.

\star Changes that Impact the Planning

- An adoption resolution will be required as a participating jurisdiction. Previously, this occurred after the plan had been approved by FEMA. However, many jurisdictions that indicated they wanted to participate and even worked on the planning aspect never formally adopted the plan.
- In order to be a participating jurisdiction you will need to adopt the plan prior to the submission to FEMA.

Changes that Impact the Planning

- Mitigation Action Items
 - These action items will have more impact on future funding than in previous planning documents. With less Federal funds, FEMA and SEMA will be reviewing the Hazard Mitigation Plans to ensure that the mitigation project you are applying for grant funds was identified during the planning process.
 - Be sure that your community identifies projects or mitigation actions if you intend to apply for grant funds from FEMA.

What Is The Planning Process

- A community/collaborative effort
- Identification of potential natural hazards
- Assessment of buildings and infrastructure that are subject to exposure from natural hazards
- Discussion on how to minimize or eliminate the hazards effects
- Conclusions drawn up by the communities on how to minimize the hazards impact

Technical Steering Committee

- The Technical Steering Committee's goals are to provide technical direction to the overall plan update to achieve a community developed comprehensive plan.
- We are relying on your participation both in your contribution to the overall plan but also participating on the Technical Steering Committee.

What Will The Committee Do

- As part of the Technical Steering Committee you will:
 - Encourage local governments and private sector to prepare and submit pre-disaster mitigation plans
 - Review the current plan
 - Assist and Update mitigation goals
 - Assist and Update mitigation objectives
 - Assist and Update mitigation actions
 Make recommendations on the mitigation actions
 - Review draft of the updated plan

Why Is Hazard Mitigation Important

- What are the benefits of Hazard Mitigation
- Planning?
- Reduction in loss of lives
- Reduction in property damage
- Reduction in lost essential services
- Reduction in loss of critical facilities
- Reduction in economic disruption
- Reduction or elimination in cycles of repetitive losses
- Reduction in recovery time
- Planning for an emergency saves lives, time, and money.

Why Is Hazard Mitigation Essential

- It creates a road map, a plan of what to do in the event of a natural disaster.
- It creates more disaster resilient communities.
- It creates safer communities by reducing loss of life and property
- It creates the opportunity for communities to be eligible for FEMA's Mitigation Grant Funds.
- It lessons the financial impact on the Treasury, State, and communities
- "Each dollar spent on mitigation saves and average of four dollars"-Multihazard Mitigation Council (MMC)

How Can Your Community Participate

- In order to be a participating Jurisdiction you must:
 - Partcipate in the planning process
 - Provide an asset inventory
 - Review the mitigation actions
 - Review a draft of the plan
 - Formally adopt the Hazard Mitigation Plan

What Type of Natural Hazards are included In The Hazard Mitigation Plan

- Dam Failure
- Drought
- Earthquake
- Extreme Heat
- □ Fires (Urban/Structural and Wild)
- Flooding (River & Flash Flood)
 Land Subsidence/Sinkholes
- Land Subsider
 Levee Failure
- Thunderstorm/High Winds/Lightening/Hail
- Tornado
- Winter Weather/Snow/Ice/Severe Cold

FEMA's Mitigation Funding

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation Program (PDM) * School Safe Rooms
- Flood Mitigation Assistance (FMA)
- Repetitive Flood Claims (RFC)
- □ Severe Repetitive Loss (SRL)

What Type Of Projects Are Being Done With Hazard Funding

- Flooding Mitigation (purchasing flood plain properties, buyouts)
- Tornado Safe Rooms (FEMA 361 Safe Room) (see next two slides)
- Infrastructure Projects (low water crossing, and culvert replacements)
- Stream Bank Stabilizations
- Underground Utility Lines





Benefits and Participation

- Increased awareness of hazards and risks, and communicating local priorities to government officials
- Opportunity to share resources, build partnerships, and align risk reduction measures
- Your community will have a plan that promotes cost-effective measures to reduce or eliminate short and long terms risks to life and property in the event of a natural hazard or disaster.
- Your community will also have confidence in local resources because you have taken the time to participate and set in action a plan that will diminish vulnerabilities
- $\hfill\square$ We are asking for your participation in the Technical Steering Committee and the planning process.

Next Meeting

□ When? □ Where? September 26, 2017 @ 6:00 pm Eldon Community Center 309 E. 2nd Street, Eldon, MO





Lake of the Ozarks Council of Local Governments

Serving Camden, Laclede, Miller and Morgan Thursday August 31, 2016 6:00 p.m. Miller County Hazard Mitigation Plan Meeting Eldon Community Center 309 East 2nd Street Eldon, MO 65026

	Representing: C=Concerned Citizen E=Emergency Response (Company)				Miles Driven To Meeting
Name of Attendee	O=Other Please explain	Mailing Address	Contact Phone #	Email Address	(Round Trip)
Dan viewert	O-LOCLG	CAMPENTON, MOGSOSO P.D. Box 3553	523-346-5692	pam.gilbert@loclg.org	56
2 Mancy Crall	O-LOCLO	1319 Deadra Nr Lebanon, MO 65536	417-322-3937	naneyera u @luch s.us	60
3 BARION DIGGERS	E-MILLER GANTY	POBOX 12 TUSCUMBIA, MO	573-369-1954	and emillere maior	12
4 WALTER MORELAND	CITY OF TRERIA		573-793-2300	WMONELAND CONTLOOK.	50
5 Warren Witt	Ameren	617 River Ruad Lake Ozark, Mp	573-365-9322	Wawit to ameren, con	225
6 Joni Witt	• (1.		
7 ton Schlicht	miller Ca Ambulance		513 392 7303	rschlichts millerc	ountyamb
8 BRAD VODER	Show alph Osicie		573-286-5922	Voderb Dosc 50 schude.	ws 25
· Dave Jan Dee	Lake Deart				
10 LISA Van DES	Lake Oeark				10
11 CAROL Thornton	Miller Connety	POBXIZ Tuscumbia 654	573-369-1884	lepce millercounty man	15

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Coreal Government	Serving Camden, Laclede, M Thursday August 31, 2016 6: Eldon Community Center 30	iller and Morgan 00 p.m. Miller County H 09 East 2nd Street Eldon,	azard Mitigation Plan MO 65026	Meeting	
Name of Attendee	Representing: C=Concerned Citizen E=Emergency Response (Company) O=Other Please explain	Mailing Address	Contact Phone #	Email Address	Miles Dr To Meet (Round T
12 Linde Corner	O = LOCLG	P.O. Box 2462 Lake Ozark, mo	573-692-0700	linda. Connera lod	g.org
13 Ton Whight	Milly County	Po 12 Mo 65082	573 - 369-1900	formeright @ millere	witz.
14 Clinton Venkins	Miller County	PO Boxe Tusankia	573-369-1911	Clinton jenkingen no org	1/2
15 Taylor Schlueter	O=Locic	Late Ozerte, and	646 824 3514	tailor.scll votor pluly.org	46
16					
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SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

LAKE OF THE OZARKS COUNCIL OF LOCAL GOVERNMENTS MILLER COUNTY HAZARD MITIGATION PLAN UPDATE MEETING NOTICE AND AGENDA

Tuesday, September 26, 2017 6:00 pm Eldon Community Center 309 East 2nd Street Eldon, MO 65026

<u>AGENDA</u>

- I. CALL TO ORDER
- II. INTRODUCTIONS AND SIGN-IN SHEET
- III. HAZARD MITIGATION PLAN (HMP)
 - a. Update of the Current Hazard Mitigation Plan
 - i. Evaluate natural hazards as identified in the original HMP 2013
 - ii. Identify current natural hazards
 - iii. Risk Assessment-Measures of Probability and Severity
 - b. Miller County Hazard Mitigation Survey 2018
 - i. Public Survey in regard to impacts of Natural Disasters
 - ii. Deadline for completion
 - c. Planning Process Continues
 - i. Next Meeting Date
 - ii. Next Meeting Agenda
- IV. OPEN DISCUSSION
- V. CONCLUSION
- VI. ADJOURN

Morgan County Hazard Mitigation 2018

Jurisdictions

- Morgan County
- City of Barnett
- Village of Gravois Mills
- City of Laurie
- City of Stover
- City of Syracuse
- City of Versailles
- Morgan County R-1 School District
- Morgan County R-II School District

Community Capability Assessment Surveys

- Each jurisdiction has a unique set of capabilities which include authorities, policies, programs, staff, funding, and other resources to approach mitigation and to reduce long-term vulnerabilities.
- As the planning team we need to review these capabilities that currently reduce losses and how they could be used to reduce future losses as well as capabilities that inadvertently increase risks in our communities.
- Do the jurisdictions have the primary types of capabilities?
- Planning and Regulatory
- Administrative and Technical
- Financial
- Education and Outreach
- Understanding these capabilities allows our planning team to enhance strengths and address any shortfalls







- Dam Failure
- Drought
- Earthquakes
- Extreme Heat
- Hail
- Levee Failure
- Tornado
- Terrorism?
- Attack (Nuclear, Conventional, Chemical, and Biological)? Civil Disorder?
- Cyber Disruption?

2013 Hazard Mitigation Plan Risk Analysis Severity/Magnitude/Extent

- > Measure of Probability: Low
- Measure of Severity: Moderate
- Detentiol impact of Scheting Structures: Three have been no reported Dan Failures in Margan County, unable to reply on Inforcia data within our regione base into account the amount of posterial water and debris that would flow downstream. The impact of Dam Failure will have a direct correlation to the Dam itself and the buildings that juni the path of the water and debris. In all cases of complete Dam Failure there will be considerable amount of devisation that will be associated with any incident including detrying all Existing Structures in the path of water and debris.
- The severity/magnitude of dam failure would be similar in some cases to the impacts associated with flood events (see the flood hazard vulnerability analysis and discussion). Based on the hazard class definitions, failure of any of the High Hazard (class I dams could result in a serious otherat of loss of human life, serious damage to residential, industrial or commercial areas, public utilities, public buildings, or major transportation facilities. Clastarophic flatilure of any of the potential to result in greater destruction due to the potential speed of onset and greater depth, extent, and velocity of flooding. Note that for this result, clastarophic flatilure could flood areas outside of magned flood hazards.



Discussion Must Include:

Is there any anticipated future development that can affect the amount of damages such as: residential development, special districts and school district impacts.

Problem Statement

Mitigation: Missouri Department of Natural Resources is the primary resource for state regulated dams. Their website provides information, templates, and guidance in creating the required Emergency Action Plans for all regulated dams. These plans are to help save lives and reduce property damage concerning dam failures. Planning is an important mitigation tool as it often saves lives, lessens property damage, and shortens recovery time.

Increasing the number of dams that are regulated may become necessary, as these older unregulated dams become more of a hazard



Defined as drought that impacts supply and demand of some economic commodity

2013 Hazard Mitigation Plan Risk Analysis Severity/Magnitude/Extent

- > Measure of Probability: Moderate
- > Measure of Severity: Moderate
- Potential Impact of Existing Structures: Drought similar to Extreme Heat does not necessarily have a direct impact on Existing Structures. Prolonged Drought can have an impact on the stability of the earth beneath a structure. However, with limited data there is little evidence that drought will have any significant impact or damage to any existing structures.

2013 Hazard Mitigation Plan Risk Analysis

Previous & Probability of Future Occurrences and Vulnerability

Measure of Vulnerability: Moderate

Problem Statement

Mitigation:

- Crop Insurance: Crop insurance protects farmers from losses due to natural disasters, including drought. Crop insurance can be purchased through private insurance companies or agents.
- Drought Tolerant Crops: With the increase of genetically engineered crops such as corn and soybean, there are many drought tolerant hybrids on the market today. Educating farmers on the new products and advantages of these hybrid seeds can increase resiliency of our farming communities.

Probability of Future Occurrence

 Calculations of your occurrence
 Calculations from 2007 through 2017 predict a 40% probability factor of future occurrence of moderate to severe drought. Although drought is not predictable, long-range outlooks and predicted impacts of climate change could indicate an increased chance of drought. During this time frame all events were in 2012. The costs were \$25K in property damages and 20H in crog damages. (according to NOAA)



- Discuss how anticipated future development in the county could impact the risk of damages from this hazard in the planning area. Include any expansion plans for the school districts and special districts.
- Increases in acreage planted with crops would add to exposure to drought-related agricultural losses.
- > In addition, increases in population result in increased demand for treated water, adding additional strain on water supply systems.



2013 Hazard Mitigation Plan Risk Analysis Severity/Magnitude/Extent

- The New Madrid Seismic Zone , sometimes called the New Madrid Fault Line, is a major seismic zone and a prolific source of intraplate earthquakes (earthquakes within a tectonic plate) in the southern and Midwestern United States, stretching to the southwest from New Madrid, Missouri.
- States, stretching to the southwest from New Madrid, Missouri. There has been much research into the New Madrid Seismic Zone and the potential impact it would have on the region as well as the State of Missouri. Within our region alone it has been forecasted to have a minimal impact as the rock structure in our area will shield us from a direct impact. It is also predicted that because of our unique location and many residents from the St. Louis and surrounding areas own second homes at the lake it is possible that we would see an influx of homeowners seeking refuge in a safe and familiar location. There would also be a positive economic impact as we are slated to serve in a supporting role for emergency and recovery assistance to areas that have experienced damage and catastrophic disaster.
- Probability: Low
- Severity: Low

2013 Hazard Mitigation Plan Risk Analysis Previous & Probability of Future Occurrences and Vulnerability

Previous Occurrences

Brumley, Missouri experienced a 3.1 magnitude, 5.0mi depth earthquake 1/21/1992. Eldon, Missouri experienced a 3.3 magnitude, 5.0mi depth earthquake 7/31/2005 (No damages noted for either event.)

Probability of Future Occurrence

Probability of magnitude 5.0 or greater within 100 Years is .47%, United States Geological Survey. Measure of Vulnerability: Low

Problem Statement

- Mitigation: Missouri has designated February as Earthquake Awareness Month. The Emergency Management Director of Miller County participates in an exercise to replicate a severe earthquake called the Great Central U.S. Shakeouri Earthquake Drill.
- October 10, 2017 @ 10:19 a.m.
- Get as many organizations/schools/first responder agencies to sign up @ https://www.shakeout.org/centralus/index.html

Discussion Must Include

Need to include HAZUS information

- Building Inventory Counts
- > Dun & Bradstreet Business Populations Report
- Inventory values
- Population counts
- Include data from State Plan







2013 Hazard Mitigation Plan Risk Analysis Previous & Probability of Future Occurrences and Vulnerability

rs for Environmental Information of NOAA resulted in no recorded e

Previous Occurrences

Probability of Future Occurrence

Measure of Probability: High

The National Centers for Environmental Information of NOAA and the National Climatic Data Center searches provided little data, leading to the possibility that may heat events go unreported to the NCDC. Resource of Vulnerability: Moderate

Problem Statement

Itigation: In an effort to mitigate Extreme Heat there are several options in which our planning organization facilitates in order to lessen the effects of extreme heat. Educating the public about the concerns, hazards and potential health risks from extreme heat has been a priority.

The Missouri Department of Health and Human Services maintains a list of cooling centers throughout the state. In the planning area there are several locations provided.

Discussion Must Include

- > Any school without air conditioning
- Strategic buildings without air conditioning
- > Assets susceptible to loss or damage from extreme heat
- Information about schools mandating closure due to extreme heat



Incident Types

The incident types considered for urban/structural fire include all fires in the following categories:

- general fires,
- structure fire,
- fire in mobile property used as a fixed structure, and
- mobile property (vehicle) fire

The fire incident types for wildfires include:

- natural vegetation fire,
- outside rubbish fire,
- special outside fire, and
- cultivated vegetation, crop fire

2013 Hazard Mitigation Plan Risk Analysis Severity/Magnitude/Extent

Severity/Magnitude/Extent

- Structural and urban fires are a daily occurrence throughout the State. Statewide, <u>approximately 100 fatalities occur annually</u>, as well as numerous injuries affecting the lives of the victims, their families, and many others—especially those involved in fire and medical services. Unlike other disasters, structural fires can be caused by human criminal activity: arson. All citizens pay the costs of arson whether through increased insurance rates, higher costs to maintain fire and medical services, or the costs of supporting the criminal justice system.
- Wildfires damage the environment, killing some plants and occasionally animals. Firefighters have been injured or killed, and structures can be damaged or destroyed. The loss of plants can heighten the risk of soil erosion and landslides. Although Missouri wildfires are not the size and intensity of those in the Western United States, they could impact recreation and tourism in and near the fires.

2013 Hazard Mitigation Plan Risk Analysis

Previous & Probability of Future Occurrences and Vulnerability

Pervised Socurrences — The Missiour Department of Conservation (MDC) collected wildfire data 2003-2013 and determined an average number of wildfires in Missiouri were <u>821, huming an average annuable of 22-20 crcss</u>. After collecting the data, the MDC considered two factors regarding wherefailing traits: likelihood and annualized area burned.

bility of Future Occurrence:

Measure of Probability: Low

Problem Statement

- Mitigation: Operation Forest Arson is a toll-free hotline that allows concerned citizens to call in anonymously, and report arson related fires and any information that may be available on any suspected arson. (800) 392-1111
- Miller County partners with local fire departments and fire protection districts and community groups to conduct special
 public education events, such as Fire Safety and Awareness Day.
- Public awareness of burn bans is particularly important when unsafe burn conditions exist. Miller County works with local fire departments, fire protection districts and local media to create public service announcements that reflect burn ban restrictions. Darks First Com also provides and updated listing on all Burn Bans in the Ozarks.

Discussion Must Include

- > Any difference in vulnerability including school districts and special districts?
- > Any jurisdiction at greater risk for structural or wildfire than others?



Types of Flooding

Flood

- For NFIP purposes, a partial or complete inundation of normally dry land areas from: Overland flow of a lake, river, stream, creek, slough, or ditch. The unusual and rapid accumulation of rainfall runoff or snowmelt.
- Mudflows or the collapse of shoreline land.
- **Riverine Flood**
- Flooding that occurs along a river, stream, or other non-coastal watercourses.

Flash Flood

 A flood in hilly areas that arrives at a location very quickly (minutes instead of hours) after a heavy rain. This can also occur in urban areas where pavement and drainage improvements speed rainfall runoff to a stream

2013 Hazard Mitigation Plan Risk Analysis Severity/Magnitude/Extent

- Flooding presents a danger to life and property
- > Floodwaters can interact with hazardous materials.
- Public health concerns disease, private water, and sewage sanitation
- Erosion mud and rock slides
- Costly clean up

2013 Hazard Mitigation Plan Risk Analysis

Previous & Probability of Future Occurrences and Vulnerability

Previous Occurrences

Miller County has experienced some 62 incidents of severe flooding from 1995 to 2017. This includes eleven Presidential Disaster Declarations Measure of Probability: High

Future Occurrences:

Flooding in Miller County can happen throughout the year, as the chart below reflects an incident of flooding in nearly every month of the year. Measure of Vulnerability: Low

Problem Statement

Mitigation: Floodplain mapping and participation in the National Flood Insurance Program (NFIP) both play a major role in flood mitigation. The objectives of flood mitigation are to keep people, property, and possessions out of the floodplain area where reasonably achievable.

Discussion Must Include

- > Any future development that could impact flash and riverine flooding? Future development if any, in low lying areas near rivers and streams or where interior drainage systems are not adequate to provide drainage?
- > Any variation between jurisdictions? List those that may be at greater risks.
- > Any repetitive loss areas? (See H/O page 13)



2013 Hazard Mitigation Plan Risk Analysis Severity/Magnitude/Extent

- Caves and Mines are new to the 2018 Plan
- Miller County has 2 Active Mines (ME), 2 Intermittent, 3 Abandoned, 1 Unknown status,

2013 Hazard Mitigation Plan Risk Analysis Previous & Probability of Future Occurrences and Vulnerability

ous Occurrer

Miller County has not had any notable sinkholes issues

Measure of Probability: High

Future Occurrences: - There are no records of previous event dates in the planning area so the probabi Measure of Vulnerability: Low

Problem Statement

Sinkholes in Missouri are a common feature where limestone and dolomite outcrop. Dolomite is a rock animatives in mission are a common result where intersione and bootnine outcop. Dooline is a similar to limestone with magnesium as an additional element. C calcium is normally present.
 in the minerals that form the rocks. While some sinkholes maybe considered a slow changing nulsance;
 Other more sudden, catastrophic collapses can destroy property, delay construction projects, and

nate ground water resources

Mitiaation:

detrification techniques include field surveys and geomorphologic mapping combined with accounts from local people and historical sources. Detailed sinkhole maps can be constructed from sequential historical maps, recent topographical maps, and digital devalorin models (Edit) complemented with building-damage surveying, remote sening, and high resolution gooderic surveys. Simbleic distribution can be investigated by spatial distribution analysis techniques including studies of preferential disorgation, alignment, and nearest mellighor analysis

Discussion Must Include

- Issues with sinkholes
- Issues with caves
- Issues with mines
- Discuss if any mining activities have occurred in the planning area
- Discuss if there has been any development over known caves and
- abandoned mines
- Discuss if there is any developments near sinkholes
- Discuss if there are any risks to special districts such as schools and if the risks are uniform across the planning area

Levee Failure

- A through search in the U.S. Army Corp of Engineers resulted in no levees in the Miller County area.
- Does anyone know of any levees that may exist or if so are an issue?

2013 Hazard Mitigation Plan Risk Analysis Severity/Magnitude/Extent

Severity: Low

Levee failure often occurs during a flood event, causing destruction in addition to what would have been caused by flooding alone. In addition, there would be an increased potential for loss of life due to the speed of onset and greater depth, extent, and velocity of flooding due to levee breach.

2013 Hazard Mitigation Plan Risk Analysis Severity/Magnitude/Extent

Severity/Magnitude/Extent

> NA

2013 Hazard Mitigation Plan Risk Analysis Previous & Probability of Future Occurrences and Vulnerability

Previous Occurrences

- > NA
- **Probability of Future Occurrence**
- > NA

Vulnerability Overview

> No further mitigation is required at this time.

Discussion Must Include

While there is a possibility that levees may exist, such as a low-head agricultural levees, no records indicate that the breach or overtopping of these levees would impact any property other than that of the levee owner. Damage to residential structures is unlikely. Therefore, the planning team agreed with the original plan so no further risk assessment has been done on this natural hazard.

Thunderstorm/High Winds/Lightening/Hail



2013 Hazard Mitigation Plan Risk Analysis Severity/Magnitude/Extent

> Assets in the County vulnerable to thunderstorms with lightning, high winds, and hail include people, crops, vehicles, and built structures. Although this hazard results in high annual losses, private property insurance and crop insurance usually cover the majority of losses. Considering insurance coverage as a recovery capability, the overall impact on jurisdictions is reduced.

2013 Hazard Mitigation Plan Risk Analysis

Previous & Probability of Future Occurrences and Vulnerability

- All Grouped together for 2018 Plan
- Thunderstorms
 Lightening-
- High Wind
- > Hail-
- Include probability calculations for thunderstorms, high winds, hail, and lightning. Calculate the probability (x number of reported events in y number of years equals z probability of an event in the planning area in any given year). If the results indicate that more than one event would occur annually, state the average number of events annually.

Problem Statement

 Mitigation: Early-warning systems and public information increase the safety and lessen the loss of life in the event of Severe Thunderstorms, Tornadoes, Windstorms, and Hallstorms. Increased public awareness and education in conjunction with the early-warning systems have helped mitigate discussers from these severe weather threats.

Discussion Must Include

 Possible solutions to reduce the impact of property damage and to save lives



Scale	Wind Speed (mph)	Relative frequency	Potential Damage
670	65.65	53.5%	Light. Peels surface off some routi, some damage to guiter or soling, branches breaken off traces, shallow-routed trace pushed over. Confirment ternations with no reporter stemage to a tose that remain in open fields) are always rated EFO.
671	86-110	31.6%	Moderate. Boofs severely shipped, mobile homes overturned or bady damaged; loss of exterior doors; windows and other glass broken.
	\$13-155	10.7%	Consultatiable Bauch love off welt-constructed houses, foundations of frame hours shifted, mobile hours complete destroyed, large treas snapped or uprested, light object missiles generated; cars lifted off ground.
	158-185	3.4%	Severe. Entrie stores of well-constructed houses destroyed, severe damage to large buildings such as shopsing malita- trains overturned, trans debarked, heavy cars lifted aff thus ground and thrown, structures with weak foundations blown away some distance.
674	166-200	0.7%	Devestating, Well-constructed houses and whole frame houses completely leveled; cars thrown and small missies generated.
675	>200	<0.1%	Explosive. Strong frame houses leveled off foundations and sweet away: automobile-scand missiles fly through the ari in excess of 300 ft; steel reinforced concrete structure hadf danagend; high rise buildings have significant structure deformation; incredible givenomenes will occur.

2013 Hazard Mitigation Plan Risk Analysis Severity/Magnitude/Extent

Enhanced weather forecasting has provided the ability to predict severe weather likely to produce tornadoes days in advance. Tornado watches can be delivered to those in the path of these storms several hours in advance. Lead-time for actual tornado warnings is about 30 minutes. Tornadoes have been known to change paths very rapidly, thus limiting the time in which to take shelter. Tornadoes may not be visible on the ground if they occur after sundown or due to blowing dust or driving rain and hail.

FIEVIC	ous & Pro	bability o	f Futui	re Occi	urrer	ices	and	Vulner	ability
							-		
Date/Time (CST)	Beginning Location	Ending	(miles)	Width (yards)	Rating	Death	Injury	Property Damage	Crop Damager
2001-08-29 15:00-15:05	15E Iberia 38.07/-92.30	2 SE Iberia 38.07/-92.30	.5 mile	100 Yards	F0	0	0.	10K	0
2001-10-23 15:30-16:05	15 SW Eldon 38.18/-92.78	3 5 Eldon 38.30/-92.58	15 miles	300 yards	F1	0	1	100K	0
2003-05-04 19:30- 19:30	1 S Iberia 38.07/-92.32	1 S Iberia 38.07/-92.32	.2 miles	20 yards	FO	1	•	0	0
2003-05-06 15:45-15:42	3 W Eldon 38.35/-92.63	Eldon 38.35/-92.58	3 miles	100 yards	FO	0	0	0	0
2003-05-06 15:50-15:50	Eldon 38.35/-92.58	Eldon 38.35/-92.58	.2 miles	20 yards	FO	0	0	0	0
2004-07-05 06:34-06:35	4 SE Eldon 38.32/+92.53	4 SE Eldon 38.32/-92.53	.2 miles	125 yards	F1	0	0	50K	0
2004-07-05 06:37-06:38	5ESE Eldon 38.32/-92.50	5ESE Eldon 38.32/-92.50	.2 miles	125 yards	F1	0	٥	10K	0
2004-07-05 06:40-06:41	6E Eldon 38.35/-92.47	6E Eldon 38.35/-92.47	.2miles	.2 miles	F1	0	0	10K	0
	Total:							180K	0



Discussion Must Include

- > Any anticipated developments that would result in increase of population in terms of increased exposure?
- > Any higher occupancy buildings?
- > Mobile home parks



Types of Winter Events

Blizzard—Winds of 35 miles per hour or more with snow and blowing snow reducing visibility to less than ¼ mile for at least three hours.

- Blowing Snow—Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind. Snow Squalls—Brief, intense snow showers accompanied by strong, gusty
- winds. Accumulation may be significant. Snow Showers-Snow falling at varying intensities for brief periods. Some
- accumulation is possible. Freezing Rain—Measurable rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coating or glaze of ice. Most freezing-rain events are short lived and occur near surrise between the months of December and
- March.

Sleet—Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects.

2013 Hazard Mitigation Plan Risk Analysis Severity/Magnitude/Extent

Severity/Magnitude/Extent

- Heavy snow can bring a community to a standstill by inhibiting transportation (in whiteout conditions), weighing down utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the snow.
- Extreme cold often accompanies severe winter storms and can lead to hypothermia and frostbite in people without adequate clothing protection.
- The elderly are especially vulnerable to hypothermia
- Downed trees and power lines, and busted water pipes add to the expense of cold weather.

2013 Hazard Mitigation Plan Risk Analysis

Previous & Probability of Future Occurrences and Vulnerability

Future Occurrences Blizzard-

- Cold/Wind Chill-
- Extreme Cold/Wind Chill
- Heavy Snow-Ice Storm
- Sleet
- Winter Storm Winter Weather

Vulnerability Overview

The account ic impact fait by Miller Country has increased in the past few years as several of the lakeformt communities than be had considerable damage to backs and beat doack that were damaged by severe ice storms. The buildup of ice on the boat docks can cause the roof to buckle under the weight and fail onto the boat, and in some cases sink the entire dock into the lake.

2013 Hazard Mitigation Plan Risk Analysis

Previous & Probability of Future Occurrences and Vulnerability

Problem Statement

- bblem Statement Mikigation: Preservation of critical power sources is essential in rural areas to ensure that people are not stranded in homes with no heat and no access to the main roads. Many of the local power companies spend considerable time during the summer months trimming trees along the power lines to help minimize the impact closest to those power lines. The cost to bury the utility lines has often been discussed but the cost factor has limited many projects from being feasible and therefore, left undone. A Multi-Jurisdictional Hazard Mitigation Plan for Missour's Electric Cooperatives was developed and submitted to FEMA and approved in 2012. Within the LOCLG region, all the Rural Electric Cooperatives serving our area participated in the planning process; this will enable the electric cooperatives to eligible for FEMA mittgation funds, which could be used to help offset the cost of some of these improvements. A search on the Missouri Association of Councils of Governments (MACOG) shows the latest update to the plan was 2012.
- The Springfield Office of the National Weather Service covers our planning area and has established an early-warning system to help the public prepare for pending severe weather.
- Refer to Section 2.9 in reference to the early-warning systems currently in place, shelters available and the public notifications that are used within the planning area.
- Early-warning systems currently in place, shelters available and the public notifications that are used within the planning area.

Discussion Must Include

- Summary of the risk
- > List any jurisdictions that would suffer heavier damages during winter events
- > Damages caused to schools
- > Special District assets
- Buildings with high occupancy
- Mobile home parks

Terrorism

SEMA rates terrorism:

- > Probability: Low
- Severity: High
- Acknowledges as a reason for dam failure is terrorism
- Acknowledges as a reason in Fires

Attack (Nuclear, Conventional, Chemical, and Biological)?

SEMA rates Attack:

- Probability: Low
- Severity: High

Civil Disorder

SEMA rates Civil Disorder:

- Probability: Low
- Severity: Low to High

Cyber Disruption

SEMA Rate Cyber Disruption:

- Probability: Moderate to High
- Severity: Moderate to High

Miller County Hazard Mitigation Survey 2018

- https://www.surveymonkey.com/r/MillerHMP2018
- > We want as many public opinions as possible
- Please share the link with family, friends, and neighbors

PRESS RELEASE

For Immediate Release

September 12, 2017



SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

Public Workshop -- Meeting Notice Date: September 26, 2017 Time: 6:00PM Location: Eldon Community Center 309 East Second Street Eldon, MO 65026

MILLER COUNTY MISSOURI HAZARD MITIGATION PLAN UPDATE

Lake of the Ozarks Council of Local Governments (LOCLG) will be hosting the second meeting of a series of public meetings to gain public input into the local multi-jurisdictional hazard mitigation plan for Miller County. The meeting is planned for September 26, 2017 at 6:00PM at the Eldon Community Center is slated to identify the risks and natural hazards that have had an impact on Miller County. Each identified natural hazard will be measured for probability and severity. Each jurisdiction is encouraged to attend, as we will be discussing risk assessment-measures of probability and severity.

Missouri has experienced twenty-three natural disasters declarations in the past twenty years. These natural disasters can lead to loss of life, property damages, loss of essential services, loss of critical facilities and economic disruption. The time and money spent on recovering from a natural disaster can also exhaust additional resources both personally and community wide. Miller County recognizes the impact of these disasters on our communities and is taking a proactive approach to updating our Hazard Mitigation Plan. Through the planning process, we hope to make our communities more resilient.

Hazard Mitigation by definition is any actions taken to reduce or eliminate the long-term risk to human life and property from natural hazards.

It is very important that we have a good representation from across the county to ensure we have the support for the plan update in each local community.

We also have a Miller County Hazard Mitigation Survey 2018 located at: <u>https://www.surveymonkey.com/r/MillerHMP2018</u> The survey is to help determine the local impact of Natural Disasters within Miller County. Please take the time to complete the survey as your input is important to the planning process. The deadline for completion of the survey is Thursday, November 30, 2017.

We look forward to developing a comprehensive and effective Hazard Mitigation plan to serve our local needs.

More information about the planning process or copies of our current plan, please call LOCLG at 573-346-5692. If you have any questions, or need any special accommodations for the meeting, please call us.

Lake of the Ozarks Council of Local Governments P.O. Box 3553 Camdenton, MO 65020 Phone: 573-346-5692 Fax: 573-346-9686



Lake of the Ozarks Council of Local Governments

Miller County Hazard Mitigation Plan Meeting Tuesday 6:00p.m. September 26, 2017 Eldon Community Center 309 East 2nd Street Eldon, MO 65026

Name of Attendee Representing		County You Live In	Contact Phone #	Email Address	Miles Driven To Meeting (Round Trip)
1 PAM Gilbert	LOCLG	CAMPEN	573-346-5692	pam.gilbertolocly.org	72
2 Terre Brown	LOCLG	CAMDEN	373-346-5692	terre, brown Dladg,	72
3 BARLOW BIGGERS	MILLER GUNTY	MILLER	573-369-1952	Ende miller countin	50
4 Aaron Hees	City of Eldon	Miller	573-480-0925	ahere olderno or	10
5 Blenda Derlad	SEMA	Moniteau	573-644-3728	brenda, gerladfa sema. dps. mo. gov	
6 MAH Michalik	City of Lake Ozark	Pulaski	573-365-5378	pudle city of Lake OZAK	20
- Hanaj Crael	LOCLO	Laclede	417-322-3937	npfeiffel@druy.cda	75
8 CAROL THORNHON	miller County EM	Miller	573-369-1884	lepce millercount	50 MDiora
9 BRAD VODEL	School u/ the OSAE	Miller	573-286-5922	Hoder & Oscage Schuls. Das	25
10 Tim Hadu	Lake Ozavk	Miller	573-216-2520	building Perty of lake of the	tR. not 20
11 Toni W - Taylor	St. Elizabeth R-4	Miller	573-616-9477	Tonia Ste. KIZ. mo. LS	50



Lake of the Ozarks Council of Local Governments

Miller County Hazard Mitigation Plan Meeting Tuesday 6:00p.m. September 26, 2017 Eldon Community Center 309 East 2nd Street Eldon, MO 65026

						Miles Driven To Meeting
	Name of Attendee	Representing	County You Live In	Contact Phone #	Email Address	(Round Trip)
12	Sava Richardson	Eldon NER	Miller	573 392 3164	eldonbkpr@sockit.ne	
13	Ref. Phando		I (573.286-9848		
14	-Tom Klugas	Mille Co.	Miller			
15	Karla Vegry Lent	Miller 65A 40 Board	Morgan	573-348-375/	karla @mcbsddco	HM
16	Linda Connes	LOCLG	milles	513-1346-5692	linda. conner alla	da, ora
17	Matt Davis	Eldon School Destrot	Maler	573-392-8000	Matt. DEVISE Eldon Mustarin	
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SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

LAKE OF THE OZARKS COUNCIL OF LOCAL GOVERNMENTS MILLER COUNTY HAZARD MITIGATION PLAN UPDATE MEETING NOTICE AND AGENDA

Thursday, October 26, 2017 4:00 p.m. Eldon R-I School District Old Gymnasium Classroom 110C 112 South Pine Street Eldon, MO 65026

<u>AGENDA</u>

- I. CALL TO ORDER
- II. INTRODUCTIONS AND SIGN-IN SHEET
- III. HAZARD MITIGATION PLAN (HMP)
 - a. Update of the Current Hazard Mitigation Plan
 - i. Discussion on Hazards
 - ii. Risk Assessment-Measures of Probability and Severity
 - iii. Evaluate Mitigation Actions as identified in the original HMP 2013
 - b. Miller County Hazard Mitigation Survey 2018
 - i. Review new Hazards and Mitigation Actions to adopt
 - ii. Deadline for completion of Draft
 - c. Planning Process Continues
 - i. Next Meeting Date-TBD
 - ii. Next Meeting Agenda-TBD
- IV. OPEN DISCUSSION
- V. CONCLUSION
- VI. ADJOURN

PRESS RELEASE

For Immediate Release

September 12, 2017



SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

Public Workshop -- Meeting Notice Date: Thursday October 26, 2017 Time: 4:00PM

Location: Eldon R-I School District at the Old Gymnasium Classroom 110C, 112 South Pine Street Eldon, MO 65026

MILLER COUNTY MISSOURI HAZARD MITIGATION PLAN UPDATE

Lake of the Ozarks Council of Local Governments (LOCLG) will be hosting the third meeting of a series of public meetings to gain public input into the local multi-jurisdictional hazard mitigation plan for Miller County. The meeting is planned for October 26, 2017 at 4:00PM at the Eldon R-I School District, Old Gymnasium in Classroom 110C. This meeting is slated to discuss the risks and natural hazards that have had an impact on Miller County. Each identified natural hazard will be measured for probability and severity. Mitigation actions from the current plan will be evaluated along with discussions about any new mitigation actions. Each jurisdiction and the public are encouraged to attend, as we will be discussing risk assessment-measures of probability and severity.

Missouri has experienced twenty-three natural disasters declarations in the past twenty years. These natural disasters can lead to loss of life, property damages, loss of essential services, loss of critical facilities and economic disruption. The time and money spent on recovering from a natural disaster can also exhaust additional resources both personally and community wide. Miller County recognizes the impact of these disasters on our communities and is taking a proactive approach to updating our Hazard Mitigation Plan. Through the planning process, we hope to make our communities more resilient.

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We also have a Miller County Hazard Mitigation Survey 2018 located at:

<u>https://www.surveymonkey.com/r/MillerHMP2018</u>. The survey is to help determine the local impact of Natural Disasters within Miller County. Please take the time to complete the survey as your input is important to the planning process. The deadline for completion of the survey is Thursday, November 30, 2017.

We look forward to developing a comprehensive and effective Hazard Mitigation plan to serve our local needs.

Lake of the Ozarks Council of Local Governments P.O. Box 3553 Camdenton, MO 65020 Phone: 573-346-5692 Fax: 573-346-9686

PRESS RELEASE

For Immediate Release

September 12, 2017



SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

More information about the planning process or copies of our current plan, please call LOCLG at 573-346-5692. If you have any questions, or need any special accommodations for the meeting, please call us.
	the of th	Miller County Hazard Mitigation Thursday 4:00 p.m. October 2 Eldon R-I School District Old Gymnasium Classroom 11 Eldon, MO 65026	on Plan Meeting 6, 2017 OC, 112 South Pine Stre	et		
	Name of Attendee	Representing	County You Live In	Contact Phone #	Email Address	Miles Driven To Meeting (Round Trip)
1	PAMGilbert	LOCLG	Campen	573-346-5692	pam. qilbert plock.on	56
2	BARION BIGGERS	MILLER COUNTY EMA	MILZER	573-369-1954	end Onillon courry more	, , r ç
• ع	Terre Brown	LOCLG	Camden		terre, braun Dag.	60
4	Sara Richardson	Eldon Né R	Miller	57322663351	eldenbkor esuketit	
5	Brandon Green	Elelon WiR	Canden	573-836-5899		
6	BRAD LODEN	Scheul 1 the DSAGE	MECEEN	573-286-5922	Vodub Porcego schooks, u-	30
4	Gale M. Carlson		Millen	573-392-5710	galecan son Dhugheson	- 12
8	INALTER MCRELAND	CITY OF IBERIA	MILLER	573 - 743 - 2306	WMORELANS 1 QOUTLOOK, CON	25
9	Ame Var DEF	City of Lake Orask	Miller			
10	Matt Davis	Eldon	Miller	573-392-8000	Matt. Darsp Elder roush	0

C in	Miller County Hazard Mitigati Thursday 4:00 p.m. October 2 Eldon R-I School District Old Gymnasium Classroom 11 Eldon, MO 65026	ion Plan Meeting 26, 2017 10C, 112 South Pine Stre	et		
Name of Attendee	Representing	County You Live In	Contact Phone #	Email Address	Miles Driven To Meeting (Round Trip)
11 Ton, Taylor 12 Brenda Derlach	SI. Elizabeth &-4 SEMA	Region F	573-644-3728	Toni CSTE.KIZ. Mo. W brenda-gerlach @sema .dps. mo.g	50 V —
13 Jon y Chall 15 Perior Corner	LOCLOF	Jaclede Milles	573-368-2375 417-322-3937 573-346-5692	JPrice & turconte a mo nancy Crall@lucks. Org linda. Conner@la	72 Ja.org
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18 19 20					

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SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

LAKE OF THE OZARKS COUNCIL OF LOCAL GOVERNMENTS MILLER COUNTY HAZARD MITIGATION PLAN UPDATE MEETING NOTICE AND AGENDA

Tuesday, December 12, 2017 4:00 p.m. Eldon R-I School District Old Gymnasium Classroom 110C 112 South Pine Street Eldon, MO 65026

<u>AGENDA</u>

- I. CALL TO ORDER
- II. INTRODUCTIONS AND SIGN-IN SHEET
- III. HAZARD MITIGATION PLAN (HMP)
 - a. Update of the Current Hazard Mitigation Plan
 - i. Discussion on Hazards
 - ii. Risk Assessment-Measures of Probability and Severity
 - iii. Evaluate Mitigation Actions as identified in the original HMP 2013
 - b. Miller County Hazard Mitigation Survey 2018
 - i. Review new Hazards and Mitigation Actions to adopt
 - ii. Deadline for completion of Draft
 - c. Planning Process Continues
 - i. Next Meeting Date-TBD
 - ii. Next Meeting Agenda-TBD
- IV. OPEN DISCUSSION
- V. CONCLUSION
- VI. ADJOURN

PRESS RELEASE

For Immediate Release

December 1, 2017



SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

Public Workshop -- Meeting Notice Date: Tuesday, December 12, 2017 Time: 4:00PM

Location: Eldon R-I School District at the Old Gymnasium Classroom 110C, 112 South Pine Street Eldon, MO 65026

MILLER COUNTY MISSOURI HAZARD MITIGATION PLAN UPDATE

Lake of the Ozarks Council of Local Governments (LOCLG) will be hosting the fourth meeting of a series of public meetings to gain public input into the local multi-jurisdictional hazard mitigation plan for Miller County. The meeting is planned for December 12, 2017 at 4:00PM at the Eldon R-I School District, Old Gymnasium in Classroom 110C. This meeting is slated to discuss the risks and natural hazards that have had an impact on Miller County. Each identified natural hazard will be measured for probability and severity. Mitigation actions from the current plan will be evaluated along with discussions about any new mitigation actions. Each jurisdiction and the public are encouraged to attend, as we will be discussing risk assessment-measures of probability and severity.

Missouri has experienced twenty-three natural disasters declarations in the past twenty years. These natural disasters can lead to loss of life, property damages, loss of essential services, loss of critical facilities and economic disruption. The time and money spent on recovering from a natural disaster can also exhaust additional resources both personally and community wide. Miller County recognizes the impact of these disasters on our communities and is taking a proactive approach to updating our Hazard Mitigation Plan. Through the planning process, we hope to make our communities more resilient.

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It is very important that we have a good representation from across the county to ensure we have the support for the plan update in each local community.

We look forward to developing a comprehensive and effective Hazard Mitigation plan to serve our local needs.

More information about the planning process or copies of our current plan, please call LOCLG at 573-346-5692. If you have any questions, or need any special accommodations for the meeting, please call us.

Lake of the Ozarks Council of Local Governments P.O. Box 3553 Camdenton, MO 65020 Phone: 573-346-5692 Fax: 573-346-9686



Lake of the Ozarks Council of Local Governments

Miller County Hazard Mitigation Plan Meeting Tuesday 4:00p.m. December 12, 2017

Eldon R-1 School District, Old Gymnasium Classroom 112 South Pine Street Eldon, MO 65026

Name of Attendee	Representing	County You Live In	Contact Phone #	Email Address	Miles Driven To Meeting (Round Trip)	
1 Nancy Craci	LOCLG	Leclede	417-322-3937	nancy. Craliplacher.urg	521	
There Broun	LOCLG	Camelen)	573-346-5692		52	
3 Juia Connes	LOCLG	Milly	573-692-0700	linda. Conner & lode	, Drg	
4 Joson Price	Miller Co. R TIL Schools	Camden	573-369-2375	I price @ Lusampia ling	SIKE. MO. 43	19
5 WALTER MORELAND	TBERIA	MILLER		WMORELAUNIQUETION 10	25	
6 Matt Davis	Elden School District	Miller	573-392-8000	Matt. Davise Film Mules		
7 BRAD VOIDER	Settuce of the Ostat	MELLER	573-286-5922	Voderb @ osage scholo. org	30	
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SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

LAKE OF THE OZARKS COUNCIL OF LOCAL GOVERNMENTS MILLER COUNTY HAZARD MITIGATION PLAN UPDATE MEETING NOTICE AND AGENDA

Tuesday, January 30, 2018 6:00 p.m. Eldon Community Center 309 East 2nd Street Eldon, MO 65026

<u>AGENDA</u>

- I. CALL TO ORDER
- II. INTRODUCTIONS AND SIGN-IN SHEET
- III. HAZARD MITIGATION PLAN (HMP)
 - a. Present Draft Copy of Miller County Hazard Mitigation Plan Update 2018
 - i. Open discussion of HMP Sections
 - ii. Participating Jurisdictions Review Important Information
 - b. Present Miller County Hazard Mitigation Survey 2018
 - i. How the Survey Responses Compared to Data Available
 - c. Public Comment Period 30-Days
 - i. Draft Copy Review
 - ii. Submit Comments, Phone, Fax or Email
 - iii. Adoption Resolutions Submitted with Draft to SEMA
 - iv. Draft Copy to SEMA by March 1, 2018
 - v. Draft Copy to FEMA
- IV. OPEN DISCUSSION
- V. CONCLUSION
- VI. ADJOURN

PRESS RELEASE

For Immediate Release

December 23, 2017



SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

Public Workshop -- Meeting Notice Date: Tuesday, January 30, 2018 Time: 6:00PM Location: Eldon Community Center 309 East 2nd Street Eldon, MO 65026

MILLER COUNTY HAZARD MITIGATION PLAN DRAFT COPY FOR REVIEW AND COMMENT

Lake of the Ozarks Council of Local Governments (LOCLG) will be hosting our fifth and final meeting of the planning efforts for the local multi-jurisdictional hazard mitigation plan for Miller County. The meeting is planned for Tuesday January 30, 2018 at 6:00 p.m. at the Eldon Community Center located at 309 East 2nd Street Eldon, MO 65026. This meeting is slated to review and discuss the draft copy of the Miller County Hazard Mitigation Plan 2018. Each participating jurisdiction and the public are encouraged to attend. This will be an opportunity for participants to review the plan, ask questions, and provide comments and feedback to enhance the plan.

Missouri has experienced twenty-three natural disasters declarations in the past twenty years. These natural disasters can lead to loss of life, property damages, loss of essential services, loss of critical facilities and economic disruption. The time and money spent on recovering from a natural disaster can also exhaust additional resources both personally and community wide. Miller County recognizes the impact of these disasters on our communities and is taking a proactive approach to updating our Hazard Mitigation Plan. Through the planning process, we hope to make our communities more resilient.

This will be the first opportunity to review the proposed draft, please attend and provide your feedback on the draft plan. There will be a 30-day comment period to review and make comments on the Miller County Hazard Mitigation Plan 2018.

Each of the participating jurisdictions will have the opportunity to adopt the plan, which allows those participating communities the opportunity to apply for FEMA grants funds in the future. Participation is important to building more resilient communities.

More information about the planning process or copies of our current plan, please call LOCLG at 573-346-5692. If you have any questions, or need any special accommodations for the meeting, please call us.

Lake of the Ozarks Council of Local Governments P.O. Box 3553 Camdenton, MO 65020 Phone: 573-346-5692 Fax: 573-346-9686





Lake of the Ozarks Council of Local Governments

Miller County Hazard Mitigation Plan Meeting Tuesday, January 30, 2018 at 6:00 pm Eldon Community Center 309 East 2nd Street Eldon, MO 65026

					Miles Driven
Name of Attendee	Representing	County You Live In	Contact Phone #	Email Address	(Round Trip)
1 Rerse Brown	LOCIG	Cenuden	313-346-5692	terre brown @locly.org	60
2 WALLY MORELAND	1BERIA	MILLER	573-793-2300		25
3 Jevome Schulte	Bagnell	Miller	573-280-0374		8
4 DOWE VAN DEC	Late Ocak	Miller	573-365-5378		10
5 MARK AMSINGER	LOSPA	CAMPOU	573-216-4014	Mansinger Cla Jal. un	15
6 - Dru WRIGHT	Miller Contry	Miller	573-369-1900		24
7 Suide Conney	LOCLG	Miller	573-692-0700	linda. Conner@ loc	GORS
8 Manay Crall	LOCIO	Lallede	573-346-5692	nancy, crall Ploch g. cry	- 120
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SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

LAKE OF THE OZARKS COUNCIL OF LOCAL GOVERNMENTS MILLER COUNTY HAZARD MITIGATION PLAN UPDATE MEETING NOTICE AND AGENDA

Wednesday, May 23, 2018 6:00 p.m. Eldon Community Center 309 East 2nd Street Eldon, MO 65026

<u>AGENDA</u>

- I. CALL TO ORDER
- II. INTRODUCTIONS AND SIGN-IN SHEET
- III. MILLER COUNTY HAZARD MITIGATION PLAN (HMP) 2018
 - a. Review Comments Shared by SEMA on Items Needed
 - b. Discuss Action Items in Plan and Required Action Worksheets
 - c. Action Items Must Include at Least One FEMA Funded Proposed Action
 - d. Update Draft Due to SEMA by May 31, 2018
- IV. OPEN DISCUSSION
- V. CONCLUSION
- VI. ADJOURN

Miller County HMP 2018 Planning Meeting 05/23/2018

Action Items What is expected? What you can do to make it happen



48 Actions

- With 13 jurisdictions that are part of the Miller County HMP 2018 and 48 Action items identified we need a minimum of 48 Action worksheets and could potentially have 624 Action worksheets.
- Review action worksheet (handed out).
- 1 Action worksheet must be included in the plan for each Action that is included in the 2018 plan. Also 1 Action worksheet must be included in the plan for each jurisdiction that adopts that particular Action.
- The Action worksheet asks for specifics on estimated costs and the potential funding source to complete that Action.
- LOCLG does not have the authority to assume you or your community/county has the funding to complete the Actions identified.

We need your help! You must decide which Actions you want to keep in the plan. Meaning you are willing to complete the Action worksheet on it. Each jurisdiction that is currently in the National Flood Insurance Program will be required to keep Actions related to the NFIP. They include: 2.1.5 Participate in and ensure compliance, with flood mitigation and floodplain management programs 2.1.6 Participate in the National Flood Insurance Program (NFIP)



• If you are on the list...you must have 2.1.5 and 2.1.6 Actions



Identifying Actions to Keep and Move Forward Into the 2018

Plan

- What can your community accomplish in the next 5 years?
- What is important to your community's safety and well being?
- The laundry list of Actions are not feasible and we need to focus on Actions that play an important part in the safety and well being of your citizens and visitors to your community.
- As we review the Action items list, think about what "your" community can do? We will be meeting with each participating jurisdiction to help complete the Action worksheets.
- Your commitment to an Action will be required to keep it in the Miller County HMP 2018 Plan.



Adoption Resolutions

Still Needed!

- We have received adoption resolutions from a majority of the participating jurisdictions. We still need your support for the plan adoption.
- City of Eldon
 Eldon School District
- Iberia School District



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						Millidison Kennede	Lave Un DEE	Linda Conner	ieshe Bleven	Darrell BUNCN	Name of Attendee	Salennents Syleto
						LOCLG	Lake Ozel	Locucr	LOCLG	Miller county communication	Representing	Lake of the Ozar Miller County Hazard Mitigat Tuesday 6:00p.m. May 23, 20 Community Center 309 East
						Pulaski	n.ller	miller	Cemelens	on Miller	County You Live In	ks Council of tion Plan Meeting 018 2nd Street Eldon, MO 6
						724.831-7713	573-365-537E	573-346-5692	513-346-5690	5733691900	Contact Phone #	Local Governr 5026
											Email Address	nents
						48	26	61	60		Miles Driven To Meeting (Round Trip)	Eldon



SERVING CAMDEN, LACLEDE, MILLER AND MORGAN COUNTIES

September 6, 2017

Lake of the Ozarks Council of Local Governments is facilitating the planning process for the update and redevelopment of the local multi-jurisdictional hazard mitigation plan for Miller County. Your participation in the planning process is imperative to the success and final adoption of the Miller County Hazard Mitigation 2018.

Local elected officials, appointed staff and volunteer leaders are continually involved with the challenge of identifying community needs in order to work together in solving community issues. One effective method for identifying important issues is conducting a Community Assessment Survey. This survey will provide our planning team with insight as to your community's capabilities and needs.

We ask that you complete the enclosed Community Assessment Survey and be a valuable member of your Multi-jurisdictional Planning Committee. This survey is a valuable tool to the development of the plan. It will provide necessary data that assists the community in the event of a disaster to be more resilient. Your input is a vital component in making our community eligible for Federal Emergency Management Funds for mitigation actions. "For every dollar we spend on mitigation, we save four dollars in recovery." Mitigation actions taken now will reduce loss of life, reduce damage to property, and make our community safer.

The individuals on the team will be comprised of community leaders who can provide the necessary data, provide critical local information toward the success of your plan, and project development. Upon completion and approval of this plan by the Missouri State Emergency Management Agency (SEMA) and The Federal Emergency Management Agency (FEMA), the participating jurisdictions and special districts in Miller County will be eligible to apply for federal hazard mitigation funding for mitigation projects.

Enclosed you will find a self-addressed, stamped envelope to use when returning the survey. Please feel free to include any additional comments you deem necessary or relevant to improving the plan. Your response and time are greatly appreciated. We ask that you respond to the survey by October 5, 2017.

We look forward to meeting you. Our next meeting we will discuss the natural hazards that impact Miller County, looking at the data collected. Please join us on September 26, 2017 @ 6:00 p.m., at the Eldon Community Center, 309E. 2nd Street, Eldon MO 65026.

Thank you!

Meeting Press Information



HOME LISTEN NEWS

SHOWS & FEATURES ADVE

Beat the Winter Blues with KRMS & 93.5 Rocks January 2017

CLICK HERE

Miller County Hazard Mitigation Meeting Scheduled

WEATHER

AUGUST 17, 2017 BY KRMS NEWSROOM

🖸 SHARE 🛛 🖬 🛩 📖

The Lake of the Ozarks Council of Local Governments is seeking public input on hazard mitigation plans for Miller County. They'll be sponsoring a series of public meetings to give residents a chance to weigh in with their comments, suggestions, questions, or concerns. The Miller County hazard mitigation plan is currently in the process of being updated to better reduce long-term risks to life and property resulting from natural disasters. They have a public meeting scheduled for August 31st at 6pm in the Eldon Community Center.

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 The Reporter covers Miller, Morgan and Camden County in Central Missouri's Lake of the Ozarks and is published once per week on Wednesdays.

Published August 23, 2017

LOCLG seeking public input for hazard mitigation plan

MILLER COUNTY - Lake of the Ozarks Council of Local Governments (LOCLG) will be hosting a series of public meetings to gain public input into the local multi-jurisdictional hazard mitigation plan for Miller County.

This meeting will be held at 6:00 p.m. on August 31 at the Eldon Community Center, 309 East Second Street in Eldon

"Missouri has experienced twenty-three natural disasters declarations in the past twenty years. These natural disasters can lead to loss of life, property damages, loss of essential services, loss of critical facilities and economic disruption," a spokesman said. "The time and money spent on recovering from a natural disaster can also exhaust additional resources both personally and community wide. Miller County recognizes the impact of these disasters on our communities and is taking a proactive approach to updating our Tazard Mitigation Planning process, we hope to make our communities more resilient."

Hazard Mitigation by definition is any actions taken to reduce or eliminate the long-term risk to human life and property from natural hazards

"It is very important that we have a good representation from across the county to ensure we have the support for the plan update in each local community," said the spokesman.

LOCLG is looking forward to developing a comprehensive and effective Hazard Mitigation plan to serve the local needs

More information about the planning process or copies of our current plan, please call LOCLG at 573-346-5692. If anyone has any questions or needs any special accommodations please call the same number.

Home Economic Development Transportation Hazard Mitigation More

Miller County Hazard Mitigation Plan Public Meeting

<u>« Back to calendar</u> Thursday August 31, 2017 6:00 PM - 7:00 PM 309 E. 2nd Street Eldon, MO 65026 (<u>map</u>)	« Previous Event Next Event .»
Miller County Hazard Mitigation Plan Public Meeting	
Planning Kick Off Meeting	
Discussion on Disaster Preparedness and Hazard Mitigation Planning	
Location: Eldon Community Center 309 E. 2nd Street Eldon, MO 65026	
Time: 6:00 p.m.	
Public is encouraged to attend	

PO Box 3553, Camdenton, MO 65020 - Phone: (573)346-5692 - Fax: (573)346-9686 Copyright ©2010-2017





Meeting Press Information

Addressing natural disasters in Miller County

Miller County residents' help sought in natural disaster survey

November 13th, 2017 by Allen Fennewald in Local News Read Time: 1 min.



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This low-water crossing in Miller County is one of many in the three-county area prone to flooding during heavy rainstorms. (May 27, 2011 photo) Photo by Mike Anthony

The Lake of the Ozarks Council of Local Governments is seeking Miller County residents to participate in the Miller County Hazard Mitigation Survey of 2018.

Whether residents have experienced a natural disaster, are worried about the occurrence of such or think everything is going just fine, the council wants to know. The survey is meant to assess the occurrence of natural disasters in the county and the need for Federal Emergency Management Agency aid to alleviate the risks of natural disasters, such as tornadoes and floods

"Participation in the Hazard Mitigation Plan allows communities to have access to the FEMA dollars for mitigation activities," Linda Conner, LOCLG's executive director, said. "We are

Hazard Mitigation Plan Meeting Next Week

MAY 16, 2018 BY KRMS NEWSROOM

LEAVE A COMMENT

The Hazard Mitigation Plan for Miller County is scheduled for another review a week from today. The Lake of the Ozarks Council of Local Governments has a meeting scheduled for May 23rd to discuss the plan. They'll be reviewing comments from SEMA on the most recent updates before submitting an updated draft by the May 31st deadline. Next Wednesday's meeting will take place at 6pm at the Eldon Community Center.



Miller County Hazard Mitigation Survey 2018

To help FEMA and SEMA come up with a local natural hazard mitigation plan, they need your feedback. The questionnaire should be completed by an adult, preferably the head of the household. The information you provide will be used to help improve public/private coordination, mitigation, and risk reduction efforts in Miller County. The survey should take less than 20 minutes to complete. Survey open until December 1st, 2017.

http://www.surveymonkey.com/r/MillerHMP2018

Posted by: James Hixson Audience: Homepage Published:9/27/17

Appendix C

Completed/Deleted Mitigation Actions

Table 4.1. Summary of Completed and Deleted Actions from the Previous Plan

Completed Actions	Completion Details
	(date, amount, funding source)
2.1.7 LOCLG mapped all low water crossings	Completed 5/27/2016 with funding from CDBG Disaster Planning Grant it was part of several projects. Exact \$ not specific to just this data collection.
2.1.8 With the help of LOCLG purchase, ESRI and HAZUS flood software to improve flood hazard assessments and flood mapping.	Completed 5/27/2016 with funding from CDBG Disaster Planning Grant it was part of several projects. Exact \$ not specific to just this data collection.
2.1.9 With the help of LOCLG coordinate the collection of demographic, economic, watershed, land use and other data required by the HAZUS flood software program and GIS systems.	Completed 5/27/2016 with funding from CDBG Disaster Planning Grant it was part of several projects. Exact \$ not specific to just this data collection.
2.1.10 With the help of LOCLG conduct an in-depth flood risk analysis utilizing HAZUS data and create detailed maps to identify areas of high risk for flooding.	Completed 5/27/2016 with funding from CDBG Disaster Planning Grant it was part of several projects. Exact \$ not specific to just this data collection.
2.1.18 In collaboration with LOCLG purchase the HAZUS software and coordinate the collection of data to populate the HAZUS software on earthquake risk information.	Completed 5/27/2016 with funding from CDBG Disaster Planning Grant it was part of several projects. Exact \$ not specific to just this data collection.
3.1.3 Analyze the data collected from LOCLG in the HAZUS software.	Completed 5/27/2016 with funding from CDBG Disaster Planning Grant it was part of several projects. Exact \$ not specific to just this data collection.
Deleted Actions	Reason for Deletion
1.1.1 Encourage public facilities to have shelters to accommodate staff and visitors during tornadoes and any other natural hazard.	Not feasible as no jurisdiction completed an Action Worksheet for this action.

1.1.2 Evaluate existing facilities for shelter options. Develop a plan to clearly identify shelter locations for both visitors and employees within all public buildings.	Combined with 1.1.3 and changed to specific jurisdiction actions.
1.1.3 Seek funding to add shelters to existing public facilities to ensure adequate protection from tornadoes and strong winds.	Changed to School of the Osage 1.1.3, Miller County R-III 1.1.3 and St. Elizabeth 1.1.3
1.1.4 Seek funding for communities interested in upgrading or installing early warning systems.	Changed to City of Lake Ozark 1.1.4 and St. Elizabeth 1.1.4
1.1.5 Seek funding to initiate a storm water drainage study for the communities of City of Eldon, City of Iberia, City of Lake Ozark, Village of St. Elizabeth, and Village of Tuscumbia.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.6 Examine repetitive flood loss properties to determine feasible and practical mitigation opportunities.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.7 Encourage homeowners and businesses that are located in high flood areas to elevate all mechanical equipment within their homes and or facilities including furnaces hot water heaters, electrical panels, freezers and other electrically run equipment.	Not feasible as no jurisdiction completed an Action Worksheet rfor this action.
1.1.8 Coordinate with community service organizations to provide assistance and volunteer labor to help low-income residents and elderly winterize their homes.	Not feasible as no jurisdiction rcompleted an Action Worksheet for this action.
1.1.9 Create a network of community partners, including public health agencies emergency management agencies, volunteer organizations, to designate community locations with adequate air conditioning that can be used as hear emergency shelters during a heat wave.	Not feasible as no jurisdiction completed an Action Worksheet tfor this action.
1.1.10 Encourage additional facilities to become a part of the heat shelte network.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.11 Develop drought plans and water conservation programs.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.12 Increase hazard assessment information on dams within Miller County	Not feasible as no jurisdiction completed an Action Worksheet for this action.
1.1.13 Maintain mapping on all dams that are not currently regulated by MDNR.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.1 Increase public awareness and understanding of the benefits of a FEMA Safe Room 361 and seek funding for the building of Safe Rooms whereve needed.	Changed to School of the Osage 1.1.3, Miller County R-III 1.1.3 and St. Elizabeth 1.1.3
2.1.2 Collaborate with trade organizations, engineers, and school districts to conduct Safe Room seminars.	Changed to School of the Osage 1.1.3, Miller County R-III 1.1.3 and St. Elizabeth R-IV 1.1.3
2.1.3 Encourage construction of community tornado shelters in office buildings manufacturing facilities, multi-family rental units, schools, mobile home parks and other large population congregation centers.	Not feasible as no jurisdiction completed an Action Worksheet for this action.

2.1.4 As funding allows, repetitive flood loss properties and structures will be targeted for buyout.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.5 Participate in and ensure compliance with, flood mitigation and floodplair management programs.	Same as action 2.1.6 elected to stay with 2.1.6 all action worksheets will reflect the 2.1.6 action
2.1.6 Participate in the National Flood Insurance Program (NFIP)	Changed to Miller County 2.1.6, City of Eldon 2.1.6, City of Lake Ozark 2.1.6, Village of Tuscumbia 2.1.6
2.1.11 Encourage local governments, local businesses to develop a snow day policy that will only require essential personal to be on the road during severe winter weather events.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.12 Make the public aware of the Miller County Emergency Operations Plan in regard to heat-related mitigation.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.13 Work with community groups to sponsor a program to encourage neighbors to check on at risk people within their communities. Such as neighborhood watch or CERT.	Miller County decided that the CERT Team efforts would support this action. See Action 4.1.6
2.1.14 Temporarily reduce or eliminate fees for swimming pools during extended periods of extreme heat and humidity, applicable only to communities with swimming pools.	Not feasible as no jurisdiction scompleted an Action Worksheet for this action.
2.1.15 Review the Missouri Drought Plan and local drought plans available a Missouri Department of Natural Resources incorporate into local Emergency Management plan.	tNot feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.16 Incorporate GIS Mapping into Miller County Emergency Managemen Operations, with regard to wildfire history and potential high risk areas fo wildfires.	tNot feasible as no jurisdiction rcompleted an Action Worksheet for this action.
2.1.17 Use of burn bans during high-risk conditions such as high winds, dr conditions, and drought.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.19 Identify facilities within Miller County that have generators or emergency power in the event of an earthquake.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.20 Maintain mapping in the Miller County Emergency Operations Plan fo Dam Failure.	rNot feasible as no jurisdiction completed an Action Worksheet for this action.
2.1.21 For dams that are not regulated by MDNR encourage dam owners to inspect their dams and identify all repairs needed. Encourage repairs be made for the protection of lives and property in the inundation pathway.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
3.1.1 Encourage the use of tempered or shatter-resistant glass in the windows and doors of new public and private facilities where large numbers of people may congregate.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
3.1.2 Develop a plan for upgrading and or prioritize low water crossing based on findings from LOCLG.	Action Changed to projects identified under Miller County 2.1.22, 2.1.23, 2.1.24, 2.1.25, and 2.1.26

3.1.4 Encourage Fire Department, Fire Districts, and Ambulance Districts to have alternate routes developed in the event a low water crossing is impassable.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
3.1.5 Create a telecommute environment for employees that have access to computers at home for days where driving can be dangerous.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
3.1.6 Encourage both government agencies and businesses that have employees that must work outside during the day to have an alternate start and end time during the extreme heat.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
3.1.7 Encourage local governments and businesses to have a water conservation plan.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
3.1.8 Encourage local governments and local businesses to participate in the annual shakeout earthquake drill.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.1 Work with our Chamber of Commerce, school districts, builders associations, and communities in educating our communities on the potential natural hazards and promoting the benefits of Safe Rooms.	Action has been address with specific actions by School of the Osage, Miller R-III and St. Elizabeth R-IV See Action 1.1.3
4.1.2 Develop and distribute informational materials on Safe Rooms	Action has been addressed with specific actions by School of the Osage, Miller R-II and St. Elizabeth R-IV See Action 1.1.3
4.1.3 Work with builders, developers, and manufacturers of building materials that are tornado and wind damage resistant to demonstrate the benefits of these materials as well as building techniques that have been proven affective.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.4 Coordinate public awareness and education in regard to flooding.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.5 With brochures provided by both FEMA and SEMA concerning flood mitigation, flood preparedness, and Flood Response and Recovery work with local volunteers and civic organizations to distribute them to current homeowners and businesses in the area.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.6 CERT Training to be offered by Miller County Emergency Management at least four times per year.	Changed to Miller County CERT 4.1.6
4.1.7 Educational materials in regard to low water crossing and the dangers of driving over them during a flooding incident, distributed through the school districts for new drivers who may not be aware of the dangers.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.8 Distribute educational materials to increase awareness of severe winter weather dangers.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.9 Distribute 211 Emergency call information.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.10 Work with local builders association and developers to create a public workshop on how to effectively winterize your home.	Not feasible as no jurisdiction completed an Action Worksheet for this action.

4.1.11 Coordinate public awareness and education in regard to flooding.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.12 Disseminate information to the public as to locations for heat relief, and heat shelters available within the region.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.13 Provide educational materials that help businesses, schools and homeowners recognize the hazards within their business, school or home that can be of potential dangers such as unsecured bookcases, filing cabinets, tall furniture, and other items that would have the probability of falling over in the event of an earthquake.	Not feasible as no jurisdiction completed an Action Worksheet for this action.
4.1.14 Miller County Emergency Management in collaboration with other public safety agencies to conduct emergency response exercises.	Miller County decided that the CERT Team efforts would support this action. See Action 4.1.6
4.1.15 Miller County Emergency Management to present at least six community awareness presentation annually	Miller County decided that the CERT Team efforts would support this action. See Action 4.1.6

Source: Previously approved County Hazard Mitigation Plans; Data Collection Questionnaires, Meeting with each Jurisdiction

on the Action Worksheets

Appendix D

Miller County Hazard Mitigation Adoption Resolutions 2018

Miller County City of Bagnell Village of Brumley City of Eldon City of Iberia City of Lake Ozark Village of St. Elizabeth Village of Tuscumbia Eldon R-I School District Miller R-III School District St. Elizabeth R-IV School District School of the Osage School District

(Tommissi

of MILLER COUNTY P.O. Box 12 Tuscumbia, MO 65082

The following resolution was adopted by Miller County, Missouri on

February 16,2018

1

RESOLUTION NO. 2018-032

WHEREAS, the Miller County Hazard Mitigation Plan is a multi-jurisdictional hazard mitigation plan prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, Miller County participated in the preparation of the Miller County Hazard Mitigation Plan; and

WHEREAS, the citizens of Miller County have been afforded an opportunity to comment and provide input on the Plan and the mitigation actions therein; and

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

NOW THEREFORE, BE IT RESOLVED by the County Commission that Miller County adopts the Miller County Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to work with Miller County Emergency Management to implement the Plan.

ADOPTED this <u>lb</u> day of <u>february</u>, 2018 at the meeting of the County Commission Commission.

Presiding Commission	2-16-18
Position	Date
Frist commission	2-16-18
Position	Date
2" Commission	2-16-18
Position	Date
Position	Date
	Presiding Commission Position <u>Frist Commission</u> Position 2 nd <u>Commission</u> Position

The following resolution was adopted by the City of Bagnell, Miller County, Missouri on

1-29-18

RESOLUTION NO. 94

WHEREAS, the Miller County Hazard Mitigation Plan is a multi-jurisdictional hazard mitigation plan prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the City of Bagnell participated in the preparation of the Miller County Hazard Mitigation Plan; and

WHEREAS, the citizens of the City of Bagnell have been afforded an opportunity to comment and provide input on the Plan and the mitigation actions therein; and

WHEREAS, the City of Bagnell has reviewed the Plan and affirms that the Plan will be updated no less than every five years

NOW THEREFORE, BE IT RESOLVED by the City Council that the City of Bagnell adopts the Miller County Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to work with Miller County Emergency Management to implement the Plan.

ADOPTED this 29th day of January, 2018 at the meeting of the City Council. 1-29-18 Date Mayor Position lohn Position Ward 2 1/29/18 Date 1-29-Herman Wa Signature Position Date

Signature

Position

Date

The following resolution was adopted by the Village of Brumley, Miller County, Missouri on

Feb 13. 2018

Stenature

RESOLUTION NO. 12/3/8

WHEREAS, the Miller County Hazard Mitigation Plan is a multi-jurisdictional hazard mitigation plan prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the Village of Brumley participated in the preparation of the Miller County Hazard Mitigation Plan; and

WHEREAS, the citizens of the Village of Brumley have been afforded an opportunity to comment and provide input on the Plan and the mitigation actions therein; and

WHEREAS, the Village of Brumley has reviewed the Plan and affirms that the Plan will be updated no less than every five years

NOW THEREFORE, BE IT RESOLVED by the Board of Trustees that the Village of Brumley adopts the Miller County Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to work with Miller County Emergency Management to implement the Plan.

ADOPTED this day of 2018 at the meeting of the Board of Trustees. Position 2-13-2018 Date Dourdu Signature 2-13-18 Date oardmembe Signature Position <u>2-13-18</u> Date osition nature 2-13-18

Lon

Position

Date

4

The following resolution was adopted by the City of Eldon, Miller County, Missouri on June 12, 2018

RESOLUTION 5, 2018

WHEREAS, the Miller County Hazard Mitigation Plan is a multi-jurisdictional hazard mitigation plan prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the City of Eldon participated in the preparation of the Miller County Hazard Mitigation Plan; and

WHEREAS, the citizens of the City of Eldon have been afforded an opportunity to comment and provide input on the Plan and the mitigation actions therein; and

WHEREAS, the City of Eldon has reviewed the Plan and affirms that the Plan will be updated no less than every five years

NOW THEREFORE, BE IT RESOLVED by the Board of Alderman that the City of Eldon adopts the Miller County Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to work with Miller County Emergency Management to implement the Plan.

ADOPTED this 12th day of June, 2018 at the meeting of the City Council.

LARRY HENDERSON, MAYOR

ATTEST

TARA BERRETH, CITY CLERK

The following resolution was adopted by the City of Iberia, Miller County, Missouri on

tebruary 5 2018

RESOLUTION NO. 2018-1

Adopting A Mitigation Plan

WHEREAS, the Miller County Hazard Mitigation Plan is a multi-jurisdictional hazard mitigation plan prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the City of Iberia participated in the preparation of the Miller County Hazard Mitigation Plan; and

WHEREAS, the citizens of the City of Iberia have been afforded an opportunity to comment and provide input on the Plan and the mitigation actions therein; and

WHEREAS, the City of Iberia has reviewed the Plan and affirms that the Plan will be updated no less than every five years

NOW THEREFORE, BE IT RESOLVED by the City Council that the City of Iberia adopts the Miller County Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to work with Miller County Emergency Management to implement the Plan.

ADOPTED this 5th day of	February, 2018 at the m	eeting of the City
Council.		
Watt Palles	Alderman	2-5-18
Signature	Position	Date
Tony Gladda	Alderman	2-5-18
Signajure	Position	Date
nath hun	Alderman	2-5-18
Signature	Position	Date
pulo met	MAYOR	2-5-18
Signature	Position	Date



CITY OF LAKE OZARK A Missouri Municipality of the 4th Class

Resolution No. 2018-R04

RESOLUTION OF THE CITY OF LAKE OZARK, MISSOURI ADOPTING THE MILLER COUNTY HAZARD MITIGATION PLAN

WHEREAS, the City of Lake Ozark, Missouri recognizes that no community is immune from natural hazards, such as tornadoes, severe thunderstorms, floods, severe winter weather, droughts, heat waves, earthquakes, dam failures or wildfires, and it also recognizes the importance of enhancing its ability to withstand such natural hazards so as to reduce the human suffering, property damage, interruption of public services, and economic losses caused by those hazards; and,

WHEREAS, the Federal Emergency Management Agency ("FEMA") and the Missouri Emergency Management Agency have developed a hazard mitigation program that assists communities in their efforts to become disaster-resistant communities, which are communities focused on disaster relief, recovery and reconstruction efforts aimed at restoring the community to pre-disaster conditions in an accelerated, orderly and preplanned manner following a natural hazard; and,

WHEREAS, the Miller County Hazard Mitigation Plan is a multi-jurisdictional hazard mitigation plan prepared in accordance with FEMA requirements (the "Plan"); and,

WHEREAS, the City of Lake Ozark is committed to working with governmental and community partners to maintain and contribute to a local hazard mitigation plan; and,

WHEREAS, the Board of Aldermen of the City of Lake Ozark has determined that it is in the best interests of the City and its residents to adopt the Plan as a means to achieve a safer community in the event of a natural hazard;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY OF LAKE OZARK, MISSOURI, AS FOLLOWS:

1. The Board of Aldermen of the City of Lake Ozark hereby approves all aspects of the Plan, a copy of which is available at <u>http://www.loclg.org/publications Miller County</u> <u>Hazard Mitigation Plan 2018</u> and incorporated herein by this reference, pertaining to that portion of the City of Lake Ozark located in Miller County, Missouri. The City of Lake Ozark will use its best efforts to work with Miller County Emergency Management in implementing the Plan.

The City of Lake Ozark will regularly evaluate and review the Plan and will 2. participate in completing the mandated five-year update of the Plan for submittal to FEMA and Missouri State Emergency Management Agency for review;

THIS RESOLUTION is hereby adopted by the City of Lake Ozark, Missouri on this 13th day of February 2018.

APPROVE:

ATTEST:

Johnnie Franzeskos, Mayor

Cl

Kathy Vance, Interim City Clerk



)

The following resolution was adopted by the Village of St. Elizabeth, Miller County, Missouri on

11

,2018

From:ST E TV

RESOLUTION NO.

WHEREAS, the Miller County Hazard Mitigation Plan is a multi-jurisdictional hazard mitigation plan prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the Village of St. Elizabeth participated in the preparation of the Miller County Hazard Mitigation Plan; and

WHEREAS, the citizens of the Village of St. Elizabeth have been afforded an opportunity to comment and provide input on the Plan and the mitigation actions therein; and

WHEREAS, the Village of St. Elizabeth has reviewed the Plan and affirms that the Plan will be updated no less than every five years

NOW THEREFORE, BE IT RESOLVED by the Board of Trustees that the Village of St. Elizabeth adopts the Miller County Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to work with Miller County Emergency Management to implement the Plan.

2018 at the meeting of the Board of . ADOPTED this day of February Trustees. CHAINM Position Date 2/12/18 Street Date Position Signature 2/12 Date Water comm Position Manature clerk 2/12/18 Date Position Signature

The following resolution was adopted by the Village of Tuscumbia, Miller County, Missouri on

19 Day 05 March 2018

RESOLUTION NO. 100, 205

WHEREAS, the Miller County Hazard Mitigation Plan is a multi-jurisdictional hazard mitigation plan prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the Village of Tuscumbia participated in the preparation of the Miller County Hazard Mitigation Plan; and

WHEREAS, the citizens of the Village of Tuscumbia have been afforded an opportunity to comment and provide input on the Plan and the mitigation actions therein; and

WHEREAS, the Village of Tuscumbia has reviewed the Plan and affirms that the Plan will be updated no less than every five years

NOW THEREFORE, BE IT RESOLVED by the Board of Trustees that the Village of Tuscumbia adopts the Miller County Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to work with Miller County Emergency Management to implement the Plan.

ADOPTED this $/9$ day of	March , 2018 at the	e meeting of the Board of
Trustees.		
AL EL	Mayor	03-19-18
Signature	Position	Date
Unita	Could menter	03-19-18
Signature	Position	Date
Serall Rush	Booth monby	3-19-18

Signature

Signature

Position

Position

Date

Date

The following resolution was adopted by the Eldon School District R-I, Miller County, Missouri on

2-19-18

RESOLUTION NO. 413

WHEREAS, the Miller County Hazard Mitigation Plan is a multi-jurisdictional hazard mitigation plan prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the Eldon School District R-I participated in the preparation of the Miller County Hazard Mitigation Plan; and

WHEREAS, the Eldon School District R-I has been afforded an opportunity to comment and provide input on the Plan and the mitigation actions therein; and

WHEREAS, the Eldon School District R-I has reviewed the Plan and affirms that the Plan will be updated no less than every five years

NOW THEREFORE, BE IT RESOLVED by the Superintendent of the Eldon School District R-I adopts the Miller County Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to work with Miller County Emergency Management to implement the Plan.

ADOPTED this <u>19</u> day of <u>February</u>, 2018 by Superintendent of the Eldon School District R-I

Matt Davis Signature

2-19-18 Date





"Educate Today For Lifetime Learning" Mr. Jason Price, Superintendent

Mr. Randy Gum Principal

Mrs. Mara Wilkerson **Special Education Director**

The following resolution was adopted by the Miller County R-III School District, Miller County, Missouri on

January 15, 2018

WHEREAS, the Miller County Hazard Mitigation Plan is a multi-jurisdictional hazard mitigation plan prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and,

WHEREAS, the Miller County R-III School District participated in the preparation of the Miller County Hazard Mitigation Plan; and

WHEREAS, the Miller County R-III School District has been afforded an opportunity to comment and provide input on the Plan and the mitigation actions therein; and

WHEREAS, the Miller County R-III School District has reviewed the Plan and affirms that the Plan will be updated no less than every five years

NOW THEREFORE, BE IT RESOLVED by the Superintendent of the Miller County R-III School District adopts the Miller County Hazard Mitigation Plan as this jurisdiction's Hazard Mitigation Plan, and resolves to work with Miller County Emergency Management to implement the Plan.

ADOPTED this 15 day of January, 2018 by School Board of the Miller County R-III School District.

Sturn W. Wilson

Signature

Steve Wilson Debra Rogers President Vice President **Board of Education**

Gayla Luttrell Greg Hawken Louie Gregoire Secretary Member Member Member 526 School Road PO Box 1Tuscumbia, Missouri 65082 573-369-2375

David Grimwood Alisha Cline Weston Ash Member Member

01/15/2018 Date

12

ST. ELIZABETH R-IV SCHOOL DISTRICT, MILLER COUNTY, MISSOURI. RESOLUTION NO.

A RESOLUTION OF THE ST. ELIZABETH R-IV SCHOOL DISTRICT, MILLER COUNTY, MISSOURI ADOPTING THE MILLER COUNTY HAZARD MITIGATION PLAN 2018

WHEREAS the St. Elizabeth R-IV School District, Miller County, Missouri recognizes the threat that natural hazards pose to people and property within the St. Elizabeth R-IV School District, Miller County, Missouri; and

WHEREAS the St. Elizabeth R-IV School District, Miller County, Missouri has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the Miller County Hazard Mitigation Plan 2018, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the St. Elizabeth R-IV School District, Miller County, Missouri from the impacts of future hazards and disasters; and

WHEREAS the St. Elizabeth R-IV School District, Miller County, Missouri recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the St. Elizabeth R-IV School District, Miller County, Missouri will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the St. Elizabeth R-IV School District, Miller County, Missouri demonstrates their commitment to hazard, mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE ST. ELIZABETH R-IV SCHOOL DISTRICT, MILLER COUNTY, MISSOURI, IN THE STATE OF MISSOURI, THAT:

In accordance with (*local rule for adopting resolutions*), the St. Elizabeth R-IV School District, Miller County, Missouri adopts the final *FEMA-approved Plan*.

day of

	ADOPTED by a vote of in favor and D against, andabstaining, this $\frac{34}{2}$
Jar	mary, 2018.
	By (Sig): Dis R. How (BOARD PROJEDONT) Print name: Doughas R. Houtmenter
	ATTEST: Mary Oliopehlaegu Print name: Mary Oligschlaeger
	APPROVED AS TO FORM: Joni W Paylor By (Sig.): Print name: Toni W Taylor

SCHOOL OF THE OSAGE SCHOOL DISTRICT, MILLER COUNTY, MISSOURI. RESOLUTION NO. ___

A RESOLUTION OF THE SCHOOL OF THE OSAGE SCHOOL DISTRICT, MILLER COUNTY, MISSOURI ADOPTING THE MILLER COUNTY HAZARD MITIGATION PLAN 2018

WHEREAS the School of the Osage School District, Miller County, Missouri recognizes the threat that natural hazards pose to people and property within the School of the Osage School District, Miller County, Missouri; and

WHEREAS the School of the Osage School District, Miller County, Missouri has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the Miller County Hazard Mitigation Plan 2018, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the School of the Osage School District, Miller County, Missouri from the impacts of future hazards and disasters; and

WHEREAS the School of the Osage School District, Miller County, Missouri recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the School of the Osage School District, Miller County, Missouri will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the School of the Osage School District, Miller County, Missouri demonstrates their commitment to hazard, mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE SCHOOL OF THE OSAGE SCHOOL DISTRICT, MILLER COUNTY, MISSOURI IN THE STATE OF MISSOURI, THAT:

In accordance with School of the Osage Board Policy BBA the School of the Osage School District, Miller County, Missouri adopts the final *FEMA-approved Plan*.

ADOPTED by a vote of <u>6</u> in favor and <u>0</u> against, and <u>0</u> abstaining, this <u>26</u> day of <u>February 2018</u>

By (Sig): Print name:

ATTEST: 3 b broad By (Sig.): Print name: \000

APPROVED AS TO FORM: By (Sig.): Print name:

IBERIA R-V SCHOOL DISTRICT, MILLER COUNTY, MISSOURI.

A RESOLUTION OF THE IBERIA R-V SCHOOL DISTRICT, MILLER COUNTY, MISSOURI ADOPTING THE MILLER COUNTY HAZARD MITIGATION PLAN 2018

WHEREAS the Iberia R-V School District, Miller County, Missouri recognizes the threat that natural hazards pose to people and property within the Iberia R-V School District, Miller County, Missouri; and

WHEREAS the Iberia R-V School District, Miller County, Missouri has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the Miller County Hazard Mitigation Plan 2018, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Iberia R-V School District, Miller County, Missouri from the impacts of future hazards and disasters; and

WHEREAS the Iberia R-V School District, Miller County, Missouri recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the Iberia R-V School District, Miller County, Missouri will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the Iberia R-V School District, Miller County, Missouri demonstrates their commitment to hazard, mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE IBERIA R-V SCHOOL DISTRICT, MILLER COUNTY, MISSOURI, IN THE STATE OF MISSOURI, THAT:

In accordance with Board Policy BBA, Iberia R-V School District, Miller County, Missouri adopts the final *FEMA-approved Plan*.

ADOPTED by a vote of 6 in favor and 0 against, and 0 abstaining, this 25th day of January, 2018.

By (Sig):AChel Mperats Print name:
ATTEST: By (Sig.): Print name: Ly Let R. Whith, Supt.
APPROVED AS TO FORM: Theile Aprilling By (Sig.): Print name: Sheila Hendley