Buchanan County
Multi-jurisdictional
Natural Hazard Mitigation Plan

April 2017

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Leslie Crockett	City Clerk	City Council	Village of DeKalb
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Jack Radkey	Village Council	City Council	Village of Lewis & Clark
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Josh Baker	Superintendent	Administration	East Buchanan School District
John James	Superintendent	Administration	Mid-Buchanan School District
Solon Hayes	Director of Student Services	Administration	St. Joseph School District
Tim Kissock	Risk Manager	Risk Management	Missouri Western State

Stakeholder Representatives

Name	Title	Department	Agency/Organization
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The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. Buchanan County and participating jurisdictions and school/special districts developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses from hazard events to the County and its communities and school/special districts. The plan is an update of a plan that was approved in 2012. 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 County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following eleven jurisdictions that participated in the planning process:

- Buchanan County
- Agency
- DeKalb
- Easton
- Lewis & Clark Village
- St. Joseph
- Buchanan R-IV School District
- Mid-Buchanan School District
- St. Joseph School District
- Missouri Western State University

Buchanan County and the entities listed above developed a Multi-Jurisdictional Hazard Mitigation Plan that was approved by FEMA in May 2012. This current planning effort serves to update that previously approved plan.

The plan update process followed a methodology prescribed by FEMA, which began with the formation of a Mitigation Planning Committee (MPC) comprised of representatives from Buchanan County and participating jurisdictions. The MPC updated the risk assessment that identified and profiled hazards that pose a risk to Buchanan 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. Riverine and flash flooding, winter storms, severe thunderstorms/hail/lightning/high winds, and tornadoes are among the hazards that historically have had a significant impact.

Based upon the risk assessment, the MPC reviewed the previous goals for reducing risk from hazards and modified them in the updated plan. The goals are listed below:

1. Protect the Lives, Property and Livelihoods of All Citizens.
2. Provide Mitigation to Lessen the Impact in Hazard Prone Areas.
3. Increase Resources Available to Citizens via Education and Preparedness.
4. Ensure Continued Operation of Government and Emergency Functions in a Disaster.
5. Identify Critical Infrastructure Components.

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, ideas for implementation, responsible agency, timeline, cost estimate, potential funding sources, and more.

PREREQUISITES

44 CFR requirement 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 A, 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.

- These will be provided as the plan is reviewed and adopted by participating jurisdictions and schools/special districts.

Model Resolution

Resolution # _____

Adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, Buchanan County recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, Buchanan County fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan," and approved it as to form and content; and

Whereas, Buchanan County desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for Buchanan County demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that Buchanan County has adopted the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan" as an official plan.

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Date: _____

Certifying Official: _____

1 INTRODUCTION AND PLANNING PROCESS

1 INTRODUCTION AND PLANNING PROCESS 1

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1.1 Purpose

Hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. Mitigation activities may be implemented prior to, during or after an incident. However it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs (http://www.fema.gov/what-mitigation).

Federal Emergency Management Agency (FEMA) has implemented the various hazard mitigation planning provisions through the Code of Federal Regulations (CFR) at 44 CFR Part 201. The CFR provisions set forth the mitigation plan requirement for local and tribal governments as a condition of receiving FEMA hazard mitigation assistance. Under 44 CFR §201.6, local governments, schools or other publicly funded districts must have adopted a FEMA-approved local hazard mitigation plan in order to apply for hazard mitigation project grants. Section 322 of the Robert T. Stafford Relief and Emergency Assistance Act (P.L. 93-288), as amended by the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390), provides for States, Tribes and local governments to undertake a risk-based approach to reducing risks to natural hazards through mitigation planning.

The plan also meets the minimum planning requirements for all FEMA mitigation programs, such as Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM) and where appropriate, other FEMA mitigation related programs such as the National Earthquake Hazards Reduction Program (NEHRP), the National Flood Insurance Program (NFIP) and the Community Rating System (CRS). Entities that do not adopt the plan will not be eligible for mitigation grants.

The Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule were published in the *Federal Register* 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 DMA established the requirements for local hazard mitigation plans are in the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). The communities and school districts were informed that

adopting the plan is a prerequisite for mitigation grant eligibility. Entities that do not adopt the plan will not be eligible for mitigation grants.

1.2 Background and Scope

As required by 44 CFR §201.6(d)(3), local jurisdictions must review and revise their plan to reflect changes in development, progress in local mitigation efforts and changes in priorities and resubmit it for approval every five (5) years in order to continue to be eligible for mitigation project grant funding. The 2017 Buchanan County Multi-Jurisdictional Hazard Mitigation Plan is a revision of the previous five-year update adopted in May 2012, which was the first update of the original plan completed in 2005.

Jurisdictions that participated in the 2012 plan and are continuing participation in the 2017 include:

- Buchanan County
- Agency
- DeKalb
- Easton
- Lewis & Clark Village
- St. Joseph
- Buchanan School District
- Mid-Buchanan School District
- St. Joseph School District
- Missouri Western State University

Jurisdictions that were invited but did not participate in the plan include:

- Rushville

Information in the plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future.

1.3 Plan Organization

The 2017 HMP is organized into five chapters, which are:

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

Table 1.1 shows the revisions from the 2012 Buchanan County HMP.

Table 1.1. Changes Made in Plan Update

2012 HMP	2017 HMP
Section 1: Community Profiles	Chapter 1: Introduction and Planning Process
Section 2: Hazard Identification	Chapter 2: Planning Area Profile and Capabilities
Section 3: Vulnerability and Capability Assessment	Chapter 3: Risk Assessment
Section 4: Mitigation Strategy	Chapter 4: Mitigation Strategy
	Chapter 5: Plan Maintenance (new chapter)

The plan format has been standardized across the state in order to create hazard mitigation plans that are more consistent with each other, making it easier to locate information, as well as making plans more consistent from update to update. Chapter 5, Plan Maintenance, was added to expand the amount of information on maintaining the plan between updates. In the 2012 update, plan maintenance information was located in Section 4, Mitigation Strategy. Routine review and maintenance of mitigation actions and goals is important to make sure actions are being implemented on schedule and for the plan's goals to guide mitigation efforts. By increasing the focus on plan maintenance through the addition of a separate chapter, this aspect will receive the attention it deserves.

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.

Mo-Kan Regional Council contracted to facilitate the plan's updating process. Mo-Kan staff met with the Buchanan County Emergency Management Director (EMD) during the informational meeting to develop a list of area stakeholders and local jurisdiction representatives for the Mitigation Planning Committee (MPC). The updating process included the kick-off meeting and two subsequent MPC meetings. Mo-Kan staff produced the draft and final plan update in a FEMA-approvable document, and coordinated with the Missouri State Emergency Management Agency (SEMA) and FEMA plan reviews.

The main topics at the MPC meetings are discussed in Section 1.4.2. Mo-Kan solicited public involvement in the planning process. Press releases were disseminated for the MPC meetings on August 11, 2016, August 31, 2016, and September 22, 2016. Appendix D provides documentation of the planning process including public involvement solicitations and meeting notices.

The draft of the plan was posted on the Buchanan County website for public review and comment. A press release was sent to St. Joseph Newspress and St. Joseph post, notifying that the plan was available for public comment. Input from city and county officials was solicited through distribution of drafts of the plan to their jurisdictions.

Table 1.2 shows the representatives from local jurisdictions and stakeholders that attended meetings and participated on the MPC.

Table 1.2. Jurisdictional Representatives Buchanan County Mitigation Planning Committee

Name	Title	Department	Jurisdiction/Agency /Organization
Bill Brinton	EMD	Emergency Management	Buchanan County
Bryan Gabriel	Council Chairman	Administration	Agency
Leslie Crockett	City Clerk	Administration	DeKalb
Sally McDowell	City Clerk	Administration	Easton
Jack Radkey	Village Board Member	Administration	Lewis & Clark Village
Julie Alt	EMD	Fire Department	St. Joseph
Travis Dittemore	Superintendent	Administration	Buchanan County School District
John James	Superintendent	Administration	Mid-Buchanan School District
Solon Hayes	Director of Student Services	Administration	St. Joseph School District
Tim Kissock	Risk Manager	Risk Management	Missouri Western State University

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.

Each jurisdiction is required to participate in the planning process and officially adopt the plan, in order to be eligible for mitigation funding grants. The MPC established a minimum criteria that each jurisdiction must meet in order to be considered a "participant." Plan participation requirements were defined as:

- Designation of a representative from each participating jurisdiction to serve on the MPC;
- Participation in two MPC meetings by either direct participation or authorized representation or host a work session with the specific jurisdiction;
- 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;
- Eliminated 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;
- 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; and
- All participants should formally adopt the mitigation plan prior to submittal to SEMA and FEMA for final approval.

The participation requirements were easily met by Buchanan County and the City of St. Joseph, who have full-time staff and had several jurisdictional representatives at each meeting. The other communities in Buchanan County do not have full-time staff and were concerned about their ability to attend two meetings. The MPC agreed that if a jurisdiction was unable to attend the meetings that participation requirements could be met by holding at work session. Rushville chose not to participate in the plan. The jurisdiction of Easton was only able to attend one meeting but part-time staff kept in touch via email and phone throughout the process. All other jurisdictions met participation requirements. See Table 1.3 for jurisdictional participation in the planning process.

Table 1.3. Jurisdictional Participation in Planning Process

Jurisdiction	Kick-off Meeting	Meeting #2	Meeting #3	Work Session	Data Collection Questionnaire Response	Update/Develop Mitigation Actions
Buchanan County	Yes	Yes	Yes	Yes	Yes	Yes
Agency	Yes	Yes	No	Yes	Yes	Yes
DeKalb	No	Yes	Yes	Yes	Yes	Yes
Easton	No	No	Yes	No	Yes	Yes
Rushville	No	No	No	No	No	No
Lewis & Clark Village	No	No	Yes	Yes	Yes	Yes
St. Joseph	Yes	Yes	Yes	No	Yes	Yes
Buchanan County School District	No	Yes	No	No	Yes	Yes
Mid-Buchanan School District	Yes	Yes	No	No	Yes	Yes
St. Joseph School District	No	Yes	Yes	No	Yes	Yes
Missouri Western State University	No	Yes	Yes	No	Yes	Yes

1.4.2 The Planning Steps

FEMA's Local Mitigation Planning Handbook (March 2013), Local Mitigation Plan Review Guide (October 1, 2013), and Integrating Hazard Mitigation into Local Planning: Case Studies and Tools for Community Officials (March 1, 2013) were used as the sources for the HMP update.

The update followed the 10-step planning process adapted from FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. The10-step process allows 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. Table

1.4 shows how the CRS process aligns with the Nine Task Process outlined in the 2013 Local Mitigation Planning Handbook.

Following Table 1.4 is a summary of how Mo-Kan staff used the Nine Task Process to develop the update to the Plan.

Table 1.4. County Mitigation Plan Update Process

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); 44 CFR 201.6(c)(3)(ii); and 44 CFR 201.6(c)(3)(iii)
Step 7. Review possible activities	
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)

Step 1: Organize the Planning Team (Handbook Tasks 1 & 2)

In December 2016, Mo-Kan entered into cooperative agreements with SEMA and Buchanan County to prepare this multi-jurisdictional plan for local jurisdictions in Buchanan County. Discussions on the development of the Buchanan County Multi-Jurisdictional Hazard Mitigation Plan began on March 21, 2016 with a meeting attended by Mo-Kan staff, Buchanan County Commissioners, Buchanan County Emergency Management Director and Buchanan County GIS Specialist. This meeting was conducted to discuss the timeline for developing the hazard mitigation plan, the planning process, identification of stakeholders and community organizations to include in the planning process and a date for the Kick-Off meeting to initiate participation of jurisdictions and public entities in the planning process. The attendees identified prospective representatives and stakeholders and a contact list was prepared for mailing an invitation letter to the Kick-Off Meeting. The list of invitees included local elected officials, municipal government staff, county government staff, emergency services personnel, school administrators, members from health and social services organizations, utility providers, and volunteer organizations. A complete list of invitees is in Appendix C.

The MPC met on three occasions from August through September 2016 to collaborate on the Plan's update. Participants assisted in data collection; reviewed and revised goals, objectives and mitigation strategies; and provided reviews and comments on the plan throughout the update process. Communication with MPC members occurred throughout the planning process through face-to-face meetings, phone interviews, and email correspondence in addition to committee meetings. **Table 1.5** shows the meeting schedule and items discussed for MPC meetings.

Table 1.5. Schedule of MPC Meetings

Meeting	Topic	Date
Informational Meeting	Met with the Emergency Management Director, County Commissioners and GIS specialist to discuss who should be on the Mitigation Planning Committee. Discussed risk assessment methodology and the timeline for updating the plan.	March 21, 2016
Kick-off Meeting #1	Discussion on the background and importance of HMP, timeline and participation requirements, review of 2012 plan and began working on community data questionnaire forms (See Appendix B).	August 11, 2016
Planning Meeting #2	Review of goals and actions, discussion of past and potential mitigation projects and began working on hazard analysis and cascading disasters (See Appendix B). A levee engineer working on a project in the county discussed the levee situation with the MPC.	August 31, 2016
Planning Meeting #3	Discussion on goals, achievements and the adoption process. The MPC began working on evaluations of past actions and creating new actions (See Appendix B).	September 22, 2016

Step 2: Plan for Public Involvement (Handbook Task 3)

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.

The MPC held their Kick-Off meeting on August 11, 2016. Some of the MPC members had participated in the 2012 update but the updating process was new for the majority. There was discussion on soliciting public input and the importance of public outreach. Several MPC members volunteered to distribute information at public events and facilities. It was determined to hold a series of public meetings and to present HMP update information at city council, LEPC and other type of meetings. Mo-Kan staff and local jurisdictions disseminated public notices and press releases to the media, urging public attendance and input. Public notices, press releases, agendas and sign-in sheets for the following meetings are in Appendix C. The meetings included:

- September 15, 2016 – Agency, Village Board meeting – Attendees provided input on the jurisdiction's experience with flooding.
- September 16, 2016 – St. Joseph, Buchanan County Courthouse, public meeting – Attendees provided input on preparing vulnerable populations and levee concerns.

- October 4, 2016 – Agency, Fire Station, public meeting – Attendee asked for the information to be presented at the jurisdiction's Planning and Zoning meeting.
- October 4, 2016 - Lewis and Clark Village, Village Board meeting – Attendees provided input on their jurisdiction's experience with flooding and lack of a debris removal plan.
- October 11, 2016 – Agency, Planning and Zoning meeting – Attendees expressed concern of a dam's integrity and inundation zone and flooding caused by a creek.
- November 9, 2016 – DeKalb, City Council meeting
- November 10, 2016 – St. Joseph, Inter-Agency Council on Aging meeting – Attendees provided input on preparing the vulnerable populations and the caretakers, organizations and agencies that advocate for vulnerable populations.

The Community Rating System (CRS) was discussed at city council meetings to determine if jurisdictions were interested in participation. Buchanan County, Lewis and Clark Village and Agency expressed interest but, DeKalb, which has minimal issues with flooding, did not wish to participate. MPC member or members were usually present at the aforementioned meetings. The committee was open to public input at these meetings and incorporated this information into the plan when thought appropriate.

In addition, information regarding the hazard mitigation plan, as well as Ready-in-Three campaign materials were distributed at the following locations: Bartlett Community Center (St. Joseph), South Side Festival (St. Joseph), Senior Center (St. Joseph), animal shelter - emergency plans for pets (St. Joseph) and Lewis and Clark Community Center during the 5K fundraiser (Lewis & Clark Village).

The Local Emergency Planning Committee (LEPC) was highly involved in the plan's update. Discussion regarding the HMP occurred at the LEPC meetings on July 28, August 24, March 24, September 22 and December 1.

Upon the draft's completion, it was posted on Buchanan County's website and distributed to each jurisdiction to either post on their website or to have a hard copy available for the public to review. Public feedback was encouraged.

Step 3: Coordinate with Other Departments and Agencies and Incorporate Existing Information (Handbook Task 3)

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.

At the informational meeting, held on March 21, 2016, the Emergency Management Director and Buchanan County Commissioners compiled a list of organizations to invite to participate in updating the plan, whose goals and interests interfaced with hazard mitigation. Invitations were sent to all jurisdictions located in Buchanan County, school districts, the university, emergency

management and responders personnel, National Guard, public works personnel, industry representatives, etc. A list of organizations and agencies receiving invitations are located in Appendix C. Invitation respondents were the MPC, whose input guided the plan update.

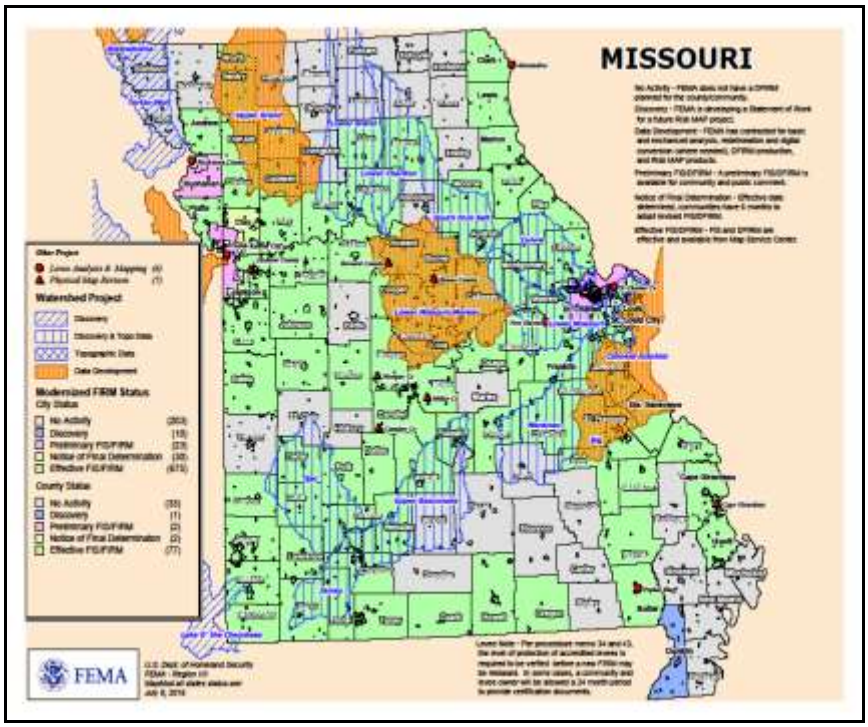
Coordination with FEMA Risk MAP Project

Risk Mapping, Assessment, and Planning (Risk MAP) is the Federal Emergency Management Agency (FEMA) Program that provides communities with flood information and tools they can use to enhance their mitigation plans and take action to better protect their citizens. Through collaboration with State, Tribal, and local entities, Risk MAP delivers quality data that increases public awareness and leads to action that reduces risk to life and property.

Buchanan County does not currently have a Risk Map watershed project; however, it does have a preliminary FIS/DFIRM (available from the Map Service Center). Once completed, Risk MAP will provide mitigation planning support in a variety of ways including helping in the assessment of risks and identifying action items to reduce vulnerability. In addition, this project will provide tools to improve the understanding of risk by local officials and the general public.

Figure 1.1, Missouri Study Status Map illustrates the current status of Missouri counties in regard to RiskMap projects, including Buchanan County. There were six levee analysis and mapping RiskMap projects in Buchanan County as of 2015.

Figure 1.1. Map of RiskMAP projects



(Source: Missouri Study Status Map 7-6-2015)

Integration of Other Data, Reports, Studies, and Plans

Additional input was solicited from other agencies and organizations that were not able to attend planning committees. Meetings were held with these organizations, which included American Red Cross, Village of Agency Planning and Zoning, and IACA (Inter-agency Council on Aging), which included representatives from over a dozen agencies serving the county in numerous capacities. Phone conversations were held with representatives from the Missouri Department of Conservation, University of Missouri Extension Office and KCP&L, electricity provider.

Data was collected and reviewed from multiple sources, which are referenced through out the document. These sources include, but are not limited to, the US Census, Andrew County HMP (adjacent county), Flood Insurance Studies (FIS), Flood Insurance Rate Maps (FIRMS), State Department of Natural Resources (DNR) dam information, National Inventory of Dams (NID), dam inspection reports, Village of Agency's and City of St. Joseph's budgets and land use plans, US Department of Agriculture's USDA) Risk Management Agency Crop Insurance Statistics.

Step 4: Assess the Hazard: Identify and Profile Hazards (Handbook Task 5)

At the first MPC meeting, held on August 11, 2016, hazards from the 2012 plan were briefly identified and profiled. The MPC agreed that historically, flooding and levee failure have been the most costly hazards. Tornados and severe weather have also been areas of concern. Several key members on the MPC were involved in the 2012 HMP update and shared their experience on the more notable disasters of the past five years, such as the 2012 Missouri river flooding. At the second MPC meeting, held on August 31, the hazards were discussed in more detail and minor changes were made to the risk assessment. The changes are examined in Chapter 3. A engineer involved in a levee project occurring in the county spoke to the MPC about current condition of the overall levee system and mitigation actions that would better protect the entire area from flooding and levee failure. The MPC discussed adding communication failure and public health outbreak to the list of hazards covered, expanding into the man-made disasters. These were not included due to the timeframe for submitting the plan.

A list of previous disaster declarations was available to jurisdictions to assist in their risk assessment, but this list was not reviewed at a MPC meeting. The data collection questionnaire forms provided valuable information regarding each jurisdiction's experience with disasters. This information was used by the individual jurisdictions in evaluating their risk assessment and by Mo-Kan staff in generating the data for risk assessments for Chapter 3. The MPC did not review each jurisdiction's data collection questionnaire at a MPC meeting, as most questionnaires were not completed by the third MPC meeting.

The 2012 Buchanan County HMP and 2010 State Plan provided a basis for the 2017 Buchanan County HMP. Christian County's HMP was referred to, since it followed the new outline and has a similar risk assessment, other than flooding and levee failure. The levee engineer provided the MPC Circular No. 11-2-212, which is "Guidance for Emergency Action Plans for Dams and Levees" from the U.S Army Corps of Engineers. Additional details on conclusions drawn from data can be found in Chapter 3.

Step 5: Assess the Problem: Identify Assets and Estimate Losses

Jurisdictions identified their respective assets on their Data Collection Questionnaire form, as well

as during work sessions. These assets were compared against various GIS layers and HAZUS to access their vulnerability to disasters.

The jurisdictions of Agency, Easton, DeKalb and Lewis and Clark Village do not have full time city staff, so the city clerk, mayor and/or city council members collaborated to complete the data collection questionnaires. The City of St. Joseph and Buchanan County have full time staff, including emergency management personnel, who provided information on the data collection questionnaires. The superintendents and/or principals completed the data collection questionnaires for their school districts. Most of the data on the school questionnaire forms was readily available, in a different format, for school emergency plans. Missouri Western State Universities Risk Manager completed the data collection questionnaire. The data retrieved from the questionnaires can be found in Chapter 2. This data includes information on regulatory, personnel, fiscal and technical capabilities, and existing mitigation initiatives.

Inventory estimates for each jurisdiction's building stock in the county were derived through the use of HAZUS MH 3.2. These estimates were given by total building by type as well as total dollars of assets. Exposure values were estimated by using parcel data from the Buchanan County Assessor and a Buchanan County individual structures dataset. To derive the exposure dollars, only the appraised value of the building itself was used for residential and commercial properties. For agricultural parcels, both the buildings and the land were used to determine value, since the land is necessary for the function of agricultural practices. The methodology for estimating losses varies by hazard. Loss estimates are included for various hazard profiles in the Risk Assessment chapter.

Step 6: Set Goals (Handbook Task 6)

At the second MPC meeting, held on August 31, 2016, the MPC reviewed the goals from the previous plan. They decided to wait until the third meeting, held on September 22, 2016, to make changes to the goals. This decision was based on allowing the jurisdictions more time to examine what progress had been made from the previous plan and to determine if there are new needs. The 2012 plan goals were:

Goal 1: Protect the Lives, Property and Livelihoods of All Citizens.

1. Objective: Protect citizen's lives and property.
2. Objective: Provide sufficient warning of impending disasters.
3. Objective: Identify the citizens most vulnerable to disasters and plan accordingly.

Goal 2: Manage Growth in Designated Hazard Areas Through Sustainable Policies, Principles and Practices.

1. Objective: Decrease the occurrence of certain disasters and reduce the damage of disasters.
2. Objective: Decrease the cost of the next disaster.
3. Objective: Increase our economic resistance to disasters.

Goal 3: Ensure Access to Information Regarding Hazards Preparation and Recovery.

1. Objective: Increase knowledge among citizens about disaster safety and preparedness.

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster.

1. Objective: Increase disaster mitigation management capability in local governments.
2. Objective: Strengthen critical infrastructure.

At the third meeting, the MPC decided to keep Goal 1 and its objectives the same. Goal 2 was reworded to apply generally throughout the county, as most communities do not have planning and zoning policies and are not experiencing growth. The MPC was unsure if reducing the occurrences of certain disasters was within their ability to control so the first objective was reworded to focus on measurable standards. Goal 3 was reworded to reflect the MPC desire for the plan to provide resources to citizens, as well as access to information. Goal 4, objective one remained as is. However, the second objective was moved to a newly created goal. Goal 5 was created because the MPC felt that an emphasis should be placed on identifying and protecting critical infrastructure components. During the 2012 plan update, the county was experiencing heavy flooding, which threatened critical infrastructure. The important role of infrastructure was brought forward into defining goals.

Buchanan County's 2017 HMP goals are:

Goal 1: Protect the Lives, Property and Livelihoods of All Citizens.

1. Objective: Protect citizen's lives and property.
2. Objective: Provide sufficient warning of impending disasters.
3. Objective: Identify the citizens most vulnerable to disasters and plan accordingly.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas.

1. Objective: Lessen the impact of certain disasters and reduce the damage of disasters.
2. Objective: Decrease the cost of the next disaster.
3. Objective: Increase our economic resistance to disasters.

Goal 3: Increase Resources Available to Citizens via Education and Preparedness Information.

1. Objective: Increase knowledge among citizens about disaster safety and preparedness.

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster.

1. Objective: Increase disaster mitigation management capability in local governments.

Goal 5: Identify Critical Infrastructure Components.

1. Objective: Increase mitigation strategies to support those infrastructures.

Step 7: Review Possible Mitigation Actions and Activities

At the second MPC meeting, held on August 31, 2016, the mitigation strategy from the previous plan was reviewed and a new strategy was discussed. Representatives from the jurisdictions also reviewed the previous actions and reported on progress made on previously proposed actions. A packet for each jurisdiction was provided that included evaluation and STAPLEE forms, information on how to complete the forms and the actions to be evaluated. How to evaluate the past actions was discussed during the meeting but due to the sheer number of actions needing to be evaluated, jurisdiction representatives evaluated actions outside of the scheduled MPC meetings.

Participants were to consider the potential cost of each action in relation to the anticipated future cost savings. Members were encouraged to continue forwarding only those actions that substantively addressed long-term risks identified in the risk assessment. There was little difference in the risk assessment of natural hazards from the 2012 plan. The most notable difference the addition of an earthquake added as a potential hazard, albeit with minor damage expectancy.

The STAPLEE method was used to prioritize actions that would continue forward. The modified STAPLEE method determined if an action is socially acceptable, technically feasible, administratively possible, politically acceptable, legal, economic beneficial and environmentally sound. The STAPLEE method also considered if lives will be saved or if disaster damages would decrease through implementation. However, several MPC members said that certain actions scored higher than they felt their level of importance was. The representatives used their discretion on including those low scoring actions with high importance since a STAPLEE method is a guideline to assist in ranking and not the only factor in determining importance.

At the third MPC meeting, held on September 22, 2016, new actions were discussed. MPC members were encouraged to continue actions that addressed long-term risks identified in the risk assessment. Copies of the FEMA publication *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013)* were made available for jurisdictions to reference.

Step 8: Draft an Action Plan

At the third MPC meeting, held September 22, 2016, new actions were discussed. It was at the individual jurisdiction's discretion on whether to include actions with low STAPLEE scores.

Step 9: Adopt the Plan (Handbook Task 8)

Jurisdictions were provided a copy of the plan to make available to the public. The public and the jurisdictions were asked for feedback. The plan went before the Buchanan County Commissioners for adoption and then the other jurisdictions. Adoption resolutions can be found in Appendix A.

Step 10: Implement, Evaluate, and Revise the Plan (Handbook Tasks 7 & 9)

At each MPC meeting strategies were discussed for plan implementation, monitoring and plan maintenance. At the second MPC meeting, held on August 31, 2016, the discussion was more in depth. Buchanan County, LEPC representatives and St. Joseph set up general dates to review the plan. Details of plan maintenance and review are in Chapter 5.

2 PLANNING AREA PROFILE AND CAPABILITIES 2.1

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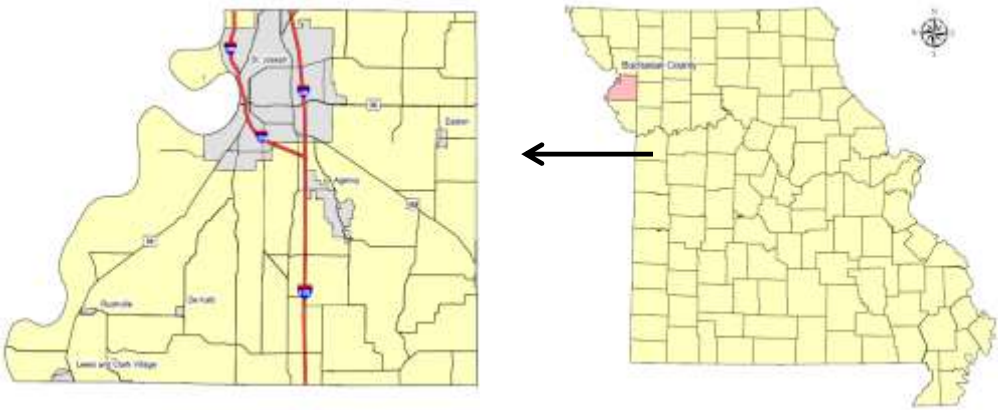
2.1 Buchanan County Planning Area Profile

Buchanan County is bordered by Andrew, DeKalb, Clinton and Platte counties in Missouri and Doniphan and Atchison counties in Kansas. The Missouri River runs the county's entire western border. Buchanan County is part of the St. Joseph Metropolitan Statistical Area (MSA). Incorporated communities include Agency, DeKalb, Easton, Rushville, Lewis & Clark Village and St. Joseph. Of these cities, St. Joseph is the largest, with a population of 76,596 and the Village of Lewis & Clark is the smallest, with a population of 132.

Figure 2.1 is a map of the county's location in Missouri.

Figure 2.1 Map of Buchanan County



According to the U.S. Bureau of the Census July 1, 2015 Population Estimates, the population of Buchanan County is 89,201. This is a 3.72% increase from 2000 U.S. Census population of 85,998. The increase is larger than Missouri's and the United States' population growth rates of 1.58% and 1.42%, respectively. Buchanan County's median household income (MHI) increased 33.46% from $34,704 in 2000 to $46,315 in 2015. During the same timeframe Missouri and the United States experienced an increase in median income of 26.99% and 28.33%, respectively. From 2000 to 2015, the median house value in the county rose from $72,700 to $109,700, an increase of 50.89%. This increase lagged behind the state and national median house value increases of 53.95% and 59.75%, respectively (Source: http://www factfinder.census.gov).

2.1.2 Geography, Geology and Topography

Buchanan County has a total area of 415 square miles; which includes 410 square miles of land and five square miles of surface water. The Missouri River flows along the western edge of the county and forms the border between Kansas and Missouri. St. Joseph, the county seat of Buchanan County, is located at 39º47' North and 94º55' West.

Buchanan County is located approximately 50 miles north of Kansas City and 130 miles south of Omaha, Nebraska. The area is served by Interstate 29 and numerous federal and state highways. Commercial railroad and port services are available within the county and commercial air transportation and rail are available in Kansas City.

The topography of Buchanan County consists of rolling hills, valleys, and ample drainage. Ground elevations along the Missouri range from 800 to 900 feet above sea level. Ground elevations along the northern border of the region are from 900 feet at the Missouri River to about 1,100 feet in southern Buchanan County. The majority of the land space throughout the region is approximately 900 feet above sea level.

The bedrock of Buchanan County is believed to have been formed during the Quaternary and Pennsylvanian Periods of approximately 300 million years ago. Alluvium soil formed during the Quaternary Period in the Missouri River Flood Plain, and consists mainly of a rich mixture of sand, silt and clay. These soils are 100 to 150 feet thick.

The rivers and streams of northwest Missouri have influenced the county's history. The Missouri River is the backbone of the area's economic growth and is now a major contributor to the region's growing tourism industry.

There are three watersheds in Buchanan County. The Independence-Sugar watershed includes the communities of DeKalb, Lewis and Clark Village, Rushville and St. Joseph. The One Hundred Two watershed includes St. Joseph. The Platte watershed includes the communities of Agency, Easton and St. Joseph. Figure 2.2 shows the three watersheds in county (Source: MoDNR).

Figure 2.2 Watersheds in Buchanan County

(Source: Mo-Kan)

2.1.3 Climate

The climate of northwest Missouri is continental in nature with cold winters, hot summers and is subject to extreme changes in temperature, humidity, cloudiness and wind speeds. The National Weather Service (NWS) data shows that Buchanan County has a mean temperature of 53.4°. Based on weather data from 1981 to 2010, July is the warmest month and has a mean maximum temperature of 87.0° (77.1°mean average temperature). January is the coldest month and has an mean average minimum temperature of 17.4° (27.2°). The wind average in 2015 was 8.4 mph and usually comes from the south. The average rain fall is 37.7 inches per year and average snow fall is 18.3 inches per year (Source: http://w2.weather.gov/climate/ index.php?wfo=eax).

2.1.4 Population/Demographics

Table 2.3 provides population information for Buchanan County from 2000 to 2015. During this time period, the county added 3,102 people to their overall population. The population percent change of 3.72% indicates a positive growth rate. The cities of Agency and St. Joseph increased their population by 10 and 2,624, respectively. The cities of DeKalb, Easton, Lewis and Clark Village and Rushville saw a decrease in population. The population of Lewis and Clark Village only decreased by 23 people, but this translates to a -14.84% population deduction. Thus, a seemingly small decrease in the population for rural communities is impactful. Buchanan County reflects the national trend of out migration from small rural communities, such as Lewis and Clark Village, to larger population centers, such as St. Joseph.

Table 2.3 Buchanan County Population 2000-2015 by Community

Jurisdiction	2000 Population	2015 Estimated Population	2000-2015 # Change	2000-2015 % Change
Buchanan County	85,998	89,201	3,203	3.72%
Agency	662	672	10	1.51%
DeKalb	257	220	-37	-14.40%
Easton	258	238	-20	-7.75%
Lewis & Clark Village	155	132	-23	-14.84%
City of St. Joseph	73,972	76,596	2,624	3.55%

(Source: U.S. Bureau of the Census, Decennial Census, and 2015 Population Estimates)

Buchanan County is slightly above state and national averages in regards to the percentage of the population under the age of five. Buchanan County's percentage is 6.6% while Missouri and the United States are 6.2% and 6.3%, respectively. The county has 33,176 total households, with an average household size of 2.69. This is larger than the state average of 2.48 and the national average of 2.64.

The University of South Carolina developed an index to evaluate and rank the ability to respond to, cope with, recover from, and adapt to disasters. The index synthesizes 30 socioeconomic variables which research literature suggests contribute to reduction in a community's ability to prepare for, respond to, and recover from hazards. SoVI ® data sources include primarily those from the United States Census Bureau. Buchanan County has a SoVI score of -0.655624 and in a national percentile of 39.29%, placing the county in the medium range for resiliency.

Figure 2.4 shows how Buchanan County compares to the region in social vulnerability to environmental hazards. A higher percentage indicates a higher vulnerability. Scores in the top 20% of the United States are more vulnerable counties (red) and scores in the bottom 20% of the United States indicate the least vulnerable counties (blue). Buchanan County scores in the medium range, the same range as most of Missouri's counties. (Source: http://webra.cas.sc.edu/hvri/products/sovi.aspx)

Figure 2.4 Social Vulnerability to Environmental Hazards

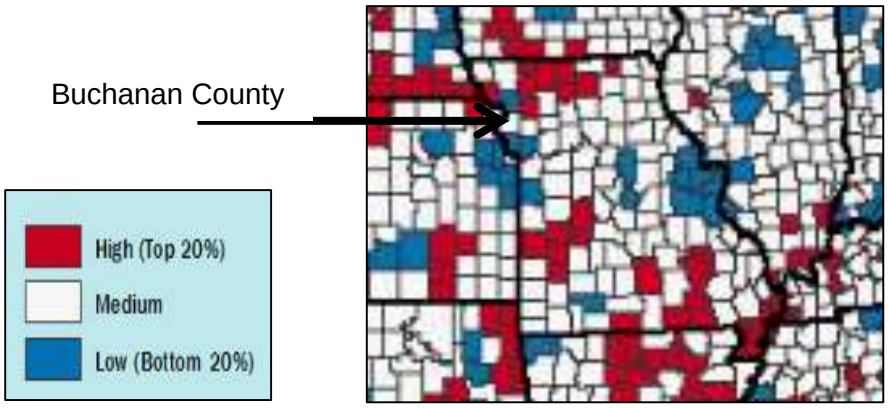


Table 2.5 displays information additional demographics regarding Buchanan County.

Table 2.5 Unemployment, Poverty, Education, and Language Percentage Demographics, Buchanan 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 (primary language other than English)
Buchanan County	45,441	7.5%	13.9%	87.3%	19.7%	6%
Agency	488	12.7%	8.5%	87.3%	9%	6%
DeKalb	108	8.3%	1.8%	86.8%	9.9%	0%
Easton	154	11.7%	4.5%	80%	15.7%	4.6%
Lewis & Clark	52	1.9%	0%	85.3%	6%	0%
St. Joseph	38,574	7.7%	19.9%	86.4%	19.2%	6.6%
Missouri	3,034,524	7.5%	15.6%	88.4%	27.1%	6%
United States	158,897,824	8.3%	15.5%	86.7%	29.8%	21%

(Source: U.S. Census, 2015 American Community Survey, 5-year Estimates)

2.1.5 History

The Native American residents included the tribes of the Kanza, Iowa, Sac, Fox, Delaware, Kickapoo, and a few Pottawatomie.

The early white settlers to the region were fur traders who trapped along the Missouri River in the late 1700s. The river provided not only an abundant home for fur-bearing animals, but also a relatively accessible and dependable means of transportation. Explorers Lewis and Clark, leading the Corps of Discovery, passed through the area in the summer of 1804 as they explored the newly obtained Louisiana Purchase territory. On July 4, 1804, President Jefferson's Corps of Discovery celebrated the birth of the nation in what is today Lewis and Clark Village, located on the east bank of the Missouri River.

The area west of what was then the state border of Missouri and east of the Missouri River was granted to the Native American tribes in residence by the Prairie-du-Chien treaty with the French government, the landholders before the advent of the Louisiana Purchase. By June 1836, the treaty was amended to extinguish Indian claims to land in northwest Missouri.

The federal government paid the resident tribes of Native Americans $7,500 for the six counties of the Platte Purchase, as it is now known. In 1837, President Van Buren declared the Platte Region an extension of the state of Missouri and open for settlement.

Settlers from Virginia and Kentucky moved into the area as the frontier grew westward. Businesses sprang up in St. Joseph supplying the pioneers that traveled westward and serving the growing communities down the Missouri River. The City of St. Joseph began to take shape.

2.1.6 Occupations

Table 2.6 displays occupation statistics for Buchanan County.

Table 2.6 Occupation Statistics, Buchanan 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
Buchanan County	26.7%	20.9%	24.3%	8.2%	19.9%
Agency	19.0%	17.6%	22.1%	15.5%	25.8%
DeKalb	23.2%	18.2%	16.2%	18.2%	24.2%
Easton	20.6%	23.5%	25.0%	7.4%	23.5%
Lewis & Clark	9.8%	19.6%	3.9%	3.9%	62.7%
City of St. Joseph	27.7%	20.0%	24.7%	8.3%	19.3%

(Source: U.S. Census, 2015 American Community Survey, 5-year Estimates).

2.1.7 Agriculture

According to the USDA 2012 Census on Agriculture, Buchanan County has 727 farms with a total acreage of 188,688 acres. The neighboring counties of Andrew, Clinton and DeKalb have 826, 758 and 893 farms, respectively. The average size per farm is 260 acres, which is slightly lower than the state average of 285 acres. The neighboring counties of Andrew, Clinton and DeKalb have average size farms of 240, 253 and 281 acres, respectively. The market value of agricultural products sold is $67,532, with $60,492 coming from crops, nursery and green house products and $7,040 from livestock, poultry and their products. Beef cattle production was a significant farming activity with 6,804 head of cattle on 234 farms and 7,703 head of cows and calves sold on 230 farms. Other significant farming activity included the production of 4,996,290 bushels of corn from 269 farms, 1,933,789 bushels of soybeans from 297 farms and 18,738 tons of forage from 315 farms. In addition, 56% of principal operators reported their primary occupation being something other than farming. The 2011-2015 Community Survey 5-Year Estimates show that 153 were employed in agriculture, fishing and forestry operations, which is 0.36% of the Buchanan County work force.

2.1.8 FEMA Hazard Mitigation Assistance Grants in Planning Area

Buchanan County has received three Hazard Mitigation Assistance (HMA) grants since 1993. These are listed in Table 2.7.

Table 2.7 FEMA HMA Grants in Buchanan County from 1993-2014

Project Type	Sub applicant	Award Date	Project Total
200.1: Acquisition of Private Real Property (Structures and Land) - Riverine	Buchanan	July 9,1993	$964,929
200.1: Acquisition of Private Real Property (Structures and Land) - Riverine	Agency	April 5, 2006	$22,679
206.2: Safe Room (Tornado and Severe Wind Shelter) - Public Structures	Mid-Buchanan School District	August 12, 2011	$1,625,744
Total	N/A	N/A	$2,613,352

(Source: Missouri State Emergency Management Agency)

2.2 Jurisdictional Profiles and Mitigation Capabilities

Buchanan County's Emergency Management Department has one full-time staff, the Emergency Management Director (EMD), who is responsible for:

- Planning, organizing and directly the county's emergency management plan with other government and business officials
- Speaking before various groups to promote interest and cooperation in emergency situations
- Advising and assisting businesses in industrial emergency management programs
- Meeting with state and federal officials to coordinate county program
- Preparing necessary documentation to affected agencies
- Planning and coordinating county's disaster drills

The EMD organizes the Local Emergency Planning Committee (LEPC) monthly meetings and works closely with the local chapter of the American Red Cross. The LEPC meetings have a cross-section of agencies, organizations and businesses in regular attendance. Buchanan County has 22 outdoor warning sirens.

2.2.1 Unincorporated Buchanan County

This section will include individual profiles for each participating jurisdiction in Buchanan County. A summary table indicating specific information for each jurisdiction is provided.

Buchanan County

Buchanan County's jurisdiction includes all unincorporated areas within the county boundaries. The governing body of Buchanan County is the County Commission, which consists of a presiding Commissioner, a western Commissioner and an eastern Commissioner. The departments include:

- Board of Commissioners
    - Harry Roberts (Presiding Commissioner)
    - Ron Hook (Eastern District Commissioner)
    - Scott Burnham (Western District Commissioner)
- County Auditor
    - Tara Horn
- County Clerk
    - Mary Baack- Garvey
- County Prosecuting Attorney
    - Dwight K Scroggins, Jr.
- County Recorder
    - Ed Wildberger (Recorder of Deeds)
- County Sheriff
    - Mike Strong
- County Treasurer
    - John D. Nash
- Emergency Management
    - Bill Brinton (Emergency Management Coordinator)
- GIS Coordinator
    - Bryce Good
- Human Resources
    - Brenda Moran (Director)
- Public Administrator
    - Bill McMurray
- Purchasing
    - Kim Hartman (Purchasing Agent)
- County Zoning Administrator
    - Denise Embrey (Director of Planning and Zoning)

Table 2.8 Buchanan County Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	Yes, 2003
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	Yes
County Emergency Plan	Yes
Local Recovery Plan	No
County Recovery Plan	No

Local Mitigation Plan	Yes
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	Yes
County Mitigation Plan (PDM)	Yes
Economic Development Plan	No
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)	Yes
Policies/Ordinance	
Zoning Ordinance	Yes
Building Code	No
Floodplain Ordinance	Yes
Subdivision Ordinance	Yes
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	No
Landscape Ordinance	No
Debris Management Plan	No
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	Yes
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Yes

Capabilities	Status Including Date of Document or Policy
Economic Development Program	No
Land Use Program	Yes
Public Education/Awareness	Yes
Property Acquisition	1
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	
Hazard Analysis/Risk Assessment (County)	
Flood Insurance Maps	Yes
FEMA Flood Insurance Study (Detailed)	Yes
Evacuation Route Map	Yes
Critical Facilities Inventory	Yes
Vulnerable Population Inventory	No Red Cross Has One
Land Use Map	Yes
Staff/Department	
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	Yes
Engineer	No
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	Yes
County Emergency Management Commission	Yes
Sanitation Department	No
Transportation Department	Yes
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Yes
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	Yes
Salvation Army	Yes
Veterans Groups	Yes
Environmental Organization	No
Homeowner Associations	Yes
Neighborhood Associations	Yes
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	
Ability to apply for Community Development Block Grants	No
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	Yes
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	
Ability to withhold spending in hazard prone areas	

(Source: Data Collection Questionnaire, 2016)

2.2.2 Agency

Agency is located in eastern Buchanan County on Missouri Route FF along the Platte River. The population has remained stable, with a .23% growth since 2000. There are three outdoor warning sires that provide full coverage within the city limits. The community has one part-time staff (city clerk) and relies on the county for emergency management, public safety and public education programs. Portions of the community are susceptible to flooding. Of particular concern is the limited access caused by flooding on Route FF. The community has been involved in several flood mitigation efforts, including participation in NFIP, buyouts for repetitive loss properties and elevating structures. Critical structures include the Agency Community Center (local government meetings are held at the center), South Central Buchanan Co. Fire Station and post office. It is in the Mid-Buchanan School District and the community does not have Reverse 911 or a public saferoom.

Total Population	672
Leadership Structure	Board of Trustees/Chairman
Median Household Income	$71,094
Total Household Units	285
Water Service	Buchanan County Water District
Sewer Service	Rural Buchanan County
Electric Service	KCP&L
Fire Service	South Central Buchanan County

Table 2.9 Agency Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	27 December 2012
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	No, Buchanan County
Local Recovery Plan	No
County Recovery Plan	N/A
Local Mitigation Plan	No
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	N/A
Economic Development Plan	In comprehensive plan
Transportation Plan	In comprehensive plan
Land-use Plan	Yes, in comprehensive plan

Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	N/A
School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Yes
Building Code	No
Floodplain Ordinance	Yes, included in zoning ordinance
Subdivision Ordinance	Yes, included in zoning ordinance
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes, ordinance #1
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Debris Management Plan	N/A
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	In comprehensive plan
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	N/A
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)	N/A
Flood Insurance Maps	Yes
FEMA Flood Insurance Study (Detailed)	Yes
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	N/A, Use Buchanan County GIS
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Coordinator	No
NFIP Floodplain Administrator	Yes, Bryan Gabriel
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No

Local Emergency Planning Committee	No
County Emergency Management Commission	N/A
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Yes
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 Grants	Assume so but don't know
Ability to fund projects through Capital Improvements funding	Assume so but don't know
Authority to levy taxes for a specific purpose	Assume so but don't know
Fees for water, sewer, gas, or electric services	No, Assume so but don't know
Impact fees for new development	Assume so but don't know
Ability to incur debt through general obligation bonds	Assume so but don't know
Ability to incur debt through special tax bonds	Assume so but don't know
Ability to incur debt through private activities	Assume so but don't know
Ability to withhold spending in hazard prone areas	Assume so but don't know

(Source: Data Collection Questionnaire, 2016)

2.2.3 DeKalb

DeKalb is located in southern Buchanan County on Missouri Route JJ. The community has experienced a population decrease of -14.40% since 2000. It has one centrally located outdoor warning siren that is linked to St. Joseph's warning system. DeKalb has one part-time staff (city clerk) and relies on the county for emergency management, public safety and public education programs. Critical structures include the fire station/community center at 106 Locust Street and Buchanan County R-IV High School. However, these facilities do not have saferooms. There is no Reverse 911. DeKalb is in the Buchanan County R-IV School District and the school is located just outside of city limits.

Total Population	220
Leadership Structure	Mayor/Board
Median Household Income	$58,542
Total Household Units	75
Water Service	Buchanan County Water District
Sewer Service	Rural Buchanan County
Electric Service	KCP&L
Fire Service	DeKalb Fire Protection

Table 2.10 DeKalb Mitigation Capabilities

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	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Yes
Economic Development Plan	No
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	Yes
Critical Facilities Plan (Mitigation/Response/Recovery)	No
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
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 Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	
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 (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No

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	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	Yes
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 Grants	No
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
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	Yes
Ability to withhold spending in hazard prone areas	No

(Source: Data Collection Questionnaire, 2016)

2.2.4 Easton

Easton is located in northeastern Buchanan County on Missouri Highway 31, off U.S. Highway 36. The city is in the East Buchanan Middle School District. The rest of the school district's facilities are located outside of Buchanan County. Besides the middle school, other critical infrastructure includes the U.S. Post Office, St. Joseph's Catholic Church and fellowship hall, Easton Presbyterian Church, Easton Park Shelter and concession stand. Easton has three part-time staff members, city clerk, police officer and building inspector/official. The community relies on the county for emergency management, public safety and public education programs. Easton has one warning siren, which is linked to St.

Joseph's warning system. The community does not have a public saferoom or Reverse 911. Easton has experienced approximately -8% population decrease since 2000.

Total Population	238
Leadership Structure	Mayor/Council
Median Household Income	$51,500
Total Household Units	86
Water Service	Buchanan County Water District
Sewer Service	Rural Buchanan County
Electric Service	KCP&L
Fire Service	Easton Fire Protection

Table 2.11 Easton Mitigation Capabilities

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	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	No
Economic Development Plan	No
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	**Status Including Date of Document or Policy**
Zoning Ordinance	Yes
Building Code	Yes
Floodplain Ordinance	No
Subdivision Ordinance	Yes
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	
Historic Preservation Ordinance	No
Landscape Ordinance	No
Debris Management Plan	No
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	
National Flood Insurance Program (NFIP) Participant	No
NFIP Community Rating System (CRS) Participating Community	No
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	Yes
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
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	Yes, Part Time
Building Inspector	Yes, Part Time
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	Yes, Part Time
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	Yes
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 Grants	Yes
Ability to fund projects through Capital Improvements funding	N/A
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	N/A
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	N/A
Ability to withhold spending in hazard prone areas	N/A

(Source: Data Collection Questionnaire, 2016)

2.2.5 Lewis & Clark Village

Lewis and Clark Village is located in southwest Buchanan County, near Sugar Lake, an oxbow lake of the Missouri River. Its location near the Missouri River makes the village susceptible to flooding. The community is adjacent to the Lewis and Clark State Park, which draws a number of visitors and campers. Critical structures are Village Hall and Southwest Buchanan Co. Fire Station. The village is in the Buchanan Co. R-IV School District. There is a volunteer city clerk and the community relies on the county for most of its emergency management and public safety needs. There is one warning siren that is linked to Atchison, Kansas. Lewis and Clark Village has experienced a -14.84% population decrease since 2000.

Total Population	132
Leadership Structure	Village Council/Mayor
Median Household Income	$26,806
Total Household Units	41
Water Service	Buchanan County Water District
Sewer Service	Rural Buchanan County
Electric Service	KCP&L
Fire Service	Southwest Buchanan County Fire

Table 2.12 Lewis & Clark Mitigation Capabilities

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	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	Yes
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Yes
Building Code	Yes
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
Debris Management Plan	No
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	
ISO Fire Rating	
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	Yes
FEMA Flood Insurance Study (Detailed)	Yes
Evacuation Route Map	Yes
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	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	Yes
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 Grants	No
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
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	
Ability to withhold spending in hazard prone areas	

(Source: Data Collection Questionnaire, 2016)

2.2.6 St. Joseph

St. Joseph is the county seat and is located in northwest Buchanan County on Interstate 29 and U.S. Highway 36 along the Missouri River. City government consists of a mayor, city council and a city manager who conducts the day-to-day operations. There are 740 city employees, including an emergency manager, police chief and fire chief. There has been a 3.55% population increase since the 2000 Census.

The city's health department and regional MoDOT office provide child safety seat training. The Safety Council is also involved in a number of safety programs, including bicycle safety. There are 22 sires located in city limits and there is Reverse 911.

Heartland Hospital and several health care facilities are located in St. Joseph. Government buildings in the city include the Buchanan County Courthouse, St. Joseph City Hall, Law Enforcement Center, Missouri State Highway Patrol Troop H Headquarters, Missouri Department of Transportation Regional Office, Missouri Department of Conservation Regional Office, Missouri State Office Building and U.S. Federal Building which includes the U.S. Post Office. The city also has the Western Reception, Diagnostic and Correctional Center and Northwest Missouri Psychiatric Rehabilitation Center. St. Joseph is in the St. Joseph School District.

An estimated 11,197 homes were built prior to 1939 and there are approximately 1,575 mobile homes. According to the 2011-2015 American Community Survey, 2,572 people don't speak English very well.

Total Population	76,596
Leadership Structure	City Manager/Council /Mayor
Median Household Income	$42,040
Total Household Units	33,286
Water Service	Missouri American Water Co.
Sewer Service	City of St. Joseph
Electric Service	KCP&L
Fire Service	City of St. Joseph

Table 2.13 St. Joseph Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	1999
Builder's Plan	No
Capital Improvement Plan	2014-2019
Local Emergency Plan	12/2015
County Emergency Plan	12/2015
Local Recovery Plan	
County Recovery Plan	2012
Local Mitigation Plan	
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	
County Mitigation Plan (PDM)	Yes
Economic Development Plan	Yes
Transportation Plan	SJATSO 2040 MTP
Land-use Plan	2004-2024
Flood Mitigation Assistance (FMA) Plan	
Watershed Plan	Yes
Firewise or other fire mitigation plan	
School Mitigation Plan	Yes
Critical Facilities Plan (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	Yes
Nuisance Ordinance	Yes
Storm Water Ordinance	Yes
Drainage Ordinance	Yes
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	Yes
Landscape Ordinance	Yes
Debris Management Plan	Yes
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	Yes
National Weather Service (NWS) Storm Ready	Yes
Building Code Effectiveness Grading (BCEGs)	
ISO Fire Rating	
Economic Development Program	Yes
Land Use Program	No
Public Education/Awareness	Yes - numerous
Property Acquisition	Yes
Planning/Zoning Boards	Yes
Stream Maintenance Program	Yes
Tree Trimming Program	Yes
Engineering Studies for Streams (Local/County/Regional)	Yes
Mutual Aid Agreements	Yes
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	
Hazard Analysis/Risk Assessment (County)	

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

(Source: Data Collection Questionnaire, 2016)

Table 2.14 is a summary of the mitigation capabilities of the jurisdictions in Buchanan County.

Table 2.14 Mitigation Capabilities Summary Table

CAPABILITIES	Buchanan County	Agency	DeKalb	Easton	Lewis & Clark	St. Joseph
Planning Capabilities						
Comprehensive Plan	Yes	Yes	No	No	No	Yes
Builder's Plan	No	No	No	No	No	No
Capital Improvement Plan	No	No	No	No	No	Yes
Local Emergency Plan	Yes	No	No	No	No	Yes
County Emergency Plan	Yes	Yes	Yes	Yes	Yes	Yes
Local Recovery Plan		No	No	No	No	No
County Recovery Plan	Yes	Yes	Yes	Yes	Yes	Yes
Local Mitigation Plan	Yes	No	No	No	No	No
County Mitigation Plan	Yes	Yes	Yes	Yes	Yes	Yes
Local Mitigation Plan (PDM)		No	No	No	No	No
County Mitigation Plan (PDM)	Yes	Yes	Yes	Yes	Yes	2012
Debris Management Plan	No	No	No	No	No	Yes
Economic Development Plan	Yes	Yes	No	No	No	Yes
Transportation Plan	No	Yes	No	No	No	Yes
Land-use Plan	No	Yes	No	No	No	Yes
Flood Mitigation Assistance (FMA) Plan			No	No		Yes
Watershed Plan	No	No	No	No	No	Yes
Firewise or other fire mitigation plan	No	No	No	No		Yes
School Mitigation Plan	No	No	Yes	No	No	Yes

CAPABILITIES	Buchanan County	Agency	DeKalb	Easton	Lewis & Clark	St. Joseph
Critical Facilities Plan (Mitigation/Response/Recovery)	Yes	No	No	No	No	Yes
Policies/Ordinance						
Zoning Ordinance	Yes	Yes	No	Yes	No	Yes
Building Code	No	Yes	No	Yes	No	Yes
Floodplain Ordinance	Yes	Yes	No	No	Yes	Yes
Subdivision Ordinance	Yes	Yes	No	Yes	No	Yes
Tree Trimming Ordinance	No	No	No	No	No	Yes
Nuisance Ordinance	Yes	Yes	No	Yes	No	Yes
Storm Water Ordinance	No	No	No	No	No	Yes
Drainage Ordinance	No	No	No	No	No	Yes
Site Plan Review Requirements	Yes	No	No		No	Yes
Historic Preservation Ordinance	No	No	No	No	No	Yes

CAPABILITIES	Buchanan County	Agency	DeKalb	Easton	Lewis & Clark	St. Joseph
Landscape Ordinance	No	No	No	No	No	Yes
Program						
Zoning/Land Use Restrictions	Yes	Yes	No	Yes	No	Yes
Codes Building Site/Design	No	Yes	No		No	Yes
NFIP Participant	Yes	Yes	No	No	Yes	Yes
NFIP Community Rating System (CRS) Participating Community	No	No	No	No	No	No
Hazard Awareness Program	Yes	No	No	No	No	Yes
National Weather Service (NWS) Storm Ready	No	No	No	No	No	Yes
Building Code Effectiveness Grading (BCEGs)	No	No	No	No	No	No
ISO Fire Rating						
Economic Development Program	No	No	No	No	No	Yes
Land Use Program	Yes	No	No	No	No	Yes
Public Education/Awareness	Yes	No	No	No	No	Yes
Property Acquisition	Yes	Yes				Yes
Planning/Zoning Boards	Yes	Yes	No	Yes	No	Yes
Stream Maintenance Program	No	No	No	No	No	Yes
Tree Trimming Program	No	No	No	No	No	Yes
Engineering Studies for Streams (Local/County/Regional)	No	N/A	No	No	No	Yes

CAPABILITIES	Buchanan County	Agency	DeKalb	Easton	Lewis & Clark	St. Joseph
Mutual Aid Agreements	Yes	Yes	Yes	Yes	Yes	Yes
Studies/Reports/Maps						
Hazard Analysis/Risk Assessment (Local)		No	No	No		
Hazard Analysis/Risk Assessment (County)		No	No	No		
Flood Insurance Maps	Yes	Yes	No	No	Yes	Yes
FEMA Flood Insurance Study (Detailed)	Yes	Yes	No	No	Yes	Yes
Evacuation Route Map	Yes	No	No	No	No	Yes
Critical Facilities Inventory	Yes	No	No	No	No	
Vulnerable Population Inventory	No	No	No	No	No	Yes
Land Use Map	Yes	Yes	No	No	No	Yes
Staff/Department						
Building Code Official	Yes	No	No	Yes	No	Yes
Building Inspector	No	No	No	Yes	No	Yes
Mapping Specialist (GIS)	Yes	No	No	No	No	Yes
Engineer	No	No	No	No	No	Yes
Development Planner	No	No	No	No	No	Yes

CAPABILITIES	Buchanan County	Agency	DeKalb	Easton	Lewis & Clark	St. Joseph
Public Works Official	Yes	No	No	Yes		Yes
Emergency Management Coordinator	Yes	No	No	No	No	Yes
NFIP Floodplain Administrator	Yes	Yes	No	No	No	No
Bomb and/or Arson Squad	No	No	No	No	No	No
Emergency Response Team	No	No	No	No	No	No
Hazardous Materials Expert	No	No	No	No	No	Yes
Local Emergency Planning Committee	Yes	No	No	No	No	Yes
County Emergency Management Commission	Yes	N/A	No	No	No	No
Sanitation Department	No	No	No	No	No	No
Transportation Department	Yes	No	No	No	No	Yes
Economic Development Department	No	No	No	No	No	Yes
Housing Department	No	No	No	No	No	Yes
Planning Consultant	No	No	No	No	No	Yes
Regional Planning Agencies	Yes	No	No	No	No	
Historic Preservation	No	No	No	No	No	Yes
Non-Governmental Organizations (NGOs)						
American Red Cross	No	No	No	No	No	Yes
Salvation Army	No	No	No	No	No	Yes

CAPABILITIES	Buchanan County	Agency	DeKalb	Easton	Lewis & Clark	St. Joseph
Veterans Groups	No	No	No	No	No	Yes
Environmental Organization	No	No	No	No	No	Yes
Homeowner Associations	No	No	No	No	No	Yes
Neighborhood Associations	No	No	No	No	No	Yes
Chamber of Commerce	No	No	No	No	No	Yes
Community Organizations (Lions, Kiwanis, etc.)	No	No	No	No	No	Yes
Financial Resources						
Apply for Community Development Block Grants	No	Assume So But Don't Know	No	Yes	No	Entitled
Fund projects through Capital Improvements funding		Assume So But Don't Know	Yes	N/A	No	Yes
Authority to levy taxes for specific purposes	Yes	Assume So But Don't Know	Yes	Yes	No	Yes
Fees for water, sewer, gas, or electric services	No	Assume So But Don't Know	No	Yes	No	Yes
Impact fees for new development		No	No	N/A	No	Yes
Incur debt through general obligation bonds		Assume So But Don't Know	Yes	Yes		Yes
Incur debt through special tax bonds		Assume So But Don't Know	Yes	Yes		Yes

CAPABILITIES	Buchanan County	Agency	DeKalb	Easton	Lewis & Clark	St. Joseph
Incur debt through private activities		Assume So But Don't Know		N/A		Yes
Withhold spending in hazard prone areas		Assume So But Don't Know		N/A		

(Source: Data Collection Questionnaires, 2016)

2.2.7 Missouri Western State University

Missouri Western State University, located on more than 700 acres in St. Joseph, Mo., serves Missouri and surrounding states. Originally founded as St. Joseph Junior College in 1915, Missouri Western was transformed into a four-year college in 1969 and became a full member of the State of Missouri system in 1977. In 2005, Missouri Western received university designation and changed its name to Missouri Western State University. Missouri Western offers certificates, associate's, bachelor's and master's degrees. Student-centered, high-quality instruction emphasizes experience-based learning and community service. (Source: https://www.missouriwestern.edu/about/) The school enrolls 6,010 undergraduate students and 124 graduate students.

Total Student Population	6,010 undergraduates/124 graduate students
Total Faculty/Staff Population	
Leadership Structure	President/Board of Governors
Water Service	Missouri American Water Co.
Sewer Service	City of St. Joseph
Electric Service	KCP&L
Fire Service	City of St. Joseph

Table 2.15 Missouri Western State University

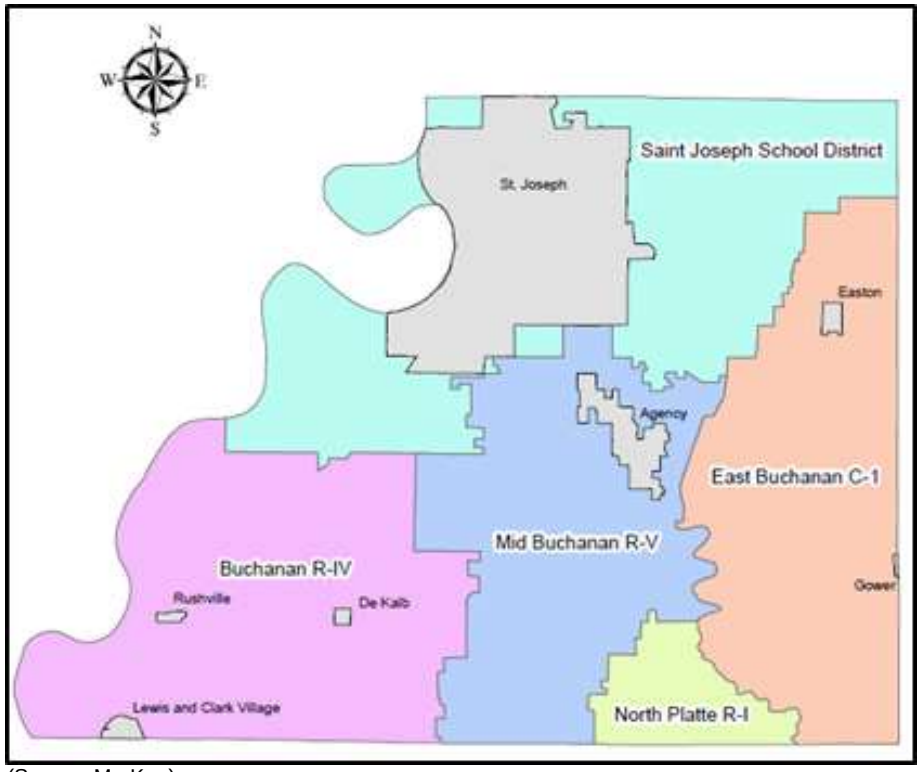
Capability	Missouri Western State University
Planning Elements	
Master Plan/ Date	Yes, 2016
Capital Improvement Plan/Date	Yes, 2015
School Emergency Plan / Date	Yes, 2014
Weapons Policy/Date	Yes, 2012
Personnel Resources	
Emergency Manager	Yes, Risk Management
Grant Writer	No
Public Information Officer	Yes, Public Affairs

Financial Resources	
Capital Improvements Project Funding	Yes, limited
Local Funds	No
General Obligation Bonds	No
Special Tax Bonds	No
Private Activities/Donations	Yes
State And Federal Funds/Grants	Yes
Other	
Fire Evacuation Training	Yes
Tornado Sheltering Exercises	Yes
Public Address/Emergency Alert System	Yes
NOAA Weather Radios	Yes
Lock-Down Security Training	Yes
Mitigation Programs	
Tornado Shelter/Saferoom	No
Campus Police	Yes, 10 officers

2.2.8 Public School District Profiles and Mitigation Capabilities

This section provides general information about participating school districts in Buchanan County. There are four school districts with facilities in Buchanan County and three are participants in the plan. The East Buchanan School District and North Platte have most of their facilities in other counties. Figure 2.16 is a map of school district boundaries in Buchanan County.

Figure 2.16 School Districts in Buchanan County



(Source: Mo-Kan)

Table 2.17 Buchanan County School District Buildings and Enrollment Data, 2015

District Name	Building Name	Building Enrolment
Buchanan County R IV	Secondary School	143
Buchanan County R IV	Mobile Classroom Unit	0
Buchanan County R IV	Rushville Elementary	201

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

Table 2.18 Mid-Buchanan School District Buildings and Enrollment Data, 2015

District Name	Building Name	Building Enrolment
Mid-Buchanan School District	Mid- Buchanan Senior High School	158
Mid-Buchanan School District	Mid- Buchanan Elementary school	352

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

Table 2.19 St. Joseph School District Buildings and Enrollment Data, 2015

District Name	Building Name	Building Enrolment
St. Joseph School District	Benton High School	839
St. Joseph School District	Central High School	1,711
St. Joseph School District	Lafayette High School	849
St. Joseph School District	Bode Middle School	544
St. Joseph School District	Edison Elementary School	373
St. Joseph School District	Bessie Ellison	379
St. Joseph School District	Eugene Field Elementary	352
St. Joseph School District	Coleman Elementary	384
St. Joseph School District	District Maintenance Building	-
St. Joseph School District	TMS	-
St. Joseph School District	Hosea Elementary	419
St. Joseph School District	Humboldt Elementary	316
St. Joseph School District	Hyde Elementary	448
St. Joseph School District	Lake Contrary Elementary	302
St. Joseph School District	Mark Twain Elementary	359
St. Joseph School District	Early Learning Center	-
St. Joseph School District	Noyes Elementary	358 (2014 data)
St. Joseph School District	Parkway Elementary	440
St. Joseph School District	Pershing Elementary	334
St. Joseph School District	Robidoux Middle School	350
St. Joseph School District	Skaith Elementary	399
St. Joseph School District	Spring Garden Middle School	356
St. Joseph School District	Lindbergh Elementary	453
St. Joseph School District	Truman Middle School	468
St. Joseph School District	Webster	-

St. Joseph School District	District Warehouse	-
St. Joseph School District	Keatley Center	-
St. Joseph School District	Administration Building	-
St. Joseph School District	Hillyard Technical Center	-
St. Joseph School District	Enright Center	-
St. Joseph School District	Warehouse	-
St. Joseph School District	Carden Park Elementary	585
St. Joseph School District	Oak Grove Elementary	494

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

Table 2.20 Summary of Mitigation Capabilities of Buchanan, Mid-Buchanan and St. Joseph School Districts

Capability	DeKalb School	Mid-Buchanan	St. Joseph
Planning Elements			
Master Plan/ Date	No	No	No
Capital Improvement Plan/Date	No	No	No
School Emergency Plan / Date	Yes, 2014 Plan being updated during 16-17 SY.	Yes, 2009	Yes, 2115
Weapons Policy/Date	Yes	Yes, 5/19/2014	Yes, 2008
Personnel Resources			
Full-Time Building Official (Principal)	Yes, HS & ES 1 Principal, HS/MS 7-12	Yes, Superintendent	Yes, Principal
Emergency Manager	No	Yes, Superintendent/SRO	Yes, Student Services
Grant Writer	No	Yes, Varies	
Public Information Officer	No	Yes, Superintendent	Yes, Joey Austin
Financial Resources			
Capital Improvements Project Funding	No	Yes	Yes
Local Funds	Yes	Yes	Yes
General Obligation Bonds	No	Yes	Yes
Special Tax Bonds	No	No	Yes
Private Activities/Donations	No	Yes	Yes
State And Federal Funds/Grants	No	Yes	Yes
Other			
Public Education Programs	No	No	Yes

Capability	DeKalb	Mid-Buchanan	St. Joseph
Fire Evacuation Training	Yes	Yes	Yes
Tornado Sheltering Exercises	Yes	Yes	Yes
Public Address/Emergency Alert System	Yes	Yes	Yes
NOAA Weather Radios	Yes	Yes	Yes
Lock-Down Security Training	Yes	Yes	Yes
Mitigation Programs	Yes	Yes	Yes
Tornado Shelter/Saferoom	No	Yes	Some locations
Campus Police	No	Yes, SRO	Yes, SRO

(Source: Data Collection Questionnaires, 2016)

3 RISK ASSESSMENT

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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 better understand their potential risk to the identified hazards. The risk assessment will provide a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This plan is an update of the original plan which was adopted in 2005 and reviewed and updated in 2012. Some changes have occurred since the 2012 update that may impacted risk in Buchanan County. Industrial development along the Missouri River in the St. Joseph area has continued, and will be addressed later in the chapter.

Also, Census data shows that the number of privately owned residential building permits issued in the county between 2011 and 2015 have ranged between 91 and 96 annually. Most of the building permits are for single family homes. However, in 2015, 96 building permits were issued to construct 197 units. Over 100 of these units were for multi-family apartments in St. Joseph.

This chapter is divided into four main parts:

- **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 impacting the planning area. For each hazard, there are three sections: 1) Hazard Profile 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) Vulnerability Assessment further defines and quantifies populations, buildings, critical facilities, and other community/school or special district assets at risk to natural hazards; and 3) Problem Statement 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.

The plan profiles all natural hazards that can affect Buchanan County. The natural hazards that can affect the county have been identified in the 2012 Buchanan County Hazard Mitigation Plan and the 2013 Missouri State Plan. Natural hazards are naturally occurring climatological, hydrological or geologic events that have a negative effect on people and the built environment. Technological hazards refers to hazards that stem from technological or industrial conditions that can include hazardous materials events, national security hazards, power failure, telecommunications failure, etc. Only natural hazards are included.

3.1.1 Review of Existing Mitigation Plans

The Mitigation Planning Committee (MPC) reviewed hazards identified in the original plan to determine if any conditions had changed. The Missouri Hazard Mitigation Plan was considered in determining local hazards. Buchanan County was determined not to be at risk for some natural hazards, due to location, climate or soil structure. These hazards which are not included in the hazard mitigation plan are tsunamis, volcanoes, avalanches, hurricanes, coastal storms, coastal erosion, expansive soils and landslides. Hazards which are included in the mitigation plan, in alphabetical order, are: dam failure, drought, earthquakes, flooding, levee failure, heat waves, land subsidence, severe winter weather, thunderstorms which includes wind and hail storms, tornados and fires.

Several MPC members expressed interest in including public health outbreaks and communication failure in the plan. However, these hazards were not included in the plan due to time constraints. The MPC agreed to revisit the possibility during the next update and to collect information which would be helpful for the hazard profiles and risk assessment.

3.1.2 Review Disaster Declaration History

Federal disaster 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 lists the federal FEMA disaster declarations that have occurred in Buchanan County from 1990 to present.

Table 3.1. FEMA Disaster Declarations that included Buchanan County, Missouri, 1990-Present

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
DR-4283	Severe Storms, Tornadoes, Straight- line Wind, and Flooding	August 7, 2015 May 15, 2015 – July 27, 2015	PA
DR-4012	Flooding	August 12, 2011 June 1, 2011 – August 1, 2011	IA, PA
DR-1934	Severe Storms	August 17, 2010 June 12 – July 31, 2010	PA
DR-1773	Severe Storrns and Flooding	June 25, 2008 July 1, 2008 – August 13, 2008	PA
DR-1736	Severe Winter Storms	December 27, 2007 December 13 – 17, 2007	PA
DR-1708	Severe storms and flooding	June 11, 2007	
DR-1463	Severe storms, tornado and flooding	May 6, 2003	
DR-995	Flooding, severe storm	July 9, 1993	

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

3.1.3 Research Additional Sources

Below are sources of data on locations and past impacts of hazards in the planning area:

- Missouri Hazard Mitigation Plans (2010 and 2013)
- Previously approved planning area Hazard Mitigation Plan (date)
- 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 (NCDC);

- 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)

The only centralized source of data for many of the weather-related hazards is the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC). Although it is usually the best and most current source, there are limitations to the data which should be noted. The NCDC documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, property damage, and/or disruption to commerce. In addition, it is a partial record of other noteworthy meteorological events, such as record maximum or minimum temperatures or precipitation that occurs in connection with another event. Some information appearing in the NCDC may be provided by or gathered from sources outside the National Weather Service (NWS), such as the media, law enforcement and/or other government agencies, private companies, individuals, etc. An effort is made to use the best available information but because of time and resource constraints, information from these sources may be unverified by the NWS. Using information from NCDC does not guarantee the accuracy or validity of the information, but it is an important source to base estimate.

The NCDC damage amounts are estimates received from a variety of sources, including those listed above in the Data Sources section. For damage amounts, the NWS makes a best guess using all available data at the time of the publication. Property and crop damage figures should be considered as a broad estimate. Damages reported are in dollar values as they existed at the time of the storm event. They do not represent current dollar values.

The database currently contains data from January 1950 to March 2014, as entered by the NWS. Due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event type. The following timelines show the different time spans for each period of unique data collection and processing procedures:

1. Tornado: From 1950 through 1954, only tornado events were recorded.
2. Tornado, Thunderstorm Wind and Hail: From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the Unformatted Text Files.
3. All Event Types (48 from Directive 10-1605): From 1996 to present, 48 event types are recorded as defined in NWS Directive 10-1605.

Injuries and deaths caused by a storm event are reported on an area-wide basis. With NCDC data, a death or injury listed in connection with that county search may not necessarily occur in that county.

3.1.4 Hazards Identified

The hazards that significantly impact the planning area were chosen for further analysis in alphabetical order. Not all hazards impact every jurisdiction, although most do. The table below provides a summary of the jurisdictions impacted by each hazard. An “x” indicates the jurisdiction is impacted by the hazard, and a "-" indicates the hazard is not applicable to that jurisdiction. For example, St. Joseph and Lewis and Clark Vilage are located near the Missouri River and prone to flooding, but DeKalb experiences minimal flood events. However, DeKalb is located on higher ground and may be more susceptiable to damage from a tornardo or high wind. Earthquakes and sinkholes are uncommon in Buchanan County, but they were included due to recent events. Tremors from an earthquake in Oklahoma were felt in many parts of Buchanan County and a sinkhole occurred from a sewer line break. The sinkhole was caused by a man-made event, but sinkholes can occur after flooding, which is an identified hazard.

Table 3.2 Hazards Identified for Each Jurisdiction

	Dam Failure	Drought	Earthquake	Extreme Heat	Fires (Structural/Urban/Wild)	Flooding (River and Flash)	Land Subsidence/Sinkholes	Levee Failure	Severe Winter Weather	Thunderstorm/Lightning/Hail/High Wind	Tornado
Buchanan County	x	x	x	x	x	x	x	x	x	x	x
Agency	x	x	x	x	x	x	x	-	x	x	x
DeKalb	-	x	x	x	x	x	x	-	x	x	x
Easton	-	x	x	x	x	x	x	-	x	x	x
Lewis & ClarkVillage	-	x	x	x	x	x	x	x	x	x	x
St. Joseph	-	x	x	x	x	x	x	x	x	x	x
Buchanan County School District	-	-	x	x	x	x	x	-	x	x	x
Mid-Buchanan School District	-	-	x	x	x	x	x	x	x	x	x
St. Joseph School District	-	-	x	x	x	x	x	x	x	x	x
Missouri Western State University		x	x	x	x	x	x	x	x	x	x

3.1.5 Multi-Jurisdictional Risk Assessment

The risk assessment evalutes each participating jurisdiction's vulnerability to each hazard that can affect the planning area. Many of the hazards identified in the risk assessment have the same probability of occurrence throughout the planning area. The hazards that vary across the planning area in terms of risk include dam failure, flash flood, structural or wildland fire, riverine flood and flash flood. These differences are detailed in each hazard profile under geographic location and vulnerability.

Buchanan County is fairly uniform in terms of climate, topography, and building construction characteristics. St. Joseph is the only urbanized area within the planning area which has more assets at a greater density. Therefore, it has greater vulnerability to weather-related hazards. Conversely, rural areas have agricultural assets (crops/livestock) that are vulnerable to hail damages. These differences will be discussed in greater detail in the vulnerability sections of each hazard.

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. The inventory of assets for each jurisdiction were derived from parcel data from the Buchanan County Assessor, the Buchanan County structures dataset downloaded from Missouri Spatial Data Information Service (MSDIS), local jurisdiction data collection questionnaires, and HAZUS MH 3.2.

3.2.1 Total Exposure of Population and Structures

Unincorporated County and Incorporated Cities

In the following three tables, population data is based on Census Bureau data. Building counts and building exposure values are based on parcel data provided by the State of Missouri Geographic Information Systems (GIS) database which can be found at the following website, http://sema.dps.mo.gov/programs/mitigation_management.php. Contents exposure values were calculated by factoring a multiplier to the building exposure values based on usage type. The multipliers were derived from the HAZUS MH 3.2 and are defined in Table 3.3. Land values have been purposely excluded from consideration because land remains following disasters, and subsequent market devaluations are frequently short term and difficult to quantify. Another reason for excluding land values is that state and federal disaster assistance programs generally do not address loss of land (other than crop insurance). It should be noted that the total valuation of buildings is based on county assessors' data which may not be current. In addition, government-owned properties are usually taxed differently, or not at all, and may not be an accurate representation of true value. Note that public school district assets and special district assets are included in the total exposure tables showing assets by community and county.

- Table 3.3 shows the total population, building count, estimated value of buildings, estimated value of contents and estimated total exposure for parcels in the unincorporated county and each incorporated city. For multi-county communities, the population and building data may include

data on assets located outside the planning area.

- Table 3.4 provides the building value exposures for the county and each city in the planning area broken down by usage type.
- Table 3.5 provides the building count by usage total for the county and each city in the planning area.

Table 3.3 Maximum Population and Building Exposure by Jurisdiction

Jurisdiction	2015 Population	Building Count	Building Exposure	Contents Exposure	Total Exposure ($)
Unincorp.	10,848	2,863	$689,740,000	$344,870,000	$1,034,610,000
Agency	684	556	$134,985,000	$74,963,000	$209,948,000
DeKalb	220	141	$32,790,000	$19,081,000	$51,871,000
Easton	234	134	$31,504,000	$17,350,500	$48,854,500
Lewis & Clark Village	132	113	$21,768,000	$11,397,500	$33,165,500
St. Joseph	76,780	32,290	$9,625,611,000	$6,558,504,000	$16,184,115,000
Totals	89,201	36,312	$10,579,076,000	$7,049,082,000	$17,628,158,000

(Sources: Population, 2015 U.S. Census; Building Count and Building Exposure, Missouri GIS Database: http://sema.dps.mo.gov/ programs/mitigation_management.php)

Table 3.4 Building Values/Exposure by Usage Type

Jurisdiction	Residential	Commercial	Industrial	Agricultural	Religion, Education & Government	Total
Unincorp.	$618,384,000	$28,475,000	$10,200,000	$16,134,000	$16,547,000	$689,740,000
Agency	$115,669,000	$8,818,000	$2,015,000	$2,094,000	$6,389,000	$134,985,000
DeKalb	$24,267,000	$740,000	$0	$1,733,000	$6,050,000	$32,790,000
Easton	$27,154,000	$1,175,000	$256,000	$106,000	$2,813,000	$31,504,000
Lewis & Clark Village	$20,949,000	$220,000	$303,000	$201,000	$95,000	$21,768,000
St. Joseph	$6,554,788,000	$2,055,359,000	$659,754,000	$20,114,000	$335,596,000	$9,625,611,000
Totals	$7,339,738,000	$2,097,549,000	$672,528,000	$40,774,000	$368,487,000	$10,579,076,000

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

Table 3.5 Building Counts by Usage Type

Jurisdiction	Residential Counts	Commercial Counts	Industrial Counts	Agricultural Counts	Religion, Education & Government Counts	Total
Unincorp.	2,650	88	34	76	15	2,863
Agency	497	31	11	6	11	556
DeKalb	127	3	0	6	5	141
Easton	121	5	1	1	6	134
Lewis & Clark Village	108	2	2	1	0	113
St. Joseph	29,301	2,059	469	76	385	32,290
Totals	33,008	2,194	517	168	425	36,312

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

Even though schools and special districts' total assets are included in the tables above, additional discussion is needed, based on the data that is available from the districts' completion of the Data Collection Questionnaire and district maintained websites. The number of enrolled students at the participating public school districts is provided in Table 3.6 below. Additional information includes the number of buildings, building values (building exposure) and contents value (contents exposure). These numbers will represent the total enrollment and building count for the public school districts regardless of the county in which they are located.

Table 3.6 Population and Building Exposure by Jurisdiction-Public School Districts

Public School District	Enrolment	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
Buchanan	338	9	$13,349,397	$3,341,662	$16,691,059
Mid-Buchanan	719	2	$20,936,974	$2,057,635	$22,994,609
St. Joseph	11,746	33	$228,746,768	$27,767,771	$256,514,539

(Source: 2016 Community Data Questionnaires & http://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx)
*Exposure calculated for the building in Buchanan County. The other buildings are in Clinton County.

3.2.2 Critical and Essential Facilities and Infrastructure

This section will include information from the Data Collection Questionnaire and other sources concerning the vulnerability of participating jurisdictions' critical, essential, high potential loss, and transportation/lifeline facilities to identified hazards. Definitions of each of these types of facilities are provided below.

- Critical Facility: Those facilities essential in providing utility or direction either during the response to an emergency or during the recovery operation.
- Essential Facility: Those facilities that if damaged, would have devastating impacts on disaster response and/or recovery.
- High Potential Loss Facilities: Those facilities that would have a high loss or impact on the community.
- Transportation and lifeline facilities: Those facilities and infrastructure critical to transportation, communications and necessary utilities.

Table 3.7 includes a summary of the inventory of critical and essential facilities and infrastructure in the planning area. The list was compiled from the Data Collection Questionnaire as well as the following sources:

- Files from the Emergency Management Director, including Chemical Facilities (Tier II Facilities) information
- LEPC members
- HAZUS MH 3.2
- Meetings with city councils, boards and agencies

Table 3.7 Inventory of Critical/Essential Facilities and Infrastructure by Jurisdiction

Jurisdiction	Airport Facility	Bus Facility	Childcare Facility	Communications Tower	Electric Power Facility	Emergency Operations	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	Stormwater Pump Stations	Tier II Chemical Facility	Wastewater Facility	Total
Unincorp.	0	0	3	2	1	0	3	2	0	0	**	0	0	0	0	1	1	0	0	0	0	9	0	22
Agency	0	0	0	0	0	0	1	0	0	0	**	0	0	0	0	0	0	0	0	0	0	0	0	1
DeKalb	0	0	0	1	0	0	1	0	0	0	**	0	0	0	0	0	0	0	0	1	0	0	0	2
Easton	0	0	0	0	0	0	1	1	0	0	**	0	0	0	0	0	0	0	0	1	0	1	0	4
Lewis & Clark	0	0	0	0	0	0	1*	0	0	0	**	0	0	0	0	0	0	0	0	0	0	0	0	1
St. Joseph	1	2	51	1	0	1	9	18	0	4	**	1	2	0	16	1	1	1	0	33	1	162	0	304
Totals	1	2	54	4	1	1	16	21	0	4	**	1	2	0	16	2	1	1	0	35	1	172	0	328

*Fire station serves both Rushville and Lewis & Clark Village

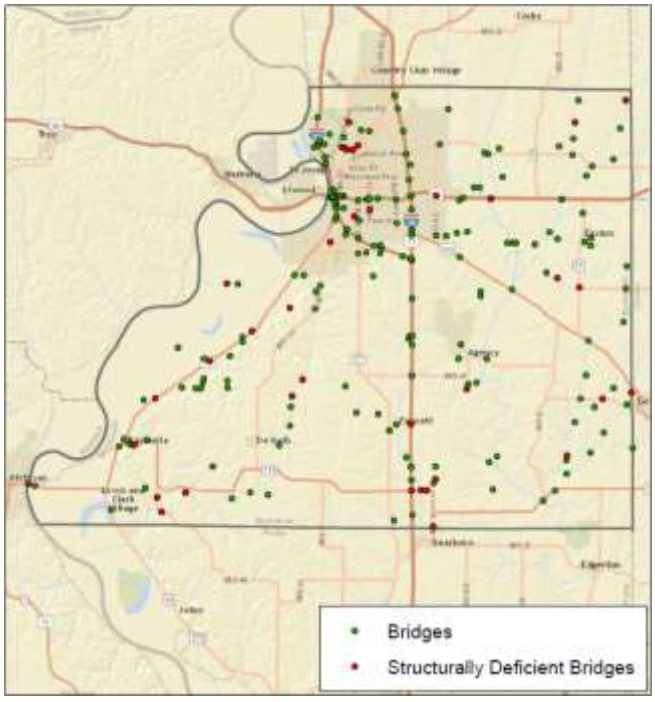
** See Figure 3.8 on following page

(Source: Data Collection Questionnaires; HAZUS MH 3.2, MO Department of Health and Senior Services)

Figure 3.8 shows the locations of bridges in Buchanan County that are included in the National Bridge Inventory data set. There are 247 bridges in the county and 31 of these are structurally deficient and 30 are functionally obselete. Structurally deficient bridges are identified in red on the map below.

The term scour critical 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. There are no scour critical bridges identified in Buchanan County.

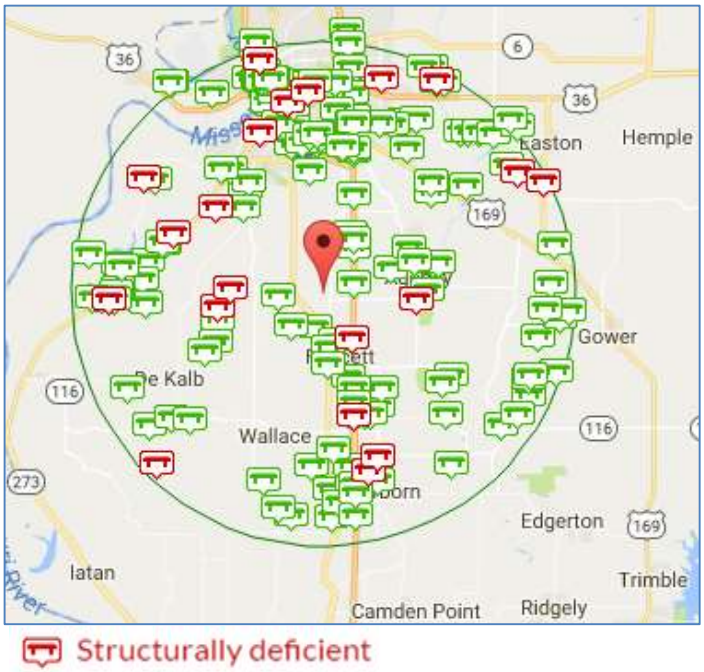
Figure 3.8 Buchanan County Bridges



(Source: http://www.fhwa.dot.gov/bridge/nbi/no10/county.cfm)

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. Figure 3.9 show information obtained from their website. It identifies 20 structurally deficient bridges in red in the county.

Figure 3.9 Structurally Deficient Bridges



(Source: http://t4america.org/maps-tools/bridges/)

3.2.3 Other Assets

Assessing the vulnerability of the planning area to disaster also requires data on the natural, historic, cultural, and economic assets of the area. This information is important for many reasons.

- These types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- Knowing about these resources in advance allows for consideration immediately following a hazard event, which is when the potential for damages is higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- The presence of natural resources can reduce the impacts of future natural hazards, such as wetlands and riparian habitats which help absorb floodwaters.
- Losses to economic assets like these (e.g., major employers or primary economic sectors) could have severe impacts on a community and its ability to recover from disaster.

Specific natural, historic, cultural, and economic assets in the planning area are included below.

Threatened and Endangered Species: Table 3.10 shows Federally Threatened, Endangered, Proposed and Candidate Species in the county.

Table 3.10 Threatened and Endangered Species in Buchanan County

Common Name	Scientific Name	Status
Indiana Bat	*Myotis sodalis*	Endangered
Northern long-eared bat	*Myotis septentrionalis*	Threatened
Least tern	*Sterna antillarum*	Endangered
Piping plover	*Charadrius melodus*	Threatened
Rufa Red knot	*Calidris canutus rufa*	Threatened
Pallid Sturgeon	*Scaphirhynchus albus*	Endangered

(Source: U.S. Fish and Wildlife Service, http://www.fws.gov/midwest/Endangered/lists/missouri-cty.html)

Natural Resources: The Missouri Department of Conservation (MDC) provides a database of lands the MDC owns, leases, or manages for public use. Table 3.11 lists the names and locations of parks and conservation areas (CA) in the planning area.

Table 3.11 Parks in Buchanan County

Area Name	Address	City
Agency Access	Route H, 0.6 miles East	Agency
Agency CA	Rock Creek Road east 0.25 miles	Agency
Bee Creek CA	Interurban Rd. SE, north 0.25 miles	Faucett
Belcher Branch Lake CA	County Road 330 Road south 0.75 mile	St. Joseph
Bluffswood CA	Bethel Road 0.60 mile	St. Joseph
Bluffswood CA-Goodwell Mem Annex	Highway 59, southeast, 0.60 miles after	St. Joseph
Buchanan County (Gasper Landing)	Lake Front Lane north 2 miles	St. Joseph
Burton Bridge Access	Louter Milch Road east 0.25 mile	St. Joseph
Dupree (Arthur) Mem CA	DuPree Road east 0.75 mile	St. Joseph
Jentell Brees Access	Contrary Creek Road west 1 mile	St. Joseph
Kendzora (Anthony and Beatrice) CA	North Platte Avenue/Union Mill Road north 1.50 miles	Anthony and Beatrice
Kneib (Wilfred V and Anna C) Mem	County Road SW 43rd north 0.50 mile	St. Joseph
Logan (Caroline Sheridan) Mem CA	Huntoon Road north 2 miles	St. Joseph
Mo Western State University (MWSU) Everyday Pond	James McCarthy Drive	St. Joseph
MWSU Skeet Range	Mitchell Ave. west over I-29	St. Joseph
Northwest Regional Office	MWSU Campus	St. Joseph
Pigeon Hill CA	SE 50 Road south	St. Joseph
Saxton Access	Saxton/Easton Road west 0.50 mile.	St. Joseph
St. Joseph (French Bottom Access)	McArthur Drive northwest 0.25 mile	St. Joseph
Sunbridge Hills CA	Huntoon Road north 2 miles	St. Joseph
Youngdahl (Mark) Urban CA	Faraon/Jules and Messanie Streets	St. Joseph

(Source: http://mdc4.mdc.mo.gov/applications/moatlas/AreaList.aspx?txtUserID=guest&txtAreaNm=s)

Park Name	Address	City
Krug Park	3500 St. Joseph Avenue	St. Joseph
Northside Complex/ Krug Pool	2202 Waterworks	St. Joseph
Lura M. Story Sitting Park	2900 Ashland Ave.	St. Joseph
Marion & Goff Ballfield	2500 Marion & Goff	St. Joseph
Corby Cove	22nd to 26th on Parkway	St. Joseph
Maple Leaf Park	Grand Ave. & Richardson	St. Joseph
Mason Adams Memorial Field	11th and Grand	St. Joseph

Urban Outdoor Nature Walk	trails throughout St. Joe	St. Joseph
Heritage Park	2202 Waterworks	St. Joseph
Wyeth Hill	Poulin St.	St. Joseph
Riverfront Park	1st & Francis	St. Joseph
Felix Street Square	7th & Felix	St. Joseph
Civic Center Park & Pony Express Monument	9th-12th St. & Frederick	St. Joseph
College Hill Park	12th & Henery	St. Joseph
Bartlett Center Complex	18th & Charles	St. Joseph
Eugene Field Marker	Lovers Lane	St. Joseph
Fairleigh Terrace Park	2700 Farleigh Terrace	St. Joseph
Noyes Field Recreation Complex	26th & Noyles	St. Joseph
Parkway A (Mary Park)	28th & Parkway	St. Joseph
Bartlett Park	Renick to Duncan, 30th to 32nd	St. Joseph
Hochman Park	4700 Pickett Road	St. Joseph
Bode Sports Complex / Phil Welch Stadium	2500 Southwest Parkway	St. Joseph
South Park / Drake Field	22nd & Commercial	St. Joseph
King Hill Overlook	Southwest Parkway & Mansfield	St. Joseph
Hyde Park	8th & Hyde Park Ave.	St. Joseph
Gateway Park	3rd & Edmond	St. Joseph

(Source: http://www.stjoemo.info/index.aspx?NID=238)

Historic Resources: 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 U.S 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.

St. Joseph is a local certified government that employs a Preservation Planner. There is a Landmark Commission and several historical neighborhood groups and organizations that focus on historic preservation.

Table 3.12 lists properties that are on the National Register of Historic Places.

Table 3.12 Buchanan County Properties on the National Register of Historic Places

Property	Address	City	Date Listed
Buchanan County Courthouse and Jail	411 Jules, Courthouse Sq.	St. Joseph	8/21/72; boundary decrease 8/02/78
Buchanan County Infirmary	3500 N. Village Dr.	St. Joseph	1/29/09
Buddy, Charles A. and Annie, House	424 S. 9th St.	St. Joseph	5/14/04
Burnside-Sandusky Gothic House	720 S 10th St	St. Joseph	1/19/05
Cathedral Hill Historic District	N 9th St, Powell St & North 13th St	St. Joseph	6/15/00
Central/North Commercial Historic District	N 4th,Main,Francis,& Robidoux Sts.	St. Joseph	3/8/91
Central Police Station	701 Messanie	St. Joseph	11/05/09
Century Apartments	627 N. 25th St	St. Joseph	7/05/01
Christian Sachau Saloon	1613-1615 Frederick Ave	St. Joseph	10/25/85
City Hose Company # 9	2217 Frederick Ave	St. Joseph	10/25/85
Corby-Forsee Building	5th & Felix	St. Joseph	3/27/80

Dewey Ave –West Rosine Historic District	Prospect Ave, Auguste St, Dewey	St. Joseph	8/01/02
Eckel, Edmond Jacques, House	515 N 4th St	St. Joseph	1/31/80
Everett School	826 S 14th St	St. Joseph	9/15/05
Fenton, Enoch Madison,House	SE of Rushville	Rushville	4/12/82
Geiger, Dr. Jacob, House	2501 Frederick	St. Joseph	3/12/86
German-American Bank Building	624 Felix St.	St. Joseph	11/24/78
Hall Street Historic District	Isadore,Corby,6th & 9th Sts.	St. Joseph	7/17/79
Harris Addition Historic District	16th St., Dalton St.,22nd & Edmond St	St. Joseph	1/13/03
Herbert, Alois, Double House	620 S. 10th St.	St. Joseph	5/29/07
James, Jesse House	12th St. & Mitchell Ave.	St. Joseph	9/04/80
Kelley and Browne Flats	1208-1216 Frederick Ave	St. Joseph	8/03/89
Kemper Addition Historic District	Clay, Union, Kemper,& Bon Ton Sts.	St. Joseph	9/20/02
King's Hill Archaeological Site	St Joseph	St. Joseph	4/16/69
Krug Park Place Historic District	St. Joseph Ave, Myrtle St.,&	St. Joseph	8/01/02
Lawler Motor Co. Building	1224 Frederick Ave	St. Joseph	1/08/09
Livestock Exchange Building	601 Illinois Ave	St. Joseph	4/20/04
Logan, John Sublett Jr & Caroline Ashton	1906 N.22nd St.	St. Joseph	5/07/07
"Maple Grove"	2100 N 11th St.	St. Joseph	10/16/74
Market Square Historic District	Edmond, Felix, N 3rd Sts., & Market	St. Joseph	2/17/72
McIntyre-Burri House	808 N. 24th St.,	St. Joseph	12/23/05
Miller, Issac, House	3003 Ashland Ave.	St. Joseph	9/17/80
Miller-Porter-Lacy House	2912 Frederick Blvd	St. Joseph	09/09/82
Missouri Theater & Missouri Theater Bldg	112-128 S 8th & 713-721 Edmond St.	St. Joseph	10/11/79
Missouri Valley Trust Co. Historic Dist.	Felix & 4th Sts.,	St. Joseph	3/04/75
Mount Mora Cemetery	824 Mount Mora Road	St. Joseph	7/19/06
Museum Hill Historic District	9th St.,Francis St, 12th St, Jules, 15th,	St. Joseph	3/08/91
Museum Hill Historic District	321 & 323 N.15th & 1510 Faraon St.	St. Joseph	8/5/09
Neely Elementary School	1909 S. 12th St.	St. Joseph	6/23/14
Nelson-Pettis Farmsteads Historic Dist.	4401 Ajax Rd., 3412 Pettis Rd.	St. Joseph	5/11/95
Patee John, House	12th & Penn Sts.	St. Joseph	10/15/66 NHL
Patee Town Historic District	Penn St., S. 11th St., Lafayette St &	St. Joseph	08/01/02
Pleasant Ridge School	near Highway 371	St. Joseph	5/02/85
Pony Express Stables	914 Penn St.	St. Joseph	4/3/70
Richardson, John D., Dry Goods Co.	300 N. 3rd St	St. Joseph	4/12/82
Robidoux Hill Historic District	Franklin St., Robidoux St. ,Fourth	St. Joseph	8/03/89
Robidoux Row	219-225 E. Poulin St.	St. Joseph	3/07/73
Robidoux School	201 S. 10th St.	St. Joseph	8/11/83
Ryan Block	1137-1141 Frederick Ave.	St. Joseph	1/29/13
St. Joseph City Hall	Frederick @ 11th St.	St. Joseph	10/25/85
St. Joseph Park & Parkway System	Northwest, Northeast, Corby Grove,Southwest and A pkwys and Noyes Blvd. from Krug Park to Hyde Park	St. Joseph	1/20/95
St. Joseph Public Library-Carnegie	316 Massachusetts St	St. Joseph	5/20/99
St. Joseph Public Library	10th & Felix Sts.	St. Joseph	9/20/82
St. Joseph Commerce & Banking Historic	Francis, Edmond,Third & Ninth Sts.,	St. Joseph	7/5/01
South Fourth Street Commercial Historic	S. 3rd , S 5th , Charles & Messanie	St. Joseph	3/8/91
Sugar Lake State Park Open Shelter	Rushville, vicinity of MO 138	Rushville	2/28/85
Thompson-Brown –Sandusky House	207 E Cliff St	St. Joseph	2/10/83
Virginia Flats	516-518 & 520-528 N. 10th St	St. Joseph	5/21/92
Vosteen-Hauck House	913 N. 2nd St.	St. Joseph	9/23/82
Western Tablet& Stationery Co. Building #	1300 S 12th St.	St. Joseph	8/16/07
Wholesale Row	Jules, 3rd, 4th, & Francis Sts.	St. Joseph	9/19/77
Wyeth Flats	San Regis Apts., 1015-1031 Faraon	St. Joseph	10/25/85

(Source: Missouri Department of natural Resources – Missouri National Register Listings by County http://dnr.mo.gov/shpo/mnrlist.htm)

Table 3.13 Major Non-Government Employers in Buchanan County

Employer Name	Main	Product or Service	Employees
Mosaic Life Care	St. Joseph	Healthcare	3,471
Triumph Foods	St. Joseph	Food Processing	2,767
St. Joseph School District	St. Joseph	Education	2,047
Boehringer Ingelhiem Vetmedica, Inc	St. Joseph	Animal Pharmaceuticals	1,191
139th Airlift Wing MO National Guard	St. Joseph	Government	1,494
Missouri Western State University	St. Joseph	Education	820
American Family Insurance	St. Joseph	Insurance	767
City of St. Joseph	St. Joseph	Government	740
Wal-Mart	St. Joseph	Retail	712
Johnson Controls	St. Joseph	Manufactoring	658

(Source: http://choosesaintjoseph.com/site-selection/data/largest-employers/)

Agriculture, Animal Science and Food Processing: Agriculture has traditionally been an important part of the county's economy. The area has also become a major center for food processing companies and animal pharmaceuticals. In St. Joseph there are 5,333 agriculture and animal science related jobs with workers earning an average annual salary of $44,800. St. Joseph is also ranked forth on Forbes list for farming and agribusiness (Source: St. Joseph Chamber of Commerce, 2015). Boehringer Ingleheim Vetmedica, an animal pharmaceuticals company, employees 1,191 at their facilitly in St. Joseph. According to the 2012 Cenus of Agriculture 294 people are employeed as farmers or farm hands in Buchanan County.

3.3 Land Use and Development

3.3.1 Development Since Previous Plan Update

The population in Buchanan County has remained relatively stable, which is fortunate since many smaller counties are experiencing out-migration. **Table 3.14** shows the population growth statistics for all cities in Buchanan County as well as the county as a whole.

Table 3.14 Buchanan County Population Growth, 2000-2015

Jurisdiction	Total Population 2000	Total Population 2015	2000-2015 # Change	2000-2015 % Change
Agency	745	907	153	20.5%
DeKalb	226	202	- 24	-10.6%
Easton	258	254	- 4	-1.5%
Lewis & Clark	97	122	25	25.77%
Rushville	230	258	- 28	-12.2%
St. Joseph	76,729	77,037	308	.43%
Total (including unincorporated areas)	85,162	89,561	399	.44%

(Source: U.S. Bureau of the Census, Decennial Census; Population Statistics are for entire incorporated areas as reported by the Census bureau)

Population growth or decline is generally accompanied by increases or decreases in the number of housing units. Table 3.15 shows the change in numbers of housing units in the planning area from 2000 to 2015.

Table 3.15 Change in Housing Units, 2000-2015

Jurisdiction	Housing Units 2000	Housing Units 2015	2000-2015 # Change	2000-2015 % Change
Agency	290	294	4	1.4%
DeKalb	95	83	- 8	-8.4%
Easton	98	97	- 1	-1.02%
Lewis & Clark	45	62	17	37.7%
Rushville	99	104	5	5.05%
St. Joseph	31,752	33,307	1,555	4.90%
Total (including unincorporated areas)	36,574	38,487	1,913	5.23%

(Source: U.S. Bureau of the Census, Decennial Census; Population Statistics are for entire incorporated areas as reported by the U.S. Census Bureau)

The changes in development for each participating jurisdiction since the previous plan update is discussed below. Within each hazard section under the heading “Previous and Future Development” these changes in development that have impacted the community’s vulnerability to specific hazards, will be discussed.

Agency

Agency has experienced a population increase, but there has been no subsequent commercial development. The population increase has not been significant enough to increase the hazard vulnerability of the community. Minimal residential construction has occurred and what has occurred has been out of the flood prone areas. During the past decade, the city has been aggressive in

annexing surrounding land, most of this has occurred to the north along Missouri State Rte. F. Currently, Agency and the City of St. Joseph are in litigation regarding proposed annexation to the southwest of the community.

DeKalb
Although DeKalb has seen a 10% decline in population, there have been no significant changes leading to a change in risk for natural hazards.

Easton
Easton has experienced minimal change since the last plan. The community's risk to natural hazards remains the same.

Lewis & Clark Village
No recent development has occurred in Lewis & Clark Village that would impact the community's vulnerability.

St. Joseph
St. Joseph has experienced development in the north and southwest areas of the community. The north development is largely from an expansion of a retail center called the North Shoppes. This area has expanded to include a hotel, gas station, a new YMCA and other retail shops. Single-family residential development has also occurred in this area. The area is not in a flood zone. Warning siren coverage has been expanded to assure this heavily visited area has adequate coverage.

Industrial redevelopment is occurring in the southwest part of the city. This is an older part of town that includes the historic stockyard area, known for its meat processing plants for much of the 1900s. Several large companies operate in this area, such as Triumph Foods, National Beef, Biozyme, Inc. and Johnson Controls. Additionally, the city's wastewater treatment facility is located in this section of St. Joseph. This area is potentially vulnerable to flooding and levee failure; however, Buchanan County held a referendum on August 2, 2016, asking constituents to support a quarter-cent sales tax to improve existing levees; the levee issue passed overwhelmingly by 77%. Total estimated cost is $70 million with U.S. Army Corps of Engineers resources providing 65% of the funds. (Source:http://www.stjosephpost.com/2016/07/30/buchanan-county-voters-to-decide-on-levee-tax/)

3.3.2 Future Land Use and Development

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.

Buchanan County
County planning and zoning activities are managed through the County Planning Commission. The Planning Commission enforces existing zoning orders, plans for future land use, issues conditional permits, and allows property owners to change zoning for land purposes. The office falls under the direction of the County Commission.

Planning and Zoning staff rely on an existing comprehensive land use plan. The county is in the process of updating this plan and anticipates it being completed by early 2018.

Anticipated development in the unincorporated areas include immediately south and east of St. Joseph. This is mirrors development for the city; additionally, growth patterns are limited to the north by county boundaries and west by the Missouri River.

Agency
The community has a comprehensive plan and land use plan. No future development is anticipated. As previously noted, the city is currently in litigation with the City of St. Joseph in regards to annexation, which may impact future development patterns.

DeKalb
The community does not have a comprehensive plan or land use plan. No future development is anticipated.

Easton
The community does not have a comprehensive plan or land use plan. No future development is anticipated.

Lewis & Clark
The community does not have a comprehensive plan or land use plan. No future development is anticipated.

St. Joseph
The community does not have a comprehensive plan, but it does have a 20-year land use plan (2004-2024).

> *The Land Use Plan for the City of St. Joseph serves as the official policy to guide future growth of the City. The plan details and describes the activities related to land use and future growth areas. This document presents an update of St. Joseph's 1987 Land Use Plan. The plan is comprehensive in nature and includes a detailed analysis of the various factors that affect land development in the city. These include physical, economic, and demographic factors, as well as those considered part of St. Joseph's built environment. The report also lists specific recommendations and strategies for Plan Implementation.* (Source: Land Use Plan of the City of St. Joseph, Missouri: January 24, 2008)

The plan has components similar to what you would expect to see in a comprehensive plan, but provides little analysis, structure, or specific direction. The result is the city does not have detailed strategies being implemented to encourage development and future growth. All new growth is determined by the private market.

The city also relies on a number of Precise Plans for specific areas of the community, these include:

- Uptown Development
- Downtown
- Heartland Health
- North Land Development
- Tuscany Village
- Whitehead Plaza
- EBR Enterprises-Heartland Regional Medical Center
- Riverside Business Park
- Fountain Creek
- The Commons
- Retail Use of Sidewalks Policy
- Survey Control Requirements

The city has a Planning Commission that has three primary tasks: considers all zoning and subdivision ordinances and amendments for the purpose of promoting health, safety, and the general welfare of the community; makes recommendations to the city council before final action is taken by the council; and reviews the city's comprehensive plan and any respective updates. (Source: http://www.stjoemo.info/index.aspx?nid=358)

St. Joseph has a Five-Year Capital Improvement Plan (CIP) that is used to complete larger projects. The funds are allocated into a number of activities, but the majority of these dollars are directed to General Capital Projects, i.e. street and bridge improvements, public buildings and facility projects, and major capital outlays; and Wastewater treatment facility improvements.

School District's Future Development

Buchanan County R-IV School District
Buchanan County R-IV School District is located in DeKalb and serves the areas surrounding the communities of Rushville and DeKalb. Enrollment data from Missouri's Department of Elementary and Secondary Education (DESE) indicates the district is slowly declining in students.The information covers a 15-year period (1991-2016) and includes ages from pre-school to 12th grade. According to DESE, the district has 83 fewer students enrolled in 2016 than in 1991. (Source: https://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx)

The District added a Vocational-Agriculture Building in 2014, which features a tornado safe room. Using a Data Collection Questionnaire completed by District's Superintendent Travis Dittemore, the district does not have bond capacity, and there are no proposed plans for additional facilities or bond elections in the near future.

Mid-Buchanan R-V School District
Mid-Buchanan R-V School District is located in Faucett and serves the areas in southern Buchanan County. Enrollment data from Missouri's Department of Elementary and Secondary Education (DESE) indicates the district is slight increase in students. The information covers a 15-year period (1991-2016) and includes ages from pre-school to 12th grade. According to DESE, the district has 20 more students enrolled in 2016 than in 1991. (Source: https://mcds. dese. mo. gov/ quick facts/ Pages/District-and-School-Information.aspx)

Currently, the District is constructing a FEMA-funded tornado safe room. Using a Data Collection Questionnaire completed by District's Superintendent John James, there are no proposed plans for additional facilities or bond elections in the near future. The district has a capital improvement project plan, local funding, general obligation and special bond capacity.

St. Joseph School District
The St. Joseph School District is located in St. Joseph and serves the city and areas immediately surrounding the community. Enrollment data from Missouri's Department of Elementary and Secondary Education (DESE) indicates the district has experienced a notable decrease in students. The information covers a 15-year period (1991-2016) and includes ages from pre-school to 12th grade. According to DESE, the district has 519 fewer students enrolled in 2016 than in 1991. (Source: https://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx)

The District has 33 total buildings/sites it maintains. This includes three high schools, four middle schools, 16 elementary school with the remainder either support, maintenance or administration buildings. Two of the elementary schools were constructed within the last year.

According to the District's 2016-2017 Board-approved budget, the District is facing many financial challenges. "With the loss of the $.63 sunset levy in 2014-2015 for our local property tax levy, the district is faced with an overall decrease of operating revenue of over $6 million." This will curtail capital improvement projects over the next years. (Source: https://www. sjsd. k12. mo. us /Page /21167)

Missouri Western State University

Missouri Western State University (MWSU) is located in St. Joseph and serves Missouri and the surrounding states. The university was founded in 1915 and joined the State of Missouri system in 1977. In 2005, MWSU received university designation.

MWSU has a Master Plan that was completed in 2015. The plan identifies a number of goals, including Creating a Pride of Place and Develop a Cohesive University Community. Specific tasks are listed; these include activities such as deferred maintenance, replacing furnishings, and plans for renovation.

Information from the Data Collection Questionnaire completed by the University's HMP participant, shows the school is constantly improving buildings and facilities. Most recently, the University made substantial enhancements to its football stadium, and constructed two new residence halls. The University also hosts the Kansas City Chiefs' training camp.

3.4 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 impact 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 evaluations 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, use maps 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. Historic event records form a solid basis for probability calculations.

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.

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 2013 Missouri Hazard Mitigation Plan. 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 3.2 loss estimation software.

The vulnerability assessments in the Buchanan 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.

Within the Vulnerability Assessment, the following sub-headings will be addressed:

Vulnerability Overview

Potential Losses to Existing Development: This will including types and numbers, of buildings, critical facilities, etc.

Previous and Future Development: This section will include information on how changes in development have impacted the community's vulnerability to this hazard. It will describe how changes in development that occurred in known hazard prone areas since the previous plan have increased or decreased the community's vulnerability. Any anticipated future development in the county, and how that would impact hazard risk in the planning area will be examined.

Hazard Summary by Jurisdiction: For hazard risks that vary by jurisdiction, this section will provide an overview of the variation and the factual basis for that variation.

Problem Statements

Each hazard analysis must conclude with a brief summary of the problems created by the hazard in the planning area, and possible ways to resolve those problems. It will include jurisdiction-specific information in those cases where the risk varies across the planning area.

3.4.1 Dam Failure

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.

As of 2013, Missouri had 5,423 recorded dams, the largest number of man-made dams in the country. However, only 66 are federally regulated dams and 682 are state regulated dams. This leaves 4,495 unregulated dams.

Dams regulated by the state are non-federally regulated dams that are over 35 feet in height. Missouri Department of Natural Resources (MDNR) Water Resources Center maintains the Dam and Reservoir Safety Program in Missouri. They ensure these dams are safely constructed, operated, and maintained pursuant to Chapter 236 of Revised Statutes of Missouri. The MDNR has data on the regulated and non-regulated dams in the state and uses the dam hazard classification system shown in **Table 3.16.**

Federally regulated dams fall under the jurisdiction of the US. Army Corps of Engineers (USACE) and the U.S. Department of Agriculture and Forest Service. The USACE maintains the National Inventory of Dams (NID), which includes data and the hazard classification of dams described in **Table 3.17.**

Table 3.16 MDNR Dam Hazard Classification Definitions

Hazard Class	Definition
Class I	The area downstream from the dam that would be affected by inundation contains ten (10) or more permanent dwellings or any public building. Inspection of these dams must occur every two years.
Class II	The area downstream from the dam that would be affected by inundation contains one to nine permanent dwellings, or one (1) or more campgrounds with permanent water, sewer and electrical services or one (1) or more industrial buildings. Inspection of these dams must occur once every three years.
Class III	The area downstream from the dam that would be affected by inundation does not contain any of the structures identified for Class I or Class II dams. Inspection of these dams must occur once every five years.

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

Table 3.17 NID Dam Hazard Classification Definitions

Hazard Class	Definition
High Hazard	Failure results in likely loss of human life.
Significant Hazard	Failure results in possible loss of human life and likely significant property or environmental destruction.
Low Hazard	Failure results in only minimal property damage.

(Source: National Inventory of Dams)

Geographic Location

Dams in Planning Area

The MDNR data base lists 32 dams in Buchanan County and four of those dams are regulated. The regulated dams are Belcher Branch Lake Dam (Class I), Komer Lake Dam (Class II), Farmland Industries Lake Dam (Class III) and Bear Lake Dam (Class III), since they are over 35 feet in height. Of the 32 dams, 17 are classified as Class III, eight are Class II and four had no listed classification. Four dams are classified as Class I, since the area downstream from the dam that would be affected by inundation contains ten or more permanent dwellings or any public building. Inspection of these dams must occur every two years. The Class I dams are Belcher Branch Lake Dam, McPheeters Lake Dam, Scotty's Lake Dam and Ussary Dam. McPheeters Lake Dam breached in 1993 and was filled in.

The USACE lists 27 dams in their NID for Buchanan County. Ten of these dams are classified as high hazard, with the failure of the dam likely resulting in loss of human life. The high hazard dams are Dead Man's Hole Dam, Scotty's Lake Dam, Komer Lake Dam, Ussary Dam, Jones Dam, McPheeters Lake Dam, Grant Lake Dam, Belcher Branch Lake Dam, Dearborn Reservoir Dam and Wales Lake Dam.

Table 3.18 is a list of the high hazard dams in Buchanan County, using both the MDNR (Class I) and NID (high hazard) classification systems. The table includes names, locations, and other pertinent information for all high hazard dams in the planning area. The term "acre-foot." is a unit of volume commonly used in reference to large-scale water resources, such as reservoirs, aqueducts, canals, sewer flow capacity, irrigation water, and river flows (Source: https: // en.wikipedia.org/wiki/Acre-foot).

Table 3.18 High Hazard and Class I Dams in the Buchanan County Planning Area

Dam Name	Emergency Action Plan (EAP)AP	Dam Height (Ft)	Normal Storage (Acre-Ft)	Last Inspection Date	River	Nearest Downstream City	Distance To Nearest City (Miles)	Dam Owner
Belcher Branch Lake Dam (Class I)	Yes	47	1,765	01/14/2015	TR – Belcher Branch	Faucett	4.1	MO Dept. of Conservation
Dearborn Reservoir Dam	No	28	180	Not listed	TR – Bee Creek	Dearborn	1	City of Dearborn
Dead Mans Hole Dam	No	32	51	Not listed	TR Missouri River	Atchison	6	Sonnenmoser Bros
Grant Lake Dam – South	No	20	86	Not listed	TR - Platte River	Platte City	26	Claude S. Grant
Jones Dam	No	25	67	Not listed	Rock Creek	Agency	5	Larry A. Jones
Komer Lake Dam	Yes	42	175	08/19/2016*	TR – Possum Hollow	Agency	2.5	Evelyn Noland
McPheeters LakeDam (Class I)	No	37	-	-	-	-	-	-
Scotty's Lake Dam (Class I)	No	25	80	03/27/1979	TR – Missouri River	Agency	5	Albert Scott Hall
Ussary Dam (Class I)	No	33	141	06/02/1980	TR – Pigeon Creek	Agency	2	John Ussary
Wales Lake Dam	No	20	160	Not listed	TR – Platte City	Agency	11	Mrs Russell Wales

(Sources: Missouri Department of Natural Resources, http://dnr.mo.gov/env/wrc/dam-safety/statemap.htm and National Inventory of Dams, http://nid.usace.army.mil/cm_apex/f?p=838:12)

*Inspection date is from Komer Lake Dam Inspection Report.

Figure 3.19 provides the locations of NID high hazard dams located in the planning area. Agency is located near several high hazard dams. According to indunation maps the community's assets would not be impacted by dam failure from a high hazard dam. However, road closures may occur in the event of a dam breach. See Appendix B for indundation maps for NID high hazard dams in Buchanan County and inspection reports for Komer Lake Dam and Belcher Branch Lake Dam. Unofficial inundation maps for the remaining High Hazard and Class I dams are also located in Appendix B.

Figure 3.19 High Hazard Dam Locations in Buchanan County

(Source: U.S. Army Corps of Engineers, Missouri Department of Natural Resources)

Upstream Dams Outside the Planning Area

According to the 2013 State Plan, the Gavins Point Dam, located on the Missouri River in South Dakota, is a dam outside of Missouri's boundaries that has the possibility of impacting Buchanan County in the case of a failure. The plan states that there are a number of reports that focus on past and future spring pulse releases from this structure in addition to studies on possible water storage increases within the system. In June/July 2011 Gavins Point Dam had a record release of 160,700 cubic feet per second, which significantly surpassed the previous record of 70,000 cubic feet per second (Source: "Missouri River Mainstem Reservoir Bulletin" (PDF). U.S. Army Corps of Engineers. June 28, 2011). To prevent overtopping, a form of dam failure, water was released.

Figure 3.20 is a map of Gavins Point Dam, located 294 miles northwest of St. Joseph. St. Joseph is identified by a star on the map.

Figure 3.20 Upstream Dams Outside Buchanan County

(Source:Google Maps)

Severity/Magnitude/Extent

Based on the hazard class definitions, failure of any of the High Hazard/Class I 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. For this reason, dam failures could flood areas outside of mapped flood hazards.

Actual dam failure can result not only in loss of life, but also property damage and loss of income if agricultural fields are flooded.

Previous Occurrences

There are no records of recent dam failure in Buchanan County, other than McPheeters Lake Dam breaching in 1993. No damage was reported. Stanford University's National Performance of Dams Program has no incident records for the Class I dams of Belcher Branch Lake, Komer Lake, Scotty's Lake and Ussary (Source: http://npdp.stanford.edu/).

Since there are zero recorded events (there was not an incident report for McPheeters Lake Dam) causing damage in the planning area, a calculation of a probability percent is not possible. According to information from the 2013 State Plan, Missouri's percentage of high hazard dams in the DNR inventory puts the State at about the national average for that category.

Probability of Future Occurrence

Other than the McPheeters Lake Dam, there is no record of a dam failure within the county so it is not possible to calculate the probability of future occurance. If development occurs in inundation zones the percentage of high hazard dams will increase. Additionally, the probability of dam failure increases as many of the smaller and privately owned dams continue to deteriorate without the benefit of further regulation or improvements. Regular inspection and maintenance schedules for dams greatly reduces the probability of dam failure. One high hazard NID dam, Belcher Branch Lake Dam was inspected in 2015. Ussary Dam and Scotty's Lake Dam have not been inspected in over 30 years (Source: National Inventory of Dams). McPheeters Lake Dam has been filled in.

Vulnerability

Vulnerability Overview

Vulnerability to dam failure in Buchanan County is limited to structures located in dam inundation zones. The dams are located in unincorporated parts of the county and no critical structures are located in the inundation zones. Currently, there are only four state regulated dams with heights of 35 or greater. One of these dams, Belcher Branch Lake Dam, is rated High Hazard/Class I dam. One dam is rated Class II and the other two are rated Class III. Although failure potential certainly exists for these non-regulated dams, it is very difficult to attempt to analyze vulnerability due to data limitations. There are no federally regulated dams in Buchanan County.

Potential Losses to Existing Development: (including types and numbers, of buildings, critical facilities, etc.)

Potential loss estimates at Komer Lake Dam were calculated by overlaying the inundation zone with both the county's tax parcel layer and the Community Anchor Institutions layer, which shows the location of each structure within Buchanan County. The inundation zone was included with a report produced by the Missouri Department of Natural Resources. The results of this analysis indicated that there were nine structures located directly within the inundation zone: five agricultural/livestock, three general buildings, and one single-family dwelling. There were 19 parcels intersecting the inundation zone that contained structures. Twelve of these parcels were residential, with a total exposure of $132,980, and seven of these parcels were agricultural, with a total exposure of $125,430. Figure 3.21 shows that the inundation zone includes Route H.

Figure 3.21 Komer Lake Dam Inundation Zone

(Source: DNR, Komer Branch Lake Dam Report)

Belcher Branch Lake Dam's inundation area shows no structures located in the inundation zone so an loss analysis was not conducted. However, the inundation zone crosses Highway 116 and Route MM, in unincorporated areas (See Appenidx B).

It is not possible to estimate losses without a dam inundation area analysis from DNR for the other dams in Buchanan County.

Table 3.22 lists the exposure vulnerability for four state regulated dams (over 35 feet in height) in Buchanan County.

Table 3.22 Vulnerability Analysis for Failure of State-regulated Dams in Missouri

Jurisdiction	Estimated # of Buildings Vulnerable	Average Exposure Value Per Structure ($)	Estimated Total Population Exposure	Estimated Building Losses ($)
Buchanan County	15	$127,278	$2,724,015	$241,362,008

(Source: 2013 State Plan)

Impact of Previous and Future Development

Future development in Buchanan County could impact the amount of damages caused by a dam failure in the planning area if residential development occurs in the dam inundation area. Most of Buchanan County is rural in nature with little development occurring near High Hazard/Class I dams.

Hazard Summary by Jurisdiction

Vulnerability to dam failure varies across the planning area. No schools or community assets are located in known dam breach inundation areas. However, the unofficial inundation map shows a residential and agricultural structure located in an inundation zone and the unofficial Lake Flamingo Dam map shows a deadend road being in the inundation zone. A dam failure resulting in the closure of that road could potentially cut off residents in an unincorporated area. Other unofficial inundation zone maps are located in Appendix B, in which several show roads located in the unincorporated areas in the inundation zones

Problem Statement

Although the probability of dam failure in the county is very low the potential for damage remains. Only Belcher Branch Lake Dam (Class I and regulated) and Komer Lake Dam (Class II) have emergency action plans. Emergency plans written for dams include procedures for notification and coordination with local law enforcement and other governmental agencies, information on the potential inundation area, plans for warning and evacuation, and procedures for making emergency repairs. Residents near a Class I or Class II hazard dams should become familiar with what action to take if there is a dam breach. Public education campaigns can help inform and prepare citizens.

3.4.2 Drought

Hazard Profile

Hazard Description

Drought is generally defined as a condition of moisture levels significantly below normal for an extended period of time 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.

- Meteorological 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.

- Hydrological 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.

- Agricultural 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

The entire planning area is at risk to drought. Drought most directly impacts the agricultural sector. Buchanan County covers 415 square miles and approximately 295 square miles (71%) is land in farm use. Farming is not concentrated in any geographical area within the county. Of the 188,688 acres of land in farm use, only 3,621 acres are irrigated. From 2002 to 2012, the amount of land in farm use decreased by 5.73% and the number of farms decreased by 14.27%. Although the city of St. Joseph is not experiencing significant growth, new construction often occurs on the outskirts of town, resulting in conversion of agricultural land to residential use (Source: http://www .ag census. usda. Gov /Publications/2012/Full Report/Volume 1, Chapter 2 County Level/Missouri).

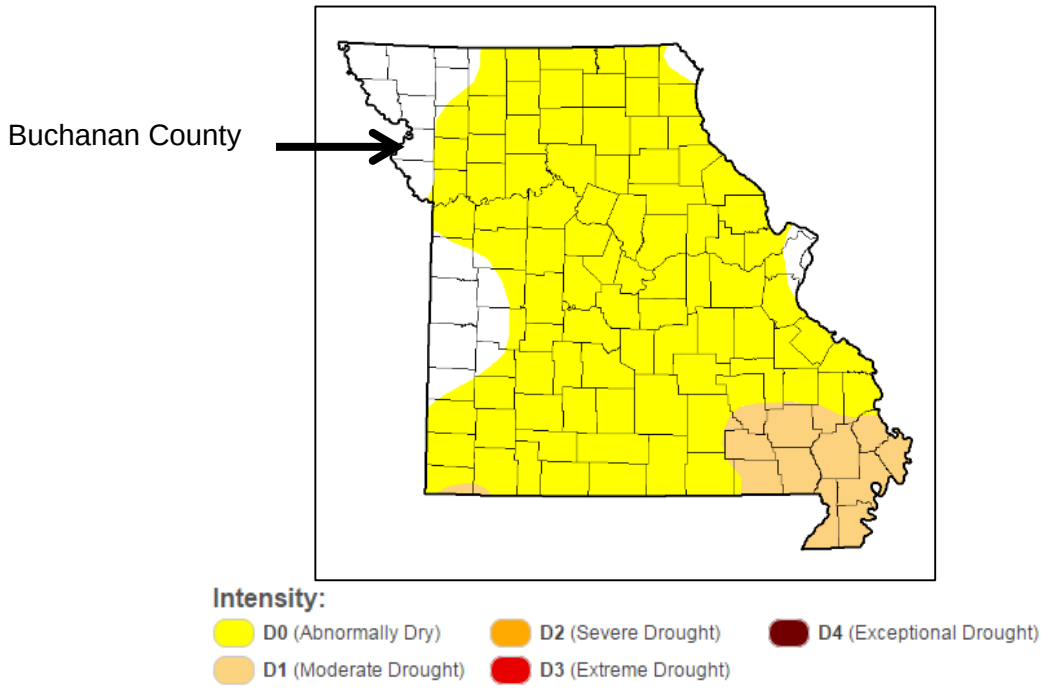
Severity/Magnitude/Extent

The National Drought Monitor Center at the University of Nebraska at Lincoln summarized the potential severity of drought as follows. 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 places 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 contribute to increased mortality.

Figure 3.23 is a U.S. Drought Monitor for Missouri. Buchanan County is in a white zone, which indicates the county is currently not in a drought. The U.S. Drought Monitor is only a snapshot of conditions at a given moment in time.

Figure 3.23 U.S. Drought Monitor Map of Missouri on December 20, 2016



(Source: U.S. Drought Monitor, http://droughtmonitor.unl.edu/Home/StateDroughtMonitor.aspx?MO)

The USDA's Risk Management Agency tracks insured crop loss payments in the county as a result of drought. Table 3.24 shows the crop loss payments in Buchanan County from 2011 to 2015. Crop loss payments were the highest in 2012, with a total of $4,229,775 in payments.

Table 3.24 Crop loss payments in Buchanan County from 2011-2015

Year	Crop Loss Payment
2015	$0
2014	$21,491
2013	$1,182,294
2012	$4,229,775
2011	$9,493

(Source: http://www.rma.usda.gov/data/cause.html)

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 locationbased 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.

St. Joseph uses the Missouri River Alluvial aquifer and Agency uses the Platte River for their surface water sites. St. Joseph and also Lewis and Clark Village have a groundwater site (Source: http://maps.waterdata.usgs.gov/mapper/index.html and Community Data Questionnaires). None of the participating communities use well water as the only source of water. However, many people residing in the unincorporated areas do.

Previous Occurrences

Buchanan County experienced droughts in 1989, 2002, 2005-2006 and 2012-2013. The county is listed in the Drought Impact Reporter in 2013 as having stressed trees, corn and soybean crops, as well as dying corn (Source: http://droughtreporter.unl.edu/). Other events included in the report are the drought disaster declarations in "Drought-related USDA disaster declarations in 2013" (Dates of Impact: 2013-01-09 to 2013-05-16), "USDA Designates 97 Counties in Missouri as Primary Natural Disaster Areas with Assistance to Producers in Surrounding States" (Dates of Impact: 2012-04-01 to unknown) and "All but three Missouri counties received drought disaster designation" (Dates of Impact: 2011-07-01 to 2011-10-18).

Probability of Future Occurrence

Although it would be best to use at least a 20-year period from which to draw data on drought events in order to obtain a more accurate estimate of probability, only an 18-year record period is available from the NCDC. Over the 18-year record period, Buchanan County was in a drought for nine months. There are a total of 216 months in the record period. The calculated risk percent from the number of months of drought and the total number of months in the record period equates to the annual average percentage of 4.17% probability of drought occurrence in the county. Although drought is not predictable, long-range outlooks and predicted impacts of climate change could indicate an increased chance of drought persistence and severity. The nine events took place in 2000 (one event), 2012 (six events) and 2013 (two events). (Source: https://www.ncdc.noaa.gov/stormevents)

Vulnerability

Vulnerability Overview

The agriculture sector is particularly vulnerable to drought. Periods of dry weather can reduce stock ponds and force the early sale of livestock. Between 2007 and 2012, the number of cattle has decreased by nearly 17%, which lessens the demand for stock ponds (Source: Ag. census 2012). However, drought can still stress stock ponds water levels and be disruptive to crop production. Those relying on private wells are likely to be impacted by reductions in the groundwater supply.

Potential Losses to Existing Development

The 2013 State Plan shows that from 1998 through 2012 there were $7,893,030 in insured crop loss payments in Buchanan County (Source: http://sema.dps.mo.gov/docs/ programs/LRMF/ mitigation /MO Hazard Mitigation Plan 2013.pdf). In addition, according to the USDA Risk Management Agency, there was a total of $1,203,785 in insured crop loss payments from 2013-2015. (Source: http://www.rma.usda.gov/data/cause.html). According to this data, the total losses divided by the 18 year timeframe ($7,893,030 + $1,203,785/18) equals $505,378.61 per year. There are no anticipated structural losses, loss of life or injuries associated with this hazard.

Impact of Previous and Future Development

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.

Impact of Climate Change

A new analysis, performed for the Natural Resources Defense Council, examined the effects of climate change on water supply and demand in the contiguous United States. The study found that more than 1,100 counties will face higher risks of water shortages by mid-century as a result of climate change. Two of the principal reasons for the projected water constraints are shifts in precipitation and potential evapotranspiration (PET). Climate models project decreases in precipitation in many regions of the U.S., including areas that may currently be described as experiencing water shortages of some degree.

The Natural Resources Defense Council developed a new water supply sustainability index. The risk to water sustainability is based on the following criteria:

- Projected water demand as a share of available precipitation
- Groundwater use as a share of projected available precipitation
- Susceptibility to drought
- Projected increase in freshwater withdrawals
- Projected increase in summer water deficit

The risk to water sustainability for counties meeting two of the criteria are classified as “moderate” while those meeting three of the criteria are classified as “high,” and those meeting four or more are classified as “extreme.” Counties meeting less than two criteria are considered to have low risk to water sustainability. According to the Natural Resources Defense Council, without climate change the water sustainability index for Buchanan County is low. With climate change, thewater supply sustainability index increases to moderate (Source: https://www.nrdc.org/ issues/climate-change).

Hazard Summary by Jurisdiction

Although the probability of drought is the same for the entire county, farming and livestock enterprises in the unincorporated parts of the county would feel the greatest impact. These impacts are mitigated somewhat by the purchase of crop insurance. The communities in Buchanan County are on water systems. Missouri American Water pumps ground water from in Andrew County to service the St. Joesph area. However, many rural residents rely on limited source wells, which would be impacted during water shortages. 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. School and special districts would be the least impacted by drought, however, those districts in communities with single source wells may experience water shortages prior to those in larger communities.

Problem Statement

Although drought most likely will not cause structural damage, the impact is greatest on the agriculture sector and if persistent enough, could cause reductions in groundwater and water shortages in communities that provide potable water services. Potential solutions to mitigate the impact of drought would be for communities to develop an ordinance to restrict the use of public water resources for non-essential usage, such as landscaping, washing cars, filling swimming pools, etc. during extreme drought periods. Schools can also implement water conservation measures at all district facilities.

3.4.3 Earthquakes

Hazard Profile

Hazard Description

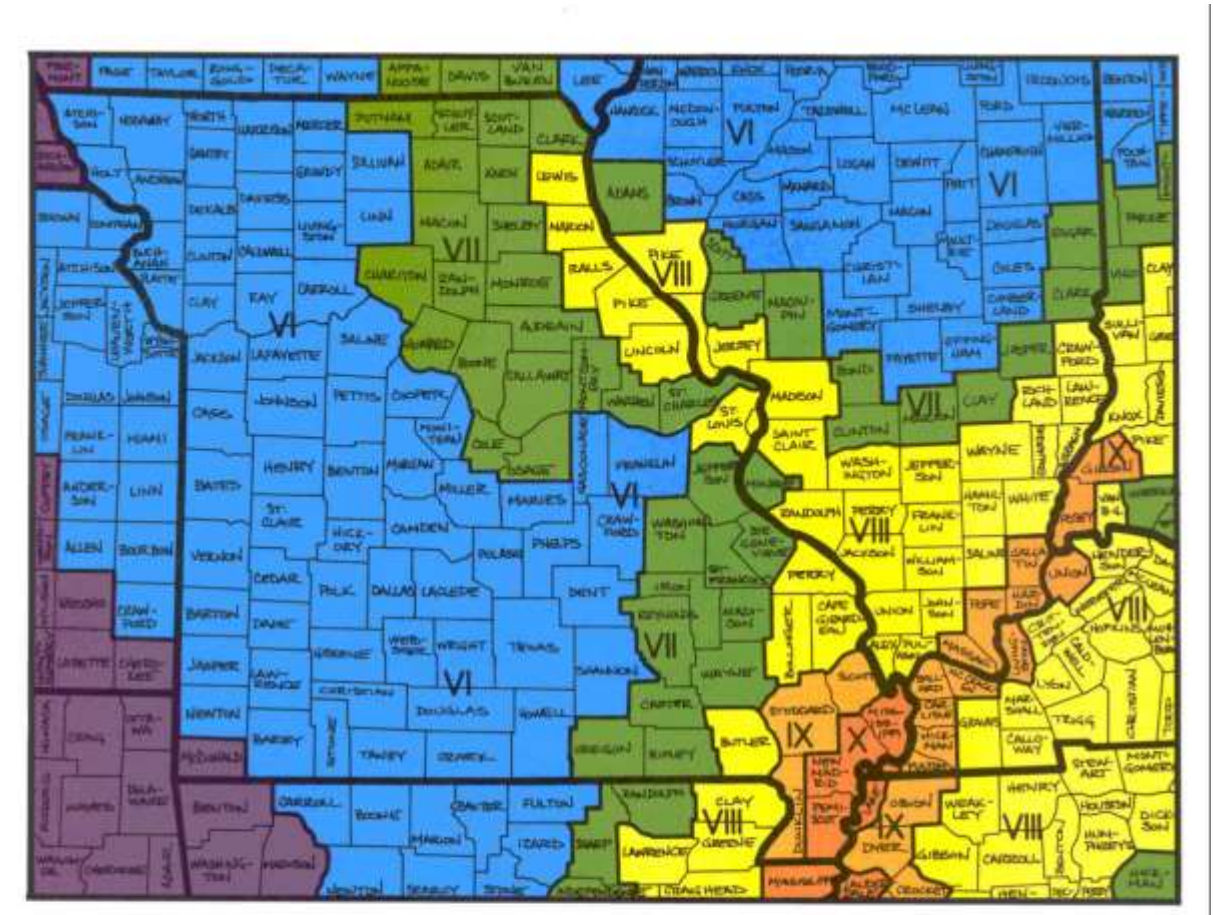
An earthquake is a sudden motion or trembling that is caused by a release of energy accumulated within or along the edge of the earth's tectonic plates. Earthquakes occur primarily along fault zones and tears in the earth's crust. Along these faults and tears in the crust, stresses can build until one 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 the 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.

The greatest hazard from earthquakes in Buchanan County comes from the New Madrid Seismic Zone situated in the boot-\heel area of southeast Missouri. The potential of high magnitude earthquakes occurring along the New Madrid fault presents risk that does not vary across the planning area. The Nemaha uplift in central Kansas is also prone to seismic activity, however, the center of the Humbolt fault zone near the Nemeha Uplift is approximately 250 mile southwest of Buchanan County and produces lower magnitude seismic events.

Geographic Location

Figure 3.25 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. The secondary maps in Figure 3.25 show the same regional intensities for 6.7 and 8.6 earthquake, respectively.

Figure 3.25 Impact Zones for Earthquake Along the New Madrid Fault

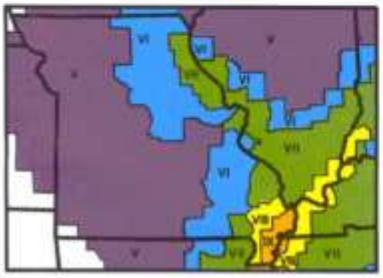


This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude – 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.

6.7

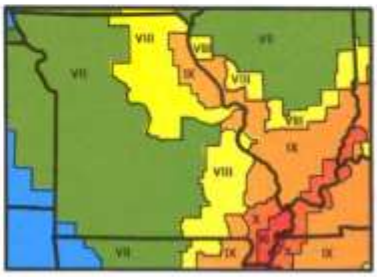
7.6

8.6



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/2012-State-Hazard-Analysis/Annex_F_Earthquakes.pdf)

MODIFIED MERCALLI INTENSITY SCALE

I 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.

V 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.

VI 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.

VII 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.

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.

X 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.

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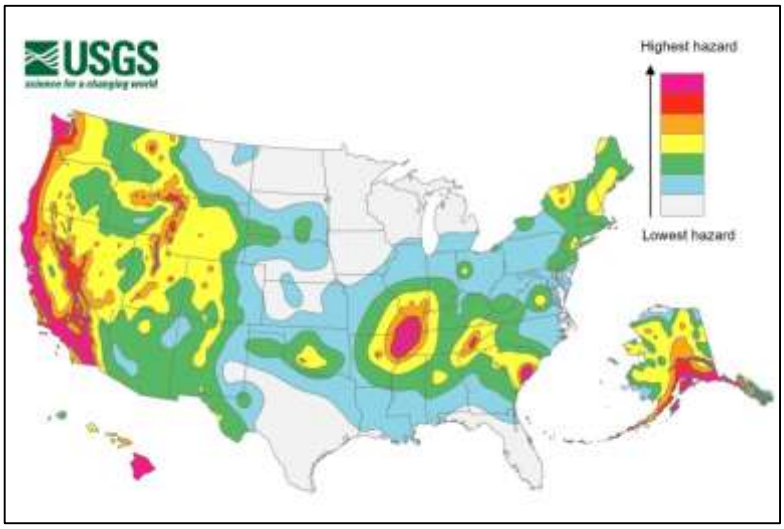
Figure 3.26 illustrating seismicity in the United States. Buchanan County is located in the blue zone,which is the second lowest hazard area.

Figure 3.26 United States Seismic Hazard Map



(Source: United States Geological Survey at http://earthquake.usgs.gov/hazards/ products/conterminous/2014/HazardMap2014_lg.jpg)

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.

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 is 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 does not have a mathematical basis, but is based on observed effects. Its use gives the laymen a more meaningful idea of the severity.

Previous Occurrences

Earthquakes are rare in Buchanan County. The strongest occurred on April 24, 1867, when St. Joseph experienced a 7.0 earthquake. According to newspaper accounts, windows broke, plaster fell, solid bricks swayed and walls cracked. It was reported that the brick wall of the schoolyard cracked several feet from the ground. There was no serious damage reported. On January 7, 1906, St. Joseph experienced a 5.0 to 6.0 earthquake. Newspaper accounts indicated the event rattled dishes and tinware, detached several pictures from walls, swayed floors and frightened residents. There was no serious damage reported. A similar incident occurred in 1969.

On February 13, 2016 Buchanan County residents felt tremors from a 5.1 earthquake originating near Fairview, Oklahoma. No damage was reported. There is speculation that the earthquake was a result of man-made activity, fracking.

Probability of Future Occurrence

The United States Geological Survey (USGS) earthquake probability map for the Buchanan County area is shown in Figure 3.27. Buchanan County falls into the 0 - .01% probability range, indicated by white and light gray on the map. Over the past 149 years, only four known earthquakes have occurred in Buchanan County. When the four events are divided into 149 years, the result is a less than 3% probability of an earthquake occurring a year.

Figure 3.27 2009 Earthquake Probability Mapping

(Source:https://geohazards.usgs.gov/eqprob/2009/output/284df9fac901f367aef66cff2ec5f19e.pdf)

Hazard Summary by Jurisdiction

Earthquake risk and intensity is not likely to vary greatly throughout the planning area. However, damages could differ if there are structural variations in the planning area built environment, such as St. Joseph having a high number of older structures. Many of the school districts' building are newer than 1939 and would be able to better withstand earthquakes than many other structures in the communities.

Impact of Previous and Future Development

Future development is not expected to increase the risk contributing to the overall damage exposure.

Vulnerability

Vulnerability Overview

Ground shaking is the most damaging effect from earthquakes. Ground shaking will impact all structures and critical infrastructure such as roads and electrical transmission systems. Although Buchanan County has experienced several earthquakes there were no documented damages associated with this event. In the event of a 7.6 magnitude earthquake, damage to structures would vary depending on the quality of construction. In addition, some underground utilities may be damaged. Injuries may occur but fatalities are unlikely.

Potential Losses to Existing Development

Potential losses to existing development include the total exposure for all communities listed in Tables 3.3 and 3.4 in the Assets at Risk section of this chapter. The total exposure of each jurisdiction was used to estimate losses from a 7.6 earthquake along the New Madrid. A damage factor of 0.5% was applied to each jurisdiction's total building and contents based on the expected impact for Zone VI on the modified Mercalli scale.

Table 3.28 depicts the estimated losses in each jurisdiction based on total exposure and a 0.5% damage factor.

Table 3.28 Estimated Earthquake Losses for Buchanan County

Jurisdictions	Estimated Potential Earthquake Losses
Unincorp. Buchanan County	$34,487,000.00
Agency	$6,749,250.00
DeKalb	$1,639,500.00
Easton	$1,575,200.00
Lewis & Clark Village	$1,088,400.00
St. Joseph	$528,953,800
Buchanan School District	$667,469.85
Mid-Buchanan School District	$1,046,848.70
St. Joseph School District	$11,437,338.40

(Source: Hazus MH 3.2)

Impact of Previous and Future Development

Future development is not expected to increase the risk other than contributing to the overall exposure of potential damage.

Hazard Summary by Jurisdiction

Since the earthquake intensity is not likely to vary greatly across the planning area, the risk will be the same throughout. As previously stated, damages could differ in communities that have older structures. Table 3.29 lists the years structures were built in the county's jurisdictions.

Table 3.29 Age of Structures in Buchanan County

Year Structure Built	Buchanan County	Agency	Easton	Lewis & Clark Village	St. Joseph
2014 or later	.01%	0%	0%	0%	.1%
2010 to 2013	.07%	2.5%	2.2%	0%	.6%
2000 to 2009	8.3%	6.8%	14.6%	4.5%	7.5%
1980 to 1999	18.3%	40.2%	20.2%	22.7%	16.5%
1960 to 1979	26%	39.4%	29.2%	40.9%	25.5%
1940 to 1959	18%	3.9%	19.1%	25%	19.4%
1939 or earlier	28.6%	11.4%	14.6%	6.8%	30.5%

(Source: http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml)

Problem Statement

Based on intensity damage discription in Figure 3.6, a 7.6 magnitude earthquake along the New Madrid fault may result in slight damage to older, poorly built structures, if any. St. Joseph's percentage of housing units built in 1939 or earlier is 30.5%, which could potentially be impacted. Potential damages to future development can be mitigated by all jursidcitions adopting and enforcing IBC 2012 building codes. Potential damages to older homes can be somewhat mitigated during remodeling and renovation.

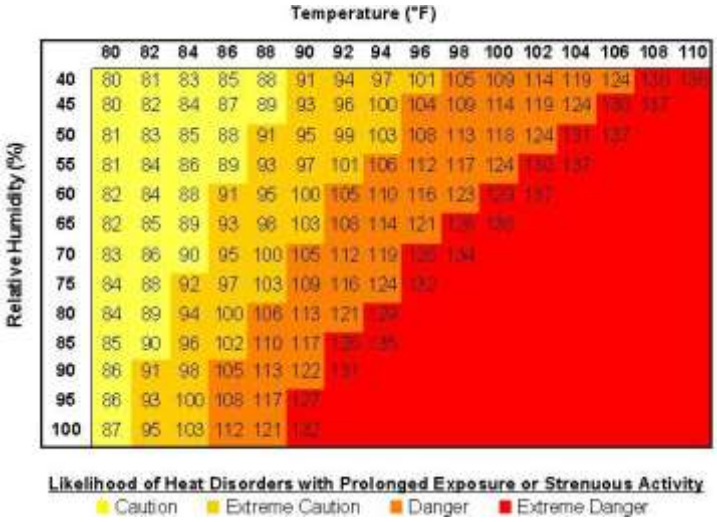
3.4.4 Extreme Heat

Hazard Profile

Hazard Description

Extreme temperature events, both hot and cold, can impact 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 shown in Figure 3.30 uses both of these factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

Figure 3.30 Heat Index (HI) Chart



(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 Heat Index that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

Geographic Location

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

Severity/Magnitude/Extent

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 2006-2015 were $733,192. Extreme heat can also strain electricity delivery infrastructure, which can overload 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, one deaths were recorded in Buchanan County, according to NCDC 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.

Table 3.31 lists typical symptoms and health impacts due to exposure to extreme heat.

Table 3.31 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)

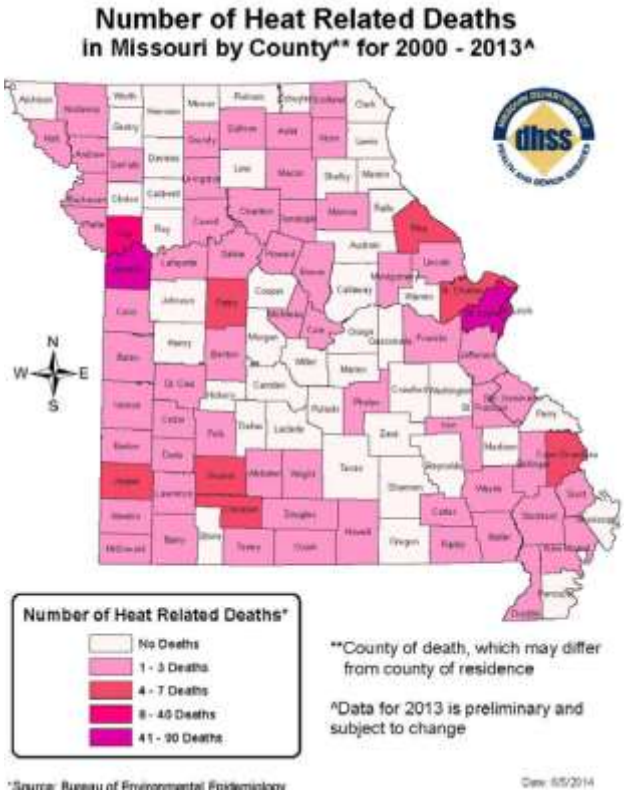
The NWS has an alert system in place (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for issuing excessive heat alerts is when for two or more consecutive days is 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

The NCDC database reports 13 events of heat from 1995-2015, with one death in Buchanan County. No crop damage reported. The death occurred in 1999 when the area temperatures were around the 90 -100 degree mark for 14 consecutive days.

Figure 3.32 shows the number of heat related deaths in Buchanan County between 2000-2013. The map illustrates in light pink that between 1-3 deaths occurred due heat during this timeframe.

Figure 3.32 Heat Related Deaths in Missouri 2000-2013



Probability of Future Occurrence

There are 13 recorded heat events in the National Climatic Data Center (NCDC) database from 1995 to 2015 for Buchanan County. There was one death. No injuries or property or crop damage associated with these events in the NCDC data for Buchanan County.

The probability that an extreme heat event will occur in Buchanan County in any given year is 62%. This equates to dividing 21 years with 13, the number of events. Data limitation indicates that extreme heat events could be underreported in the NCDC.

Vulnerability

Vulnerability Overview

High humidity, which often accompanies heat in Missouri, can make the effects of heat even more harmful. While heat-related illness and death can occur from exposure to intense heat in just one afternoon, heat stress on the body has a cumulative effect. Consequently, the persistence of a heat wave increases the threat to public health. The people most at risk are children under five years of age and adults over the age of 65 as well as people who work outdoors. The agriculture sector can also suffer crop loss during periods of extreme heat. Extreme heat may also cause buckling of roads.

Potential Losses to Existing Development

Based on information in the 2013 Plan and DHSS, one to three heat related deaths may occur within Buchanan County over the next 13 years.

For agricultural losses, the USDA Crop Insurance payments during the 11 year period from 2005 – 2015 were used and annualized to determine an average annual loss. Losses from heat totaled $733,192 and this equates to $66,653.82 in average annual losses countywide.

Impact of Previous and Future Development

Population growth can result in increases in the age-groups that are most vulnerable to extreme heat. Population growth also increases the strain on electrical infrastructure, as more electricity is needed to accommodate the growing population. Agency is the only jurisdiction in a population growth mode, but the population increase has not significantly changed the jurisdiction's vulnerability.

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 3.33 below summarizes vulnerable populations in the participating jurisdictions. 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 3.33 County Population Under Age 5 and Over Age 65

Jurisdiction	Population Under 5 yrs	Population Under 5 yrs %	Population 65 yrs and over	Population 65 yrs and over %
Buchanan County	59	6.6%	12,807	14.3%
Agency	68	7.5%	112	12.3%
DeKalb	11	5.4%	29	14.4%
Easton	15	5.9%	34	13.4%
Lewis & Clark	4	3.3%	18	14.8%
St. Joseph	5,470	7.1%	10,862	14.1%

(Source: U.S. Census Bureau, 2015)

Schools in Buchanan County have air conditioning in nearly all facilities. Mid-Buchanan School Distirct School went from having 50% to 100% air-conditioned facilities in 2015, significantly decreasing the number of days school closed early due to heat. The school districts do not have policies mandating closure during high heat events, but monitor the situation and make school closures accordingly.

Problem Statement

Older and younger segments of the population are more vulnerable to the impact of extreme heat. In addition, people living in poverty may be more vulnerable during periods of extreme heat due to a lack of air conditioning or utilities in their homes. Institutionalized populations such as those living in nursing homes become more vulnerable to extreme heat due to power outages. This problem has been mitigated due to the installation of emergency generators at a number of these facilities. In the past, several St. Joseph nursing homes allowed elderly non-residents who did not have air-conditioning to stay at the nursing home during periods of high heat. The Buchanan County EMD

works with the American Red Cross, who maintains a list of heating and cooling centers throughout the county. The jurisdictions can expand their partnerships with local community organizations who donate fans and offer weatherization programs to vulnerable populations in the county.

3.4.5 Fires (Urban/Structural and Wild)

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.

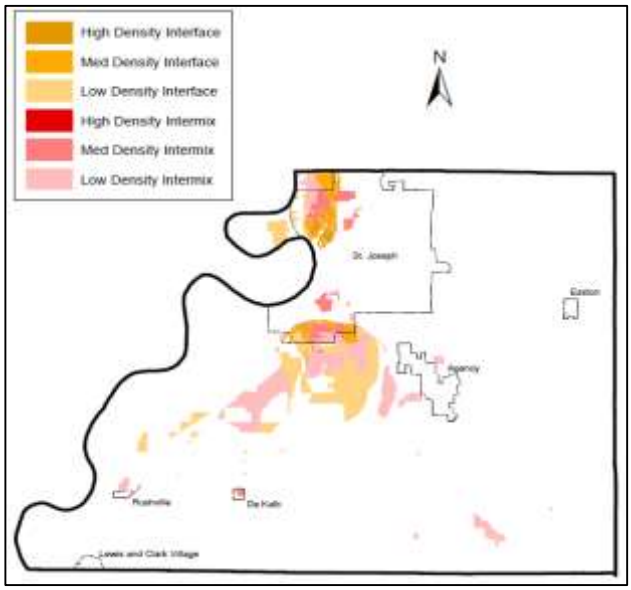
The Forestry Division of the Missouri Department of Conservation (MDC) is responsible for protecting privately owned and state-owned forests and grasslands from wildfires. To accomplish this task, eight forestry regions have been established in Missouri for fire suppression. The Forestry Division works 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 wildland 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

The risk of structural fire probably is higher in St. Joseph, due to the higher density and number of older structures. However, damages due to wildfires would be higher in communities with more wildland–urban interface (WUI) areas, which also includes St. Joseph. WUI is the transition between unoccupied land and human development. Within the WUI, there are two specific areas identified: 1) Interface and 2) Intermix. The interface areas are those areas that abut wildland vegetation and the intermix areas are those areas that intermingle with wildland areas. Figure 3.34 is a WUI map of Buchanan County, that identifies the density interface and intermix. St. Joseph and DeKalb have the most infaceface and intermix areas.

Figure 3.34 Wildland—Urban Interface and Intermix Areas in Buchanan County



(Source: http://silvis.forest.wisc.edu/maps/wui_main)

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 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.

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.

Often wildfires in Missouri go unnoticed by the general 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.

In March 2015 a controlled burn in Kansas jumped the Missouri River, causing a 5 mile stretch of wildfire on the outskirts of St. Joseph. The St. Joseph Frontier Casino was closed and area residents in the area were evacuated. That same month three separate structural fires occurred within a 12 hour period in St. Joseph. First Ward House, a historic building and bar, caught on fire during business hours but staff and customers were able to escape without injury. A hair salon caught on fire and the fire spread to a nearby vacant building. A residential fire also occurred that night.

Previous Occurrences

According to MDC Wildfire Data, there have been 599 wildfires reported in Buchanan County from 2001 to 2015. A total of 3,827.91 acres burned as a result of these reported wildfires. In addition, three outbuildings were destroyed with another six outbuildings and two residences damaged. Threatened included 13 residential buildings and 19 outbuildings. No commercial structures were threatened, damaged or destroyed during this timeframe. The highest number of fires was 85 in 2009 buring 656 acres, followed by 66 wildfires 2012 burning 485 acres and 62 fires in 2003, burning 62 acres.

In St. Joseph, from 2005 – 2015 the city has experienced 1,295 structural fires. Of these fires, 1,005 were residential buildings and 290 were non-residential buildings. Exact structure values were not available so annualized loss amounts were not generated.

Probability of Future Occurrence

Based on the last ten years of fire reporting statistics from the MDC in Table 3.23, there were a total of 599 reported wildfires from 2001 - 2015. This equates to an average of 39.93 wildfire events annually and a 100% probability of occurrence in any given year.

Based on 11 years of fire reporting statistics from 2005-2015, St. Joseph has experienced 1,295 structural fires. This equates to an average of 117.72 structural fire events annually and a 100% probability of occurrence in any given year. During this timeframe, 123 people died or were injured from structural fires. The equates to an average of 11.18 deaths or injures per year.

Vulnerability

Vulnerability Overview

The 2013 State Plan provides the detailed statistical data that was used for the vulnerability analysis for urban/structural fire for each county from 2009-2012. The shaded columns are the factor ratings established by applying the above ranges. See the 2013 State Plan for specific data explanations. According to this data, the average annual number of fires in Missouri was 23,051 causing estimated total annual average damages in the amount of $3,709,720,410. The table that follows provides the results for the the overall vulnerability rating calculated by assigning an equal weight to each of the five contributing factors. National Fire Incident Reporting System (NFIRS) data from 2004 to 2008 was used to determine vulnerability it is stated in the State Plan. However, only 61 percent of fire departments in Missouri reported to the NFIRS).

Table 3.35 Statistical Data and Factor Ratings for Urban/Structure Fire Vulnerability, 2004-2008

	County Housing Units /sq. mi.	Housing Density Rating	Average Likelihood Rating Total Building Exposure ($)	Building Exposure Rating	Average Annual Property Loss ($)	Property Loss Ratio Rating	Total Deaths	Total Injuries	Overall Vulnerability Rating
Buchanan County	94.2	2	453	4	9,701,152,000	3	9	72	4

(Source: 2013 State Plan)

Wildfires occur throughout wooded and open vegetation areas of Missouri. They can occur any time of the year, but mostly occur during long, dry hot spells. Any small fire, if not quickly detected and suppressed, can get out of control. Most wildfires are caused by human carelessness or negligence. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion. Structures and people in WUI areas in the county and cities are more vulnerable to the impact of wildfires due to the level of fuel mixed with structures.

Potential Losses to Existing Development

Data is not readily available for the areas outside of St. Joseph. Over the past 11 years there have been 1,005 residential structural and 290 non-residential structures occurred. This equates to 91.36 residential structural fires and 26.36 non-residential structural fires annually.

Impact of Previous and Future Development

It is anticipated that there will be future development in WUI areas throughout unincorporated areas of the county. Future growth in WUI areas of the county will increase the risk and exposure to wildfires. It is expected that WUI development in cities will be mitigated by development regulations reducing the risk to wildfire hazard.

It is anticipated that there will be continued risk and exposure to structural fires, especially in St. Joseph since there's a higher number of older as well as uninhabited buildings. St. Joseph has a higher housing density, which increases the possibility of a fire spreading from one structure to another.

Hazard Summary by Jurisdiction

Table 3.36 summarizes the structure exposure for Buchanan County and its jurisdictions for wildfires. Communities with more WUI areas will be at greater risk of wildland fires. The structure counts and values were derived by overlaying Buchanan County Assessor parcels with the WUI census block data. The exposure amount indicates the dollar amount of assets at risk and the variability of vulnerability from place to place.

Table 3.36 Wildfire Structure Exposure by Jurisdiction

Jurisdiction	Acres	Residential	Commercial	Agriculture	Total Exposure
Buchanan County	19,774	$312,638,790	$99,910,270	$10,655,150	$423,204,210
Agency	261	$315,940	$0	$45,500	$361,440
DeKalb	88	$1,136,820	$20,000	$22,950	$1,179,770
Easton	12	$123,440	$0	$6,780	$130,220
Lewis & Clark Village	0	$0	$0	$0	$0
St. Joseph	6,614	$230,984,210	$74,694,760.00	$897,250	$306,576,220
Unincorporated	12,616	$79,903,580	$25,195,510.00	$9,671,490	$114,770,580

(Source: http://silvis.forest.wisc.edu/maps/wui_main)

Table 3.37 lists the seven schools are located in or near interface/intermix zones. The St. Joseph School District has a five schools located in interface area. The risk of wildfire for these school facilities is mitigated by fire breaks created by roads, parking lots, and landscaping.

Table 3.37 Schools Located in the Wildland—Urban Interface and Intermix Areas

School Name	School District	Location	Student Enrollment
Lindbergh Elementary	St. Joseph School District	2812 St. Joseph Avenue, St. Joseph	453
Noyes Elementary	St. Joseph School Disrict	1415 N. 26th Street, St. Joseph	358
St. Joseph Cathedral	Private	518 N. 11th Street, St. Joseph	211
DeKalb, Jr-Sr High	Buchanan R-IV School District	702 Main Street, DeKalb	143
Benton High	St. Joseph School District	5655 S. 4th Street, St. Joseph	839
Hyde Elementary	St. Joseph School District	509 Thompson, St. Joseph	448
Hosea Elemantary	St. Joseph School District	6401 Gordon Street, St. Joseph	419

(Source: http://silvis.forest.wisc.edu/maps/wui_main)

Problem Statement

Wildfire occurrence is frequent within Buchanan County. These events can destroy, damage, and threaten structures in hazard prone areas. Populations and structures in WUI areas of the county have an increased risk to wildfires due to the level of fuel mixed with structures. St. Joseph and DeKalb have the highest exposure of risk to wildfire in Buchanan County. Cities that have adopted landscape ordinances can include fire safe landscape design requirements in these areas. The school districts that have facilities located in WUI areas, have a slightly elevated risk of wildfire due to the proximate amount of fuel present.

The county and its communities can promote fire resistant construction materials and landscape design techniques to mitigate the risk to wildfire in future development. Information about these materials and techniques are included in the MDC publication, “Living with Wildfire”. Including this information to education and awareness programs for the public may potentially mitigate wildfire damage in the county.

The City of St. Joseph has the highest risk and exposure to structural fires.

3.4.6 Flooding (Flash and River)

Profile

Hazard Description

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.

Flooding caused by dam and levee failure is discussed in Section 3.4.1 and Section 3.4.8 respectively. It will not be addressed in this section.

A flash flood occurs when water levels rise at an extremely fast rate as a result 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 also 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 rain events 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.

Geographic Location

Riverine flooding is most likely to occur in SFHAs. Maps in Figures 3.38 to 3.41 shows SFHA's for Buchanan County and juriscitions that have a 100-year flood plain in their city limits. The 100-year flood plain boundaries are based on Hazus MH 3.2, which closely but not completely follow the preliminary Flood Insurance Rate Maps (FIRMs). The preliminary FIRMs are from 1983/84 and are awaiting adoption. According to these maps no schools or critical facilities are located in SFHAs.

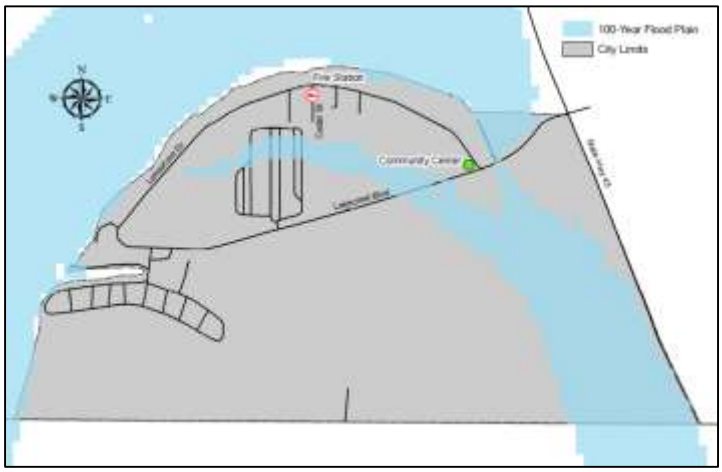
Figure 3.38 Buchanan County's 100-Year Flood Plain with Critical Facilities

(Source: Hazus MH 3.2)

Figure 3.39 Agency's 100-Year Flood Plain with Critical Facilities

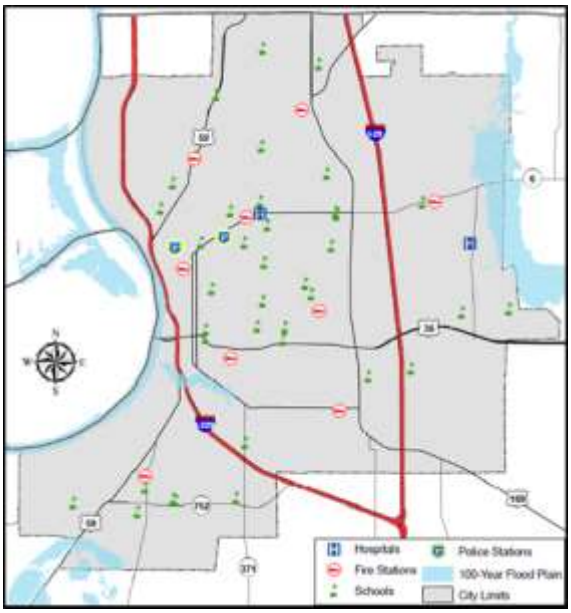
(Source: HAZUS MH 3.2)

Figure 3.40 Lewis & Clark Village's 100-Year Flood Plain with Critical Facilities



(Source: HAZUS MH 3.2)

Figure 3.41 St. Joseph's 100-Year Flood Plain with Critical Facilities



(Source: Hazus MH 3.2)

Full size 100-year flood maps are located in Appendix B.

Flash flooding events pose the most pervasive hazard of the two flood types in the county due to permeability of soils, slopes, increasing urban development and extensive network of streams and rivers. Sustained rainfall or downpours at the rate of one inch per hour have caused street flooding in incorporated areas and made a significant number of low water crossings impassible. In the instances of low water crossings, flash flooding occurs in the floodplain while low-lying areas in all jurisdictions are susceptible to flash floods outside the 100-year floodplain. They also occur in areas without adequate drainage to carry away the amount of water that falls during intense rainfall events. A review of the NCDC storm event database determined which jurisdictions are most prone to flash flooding from 1996 to August 2015 are listed in Table 3.42.

Table 3.42 Buchanan County NCDC Flood Events by Location, 1995-2015

Location	# of Events
Buchanan County	93
-Buchanan County (unspecified)- 6 flood events	
-Buchanan County (Missouri River/St. Joseph)- 48 flood events	
-Buchanan County (Platte River/Agency) - 39 flood events	
Agency	39
-Agency (unspecified)- 0 flood events	
-Agency/Platte River- 39 flood events	
DeKalb	
-DeKalb (unspecified)- 0 flood events	
Easton	
- Easton (unspecified)- 0 flood events	
Lewis & Clark	
- Lewis & Clark (unspecified)- 0 flood events	
Rushville	
- Rushville (unspecified)- 0 flood events	
St. Joseph	48
- St. Joseph (unspecified)- 0 flood events	
- St. Joseph/Missouri River- 45 flood events	
- St. Joseph Industrial City/Missouri River- 3 flood events	

(Source: National Climatic Data Center)

Flash flooding occurs in SFHAs and those locations in the planning area that are low-lying. They also occur in areas without adequate drainage to carry away the amount of water that falls during intense rainfall events. Table 3.43 shows the number of flash flood events by location recorded in NCDC for the 21-year period. NCDC event narratives may show that a given stretch of road is repeatedly underwater during flash flood events, so this information is included in the risk assessment.

Table 3.43 Buchanan County NCDC Flash Flood Events by Location, 1995-2015

Location	# of Events
Buchanan County	14
-Buchanan County (unspecified)- 0 flood events	
-Buchanan County (St. Joseph)- 11 flood events	
-Buchanan County (Easton)- 2 flood events	
-Buchanan County (Dekalb)- 1 flood events	
Agency	0
-Agency (unspecified)- 0 flood events	
DeKalb	1
-DeKalb (unspecified)- 1 flood events	
Easton	2
- Easton (unspecified)- 2 flood events	
Lewis & Clark	0
- Lewis & Clark (unspecified)- 0 flood events	
Rushville	0
- Rushville (unspecified)- 0 flood events	
St. Joseph	11
- St. Joseph (unspecified)- 10 flood events	
- St. Joseph (South St. Joseph)- 1 flood events	

Severity/Magnitude/Extent

Missouri has a long and active history of flooding over the past century, according to the 2010 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 downstreamsufficient 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 as a result 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 road beds. 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

Table 3.44 lists NFIP participation for the communities in the planning area. Table 3.45 lists the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction.

Table 3.44 NFIP Participation in Buchanan County

Community ID #	Community Name	NFIP Participant (Y/N)	Current Effective Map Date	Regular- Emergency Program Entry Date
290040	Buchanan County	Y	08/01/1983	08/01/1978
290041	Agency	Y	05/01/1980	08/19/1985
290481	Lewis and Clark	Y	09/29/1978	09/29/1978
290042	Rushville	Y	(NSFHA)	08/19/1986
290043	St. Joseph	Y	09/19/1984	09/30/1977
---	Easton	N	---	---
---	DeKalb	N	---	---

(Source: NFIP Community Status Book, 9/26/2013; BureauNet, http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book; M= No elevation determined – all Zone A, C, and X: NSFHA = No Special Flood Hazard Area; E=Emergency Program)

Table 3.45 NFIP Policy and Claim Statistics as of October, 2016

Community Name	Policies in Force	Insurance in Force	Closed Losses	Total Payments
Buchanan County	77	$15,105,700	172	$5,510,580.54
Agency	4	$717,300	5	$280,180.90
Lewis and Clark Village	30	3,791,400	55	$3,560,616.46
Rushville, City of	N/A	N/A	17	$351,021.17
St. Joseph	259	$53,829,300	114	$3,791,541.15
Totals	370	$73,443,700	364	$13,503,868.22

(Source: NFIP Community Status Book, [insert date]; BureauNet, http://bsa.nfipstat.fema.gov/reports/reports.html)

The communities of Lewis & Clark Village and St. Joseph have the most in insurance payments, with $3,560,616.46 and $3,791,541.15 respectively.

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 total of 18 repetitive loss properties. As of February 2016, four properties have been mitigated, leaving 14 un-mitigated repetitive loss properties.

Table 3.46 provides a summary of the repetitive loss properties in the planning area.

Table 3.46 Buchanan County Repetitive Loss Properties

Jurisdiction	# of Properties	Type of Property	Mitigated	Building Payments	Content Payments	Total Payments	Average Payment	# of Losses
Agency	1	Single Family	Yes	$92,625.65	$7,340.95	$99,966.60	$33,322.20	3
Rushville	1	Single Family	No	$47,494.98	$12,073.00	$59,567.98	$29,783.99	2
St. Joseph	1	Assumed to be Condo	Yes	$249,406.09	$20,187.47	$269,593.56	$67,398.39	4
Rushville	1	Single Family	No	$35,700.00	$10,300.00	$46,000.00	$23,000.00	2
Rushville	1	Single Family	No	$41,301.66	$5,300.00	$46,601.66	$23,300.00	2
St. Joseph	1	Other Non-Residential	Yes	$10,329.17	$0.00	$10,329.17	$3,443.06	3
St. Joseph	1	Single Family	No	$81,632.92	$0.00	$81,632.92	$27,210.97	3
St. Joseph	1	Single Family	No	$37,411.04	$0.00	$37,411.04	$18,705.52	2
St. Joseph	1	Single Family	No	$35,581.72	$0.00	$35,581.72	$17,790.86	2
Rushville	1	Single Family	No	$34,553.80	$11,000.00	$45,553.80	$22,776.90	2
St. Joseph	1	Single Family	Yes	$4,175.66	$2,352.92	$6,528.58	$2,176.19	3
St. Joseph	1	Other Residential	No	$54,970.71	$0.00	$54,970.71	$13,742.68	4
St. Joseph	1	Other Non-Residential	No	$0.00	$35,167.55	$35,167.55	$17,583.78	2
St. Joseph	1	Single Family	No	$19,013.21	$0.00	$19,013.21	$9,506.61	2
St. Joseph	1	Other Non-Residential	No	$6,863.91	$0.00	$6,863.91	$3,431.96	2
St. Joseph	1	Single Family	No	$6,617,49	$2,092.98	$8,710.47	$4,355.24	2
St. Joseph	1	Single Family	No	$5,600.16	$0.00	$5,600.16	$2,800.08	2
St. Joseph	1	Single Family	No	$21,716.98	$4,310.10	$26,027.08	$13,013.54	2

(Source: Flood Insurance Administration as of February, 2016)

Severe Repetitive Loss (SRL): A SRL property is defined as a single family property (consisting of one-to-four residences) that is covered under flood insurance by the NFIP; and has (1) incurred flood-related damage for which four or more separate claims payments have been paid under flood insurance coverage with the amount of each claim payment exceeding $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. There are no validated Severe Repetitive Loss residential structure located in Buchanan County.

Previous Occurrences

Past Presidential Flooding Disaster Declarations in Buchanan County and their impact are listed in Table 3.47

Table 3.47 Presidential Disaster Declarations for Flood, 1975-2015

Date	Declaration #	Disaster
July 9, 1993	DR-995	Flooding, severe storm
May 6, 2003	DR-1463	Severe storms, tornado and flooding
June 11, 2007	DR-1708	Severe storms and flooding
August 17, 2010	DR-1934	Severe storms, flooding and tornado
August 12, 2011	DR-4012	Flooding

(Source: 2013 State Plan)

Tables 3.48 and 3.49 are based off NCDC information for the last 21 years for both flash and river flooding.

Table 3.48 NCDC Buchanan County Flash Flood Events Summary, 1995-2015

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
1996	1	0	0	0	0
1998	1	1	0	$500,000	0
2004	1	0	0	0	0
2005	3	0	0	0	0
2007	1	0	0	0	0
2009	1	0	0	0	0
2014	2	0	0	0	0
2015	3	0	0	0	0
Totals	13	1	0	$500,000	0

(Source: NCDC, date accessed 2016)

Table 3.49 NCDC Buchanan County Riverine Flood Events Summary, 1995-2015

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
1996	21	0	0	0	0
1997	10	0	0	0	0
1998	12	0	0	0	0
1999	13	0	0	0	0
2000	1	0	0	0	0
2001	7	0	0	0	0
2002	1	0	0	0	0
2004	8	0	0	0	0
2005	5	0	0	0	0
2006	1	0	0	0	0
2007	8	0	0	$50,000	$500,000
2008	5	0	0	0	0
Totals	92	0	0	$50,000	$500,000

(Source: NCDC, data accessed 2016)

Probability of Future Occurrence

Over the past 21 years, 92 riverine flood events have occurred. Based on this historical data, the average is (92 floods/21 years) 4.4 riverine flood events occur per year. Thus, there is a 100% chance of a riverine flood occurrence in a given year. The NCDC data does not include the flood events in 2011.

Over the past 21 years, 13 flash flood events have occurred. Based on this historical data, the average is (13 floods/21 years), .62 flash flood events occur per year. Thus, there is a 62% change of a flash flood occurrence in a given year.

Vulnerability

Vulnerability Overview

Since 1975, Buchanan County has been included in five of the 13 Presidential Disaster Declarations. Periods of heavy rain falling at the rate of one-inch per hour floods low water crossings throughout the county making many roads impassable. This creates a severe threat to motorists that attempt to drive through flood waters over the roadway. Riverine flooding occurs less frequently than flash flooding, however, there are 18 repetitive loss properties in the county and property damage is likely to continue. Areas in low lying areas outside of the floodplain are frequently flooded. Street flooding over roadways has been reported in all communities in the county. There are no school or special district facilities in SFHAs in Buchanan County. Increases in development add to surface runoff and can exacerbate flash flooding in areas that previously have not experienced flooding.

Potential Losses to Existing Development

Flood loss estimates were developed by overlaying a HAZUS 3.2 flood plain map with parcel data from the Buchanan County Accessor. Flood losses by building type by jurisdiction are presented in Table 3.50.

Table 3.50 Potential Losses for Building Type by Jurisdiction

Jurisdiction	Residential	Commercial	Agriculture	Total Building Count
Buchanan County	438	71	245	754
Agency	12	-	5	17
DeKalb	-	-	-	-
Easton	-	-	-	-
Lewis and Clark Village	18	2	1	21
St. Joseph	113	47	9	169
Unincorporated	295	22	230	547

(Source: HAZUS 3.2)

Table 3.51 provides the total exposure for structures and contents by building type and jurisdiction. Losses were estimated by applying a 5% damage factor to total exposure.

Table 3.51 Potential Losses at 5% for Building Type by Jurisdiction

Jurisdiction	Residential	Commercial	Agriculture	Other	Estimated Exposure	Estimated Loss
Unincorp. Buchanan County	$22,886,790	$5,894,814	$24,701,196	$5,099,200	$58,582,000	$2,929,100.00
Agency	$396,120	-	$285,140	$186,550	$867,810	$43,390.50
DeKalb	-	-	-	-	-	-
Easton	-	-	-	-	-	-
Lewis & Clark Village	$1,040,430	$196,820	$140,460	$399,500	$1,777,210	$88,860.50
St. Joseph	$3,552,280	$48,583,850	$1,083,400	$6,813,180	$60,032,710	$3,001,635.50
Total	$27,875,620	$54,675,484	$26,210,196	$12,498,430	$121,259,730	$6,062,986.50

(Source: HAZUS 3.2)

There are no schools or critical facilities in SFHAs.

Impact of Previous and Future Development

Future development could impact flash and riverine flooding in the planning area. Development in low-lying areas near rivers and streams or where interior drainage systems are not adequate to provide drainage during heavy rainfall events can increase the risk of flood. Future development would also increase impervious surfaces causing additional water run-off and drainage problems during heavy rainfall events.

Hazard Summary by Jurisdiction

Agency, Lewis and Clark Village, St. Joseph and some unincorporated areas in the county are at risk to flood hazards. As demonstrated in Table 3.51 exposure of assets in SFHAs varies among jurisdictions. It should be noted that all communities in Buchanan County can be impacted by flooding of major roads and low water crossings. The greatest impact of flooding is in the unincorporated part of the county and St. Joseph. Several large employers are located near the Missouri River and flooded roads and facilities could cause significant disruptions for the employers and employees. Although Buchanan County is a participant in the NFIP and can substantially regulate development in the floodplain many pre-FIRM structures remain. Due to the topography and many streams in the county, numerous low water crossings are damaged and create a significant hazard to public safety during flood events. There are no school facilities in SFHAs and no previous damages were reported on the Data Collection Questionnaire for schools. Missouri Western State University has no facilities located in SFHAs.

Problem Statement

Floods are frequent events and have been listed in five out of 13 Presidential Disaster Declarations that have included Buchanan County. All communities in the county participate in the NFIP. These communities have passed floodplain management ordinances and have the ability to substantially regulate development in the floodplain. Their participation in the NFIP enables residents to purchase flood insurance. Street flooding in incorporated areas can be addressed through storm water management projects and enforce stormwater management regulations.

3.4.7 Land Subsidence/Sinkholes

Hazard Profile

Hazard Description

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 sudden collapse of land surface above them can be dramatic and range in size from broad regional lowering of the land surface to localized collapse.

The primary cause of most subsidence is human activities. These include mining of coal, ground water or petroleum withdrawal, and drainage of organic soils. Sinkholes can also form as a result 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 general rule. On occasion, it can occur abruptly, as in the sudden formation of sinkholes. Sinkholes or potential sinkholes can be triggered or aggravated by flooding.

As 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 openings 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 collapses will occur. Sinkholes range in size from several square yards to hundreds of acres and may be quite shallow or hundreds of feet deep.

Previous Occurrences

In St. Joseph, Missouri, located in Buchanan County a sinkhole was recorded. It was a manmade sinkhole that caused minimal property damage (Source: http://www.stjoechannel. com/news/ local-news/sewer-line-to-blame-for-sinkhole).

Location

Sinkholes are a common hazard in southern Missouri, but also occur in the central and northeastern parts of the state. However, they are not common in northwest Missouri, where Buchanan County is located.

Buchanan County does experience soil erosion. This can happen during periods of heavy rain and road crossings can wash out.

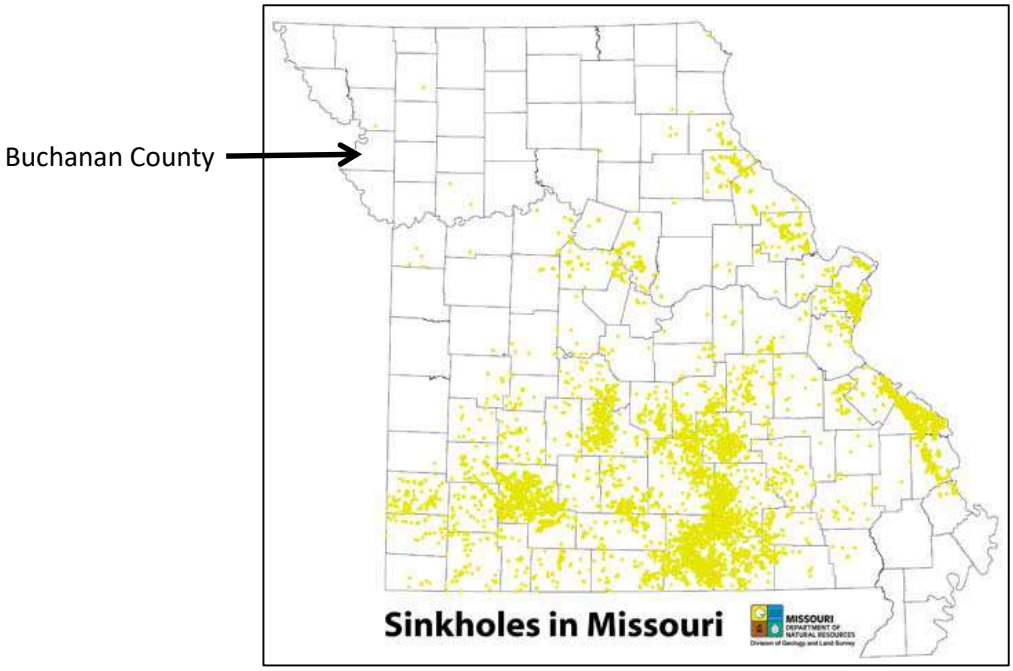
Severity/Magnitude

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 the community’s groundwater system. Sinkhole collapse can be triggered by large earthquakes.

Sinkholes located in floodplains can absorb floodwaters, making detailed flood hazard studies difficult to model.

In Missouri, the likelihood of a sinkhole event is moderate. Missouri sinkholes have not historically had major impacts on developments nor have they caused serious damage. Figure 3.52 shows that there are no natural sinkholes recorded in Buchanan County.

Figure 3.52 Sinkholes in Missouri



(Source: 2013 State Plan)

Probable Risk

Even though Missouri has a moderate probability of a sinkhole event, the soil and subsoil structure of Buchanan County make significant land movement events unlikely.

Vulnerability

Vulnerability Overview

Buchanan County has not experienced any sinkhole events, besides one man-made event.

Problem Statement

Even though the county has not experienced any sinkhole events jurisdictions should be mindful that an event could occur.

3.4.8 Levee Failure

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" (http://content.asce.org/ASCELeveeGuide.html). 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).

Agricultural levees and other non-regulated levees exist within the planning area but are not inventoried or inspected. These levees that are not designed to provide protection from the 1% annual chance flood would overtop or fail in the 1% annual chance flood scenario. Therefore, any associated losses would be taken into account in the loss estimates provided in the Flood Hazard Section.

In 2004, as it initiated work under the Flood Map Modernization Initiative (Map Mod), FEMA determined that analysis of the role of levees in flood risk reduction would be an important part of the mapping efforts. A report issued in 2005 noted that the status of the Nation's levees was not well understood and the condition of many levees and floodwalls had not been assessed since their original inclusion in the NFIP. As a result, FEMA established Procedure Memorandom 34 and 43 to address the status of existing levees. As DFIRMs are developed, levees fall under one of the three categories. Provisionally Accredited Levee (PAL) is the category that all three of Buchanan County's levees are under. PAL is if data and documentation is not readily available, and no known deficiency precludes meeting requirements of 44 CFR 65.10, FEMA can allow the party seeking recognition up to two years to compile and submit full documentation to show compliance with 44 CFR 65.10. During this two-year period of provisional accreditation, the area behind the levee will be mapped as moderate-risk with no mandatory flood insurance purchase requirement (Source: 2013 State Plan).

Buchanan County's current levee system was constructed in the 1960s and the series of levees on both the left and right side were designed as a single system. The left bank levee (Unit L-455) is the east side of the Missouri River, protecting St. Joseph and unicorporated parts of Buchanan County. The right bank levee (Unit R471-460) is the west side of the Missouri River, and protects Rosecrans Memorial Airport, the Missouri National Guard 139th Airlift Wing base and Elwood, KS. There are three levee districts that are responsible for operating and maintaining the levee system. The South St. Joseph Levee and Drainage District and Halls Levee District are responsible for the left bank system and St. Joseph Airport Levee District and Elwood-Gadden Drainage District (a Kanasas entity) are each responsible for various sections o fthe right bank unit (Source: http://www.stjoemo.info/DocumentCenter/View/4412). Table 3.53 list the levee districts and relevant information. Buchanan County has preliminary FIRMs from 1983/84 with levees noted on them. The preliminary FIRMs are awaiting adoption. These can be found in Appendix B. Panels 20, 75 and 125 show levees along the left and right banks of the Missouri River.

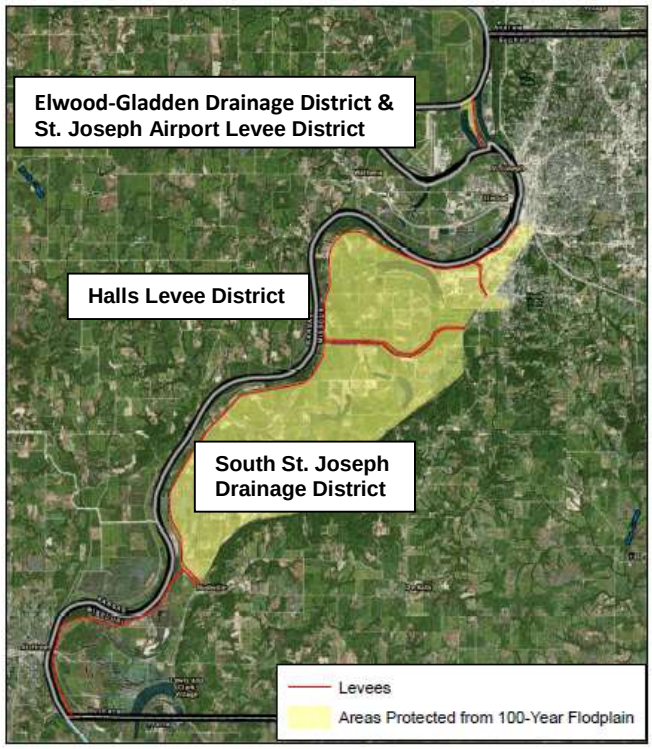
Table 3.53 Accredited Levees in Buchanan County

Primary Community Protected	Levee Owner	Corps Program Levee	Levee Status	Length (Miles)	Inspection Rating	Leverage Area
Buchanan County Unincorporated Areas	Halls Levee District	Yes	PAL	17.45	Minimally Acceptable	17,363.30
St. Joseph & Buchanan County Unincorporated Areas	South St. Joseph Drainage District	Yes	PAL	15.68	Minimally Acceptable	7,739,68
Elwood, Troy and St. Joseph	Elwood-Gladden Drainage District and St. Joseph Airport Levee District	Yes	-	13.8	Minimally Acceptable	13,172.08

(Source: 2013 State Plan)

Figure 3.54 shows the levees, levee districts and the areas protected from the 1% annual chance flood on the preliminary FIRM. Lake Contrary Elementary School is located in the protected area.

Figure 3.54 County Levees Shown on DFIRM as Providing Protection from the 1-Percent Annual Chance Flood



(Source: HAZUS 3.2)

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% annual chance flood likely do exist in the planning area. However, none of these levees are shown on the Preliminary FIRM, 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% 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. The first is routine inspection, which 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. The second is a periodic inspection, which 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. Table 3.55 below defines the three ratings.

Table 3.55 Definitions of the Three Levee System 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.

None of the levees in the planning area are currently rated unacceptable (Source: 2013 State Plan). However, in 1999 FEMA decertified the right bank levee since it was deemed unable to provide protection from a 100 year flood.

Previous Occurrences

The Rosecrans Memorial Airport, Missouri National Guard 139th Airlift Wing base, industrial areas and a significant part of Elwood, KS flooded in 1993 after the right bank levee overtopped and breached. The left bank levee held but preventative measures, including sandbagging, at several points occurred. The damages were estimated at $98 million. The levees were repaired and protected the area during the Missouri River floods in 2007, 2008, 2010 and 2011. In 2007 the flood was predicted to overtop the levee but did not. In 2011 the water level was 18 inches for approximately 120 days.

Probability of Future Occurrence

There is a lack of a centralized database for Missouri levees so the actual number of years and levee failure events can be difficult to determine and, therefore difficult to calculate an accurate probability. Buchanan County, by best estimates, has experienced one levee failure in 20 years, which equals a 5% probability of a levee failure in the planning area in any given year. It must be noted that the right bank levee has been decertified, although it shows a minimally acceptable inspection rating in the 2013 State Plan. FEMA has deemed it unable to protect the area from a 100-year flood. Although there has been only one levee breach event recently recorded, there have been several near over toppings and preventative actions, such as sandbagging.

Vulnerability

Vulnerability Overview

The 2013 State Plan determines the population and building count vulnerable to damage if levee segments were to fail. The "Area Protected by Levees" feature class from the FEMA Midterm Levee Inventory was overlaid on census block – level buildings and population data from US Census 2010. As the vulnerability analysis of levee failure in this plan is limited to levees indicated as providing protection from 100-year or higher base flood level, protected area polygons were extracted for levees with a stated level of protection for the 100-year flood or greater. The overlay was performed using proportional division (so that if the levee protected area covers a fraction of a census block, that fraction of the building or population data is counted in the exposure), the building and contents value, building count and population exposure was calculated.
In the event of a levee failure 2,117 people and 1,034 buildings would be at risk.

Potential Losses to Existing Development

The 2013 State Plan based a depth-damage percentage of 50%, the building loss estimate for failure of levee segments designed to provide 100-year flood protection. The estimated loss of 50% for Buchanan County is $93,887,721. Local estimates put the loss at approximately $6 million higher.

The map in Figure 3.56 depicts locations of levees in Missouri. The integrated MLI-NLD dataset is used for the geometry of the levees and the map is symbolized to distinguish between levees that provide protection against 100 year flood and levees that provide lower levels of flood protection. The red lines indicate levees that do not provide flood protection, while blue lines indicate levees that do provide flood protection.

Figure 3.56 Levee Locations in Buchanan County

(Source: 2013 State Plan)

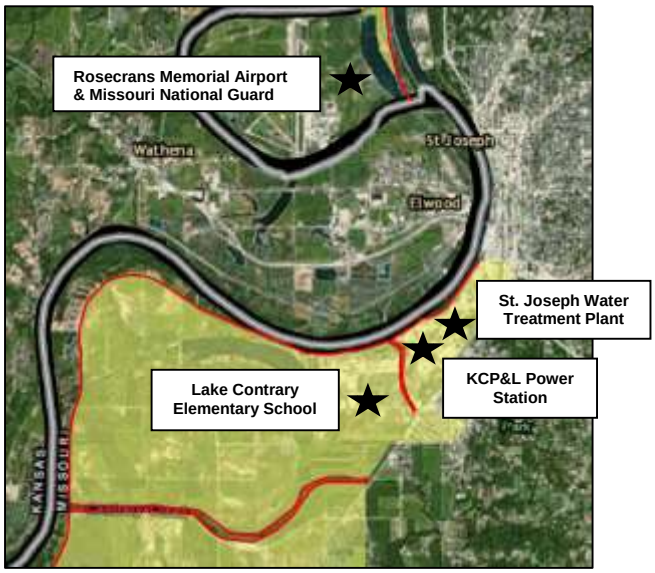
Impact of Previous and Future Development

Additional development would result in the exposure of more households and businesses vulnerable to damages from levee failure.

Hazard Summary by Jurisdiction

The area impacted by a levee failure would be St. Joseph and the unincorporated areas along the Missouri River. The Kansas communities of Elwood and Troy would also be impacted. Facilties located in protected areas include Rosecrans Memorial Airport, the Missouri National Guard 139th Airlift Wing base, St. Joseph's wastewater treatment plant, KCP&L power generation station and Lake Contrary Elementary School, as shown in Figure 3.57. St. Joseph has significant amount of industry also located in the levee protected area.

Figure 3.57 Facilities in the Levee Protected Area



(Source: HAZUS MH 3.2)

Problem Statement

A levee failure would be a devastating event for the impacted areas. After several instances of levee overtopping nearly occurring and the decertification of the right levee, Buchanan County voters passed a four-year, quarter cent, sales tax levy in August 2016 to pay a portion of the Missouri River levee repairs. The levy passed with 77% voting in favor of the sales tax. The $70.7 million project cost will be shared by the federal government, State of Missouri, USACE, local levee districts, St. Joseph, Buchanan County and the funds generated from sales tax. This is a significant mitigation measure that supports the plan's first goal to protect the lives, property and livelihood of all citzens. However, as Figure 3.56 shows, there are other areas along the Missouri River in Buchanan County not protected by levees. This may be a topic to explore by the MPC at the next plan update.

3.4.9 Thunderstorm/High Winds/Lightning/Hail

Hazard Profile

Hazard Description

A thunderstorm is formed from a combination of moisture, rapidly rising warm air and a force capable of lifting air such as warm or cold fronts, a sea breeze or a mountain. Nearly 1,800 thunderstorms are in progress over the surface of the earth at any time. The United States experiences 100,000 thunderstorms each year. Approximately 1,000 tornadoes develop from these storms. At any given moment across the world, there are about 1,800 thunderstorms occurring.

Thunderstorms

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. Severe thunderstorms in Missouri most often occur 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 (discussed separately in Section 3.4.6) and tornadoes (discussed separately in Section 3.4.10).

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 of precipitation. In fact, lightining has been known to fall more than 10 miles away from the rainfall area. Lightning is a 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 an extremely cold atmosphere causing them to freeze. The raindrops then form into small frozen droplets. They continue to grow as they come into contact with super-cooled water which will freeze on contact with the frozen rain droplet. 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 to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 miles per hour, while a 2 ¾" 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

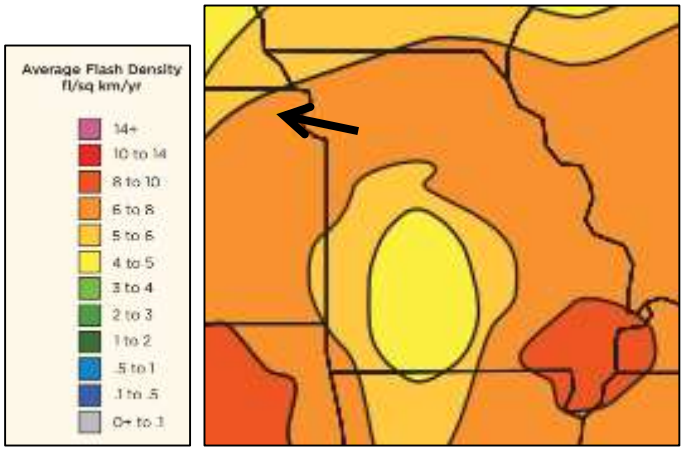
eight inches in diameter, almost the size of a soccer ball. Soccer-ball-sized hail is the exception, but even small pea-sized hail can do damage.

Geographic Location

The area of Buchanan County is at risk for thunderstorms.

Figure 3.58 shows lightning frequency in the state. Buchanan County is identified with an arrow. It is located in the orange zone on the map, indicating a six to eight average flash density per square kilometer per year. Much of the state is in the same zone.

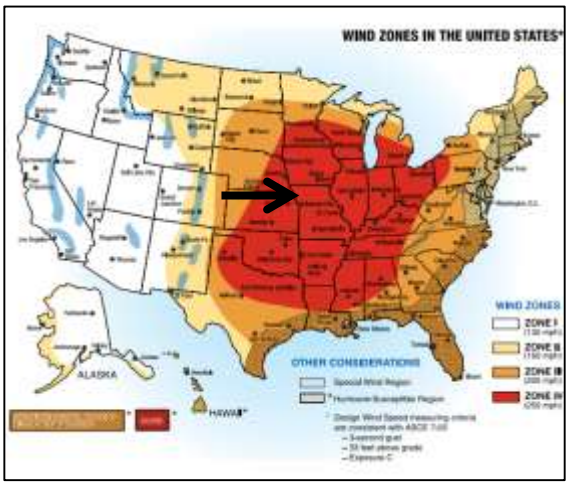
Figure 3.58 Location and Frequency of Lightning in Missouri



(Source: http://www.lightningsafety.noaa.gov/stats/08_Vaisala_NLDN_Poster.pdf)

Figure 3.59 shows wind zones in the United States. Buchanan County is identified with an arrow. It is located in the red zone, Zone IV, on the map. Winds can reach 250 miles per hour in this zone.

Figure 3.59 Wind Zones in the United States



(Source: FEMA 320, Taking Shelter from the Storm, 3rd edition, http://www.weather.gov/media/bis/FEMA_SafeRoom.pdf)

Severity/Magnitude/Extent

Severe thunderstorm losses are usually attributed to the associated hazards of hail, 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 making federal assistance necessary. Hail and wind 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 destroy plants 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, occacionally fatal, to humans.

In general, assets in Buchanan County vulnerable to thunderstorms with lightning, high winds, and hail include people, crops, vehicles, and 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 financial impact on jurisdictions is reduced.

Most lightning damages occur to electronic equipment located inside buildings. 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 rendered useless by lightning strikes.

Based on information provided by the Tornado and Storm Research Organization (TORRO), Table 3.60 below describes typical damage impacts of the various sizes of hail.

Table 3.60 Tornado and Storm Research Organization Hailstorm Intensity Scale

Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	5-9	0.2-0.4	Pea	No damage
Potentially Damaging	10-15	0.4-0.6	Mothball	Slight general damage to plants, crops
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 > squash ball	Widespread glass damage, vehicle bodywork damage
Destructive	41-50	1.6-2.0	Golf ball > Pullet's egg	Wholesale destruction of glass, damage to tiled roofs, 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 > cricket ball	Severe roof damage, risk of serious injuries
Destructive	76-90	3.0-3.5	Large orange > Soft ball	Severe damage to aircraft bodywork
Super Hailstorms	91-100	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
Super Hailstorms	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even 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. http://www.torro.org.uk/site/hscale.php

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, that 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 3.61 through Table 3.63) summarize past crop damage as indicated by crop insurance claims, as well as the magnitude of the impact on the planning area's agricultural economy. Thunderstorms were not listed as the cause of loss for any insurance claims in Buchanan County from 2011 – 2015.

Table 3.61 Crop Insurance Claims Paid in Buchanan County from High Winds, 2011-2015

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2013	Grain sorghum	Wind/Excess Wind	$5,449.00
2011	Corn	Wind/Excess Wind	$4,634.00
2011	Corn	Wind/Excess Wind	$9,395.00
2011	Soybeans	Wind/Excess Wind	$20,780.00
Total			$40,258.00

(Source: USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.html)

Table 3.62 Crop Insurance Claims Paid in Buchanan County from Lightning, 2011-2015

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2014	Soybeans	Other (snow, lightning, etc.)	$10,814.80
2013	Corn	Other (snow, lightning, etc.)	$374.00
Total			$11,188.80

(Source: USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.html)

Table 3.63 Crop Insurance Claims Paid in Buchanan County from Hail, 2011-2015

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2014	Soybeans	Hail	$508.20
2014	Soybeans	Hail	$27,248.00
2012	Corn	Hail	$49,518.00
2011	Corn	Hail	$37,911.00
2011	Soybeans	Hail	$16,483.00
2011	Burley Tobacco	Hail	$13,236.00
2011	Burley Tobacco	Hail	$38,242.00
Total			$183,146.20

(Source: USDA Risk Management Agency, http://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.

Previous Occurrences

The tables below include NCDC reported events and damages for the past 10 years for thunderstorms, wind, and hail. There were no NCDC reported events during the past 10 years for lightning. One limitation of NCDC reported lightning events is the fact that only those that result in fatality, injury, and/or property and crop damage are reported.

There were 30 recorded thunderstorm wind events in Buchanan County, causing two injuries and $127,000 in property damage. Table 3.64 lists only thunderstorm wind events resulting in injuries or property damage.

Table 3.64 NCDC Thunderstorm Wind Events in Buchanan County, 2006-2015

Jurisdiction	Date	Wind Speed (in knots)	Injuries	Propery Damage
Lake Contrary	11/16/2013	61 kts.	0	$10,000
St. Joseph	09/01/2013	52 kts.	0	$7,000
Hurlingen	05/19/2013	61 kts.	0	$2,000
Industrial City	08/18/2011	61 kts.	0	$15,000
Lake Contrary	06/19/2010	77 kts.	0	$40,000
Lake Contrary	06/19/2010	70 kts.	0	$20,000
Agency	06/10/2009	61 kts.	0	$2,000
Winthrop	06/10/2009	52 kts.	2	$1,000
St. Joseph	06/08/2008	65 kts.	0	$25,000
St. Joseph	08/25/2007	60 kts.	0	$1,000
Faucett	08/25/2006	52 kts.	0	$2,000
Total			2	$127,000

(Source: NCDC, https://www.ncdc.noaa.gov/stormevents)

There were 22 recorded hail events in Buchanan County, with no injuries or property damage reported. Table 3.65 lists only the hail events with hail over one inch in diameter.

Table 3.65 NCDC Thunderstorm Hail Events in Buchanan County, 2006-2015

Jurisdiction	Date	Size (in inches)	Injuries	Property Damage
DeKalb	06/21/2015	2.75 in.	0	0
Saxton	11/16/2013	1.25 in.	0	0
St. Joseph	06/30/2012	1.25 in.	0	0
Hurlingen	05/21/2011	1.75 in.	0	0
Halls	04/03/2011	1.25 in.	0	0
South St. Joseph	05/07/2010	1.25 in.	0	0
South St. Joseph	05/07/2010	1.75 in.	0	0
St. Joseph (Mem A)	05/15/2009	1.50 in.	0	0
DeKalb	05/01/2008	1.75 in.	0	0
St. Joseph	03/12/2006	1.25 in.	0	0
St. Joseph	03/12/2006	1.75 in.	0	0
Total			0	0

(Source: NCDC, https://www.ncdc.noaa.gov/stormevents)

Table 3.66 NCDC High Wind/Strong Wind Events in Buchanan County, 2006-2015

Jurisdiction	Date	Wind Speed (in knots)	Injuries	Property Damage
Buchanan County	11/11/2015	52 kts.	0	0

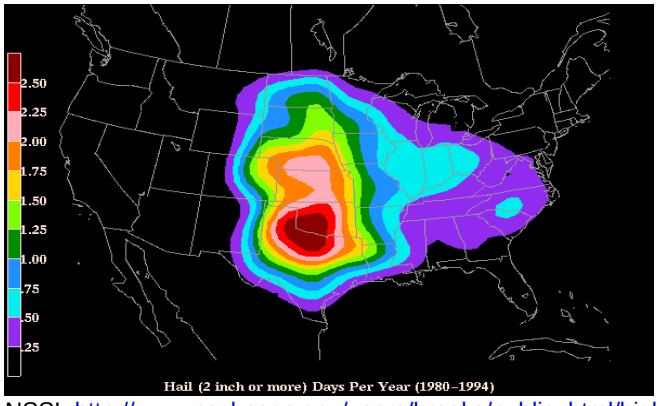
Probability of Future Occurrence

Thunderstorm Wind
There have been 30 recorded thunderstorm wind events over a 10-year period from 2006 to 2015. This equates to three thunderstorm wind events in any given year with a 100% probability of occurrence. There was one event that resulted in two injuries and 11 events resulted in $127,000 of property damage. This equates to 1.1 damaging events per year with annualized losses of $12,700.

Hail
There have been 22 recorded hail events over a 10-year period from 2006 to 2015. This equates to 2.2 hail events in any given year with a 100% probability of occurrence. There were no reports of damage or injuries from the NCDC database so there are no annualized losses.

Figure 3.67 is based on hailstorm data from 1980-1994. It shows the probability of hailstorm occurrence (2" diameter or larger) based on number of days per year. Buchanan County is located in the light green zone, indicating the county's probability of hailstorm with 2" diameter or larger hail is 1.25 to 1.50 days per year.

Figure 3.67 Annual Hailstorm Probability (2'' diameter or larger), 1980-1994



(Source:NSSL,http://www.nssl.noaa.gov/users/brooks/public_html/bighail.gif)

Wind

There has been one recorded high/strong wind report over a 10-year period from 2006-2015. This equates to 10% probability of a high/strong occurance in any given year. There were no reports of high/strong wind causing injuries or property damage. Thus, there are no annualized losses.

Vulnerability

Vulnerability Overview

Severe thunderstorms are a common occurrence in Buchanan County. Wind, hail, and lightning are all contributing elements of severe thunderstorms. The 2013 State Plan focused on damaging winds in excess of 67 miles per hour (58 knots), hail in excess of 0.75 inches or larger and damaging lightning strikes to analyze vulnerability, risk, and estimated losses to this hazard.

The method used to determine vulnerability to severe thunderstorms was statistical analysis of data from several sources: National Climatic Data Center (NCDC) storm events data (1993 to December 31 2012), Crop Insurance Claims data from USDA's Risk Management Agency (2009-2012), U.S. Census Data (2010), USDA's Census of Agriculture (2007), and the calculated Social Vulnerability Index for Missouri Counties from the Hazards and Vulnerability Research Institute in the Department of Geography at the University of South Carolina. Table 3.68 provides the housing density, building exposure, crop exposure, and social vulnerability data. These are the common data elements for the analysis of wind, hail, and lightning with one exception; the lightning analysis did not consider crop exposure as crop loss is an unlikely result of lightning events. Table 3.69 provides additional statistical data compiled for vulnerability analysis from the 2013 State Plan.

Table 3.68 Housing Density, Building Exposure and Crop Exposure Data

Jurisdiction	County Housing Units/sq. mi.	Total Building Exposure ($)	Crop Exposure (2007 Census of Agriculture)*	Social Vulnerability Index (1-5)
Buchanan County	94.2	$9,701,152,000	$43,096,000	4

(Source: 2013 State Plan)

Table 3.69 Additional Statistical Data Compiled for Vulnerability Analysis

Jurisdictions	County Annualized Property Loss and Crop Claims-Wind ($)	Annualized Property Loss and Crop Claims-Hail ($)	Annualized Property Loss-Lightning ($)	Combined Annualized Losses (wind, hail, lightning) ($)
Buchanan County	$76,769.36	$38,256.88	$0.00	$115,026

(Source: 2013 State Plan)

Potential Losses to Existing Development

The average annual loss determined from historical losses for high wind and hail are indicators of the potential losses to existing development. High wind events in Buchanan County have damaged private property and commercial buildings. Based on the $127,000 loss from thunderstorm wind damage recorded in the NCDC database from 2006-2015, potential losses for future events is annualized at $12,700.

Previous and Future Development

Additional development would result in the exposure of more households and businesses vulnerable to damages from severe thunderstorms/high winds/lightning/hail.

Hazard Summary by Jurisdiction

Although thunderstorms/high winds/lightning/hail events are area-wide, there may be demographics indicating higher losses in one jurisdiction as compared to another. Structures built before 1939 are considered to be more vulnerable to the impact of high wind and hail damage. Please see page Table 3.19 for ages of structures in jurisdictions in Buchanan County.

Risk to new development is somewhat mitigated by IBC 2012 building codes.

Problem Statement

Poorly built structures, barns, outbuildings are more vulnerable to the impact of high winds during thunderstorms. High winds can topple utility poles and lead to power outages. Both high winds and hail can damage roofs. Hail can also damage crops and dent cars and trucks. People are also at risk of injury and death during high wind events. Crop insurance mitigates the risk to farmers and the agriculture sector within the county.

The risk of injury and death in the county can be mitigated by identifying safe refuge areas in public buildings, nursing homes and other facilities that house vulnerable populations that do not have a saferoom. Retrofitting school district facilities to better withstand high winds will provide more protection for students and staff. Additional warnings and alerts will also provide the public and schools more time to take cover during high wind events. Education and hazard awareness programs would also increase public safety in the event of severe thunderstorm events.

3.4.10 Tornado

HazardProfile

Hazard Description

National Weather Service (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 not associated with tornadoes are profiled separately in this document in Section 3.4.9, Thunderstorm/High Wind/Hail/Lightning.

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 upwards of 300 miles and can be up to a mile wide. The NWS, 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

In contrast to thunderstorms, which can cause widespread damage, tornadoes represent a hazard that is a more defined area. With this tradeoff of a smaller impact area, the damage will be much more catastrophic. The geographic location in which these tornadoes have occurred in the past will be discussed in previous occurrances. The numbers on the markers correspond with the class of tornado.

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 which becomes airborne shrapnel that causes additional damage. If wind speeds are high enough, debris 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 3.70) 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.

Table 3.70 Enhanced F Scale for Tornado Damage

FUJITA SCALE			DERIVED EF SCALE		OPERATIONAL EF SCALE	
F Number	Fastest ¼-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	EF Number	3 Second Gust (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

(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 in Table 3.71. 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.

Table 3.71 Enhanced Fujita Scale with Potential Damage

Enhanced 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 levelled; cars thrown and small missiles generated.
EF5	>200	<0.1%	Explosive. Strong frame houses levelled 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.

(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 for a number of reasons, if they occur after sundown, or if a high amount of dust or heavy rain and hail.

Previous Occurrences

Table 3.72 includes NCDC reported tornado events and damages since 1995 in the planning area. Prior to that date, only destructive tornadoes were recorded

There are limitations to the use of NCDC 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 NCDC. Also, a tornado that lifts off the ground for less than five minutes or 2.5 miles is considered a separate segment. If the tornado lifts off the ground for greater than five minutes or 2.5 miles, it is considered a separate tornado. Tornadoes reported in Storm Data and the Storm Events Database are in segments.

Table 3.72 Recorded Tornadoes in Buchanan County, 1995 - 2015

Date	Beginning Location	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damages
7/4/1995	N St Joseph	----	0.1	10	----	0	0	$12,000	0
9/20/2001	ST JOSEPH	ST JOSEPH	0.1	0.2	F0	0	0	0	0
9/20/2001	ST JOSEPH	ST JOSEPH	0.1	0.2	F0	0	0	0	0

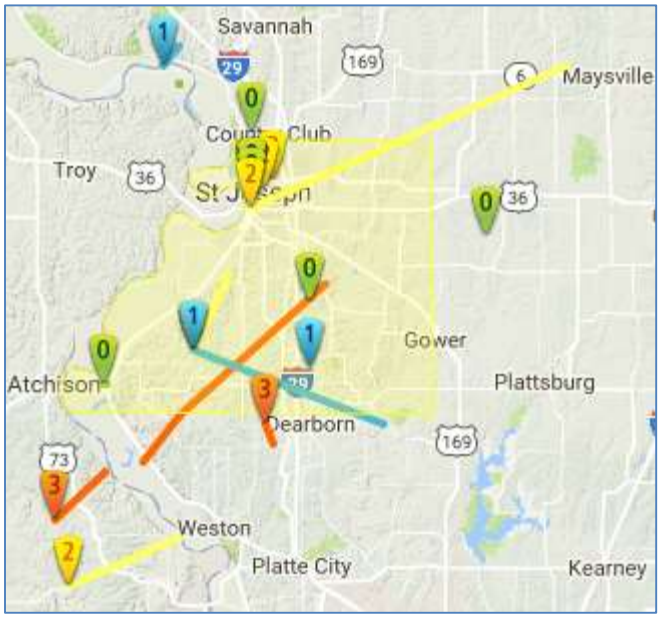
9/20/2001	ST JOSEPH	ST JOSEPH	0.1	0.2	F0	0	0	0	0
9/20/2001	EASTON	EASTON	0.1	0.2	F0	0	0	0	0
5/29/2004	DE KALB	DE KALB	5	400	F3	0	0	0	0
5/29/2004	AGENCY	AGENCY	0.2	50	F0	0	0	0	0
6/4/2005	ST JOSEPH	ST JOSEPH	7.5	50	F0	0	0	$300,000	0
4/10/2008	ST JOSEPH	ST JOSEPH	0.33	30	EF0	0	0	$70,000	0
	Totals	----	13.53	540.8	----	0	0	$490,000	0

(Source: National Climatic Data Center, http://www.ncdc.noaa.gov/stormevents/)

There were 10 tornado events recorded in the NCDC database from 1995-2015. Fortunately, the damages from these events resulted in no deaths, injuries or crop damage. There was $490,000 in property damage.

Figure 3.73 shows historic tornado paths in the planning area.

Figure 3.73 Buchanan County Map of Historic Tornado Events



(Source: Missouri Tornado History Project, http://www.tornadohistoryproject.com/tornado/Missouri)

USDA Risk Management Agency has no insurance payments in Buchanan County for crop damages as a result of tornadoes from 2012 - 2015.

Probability of Future Occurrence

According to the NCDC, 10 tornados have occurred during the 21 year period from 1995 to 2015 resulting in a probability percentage of 48% chance of a tornado of any magnitude event in the planning area in any given year.

Vulnerability

Vulnerability Overview

Tornado Alley refers to the area of the United States where tornadoes are most likely to occur. Some view it as the area where the most dangerous tornadoes occur, such as F4 and F5 tornadoes on the

Fujita rating system, this is not necessarily true. Most dangerous tornadoes are sporadic. Tornado Alley is in reference to the most frequently reported tornadoes. Figure 3.74 refers to this area known as Tornado Alley. This area averages three tornadoes or more per year per 10,000 square miles in general.

Buchanan County is located in the center of Tornado Alley, which poses a high risk for future tornadoes.

Figure 3.74 Tornado Alley in the U.S.

(Source: http://www.tornadochaser.net/tornalley.html)

The 2013 State Plan looked at four factors to determine tornado vulnerability. This vulnerability analysis measured the likelihood of future tornado impacts, average annual property loss ratio (total building exposure value divided by average annualized historic losses), population change (percent change), and housing change (percent change). Scales were created to rank these factors: likelihood (1- 3), loss ratio with exposure as of 2012 (1-3), population change from 2000 - 2010 (1-3), housing change from 2000-2010 (1-3). The factor scores were added up for each county for the purposes of ranking the counties by total vulnerability. This approach attempts to identify where tornadoes could have the greatest impacts. Devastating tornadoes could still impact counties that ranked lower in this process. For this reason, the low end of the risk is still considered Moderate and the top end Very High. Counties with a total risk score of 8 to 9 were considered to be at very high risk. Buchanan County is considered to have Moderate risk. The State's data shows a 34.15% likelihood of occurance in a year.

Potential Losses to Existing Development

During the 21-year period from 1995 to 2015, a total of $490,000 in property losses equates to $23,333.33 in average annual losses countywide.

Hazus MH 3.2 was used to model the damage that could occur in St. Joseph in the event of a tornado, a scenario was created in which an EF3 tornado event occurs in the east-central portion of the city. The parameters of the tornado are as follows:

- The length of the tornado's path is approximately three miles

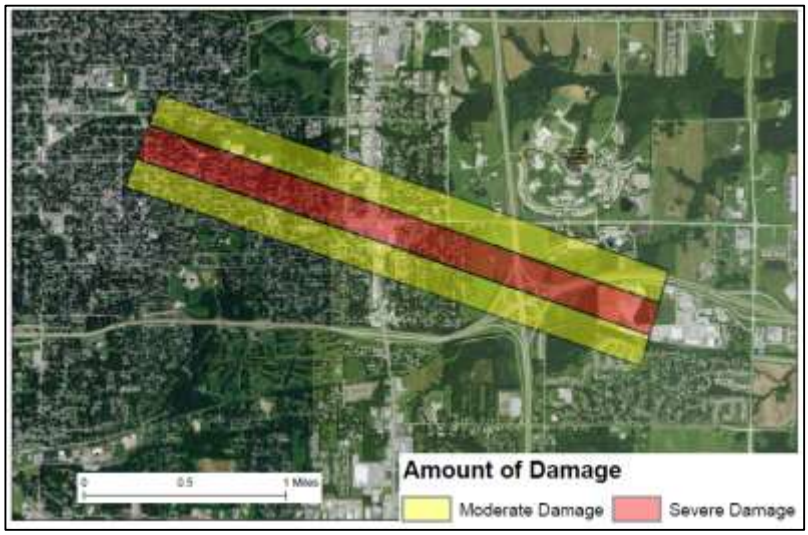
- The tornado is a half-mile in width, with the center of the path causing more severe damage (See Figure 3.75)
- Wind speeds of EF3 tornadoes are typically between 136 and 165 miles per hour

The tornado path encompasses a total of over 2,000 structures. Most of these structures are single-family dwellings, but commercial retail facilities, gas stations, schools, industrials facilities, a church, and multi-family dwellings can also be found in the tornado path. 895 residential structures in the path are valued at less than $50,000, which indicates a higher risk of damage. The area also contains a large amount of homes that are over the age of 25, another indicator of high risk.

To estimate damage from this tornado, dollar exposure amounts from the county parcel layer were multiplied by likely damage coefficients, dependent upon the type of structure and whether the structure is in the path of severe or moderate damage. In the path of severe damage, residential dwellings valued at less than $50,000 were assumed to be completely destroyed (100% replacement cost). The exposure for other residential dwellings and commercial structures were multiplied by 0.75, since extreme damage is likely to occur. In the path of moderate damage, exposures for residential dwellings of less than $50,000 were multiplied by 0.75, and all other structure exposures were multiplied by 0.5.

In the event of an EF3 tornado in east-central St. Joseph, the city would see approximately $81,548,000 in damage.

Figure 3.75 Model of EF3 Tornado Scenario in St. Joseph



(Source: Hazus MH 3.2)

In the 2013 State Plan, a statistical vulnerability methodology was used to determine annualized tornado losses by county. This methodology used the National Climatic Data Center data for tornado losses between 1950 and July 31, 2012. It is important to realize that one limitation to this data is that many tornadoes that might have occurred in uninhabited areas, as well as some in inhabited areas, may not have been reported. The incompleteness of the data suggests that it is not appropriate for use in parametric modeling. In addition, NOAA data cannot show a realistic frequency distribution of different Fujita scale tornado events, except for recent years. Thus a parametric model based on a combination of many physical aspects of the tornado to predict future expected losses was not used. The statistical model used for this analysis was probabilistic based purely on tornado frequency and historic losses. It is based on past experience and forecasts the expected results for the immediate or extended future. The approach to the 2013 update of tornado risk in Missouri included an update

of the tornado events and annualized losses and an enhanced analysis and representation of the risk assessment results. The number of tornado occurrences was updated by adding the events that have been reported in each county since July 31, 2009 (through July 31, 2012). According to the 2013 State Plan, Buchanan County's exposure is $9,701,152,000 and annualized losses is $109,278.

Previous and Future Development

Development may result in an increase in population in terms of increased exposure to damage. Due to the vulnerability of mobile homes to tornado and high wind damage, St. Joseph has specific permit requirements for mobile homes. As expansion occurs, Buchanan County and St. Joseph's EMD monitor the warning siren coverage area.

Hazard Summary by Jurisdiction

In Buchanan County, a tornado could occur due to its location in Tornado Alley and historical precedence. The county also has an at-risk population of homes that are valued below $50,000 (2,976) and mobile homes (1,575) that are at a higher risk yet. These homes are at risk due to the fact that they could have weak structural protection from high winds associated with tornados due to their low value, or may not have foundation.

Homes that are over 25-years old also face the risk of older building codes and deteriorating structure. A tornado, of any magnitude, could have a large, adverse impact on these homes. Because a significant number of homes in Buchanan County are over 25 years old, the impact of a tornado would be substantial. Please see Table 3.29 for the ages of homes of jurisdictions in Buchanan County.

A tornado event could occur anywhere in the planning area, but some jurisdictions, such as St. Joseph would suffer heavier damages because of the age of the housing, concentration of buildings and higer number of mobile homes (Source: www.factfinder.census.gov). School district assets are also at risk from tornados. The Mid-Buchanan School District constructed a tornado shelter with funding from a 2011 FEMA mitigation grant. The shelter can accommodate 1,100 people and is available to the public for shelter during tornado and high wind events.

Problem Statement

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. Over the past 21 years significant tornado events in Buchanan County have resulted in zero deaths, injuries and crop insurance claims, but $490,000 in property damage. Information in the 2013 State Plan indicates that Buchanan County has an very high vulnerability to tornados based on frequency of occurrence and previous damages.

The risk of property damage, injury, and death in the county can be mitigated by constructing FEMA saferooms in facilities that house vulnerable populations such as nursing homes government buildings, and schools. In addition, identifying safe refuge areas in public buildings, nursing homes and other facilities that house vulnerable populations that do not have a saferoom. Retrofitting school district facilities with protective filming of windows and installation of blast proof doors will provide more protection for students and staff at school facilities. Additional warnings and alerts will also provide the public and schools more time to take cover during tornado. In addition, public safety fairs provide an opportunity to disseminate information to homeowners about individual saferoom construction in homes. Cities can adopt or update and enforce IBC 2012 building codes that include construction techniques such as roof tie down straps for mobile homes to mitigate damage to future development.

3.4.11 Winter Weather/Snow/Ice/Severe Cold

Hazard Profile

Hazard Description

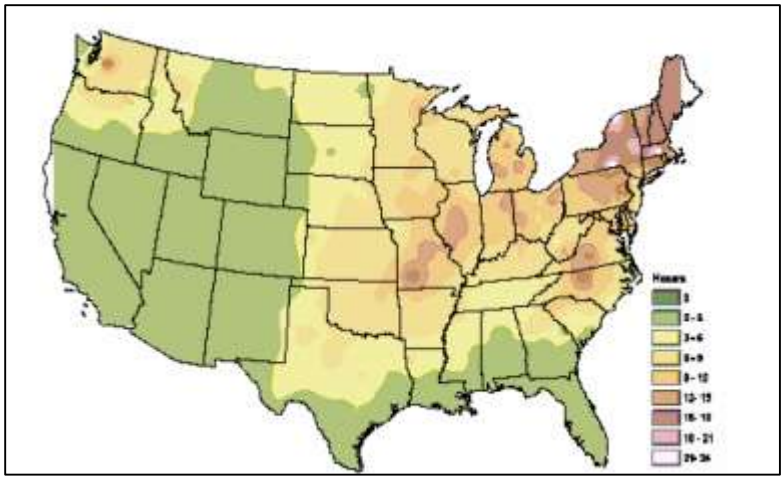
A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows.

- Blizzard Winds are 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 is 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 are brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- Snow Showers are snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- Freezing Rain is 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 sunrise between the months of December and March.
- Sleet is 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. Figure 3.76 shows the zones of avarge number of hours of freezing rain per year. Buchanan County is located in the light yellow zone, indicating that the county receives three to six hours of freezing rain per year.

Figure 3.76 NWS National Average Number of Hours per Year with 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 and especially vulnerable to hypothermia, with the isolated elders being most at risk. About 10% of people over the age of 65 have some kind of bodily temperature-regulating defect, and 3-4% 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.

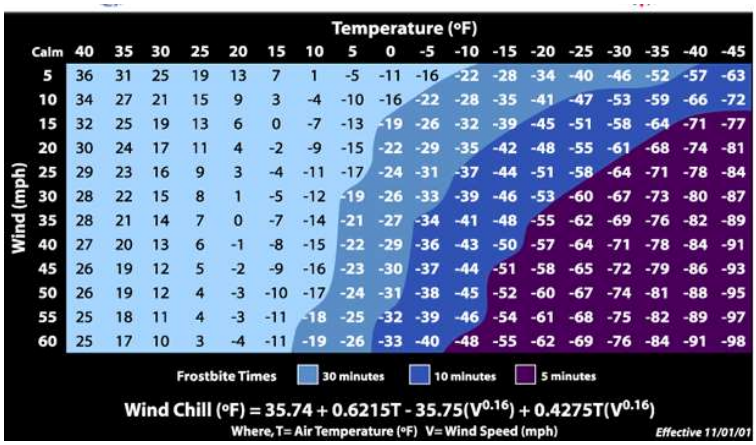
Buildings with overhanging tree limbs are more vulnerable to damage during winter storms when limbs fall. Businesses experience loss of income as a result of closure during power outages. In general heavy winter storms increase wear and tear on roadways though the cost of such damages is difficult to determine. With the power being out, restaurants and grocery stores may have a substantial loss of inventory.

Overhead power lines and infrastructure are also vulnerable to damages from winter storms. In particular, ice accumulation during winter storm events can cause damage to power lines due to the weight of ice. Damage 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. FEMA's 2009 BCA Reference Guide reported that the standard value for loss of utilities service is $126 per person per day of lost service.

Wind can greatly amplify the impact of cold ambient air temperatures. This is illustrated by Figure 3.77, which shows the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite.

Figure 3.77 Wind Chill Chart



(Source: National Weather Service, http://www.nws.noaa.gov/om/winter/windchill.shtml)

Winter storms, cold, frost and freezing take a toll on crop production in the planning area. Table 3.78 shows the USDA's Risk Management Agency payments for insured crop losses in the planning area as a result of cold conditions and snow for the past 11 years.

Table 3.78 Crop Insurance Claims Paid in Buchanan County as a Result of Cold Conditions and Snow, 2005-2015

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2015	Corn	Cold Wet Weather	$6,451.00
2014	Corn	Cold Wet Weather	$8,222.00
2014	Soybeans	Cold Wet Weather	$55,901.00
2014	Soybeans	Other (Snow-Lighting)	$10,814.80
2014	Wheat	Cold Winter	$23,942.00
2014	Wheat	Cold Wet Weather	$5,464.00
2014	Wheat	Frost	$1,239.00
2013	Corn	Cold Wet Weather	$10,609.00
2013	Corn	Other (Snow-Lighting)	$374.00
2013	Soybeans	Cold Wet Weather	$618.00
2013	Wheat	Cold Wet Weather	$15,417.00
2013	Wheat	Frost	$7,921.00
2012	Wheat	Cold Wet Weather	$6,008.00
2012	Wheat	Frost	$2,575.00
2011	Corn	Cold Wet Weather	$7,016.00
2011	Corn	Cold Winter	$976.00
2011	Soybeans	Cold Wet Weather	$7,195.00
2011	Soybeans	Other (Snow-Lighting)	-$4,518.00
2010	Corn	Cold Wet Weather	$315.00
2010	Wheat	Cold Wet Weather	$1,224.00
2010	Wheat	Cold Winter	$1,167.00
2009	Corn	Cold Wet Weather	$346.00
2009	Wheat	Cold Wet Weather	$145.00
2008	Corn	Cold Wet Weather	$2,148.00

2008	Wheat	Freeze	$9,316.00
2007	Wheat	Cold Winter	$21,516.00
2007	Wheat	Freeze	$32,791.00
2005	Corn	Cold Wet Weather	$5,635.00
2005	Corn	Freeze	$928.00
2005	Soybeans	Cold Wet Weather	$822.00
2005	Wheat	Cold Wet Weather	$3,376.00
2005	Wheat	Cold Winter	$310.00
2005	Wheat	Freeze	$2,843.00
Totals	---	---	$249,106.80

(Source: USDA Risk Management Agency, http://www.rma.usda.gov/data/cause.html)

Previous Occurrences

Table 3.79 includes NCDC reported events and damages for the past 21 years in Buchanan County.

Table 3.79 NCDC Buchanan County Winter Weather Events Summary, 1995-2015

Type of Event	Inclusive Dates	Magnitude	# of Injuries	Property Damages	Crop Damages
Cold/Wind Chill	01/10/1997	Very cold arctic air, -30 degrees	0	0	0
Winter Storm	02/21/1997	2 to 4 in. snow less than 24 hr.	0	0	0
Ice Storm	12/21/1997	Icy roads, rain, sub-freezing temp.	0	0	0
Ice Storm	01/05/1998	¼ in. ice accumulation on roads	0	0	0
Heavy Snow	12/05/1999	6 to 11 in. of snow	0	0	0
Cold/Wind Chill	10/06/2000	Record low temps., 20 degrees	0	0	0
Cold/Wind Chill	12/10/2000	Arctic air, -9 degrees	1 (death)	0	0
Winter Storm	12/11/2000	7 in. snow, freezing drizzle	0	0	0
Winter Storm	01/28/2001	4 to 6 in. snow, Ice and snow mix	0	0	0
Winter Storm	02/09/2001	6 to 8 in. snow, school closings	0	0	0
Heavy Snow	02/27/2001	6 to 9 in. snow, school closings	0	0	0
Heavy Snow	01/30/2002	8 to 14 in. snow, Ice over an inch	0	0	0
Winter Storm	12/09/2003	2 to 4 in. snow, school closings	0	0	0
Winter Storm	01/25/2004	Freezing rain, ice accumulation ¼ in.	0	0	0
Winter Storm	02/05/2004	6 to 8 in. snow	0	0	0
Ice Storm	01/04/2005	¼ to ¾ in. ice mixes with sleet	0	0	0
Winter Weather	01/20/2006	Sleet, freezing rain, snow 2 to 4 in.	0	0	0
Ice Storm	11/29/2006	¼ to ½ in. ice, freezing rain/sleet	0	0	0
Frost/Freeze	04/04/2007	Low temps in Apr. damage to crops	0	0	0
Ice Storm	12/10/2007	Long dur. freezing rain, power lose	0	$25,000	0
Winter Storm	12/22/2007	9 in. snow, road closures, accidents	0	0	0
Heavy Snow	02/05/2008	6 to 10 in snow, snow drifts 3 ft.	0	0	0
Blizzard	12/07/2009	14 in snow, 45 mph winds	0	0	0
Blizzard	12/24/2009	11 to 14 in. snow, strong winds	0	0	0
Winter Storm	02/21/2010	6 to 8 in. snow, hazards driving	0	0	0
Winter Weather	01/10/2011	4 to 8 in snow, prolonged snow	0	0	0
Winter Weather	01/19/2011	5 to 6 in snow, hazardous driving	4	0	0
Winter Weather	01/22/2011	6.5 in snow	0	0	0
Blizzard	02/01/2011	7.5 in snow, 45mph winds	0	0	0
Winter Storm	02/24/2011	5 in snow, hazardous driving	0	0	0
Winter Weather	09/11/2011	1.5 in snow, first of season	0	0	0
Winter Weather	02/13/2012	1 to 4 in snow, freezing drizzle	0	0	0
Bilzzard	12/20/2012	1 to 3 in snow, high winds	0	0	0
Winter Weather	01/29/2013	1 to 4 in snow, some ice	0	0	0
Winter Storm	02/21/2013	4 to 7 in snow, hazardous roads	0	0	0
Heavy Snow	12/21/2013	6 to 9 in snow, hazardous roads	0	0	0

Cold/Wind Chill	01/05/2014	30 degrees below zero	0	0	0
Winter Weather	01/06/2014	Several in. snow, hazardous driving	3 (1 death)	0	0
Heavy Snow	02/04/2014	1 ft. snow, 2 to 3 ft. drifts	0	0	0
Heavy Snow	01/31/2015	6 to 8 in. snow, hazardous driving	0	0	0
Heavy Snow	02/01/2015	6 to 8 in. snow, hazardous driving	0	0	0
Winter Storm	12/27/2015	3 to 4 in. snow, ¾ in sleet	0	0	0
Totals	----	-----	4 (2 deaths)	$25,000	0

(Source: NCDC, data accessed 12/30/2016)

Probability of Future Occurrence

The probability for all of the different types of winter weather are included as one probability, since one storm generally includes several different types of events. There were 42 severe winter weather events in Buchanan County from 1995 to 2015 (21 years). This equates to a 100% probability of occurrence in any given year with approximately 2.1 events in any given year.

Vulnerability

Vulnerability Overview

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. People over 65 and those living in poverty have an increased risk of hypothermia and frostbite due to extreme cold and
wind chill.

In the 2013 State Plan, seven factors were considered in determining overall severe winter storm vulnerability as follows: housing density, likelihood of occurrence, building exposure, crop exposure, average annual property loss ratio, average annual crop insurance claims and social vulnerability. The state ranked each of these criteria using a scale from one to five, one being lowest and five being the highest, to rank each county's vulnerability to severe winter weather. Buchanan County received a vulnerability rating of medium-low and a social with no individual criterion scoring above two.

Potential Losses to Existing Development

During the 21 year period from 1995 to 2015, a total of $25,000 in property losses equates to $1,190.48 in average annual losses countywide.

Previous and Future Development

Future commercial development can expect functional downtime and decreased revenues during periods of severe winter weather. Road construction in the county will increase the need for snow removal and salt to keep transportation lifelines open during periods of severe winter weather.

Hazard Summary by Jurisdiction

Severe winter weather can cause power outages and put structures at risk to fires when individuals in homes resort to using portable fuel heaters. The risk of extreme cold deaths and frostbite varies among segments of the populations. People over 65 and those living below the poverty level have an increased vulnerability to severe winter weather. Table 3.80 includes information on populations over 65 and the percent living below the poverty level by jurisdiction.

Table 3.80 Population over 65 and Population Living Below the Poverty Level

Jurisdiction	% of Families Living Below Povery Level	% of Population Over 65
Buchanan County	13.9%	14.3%
Agency	8.5%	16.2%
Easton	1.8%	13.4%
DeKalb	4.5%	15.3%
Lewis & Clark Village	0%	14.8%
St. Joseph	19.9%	14.1%

(Source: American Community Survey, 2011-2015)

St. Joseph has the largest percent of families living below the poverty level, at nearly 20%, while Agency and Lewis and Clark Village have the highest percentages of residents over 65. Of St. Joseph's 28,557 occupied housing units, 6,225 are multi-units (21.8%) and 1,575 are mobile homes (3.4%) (Source: American Community Survey, 2011-2015).

Approximately 195 homeless people are in emergency shelters, transitional housing, safe haven housing or are literally unsheltered in St. Joseph. In addition to the Salvation Army shelter, the Community Missions Cold Weather Shelter, is open from mid-December to the end of March, to shelter the homeless population from severe winter weather.

Problem Statement

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. People over 65 and those living in poverty and the homeless have an increased risk of hypothermia and frostbite due to extreme cold and wind chill.

Public works departments and road districts can develop snow removal plans and maintain adequate snow removal equipment and salt to quickly open roads after periods of heavy snow and freezing rain. The County and cities can work with local electric coops and utility companies to develop vegetation management programs in rights of way to minimize damage to falling tree limbs laden with ice resulting from ice storms to minimize power outages throughout the county.

4 MITIGATION STRATEGY 4.1

4.1 Goals 4.1

4.2 Identification and Analysis of Mitigation Actions 4.2

4.3 Implementation of Mitigation Actions 4.15

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. The mitigation strategy was developed through a collaborative group process. The process included review of updated 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 Buchanan County's existing hazard mitigation plan approved by FEMA in 2005.Therefore, the goals from 2012 Buchanan County's Hazard Mitigation Plan were reviewed to see if they were still valid, feasible, practical, and applicable to the defined hazard impacts. The MPC reviewed and updated the plan's goals at the second and third meetings. There was a strong focus on providing more mitigation resources to citizens, identifying and strengthening critical and essential facilities and improving communication at the local government level and with citizens. The updated goals for the 2017 plan are:

Goal 1: Protect the Lives, Property and Livelihoods of All Citizens.

1. Objective: Protect citizen's lives and property.
2. Objective: Provide sufficient warning of impending disasters.
3. Objective: Identify the citizens most vulnerable to disasters and plan accordingly.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas.

1. Objective: Lessen the impact of certain disasters and reduce the damage of disasters.
2. Objective: Decrease the cost of the next disaster.
3. Objective: Increase our economic resistance to disasters.

Goal 3: Increase Resources Available to Citizens via Education and Preparedness Information.

1. Objective: Increase knowledge among citizens about disaster safety and preparedness.

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster.

1. Objective: Increase disaster mitigation management capability in local governments.

Goal 5: Identify Critical Infrastructure Components.

1. Objective: Increase mitigation strategies to support those infrastructures.

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.

During the second MPC meeting, changes in risk since adoption of the previously approved plan were discussed. Packets were distributed to the jurisdiction's representatives of actions from the previously approved plan. They were asked to evaluate past actions and to create new actions. Actions from the previous plan included completed actions, on-going actions, and actions upon which progress had not been made. Each jurisdiction was instructed to provide information regarding the "Action Status" with one of the following status choices:

- Completed, with a description of the progress,
- Not Started/Continue in Plan Update, with a discussion of the reasons for lack of progress,
- In Progress/Continue in Plan Update, with a description of the progress made to date or
- Deleted, with a discussion of the reasons for deletion.

For Meeting #3, individual jurisdictions, including school and special districts, developed final mitigation strategy for submission to the MPC. They were also offered a print out of 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.

Based on the status updates that were turned in at the third meeting or mailed at a later date, there were 40 completed actions, 139 deleted actions, and 87 continuing actions. Actions that were not evaluated were not continued into the updated plan. Completed evaluations are included in Appendix C. Many continuing actions received new title numbers in Section 4.3 Implementation of Mitigation Actions. Table 4.1 provides a summary of the action statuses for each jurisdiction:

Table 4.1. Action Status Summary

Jurisdiction	Completed Actions	Deleted Actions	Continuing Actions
Buchanan County	**1.2.3, 1.3.1, 2.2.1, 2.3.2, 2.3.2, 3.1.6, 3.1.7, 4.1.6**	**1.1.6, 1.1.8, 1.1.9, 1.1.10, 1.1.11, 1.1.13, 1.1.15, 1.1.16, 1.2.1, 1.3.3, 1.3.4, 2.1.1, 2.2.2, 2.2.3, 2.2.4, 2.3.1, 2.3.3, 3.1.3, 3.1.8, 3.1.9, 4.1.3, 4.1.4, 4.1.7, 4.1.8, 4.1.9, 4.1.11, 4.2.2, 4.2.6**	**1.1.1, 1.1.3, 1.1.8, 1.1.7, 1.1.18, 1.2.2, 1.2.3, 1.2.4, 1.2.7, 1.3.1, 1.3.3, 2.1.1, 2.1.4, 2.1.7, 2.1.8, 2.3.3, 2.3.5, 2.3.6, 3.1.1, 3.1.3, 3.1.8, 4.1.1, 4.1.3, 4.1.8, 4.1.9, 4.1.2, 5.1.1, 5.1.2**
Agency	**2.3.2**	**1.1.2, 1.1.5, 1.1.6, 1.1.5, 1.1.6, 1.1.15, 1.2.1, 1.2.2, 1.3.1, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 2.2.2, 2.3.5, 2.3.6, 3.1.1, 3.1.7, 3.1.9, 4.1.1, 4.1.7, 4.1.8, 4.1.12, 4.2.2, 4.2.4**	**1.1.12, 1.2.5, 2.1.2, 2.2.5, 2.2.9, 2.2.12, 2.3.4, 3.1.4, 4.1.4**
DeKalb		**1.1.2, 1.1.3, 1.1.5, 1.1.6, 1.1.7, 1.1.8, 1.1.11, 1.1.15, 1.2.1, 1.2.3, 1.3.1, 1.3.2, 1.3.3, 2.1.4, 2.1.6, 2.2.1, 2.2.3, 2.3.2, 2.3.4, 2.3.5, 2.3.6, 3.1.1, 3.1.2, 3.1.5, 3.1.8, 3.1.9, 3.1.10, 4.1.7, 4.1.8, 4.1.9, 4.1.12, 4.2.2**	**1.1.19, 1.3.5, 4.1.2, 4.1.5**
Easton	**2.3.5, 3.1.10, 4.1.1**	**1.1.9, 1.2.1, 1.3.1, 1.3.3, 2.1.1, 2.1.4, 2.1.6, 2.2.4, 2.1.6, 2.2.4, 3.1.7, 4.1.7, 4.1.8, 4.1.9, 4.2.2, 4.2.4**	**1.1.5, 1.1.9, 1.3.4, 2.2.13, 2.3.2, 2.3.9, 3.1.5, 3.1.8, 4.1.6**
Lewis & Clark Village	**1.2.2**	**1.1.2, 1.1.9, 1.2.1, 1.3.4, 2.3.2, 3.1.1, 3.1.7, 3.1.9, 4.1.1, 4.1.7, 4.1.8, 4.2.2, 4.2.4**	**1.1.20, 2.1.3, 2.1.6, 2.2.3, 2.2.10, 2.2.14, 2.3.6, 3.1.7, 4.1.7, 4.1.10**
St. Joseph	**1.1.1, 1.1.8, 1.1.13, 1.3.1, 1.3.2, 2.1.1, 2.1.3, 2.1.4, 2.1.5,**		**1.1.2, 1.1.4, 1.1.7, 1.1.13, 1.1.14, 1.1.16, 1.1.21, 1.1.22, 1.2.6,**

	2.3.2, 3.1.1, 3.1.3, 3.1.6, 4.1.1, 4.1.2, 4.1.5, 4.1.8, 4.2.6		**1.3.2, 2.2.11, 2.2.15, 2.2.16, 2.3.1, 2.3.10, 2.3.6, 4.1.11, 5.1.3, 5.1.5**
Buchanan County School District	**1.2.3, 3.1.4**		**1.2.3, 3.1.4**
Mid-Buchanan School District	**1.2.3, 3.1.4**		**1.2.3, 3.1.4**
St. Joseph School District	**1.2.3**		**3.12**
Missouri Western State University	**1.1.5, 1.1.9, 1.1.11, 1.2.1, 1.2.3, 2.3.5**	**2.3.3, 4.2.1**	**1.1.6, 1.1.10, 1.1.15, 1.1.17, 1.2.1, 1.3.6, 2.3.7, 5.1.4**

Table 4.2 provides a summary of the completed, deleted and continuing actions from the previous plan.

Table 4.2. Summary of Completed and Deleted Actions from the Previous Plan

Completed Actions	Completion Details
1.1.1 Have video and audio public service announcement made, delivered to the media and ready to be broadcast during emergencies and disasters.	
1.1.1 St. Joseph	Complete - Video and PSAs were produced and delivered.
1.1.5 Maintain an up-to-date list of addresses for shelters to assist fire departments and emergency services agencies to locate survivors after a disaster.	
1.1.5 Missouri Western State University	Complete - Funding amount unknown. Funding source was internal.
1.1.8 Designate certain air-conditioned facilities as heat emergency shelters and encourage people without air-conditioning to use them in a heat wave.	
1.1.8 St. Joseph	Complete - This is already completed. Work with American Red Cross.
1.1.9 Encourage businesses to implement snow day policies for employees to reduce the number of people on the roadways during severe weather.	
1.1.9 Missouri Western State University	Complete and continue - Campus closes when appropriate due to weather.
1.1.11 Assess existing pubic facilities for the location of suitable safe areas. If available, these safe areas should be clearly marked and employees and visitors informed of their location in public facilities.	

1.1.11 Missouri Western University	Complete and continue - Campus does periodic evaluation of our facilities. The NWS has been consulted and performed an inspection of our facilities. Maps to safe locations within buildings are posted throughout the campus.
1.1.13 Educate the occupants of hotels, informing them of the city and county they are in and local television and radio stations so they can be informed of impending severe weather situations.	
1.1.13 St. Joseph	Complete - The city has handouts for hotels. Internal funding source.
1.2.1 Encourage a NOAA weather radio in continuous operation in all facilities offering public accommodations.	
1.2.1 Missouri Western State University	Complete and continue - Campus police department monitor weather radios and other services. Notifies campus of emergency weather situations with the campus emergency notification system.
1.2.2 Cities that do not have warning systems should purchase them.	
1.2.2 Lewis & Clark Village	Complete - The village already has warning sirens.
1.2.3 Explore use of electronic methods, including Internet, Twitter, texting and calling systems to notify public of a hazard.	
1.2.3 Buchanan County	Complete and continue - Media list sent out to TV, radio, etc.
1.2.3 St. Joseph School District	Complete and continue - Use of electronic communication (webpage, tv, texts, social media, alert now calls, etc). Part of annual budget.
1.2.3 Buchanan School District	Complete and continue – Use of the Blackboard Connect since the last plan. Costs $600.
1.2.3 Mid-Buchanan School District	Complete and continue – Use of electronic communication to improve communication.
1.2.3 Missouri Western State University	Complete and continue - Campus uses the emergency notification system to alert the campus community. Also utilizes social media and our internal email system.
1.3.1 Inform citizens what to do to help elderly and disabled friends and neighbors or employees.	
1.3.1 Buchanan County	Complete and continue - Newspaper, tv, etc. ongoing.
1.3.1 St. Joseph	Complete and continue - Information is in place to aid the public on this action.
1.3.2 Continue to evaluate accommodating individuals with special needs in emergency shelters, including compliance with the Americans with Disabilities Act (ADA).	
1.3.2 St. Joseph	Complete - This action has already been accomplished.
2.1.1 Continue to participate in buyout programs for the highest risk properties located in the high risk flood areas.	
2.1.1 St. Joseph	Complete - Action completed.
2.2.2 Continue to participate in the National Flood Insurance Program (NIFP).	

2.1.2 St. Joseph	Complete - Action completed.
2.1.3 Adopt the most current edition of a model building code to address structural and architectural issues related to hazard mitigation.	
2.1.3 St. Joseph	Complete - Current model building code adopted.
2.1.4 Consider the construction of detention basins, small lakes and greenways or riparian corridors to channel and catch storm water, thereby reducing the likelihood of flooding as part of a countywide storm water management plan.	
2.1.4 St. Joseph	Complete – Action completed.
2.1.5 Conduct a public education campaign to inform dam owners and citizens living near inundation zones of dams about the need to properly maintain and upgrade these structures, particularly those that are more than 50 years old.	
2.1.5 St. Joseph	Complete - Action completed.
2.2.1 Consider alternative uses for flood-prone areas, such as sports fields, parks, wildlife habitats, etc. and incorporate this in all comprehensive land use plan updates.	
2.2.1 Buchanan County	Complete - Action completed.
2.3.2 Enact ordinances prohibiting residential and commercial development in all high-hazard prone areas.	
2.3.2 Buchanan County	Complete - Action completed and review permits.
2.3.2 Agency	Complete - Floodplain ordinances were incorporated into zoning ordinances.
2.3.2 St. Joseph	Complete – The city participates in NIFP.
2.3.5 Maintain and update lists of names, phone numbers and duties for all employees during regular operation and off hours.	
2.3.5 Easton	Complete - List in place.
2.3.5 Missouri Western State University	Complete and continue - This is maintained in the HR office.
3.1.1 Develop an ongoing campaign to educate the community about seasonal hazards by adopting a disaster theme for each season and coordinate this campaign with a variety of promotional resources.	
3.1.1 St. Joseph	Complete - Already in place.
3.1.3 Continue partnerships with Missouri Western State University, St. Joseph School District and City of St. Joseph to allow use of cable access channels to broadcast severe weather preparation information.	
3.1.3 St. Joseph	Complete - Action is already in place.
3.1.4 Educate children in disaster preparedness and how to survive disasters.	
3.1.4 Buchanan School District	Complete and continue – Hold several different drills to prepare children for surviving disasters.

3.1.4 Mid-Buchanan School District	Complete and continue – Have tornado, intruder, earthquake, fire and bus evacuation drills.
3.1.6 Provide information to media to publish or broadcast emergency information when conditions warrant. Establish contact information with media contacts for night and weekend emergencies.	
3.1.6 Buchanan County	Complete - There is a plan in place in coordination with the media.
3.1.6 St. Joseph	Complete - Action in place.
3.1.7 Encourage businesses and homeowners in flood-prone areas to elevate mechanical systems such as furnaces, water heaters and electrical panels.	
3.1.7 Buchan County	Complete – Handouts are automatically given out if in a floodplain.
3.1.10 Citizens that live in areas near timber or tall grass should be encouraged to remove vegetation, yard debris and other combustible materials that may be near structures.	
3.1.10 Easton	Complete - Have ordinances in place that address this.
4.1.1 Maintain a publicly accessible list of names, position, contact information, roles and responsibilities for all public safety positions and departments.	
4.1.1 Easton	Complete - List is published in community newsletter.
4.1.1 St. Joseph	Complete - Action completed.
4.1.2 Execute and maintain mutual aid agreements with all relevant agencies.	
4.1.2 St. Joseph	Complete - Action completed.
4.1.5 Make all GIS hazard information available online to	
4.1.5 St Joseph	Complete - Already completed.
4.1.6 Maintain the website for the Local Emergency Planning Committee (LEPC).	
4.1.6 Buchanan County	Complete - The website is up and maintained.
4.1.8 Inform all city and county department heads and school districts that a disaster mitigation plan exists.	
4.1.8 St. Joseph	Complete - The HMP will be posted on the city website and PFD copies will be sent out to each city department head.
4.1.9 Develop and implement official snow day plans and policies for non-essential personnel.	
4.1.9 St. Joseph	Complete – Action was implemented.
4.2.6 Water and wastewater districts should elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plans, potable water treatment plants and pump stations.	
4.2.6 St. Joseph	Complete - Action completed.
Deleted Actions	**Reason for Deletion**
1.1.2 Encourage residents to purchase weather radios to ensure they have sufficient access to information in times of disasters.	
1.1.2 Agency	Delete – No progress has been made. The village has no resources to implement this action.

1.1.2 DeKalb	Delete - Lack of staff and funding.
1.1.2 Lewis & Clark Village	Delete - No staff to promote this action.
1.1.3 Encourage the incorporation and design of shelters in the construction of new public facilities like libraries, community centers, etc.	
1.1.3 DeKalb	Delete - No staff or funding.
1.1.5 Maintain an up-to date list of addresses of shelters to assist fire departments and emergency services agencies to locate survivors after a disaster.	
1.1.5 Agency	Delete - No progress. The village has limited resources to implement this action.
1.1.5 DeKalb	Delete - Lack of staff and funding.
1.1.5 St. Joseph	Delete – The city has this through the American Red Cross.
1.1.6 Continue program to provide air conditioners to those people in the community who do not have them and are at risk during a heat wave.	
1.1.6 Buchanan County	Delete - Not the county's responsibility.
1.1.6 Agency	Delete - The community does not have the resources to implement this action.
1.1.6 DeKalb	Delete - No funding for action.
1.1.6 Easton	Delete - No progress due to lack of resources.
1.1.6 St. Joseph	Delete - Public cooling locations are located throughout the city.
1.1.7 Work with private entities, such as churches and businesses, to encourage the construction of tornado shelters in facilities where large numbers of people live, work or congregate.	
1.1.7 DeKalb	Delete – Not practical due to funding.
1.1.8 Designate certain air-conditioned facilities as heat emergency shelters and encourage people without air-conditioning to use them in a heat wave.	
1.1.8 Buchanan County	Delete - Not the county's responsibility.
1.1.8 DeKalb	Delete - No funding and understaffed.
1.1.8 Red Cross	Delete - This is not part of the American Red Cross's mission.
1.1.9 Encourage businesses to implement snow day policies for employees to reduce the number of people on the roadways during severe weather.	
1.1.9 Buchanan County	Delete – There are only a few county businesses.
1.1.9 Easton	Delete - Businesses may not have written snow day policies but do communicate what to do in a snow event.
1.1.9 Lewis & Clark Village	Delete - Lack of funding.
1.1.10 Consider offering residential and commercial builders tax incentives to encourage the construction of safe rooms in new homes and commercial buildings.	
1.1.10 Buchanan County	Delete - Not reasonable action.
1.1.10 St. Joseph	Delete - No authority to implement.

1.1.11 Assess existing pubic facilities for the location of suitable safe areas. If available, these safe areas should be clearly marked and employees and visitors informed of their location in public facilities.	
1.1.11 Buchanan County	Delete - Few facilities in the county.
1.1.11 Agency	Delete - The village has no public facilities that would be a suitable safe area.
1.1.11 DeKalb	Delete - Lack of staff and funding.
1.1.13 Educate the occupants of hotels, informing them of the city and county they are in and local television and radio stations so they can be informed of impending severe weather situations.	
1.1.13 Buchanan County	Delete - There are no hotels in the unincorporated county.
1.1.15 Form and train Community Response Teams in cities and neighborhood associations.	
1.1.15 Buchanan County	Delete - Does not exist.
1.1.15 Agency	Delete - No progress has been made and the village lacks resources to implement this action.
1.1.15 DeKalb	Delete - Lack of staff and funding.
1.1.16 Build permanent storm shelters in mobile parks.	
1.1.16 Buchanan County	Delete - Not applicable due to prioritized funding.
1.2.1 Encourage a NOAA weather radio in continuous operation in all facilities offering public accommodations.	
1.2.1 Buchanan County	Delete - Action already completed.
1.2.1 Agency	Delete - No resources.
1.2.1 DeKalb	Delete - Lack of staff and funding.
1.2.1 Easton	Delete - With cell apps, access to emergency alerts are possible.
1.2.1 Lewis & Clark Village	Delete - Lack of funding.
1.2.2 Cities that do not have warning systems should purchase them.	
1.2.2 Agency	Delete - The village has three sirens, providing adequate coverage.
1.2.2 St. Joseph	Delete - The city already has warning systems.
1.2.3 Explore use of electronic methods, including Internet, Twitter, texting and calling systems to notify public of a hazard.	
1.2.3 DeKalb	Delete - There is no funding for this action.
1.3.1 Inform citizens what to do to help elderly and disabled friends and neighbors or employees.	
1.3.1 Agency	Delete - The village does not have the resources to implement this action. Mo-Kan has provided the village Ready In 3 materials to distribute at community events.
1.3.1 DeKalb	Delete - Lack of staff and funding.
1.3.1 Lewis & Clark Village	Delete - Community center is already accessible.
1.3.2 Continue to evaluate accommodating individuals with special needs in emergency shelters, including compliance with the Americans with Disabilities Act (ADA).	
1.3.2 Agency	Delete - Discussed in 2015 but no funds to implement. The two main critical facilities are already accessible.

1.3.2 DeKalb	Delete - Lack of staff and funding.
1.3.3 Work with organizations and utilities to provide materials and volunteer labor to assist at-risk groups in winterizing their home.	
1.3.3 American Red Cross	Delete - This is not in the American Red Cross's mission.
1.3.3 Buchanan County	Delete - Not applicable. Organization is not identified who offers the materials and labor.
1.3.3 Agency	Delete - No progress. The village does not have the resources to implement this action.
1.3.3 DeKalb	Delete - Lack of staff and funding.
1.3.3 Easton	Delete – No resources to implement.
1.3.3 St. Joseph	Delete - No funding.
1.3.4 Update inventory of facilities with generators and emergency power that can be used as shelters in the event of natural disasters. Make shelters equipped to connect to generators.	
1.3.4 Buchanan County	Delete - No plans to put plan into place.
1.3.4 Agency	Delete - The village has only three businesses in town so there is no need for a list.
1.3.4 Lewis & Clark Village	Delete - Only two essential facilities and neither have generators.
1.3.4 St. Joseph	Delete - This action has already been accomplished.
2.1.1 Continue to participate in buyout program for the highest risk properties located in the highest risk flood areas.	
2.1.1 Buchanan County	Delete - County cannot afford 25%.
2.1.1 Easton	Delete - The community does not have high risk flood areas.
2.1.4 Consider the construction of detention basins, small lakes and greenways or riparian corridors to channel and catch storm water, thereby reducing the likelihood of flooding as part of a countywide storm water management plan.	
2.1.4 DeKalb	Delete - Lack of staff and funding.
2.1.4 Easton	Delete - Lack of staff and funding.
2.1.5 Conduct a public education campaign to inform dam owners and citizens living near inundation zones of dams about the need to properly maintain and upgrade these structures, particularly those that are more than 50 years old.	
2.1.5 LEPC	Delete - Not LEPC's role.
2.1.6 Communities that do not currently participate in the National Flood Insurance Program (NIFP) will consider doing so.	
2.1.6 DeKalb	Delete - Lack of staff and funding. No floodplain.
2.1.6 Easton	Delete - Not in flood plain so not interested in participat-ing.
2.2.1 Consider alternative uses for flood-prone areas, such as sports fields, parks, wildlife habitats, etc. and incorporate this in all comprehensive land use plan updates.	
2.2.1 Easton	Delete - Not in a flood zone.

2.2.2 Continue to work with SEMA in ongoing buyout program for repetitive loss structures in flood-prone areas.	
2.2.2 Buchanan County	Delete - Duplicate action.
2.2.2 Agency	Delete - Duplicate action.
2.2.2 St. Joseph	Delete - Duplicate action.
2.2.3 Continue to review needs and participate in county-wide considerations of a multi-jurisdictional comprehensive storm water management plan.	
2.2.3 Buchanan County	Delete - No longer applicable.
2.2.3 DeKalb	Delete - Lack of staff and funding.
2.2.4 Amend municipal ordinances to include a section mandating the building of a wind-resistant shelter with a capacity to handle the expected population in any new mobile home park or park undergoing renovation or expansion.	
2.2.4 Buchanan County	Delete - Not applicable for the county since it does not have zoning ordinances regarding this.
2.2.4 Easton	Delete - No ordinance exists for this to be amended.
2.3.1 Encourage up-to-date commercial and industrial disaster plans that are coordinated with community disaster plans.	
2.3.1 Buchanan County	Delete - This is not practical for the small amount of industry in the unincorporated county.
2.3.2 Enact ordinances prohibiting residential and commercial development in all high-hazard prone areas.	
2.3.2 DeKalb	Delete - Lack of staff and funding.
2.3.2 Lewis & Clark Village	Delete - No progress due to lack of staff, funding and low priority.
2.3.3 Determine how long large businesses, employers and critical facilities can operate with individual services.	
2.3.3 Buchanan County	Delete - Not applicable.
2.3.3 St. Joseph	Delete - No authority to implement this action.
2.3.3 Missouri Western State University	Delete - Does not apply to the university.
2.3.4 Ensure all local governments have the latest copies of flood insurance rate maps, flood plain maps and similar documents.	
2.3.4 DeKalb	Delete - Lack of staff and funding.
2.3.5 Maintain and update lists of names, phone numbers and duties for all employees during regular operation and off hours.	
2.3.5 Agency	Delete - No progress. The village works closely with the county's emergency management director and can obtain information from him.
2.3.5 DeKalb	Delete - Lack of staff and funding.
2.3.6 Follow guidelines as suggested in the Missouri 2002 Drought Plan, developed by MDNR.	

2.3.6 Agency	Delete - There has been no progress. The village lacks resources to implement the guidelines in the MO 2002 Drought Plan.
2.3.6 DeKalb	Delete - Lack of staff and funding.
3.1.1 Develop an ongoing campaign to educate the community about seasonal hazards by adopting a disaster theme for each season and coordinate this campaign with a variety of promotional resources.	
3.1.1 Agency	Delete - There has been no progress. The village lacks resources to implement the campaign.
3.1.1 DeKalb	Delete - Lack of staff and funding.
3.1.1 Lewis & Clark Village	Delete - No progress has been made due to lack of staff.
3.1.2 Publish detailed hazards maps on city and county websites and provide paper copies to the public.	
3.1.2 DeKalb	Delete - Lack of staff and funding.
3.1.2 St. Joseph	Delete - Action already in place.
3.1.3 Continue partnerships with Missouri Western State University, St. Joseph School District and City of St. Joseph to allow use of cable access channels to broadcast severe weather preparation information.	
3.1.3 Buchanan County	Delete - Not applicable to the county.
3.1.3 St. Joseph	Delete - Action is already in place.
3.1.5 Conduct a public education campaign to inform citizens across the region of the benefits of constructing tornado safe rooms in their homes to reduce the potential for loss of life.	
3.1.5 DeKalb	Delete - Lack of staff and funding.
3.1.5 St. Joseph	Delete - There is policy that is being implemented on this action.
3.1.7 Encourage businesses and homeowners in flood-prone areas to elevate mechanical systems such as furnaces, water heaters and electrical panels.	
3.1.7 Agency	Delete - Encouragement has been ongoing but there is no policy to require elevation of mechanical systems.
3.1.7 Easton	Delete – No progress due to lack of staff.
3.1.7 Lewis & Clark Village	Delete - No progress has been made due to lack staff.
3.1.7 St. Joseph	Delete - Action is already in place.
3.1.8 Continue and expand public awareness campaigns on hazard preparedness. Involve the Red Cross “Ready in 3 program.”	
3.1.8 American Red Cross	Delete – Ready-in-Three is not their program.
3.1.8 Buchanan County	Delete - Lack of funding prioritized to action.
3.1.8 DeKalb	Delete - Lack of staff and funding.
3.1.8 St. Joseph	Delete - This action is already in place.
3.1.9 Educate citizen on how to winterize their homes, shut off water valves in case a pipe bursts and prepare for extreme cold.	
3.1.9 Buchanan County	Delete - Currently not applicable but could be utilized in the future.

3.1.9 Agency	Delete - The village lacks the resources to implement this program.
3.1.9 DeKalb	Delete - No staff to emphasize action.
3.1.9 Lewis & Clark Village	Delete - The village lacks the resources to exercise this program.
3.1.9 St. Joseph	Delete - Area too broad to effectively implement this action.
3.1.10 Citizens that live in areas near timber or tall grass should be encouraged to remove vegetation, yard debris and other combustible materials that may be near structures.	
3.1.10 DeKalb	Delete - Lack of staff and funding.
3.1.10 St. Joseph	Delete - Area too broad to implement this action.
4.1.1 Maintain a publicly accessible list of names, position, contact information, roles and responsibilities for all public safety positions and departments.	
4.1.1 Agency	Delete - The community has no public safety positions and trustees are listed on the city's website.
4.1.1 Lewis & Clark Village	Delete - There is not enough staff to implement this action.
4.1.1 St. Joseph	Delete - Action completed.
4.1.3 Incorporate mitigation planning efforts coordinator with duties of emergency management director.	
4.1.3 Buchanan County	Delete - Action completed.
4.1.3 St. Joseph	Delete - The city lacks funding for this action.
4.1.4 Develop an accurate countywide series of maps detailing flood, plain, flash flood danger zones, landslide susceptible area and process this information within GIS.	
4.1.4 Buchanan County	Delete - Action completed.
4.1.4 St. Joseph	Delete - Already completed.
4.1.5 Make all GIS hazard information available online to county and municipal permitting departments through the Hazard Mitigation Plan.	
4.1.5 St Joseph	Delete - Already completed.
4.1.6 Maintain the website for the Local Emergency Planning Committee (LEPC).	
4.1.6 St. Joseph	Delete - The city lacks the manpower to effectively complete this action.
4.1.7. Encourage property owners, businesses and occupants in hazard areas to participate in mitigation policy formation.	
4.1.7 Mo-Kan	Delete - Current responsibility as part of contract.
4.1.7 Buchanan County	Delete - Mo-Kan is responsible.
4.1.7 Agency	Delete - Doesn't apply.
4.1.7 DeKalb	Delete - Lack of staff and funding.
4.1.7 Easton	Delete - Lack of resources.
4.1.7 Lewis & Clark Village	Delete - Lack of resources.
4.1.7 St. Joseph	Delete - No authority to implement this action.
4.1.8 Inform all city and county department heads and school districts that a disaster mitigation plan exists.	

4.1.8 Buchanan County	Delete - Mo-Kan is responsible.
4.1.8 Agency	Delete - This is done through the county.
4.1.8 DeKalb	Delete - Lack of staff and funding.
4.1.8 Easton	Delete – No progress due to lack of staff.
4.1.8 Lewis & Clark Village	Delete - This is done through the county.
4.1.8 St. Joseph	Delete - The HMP will be posted on the city website and PDF copies will be sent out to each city department head.
4.1.9 Develop and implement official snow day plans and policies for non-essential personnel.	
4.1.9 Buchanan County	Delete - Not applicable to the unincorporated county. There is a policy in place for county employees.
4.1.9 DeKalb	Delete - Lack of staff and funding.
4.1.9 Easton	Delete - There's a small staff who knows what to do.
4.1.10 Update comprehensive land use plans to specifically address development in hazard-prone areas and recommend strategies for decreasing the jurisdiction's vulnerability to hazards.	
4.1.10 St. Joseph	Delete – This action is part of the storm water policy and NFIP.
4.1.11 Promote environmentally sound watershed and storm water practices to decrease flash flooding.	
4.1.11 Buchanan County	Delete - County is no longer a part of storm water management.
4.1.11 St. Joseph	Delete - Already in practice with emergency manage-ment and the American Red Cross.
4.1.12 Encourage schools and emergency responders to participate in Electronic Response Information Portal (ERIP).	
4.1.12 Agency	Delete - Not applicable since there is no school and first responders are the fire department.
4.1.12 DeKalb	Delete - Lack of staff and funding.
4.2.1 Maintain offsite data backup of county records and plan to safeguard those that do not have backups.	
4.2.1 St. Joseph	Delete - Action completed.
4.2.1 Missouri Western State University	Delete - Not applicable to the university.
4.2.2 Encourage electric and telecommunications utilities to anchor or strengthen above ground transmission lines, poles or similar structures.	
4.2.2 Buchanan County	Delete – The County has no authority over this issue.
4.2.2 Agency	Delete – Utility cover this action.
4.2.2 DeKalb	Delete - Lack of staff and funding.
4.2.2 Easton	Delete - There are no towers. Utility companies cover this action very efficiently.
4.2.2 Lewis & Clark Village	Delete - This action is already being implemented in the community.
4.2.2 St. Joseph	Delete – This action is performed by utility companies.
4.2.3 Encourage tree trimming by electric companies to help offset damages from breaking limbs.	
4.2.3 St. Joseph	Delete – This action is performed by utility companies.

4.2.4 Review, prioritize, institute and monitor needed upgrades and retrofits for critical buildings and infrastructures.	
4.2.4 Agency	Delete - No progress due to funding and that it would only be applicable to one building.
4.2.4 Easton	Delete - This action is not feasible due to lack of funding.
4.2.4 Lewis & Clark Village	Delete - This action is not feasible due to lack of funding.
4.2.6 Water and wastewater districts should elevate vulnerable equipment, electrical controls and other equipment at wastewater treatment plans, potable water treatment plants and pump stations.	
4.2.6 Buchanan County	Delete - The county has no authority over this action.
4.2.6 St. Joseph	Delete - Action completed.

(Source: Previously approved County Hazard Mitigation Plan; Data Collection Questionnaires)

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 STAPLEE methodology, which was used in 2012 updated, was used to assess the costs and benefits, overall feasibility of mitigation actions, and other issues impacting 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 “3” if positive and “2” if neutral)

Will the implemented action result in lives saved?
Will the implanted action result in a reduction of disaster damage?

The final scores are listed below in the analysis of each action. The worksheets are attached to this plan as Appendix B. The STAPLEE final score for each action, absent other considerations, such as a localized need for a project, determined the priority. Low priority action items were those that had a total score of between 0 and 24. Moderate priority actions were those scoring between 25 and 29. High priority actions scored 30 or above. A blank STAPLEE worksheet is shown in Figure 4.1

Figure 4.1. Blank STAPLEE Worksheet

XXXXXX COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN

Action Title:	**Jurisdiction:**
Action ID:	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		
T: Is it Technically feasible and potentially successful?		
A: Does the jurisdiction have the administrative capacity to execute this action?		
P: Is it Politically acceptable?		
L: Is there Legal authority to implement?		
E: Is it Economically beneficial?		
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		
Will historic structures be saved or protected?		
Could it be implemented quickly?		
STAPLEE Score		

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): _____

The goals and actions the MPC created are consistent with the hazards identified in the plan. Each jurisdiction focused on the hazards identified with the highest probability and historic damage in their area. For example, St. Joseph and Lewis & Clark Village have more actions for flood since it is a reoccurring hazard in their jurisdiction. Final mitigation actions took the results of STAPLEE

worksheets into consideration. Several MPC members did not feel the STAPLEE score accurately represented the priority level. In these cases MPC members assigned the priority level they felt was appropriate. Actions are organized by the goal statement that they fall under and worksheets for continuing and new mitigation actions are located in Appendix C. Not all continuing actions have worksheets.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.1:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Public not informed of severe weather
Hazard(s) Addressed:	Flood, heat wave, severe winter weather, tornado, etc.
Action or Project	
Action/Project Number:	1.1.1
Name of Action or Project:	Weather Radios
Action or Project Description:	Public education outreach to inform residents to purchase weather radios to ensure they have sufficient access to information in times of disasters.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$0
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continued
Report of Progress	Proceed based on priority

Goal 1: Protect the Lives, Property and Livelihood of All Citizens.

Action 1.1.2:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Public not informed of severe weather
Hazard(s) Addressed:	Flood, heat wave, severe winter weather, tornado, etc.
Action or Project	
Action/Project Number:	1.1.2
Name of Action or Project:	Weather Radios
Action or Project Description:	Public education outreach to inform residents to purchase weather radios to ensure they have sufficient access to information in times of disasters.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens.
Estimated Cost:	$0
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Emergency Manager
Action/Project Priority:	Low
Timeline for Completion:	5 years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continued
Report of Progress	Not started. A plan must be written and implemented.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.3:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Public not having a storm shelter in severe weather
Hazard(s) Addressed:	Thunderstorm, tornado
Action or Project	
Action/Project Number:	1.1.3
Name of Action or Project:	Shelters
Action or Project Description:	Adding shelters in the construction of new public facilitates like libraries, community centers, etc.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Varies depending on project
Benefits:	Protected public
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Planning and Zoning
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, Private, Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continued
Report of Progress	No progress

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.4:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Public not having a storm shelter in severe weather
Hazard(s) Addressed:	Thunderstorm, tornado
Action or Project	
Action/Project Number:	1.1.4
Name of Action or Project:	Shelters
Action or Project Description:	Adding shelters in the construction of new public facilitates like libraries, community centers, etc.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Varies depending on project
Benefits:	Protected public
Plan for Implementation	
Responsible Organization/Department:	St. Joseph City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, Internal, Private
Local Planning Mechanisms to be Used in Implementation, if any:	Code of Ordinances
Progress Report	
Action Status	Continued
Report of Progress	No progress. City Council could be approached to create tax incentive for action

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.5:

Action Worksheet	
Name of Jurisdiction:	Easton
Risk / Vulnerability	
Problem being Mitigated:	Public not having a storm shelter in severe weather
Hazard(s) Addressed:	Thunderstorm, tornado
Action or Project	
Action/Project Number:	1.1.5
Name of Action or Project:	Shelters
Action or Project Description:	Add shelters in the construction of new public facilitates like libraries, community centers, etc.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Varies depending on project
Benefits:	Protected public
Plan for Implementation	
Responsible Organization/Department:	Easton City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, Internal, Private
Local Planning Mechanisms to be Used in Implementation, if any:	Code of Ordinances
Progress Report	
Action Status	Continued
Report of Progress	No progress. City Council could be approached to create tax incentive for action.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.6:

Action Worksheet	
Name of Jurisdiction:	Missouri Western State University
Risk / Vulnerability	
Problem being Mitigated:	Public not having a storm shelter in severe weather
Hazard(s) Addressed:	Thunderstorm, tornado
Action or Project	
Action/Project Number:	1.1.6
Name of Action or Project:	Shelters
Action or Project Description:	Add shelters in the construction of new public facilitates like libraries, community centers, etc.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Varies depending on project
Benefits:	Protected public
Plan for Implementation	
Responsible Organization/Department:	Missouri Western State University Risk Manager
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, Internal
Local Planning Mechanisms to be Used in Implementation, if any:	Code of Ordinances
Progress Report	
Action Status	Continued
Report of Progress	No progress

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.7:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Excess water
Hazard(s) Addressed:	Flood, dam failure, levee failure, etc.
Action or Project	
Action/Project Number:	1.1.7
Name of Action or Project:	Buffer zones
Action or Project Description:	Incorporate hazard buffer zones into subdivision platting regulations
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens.
Estimated Cost:	Varies by project
Benefits:	Protection of property
Plan for Implementation	
Responsible Organization/Department:	St. Joseph City Council
Action/Project Priority:	Medium
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal, private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continued
Report of Progress	Buffer zones have been incorporated into some platting regulations.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.8:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Inability to locate people after a disaster.
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, tornado, etc.
Action or Project	
Action/Project Number:	1.1.8
Name of Action or Project:	List of shelters
Action or Project Description:	Maintain up-to-date list of addresses of shelters to assist fire departments and emergency services agencies to locate survivors after a disaster.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens.
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	Medium
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue but modify
Report of Progress	No progress

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.9:

Action Worksheet	
Name of Jurisdiction:	Easton
Risk / Vulnerability	
Problem being Mitigated:	Inability to locate people after a disaster.
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, tornado, etc.
Action or Project	
Action/Project Number:	1.1.9
Name of Action or Project:	List of shelters
Action or Project Description:	Maintain up-to-date list of addresses of shelters to assist fire departments and emergency services agencies to locate survivors after a disaster.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens.
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Easton City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.10:

Action Worksheet	
Name of Jurisdiction:	Missouri Western State University
Risk / Vulnerability	
Problem being Mitigated:	Inability to locate people after a disaster.
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, tornado, etc.
Action or Project	
Action/Project Number:	1.1.10
Name of Action or Project:	List of shelters
Action or Project Description:	Maintain up-to-date list of addresses of shelters to assist fire departments and emergency services agencies to locate survivors after a disaster.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens.
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Missouri Western State University Risk Manager
Action/Project Priority:	Medium
Timeline for Completion:	2 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	Completed but will continue to expand and improve.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.11:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Public not having a storm shelter nearby.
Hazard(s) Addressed:	Tornadoes, thunderstorm
Action or Project	
Action/Project Number:	1.1.11
Name of Action or Project:	Tornado Shelters
Action or Project Description:	Work with private entities, such as churches and businesses, to construct tornado shelters in facilities where large numbers of people live, work, or congregate.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Varies depending on project
Benefits:	Protected public
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Planning and Zoning
Action/Project Priority:	Medium
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, internal, private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	Completed and continue to expand

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.12:

Action Worksheet	
Name of Jurisdiction:	Agency
Risk / Vulnerability	
Problem being Mitigated:	Public not having a storm shelter nearby
Hazard(s) Addressed:	Tornadoes, thunderstorm
Action or Project	
Action/Project Number:	1.1.12
Name of Action or Project:	Tornado Shelters
Action or Project Description:	Work with private entities, such as churches and businesses, to construct tornado shelters in facilities where large numbers of people live, work, or congregate.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Varies depending on project
Benefits:	Protected public
Plan for Implementation	
Responsible Organization/Department:	Agency City Council
Action/Project Priority:	Medium
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, internal, private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	Completed and continue to expand

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.13:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Public not having a storm shelter nearby
Hazard(s) Addressed:	Tornadoes, thunderstorm
Action or Project	
Action/Project Number:	1.1.13
Name of Action or Project:	Tornado Shelters
Action or Project Description:	Work with private entities, such as churches and businesses, to construct tornado shelters in facilities where large numbers of people live, work, or congregate.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens.
Estimated Cost:	Varies depending on project.
Benefits:	Protected public
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Planning and Zoning
Action/Project Priority:	Medium
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, internal, private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	Not started

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.14:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Decrease number of people on roads in inclement weather
Hazard(s) Addressed:	Severe winter weather
Action or Project	
Action/Project Number:	1.1.14
Name of Action or Project:	Snow day policies
Action or Project Description:	Implement snow day policies for employees to reduce the number of people on the roadway during severe winter weather.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$0
Benefits:	Decrease roadway traffic during severe winter weather
Plan for Implementation	
Responsible Organization/Department:	St. Joseph City Manager
Action/Project Priority:	Medium
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.15:

Action Worksheet	
Name of Jurisdiction:	Missouri Western State University
Risk / Vulnerability	
Problem being Mitigated:	Decrease number of people on roads in inclement weather
Hazard(s) Addressed:	Severe winter weather
Action or Project	
Action/Project Number:	1.1.15
Name of Action or Project:	Snow day policies
Action or Project Description:	Implement snow day policies for employees to reduce the number of people on the roadway during severe winter weather.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$0
Benefits:	Decrease roadway traffic during severe winter weather
Plan for Implementation	
Responsible Organization/Department:	Missouri Western State University Risk Manager
Action/Project Priority:	Medium
Timeline for Completion:	3 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.16:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Decrease number of people on roads in inclement weather
Hazard(s) Addressed:	Severe winter weather
Action or Project	
Action/Project Number:	1.1.16
Name of Action or Project:	Marked safe areas
Action or Project Description:	Assess existing public facilities for the location of suitable safe areas. If available, these safe areas should be clearly marked and employees and visitors informed of their locations in public facilities.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Cost of signage
Benefits:	Quicker identification of safe areas
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Emergency Manager
Action/Project Priority:	Low
Timeline for Completion:	3 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	Employees know the location of suitable safe areas but most facilities do not have the area clearly marked for visitors.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.17:

Action Worksheet	
Name of Jurisdiction:	Missouri Western State University
Risk / Vulnerability	
Problem being Mitigated:	Decrease number of people on roads in inclement weather
Hazard(s) Addressed:	Severe winter weather
Action or Project	
Action/Project Number:	1.1.17
Name of Action or Project:	Marked safe areas
Action or Project Description:	Assess existing public facilities for the location of suitable safe areas. If available, these safe areas should be clearly marked and employees and visitors informed of their locations in public facilities.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Cost of signage
Benefits:	Quicker identification of safe areas
Plan for Implementation	
Responsible Organization/Department:	Missouri Western State University Risk Manager
Action/Project Priority:	Low
Timeline for Completion:	3 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	Periodic evaluation of facilities are conducted. The NWS has been consulted and performed an inspection of facilities. Maps to safe locations within buildings are posted throughout campus. Need to continue and expand.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.18:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Impassible roads
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, dam failure, levee failure, etc.
Action or Project	
Action/Project Number:	1.1.18
Name of Action or Project:	Emergency Routes
Action or Project Description:	Review emergency access routes and evacuation routes and mitigate any problem areas.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	Medium
Timeline for Completion:	5 Years
Potential Fund Sources:	None
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No existing emergency routes but the county clears roads as necessary.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.19:

Action Worksheet	
Name of Jurisdiction:	DeKalb
Risk / Vulnerability	
Problem being Mitigated:	Impassible roads
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, dam failure, levee failure, etc.
Action or Project	
Action/Project Number:	1.1.19
Name of Action or Project:	Emergency Routes
Action or Project Description:	Review emergency access routes and evacuation routes and mitigate any problem areas.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	DeKalb City Council
Action/Project Priority:	Medium
Timeline for Completion:	5 Years
Potential Fund Sources:	None
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	Reviewed in 2015 and will continue to do review periodically

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.20:

Action Worksheet	
Name of Jurisdiction:	Village of Lewis & Clark
Risk / Vulnerability	
Problem being Mitigated:	Impassible roads
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, dam failure, levee failure, etc.
Action or Project	
Action/Project Number:	1.1.20
Name of Action or Project:	Emergency Routes
Action or Project Description:	Review emergency access routes and evacuation routes and mitigate any problem areas.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Lewis & Clark Village Council
Action/Project Priority:	Medium
Timeline for Completion:	5 Years
Potential Fund Sources:	None
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress has been made but will work on implementation

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.21:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Impassible roads
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, dam failure, levee failure, etc.
Action or Project	
Action/Project Number:	1.1.21
Name of Action or Project:	Emergency Routes
Action or Project Description:	Review emergency access routes and evacuation routes and mitigate any problem areas.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Emergency Manager
Action/Project Priority:	Medium
Timeline for Completion:	5 Years
Potential Fund Sources:	None
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress has been made but has been reviewed in the past

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.1.22:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	The lack of trained local personnel
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, dam failure, levee failure, etc.
Action or Project	
Action/Project Number:	1.1.22
Name of Action or Project:	Community Emergency Response Team (CERT)
Action or Project Description:	Form and train Community Response Teams in cities and neighborhood associations.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Unsure
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Emergency Manager
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress - Plans exist to develop a CERT team

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.2.1:

Action Worksheet	
Name of Jurisdiction:	Missouri Western State University
Risk / Vulnerability	
Problem being Mitigated:	Insufficient warning of hazard
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, dam failure, levee failure, etc.
Action or Project	
Action/Project Number:	1.2.1
Name of Action or Project:	Weather radio in facilities
Action or Project Description:	NOAA weather radio on continuous operation in university facilities.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$30-$40 per radio
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	Missouri Western State University Risk Manager
Action/Project Priority:	Medium
Timeline for Completion:	5 Years
Potential Fund Sources:	Private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Completed and continue.
Report of Progress	Campus police department monitors weather radios and other services. They notify campus of emergency weather situation with the campus emergency notification system.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.2.2:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Insufficient warning of hazard
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, dam failure, levee failure, etc.
Action or Project	
Action/Project Number:	1.2.2
Name of Action or Project:	Weather radio in public accommodations
Action or Project Description:	NOAA weather radio on continuous operation in all facilities offering public accommodations.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$30-$40 per radio
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Emergency Manager
Action/Project Priority:	Medium
Timeline for Completion:	5 Years
Potential Fund Sources:	Private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress – A city ordinance would need to be created

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.2.3:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Lack of warning systems
Hazard(s) Addressed:	Flood, thunderstorm, tornado, etc.
Action or Project	
Action/Project Number:	1.2.3
Name of Action or Project:	Purchasing warning systems
Action or Project Description:	Communities that do not have warning systems should purchase them.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$5,000 per used sirens
Benefits:	Notification of severe weather
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – Progress has been made and almost complete

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.2.4:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Insufficient warning of hazard
Hazard(s) Addressed:	Dam failure, drought, earthquake, flood, heat wave, thunderstorm, etc.
Action or Project	
Action/Project Number:	1.2.4
Name of Action or Project:	Electronic notifications
Action or Project Description:	Use electronic methods, including the Internet, Twitter, texting and call systems to notify public of a hazard.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Varies
Benefits:	Notified public
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress- will continue to adapt to the new technologies and expand

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.2.5:

Action Worksheet	
Name of Jurisdiction:	Agency
Risk / Vulnerability	
Problem being Mitigated:	Insufficient warning of hazard
Hazard(s) Addressed:	Dam failure, drought, earthquake, flood, heat wave, thunderstorm, etc.
Action or Project	
Action/Project Number:	1.2.5
Name of Action or Project:	Electronic notifications
Action or Project Description:	Use electronic methods, including the Internet, social media, Twitter, texting and call systems to notify public of a hazard.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Varies
Benefits:	Notified public
Plan for Implementation	
Responsible Organization/Department:	Agency City Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress was made due to lack of electronic media knowledge. Agency will expand usage of electronic notification.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.2.6:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Insufficient warning of hazard
Hazard(s) Addressed:	Dam failure, drought, earthquake, flood, heat wave, thunderstorm, etc.
Action or Project	
Action/Project Number:	1.2.6
Name of Action or Project:	Electronic notifications
Action or Project Description:	Use electronic methods, including the Internet, Twitter, texting and call systems to notify public of a hazard.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Varies
Benefits:	Notified public
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Emergency Manager
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal (part of annual budget)
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – Currently use electronic communication (webpage, tv, texts, social media, alert now calls, etc.)

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.2.7:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Lack of warning sirens
Hazard(s) Addressed:	Flood, thunderstorm, tornado, etc.
Action or Project	
Action/Project Number:	1.2.7
Name of Action or Project:	Warning sirens in unincorporated areas
Action or Project Description:	Place warning sirens in densely populated unincorporated areas
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Approximately $5,000 per siren
Benefits:	Notified public
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress - Action completed except for the unincorporated areas of Taos and Ebenezer

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.2.8:

Action Worksheet	
Name of Jurisdiction:	Buchanan County School District
Risk / Vulnerability	
Problem being Mitigated:	Insufficient warning of hazard
Hazard(s) Addressed:	Dam failure, drought, earthquake, flood, heat wave, thunderstorm, etc.
Action or Project	
Action/Project Number:	1.2.8
Name of Action or Project:	Electronic notifications
Action or Project Description:	Use electronic methods, including the Internet, Twitter, texting and call systems to notify public of a hazard.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$600
Benefits:	Notified public
Plan for Implementation	
Responsible Organization/Department:	Buchanan School District Superintendent
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – Uses Blackboard Connect to centralize and improve communication to the public. Will continue to improve/update as appropriate.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.2.9:

Action Worksheet	
Name of Jurisdiction:	Mid-Buchanan School District
Risk / Vulnerability	
Problem being Mitigated:	Insufficient warning of hazard
Hazard(s) Addressed:	Dam failure, drought, earthquake, flood, heat wave, thunderstorm, etc.
Action or Project	
Action/Project Number:	1.2.9
Name of Action or Project:	Electronic notifications
Action or Project Description:	Use electronic methods, including the Internet, Twitter, texting and call systems to notify public of a hazard.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$0
Benefits:	Notified public
Plan for Implementation	
Responsible Organization/Department:	Mid-Buchanan School District Superintendent
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – Have improved communication since last plan. Seeking a way to combine different types of events into one notification system.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.3.1:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Vulnerable citizens
Hazard(s) Addressed:	Flood, severe winter weather, heat wave, thunderstorm, tornado, etc.
Action or Project	
Action/Project Number:	1.3.1
Name of Action or Project:	Help elderly and disabled
Action or Project Description:	Inform citizens what to do to help elderly and disabled friends and neighbors or employees.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$0
Benefits:	Vulnerable citizens receive help
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress - The county has sent information to tv, radio, and other media stations to relay information to the public.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.3.2:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Vulnerable citizens
Hazard(s) Addressed:	Flood, severe winter weather, heat wave, thunderstorm, tornado, etc.
Action or Project	
Action/Project Number:	1.3.2
Name of Action or Project:	Help elderly and disabled
Action or Project Description:	Inform citizens what to do to help elderly and disabled friends and neighbors or employees.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$0
Benefits:	Vulnerable citizens receive help
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Emergency Manager
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – Information is in place to aid the public on this action.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.3.3:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Vulnerable citizens
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, heat wave, etc.
Action or Project	
Action/Project Number:	1.3.3
Name of Action or Project:	ADA compliance
Action or Project Description:	Accommodate individuals with special/functional needs in emergency shelters, including compliance with the Americans with Disabilities Act (ADA).
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Varies depending on projects
Benefits:	Special needs individuals can access shelters
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress - The County is aware of the accommodation required. Currently monitoring contact lists.

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.3.4:

Action Worksheet	
Name of Jurisdiction:	Easton
Risk / Vulnerability	
Problem being Mitigated:	Vulnerable citizens
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, heat wave, etc.
Action or Project	
Action/Project Number:	1.3.4
Name of Action or Project:	ADA compliance
Action or Project Description:	Accommodate individuals with special needs in emergency shelters, including compliance with the Americans with Disabilities Act (ADA).
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Varies depending on projects
Benefits:	Special needs individuals can access shelters
Plan for Implementation	
Responsible Organization/Department:	Easton City Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	Slow progress but plan to implement

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.3.5:

Action Worksheet	
Name of Jurisdiction:	DeKalb
Risk / Vulnerability	
Problem being Mitigated:	Lack of power
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, heat wave, etc.
Action or Project	
Action/Project Number:	1.3.5
Name of Action or Project:	Inventory of facilities with generators
Action or Project Description:	Update inventory of facilities with generators and emergency power than can be used as shelters in the event of a disaster. Make shelters equipped to connect with generators.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	$0
Benefits:	Current information
Plan for Implementation	
Responsible Organization/Department:	DeKalb City Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress but will implement

Goal 1: Protect the Lives, Property and Livelihood of All Citizens

Action 1.3.6:

Action Worksheet	
Name of Jurisdiction:	Missouri Western State University
Risk / Vulnerability	
Problem being Mitigated:	Lack of power
Hazard(s) Addressed:	Earthquake, flood, severe winter weather, heat wave, etc.
Action or Project	
Action/Project Number:	1.3.6
Name of Action or Project:	Inventory of facilities with generators
Action or Project Description:	Update inventory of facilities with generators and emergency power than can be used as shelters in the event of a disaster. Retrofit shelters to be equipped to connect with generators.
Applicable Goal Statement:	Protect the lives, property and livelihood of all citizens
Estimated Cost:	Varies depending on facility
Benefits:	Current information
Plan for Implementation	
Responsible Organization/Department:	Missouri Western State University Risk Manager
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress due to lack of funding

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.1:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Flooding in high risk areas
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.1
Name of Action or Project:	Buy-out
Action or Project Description:	Build a marketing program to inform property owners on the benefits of the buy-out program.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	Reduce repetitive property loss
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	The community is in a flood plain so action is still needed.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.2:

Action Worksheet	
Name of Jurisdiction:	Agency
Risk / Vulnerability	
Problem being Mitigated:	Flooding in high risk areas
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.2
Name of Action or Project:	Buyout program
Action or Project Description:	Participate in buyout program for the highest risk properties located in the highest-risk flood areas.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	25% of property value
Benefits:	Reduce repetitive property loss
Plan for Implementation	
Responsible Organization/Department:	Agency City Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, internal, state, federal, match, private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress but still active in plan.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.3:

Action Worksheet	
Name of Jurisdiction:	Lewis and Clark Village
Risk / Vulnerability	
Problem being Mitigated:	Flooding in high risk areas
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.3
Name of Action or Project:	Buyout program
Action or Project Description:	Participate in buyout program for the highest risk properties located in the highest-risk flood areas.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	25% of property value
Benefits:	No repeat loss of property
Plan for Implementation	
Responsible Organization/Department:	Lewis & Clark Village Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, internal, state, federal, match, private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	Community is in/near floodplain so there is a need for continued participation.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.4:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Flooding
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.4
Name of Action or Project:	Floodplain management
Action or Project Description:	Adoption and enforcement of floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs)
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	Regulated construction in floodplain
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress but still applicable

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.5:

Action Worksheet	
Name of Jurisdiction:	Agency
Risk / Vulnerability	
Problem being Mitigated:	Flooding
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.5
Name of Action or Project:	Floodplain management
Action or Project Description:	Adoption and enforcement of floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs)
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	Regulated construction in floodplain
Plan for Implementation	
Responsible Organization/Department:	Agency City Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress but still applicable

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.6:

Action Worksheet	
Name of Jurisdiction:	Lewis & Clark Village
Risk / Vulnerability	
Problem being Mitigated:	Flooding
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.6
Name of Action or Project:	Floodplain management
Action or Project Description:	Adoption and enforcement of floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs)
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	Regulated construction in floodplain
Plan for Implementation	
Responsible Organization/Department:	Lewis and Clark Village Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress but still applicable

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.7:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Structures unable to handle high winds
Hazard(s) Addressed:	Thunderstorm winds, tornados, etc.
Action or Project	
Action/Project Number:	2.1.7
Name of Action or Project:	Current edition of building code adoption
Action or Project Description:	Adopt the most current edition of a model building code to address structural and architectural issues related to hazard mitigation.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director/Planning & Zoning
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	Permits issued but no building inspections

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.8:

Action Worksheet	
Name of Jurisdiction:	Agency
Risk / Vulnerability	
Problem being Mitigated:	Excess water
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	2.1.8
Name of Action or Project:	Storm water management
Action or Project Description:	Construction of detention basin, small lakes, and greenways or riparian corridors to channel and catch storm water, thereby reducing the likelihood of flooding as part of a countywide storm water management plan.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	Varies on project
Benefits:	Storm water management
Plan for Implementation	
Responsible Organization/Department:	Agency City Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal, private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress - Currently in appeals court since the land is being annexed

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.9:

Action Worksheet	
Name of Jurisdiction:	Agency
Risk / Vulnerability	
Problem being Mitigated:	Unused flood plain land
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.9
Name of Action or Project:	Uses for flood-prone areas
Action or Project Description:	Find alternative uses for flood-prone areas, such as sports fields, parks, wildlife habitats, etc. and incorporate this in all comprehensive land use plan updates.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	Varies depending on project
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Agency City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, internal, state, federal, match, private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress was made due to the lack of funding, but will seek alternative uses for flood-prone areas.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.10:

Action Worksheet	
Name of Jurisdiction:	Lewis & Clark Village
Risk / Vulnerability	
Problem being Mitigated:	Unused flood plain land
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.10
Name of Action or Project:	Uses for flood-prone areas
Action or Project Description:	Find alternative uses for flood-prone areas, such as sports fields, parks, wildlife habitats, etc. and incorporate this in all comprehensive land use plan updates.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	Varies depending on project
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Lewis & Clark Village Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, internal, state, federal, match, private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	Must seek alternatives for flood-prone land since village is in/near a flood plain.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.11:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Unused flood plain land
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.11
Name of Action or Project:	Uses for flood-prone areas
Action or Project Description:	Find alternative uses for flood-prone areas, such as sports fields, parks, wildlife habitats, etc. and incorporate this in all comprehensive land use plan updates.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	Varies depending on project
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	St. Joseph City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, internal, state, federal, match, private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – The city has done this with Heritage Park ballparks and soccer fields and will consider for other flood-prone areas.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.12:

Action Worksheet	
Name of Jurisdiction:	Agency
Risk / Vulnerability	
Problem being Mitigated:	Excess water
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.12
Name of Action or Project:	Comprehensive storm water management plan
Action or Project Description:	Continue to review needs and participate in countywide considerations of a multi-jurisdictional comprehensive storm water management plan.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	Varies depending on project
Benefits:	Storm water management
Plan for Implementation	
Responsible Organization/Department:	Agency City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, internal, federal, state
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress due to limited resources but will renew efforts to implement.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.13:

Action Worksheet	
Name of Jurisdiction:	Easton
Risk / Vulnerability	
Problem being Mitigated:	Excess water
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.13
Name of Action or Project:	Comprehensive storm water management plan
Action or Project Description:	Continue to review needs and participate in countywide considerations of a multi-jurisdictional comprehensive storm water management plan.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	Varies depending on project
Benefits:	Storm water management
Plan for Implementation	
Responsible Organization/Department:	Easton City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, internal, federal, state
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress due to lack of staff

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.14:

Action Worksheet	
Name of Jurisdiction:	Lewis & Clark Village
Risk / Vulnerability	
Problem being Mitigated:	Excess water
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.14
Name of Action or Project:	Comprehensive storm water management plan
Action or Project Description:	Continue to review needs and participate in countywide considerations of a multi-jurisdictional comprehensive storm water management plan.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	Varies depending on project
Benefits:	Storm water management
Plan for Implementation	
Responsible Organization/Department:	Lewis & Clark Village Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, internal, federal, state
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress due to lack of staff

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.15:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Excess water
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.1.15
Name of Action or Project:	Comprehensive storm water management plan
Action or Project Description:	Continue to review needs and participate in countywide considerations of a multi-jurisdictional comprehensive storm water management plan.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	Varies depending on project
Benefits:	Storm water management
Plan for Implementation	
Responsible Organization/Department:	St. Joseph City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Grants, internal, federal, state
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress due to no staff assigned to action.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.1.16:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Vulnerable population
Hazard(s) Addressed:	Thunderstorm wind, tornado
Action or Project	
Action/Project Number:	2.1.16
Name of Action or Project:	Storm shelter in new or expanding mobile home parks
Action or Project Description:	Amend municipal ordinances to include a section mandating the building of a storm shelter with a capacity to handle the expected population in any new mobile home park or park undergoing renovation or expansion.
Applicable Goal Statement:	
Estimated Cost:	$0 to amend ordinance/Varies by project for storm shelter
Benefits:	Protection from high wind events
Plan for Implementation	
Responsible Organization/Department:	St. Joseph City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.2.1:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Development occurring in hazard-prone areas
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	2.2.1
Name of Action or Project:	Land use plan
Action or Project Description:	Update comprehensive land use plan to specifically address development in hazard-prone areas and outline strategies to decrease vulnerability
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	Reduction of property loss
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	2 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress- Currently updating land use plan

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.3.1:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	2.3.1
Name of Action or Project:	Commercial and industrial disaster plans
Action or Project Description:	Encourage up-to-date commercial and industrial disaster plans that are coordinated with community disaster plans.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	Relevant disaster plan
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Emergency Manager
Action/Project Priority:	Medium
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	Community disaster plans
Progress Report	
Action Status	Continue
Report of Progress	In progress – Currently working with several factories and industrial businesses about this action.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.3.2:

Action Worksheet	
Name of Jurisdiction:	Easton
Risk / Vulnerability	
Problem being Mitigated:	Prevention of living in high risk areas
Hazard(s) Addressed:	Flood, dam failure, levee failure
Action or Project	
Action/Project Number:	2.3.2
Name of Action or Project:	Ordinances for high-hazard prone areas
Action or Project Description:	Enact ordinances prohibiting residential and commercial development in all high-hazard prone areas.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	Reduce repeat loss structures
Plan for Implementation	
Responsible Organization/Department:	Easton City Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress due to lack of staff

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.3.3:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Outdated information
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.3.3
Name of Action or Project:	Flood insurance rate maps
Action or Project Description:	Ensure all local governments have the latest copies of flood insurance rate maps, flood plain maps and similar documents
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	Accurate information
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – Plans in place to ensure this action

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.3.4:

Action Worksheet	
Name of Jurisdiction:	Agency
Risk / Vulnerability	
Problem being Mitigated:	Outdated information
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.3.4
Name of Action or Project:	Flood insurance rate maps
Action or Project Description:	Ensure all local governments have the latest copies of flood insurance rate maps, flood plain maps and similar documents
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	Accurate information
Plan for Implementation	
Responsible Organization/Department:	Agency City Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – Have latest maps and will continue to have the latest flood insurance maps

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.3.5:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Outdated information
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	2.3.5
Name of Action or Project:	Updated list
Action or Project Description:	Maintain and updated list of names, phone numbers and duties for all employees during regular operation and off hours.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	Current information
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	1 Year
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.3.6:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Outdated information
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	2.3.6
Name of Action or Project:	Updated list
Action or Project Description:	Maintain and update list of names, phone numbers and duties for all employees during regular operation and off hours.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	Current information
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Emergency Manager
Action/Project Priority:	High
Timeline for Completion:	1 Year
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – City directors and supervisors have city cell phones and can be contacted anytime during a disaster. Will continue the action and update information.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.3.7:

Action Worksheet	
Name of Jurisdiction:	Missouri Western State University
Risk / Vulnerability	
Problem being Mitigated:	Outdated information
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	2.3.7
Name of Action or Project:	Updated list
Action or Project Description:	Maintain and update list of names, phone numbers and duties for all employees during regular operation and off hours.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	Current information
Plan for Implementation	
Responsible Organization/Department:	Missouri Western State University Risk Manager
Action/Project Priority:	High
Timeline for Completion:	1 Year
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – This is maintained in the Human Resources office. Will continue to update.

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.3.8:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Drought
Hazard(s) Addressed:	Drought
Action or Project	
Action/Project Number:	2.3.8
Name of Action or Project:	Missouri 2002 Drought Plan
Action or Project Description:	Follow guidelines as suggested in the Missouri 2002 Drought Plan, developed by MDNR.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	Ongoing, monitored progress

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.3.9:

Action Worksheet	
Name of Jurisdiction:	Easton
Risk / Vulnerability	
Problem being Mitigated:	Drought
Hazard(s) Addressed:	Drought
Action or Project	
Action/Project Number:	2.3.9
Name of Action or Project:	Missouri 2002 Drought Plan
Action or Project Description:	Follow guidelines as suggested in the Missouri 2002 Drought Plan, developed by MDNR.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Easton City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress due to lack of staff

Goal 2: Provide Mitigation to Lessen the Impact in Hazard Prone Areas

Action 2.3.10:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Drought
Hazard(s) Addressed:	Drought
Action or Project	
Action/Project Number:	2.3.10
Name of Action or Project:	Missouri 2002 Drought Plan
Action or Project Description:	Follow guidelines as suggested in the Missouri 2002 Drought Plan, developed by MDNR.
Applicable Goal Statement:	Provide mitigation to lessen the impact in hazard prone areas
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Emergency Manager
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress but developing a revised plan.

Goal 3: Increase Resources Available to Citizens via Education and Preparedness

Action 3.1.1:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	3.1.1
Name of Action or Project:	Seasonal campaigns
Action or Project Description:	Develop an ongoing campaign to educate the community about seasonal hazards and coordinate the campaign with a variety of promotional resources
Applicable Goal Statement:	Increase resources available to citizens via education and preparedness
Estimated Cost:	$0
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – Currently use tv and other media to provide information about fires but will expand to include additional hazards

Goal 3: Increase Resources Available to Citizens via Education and Preparedness

Action 3.1.2:

Action Worksheet	
Name of Jurisdiction:	St. Joseph School District
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	3.1.2
Name of Action or Project:	Educate children
Action or Project Description:	Educate children in disaster preparedness and how to survive disasters
Applicable Goal Statement:	Increase resources available to citizens via education and preparedness
Estimated Cost:	$0
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	St. Joseph School District Superintendent
Action/Project Priority:	High
Timeline for Completion:	1 Year
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – Each year one earthquake, two tornado, two intruder, two bus evacuations and five fire drills are completed. Will continue to implement action.

Goal 3: Increase Resources Available to Citizens via Education and Preparedness

Action 3.1.3:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information
Hazard(s) Addressed:	Thunderstorm wind, tornado
Action or Project	
Action/Project Number:	3.1.3
Name of Action or Project:	Public education campaign
Action or Project Description:	Conduct a public education campaign to inform citizen across the region of the benefits of constructing a tornado safe room in their homes
Applicable Goal Statement:	Increase resources available to citizens via education and preparedness
Estimated Cost:	$0 for campaign materials/ Safe room costs vary by project
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – Expected to complete action in 2017

Goal 3: Increase Resources Available to Citizens via Education and Preparedness

Action 3.1.4:

Action Worksheet	
Name of Jurisdiction:	Agency
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information
Hazard(s) Addressed:	Thunderstorm wind, tornado
Action or Project	
Action/Project Number:	3.1.4
Name of Action or Project:	Public education campaign
Action or Project Description:	Conduct a public education campaign to inform citizen across the region of the benefits of constructing a tornado safe room in their homes
Applicable Goal Statement:	Increase resources available to citizens via education and preparedness
Estimated Cost:	$0 for campaign materials/ Safe room costs vary by project
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	Agency City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress because wasn't sure where to obtain educational materials. Public education campaign will be conducted in the future.

Goal 3: Increase Resources Available to Citizens via Education and Preparedness

Action 3.1.5:

Action Worksheet	
Name of Jurisdiction:	Easton
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information
Hazard(s) Addressed:	Thunderstorm wind, tornado
Action or Project	
Action/Project Number:	3.1.5
Name of Action or Project:	Public education campaign
Action or Project Description:	Conduct a public education campaign to inform citizen across the region of the benefits of constructing a tornado safe room in their homes
Applicable Goal Statement:	Increase resources available to citizens via education and preparedness
Estimated Cost:	$0 for campaign materials/ Safe room costs vary by project
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	Easton City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress due to lack of resources and staff

Goal 3: Increase Resources Available to Citizens via Education and Preparedness

Action 3.1.6:

Action Worksheet	
Name of Jurisdiction:	Easton
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	3.1.6
Name of Action or Project:	Public education campaign
Action or Project Description:	Promote Ready-In-Three Campaign
Applicable Goal Statement:	Increase resources available to citizens via education and preparedness
Estimated Cost:	$0 for campaign materials
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	Easton City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress because of uncertainty where to obtain materials

Goal 3: Increase Resources Available to Citizens via Education and Preparedness

Action 3.1.7:

Action Worksheet	
Name of Jurisdiction:	Lewis & Clark Village
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	3.1.7
Name of Action or Project:	Public education campaign
Action or Project Description:	Promote Ready-In-Three Campaign
Applicable Goal Statement:	Increase resources available to citizens via education and preparedness
Estimated Cost:	$0 for campaign materials
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	Lewis & Clark Village Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress and will continue to reach all citizens

Goal 3: Increase Resources Available to Citizens via Education and Preparedness

Action 3.1.8:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information
Hazard(s) Addressed:	Fire
Action or Project	
Action/Project Number:	3.1.8
Name of Action or Project:	Fire mitigation
Action or Project Description:	Public information campaign to remove reduce the threat of fire (remove vegetation, yard debris and other combustible materials) in urban interface/intermix areas
Applicable Goal Statement:	Increase resources available to citizens via education and preparedness
Estimated Cost:	$0 for campaign materials
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress with burn brochures distributed but want to continue/expand

Goal 3: Increase Resources Available to Citizens via Education and Preparedness

Action 3.1.9:

Action Worksheet	
Name of Jurisdiction:	Buchanan County School District
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	3.1.9
Name of Action or Project:	Educate children
Action or Project Description:	Educate children in disaster preparedness and how to survive disasters
Applicable Goal Statement:	Increase resources available to citizens via education and preparedness
Estimated Cost:	$0
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	Buchanan School District Superintendent
Action/Project Priority:	High
Timeline for Completion:	1 Year
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – We train our staff and students on our emergency disaster plans which are on file with the Buchanan County Sheriff's Dept, follow state guidelines for fire, tornado, and earthquake drills. In addition we hold intruder training for our staff at least once year.

Goal 3: Increase Resources Available to Citizens via Education and Preparedness

Action 3.1.10:

Action Worksheet	
Name of Jurisdiction:	Mid-Buchanan School District
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	3.1.10
Name of Action or Project:	Educate children
Action or Project Description:	Educate children in disaster preparedness and how to survive disasters
Applicable Goal Statement:	Increase resources available to citizens via education and preparedness
Estimated Cost:	$0
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	Mid-Buchanan School District Superintendent
Action/Project Priority:	High
Timeline for Completion:	1 Year
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – Numerous drills are conducted each year. Will continue to modify drills to address potential hazards.

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster

Action 4.1.1:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.1.1
Name of Action or Project:	List of contacts
Action or Project Description:	Maintain a publicly accessible list of names, positions, contact information, roles and responsibilities for all public safety positions and departments
Applicable Goal Statement:	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost:	$0
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress but will modify and continue

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster

Action 4.1.2:

Action Worksheet	
Name of Jurisdiction:	DeKalb
Risk / Vulnerability	
Problem being Mitigated:	Lack of public information
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.1.2
Name of Action or Project:	List of contacts
Action or Project Description:	Maintain a publicly accessible list of names, positions, contact information, roles and responsibilities for all public safety positions and departments
Applicable Goal Statement:	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost:	$0
Benefits:	Informed public
Plan for Implementation	
Responsible Organization/Department:	DeKalb City Council
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress but want to implement

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster

Action 4.1.3:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources in an emergency
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.1.3
Name of Action or Project:	Mutual Aid
Action or Project Description:	Execute mutual aid agreements with all relevant agencies
Applicable Goal Statement:	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost:	$0
Benefits:	Ample resources
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – County is working with relevant agencies and will update agreements as appropriate

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster

Action 4.1.4:

Action Worksheet	
Name of Jurisdiction:	Agency
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources in an emergency
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.1.4
Name of Action or Project:	Mutual Aid
Action or Project Description:	Execute mutual aid agreements with all relevant agencies
Applicable Goal Statement:	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost:	$0
Benefits:	Ample resources
Plan for Implementation	
Responsible Organization/Department:	Agency City Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress – Will maintain and expand agreements

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster

Action 4.1.5:

Action Worksheet	
Name of Jurisdiction:	DeKalb
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources in an emergency
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.1.5
Name of Action or Project:	Mutual Aid
Action or Project Description:	Execute mutual aid agreements with all relevant agencies
Applicable Goal Statement:	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost:	$0
Benefits:	Ample resources
Plan for Implementation	
Responsible Organization/Department:	DeKalb City Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress but want to continue and implement

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster

Action 4.1.6:

Action Worksheet	
Name of Jurisdiction:	Easton
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources in an emergency
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.1.6
Name of Action or Project:	Mutual Aid
Action or Project Description:	Execute mutual aid agreements with all relevant agencies
Applicable Goal Statement:	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost:	$0
Benefits:	Ample resources
Plan for Implementation	
Responsible Organization/Department:	Easton City Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No new progress but want to continue

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster

Action 4.1.7:

Action Worksheet	
Name of Jurisdiction:	Lewis & Clark Village
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources in an emergency
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.1.7
Name of Action or Project:	Mutual Aid
Action or Project Description:	Execute mutual aid agreements with all relevant agencies
Applicable Goal Statement:	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost:	$0
Benefits:	Ample resources
Plan for Implementation	
Responsible Organization/Department:	Lewis & Clark Village Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	There is a policy in place regarding this action. Seek to continue.

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster

Action 4.1.8:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources in an emergency
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.1.8
Name of Action or Project:	GIS information
Action or Project Description:	Make GIS hazard information available online to county and permitting departments
Applicable Goal Statement:	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost:	Unsure
Benefits:	Ample resources
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	No progress - Seek to implement in 2017

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster

Action 4.1.9:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.1.9
Name of Action or Project:	ERIP Usage
Action or Project Description:	Schools and emergency responders to participate in Electronic Response Information Portal (ERIP)
Applicable Goal Statement:	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress- Continue to coordinate with school resource officer

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster

Action 4.1.10:

Action Worksheet	
Name of Jurisdiction:	Lewis & Clark Village
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.1.10
Name of Action or Project:	ERIP Usage
Action or Project Description:	Schools and emergency responders to participate in Electronic Response Information Portal (ERIP)
Applicable Goal Statement:	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Lewis & Clark Village Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress- Policy in place, funded by grants and will continue to implement

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster

Action 4.1.11:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.1.11
Name of Action or Project:	ERIP Usage
Action or Project Description:	Schools and emergency responders to participate in Electronic Response Information Portal (ERIP)
Applicable Goal Statement:	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost:	$0
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Lewis & Clark Village Council
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress- The city has policies in place and continues to update/expand

Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster

Action 4.1.12:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Data vulnerability
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.1.12
Name of Action or Project:	Data backup
Action or Project Description:	Maintain offsite data backup of county records and safeguard data that does not have backups.
Applicable Goal Statement:	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost:	Unsure
Benefits:	Ability to access data
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Information Technology Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue
Report of Progress	In progress- Is being implemented but progress is slow. Not complete

Goal 5: Identify Critical Infrastructure Components

Action 5.1.11:

Action Worksheet	
Name of Jurisdiction:	Buchanan County
Risk / Vulnerability	
Problem being Mitigated:	Vulnerable infrastructure
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	5.1.1
Name of Action or Project:	Critical infrastructure
Action or Project Description:	Assess critical facilities and infrastructure for needed upgrades and retrofits
Applicable Goal Statement:	Identify critical infrastructure components
Estimated Cost:	Inspection costs/ varies on building/infrastructure assessed
Benefits:	
Plan for Implementation	
Responsible Organization/Department:	Buchanan County Emergency Management Director
Action/Project Priority:	High
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue (modified)
Report of Progress	No progress

Goal 5: Identify Critical Infrastructure Components

Action 5.1.2:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Vulnerable infrastructure
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	5.1.2
Name of Action or Project:	Critical infrastructure
Action or Project Description:	Assess critical facilities and infrastructure for needed upgrades and retrofits
Applicable Goal Statement:	Identify critical infrastructure components
Estimated Cost:	Inspection costs vary on building/infrastructure assessed
Benefits:	Updated infrastructure
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Building Development, Chief Building Official
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue (modified)
Report of Progress	No progress

Goal 5: Identify Critical Infrastructure Components

Action 5.1.3:

Action Worksheet	
Name of Jurisdiction:	Missouri Western State University
Risk / Vulnerability	
Problem being Mitigated:	Vulnerable infrastructure
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	5.1.3
Name of Action or Project:	Critical infrastructure
Action or Project Description:	Assess critical facilities and infrastructure for needed upgrades and retrofits
Applicable Goal Statement:	Identify critical infrastructure components
Estimated Cost:	Inspection costs vary on building/infrastructure assessed
Benefits:	Updated infrastructure
Plan for Implementation	
Responsible Organization/Department:	Missouri Western State University Risk Manager
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue (modified)
Report of Progress	No progress due to lack of funding

Goal 5: Identify Critical Infrastructure Components

Action 5.1.4:

Action Worksheet	
Name of Jurisdiction:	St. Joseph
Risk / Vulnerability	
Problem being Mitigated:	Vulnerable infrastructure
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	5.1.4
Name of Action or Project:	Utilities
Action or Project Description:	Work with utility providers to assess vulnerability to hazards and to implement needed upgrades and retrofits
Applicable Goal Statement:	Identify critical infrastructure components
Estimated Cost:	Inspection costs vary on building/infrastructure assessed
Benefits:	Updated infrastructure
Plan for Implementation	
Responsible Organization/Department:	St. Joseph Emergency Manager
Action/Project Priority:	Low
Timeline for Completion:	5 Years
Potential Fund Sources:	Private
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Continue (modified)
Report of Progress	No progress

5 PLAN MAINTENANCE PROCESS

5 PLAN MAINTENANCE PROCESS 5.1

5.1 Monitoring, Evaluating, and Updating the Plan 5.1

5.1.1 Responsibility for Plan Maintenance 5.1

5.1.2 Plan Maintenance Schedule 5.2

5.1.3 Plan Maintenance Process 5.2

5.2 Incorporation into Existing Planning Mechanisms 5.3

5.3 Continued Public Involvement 5.4

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 and how 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) is not a standing committee. Responsibility for maintenance will reside with the individual jurisdictions for monitoring, evaluation and maintenance. Maintenance activities for the participating jurisdictions, including school and special districts, may involve:

- 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 County Commissioners and governing bodies of participating jurisdictions; and
- Inform and solicit input from the public.

It's the MPC representative's primary duty to see the plan successfully carried out and to report to the community's governing boards 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 Buchanan County Emergency Management Director (EMD) will be responsible for initiating the plan review at the LEPC meeting every other year. The St. Joseph EMD will be responsible for initiating plan reviews for St. Joseph every other year. The LEPC and St. Joseph will coordinate so their reviews do not fall on the same year. For the other jurisdictions, their MPC representative will be responsible for initiating reviews.

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. During the review, changes in vulnerability were 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 as a result of new development (and/or annexation).

Future five 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 as a result of plan implementation, the participating jurisdictions will:

- Identify an individual, office, or agency responsible for action implementation. This entity will track and report 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 jurisdiction will make 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, time frame, community priorities, and/or funding resources. Updating of the plan will be accomplished by written changes and submissions, as the jurisdictions deem appropriate and necessary. Changes will be approved by the Buchanan County Commissioners 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 schools, will use existing plans and/or programs to implement hazard mitigation actions. Those existing plans and programs were described in Chapter 2 of this plan. Based on the capability assessments of the participating jurisdictions, communities in Buchanan 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:

- Comprehensive plans of participating jurisdictions;
- Ordinances of participating jurisdictions;
- Local Emergency Operations Plan;
- Capital improvement plans and budgets;
- Other community plans within the County, such as water conservation plans, storm water management plans, and parks and recreation plans; and
- School District Emergency Plans

The MPC (or designated responsible entity) members involved in updating these existing planning mechanisms will be responsible for integrating the findings and actions of the mitigation plan, as appropriate. The MPC (or designated responsible entity) 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, the Buchanan County EMD will provide the updated mitigation strategy with current status of each mitigation action to the county commission as well as all mayors, city clerks, and school district superintendents as appropriate. The EMD will request that the mitigation strategy be incorporated, where appropriate, in other planning mechanisms.

Table 1.1 below lists the planning mechanisms by jurisdiction into which the Hazard Mitigation Plan will be integrated.

Table 1.1. Planning Mechanisms Identified for Integration of Hazard Mitigation Plan

Jurisdiction	Planning Mechanisms	Integration Process for Previous Plan	Integration Process for Current Plan
Buchanan County	Comprehensive Plan Zoning Ordinance, Floodplain Ordinance, Site Plan Review Ordinance, Emergency Operating Plan	Comprehensive Plan, Emergency Operating Plan	Comprehensive Plan Zoning Ordinance, Floodplain Ordinance, Site Plan Review Ordinance, Emergency Operating Plan
Agency	Comprehensive Plan, Zoning Ordinance Building Code, Subdivision Ordinance, Storm Water Ordinance	Unknown	Comprehensive Plan, Zoning Ordinance, Building Code, Subdivision Ordinance, Storm Water Ordinance
Easton	Zoning Ordinance, Subdivision Ordinance	Unknown	Zoning Ordinance, Subdivision Ordinance
DeKalb	None	Unknown	-
Lewis & Clark Village	Zoning Ordinance, Flood Plain Ordinance	Unknown	Zoning Ordinance, Flood Plain Ordinance
St. Joseph	Emergency Operations Plan, Zoning Ordinance, Flood Plain Ordinance, Storm Water Ordinance, Landscape Ordinance, Site Plan Review Ordinance , Land Use Plan	Zoning Ordinance	Emergency Operations Plan, Zoning Ordinance, Flood Plain Ordinance, Storm Water Ordinance, Landscape Ordinance, Site Plan Review Ordinance, Land Use Plan
Buchanan County R-IV School District	Emergency Plan	Emergency Plan	Emergency Plan
Mid-Buchanan School District	Emergency Plan	Emergency Plan	Emergency Plan
St. Joseph School District	Emergency Plan	Emergency Plan	Emergency Plan
Missouri Western State University	Emergency Plan	Emergency Plan	Emergency 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 reviews will be posted in the local newspaper as well as on the Buchanan County website following each 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 notices 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.

Appendix A: Adoption Resolutions

County Commission, Buchanan County, Missouri

STATE OF MISSOURI, } SS. JANUARY TERM, 2017
County of Buchanan, }

In the County Commission of said County, on the 2nd day of March, 2017 the following, among other proceeding, were had viz:

Now on this 2nd day of March, 2017 the Buchanan County Commission hereby orders they are adopting the 2017 Buchanan County Multi-Jurisdictional Natural Hazard Mitigation Plan as an official plan as recommended by the County's Emergency Management Officer. A copy of this official plan is attached with the rules and regulation therein incorporated by reference.

It is so ordered.

Ron Hook	Harry Roberts	Scott Burnham
Western District Commissioner	Presiding Commissioner	Eastern District Commissioner

STATE OF MISSOURI, }
County of Buchanan, }

I, Mary Baack-Garvey, Clerk of the County Commission and for said County, hereby certify the above and foregoing to be a true copy of the proceedings of said County Commission, on the day and year above written, as the same appears of record, in my office. In Testimony Whereof, I have hereunto set my hand and affixed the seal of said County Commission at office in the Courthouse in St. Joseph, MO, this 2nd day of March, 2017.

Mary Baack-Garvey CG
Clerk County Commission
By Amy Kendall, D.C.

VILLAGE OF AGENCY
RESOLUTION NO. 2017-02

A RESOLUTION TO ADOPT THE 2017 BUCHANAN COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Whereas, Agency recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, Agency fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan," and approved it as to form and content; and

Whereas, Agency desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for Agency demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE VILLAGE OF AGENCY, MISSOURI AS FOLLOWS: The Village hereby adopts the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan" as its official plan.

1. **The Board hereby adopts the document on this 16th Day of February, 2017 with a vote as follows:**

Bud Calloway YES, **Valerie Engelken** YES, **Curtis Gabriel** YES,

Jason Myers ABSENT, **Bryan Gabriel** YES.

RESOLUTION 2017-02
SIGNATURE PAGE

Bryan E. Gabriel,
Chairman of the Board of Trustees

Attest:

Earl A. Huskamp Sr.
Clerk, Agency, MO

Model Resolution

Resolution # 2-2017

Adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, DeKalb recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, DeKalb fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan," and approved it as to form and content; and

Whereas, DeKalb desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for DeKalb demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that DeKalb has adopted the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan" as an official plan.

Date: 2-8-17

Certifying Official: Leslie Crockett

Model Resolution

Resolution # 214

Adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, Easton recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, Easton fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan," and approved it as to form and content; and

Whereas, Easton desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for Easton demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that Easton has adopted the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan" as an official plan.

Date: FEBRUARY 16, 2017

Certifying Official: Linda Ellington

Model Resolution

Resolution # _____

Adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, Lewis and Clark Village recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, Lewis and Clark Village fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan," and approved it as to form and content; and

Whereas, Lewis and Clark Village desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for Lewis and Clark Village demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that Lewis and Clark Village has adopted the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan" as an official plan.

Date: 2-7-17

Certifying Official: Brad

xR-23-17

ORIGINATOR: COUNCILMEMBER

RESOLUTION No. 42426

A RESOLUTION ADOPTING AND APPROVING ALL ASPECTS PERTAINING TO THE CITY OF ST. JOSEPH IN BUCHANAN COUNTY'S MULTI-JURISDICTIONAL NATURAL HAZARD MITIGATION PLAN WITH THE INTENT TO WORK TOWARD BECOMING A SAFER COMMUNITY.

WHEREAS, the City of St. Joseph recognizes that no community is immune from natural hazards whether it be tornado/severe thunderstorm, flood, severe winter weather, drought, heat-wave, earthquake, dam failure, or wildfire, and recognizes the importance of enhancing its ability to withstand natural hazards as well as the importance of reducing the human suffering, property damage, interruption of public services and economic losses caused by those hazards; and

WHEREAS, the City of St. Joseph may have previously pursued measures such as building codes, fire codes, floodplain management regulations, zoning ordinance, and storm-water management regulations to minimize the impact of natural hazards; and

WHEREAS, the Federal Emergency Management Agency and the State Emergency Management Agency have developed a natural hazard mitigation program that assists communities in their efforts to become Disaster-Resistant Communities which are sustainable communities after a natural disaster that focus, not just on disaster relief, but also on recovery and reconstruction that brings the community to at least pre-disaster conditions in an accelerated, orderly, and preplanned manner; and

WHEREAS, by participating in the Natural Hazards Mitigation Program, St. Joseph will be eligible to apply for pre-disaster and post-disaster mitigation funds; and

WHEREAS, St. Joseph desires to commit to working with government partners and community partners to implement the Natural Hazards Mitigation Plan; and

WHEREAS, St. Joseph will implement pertinent precepts of the mitigation plan by incorporation into other community plans and mechanisms where appropriate; and

WHEREAS, St. Joseph will participate in the evaluation and review of the Plan after a disaster as well as complete mandated five-year update submitted to the State Emergency Management Agency and the Federal Emergency Management Agency for review and approval.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF ST. JOSEPH, MISSOURI, AS FOLLOWS:

SECTION 1. That the Council of the City of St. Joseph, Missouri, hereby adopts and approves all aspects pertaining to the City of St. Joseph in Buchanan County's Multi-Jurisdictional Natural Hazard Mitigation Plan, a copy of which is on file in the office of the City Clerk and incorporated herein by reference, for the purpose of building a safe community by reducing natural hazard vulnerability.

SECTION 2. That all resolutions or part of resolutions in conflict herewith be, and hereby are, repealed.

Approved as to form:

City Attorney

Adopted February 27, 20 17

Attest: Paula Heyde
City Clerk

Mayor

CITY CLERK

2017 FEB 14 AM 9:37

Date: February 14, 2017
Account Number: N/A
Amount: N/A
Type of Document: Resolution

EXPLANATION TO COUNCIL BILL

ORIGINATING DEPARTMENT: Fire/Emergency Management

PURPOSE: To adopt and approve all aspects pertaining to the City of St. Joseph in Buchanan County's Multi-Jurisdictional Natural Hazard Mitigation Plan for the purpose of building a safe community by reducing natural hazard vulnerability.

REMARKS: The Federal Emergency Management Agency (FEMA) and the State Emergency Management Agency (SEMA) have developed a natural hazard mitigation plan that assists communities in their efforts to become Disaster-Resistant Communities which are sustainable communities after a natural disaster that focus, not just on disaster relief, but also on recovery and reconstruction that brings the community to at least pre-disaster conditions in an accelerated, orderly, and preplanned manner. By participating in the Natural Hazards Mitigation Plan, St. Joseph will be eligible to apply for pre-disaster and post-disaster mitigation funds. St. Joseph will implement pertinent precepts of the mitigation plan by incorporation into other community plans and mechanisms where appropriate. St. Joseph will participate in the evaluation and review of the Plan after a disaster as well as complete mandated five-year update submitted to the State Emergency Management Agency and the Federal Emergency Management Agency for review and approval.

Submitted By:

Mike Dalsing, Fire Chief/
Interim Emergency Manager

Reviewed By:

J. Bruce Woody
City Manager

Model Resolution

Resolution # 020917

Adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the Buchanan County RIV School District recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the Buchanan County RIV School District fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan," and approved it as to form and content; and

Whereas, the Buchanan County RIV School District desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the Buchanan County RIV School District demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the Buchanan County RIV School District has adopted the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan" as an official plan.

Date: February 9, 2017

Certifying Official: Michael Vargo

Model Resolution

Resolution # _____

Adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the St. Joseph School District recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the St. Joseph School District fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan," and approved it as to form and content; and

Whereas, the St. Joseph School District desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the St. Joseph School District demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the St. Joseph School District has adopted the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan" as an official plan.

Date: 2-27-2017

Certifying Official: Matt Smith

Model Resolution

Resolution # _____

Adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the Mid-Buchanan School District recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the Mid-Buchanan School District fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan," and approved it as to form and content; and

Whereas, the Mid-Buchanan School District desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the Mid-Buchanan School District demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the Mid-Buchanan School District has adopted the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan" as an official plan.

Date: 2/20/17

Certifying Official: Ken K Jones

Model Resolution

Resolution # _____

Adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, Missouri Western State University recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, Missouri Western State University fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan," and approved it as to form and content; and

Whereas, Missouri Western State University desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for Missouri Western State University demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that Missouri Western State University has adopted the "Buchanan County Multi-Jurisdictional Local Hazard Mitigation Plan" as an official plan.

Date: Jan, 23, 2017

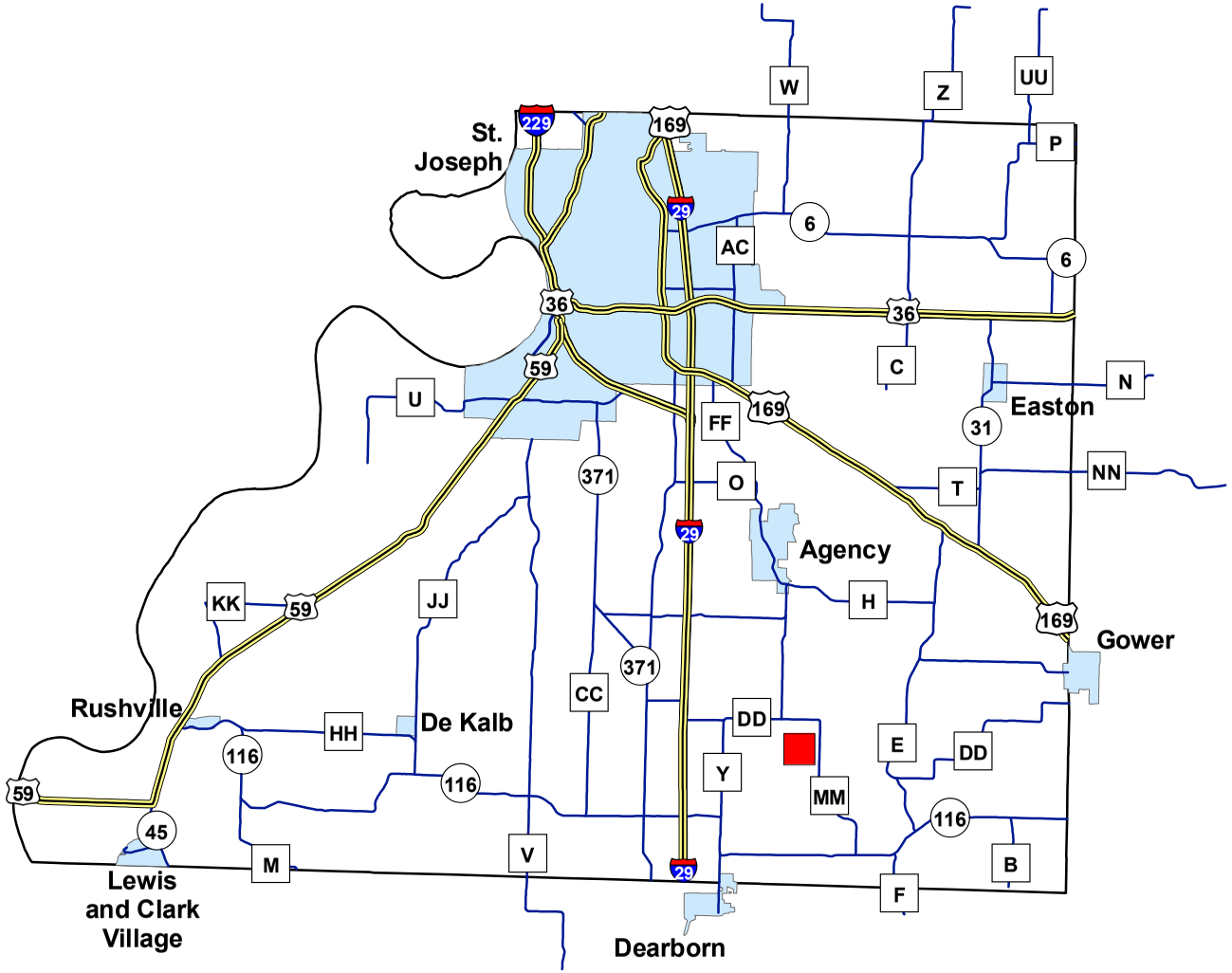
Certifying Official: Timothy J. Kelly
Risk Manager

Appendix B: Supporting materials
(maps, preliminary firms, reports, etc.)

1/14/11

Belcher Branch Lake Dam

Breach Inundation Map



Buchanan County, Missouri

BUCHANAN_MO12290

Note: Actual areas inundated will depend on the actual dam failure criteria and may differ from the areas shown. Due to limitations, methods, assumptions, and procedures used to develop the inundation area, the map should only be used for evacuation and emergency purposes.

Missouri Department of Natural Resources

Water Resources Center
P.O. Box 176
Jefferson City, MO 65102

Explanation Sheet

Project:
Belcher Branch Lake Dam Breach Analysis

Drawing Title:
Explanation Sheet 1 of 1

Missouri Department of Natural Resources
Water Resources Center
P.O. Box 176
Jefferson City, MO 65102

Project ID: BUCHANAN_MO12290

Explanation of Maps

The following maps indicate the areas which are predicted to be inundated during the occurance of a sunny day breach of the dam. The pool elevation at failure is assumed to be at the emergency spillway crest elevation or at the crest of the dam in the absence of an emergency spillway.

Use of Maps

The following maps provide a baseline for evaluation of existing emergency action plans and environmental hazards downstream of the regulated structure.

Definition of Terms

Pool Elevation- Water level in the reservoir.

Dam Crest- The lowest elevation measured along the dam crest.

Spillway Crest- The lowest elevation measured along the crest of the spillway.

Arrival Time- Elapsed time between the breach initiation and the time that water levels first begin to rise at any given point.

Assumed Conditions of Flooding

The pool elevation at failure is assumed to be at the emergency spillway crest elevation or at the crest of the dam in the absence of an emergency spillway. The assumed overtopping erodes a section of the dam resulting in a dangerous and quick release of water. For the hydraulic analysis flow initiation is required and therefore a baseflow of water has been included in the analysis.

Dam Facts

ID: MO_12290

County: Buchanan

Location: S16, T55 N, R34 W

Height of Dam: 47'

Tributary: Unnamed trib. to Belcher Branch

Lake Area: 46 acres

Max Storage Capacity: 1765 ac-ft

Breach Parameters (Froehlich, 1995)

Side slopes: 1.4:1

Bottom width: 66'

Bottom elevation: 852.5’

Breach formation time: 0.52 hr

Pool Elevation at Failure: 880’

Pool Volume at Failure: 955 ac-ft

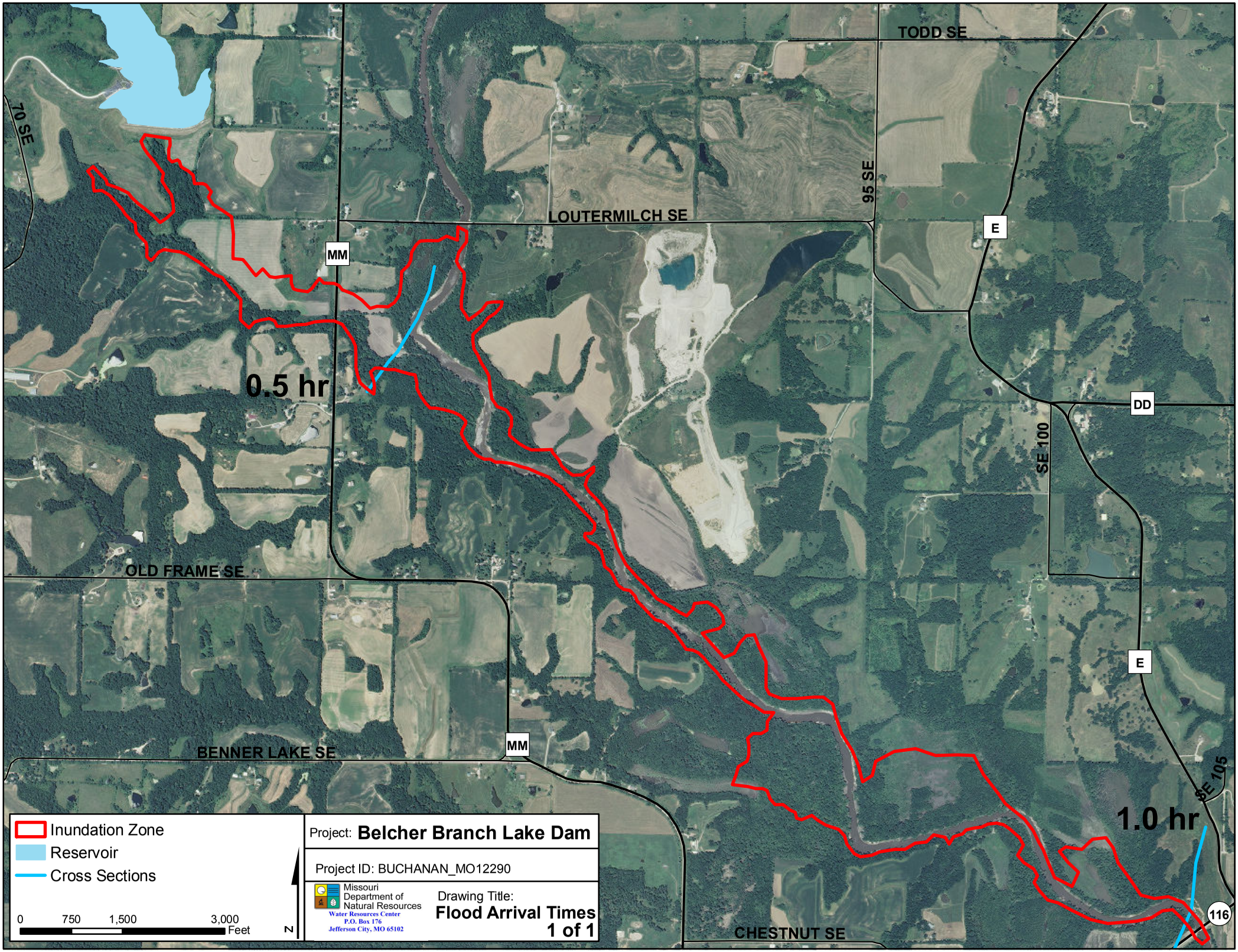
Downstream Crossings

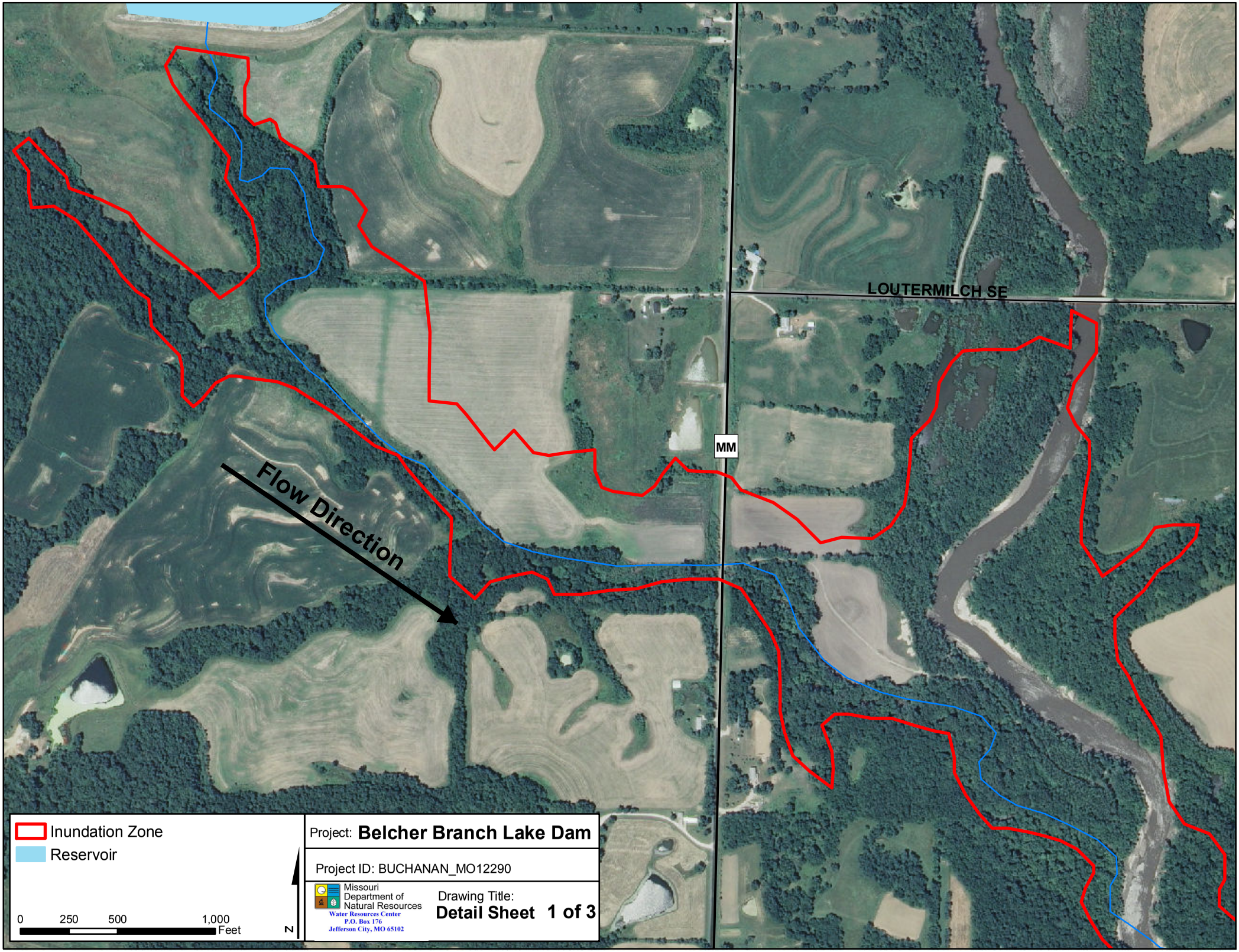
Rt MM

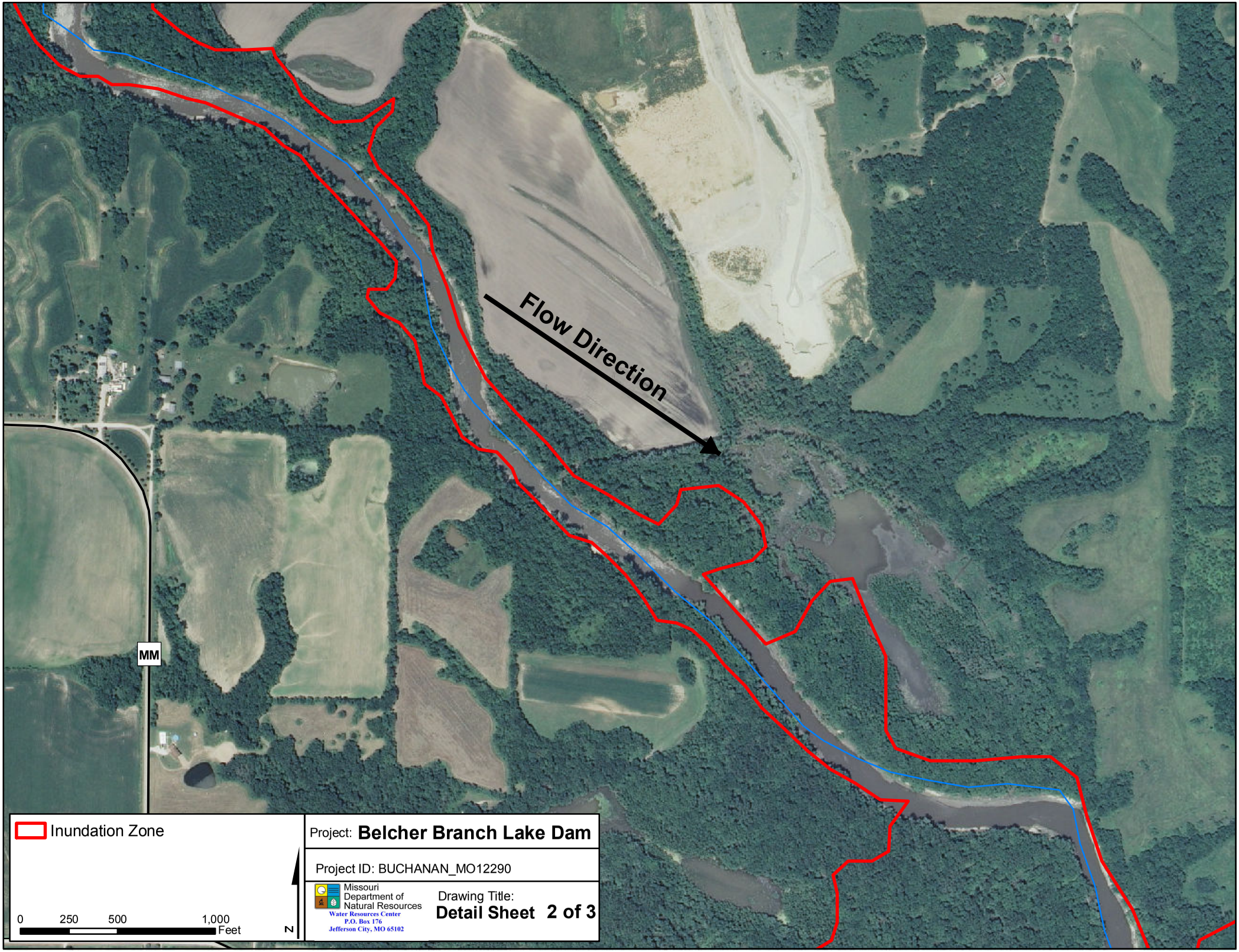
MO 116

NOTE: LiDAR Elevation data unavailable for Buchanan County. Analysis was completed with 10 meter Digital Elevation Model

Date of Aerial Photo: August 18, 2009


TODD SE
70 SE
95 SE
LOUTERMILCH SE
MM
E
0.5 hr
DD
SE 100
OLD FRAME SE
E
BENNER LAKE SE
MM
SE 105
1.0 hr
116
CHESTNUT SE
Inundation Zone
Reservoir
Cross Sections
0 750 1,500 3,000 Feet
N
Project: Belcher Branch Lake Dam
Project ID: BUCHANAN_MO12290
Missouri Department of Natural Resources
Water Resources Center
P.O. Box 176
Jefferson City, MO 65102
Drawing Title:
Flood Arrival Times
1 of 1


LOUTERMILCH SE
MM
Flow Direction
Inundation Zone
Reservoir
0 250 500 1,000 Feet
N
Project: Belcher Branch Lake Dam
Project ID: BUCHANAN_MO12290
Missouri Department of Natural Resources
Water Resources Center
P.O. Box 176
Jefferson City, MO 65102
Drawing Title:
Detail Sheet 1 of 3


Flow Direction
MM
Inundation Zone
0
250
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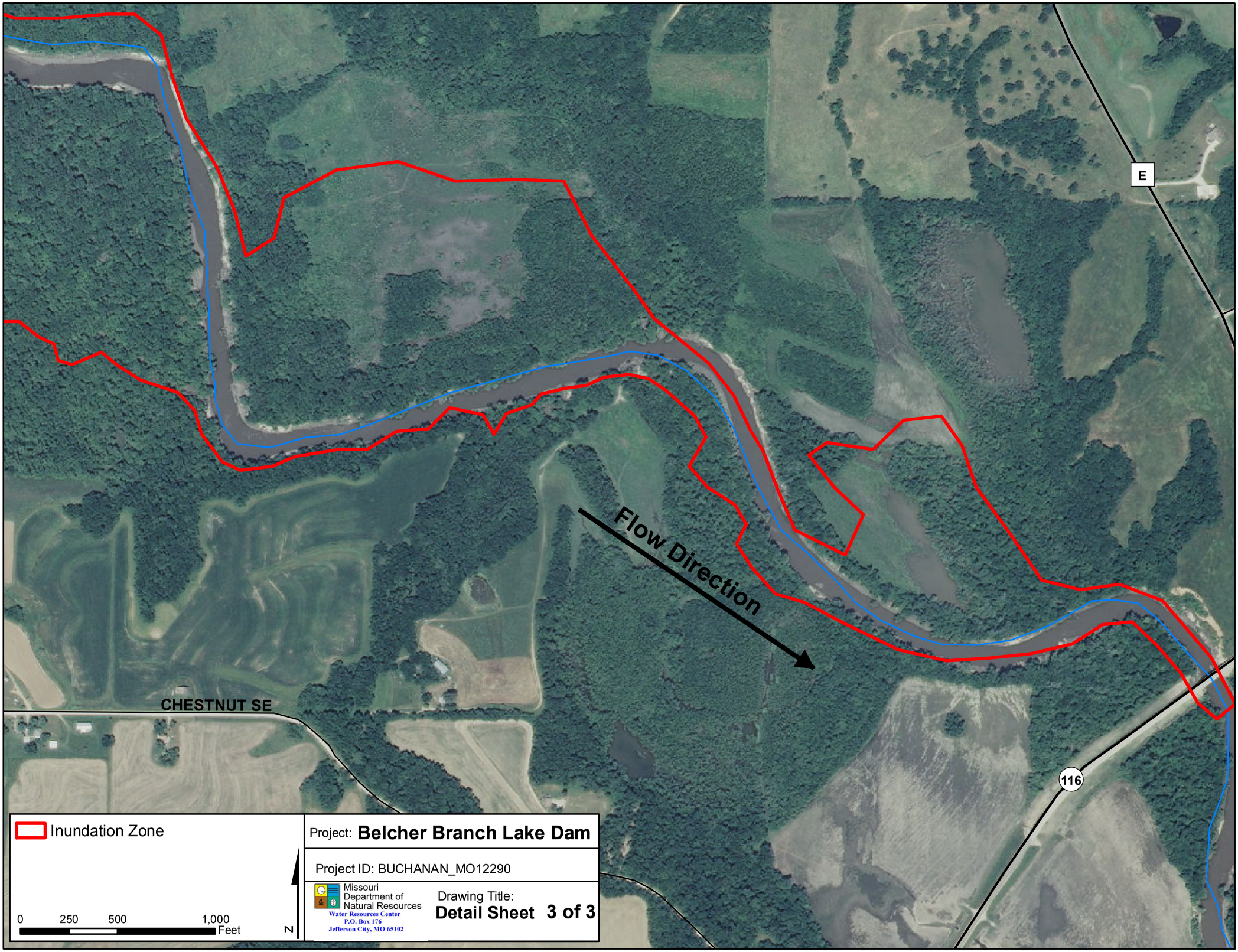
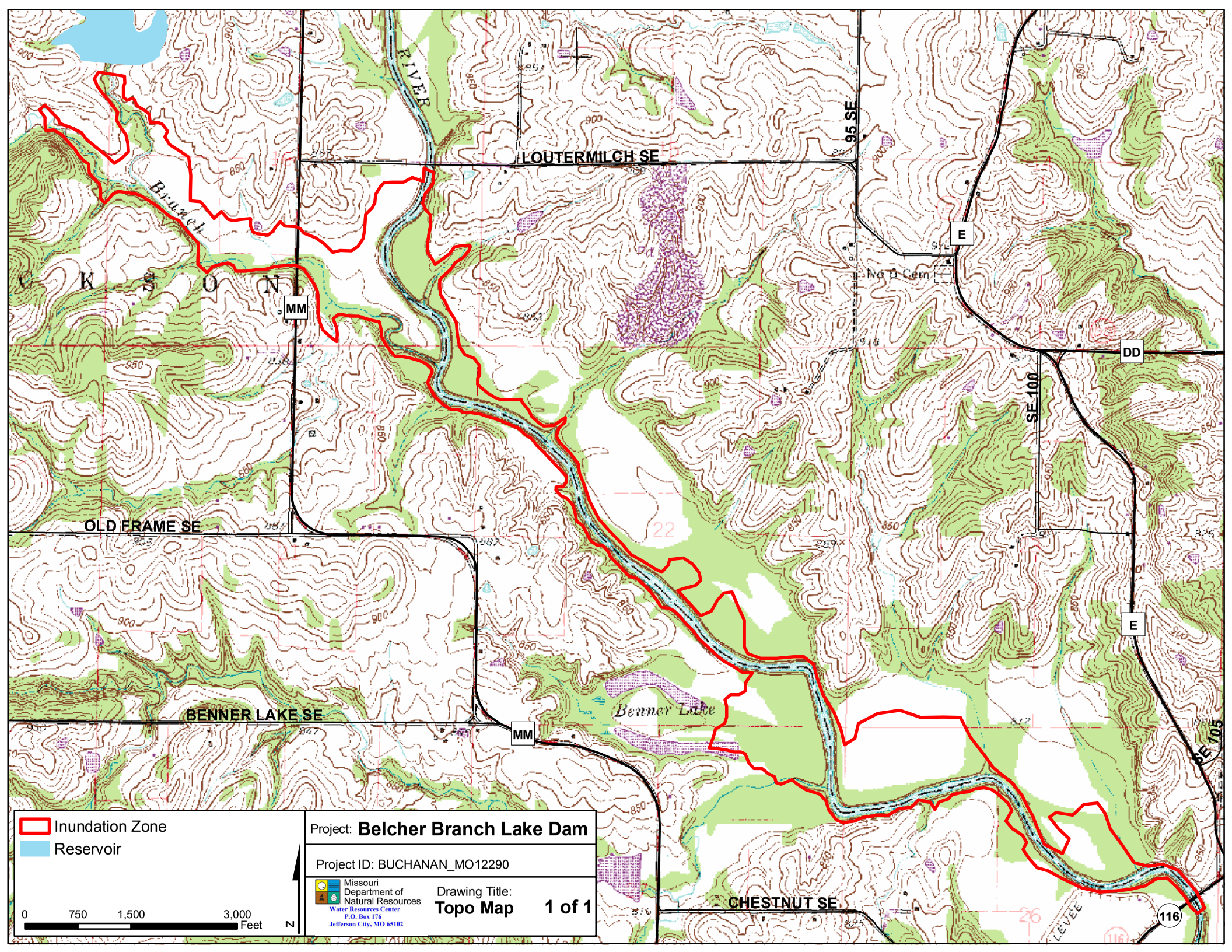
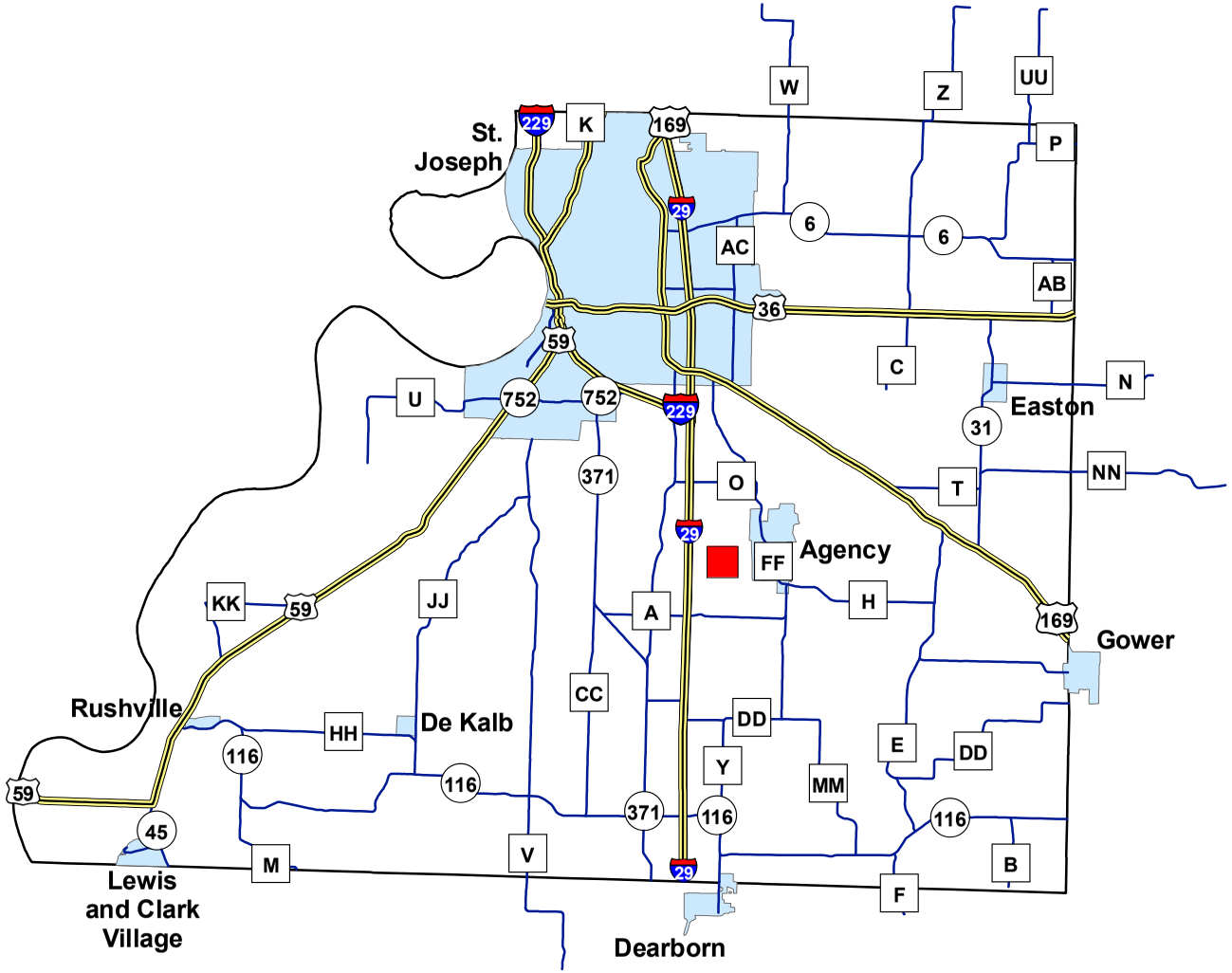
Feet
N
Project: Belcher Branch Lake Dam
Project ID: BUCHANAN_MO12290
Missouri Department of Natural Resources
Water Resources Center
P.O. Box 176
Jefferson City, MO 65102
Drawing Title:
Detail Sheet 2 of 3


E
Flow Direction
CHESTNUT SE
116
Inundation Zone
0 250 500 1,000 Feet
N
Project: Belcher Branch Lake Dam
Project ID: BUCHANAN_MO12290
Missouri Department of Natural Resources
Water Resources Center
P.O. Box 176
Jefferson City, MO 65102
Drawing Title:
Detail Sheet 3 of 3


Inundation Zone
Reservoir
0 750 1,500 3,000 Feet
N
Project: Belcher Branch Lake Dam
Project ID: BUCHANAN_MO12290
Missouri Department of Natural Resources
Water Resources Center
P.O. Box 176
Jefferson City, MO 65102
Drawing Title: Topo Map
1 of 1
LOUTERMILCH SE
OLD FRAME SE
BENNER LAKE SE
CHESTNUT SE
95 SE
SE 100
SE 105
MM
MM
E
E
DD
116
Benner Lake

1/13/11

Komer Lake Dam
Breach Inundation Map



Buchanan County, Missouri
BUCHANAN_MO10995

Note: Actual areas inundated will depend on the actual dam failure criteria and may differ from the areas shown. Due to limitations, methods, assumptions, and procedures used to develop the inundation area, the map should only be used for evacuation and emergency purposes.

Missouri Department of Natural Resources
Water Resources Center
P.O. Box 176
Jefferson City, MO 65201

Explanation Sheet

Project:	**Komer Lake Dam Breach Analysis**
Drawing Title:	**Explanation Sheet 1 of 1**
Missouri Department of Natural Resources Water Resources Center P.O. Box 176 Jefferson City, MO 65102	Project ID: BUCHANAN_MO10995

Explanation of Maps

The following maps indicate the areas which are predicted to be inundated during the occurance of a sunny day breach of the dam. The pool elevation at failure is assumed to be at the emergency spillway crest elevation or at the crest of the dam in the absence of an emergency spillway.

Use of Maps

The following maps provide a baseline for evaluation of existing emergency action plans and environmental hazards downstream of the regulated structure.

Definition of Terms

Pool Elevation- Water level in the reservoir.

Dam Crest- The lowest elevation measured along the dam crest.

Spillway Crest- The lowest elevation measured along the crest of the spillway.

Arrival Time- Elapsed time between the breach initiation and the time that water levels first begin to rise at any given point.

Assumed Conditions of Flooding

The pool elevation at failure is assumed to be at the emergency spillway crest elevation or at the crest of the dam in the absence of an emergency spillway. The assumed overtopping erodes a section of the dam resulting in a dangerous and quick release of water. For the hydraulic analysis flow initiation is required and therefore a baseflow of water has been included in the analysis.

Dam Facts

ID: MO_10995

County: Buchanan

Location: S24, T56 N, R35 W

Height of Dam: 39'

Tributary: Unnamed trib. to Possum Hollow

Lake Area: 4.8 acres

Max Storage Capacity: 175 ac-ft

Breach Parameters (Froehlich, 1995)

Side slopes: 1.4:1

Bottom width: 12'

Bottom elevation: 945’

Breach formation time: 0.18 hr

Pool Elevation at Failure: 982.28’

Pool Volume at Failure: 165 ac-ft

Downstream Crossings

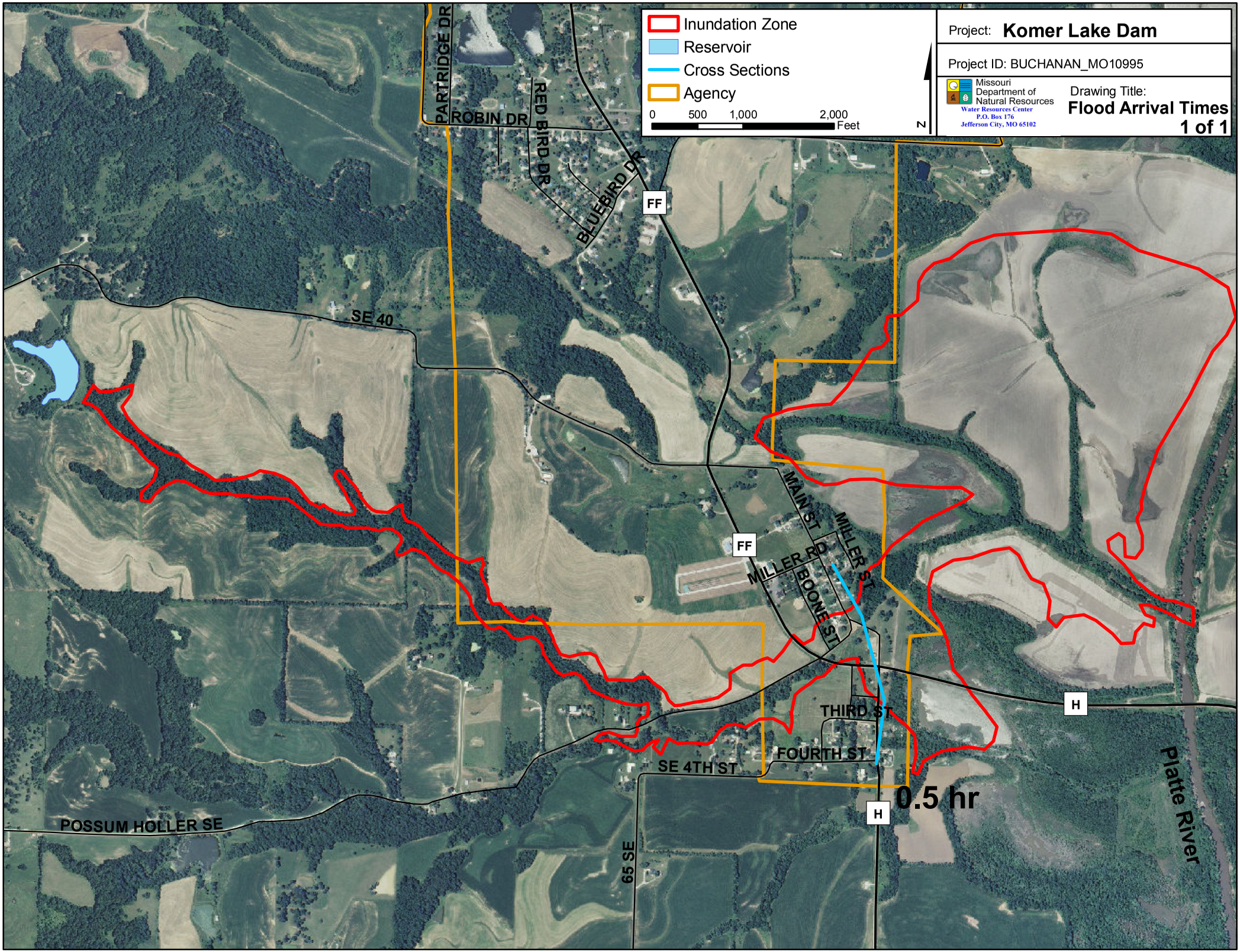
Possum Holler Rd

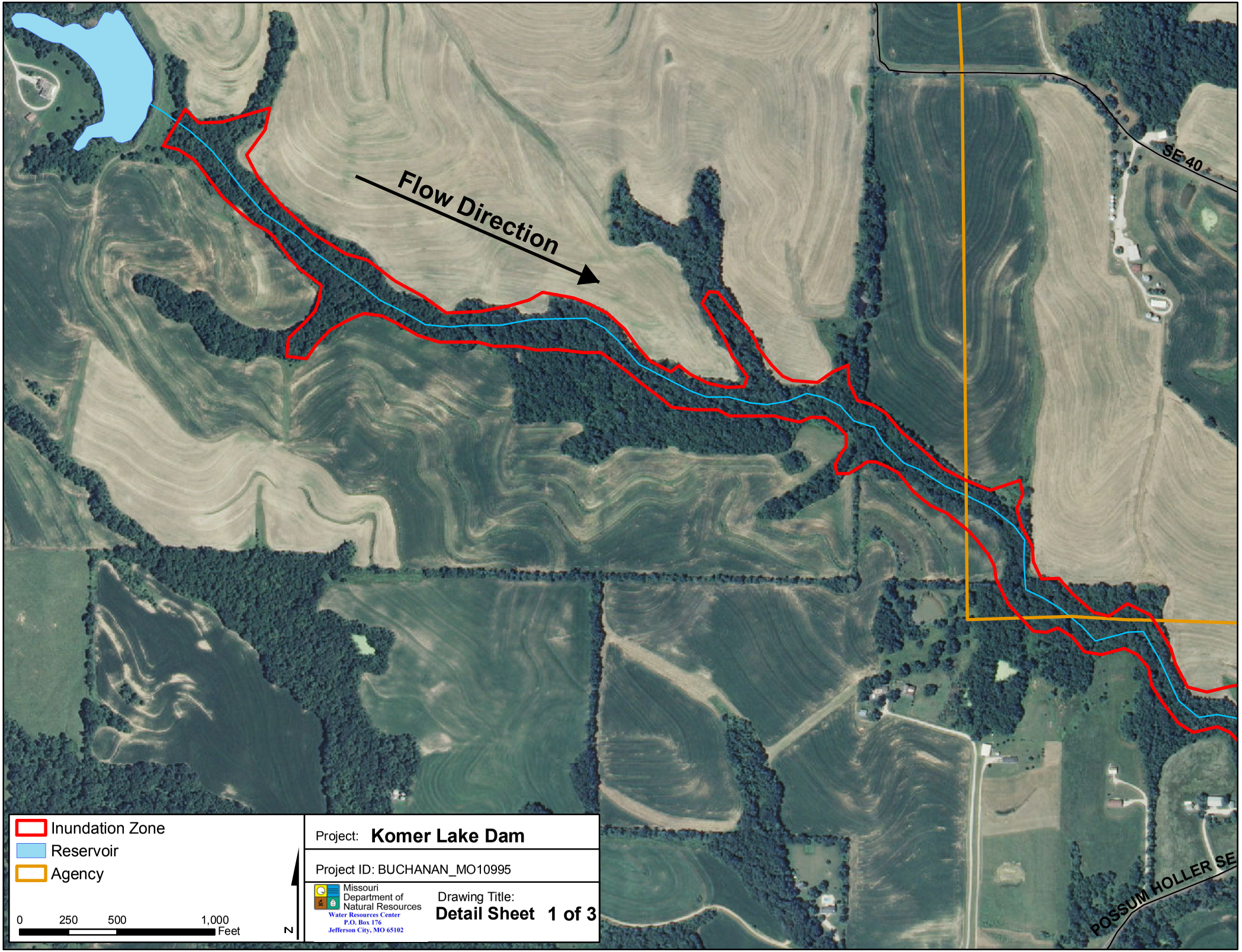
Rt FF

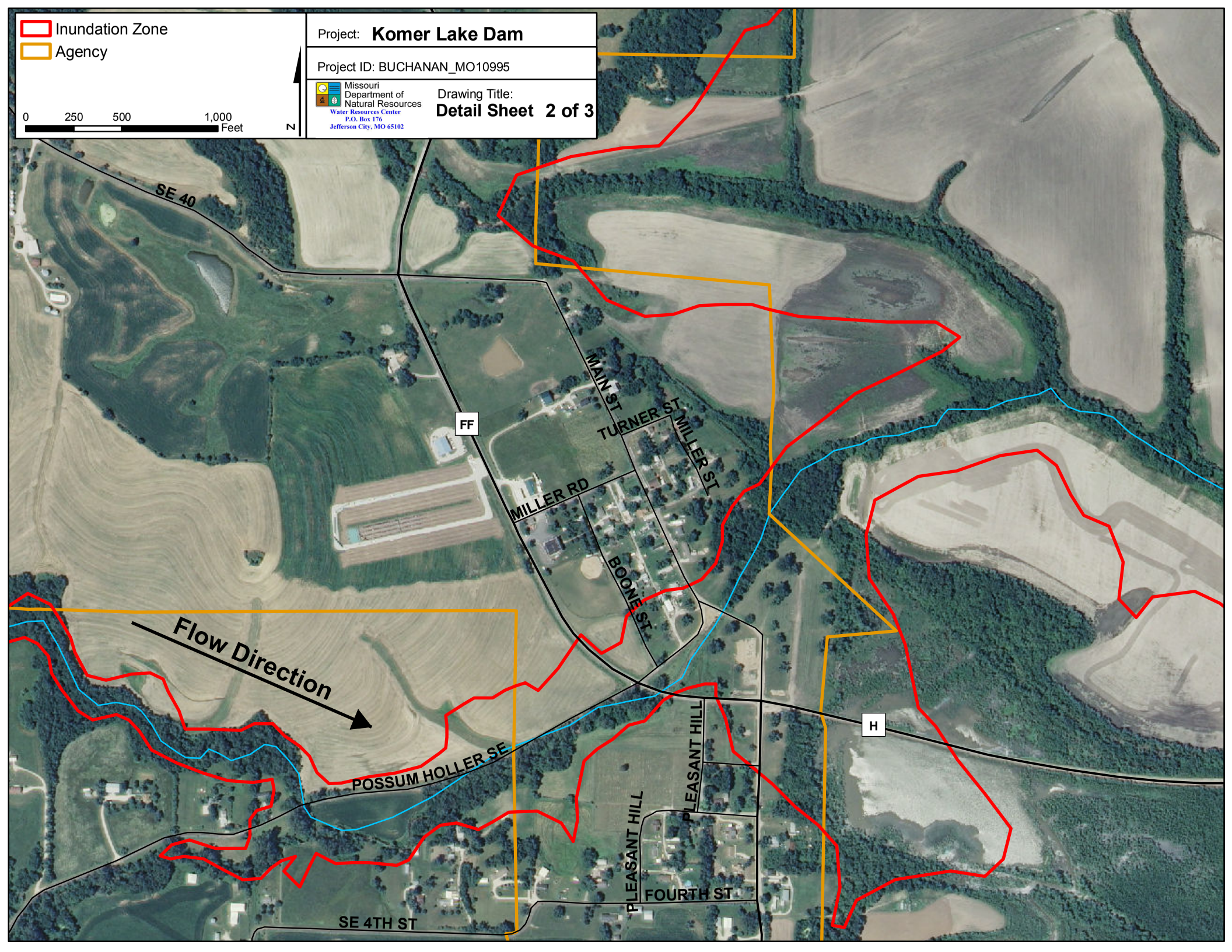
Main St (Agency)

NOTE: LiDAR Elevation data unavailable for Buchanan County. Analysis was completed with 10 meter Digital Elevation Model

Date of Aerial Photo: August 18, 2009


Inundation Zone
Reservoir
Cross Sections
Agency
0 500 1,000 2,000
Feet
N
Project: Komer Lake Dam
Project ID: BUCHANAN_MO10995
Missouri Department of Natural Resources
Water Resources Center
P.O. Box 176
Jefferson City, MO 65102
Drawing Title:
Flood Arrival Times
1 of 1
PARTRIDGE DR
ROBIN DR
RED BIRD DR
BLUEBIRD DR
FF
SE 40
MAIN ST
MILLER ST
MILLER RD
BOONE ST
FF
THIRD ST
FOURTH ST
SE 4TH ST
H
H
0.5 hr
POSSUM HOLLER SE
65 SE
Platte River


Flow Direction
SE 40
POSSUM HOLLER SE
Inundation Zone
Reservoir
Agency
0 250 500 1,000 Feet
N
Project: Komer Lake Dam
Project ID: BUCHANAN_MO10995
Missouri Department of Natural Resources
Water Resources Center
P.O. Box 176
Jefferson City, MO 65102
Drawing Title:
Detail Sheet 1 of 3


Inundation Zone
Agency
0 250 500 1,000 Feet
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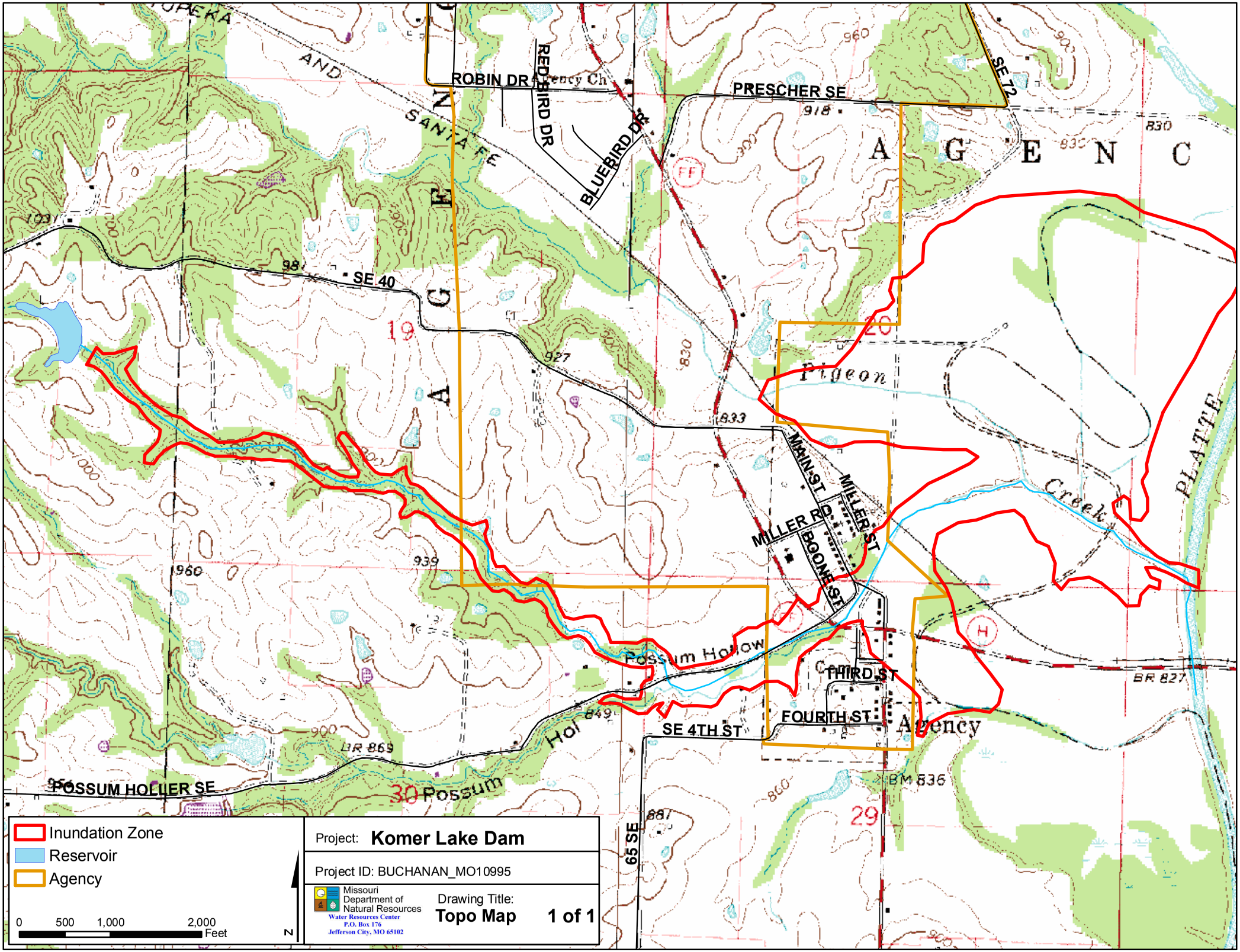
Project: Komer Lake Dam
Project ID: BUCHANAN_MO10995
Missouri Department of Natural Resources
Water Resources Center
P.O. Box 176
Jefferson City, MO 65102
Drawing Title:
Detail Sheet 2 of 3
SE 40
FF
MAIN ST
TURNER ST
MILLER ST
MILLER RD
BOONE ST
Flow Direction
POSSUM HOLLER SE
H
PLEASANT HILL
PLEASANT HILL
FOURTH ST
SE 4TH ST

Flow Direction
TURNER ST
MILLER ST
MILLER RD
MAIN ST
BOONE ST
FF
H
PLEASANT HILL
PLEASANT HILL
FOURTH ST
Inundation Zone
Agency
0 250 500 1,000
Feet
N
Project: Komer Lake Dam
Project ID: BUCHANAN_MO10995
Missouri Department of Natural Resources
Water Resources Center
P.O. Box 176
Jefferson City, MO 65102
Drawing Title:
Detail Sheet 3 of 3


ROBIN DR
RED BIRD DR
BLUEBIRD DR
PRESCHER SE
SE 72
SE 40
MAIN ST
MILLER ST
MILLER RD
BOONE ST
THIRD ST
FOURTH ST
SE 4TH ST
POSSUM HOLLER SE
65 SE
BR 869
BR 827
BM 836
Pigeon
Creek
PLATTE
Possum Hollow
Agency
Inundation Zone
Reservoir
Agency
0 500 1,000 2,000 Feet
N
Project: Komer Lake Dam
Project ID: BUCHANAN_MO10995
Missouri Department of Natural Resources
Water Resources Center
P.O. Box 176
Jefferson City, MO 65102
Drawing Title: Topo Map
1 of 1

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MEMORANDUM

DATE: April 4, 1995

TO: **FILES** McPheeters Lake Dam (MO 10525) Buchanan County

FROM: Jim Alexander JLA

SUBJECT: Breach of Dam

Fields

On March 29, 1995 Jordan Ott and I made a site visit to Buchanan County. The purpose of our site visit was to meet with Ivan ~~Fields~~ Natural Resources Conservation Service (NRCS) to discuss some sites they were working with that might be of interest to the Dam and Reservoir Safety Program (DRSP). One of these sites was the McPheeters Dam which was declassified as a dam within the last year.

According to Ivan, the McPheeters Dam failed in 1993 during the record flooding that occurred in the area. The cause of the failure was reportedly piping around the outside of the primary spillway pipe. This led to sinkholes forming in the dam and the collapse of the embankment in the vicinity of the primary spillway pipe. The breach is trapezoidal shaped with a bottom width of roughly 50 ft. and 1H:1V side slopes. The breach extends through the crest of the dam and into the sediment ponded behind the dam. Local runoff continues to erode a channel into the sediment.

The NRCS is currently considering repairing the breach, replacing the spillway pipe, and raising the crest of the dam to provide additional flood and sediment storage. If they do, the McPheeters Dam would once again be a regulated structure. The NRCS would be required to obtain a construction permit to modify the dam.

RECYCLED PAPER

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MEMORANDUM

DATE: August 8, 1994

TO: **FILES** McPheeters Lake Dam (MO 10525) Buchanan County

FROM: Jim Alexander JCA

SUBJECT: Retaining Exemption

Based on the recent Attorney General's opinion and the subsequent elimination of the retaining/retarding exemption from the rules and regulations, the retaining exemption previously issued for the McPheeters Lake Dam is no longer valid. However, based on a site visit made by Russ Adams and Ralph Hess on September 24, 1986, it appears that this structure is not capable of storing water. This is due to the reservoir being filled with sediment. Based on the definition of a dam contained in Chapter 236.400.(5) RSMo (1986), this structure no longer should be considered a dam. For this reason, the McPheeters Lake Dam is being removed from the dam safety data base (Status.dbf) and NATDAM.

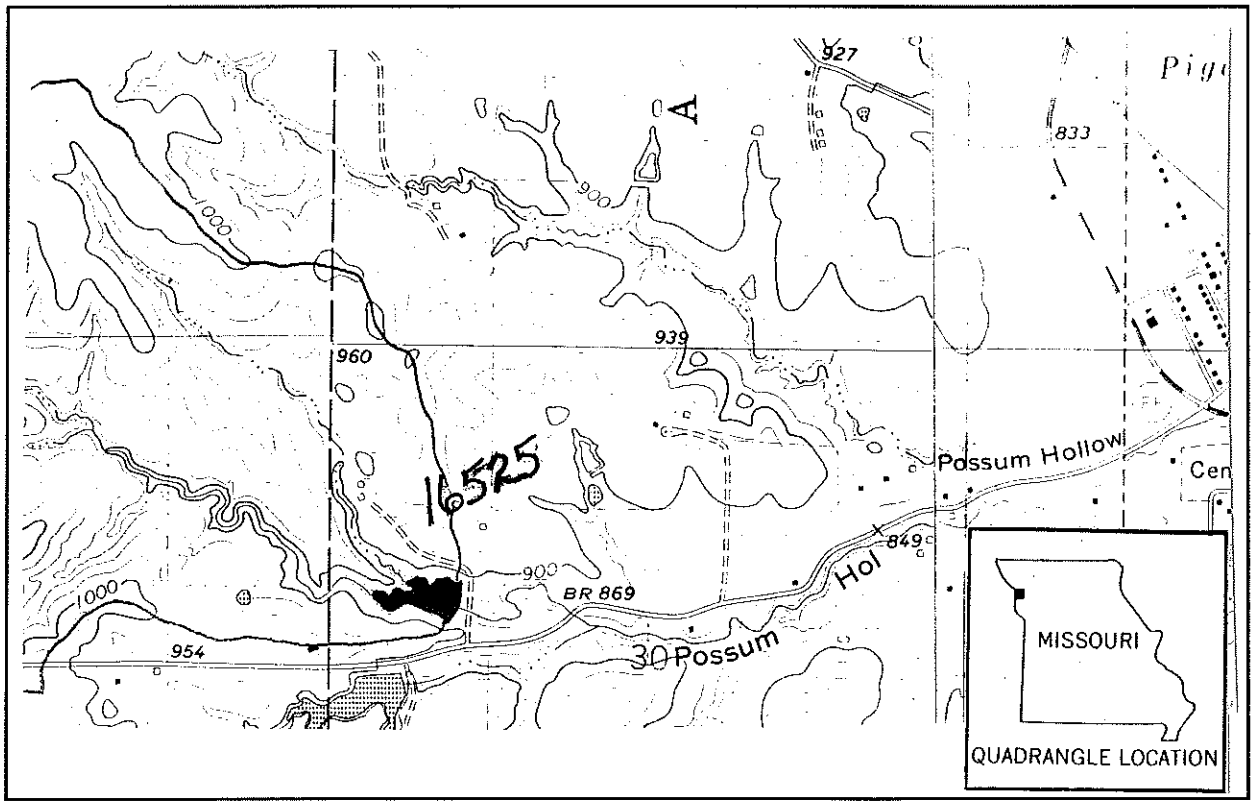
RECYCLED PAPER

DAM AND RESERVOIR SAFETY COUNCIL
December 6, 1990

McPheeters Lake Dam
MO 10525
Buchanan County

Owner:	**Mrs. R.A. McPheeters**
Address:	**Route 1, Box 80A Agency, Missouri 64401**
Height	**37 ft**
Res. Area:	**3 acres**
Watershed:	**617 acres**
D/S Hazard Zone:	**II, Located on Possum Hollow, upstream of the town of Agency**
Type of Dam:	**Earthfill**
Spillway(s):	**The principal spillway is a 48" diameter corrugated metal pipe connected to a 36" diameter drop inlet riser. There is a grass lined open channel emergency spillway in the left abutment.**
Use of reservoir:	**The purpose of the dam is for soil stabilization and flood protection.**

The Dam and Reservoir Safety Program granted a retaining exemption for the McPheeters Lake Dam in September 1986. The reservoir is entirely silted in.



JOHN ASHCROFT
Governor

FREDERICK A. BRUNNER
Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF GEOLOGY & LAND SURVEY
P.O. Box 250, 111 Fairgrounds Road
Rolla, MO 65401
314-364-1752

Division of Energy
Division of Environmental Quality
Division of Geology and Land Survey
Division of Management Services
Division of Parks, Recreation,
and Historic Preservation

September 26, 1986

Mrs. R. A. McPheeters
Route 1, Box 80A
Agency, Missouri 64401

RE: McPheeters Lake Dam (MO 10525) Buchanan County

Dear Mrs. McPheeters:

It recently came to our attention while making a site visit to a dam owned by your neighbor, Mr. Ussary, that your lake has silted in. This was verified during the same visit. It was not the intent of the Legislature in enacting the Dam Safety Law that silted in lakes be regulated. Based upon this, your dam will no longer be regulated by the State of Missouri. Please disregard any earlier correspondence regarding the registration of your dam.

Sincerely,

DAM & RESERVOIR SAFETY PROGRAM

Brian J. Swenty, P.E.
Chief Engineer

BJS/mjp

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES

Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

www.dnr.mo.gov

August 22, 2016

Mr. Mark Noland
5100 Pigeon Hill Road
Agency, Missouri 64401

RE: Komer Lake Dam (MO10995) Buchanan County

Dear Mr. Noland:

As a result of an inspection of the Komer Lake Dam on August 16, 2016, I am pleased to inform you that Registration Permit R-502 has been renewed and is enclosed for your use. The permit will be valid for a period of three years from the expiration date of the last permit issued for the dam and will expire on September 20, 2019. At that time the dam will be reinspected by the Dam and Reservoir Safety Program at no cost to you. The permit is being renewed for three years based on the downstream environmental zone classification.

Please refer to the enclosed inspection reports for additional information on the inspections. If you have any questions or need further assistance, please feel free to contact Glenn Lloyd at (573) 368-2175. Thanks for your cooperation.

Sincerely,

MISSOURI GEOLOGICAL SURVEY

Ryan P. Stack, P.E.
Chief Engineer
Dam and Reservoir Safety Program

RPS/clb
enclosures

Recycled Paper

Registration Permit No. R-502
Renewed August 22, 2016

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
DAM AND RESERVOIR SAFETY COUNCIL

SAFETY PERMIT

Pursuant to Chapters 236.400 through 236.500 of the Revised Statutes of Missouri and the rules established by the Dam and Reservoir Safety Council, and on the basis of an inspection by the Department of Natural Resources for the Komer Lake Dam, Buchanan County, all of which are made a part hereof by reference, **PERMISSION IS HEREBY GRANTED** to Mr. Mark Noland , hereafter known as the permittee, whose address for the purpose of notices and other communications pertaining to this permit is 5100 Pigeon Hill Road; Agency, Missouri 64401, which address is subject to change by written notice from the permittee, **TO OPERATE** said dam and reservoir located in Section 24, Township 56 North, Range 35 West, having identification number of MO 10995, a dam height of 39 feet, a principal spillway elevation of 974.9 feet (UTM NAD83 Zone15N GEOID12A), an emergency spillway elevation of 976.6 feet (UTM NAD83 Zone15N GEOID12A), a minimum crest elevation of 979.4 feet (UTM NAD83 Zone15N GEOID12A), a reservoir area of 4.8 acres at the water storage elevation and approximate UTM Coordinates of 4,390,705 meters North and 348,018 meters East, Zone 15, subject to the following provisions:

GENERAL PROVISIONS:

1. No liability shall be imposed upon or incurred by the State of Missouri and/or the Dam and Reservoir Safety Council, or any of their officers, agents, employees, and members, officially or personally, on account of the granting hereof or on account of any damage to any person or property resulting from any act or omission of the permittee or any of its agents, employees, or contractors, or closed corporations or successors relating to any matter hereunder. This permit shall not be construed as estopping or limiting any legal claim or right of action of the state against the permittee, its agents, employees or contractors for any damages or injury resulting from any such act or omission by them or for violation of or failure to comply with the provisions of the permit or applicable provisions of law.

DEPARTMENT OF NATURAL RESOURCES
DAM & RESERVOIR SAFETY PROGRAM
DAM INSPECTION REPORT

DATE: *August 19, 2016*

COVER SHEET

NAME OF DAM: *Komer Lake Dam* I.D. # : *MO10995*

LOCATION: County: *Buchanan* *Section: 24, Twp. 56 N, Rge. 35 W*

OWNER: *Mr. Mark Noland*
ADDRESS: *5100 Pigeon Hill Road*
CITY/STATE/ZIP: *Agency, Missouri 64401*
TELEPHONE: *816-752-8060*

PERMIT #	HAZARD CLASS	TYPE OF DAM
R-502	CLASS II	EARTHFILL

TYPE OF SPILLWAY (s) Principal *7 inch steel pipe*
Emergency *Grass lined open channel on left abutment 30 feet wide*

☒ I hereby certify that the *Komer Lake Dam* was inspected on *August 16, 2016* in accordance with RSMO 236.400 through RSMO 236.500.

☒ I hereby certify that the *Komer Lake Dam* did not have any observed defects that required correction at the time of the inspection.

☒ Judgement of Slope Stability – The embankment and appurtenant structures appeared to be in good overall condition at the time of the inspection, with no indications of slope instability or excessive seepage.

☐ Defects were found that will have to be corrected prior to the permit being renewed.

STATION	ELEVATION	COMMENTS
TBM	974.9	Principal spillway inlet
	979.4	Minimum crest of dam
	974.9	Water surface
	976.6	Emergency spillway crest

Elevations are in feet and are based on UTM NAD Zone 83 GEOID12A.

STATE OF MISSOURI GLENN DELMORE LLOYD NUMBER E-28021 REGISTERED PROFESSIONAL ENGINEER

8-22-2016

INSPECTING ENGINEER
Glenn Lloyd P.E.

Inspection Checklist

NAME OF DAM:	Komer Lake Dam	INSPECTION DATE: August 16, 2016
ID #: MO 10995	COUNTY: Buchanan	HAZARD CLASS: 2

HAZARD CLASSIFICATION: ☒ Unchanged ☐ Changed

Item	Condition*	Comments
1. Vegetation	M.R.	Cut and remove the excess vegetation on the upstream and downstream faces of the dam (see page 2 of appendix A) Cut and remove the tree growing above the principal spillway outlet pipe near the toe of the dam.
2. Seepage	O.R.	Monitor the seepage at the toe of the dam. Report any change in flow rate or color to the Dam and Reservoir Safety Program.
3. Principal Spillway	N.P.	
4. Emergency Spillway	M.R.	Cut and remove the excess vegetation at the entrance to the emergency spillway (see page 2 of appendix B)
5. Embankment	N.P.	
6. Reservoir Area	N.P.	
7. Lake Drain Gates or Valves	N.A.	
8. Spillway Outlet Channels	N.P.	
9. Embankment Drain Outlets	N.A.	
10. Riprap	N.A.	

*N.P. = No observable problem; M.R. = Maintenance Required; D.O. = Defect Observed; E.C = Emergency Condition; O.R. = Observation Required; N.A. = Not Applicable

Required Freeboard	Available Freeboard
3.3 feet	4.5 feet

RECOMMENDATION:

☒ **Permit is being renewed**

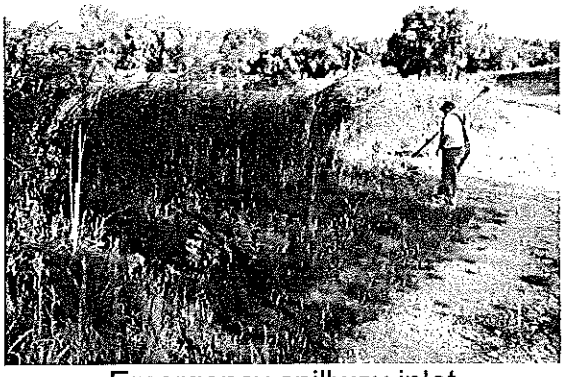
☐ **Permit is not being renewed**

Upstream face and crest

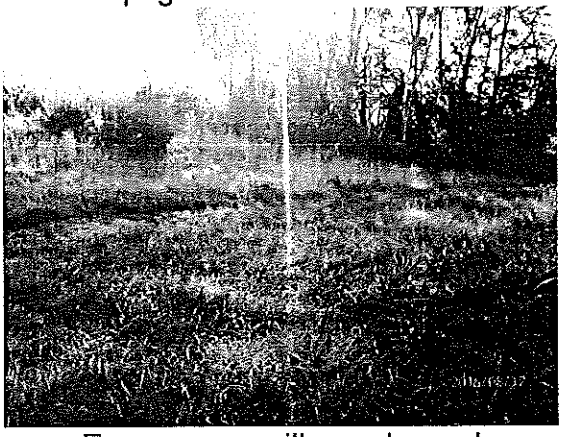
Downstream face

Principal spillway inlet

Seepage at the toe of the dam



Emergency spillway inlet



Emergency spillway channel

2. The permittee shall comply with all Federal, State and local laws and regulations, and shall obtain such other permits as may be required.

3. In cases where the doing by the permittee of anything authorized by this permit shall involve the taking, using or damaging of any property rights or interest of any other person or persons, or of any publicly owned lands or improvements thereon or interests therein, it is the sole responsibility of the permittee, before proceeding therewith, to obtain the written consent of all persons, agencies, or authorities concerned, and to acquire all property, rights and interests necessary therefore, including flood easements or permissions for all properties which may be inundated by the dam on a temporary or permanent basis in the upstream impoundment area below the top of dam elevation.

4. The permittee shall notify the Dam and Reservoir Safety Council in writing upon the sale or other transfer of interest in the dam or reservoir.

5. Based on conditions existing at the time of issuing this permit, the Downstream Environment Zone is Class II. Future development in the vicinity of the dam and flood plain below the dam may result in a change in classification. This change will necessitate hydraulic and structural upgrading of the dam so the dam is in compliance with the rules and regulations of the Missouri Dam and Reservoir Safety Council. Permittee or its representatives, successors or assigns shall perform any such upgrading upon a change in classification and upon notification from the Missouri Dam and Reservoir Safety council.

6. The permittee shall not alter, enlarge, reduce, repair or remove the dam, reservoir or appurtenances without first obtaining a construction permit from the Dam and Reservoir Safety Council.

7. The permittee shall immediately notify in writing the Chief Engineer of any conditions relating to structural stability of and seepage through the dam discovered during the term of this permit which differs from those conditions identified in the renewal inspection summary.

8. The terms and provisions of this permit shall extend to and bind the successors in authority of the Dam and Reservoir Safety Council and the legally assigned successors in interest of the permittee.

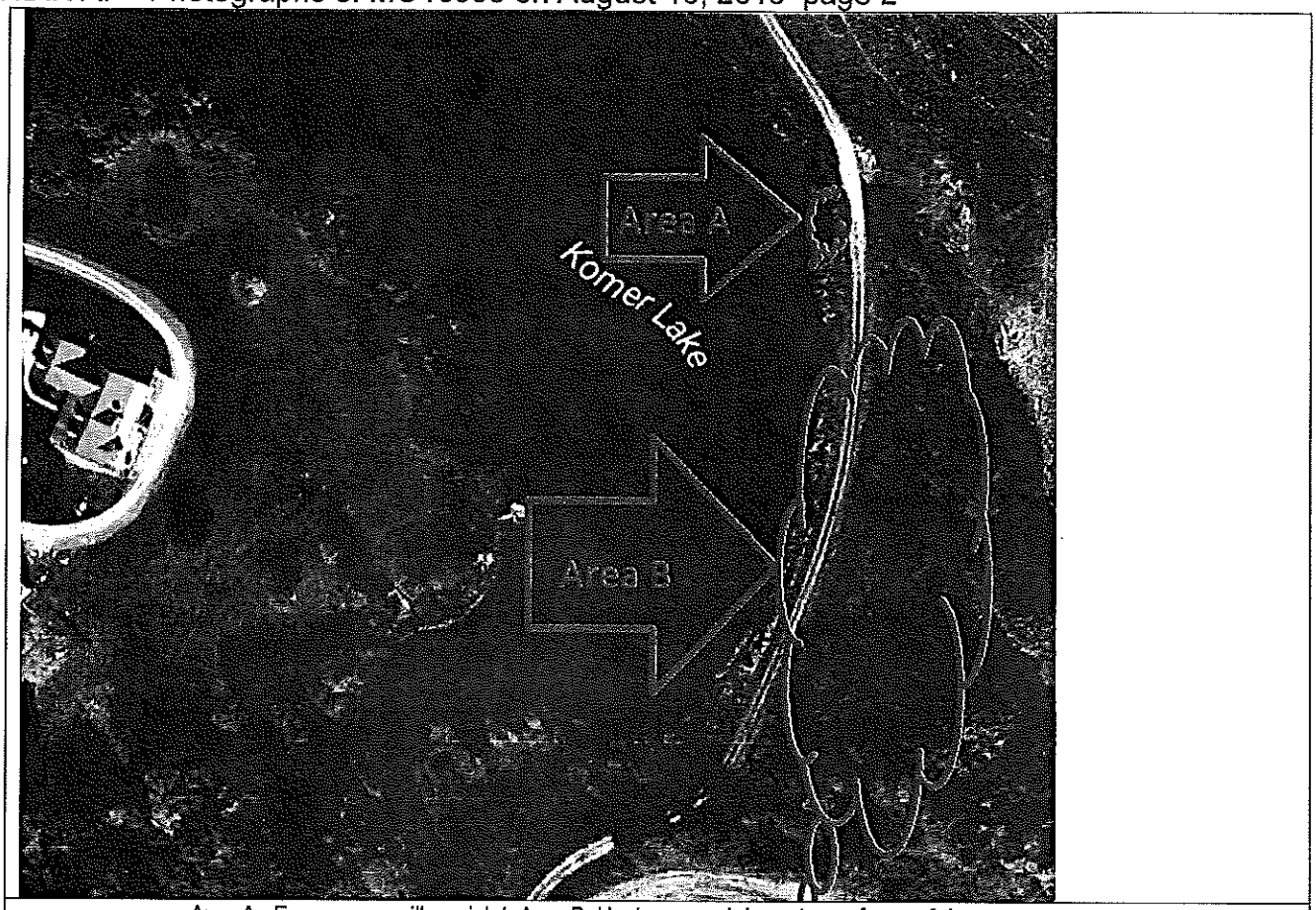
9. Maintenance of the dam and reservoir herein permitted shall be the responsibility of the permittee.

10. The term of this permit shall be three (3) years from the date of the last safety permit issued expiring on September 20, 2019. The permittee shall apply for renewal not less than sixty (60) days prior to this expiration date.

Executed at Rolla, Missouri on this 2nd day of August, 2016

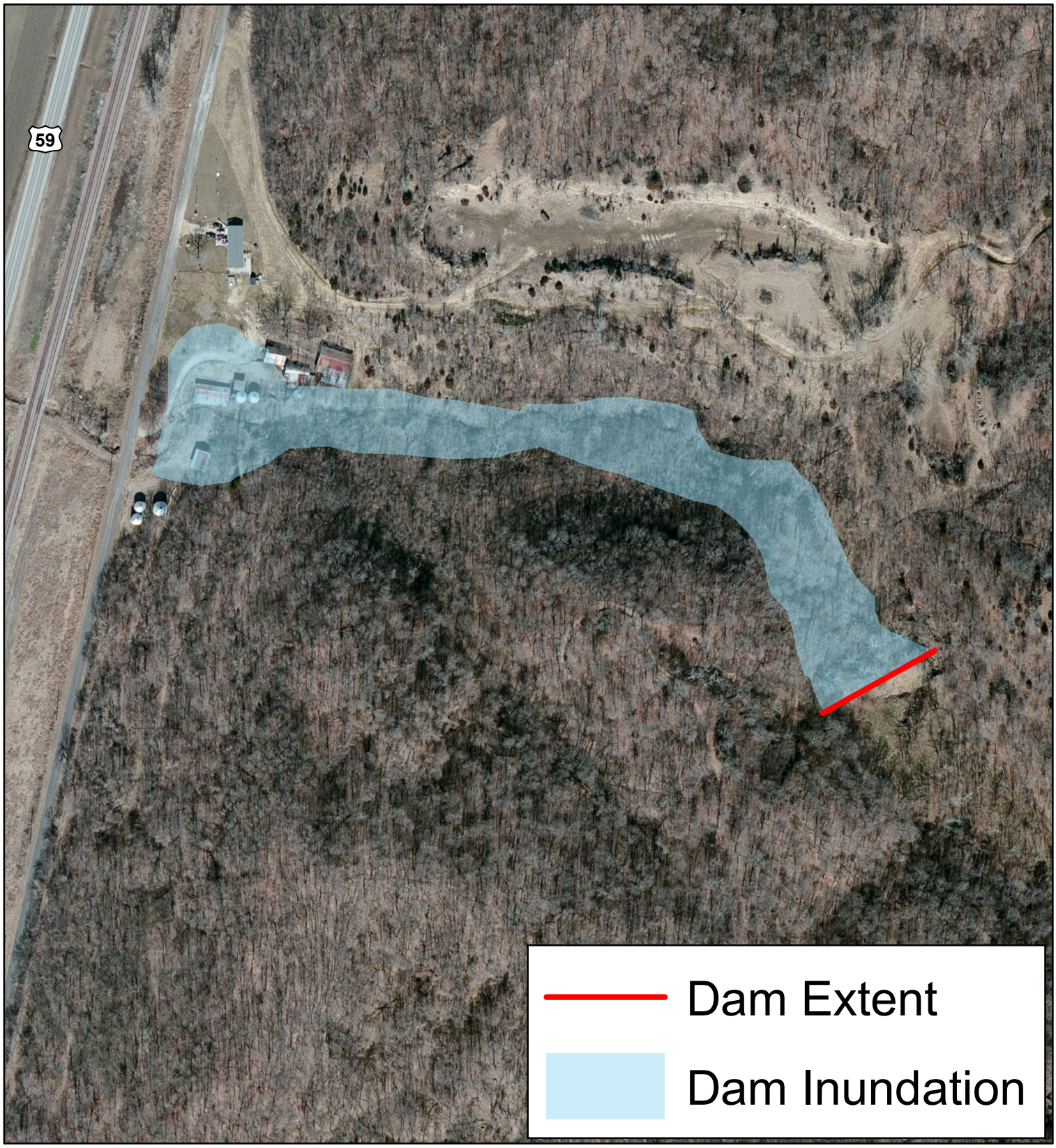
DAM & RESERVOIR SAFETY COUNCIL

By _____
Chief Engineer
Dam and Reservoir Safety Program

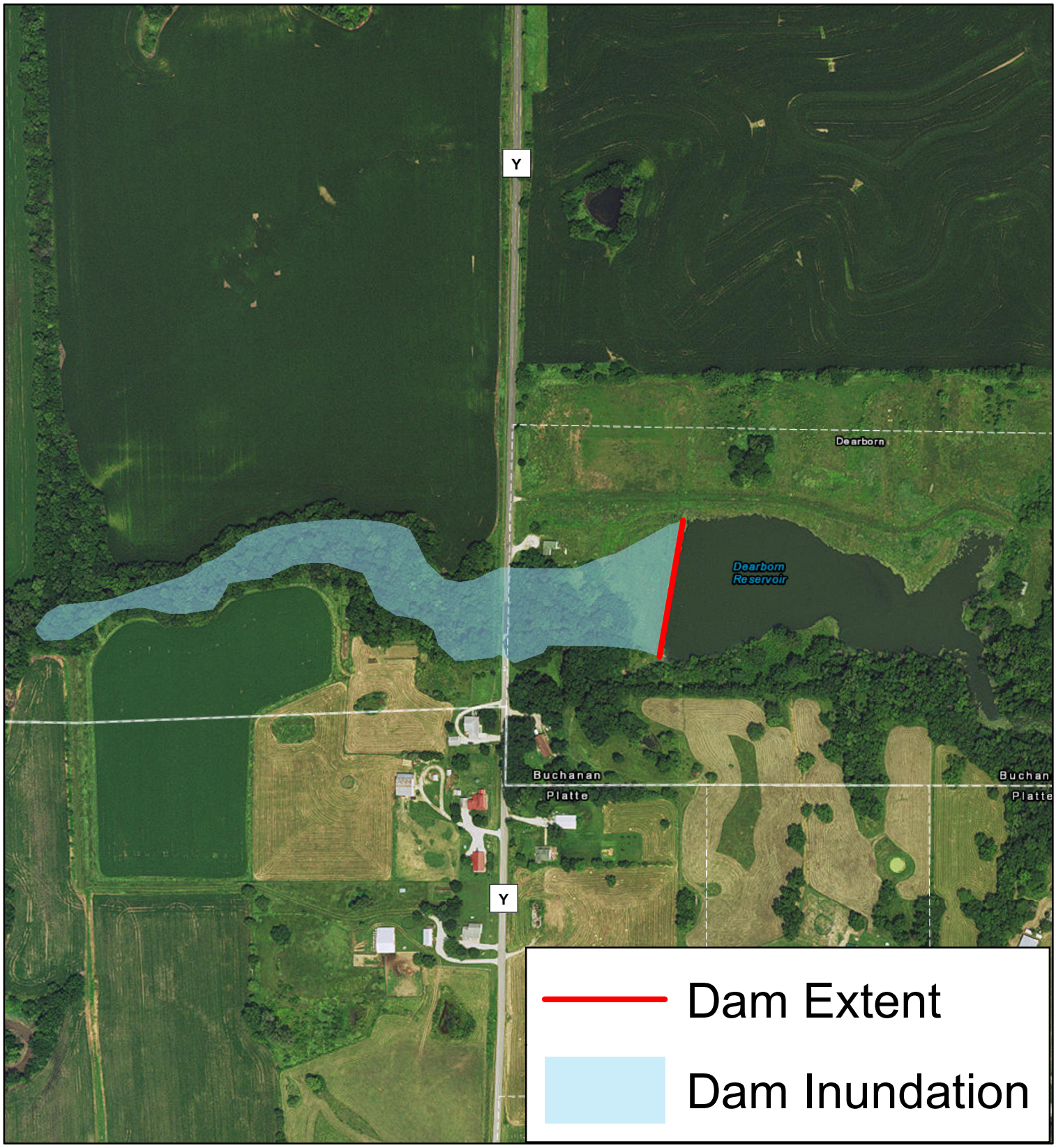


Area A: Emergency spillway inlet Area B: Upstream and downstream faces of dam

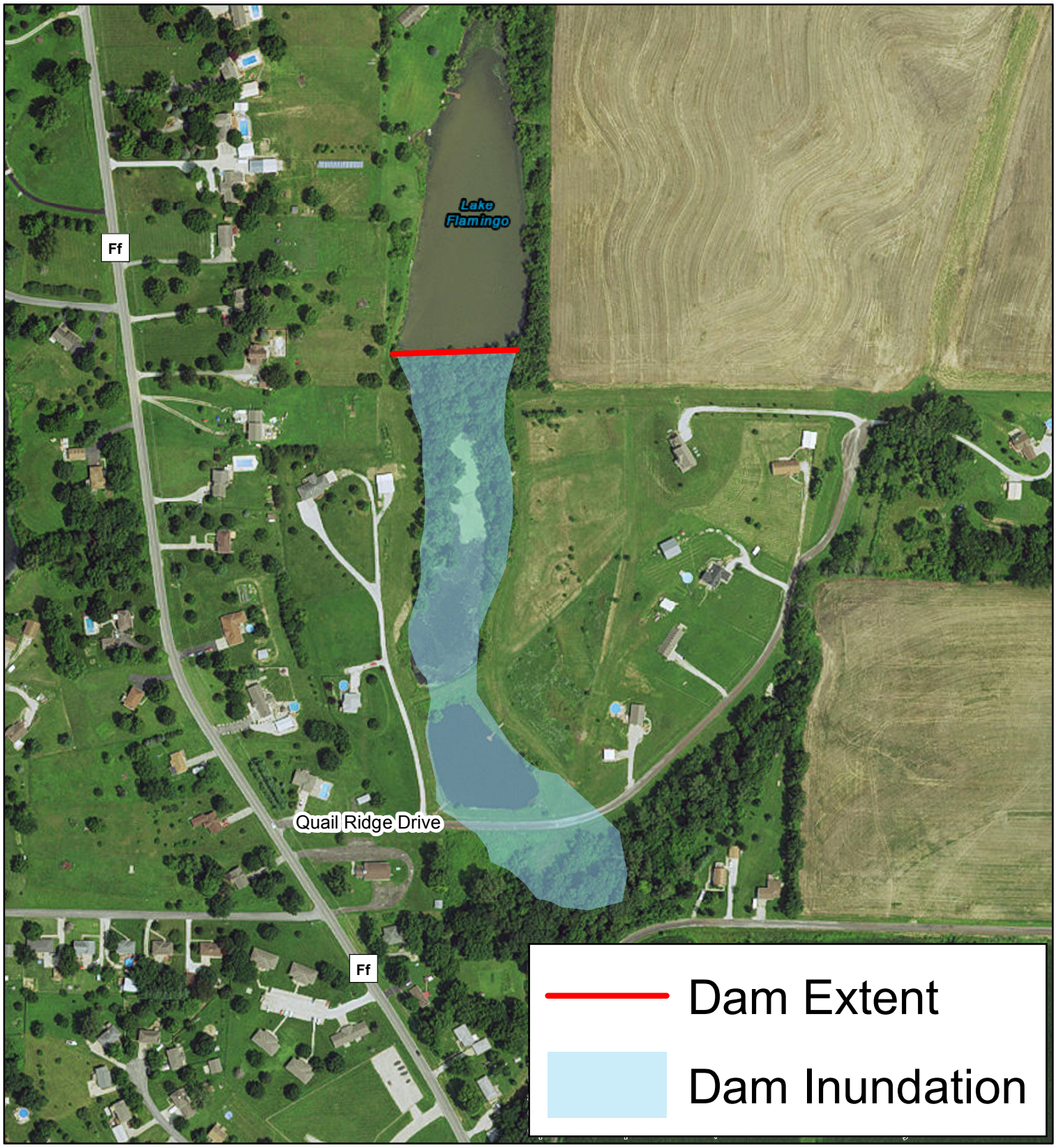
Dead Man's Hole Dam Inundation



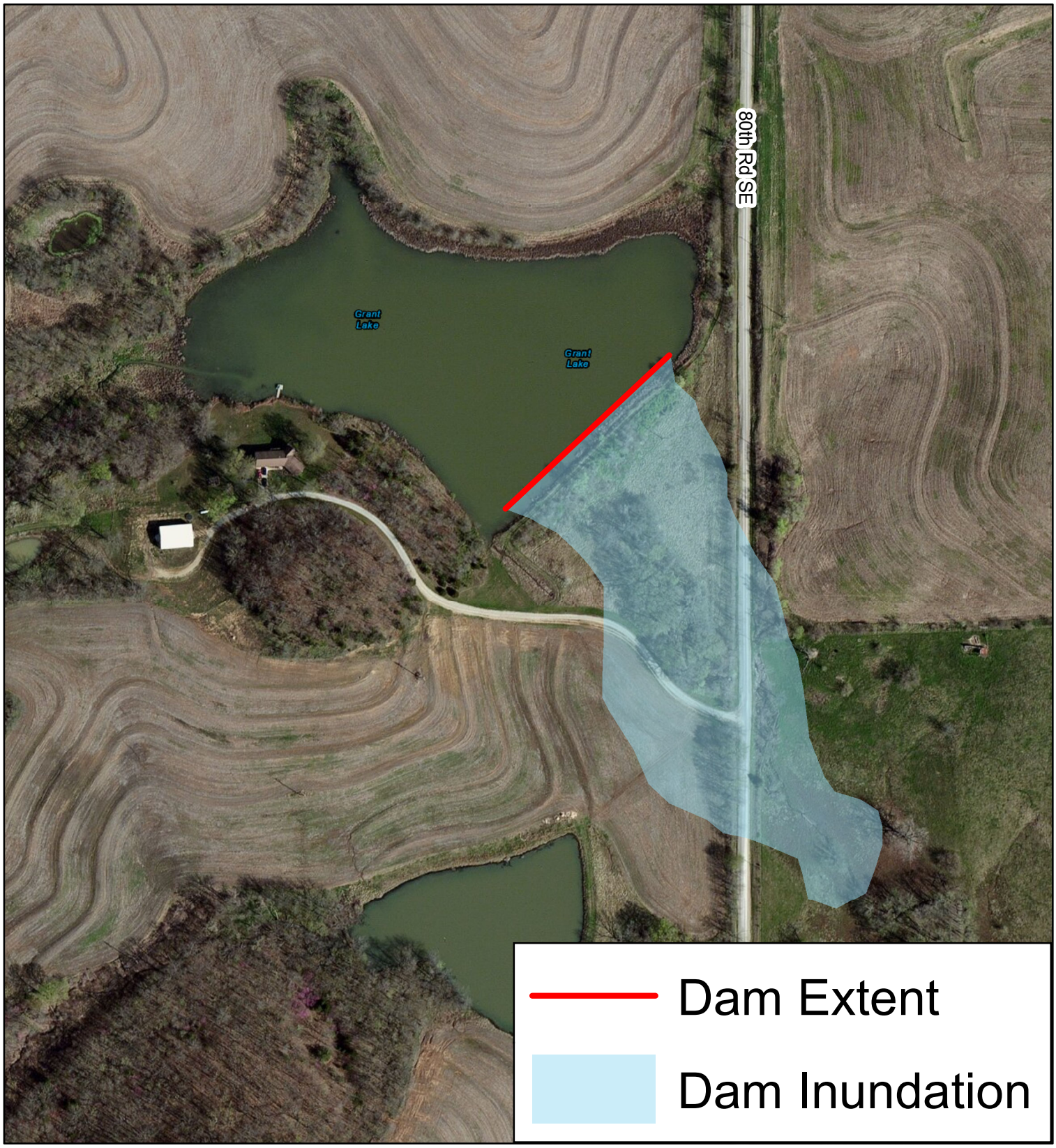
Dearborn Reservoir Dam Inundation



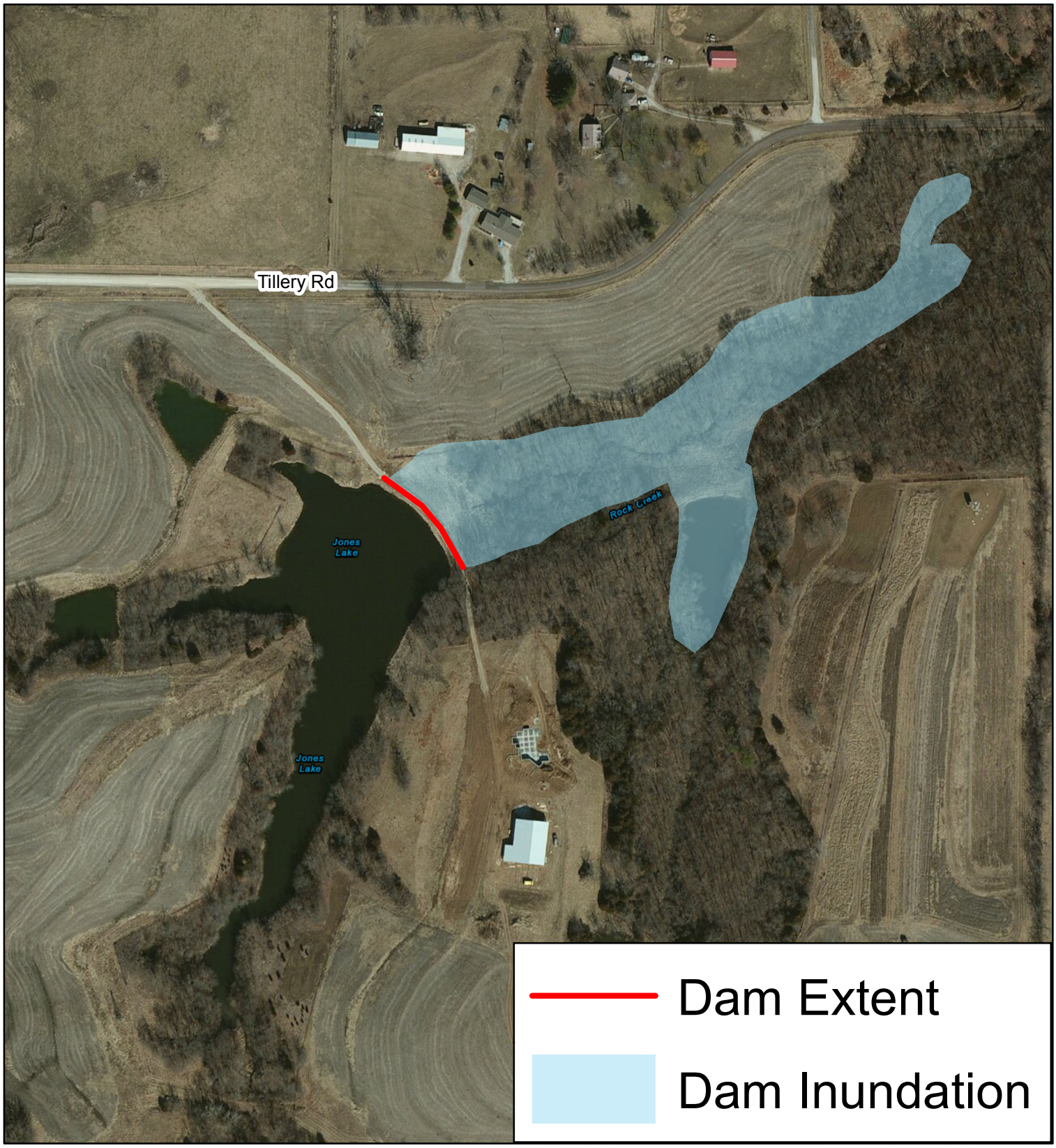
Lake Flamingo Dam Inundation



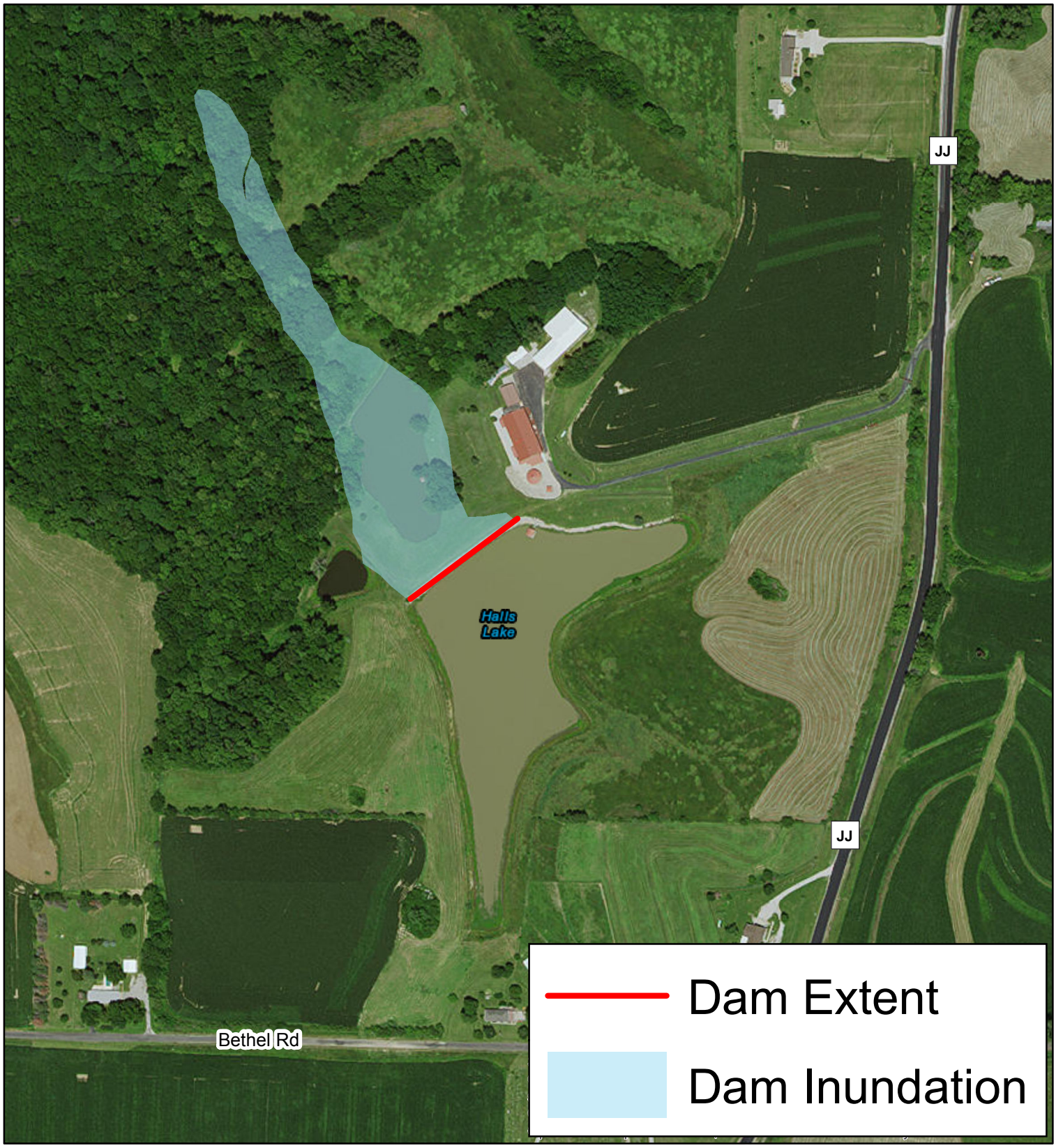
Grant Lake Dam Inundation



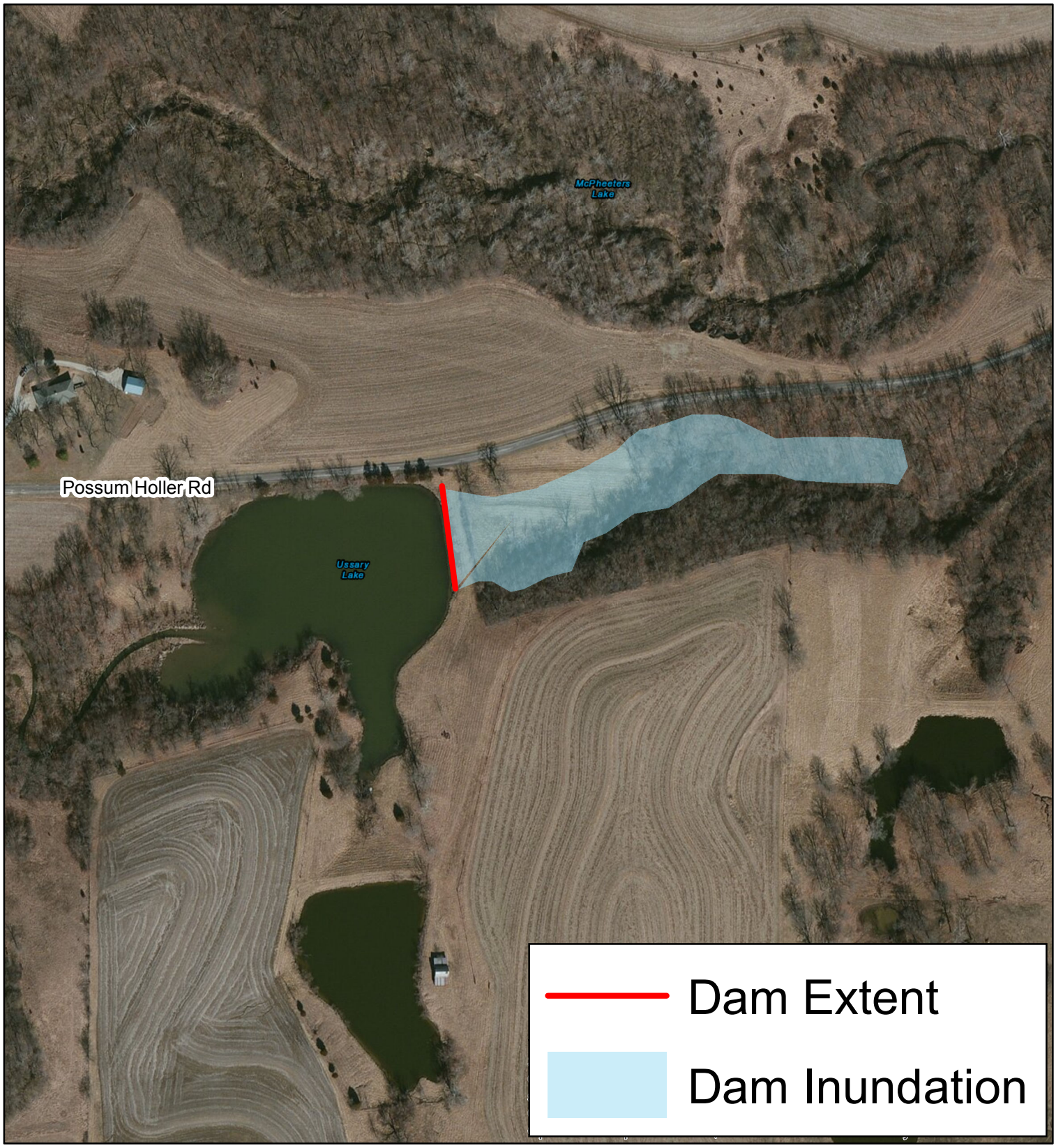
Jones Lake Dam Inundation



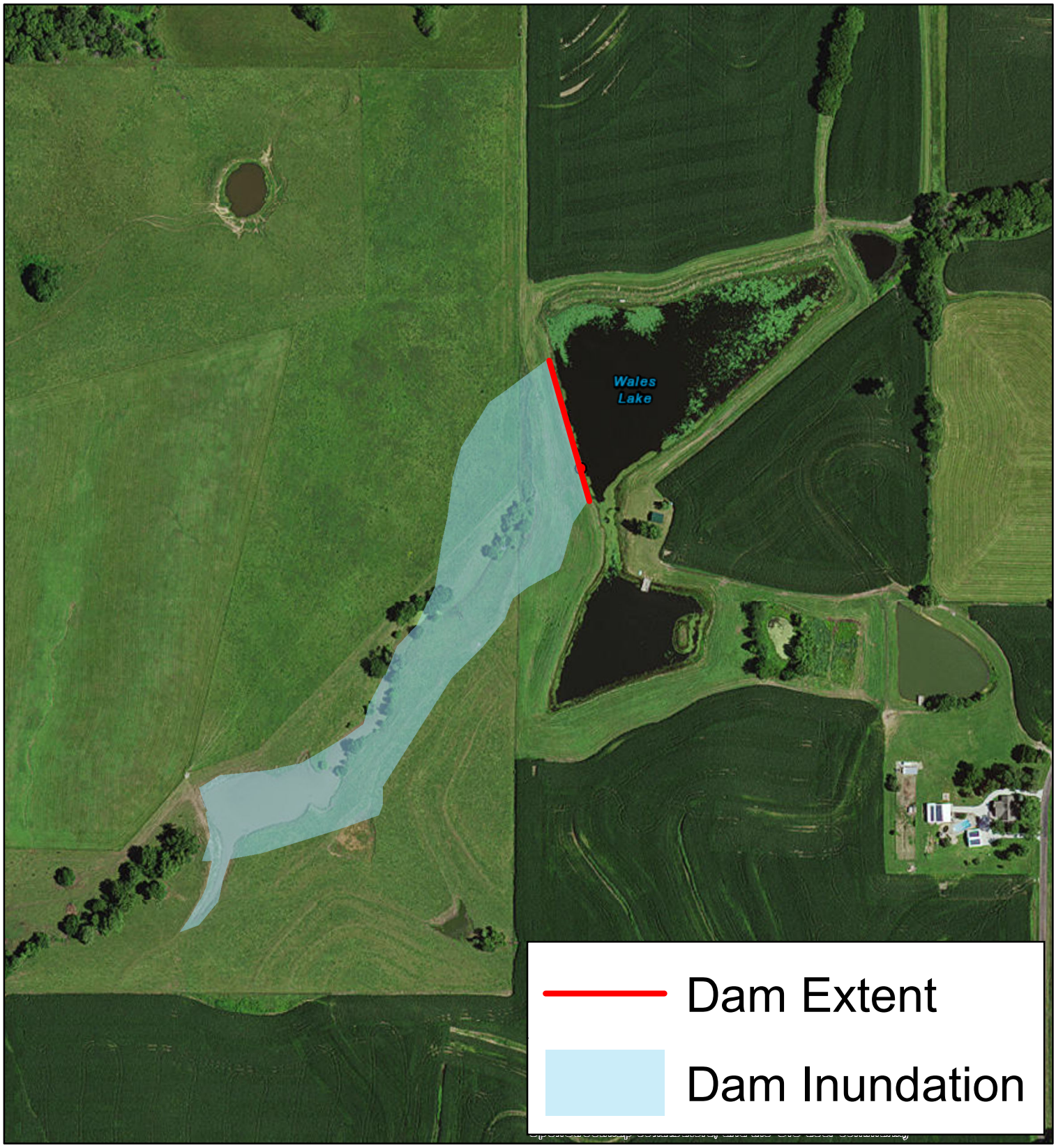
Scotty's Lake Dam Inundation



Ussary Lake Dam Inundation



Wales Lake Dam Inundation



FEMA Digital Flood Map Products

- **FIRM Panel Image:** Flood Insurance Rate Maps (FIRM) are digital images of flood hazard maps. The images are digital pictures of entire flood map panels that can be viewed and printed from a computer. Most communities and counties have many map panels to cover the entire jurisdiction and an index map that shows the location of each map panel.

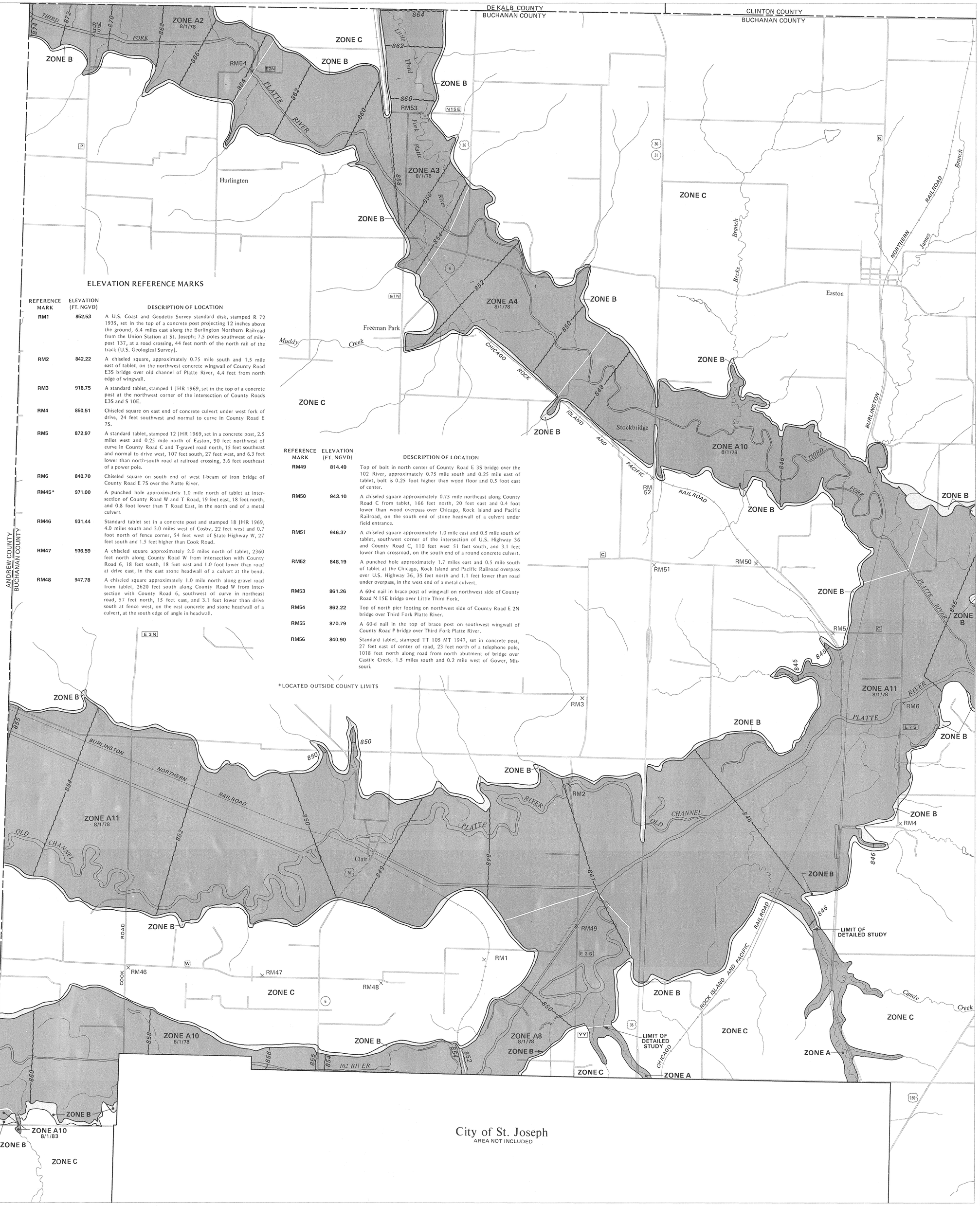
- **FIRM Worldfile:** A TFW or PGW file may accompany your flood hazard map. They are used to help view the flood maps in GIS applications.

FIRM Panel Images are TIF or PNG image files and have file names with a Community or County ID followed by a 4-digital panel number and letter suffix representing a version (e.g. 12345C0123F.tif). The FIRM worldfiles will have the same filenames but with a .tfw or .pgw extension.

FIRM Panel Images can be viewed using most freely available image viewer applications. You can also use the FIRMette-Desktop software available from the FEMA Flood Map Service Center (MSC) website at msc.fema.gov/portal/resources/firmettes. FIRM images can also be viewed in specialized GIS software where the worldfiles are used to make the images compatiable with other GIS data. See the MSC Products and Tools Overview page for more information on avialable data and tools for using FEMA's flood risk data.

For more information on available digital products, visit FEMA's Map Service Center website at https://msc.fema.gov or call the FEMA Map Information eXchange (FMIX) at 877-336-2627.

RiskMAP
Increasing Resilience Together



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM1	852.53	A U.S. Coast and Geodetic Survey standard disk, stamped R 72 1935, set in the top of a concrete post projecting 12 inches above the ground, 6.4 miles east along the Burlington Northern Railroad from the Union Station at St. Joseph; 7.5 poles southwest of mile-post 137, at a road crossing, 44 feet north of the north rail of the track (U.S. Geological Survey).
RM2	842.22	A chiseled square, approximately 0.75 mile south and 1.5 mile east of tablet, on the northwest concrete wingwall of County Road E3S bridge over old channel of Platte River, 4.4 feet from north edge of wingwall.
RM3	918.75	A standard tablet, stamped 1 JHR 1969, set in the top of a concrete post at the northwest corner of the intersection of County Roads E3S and S 10E.
RM4	850.51	Chiseled square on east end of concrete culvert under west fork of drive, 24 feet southwest and normal to curve in County Road E 7S.
RM5	872.97	A standard tablet, stamped 12 JHR 1969, set in a concrete post, 2.5 miles west and 0.25 mile north of Easton, 90 feet northwest of curve in County Road C and T-gravel road north, 15 feet southeast and normal to drive west, 107 feet south, 27 feet west, and 6.3 feet lower than north-south road at railroad crossing, 3.6 feet southeast of a power pole.
RM6	840.70	Chiseled square on south end of west I-beam of iron bridge of County Road E 7S over the Platte River.
RM45*	971.00	A punched hole approximately 1.0 mile north of tablet at intersection of County Road W and T Road, 19 feet east, 18 feet north, and 0.8 foot lower than T Road East, in the north end of a metal culvert.
RM46	931.44	Standard tablet set in a concrete post and stamped 18 JHR 1969, 4.0 miles south and 3.0 miles west of Cosby, 22 feet west and 0.7 foot north of fence corner, 54 feet west of State Highway W, 27 feet south and 1.5 feet higher than Cook Road.
RM47	936.59	A chiseled square approximately 2.0 miles north of tablet, 2360 feet north along County Road W from intersection with County Road 6, 18 feet south, 18 feet east and 1.0 foot lower than road at drive east, in the east stone headwall of a culvert at the bend.
RM48	947.78	A chiseled square approximately 1.0 mile north along gravel road from tablet, 2620 feet south along County Road W from intersection with County Road 6, southwest of curve in northeast road, 57 feet north, 15 feet east, and 3.1 feet lower than drive south at fence west, on the east concrete and stone headwall of a culvert, at the south edge of angle in headwall.
RM49	814.49	Top of bolt in north center of County Road E 3S bridge over the 102 River, approximately 0.75 mile south and 0.25 mile east of tablet, bolt is 0.25 foot higher than wood floor and 0.5 foot east of center.
RM50	943.10	A chiseled square approximately 0.75 mile northeast along County Road C from tablet, 166 feet north, 20 feet east and 0.4 foot lower than wood overpass over Chicago, Rock Island and Pacific Railroad, on the south end of stone headwall of a culvert under field entrance.
RM51	946.37	A chiseled square approximately 1.0 mile east and 0.5 mile south of tablet, southwest corner of the intersection of U.S. Highway 36 and County Road C, 110 feet west 51 feet south, and 3.1 feet lower than crossroad, on the south end of a round concrete culvert.
RM52	848.19	A punched hole approximately 1.7 miles east and 0.5 mile south of tablet at the Chicago, Rock Island and Pacific Railroad overpass over U.S. Highway 36, 35 feet north and 1.1 feet lower than road under overpass, in the west end of a metal culvert.
RM53	861.26	A 60-d nail in brace post of wingwall on northwest side of County Road N 15E bridge over Little Third Fork.
RM54	862.22	Top of north pier footing on northwest side of County Road E 2N bridge over Third Fork Platte River.
RM55	870.79	A 60-d nail in the top of brace post on southwest wingwall of County Road P bridge over Third Fork Platte River.
RM56	840.90	Standard tablet, stamped TT 105 MT 1947, set in concrete post, 27 feet east of center of road, 23 feet north of a telephone pole, 1018 feet north along road from north abutment of bridge over Castile Creek, 1.5 miles south and 0.2 mile west of Gower, Missouri.

*LOCATED OUTSIDE COUNTY LIMITS

KEY TO MAP

- 500-Year Flood Boundary
- 100-Year Flood Boundary
- Zone Designations* With Date of Identification e.g., 12/2/74
- 100-Year Flood Boundary
- 500-Year Flood Boundary
- Base Flood Elevation Line With Elevation In Feet**
- Base Flood Elevation in Feet Where Uniform Within Zone**
- Elevation Reference Mark
- Zone D Boundary
- River Mile

ZONE B / ZONE A1 / ZONE A6 / ZONE B

513

(EL 987)

RM7×

•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
AUGUST 1, 1978

FLOOD HAZARD BOUNDARY MAP REVISIONS:

FLOOD INSURANCE RATE MAP EFFECTIVE:
AUGUST 1, 1978

FLOOD INSURANCE RATE MAP REVISIONS:
August 1, 1983; to change Corporate Limits, to add new Special Flood Hazard Areas, to add Zone Designations, to add Base Flood Elevations, to add Streets, and to reduce Special Flood Hazard Areas.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE
2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

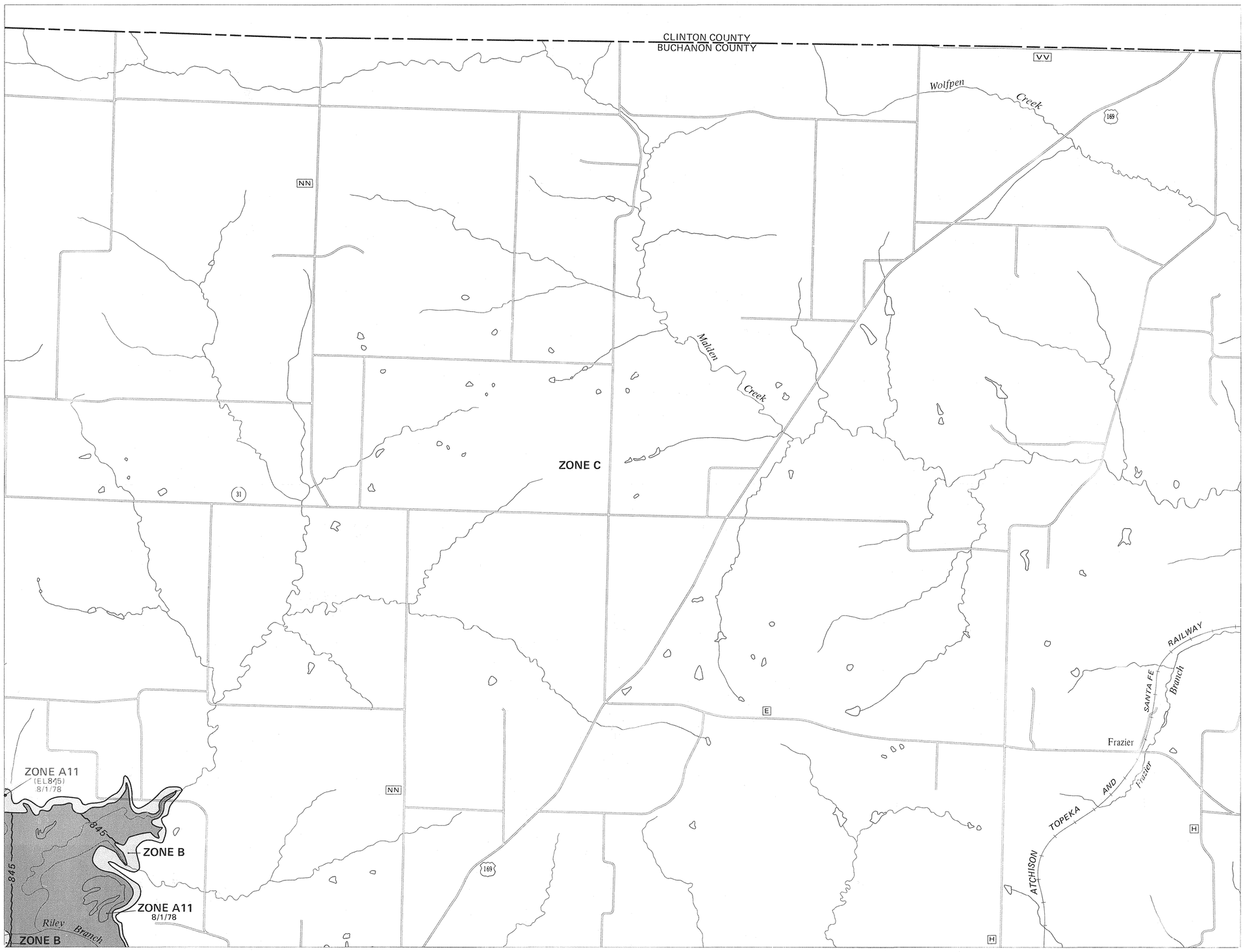
BUCHANAN COUNTY, MISSOURI
UNINCORPORATED AREA

PANEL 25 OF 125
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
290040 0025 B

MAP REVISED:
AUGUST 1, 1983

Federal Emergency Management Agency



KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations* With Date of Identification e.g., 12/2/74
100-Year Flood Boundary
500-Year Flood Boundary

ZONE B
ZONE A1 DATE
ZONE A5 DATE
ZONE B

Base Flood Elevation Line With Elevation In Feet** — 513

Base Flood Elevation in Feet Where Uniform Within Zone** (EL 987)

Elevation Reference Mark RM7 ×

River Mile • M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
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B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
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V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

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For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION
AUGUST 1, 1978

CONVERSION TO REGULAR PROGRAM
AUGUST 1, 1978

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620, or (800) 424-8872.

APPROXIMATE SCALE
2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

BUCHANAN COUNTY, MISSOURI
(UNINCORPORATED AREAS)

COMMUNITY-PANEL NUMBER
290040 0030 A

PAGE 30 OF 150
(SEE MAP INDEX FOR PAGES NOT PRINTED)

EFFECTIVE
AUGUST 1, 1978

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

CLINTON COUNTY
BUCHANAN COUNTY

City of Gower
AREA NOT INCLUDED

ZONE A3
8/1/78

ZONE C

ZONE B

ZONE A7
8/1/78

ZONE A10
8/1/78

RM33
RM34
RM35
RM36
RM37
RM38
RM39
RM40
RM41
RM42
RM43

Jenkins Branch
Tonkins Branch
Cattle Creek
Wolfpen Creek
Malden Creek
Crabapple Branch
Dermas Branch
Mitchell Branch
PLATTE RIVER
SANTA FE RAILWAY
TOPEKA AND ATCHISON RAILWAY

E235
S15E
S14E
S13E
DD
H
E
116

BUCHANAN COUNTY
PLATTE COUNTY

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM33	931.13	A railroad spike 0.30 foot above the ground in the northeast side of a 30-inch hackberry tree, on the west side of County Road E and at highway right-of-way fence.
RM34	819.28	A chiseled square on top of east concrete curb on southeast corner of State Highway 116 bridge over Platte River.
RM35	812.02	A boat spike in the north side of a 30-inch elm tree at the east toe of north-south levee.
RM36	810.77	A railroad spike in top of wood piling northwest of small bridge, near northwest end of retaining wall on the west side of north-south road, approximately 600 feet east of Platte River.
RM37	869.92	A railroad spike in top of wood piling, west side of north-south county road and outlet end of 24-inch corrugated metal pipe and 500 feet south of curve on southwest county road.
RM38	813.09	Top of 60-d nail in northwest corner of County Road SE 3 bridge over Castile Creek.
RM39	821.48	Top of 60-d nail in southeast corner of County Road E 23S bridge over Castile Creek.
RM40	844.47	Brass pin in top of curb in southwest corner of County Road DD bridge over Jenkins Branch.
RM41	893.38	A 16-d nail in west side of telephone pole at north toe of east fill of Atchison, Topeka and Santa Fe Railway bridge over Jenkins Branch.
RM42	894.46	Top of southeast corner of concrete headwall box culvert, south side of County Highway H, 0.25 mile west of Gower, Missouri.
RM43	908.09	Chiseled square on southwest corner of footbridge over Jenkins Branch, on county line, 0.5 mile north of junction with County Highway H at west edge of Gower, Missouri.
RM44*	940.78	A U.S. Coast and Geodetic Survey standard tablet, stamped B 1923 Mo 940, at Gower in southeast corner of park, 32 feet north and 43 feet west of intersection.

*LOCATED IN AREA NOT INCLUDED

KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations* With Date of Identification e.g., 12/2/74
100-Year Flood Boundary
500-Year Flood Boundary
Base Flood Elevation Line With Elevation In Feet**
Base Flood Elevation in Feet Where Uniform Within Zone**
Elevation Reference Mark
River Mile

ZONE B
ZONE A1 DATE / ZONE A5 DATE
ZONE B
513
(EL 987)
RM7 ×
• M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION
AUGUST 1, 1978

CONVERSION TO REGULAR PROGRAM
AUGUST 1, 1978

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program at (800) 638-6620, or (800) 424-8872.

APPROXIMATE SCALE
1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

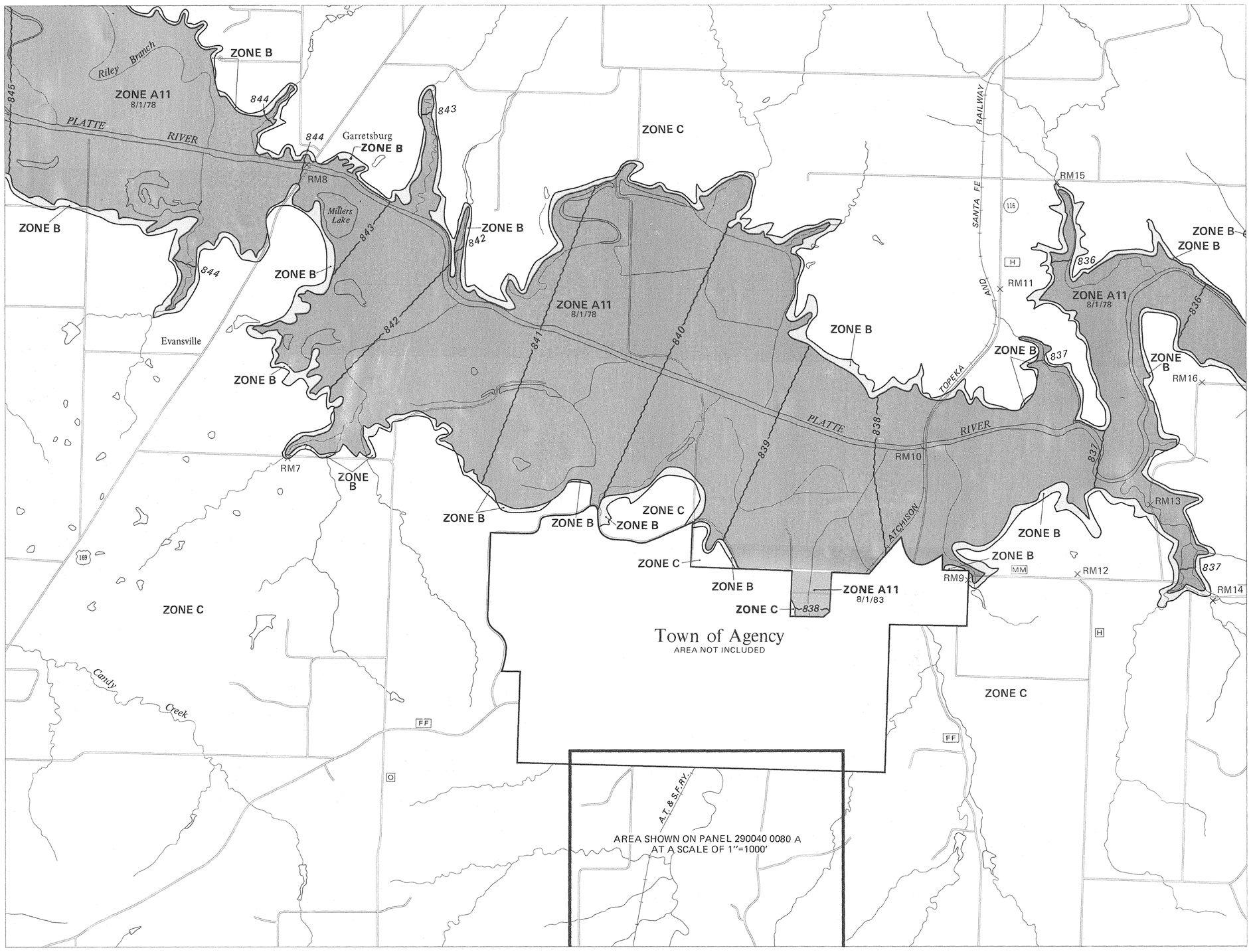
BUCHANAN COUNTY, MISSOURI
(UNINCORPORATED AREAS)

COMMUNITY-PANEL NUMBER
290040 0035 A

PAGE 35 OF 150
(SEE MAP INDEX FOR PAGES NOT PRINTED)

EFFECTIVE
AUGUST 1, 1978

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION



KEY TO MAP

500-Year Flood Boundary

100-Year Flood Boundary

Zone Designations* With Date of Identification e.g., 12/2/74

100-Year Flood Boundary

500-Year Flood Boundary

ZONE B / ZONE A1 DATE / ZONE A5 DATE / ZONE B

Base Flood Elevation Line With Elevation In Feet** — 513

Base Flood Elevation in Feet Where Uniform Within Zone** — (EL 987)

Elevation Reference Mark — RM7×

Zone D Boundary

River Mile — •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
AUGUST 1, 1978

FLOOD HAZARD BOUNDARY MAP REVISIONS:

FLOOD INSURANCE RATE MAP EFFECTIVE:
AUGUST 1, 1978

FLOOD INSURANCE RATE MAP REVISIONS:
August 1, 1983; to change Corporate Limits, to add new Special Flood Hazard Areas, to add Zone Designations, to add Base Flood Elevations, to add Streets, and to reduce Special Flood Hazard Areas.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE
2000 0 2000 FEET

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM7	847.03	Chiseled square on southwest corner of concrete headwall of large box culvert, approximately 3 miles north and 0.5 mile east of Agency, Missouri.
RM8	836.00	Standard tablet in top of right corner of upstream end of east abutment of former U.S. Highway 169 bridge, 20 feet west of east abutment of present bridge carrying U.S. Highway 169 over Platte River. (U.S. Geological Survey)
RM9	835.53	Standard tablet in concrete post, 27 feet west of center of County Road MM, 3 feet east of fence, 20 feet south of T fence west, 610 feet south from T road west in south part of Agency, Missouri.
RM10	921.12	A chiseled square at southwest corner of west concrete pier of main span of the Atchison, Topeka and Santa Fe Railway bridge over Platte River.
RM11	885.05	Standard tablet in concrete post, 442 feet west of junction of County Highway H and gravel road, 32 feet north of center of County Highway H, 2 miles east, and 0.3 mile south of Agency, Missouri.
RM12	930.03	A boat spike in the west side of a telephone pole 0.30 foot above the ground, on east side of highway at junction of County Highway H and County Road MM.
RM13	829.29	A chiseled square on top of concrete retaining wall at the southwest corner of County Road MM bridge over Rock Creek, 0.80 foot above bridge floor.
RM14	849.56	Top of bolt on north side of 3-foot steel pier, 21 feet south and 7 feet west of north end of steel and wood bridge 1.1 miles south of Agency, Missouri.
RM15	846.91	A chiseled square at top of concrete headwall of concrete box culvert on County Road S 10E over a large creek, 1400 feet south from intersection with County Highway H.
RM16	854.31	A boat spike, 0.20 foot above the ground, in the west side of a power pole on the east side of north and south gravel road and 125 feet south of turn to west.

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

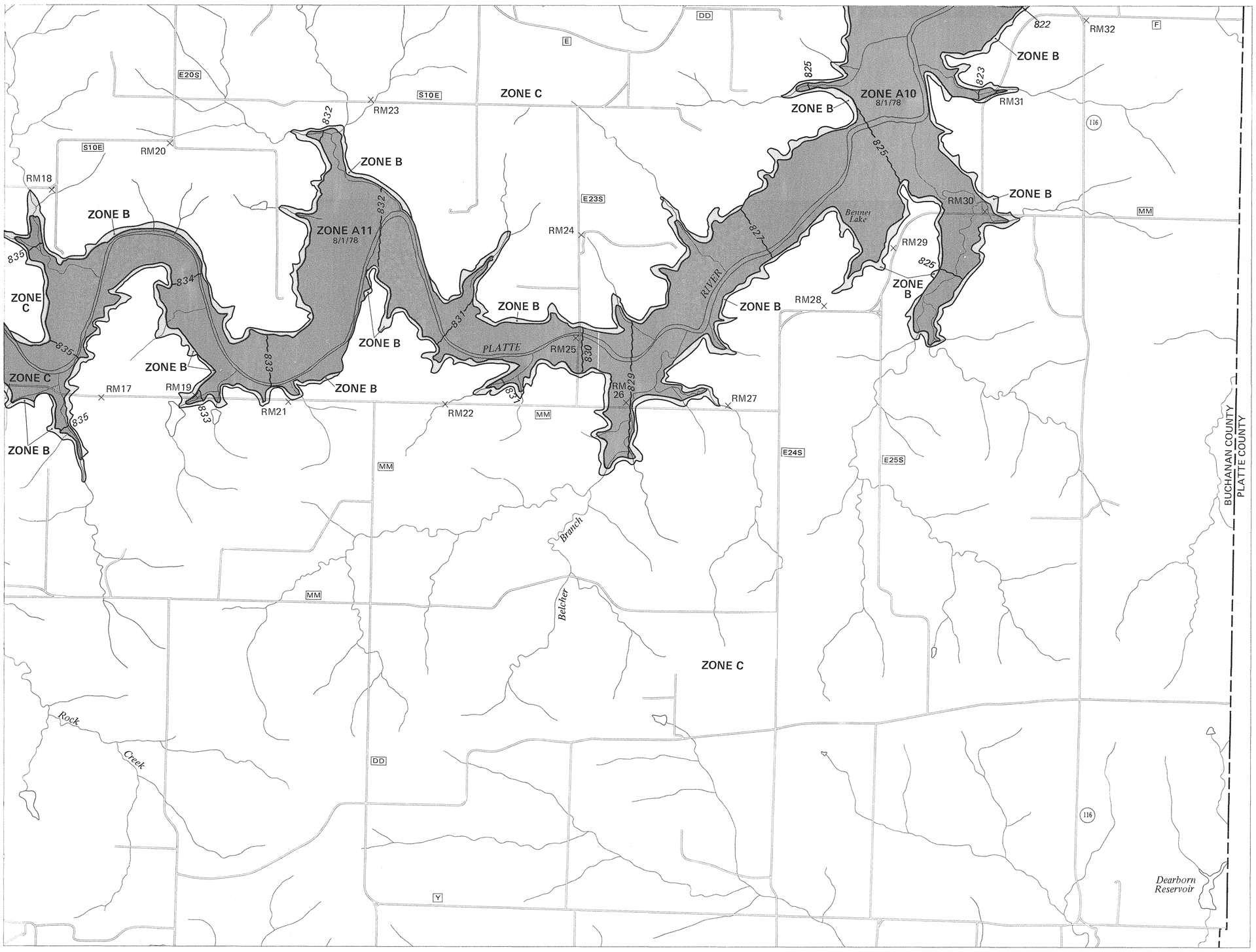
BUCHANAN COUNTY, MISSOURI
UNINCORPORATED AREA

PANEL 40 OF 125
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
290040 0040 B

MAP REVISED:
AUGUST 1, 1983

Federal Emergency Management Agency



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM17	874.71	A boat spike, 0.20 foot above the ground, in the northeast side of a telephone pole on the west side of north and south gravel road.
RM18	861.18	A boat spike, 0.10 foot above the ground, in north side of telephone poles at the northwest corner of County Road S 10E and an east-west road.
RM19	828.70	A boat spike, 0.20 foot above the ground, in the west side of a power transformer pole, on the east side of a north and south gravel road, 150 feet west of abandoned farm house.
RM20	903.07	A boat spike, 0.30 foot above the ground, in the southeast side of a power pole, at the northwest corner of intersection of County Roads E 20S and S 10E.
RM21	835.57	A boat spike, 0.20 foot above the ground, in the east side of telephone pole on the west side of north-south gravel road.
RM22	848.42	A chiseled square on top of center of the west concrete headwall for a 30-inch concrete drain pipe under County Road MM.
RM23	849.30	A boat spike, 0.30 foot above the ground, in the west side of a transformer power pole, on the east side of a north-south gravel road across from a rock quarry.
RM24	900.74	A chiseled square on southwest corner of south concrete headwall for an 18-inch reinforced concrete pipe under County Road E 23S.
RM25	827.34	A chiseled square on the northeast corner of riverward edge of steel I-beam seat on the west end of steel 2.5 feet below bridge floor on the west end of steel County Road 235 bridge over Platte River, 2.5 feet below bridge floor.
RM26	819.28	A chiseled square on the northeast corner of the east headwall of concrete box culvert on County Road MM over Belcher Branch.
RM27	844.73	A chiseled square on the southeast corner of the east headwall of concrete box culvert on County Road MM.
RM28	856.21	A boat spike, 0.20 foot above ground, in the west side of a telephone pole on the east side of County Road MM.
RM29	839.97	A chiseled cross on top of north end of 18-inch corrugated metal pipe on County Road MM, approximately 140 feet southeast of farm drive north.
RM30	818.90	A chiseled square on the south end of east headwall of concrete box culvert on County Road MM.
RM31	827.01	A chiseled square on the west corner of concrete box culvert on the southwest side of gravel road.
RM32	914.61	A boat spike in the west side of a power pole at the southwest corner of intersection of State Highway 116 and County Road F.

KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations* With Date of Identification e.g., 12/2/74
100-Year Flood Boundary
500-Year Flood Boundary

ZONE B
ZONE A1 DATE
ZONE A5 DATE
ZONE B

Base Flood Elevation Line With Elevation In Feet** — 513

Base Flood Elevation in Feet Where Uniform Within Zone** (EL 987)

Elevation Reference Mark RM7×

River Mile • M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION
AUGUST 1, 1978

CONVERSION TO REGULAR PROGRAM
AUGUST 1, 1978

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620, or (800) 424-8872.

APPROXIMATE SCALE
2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

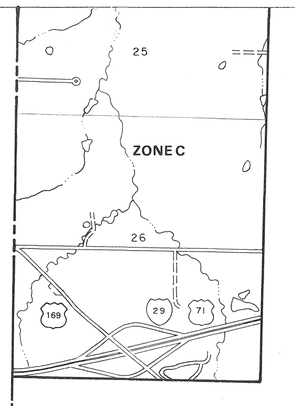
BUCHANAN COUNTY, MISSOURI
(UNINCORPORATED AREAS)

COMMUNITY-PANEL NUMBER
290040 0045 A

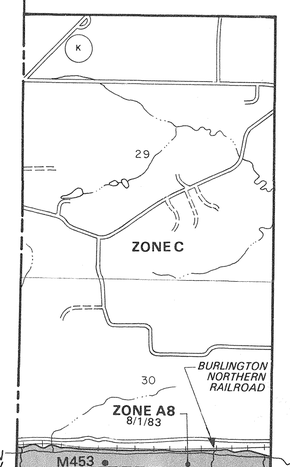
PAGE 45 OF 150
(SEE MAP INDEX FOR PAGES NOT PRINTED)

EFFECTIVE
AUGUST 1, 1978

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION



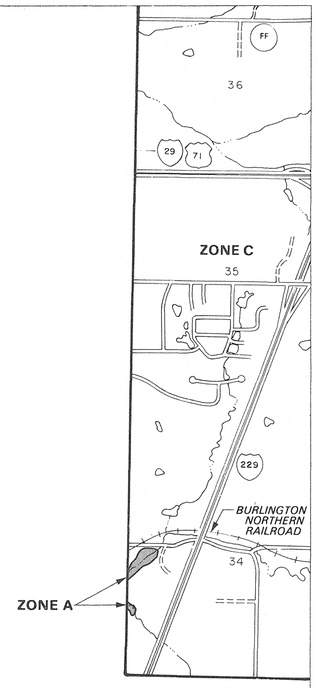
ANDREW COUNTY
BUCHANAN COUNTY

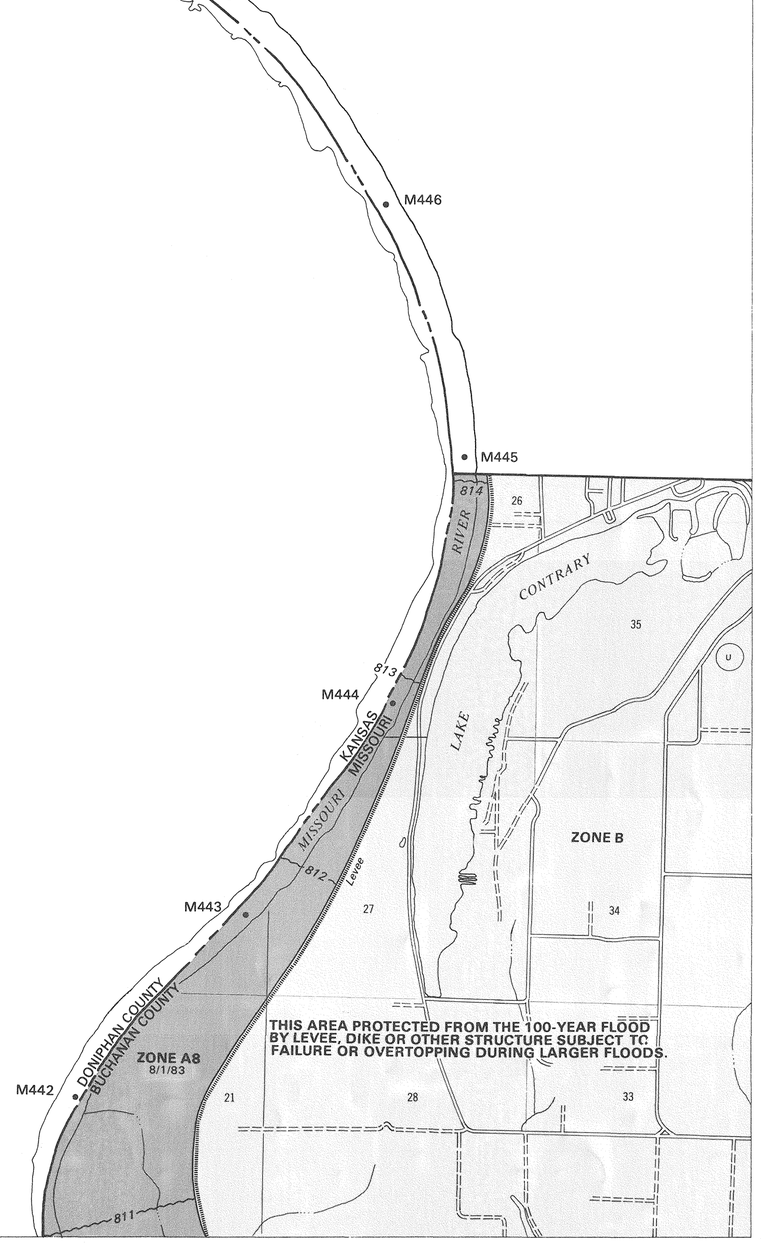


City of St. Joseph
AREA NOT INCLUDED

RM62 ×

RM63 ×





ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
*RM62	850.37	Chiseled plus (+) in the north side of the manhole rim at the center of intersection of North 4th and Auguste Streets.
*RM63	840.39	Chiseled plus (+) in a top flange of the fire hydrant located at the northeast corner of Charles and 4th Streets.

*Located In Area Not Included

KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations* With Date of Identification e.g., 12/2/74
100-Year Flood Boundary
500-Year Flood Boundary

ZONE B
ZONE A1 / ZONE A5
ZONE B

Base Flood Elevation Line With Elevation In Feet** — 513
Base Flood Elevation in Feet Where Uniform Within Zone** — (EL 987)
Elevation Reference Mark — RM7×
Zone D Boundary
River Mile — •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
AUGUST 1, 1978

FLOOD HAZARD BOUNDARY MAP REVISIONS:

FLOOD INSURANCE RATE MAP EFFECTIVE:
AUGUST 1, 1978

FLOOD INSURANCE RATE MAP REVISIONS:
August 1, 1983; to change Corporate Limits, to add new Special Flood Hazard Areas, to add Zone Designations, to add Base Flood Elevations, and to add Streets.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE
2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

BUCHANAN COUNTY, MISSOURI
UNINCORPORATED AREA

PANEL 75 OF 125
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
290040 0075 B

MAP REVISED:
AUGUST 1, 1983

Federal Emergency Management Agency

KEY TO MAP

500-Year Flood Boundary	ZONE B
100-Year Flood Boundary	ZONE A1 DATE
Zone Designations* With Date of Identification e.g., 12/2/74	ZONE A5 DATE
100-Year Flood Boundary	ZONE B
500-Year Flood Boundary	ZONE B
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7 ×
River Mile	• M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION
AUGUST 1, 1978

CONVERSION TO REGULAR PROGRAM
AUGUST 1, 1978

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620, or (800) 424-8872.

APPROXIMATE SCALE
1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

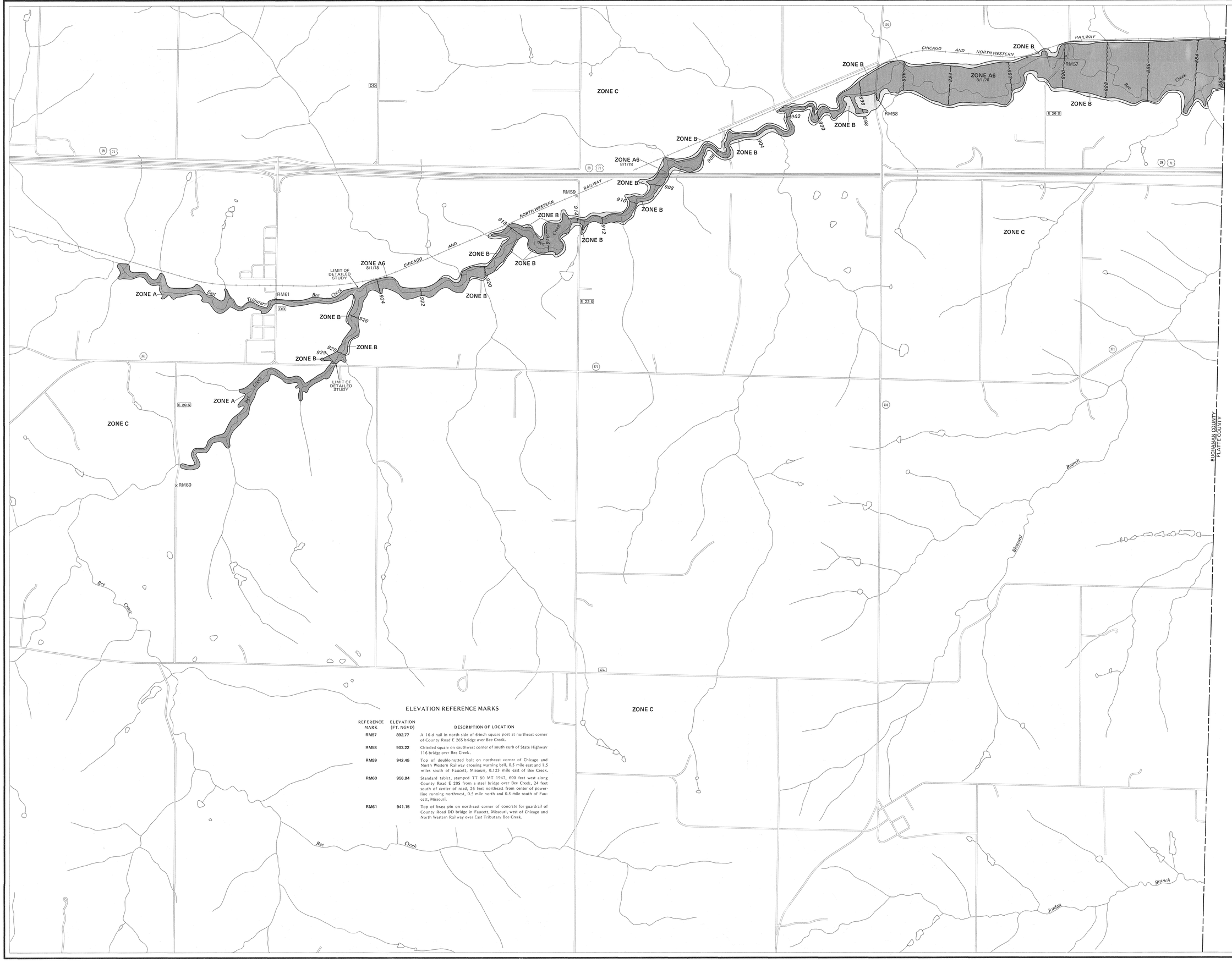
BUCHANAN COUNTY, MISSOURI
(UNINCORPORATED AREAS)

COMMUNITY-PANEL NUMBER
290040 0080 A

PAGE 80 OF 150
(SEE MAP INDEX FOR PAGES NOT PRINTED)

EFFECTIVE
AUGUST 1, 1978

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION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ZONE A6
8/1/78
ZONE A
ZONE B
ZONE A6
8/1/78
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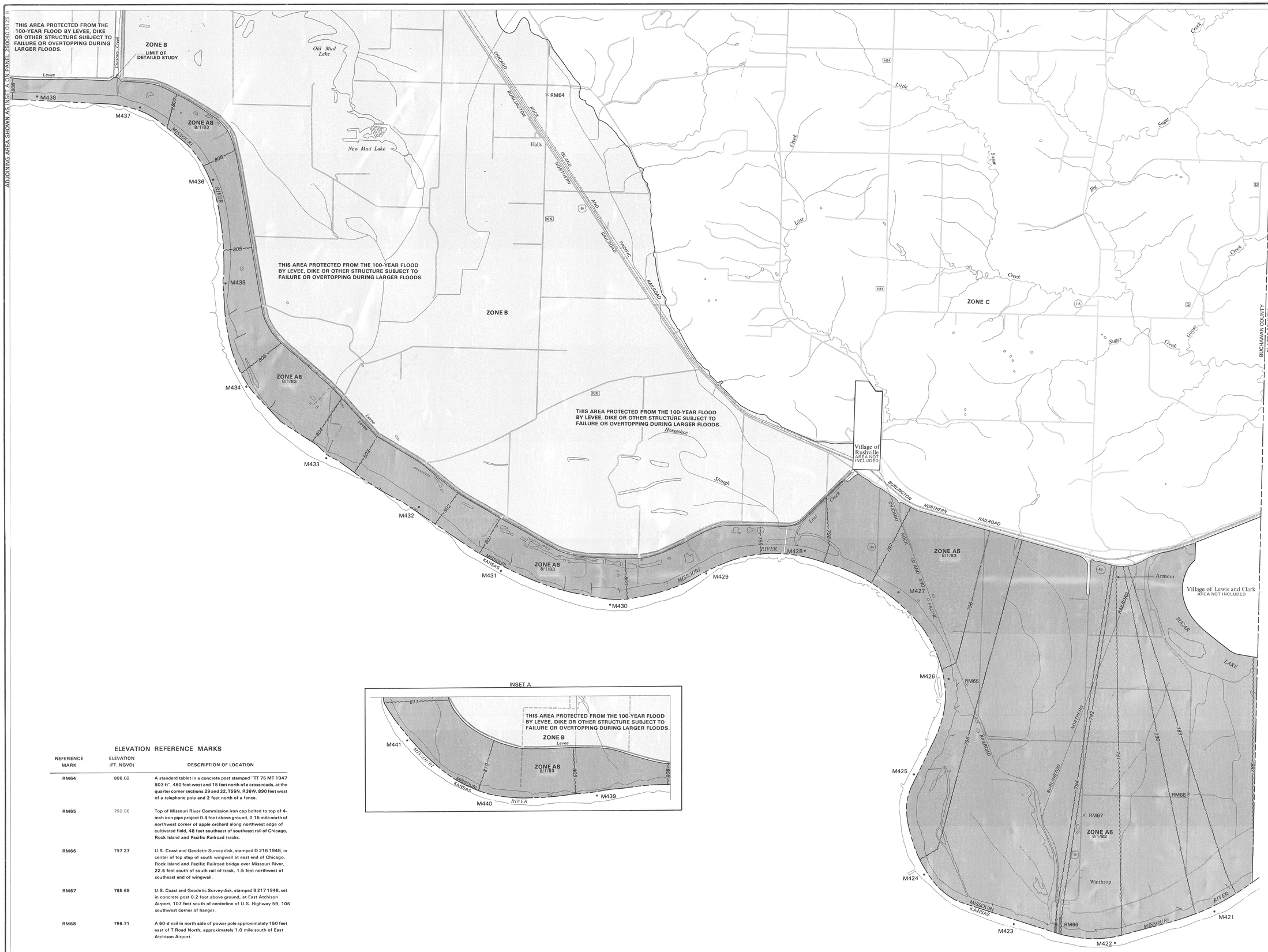


ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM64	806.02	A standard tablet in a concrete post stamped "TT 75 MT 1947 803 ft", 460 feet west and 15 feet north of a cross roads, at the quarter corner sections 29 and 32, T56N, R36W, 890 feet west of a telephone pole and 2 feet north of a fence.
RM65	792 06	Top of Missouri River Commission iron cap bolted to top of 4-inch iron pipe project 0.4 foot above ground, 0.15 mile north of northwest corner of apple orchard along northwest edge of cultivated field, 48 feet southeast of southeast rail of Chicago, Rock Island and Pacific Railroad tracks.
RM66	797.27	U.S. Coast and Geodetic Survey disk, stamped D 216 1948, in center of top step of south wingwall at east end of Chicago, Rock Island and Pacific Railroad bridge over Missouri River, 22.6 feet south of south rail of track, 1.5 feet northwest of southeast end of wingwall.
RM67	785.68	U.S. Coast and Geodetic Survey disk, stamped B 217 1948, set in concrete post 0.2 foot above ground, at East Atchison Airport, 107 feet south of centerline of U.S. Highway 59, 106 southwest corner of hanger.
RM68	786.71	A 60-d nail in north side of power pole approximately 150 feet east of T Road North, approximately 1.0 mile south of East Atchison Airport.

KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations* With Date of Identification e.g., 12/2/74
100-Year Flood Boundary
500-Year Flood Boundary

ZONE B
ZONE A1 DATE
ZONE A5 DATE
ZONE B

Base Flood Elevation Line With Elevation In Feet** — 513
Base Flood Elevation in Feet Where Uniform Within Zone** — (EL 987)
Elevation Reference Mark — RM7×
Zone D Boundary
River Mile — •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
AUGUST 1, 1978

FLOOD HAZARD BOUNDARY MAP REVISIONS:

FLOOD INSURANCE RATE MAP EFFECTIVE:
AUGUST 1, 1978

FLOOD INSURANCE RATE MAP REVISIONS:
August 1, 1983, to change Corporate Limits, to add new Special Flood Hazard Areas, to add Zone Designations, to add Base Flood Elevations, and to add Streets.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE
2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

BUCHANAN COUNTY, MISSOURI
UNINCORPORATED AREA

PANEL 125 OF 125
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
290040 0125 B

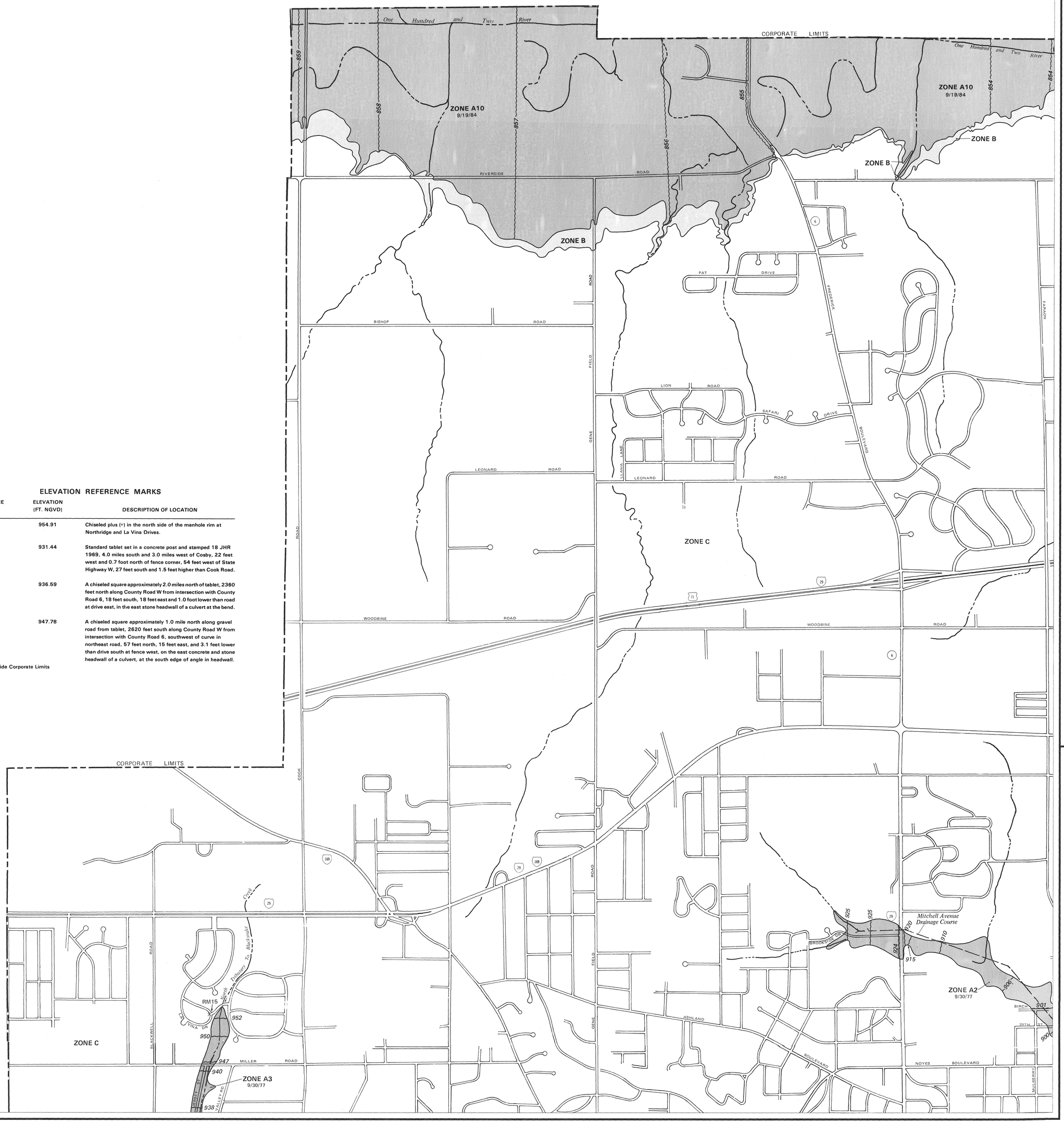
MAP REVISED:
AUGUST 1, 1983

Federal Emergency Management Agency

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM15	954.91	Chiseled plus (+) in the north side of the manhole rim at Northridge and La Vina Drives.
*RM19	931.44	Standard tablet set in a concrete post and stamped 18 JHR 1969, 4.0 miles south and 3.0 miles west of Cosby, 22 feet west and 0.7 foot north of fence corner, 54 feet west of State Highway W, 27 feet south and 1.5 feet higher than Cook Road.
*RM20	936.59	A chiseled square approximately 2.0 miles north of tablet, 2360 feet north along County Road W from intersection with County Road 6, 18 feet south, 18 feet east and 1.0 foot lower than road at drive east, in the east stone headwall of a culvert at the bend.
*RM21	947.78	A chiseled square approximately 1.0 mile north along gravel road from tablet, 2620 feet south along County Road W from intersection with County Road 6, southwest of curve in northeast road, 57 feet north, 15 feet east, and 3.1 feet lower than drive south at fence west, on the east concrete and stone headwall of a culvert, at the south edge of angle in headwall.

*Located Outside Corporate Limits



KEY TO MAP

500-Year Flood Boundary	ZONE B
100-Year Flood Boundary	ZONE A1 DATE / ZONE A5 DATE
Zone Designations* With Date of Identification e.g., 12/2/74	
100-Year Flood Boundary	ZONE B
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7×
Zone D Boundary	
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Map Index.

INITIAL IDENTIFICATION:
JUNE 7, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
OCTOBER 10, 1975

FLOOD INSURANCE RATE MAP EFFECTIVE:
SEPTEMBER 30, 1977

FLOOD INSURANCE RATE MAP REVISIONS:
Map revised September 19, 1984 to change special flood hazard area and zone designations, add base flood elevations; and reflect revised FEMA title block.

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APPROXIMATE SCALE
800 0 800 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

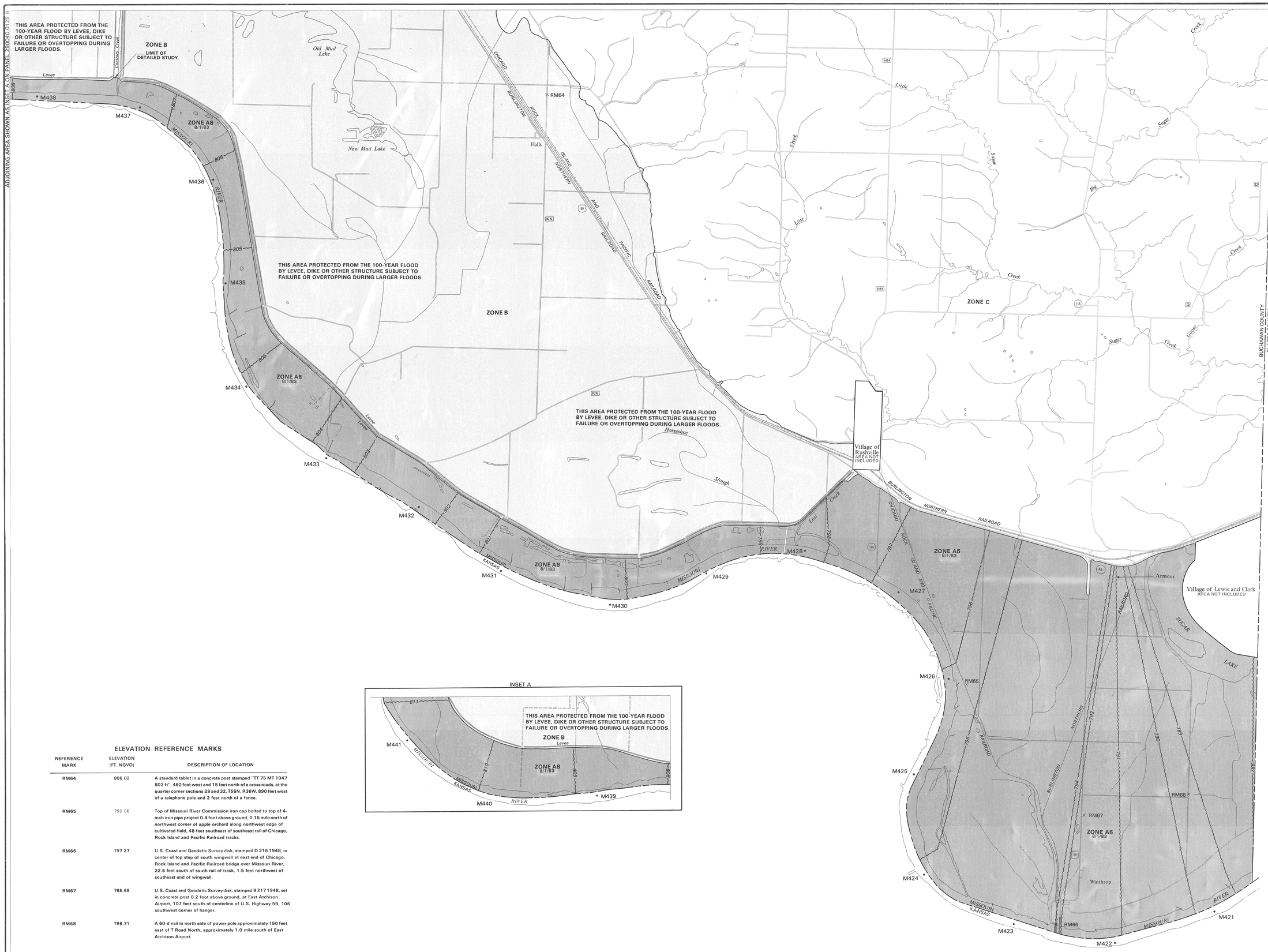
CITY OF
ST. JOSEPH, MISSOURI
BUCHANAN COUNTY

PANEL 5 OF 20

COMMUNITY-PANEL NUMBER
290043 0005 C

MAP REVISED:
SEPTEMBER 19, 1984

Federal Emergency Management Agency



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM64	806.02	A standard tablet in a concrete post stamped "TT 75 MT 1947 803 ft", 460 feet west and 15 feet north of a cross roads, at the quarter corner sections 29 and 32, T56N, R36W, 890 feet west of a telephone pole and 2 feet north of a fence.
RM65	792 06	Top of Missouri River Commission iron cap bolted to top of 4-inch iron pipe project 0.4 foot above ground, 0.15 mile north of northwest corner of apple orchard along northwest edge of cultivated field, 48 feet southeast of southeast rail of Chicago, Rock Island and Pacific Railroad tracks.
RM66	797.27	U.S. Coast and Geodetic Survey disk, stamped D 216 1948, in center of top step of south wingwall at east end of Chicago, Rock Island and Pacific Railroad bridge over Missouri River, 22.6 feet south of south rail of track, 1.5 feet northwest of southeast end of wingwall.
RM67	785.68	U.S. Coast and Geodetic Survey disk, stamped B 217 1948, set in concrete post 0.2 foot above ground, at East Atchison Airport, 107 feet south of centerline of U.S. Highway 59, 106 southwest corner of hanger.
RM68	786.71	A 60-d nail in north side of power pole approximately 150 feet east of T Road North, approximately 1.0 mile south of East Atchison Airport.

KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations* With Date of Identification e.g., 12/2/74
100-Year Flood Boundary
500-Year Flood Boundary

ZONE B
ZONE A1 DATE
ZONE A5 DATE
ZONE B

Base Flood Elevation Line With Elevation In Feet** — 513
Base Flood Elevation in Feet Where Uniform Within Zone** — (EL 987)
Elevation Reference Mark — RM7×
Zone D Boundary
River Mile — •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
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A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
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NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
AUGUST 1, 1978

FLOOD HAZARD BOUNDARY MAP REVISIONS:

FLOOD INSURANCE RATE MAP EFFECTIVE:
AUGUST 1, 1978

FLOOD INSURANCE RATE MAP REVISIONS:
August 1, 1983, to change Corporate Limits, to add new Special Flood Hazard Areas, to add Zone Designations, to add Base Flood Elevations, and to add Streets.

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APPROXIMATE SCALE
2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

BUCHANAN COUNTY, MISSOURI
UNINCORPORATED AREA

PANEL 125 OF 125
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
290040 0125 B

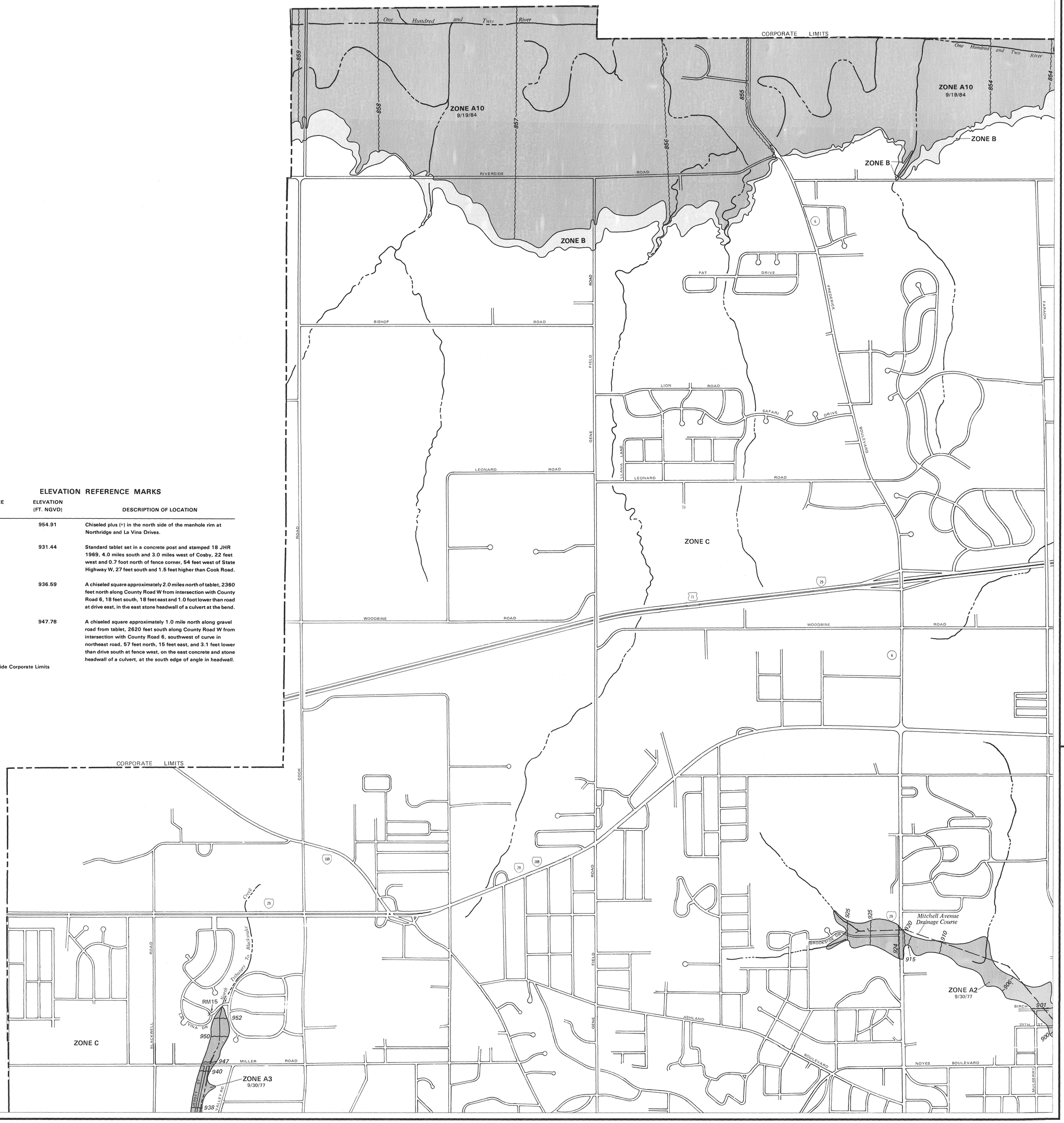
MAP REVISED:
AUGUST 1, 1983

Federal Emergency Management Agency

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM15	954.91	Chiseled plus (+) in the north side of the manhole rim at Northridge and La Vina Drives.
*RM19	931.44	Standard tablet set in a concrete post and stamped 18 JHR 1969, 4.0 miles south and 3.0 miles west of Cosby, 22 feet west and 0.7 foot north of fence corner, 54 feet west of State Highway W, 27 feet south and 1.5 feet higher than Cook Road.
*RM20	936.59	A chiseled square approximately 2.0 miles north of tablet, 2360 feet north along County Road W from intersection with County Road 6, 18 feet south, 18 feet east and 1.0 foot lower than road at drive east, in the east stone headwall of a culvert at the bend.
*RM21	947.78	A chiseled square approximately 1.0 mile north along gravel road from tablet, 2620 feet south along County Road W from intersection with County Road 6, southwest of curve in northeast road, 57 feet north, 15 feet east, and 3.1 feet lower than drive south at fence west, on the east concrete and stone headwall of a culvert, at the south edge of angle in headwall.

*Located Outside Corporate Limits



KEY TO MAP

500-Year Flood Boundary	ZONE B
100-Year Flood Boundary	ZONE A1 DATE / ZONE A5 DATE
Zone Designations* With Date of Identification e.g., 12/2/74	
100-Year Flood Boundary	ZONE B
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7×
Zone D Boundary	
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

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NOTES TO USER

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For adjoining map panels, see separately printed Map Index.

INITIAL IDENTIFICATION:
JUNE 7, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
OCTOBER 10, 1975

FLOOD INSURANCE RATE MAP EFFECTIVE:
SEPTEMBER 30, 1977

FLOOD INSURANCE RATE MAP REVISIONS:
Map revised September 19, 1984 to change special flood hazard area and zone designations, add base flood elevations; and reflect revised FEMA title block.

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APPROXIMATE SCALE
800 0 800 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

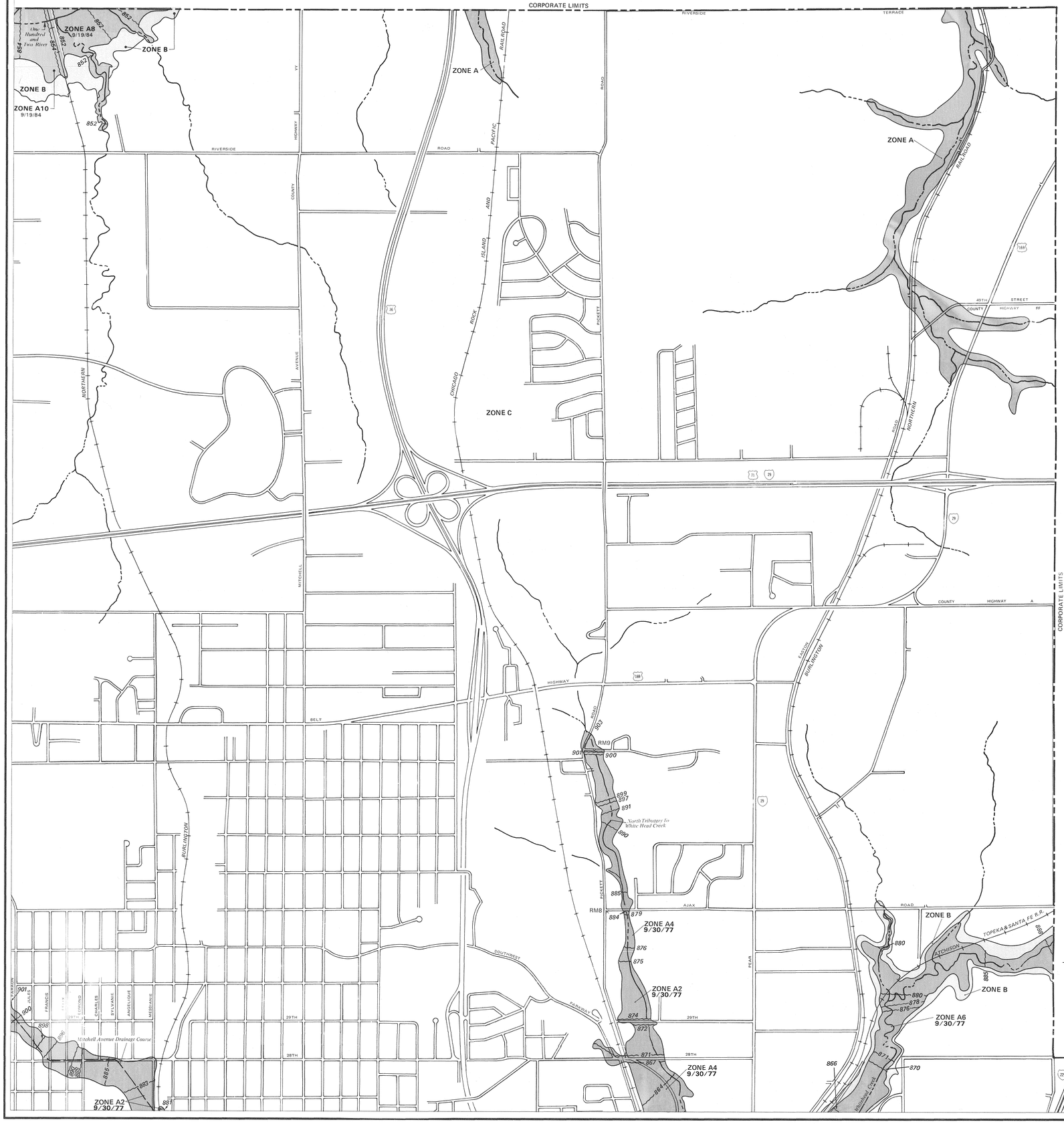
CITY OF
ST. JOSEPH, MISSOURI
BUCHANAN COUNTY

PANEL 5 OF 20

COMMUNITY-PANEL NUMBER
290043 0005 C

MAP REVISED:
SEPTEMBER 19, 1984

Federal Emergency Management Agency


CORPORATE LIMITS
ZONE A8
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ZONE A
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ZONE A
ZONE B
ZONE A4
9/30/77
ZONE A2
9/30/77
ZONE A6
9/30/77
ZONE A4
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ZONE A2
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ZONE B
RIVERSIDE
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BURLINGTON
EATON
SOUTHWEST
PARKWAY
PEAR
MITCHELL
29TH
28TH
TOPEKA & SANTA FE R.R.
ATCHISON
CORPORATE LIMITS
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Mitchell Avenue Drainage Course
Whitehead Creek
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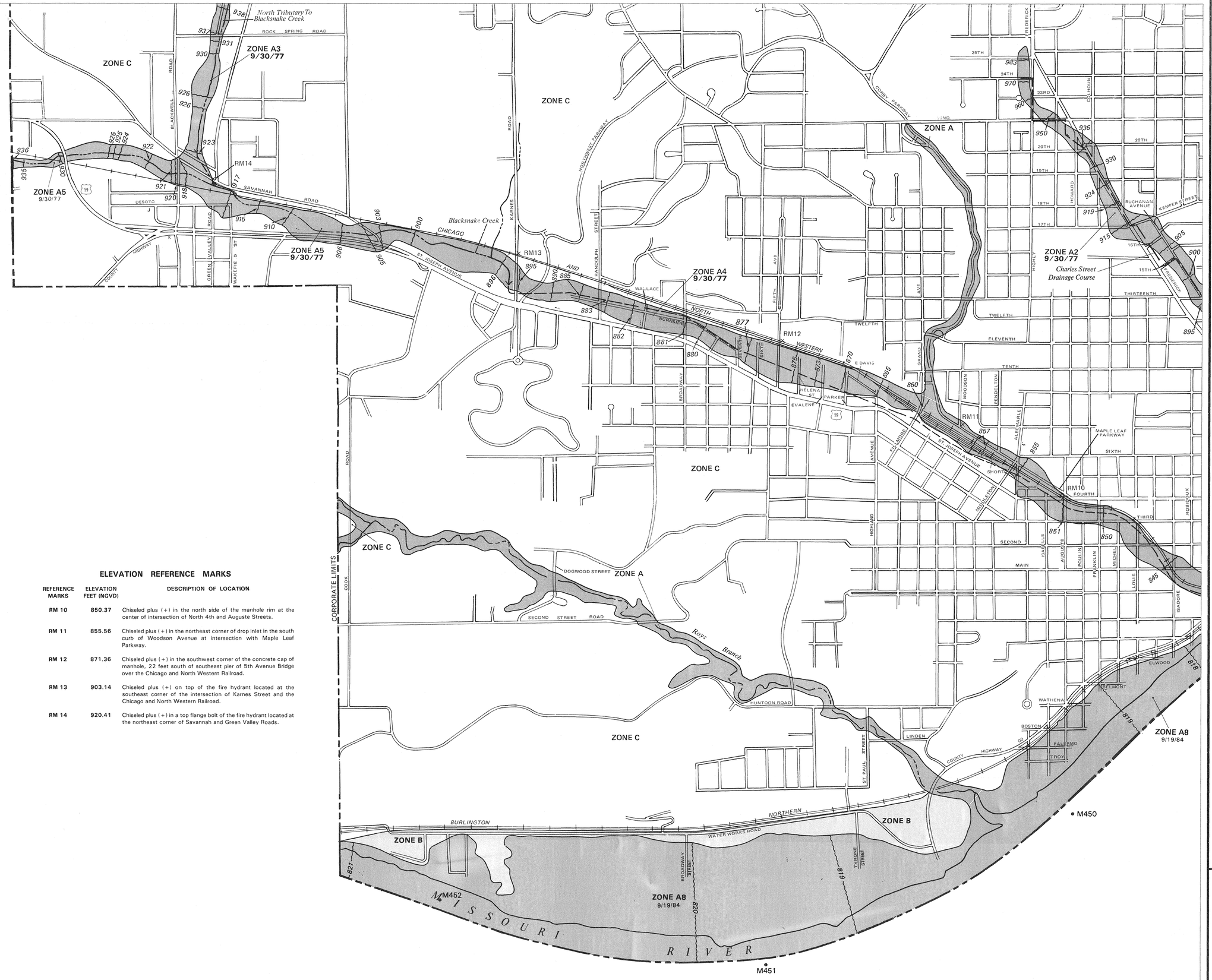

ELEVATION REFERENCE MARKS

REFERENCE MARKS	ELEVATION FEET (NGVD)	DESCRIPTION OF LOCATION
RM 10	850.37	Chiseled plus (+) in the north side of the manhole rim at the center of intersection of North 4th and Auguste Streets.
RM 11	855.56	Chiseled plus (+) in the northeast corner of drop inlet in the south curb of Woodson Avenue at intersection with Maple Leaf Parkway.
RM 12	871.36	Chiseled plus (+) in the southwest corner of the concrete cap of manhole, 22 feet south of southeast pier of 5th Avenue Bridge over the Chicago and North Western Railroad.
RM 13	903.14	Chiseled plus (+) on top of the fire hydrant located at the southeast corner of the intersection of Karnes Street and the Chicago and North Western Railroad.
RM 14	920.41	Chiseled plus (+) in a top flange bolt of the fire hydrant located at the northeast corner of Savannah and Green Valley Roads.

KEY TO MAP

500-Year Flood Boundary ——— ZONE B

100-Year Flood Boundary ———

Zone Designations* With Date of Identification e.g., 12/2/74 — ZONE A1 DATE / ZONE A5 DATE

100-Year Flood Boundary ———

500-Year Flood Boundary ——— ZONE B

Base Flood Elevation Line With Elevation In Feet** — 513

Base Flood Elevation in Feet Where Uniform Within Zone** (EL 987)

Elevation Reference Mark RM7×

Zone D Boundary — — — —

River Mile •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
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A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
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C	Areas of minimal flooding. (No shading)
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V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

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For adjoining map panels, see separately printed Map Index.

INITIAL IDENTIFICATION:
JUNE 7, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
OCTOBER 10, 1975

FLOOD INSURANCE RATE MAP EFFECTIVE:
SEPTEMBER 30, 1977

FLOOD INSURANCE RATE MAP REVISIONS:
Map revised September 19, 1984 to change special flood hazard area, zone designations, and base flood elevations, and reflect revised FEMA title block.

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APPROXIMATE SCALE
800 0 800 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
ST. JOSEPH, MISSOURI
BUCHANAN COUNTY

PANEL 15 OF 20

COMMUNITY-PANEL NUMBER
290043 0015 C

MAP REVISED:
SEPTEMBER 19, 1984

Federal Emergency Management Agency

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM1	844.72	U.S. Coast & Geodetic Survey (USC &GS) bench mark H217. Standard disk set in north end of east abutment to U.S. Highway 36 bridge over the Missouri River, about 250 feet west of 4th Street, 17 feet north of highway centerline and 0.9 foot south of top end of the abutment.
RM2	851.14	Chiseled plus (+) on southwest corner of drop inlet in the north curb of Mitchell Avenue, approximately 100 feet east of 15th Street.
RM3	883.45	USC & GS bench mark. Standard disk stamped V-72-1935, set in the north end of the east concrete abutment of the Burlington Northern Railroad bridge over 26th Street.
RM4	836.02	Chiseled plus (+) in the top of the northeast end of the concrete headwall at the inlet of the storm sewer near the 6th Street overpass of the Burlington Northern Railroad.
RM5	893.04	Chiseled plus (+) on the bottom flange bolt of the fire hydrant located on the southwest corner at the intersection of 11th Street Road and 17th Street.
RM6	922.27	Chiseled plus (+) on the bottom flange bolt of the fire hydrant located on the southeast corner at the intersection of 22nd Street and Center Drive.
RM7	856.09	USC & GS bench mark. Standard disk stamped Z72, set in the top of a concrete light tower footing located between the railroad tracks under the Southwest Parkway overpass south of the intersection of Garfield and 19th Streets.
RM16	833.46	Chiseled plus (+) in a top flange bolt of the fire hydrant located at the northwest corner of Carnegie and Alabama Streets.
RM17	389.70	Chiseled plus (+) in rim of the manhole located at the southwest corner of 8th and Mason Streets.
RM18	340.39	Chiseled plus (+) in a top flange of the fire hydrant located at the northeast corner of Charles and 4th Streets.

KEY TO MAP

- 500-Year Flood Boundary
- 100-Year Flood Boundary
- Zone Designations* With Date of Identification e.g., 12/2/74
- 100-Year Flood Boundary
- 500-Year Flood Boundary
- Base Flood Elevation Line With Elevation In Feet**
- Base Flood Elevation in Feet Where Uniform Within Zone**
- Elevation Reference Mark
- Zone D Boundary
- River Mile

ZONE B | ZONE A1 DATE | ZONE A5 DATE | ZONE B | 513 | (EL 987) | RM7× | •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

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This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Map Index.

INITIAL IDENTIFICATION:
JUNE 7, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
OCTOBER 10, 1975

FLOOD INSURANCE RATE MAP EFFECTIVE:
SEPTEMBER 30, 1977

FLOOD INSURANCE RATE MAP REVISIONS:
Map revised September 19, 1984 to change zone designations and base flood elevations and to reflect revised FEMA title block.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE
800 0 800 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
ST. JOSEPH, MISSOURI
BUCHANAN COUNTY

PANEL 20 OF 20

COMMUNITY-PANEL NUMBER
290043 0020 C

MAP REVISED:
SEPTEMBER 19, 1984

Federal Emergency Management Agency

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM1	844.72	U.S. Coast & Geodetic Survey (USC &GS) bench mark H217. Standard disk set in north end of east abutment to U.S. Highway 36 bridge over the Missouri River, about 250 feet west of 4th Street, 17 feet north of highway centerline and 0.9 foot south of top end of the abutment.
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SEPTEMBER 30, 1977

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APPROXIMATE SCALE
800 0 800 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
ST. JOSEPH, MISSOURI
BUCHANAN COUNTY

PANEL 20 OF 20

COMMUNITY-PANEL NUMBER
290043 0020 C

MAP REVISED:
SEPTEMBER 19, 1984

Federal Emergency Management Agency

Crop Insurance Claims Buchanan County 2006-2016

Reason	Year	Crop	Amount of claim ($)
Excess Moisture/Precip/Rain	2006	Wheat	2051
			8902
			6705
			1000
			1335
		Corn	704
			7074
			1996
			7514
			3254
			1488
	2007	Soybeans	22617
			8268
			2329
			316
			4650
			8084
			4460
		Grain Sorghum	666
		Corn	2463
			116294
			5740
			109860
			23030
			4363
			21760
	2008	Soybeans	61543
			4122
			62144
			25268
			63593
			23303
			14142
			60092
			772558
			12405
			5647
			601
			12396

		Grain Sorghum	2252
			471
		Corn	3400
			343346
			32311
			33966
			26514
			23239
			16868
			59244
			56560
			97845
		Wheat	32311
			6933
		Burley Tobacco	13259
	2009	Soybeans	91675
			3957
			12972
			7283
			24602
			721
			3420
			10365
			52707
			543
			8998
			597
			23116
		Grain Sorghum	4269
		Corn	-7
			12957
			19572
			52504
			7280
			45108
			9616
			8400
			37352
			50848
			53775
			38699
			76975

			2934
		Wheat	3049
			171
			2858
			8945
	2010	Burley Tobacco	35578
		Soybeans	100022
			3711
			72393
			7093
			35542
			690
			180945
			2261
			649
			13387
			59339
			19550
			150045
			70223
		Grain Sorghum	4306
		Corn	1419
			125646
			32242
			21440
			13246
			125794
			34630
			309275
			21118
			39526
			31240
			34234
			542
			161288
			566547
		Wheat	2008
			1259
			162
			582
	2011	Grain Sorghum	1648
		Soybeans	53179

			54241
			121802
			17712
			7364
			88073
			804
			13759
			2672
			984
		Corn	3081
			1397
			103154
			23355
			11530
			26096
	2012	Soybeans	8048
			764
			1807
			1026
	2013	Burley Tobacco	9256
			110246
		Soybeans	1147
			30439
			14781
			18896
		Grain Sorghum	1454
			5534
		Corn	26206
			26600
			25033
			74321
		Wheat	579
			2828
			1673
	2014	Soybeans	27826
			-419
			57221
			2050
			18721
			135629
			79911
			6107

		Corn	370
			91357
			6493
			1226
			36598
			816
	2015	Burley Tobacco	64930
		Soybeans	15127
			46573
			362770
			27883
			2645
			355689
			1244193
			1213035
			6325
		Grain Sorghum	8358
			3581
		Corn	971580
			407324
			423626
			471509
			89874
			34962
			6316
		Wheat	1647
			4478
			3041
			1623
			46502
			21198
		Total Claims	12387633.00
		Average Claim	63202.21

Reason	Year	Crop	Amount of claim ($)
Flood	2006	Soybeans	2464
			4338
			15736
		Corn	11234
			9440
	2007	Soybeans	3077

			21865
			39899
			595
			17528
		Corn	45776
			17282
			8787
			31024
			-891
			17480
			-925
		Wheat	1564
			652
			14149
	2008	Soybeans	59316
			53066
			13745
			50179
			7321
			7949
			60647
			10634
			13673
			10434
			2438
			10843
		Corn	924
			426910
			102601
			5835
			1540
			14428
			74375
			34300
			9365
			11205
			4579
		Wheat	17930
			-624
	2009	Soybeans	4687
			861

			10840
			3631
			3194
			661
			2142
			9781
		Corn	16896
			-2147
			7081
			-2285
			23317
			-2053
			202
			81656
	2010	Soybeans	106620
			10201
			14321
			-2508
			36242
			2551
			1284
			3804
			7600
			9920
			882
			13441
			35219
		Corn	373740
			4349
			65764
			4718
			125959
			12260
			-357
			105550
			30881
			1151
			49515
			39831
	2011	Soybeans	1462
			112208

			93
			392100
			-8300
			1084662
			1113
			1425
		Grain Sorghum	7187
		Corn	228399
			841
			632350
			289376
			77173
		Wheat	1381
			8301
			7945
			63745
	2012	Soybeans	2304
			18745
			2577
			8372
		Corn	20185
			1158
			10902
		Wheat	1742
			6112
			1750
	2013	Soybeans	8571
		Corn	23287
			254
			73401
			-9371
			9550
	2014	Soybeans	291590.66
			-129
			191123.3
			206
			27498
			21723
		Corn	3120
			67225.18
			887
			27932.96

		Grain Sorghum	12030.91
	2015	Soybeans	14607
			58645
			25401
			60591
			628
		Corn	-2259
			239701
			116953
			8746
			21001
			5412
		Wheat	417
		Total Claims	6750140.01
		Average Claim	47203.77

Reason	Year	Crop	Amount of claim ($)
Cold Winter/Cold Wet Weather/Freeze	2007	Wheat	1090
			5949
			11955
			2522
			8968
			18580
			590
			4653
	2008	Corn	2148
		Wheat	9316
	2009	Corn	346
		Wheat	145
	2010	Corn	315
		Wheat	1224
			1167
	2011	Soybeans	-4518
			7195
		Corn	976
			3246
			3770
	2012	Wheat	2575
			6008

	2013	Corn	374
			10609
		Soybeans	618
		Wheat	4001
			3920
			15417
			4001
			3920
			15417
	2014	Soybeans	10814
			55901
		Corn	8222
		Wheat	1239
			17594
			6348
			5464
	2015	Corn	6451
		Total Claims	258530.00
		Average Claim	6628.97

Reason	Year	Crop	Amount of claim ($)
Drought	2006	Soybeans	40978
			5370
			2210
			3925
		Corn	619
			5995
			52365
			5004
		Wheat	1282
			584
	2007	Soybeans	36007
			5158
		Corn	1016
			42783
			14044
	2008	Soybeans	182865
		Corn	60817
	2009	Corn	6643
	2010	Soybeans	7981

	2011	Soybeans	1181
		Corn	8312
	2012	Soybeans	25700
			32551
			6277
			838225
			14436
		Corn	55750
			78218
			118435
			3055594
		Wheat	4589
	2013	Burley Tobacco	19798
		Soybeans	1197
			23352
			37388
			281820
		Corn	1526
			53341
			763872
	2014	Soybeans	18332
		Corn	3159
		Total Claims	5918699.00
		Average Claim	144358.51

Reason	Year	Crop	Amount of claim ($)
Hail	2006	Burley Tobacco	3792
		Soybeans	856
		Corn	313
			1414
	2009	Burley Tobacco	27334
		Soybeans	5255
			5353
			16500
			6244
			2152
			4683
			6863
		Corn	5453

			554
			1740
			22274
	2011	Burley Tobacco	38242
			13236
		Soybeans	16483
		Corn	37911
	2012	Corn	49518
	2014	Soybeans	508
		Total Claims	266678.00
		Average Claim	12121.73

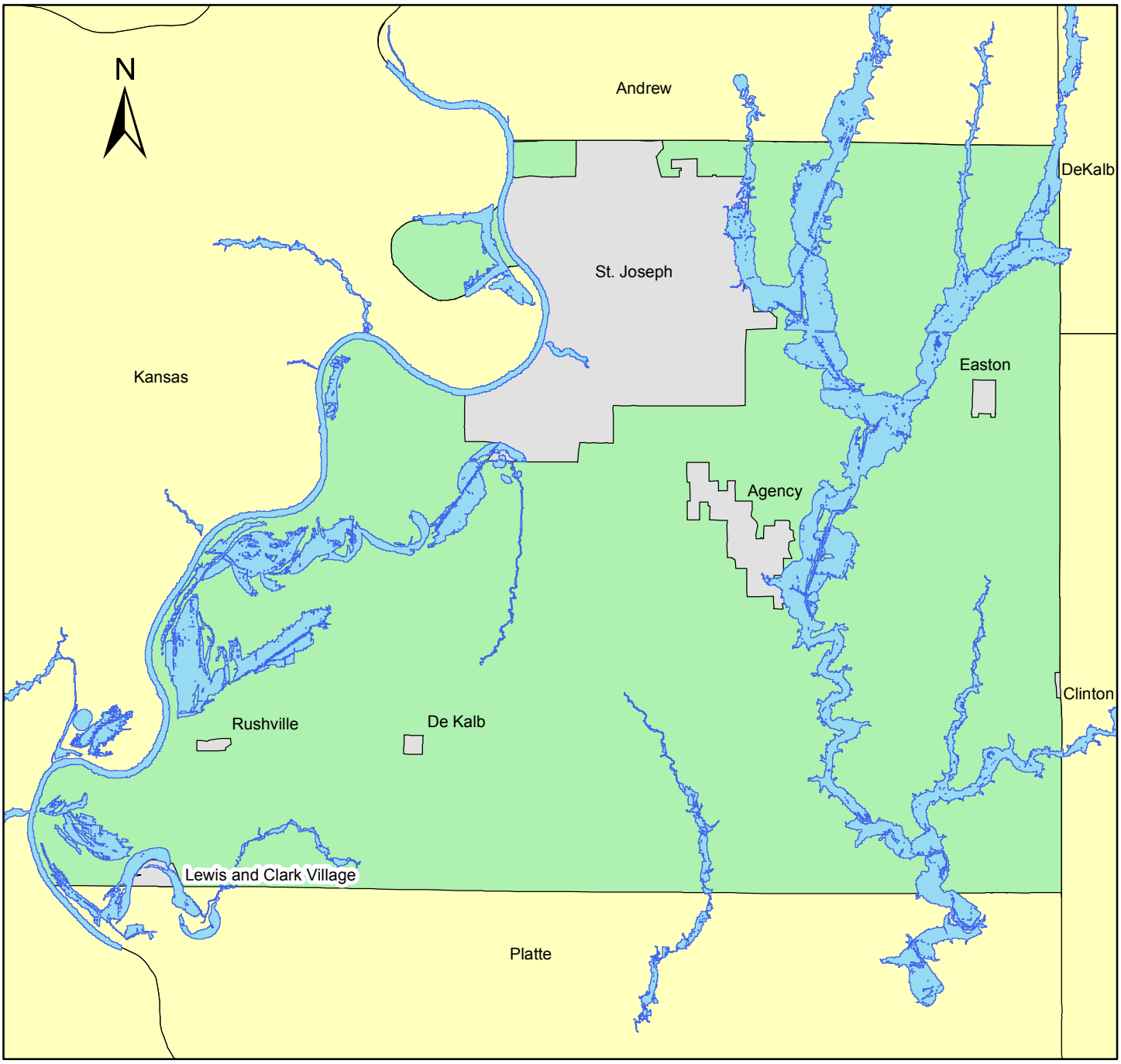
Reason	Year	Crop	Amount of claim ($)
Heat	2006	Soybeans	557
			25273
	2010	Corn	1920
	2011	Soybeans	17738
			2892
		Corn	34293
	2012	Soybeans	48743
			4759
		Corn	540851
	2013	Soybeans	817
		Corn	28101
	2014	Soybeans	27248
		Total Claims	733192.00
		Average Claim	61099.33

Reason	Year	Crop	Amount of claim ($)
Wind/Excess Wind	2007	Corn	15918
	2010	Corn	24142
	2011	Soybeans	20780
		Corn	9395
			4634
	2013	Grain Sorghum	5449
		Total Claims	80318.00
		Average Claim	13386.33

Reason	Year	Crop	Amount of claim ($)
Fire	2011	Soybeans	-1858
			10672
		Total Claims	8814.00
		Average Claim	4407.00

Reason	# of Claims	Average Claim ($)	Amount of claim ($)
Excess Moisture/Precip/Rain	196	63202.21	12387633.00
Flood	143	47203.77	6750140.01
Cold Wet Weather/Freeze	39	6628.97	258530.00
Drought	41	144358.51	5918699.00
Hail	22	12121.73	266678.00
Heat	12	61099.33	733192.00
Wind/Excess Wind	6	13386.33	80318.00
Fire	2	4407.00	8814.00

Buchanan County 100-Year Flood Plain

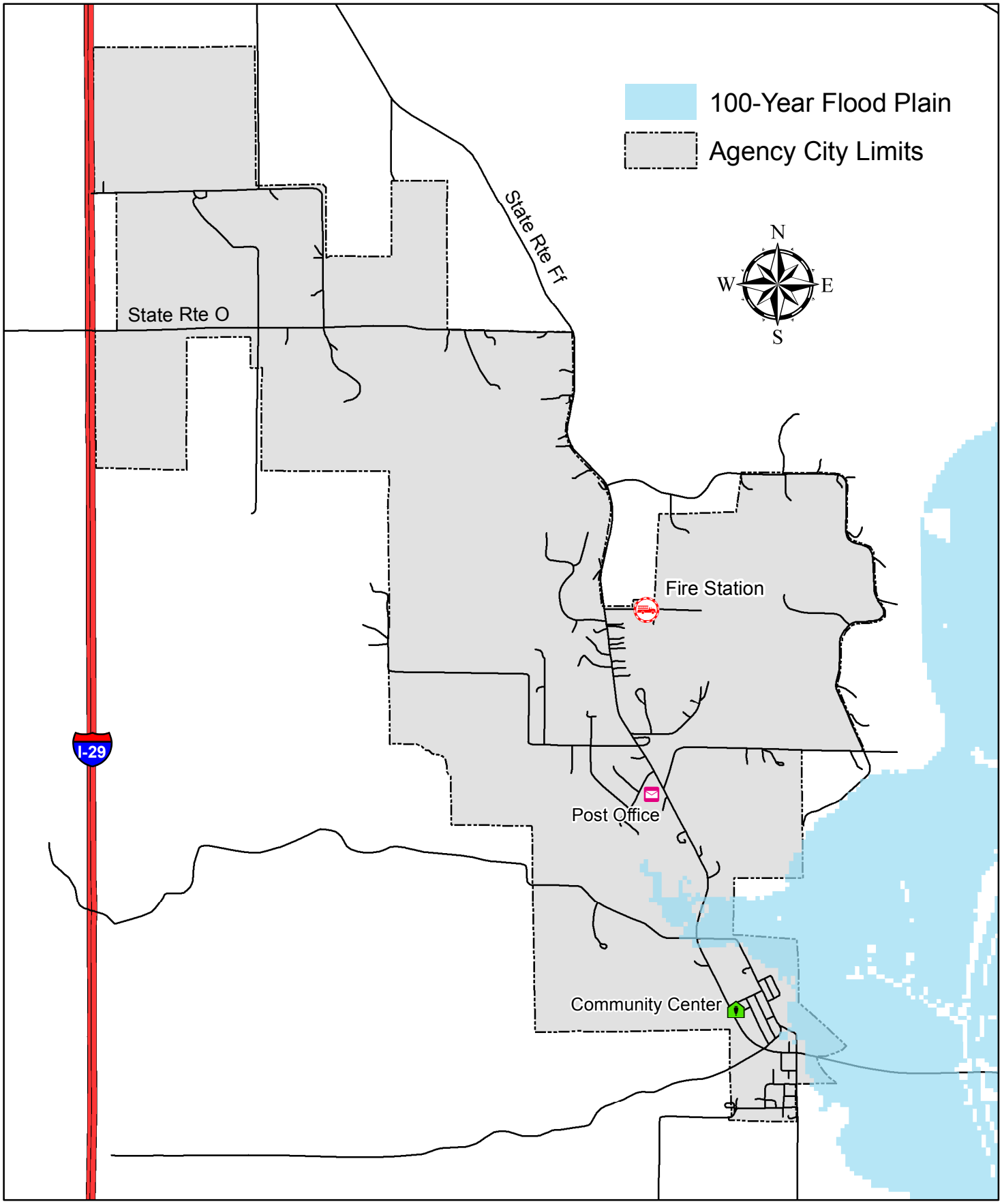


Legend

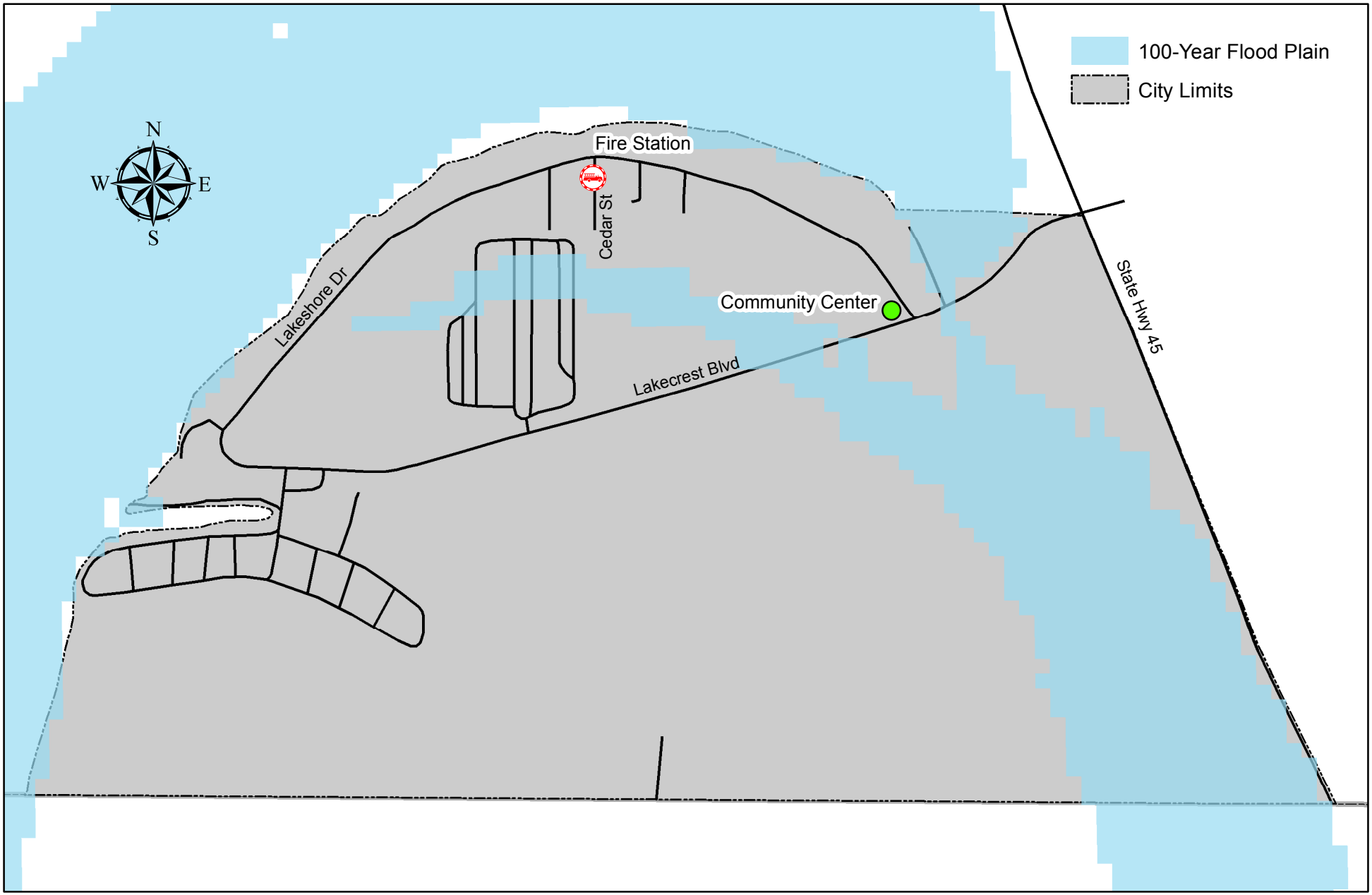
- 100-Year Flood Plain
- City Limits
- Buchanan County

0 2 4 8 12 16 Miles

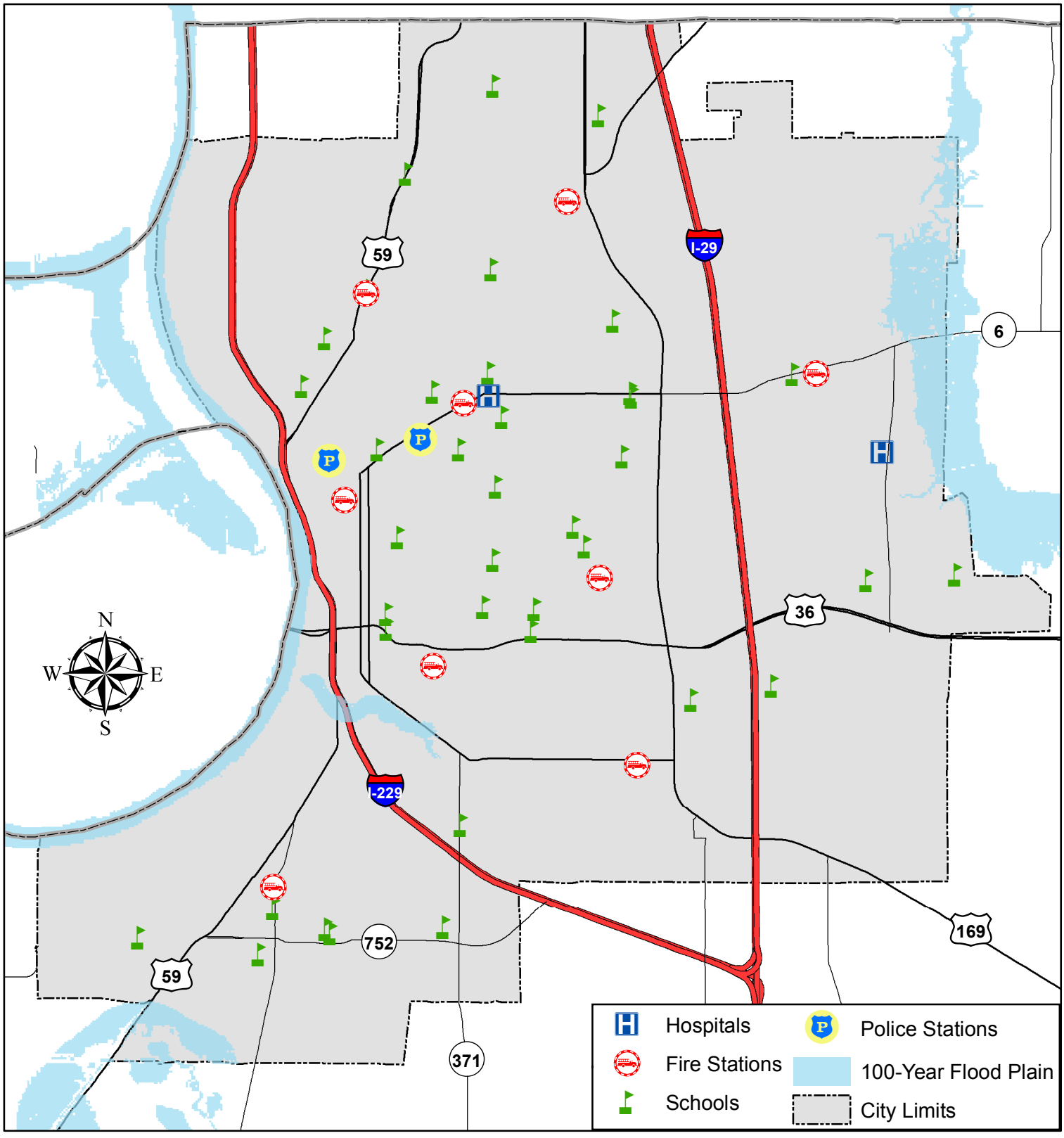
Agency 100-Year Flood Plain



Lewis and Clark Village 100-Year Flood Plain



St. Joseph 100-Year Flood Plain



Miles

0 2 4 8

Appendix C: STAPLEE and action worksheets

1.1.2

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Encourage residents to purchase weather radios	**Jurisdiction:** Buchanan County - EMD
Action ID: 1.1.2	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score 8
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		0
A: Does the jurisdiction have the administrative capacity to execute this action?		0
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		0
E: Is it Economically beneficial?		0
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		2
Will historic structures be saved or protected?		1
Could it be implemented quickly?		0
STAPLEE Score		

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		10

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 18

Priority Level: ☐ High (30+ points) ☐ Medium (25-29 points) ☒ Low (less than 25 points)

Completed by (name/title/phone #): Bill Burton EMD

1.1.3

Provide info...>

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: [redacted] incorp. + design of shelters in new public facilities	Jurisdiction: Buchanan County
Action ID: 1.1.3	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	1	
T: Is it Technically feasible and potentially successful?	1	
A: Does the jurisdiction have the administrative capacity to execute this action?	1	
P: Is it Politically acceptable?	1	
L: Is there Legal authority to implement?	1	
E: Is it Economically beneficial?	1	
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	1	
Will historic structures be saved or protected?	1	
Could it be implemented quickly?	1	
STAPLEE Score	9	

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 19

Priority Level: ☐ High (30+ points) ☐ Medium (25-29 points) ☒ Low (less than 25 points)

Completed by (name/title/phone #): [redacted]

Jurisdiction: City of St. Joseph

1.1.4

Action # from previously approved plan	1.1.7
Description of action	Build community tornado shelters in office complexes, apartment complexes etc.
Person or agency responsible for implementation	EMD / City Council / Bldg Dept.

Designate into which of the following four categories the previously proposed action should be placed, including discussion of that designation.

Completed since previous plan adoption and description of progress	
Not Started/Continue in Plan Update and discussion of reasons for lack of implementation	This is a complex issue that should be divided into several. (See below)
In Progress/Continue in Plan Update with a description of the progress made to date	
Deleted from the update with a discussion of the reasons for deletion	

1. City Ordinances could be written to require new construction to include shelters in factories, churches, apartment & office complexes.

2. The funding necessary to purchase shelters to protect large numbers of people in existing structures would be prohibitive.

3. Would an ordinance be able to be created requiring mobile home parks to purchase or build underground shelters?

Leave in plan - further discussion and research needed.

1.1.8

collaborate work w/ ARC for list of shelters

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: maintain up-to-date list of addresses w/ shelters...	**Jurisdiction:** Buchanan County
Action ID: 1.1.5	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score 16
S: Is it Socially acceptable?	3	3
T: Is it Technically feasible and potentially successful?	3	2
A: Does the jurisdiction have the administrative capacity to execute this action?	2	2
P: Is it Politically acceptable?	2	2
L: Is there Legal authority to implement?	1	1
E: Is it Economically beneficial?	3	3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	3	3
Will historic structures be saved or protected?	0	0
Could it be implemented quickly?	0	0
STAPLEE Score		

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		13

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 29

Priority Level: ☐ High (30+ points) ☒ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Brunton

1.1.11

Provide info.

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: work with private entities "to encourage the construction of tornado shelters...."	**Jurisdiction:** Buchanan County
Action ID: 1.1.7	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		2
T: Is it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		0
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		0
E: Is it Economically beneficial?		0
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		2
Will historic structures be saved or protected?		2
Could it be implemented quickly?		1
STAPLEE Score		

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score** 11
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 26

Priority Level: ☐ High (30+ points) ☒ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Denise Embray / Director / 271-1429

1.1.18

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Review emergency access routes & evacuation routes...	**Jurisdiction:** Buchanan County
Action ID: 1.1.14	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?	WE DO NOT HAVE EMERGENCY ACCESS ROUTES BUT WE DO OPEN ROADS	3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		2
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		3
Will historic structures be saved or protected?		0
Could it be implemented quickly?		3
STAPLEE Score		23

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		10

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Buntin

1.2.3

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Cities that do not have warning systems should purchase them	**Jurisdiction:** Buchanan County
Action ID: 1.2.2.	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		3
Will historic structures be saved or protected?		3
Could it be implemented quickly?		3
STAPLEE Score		27

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		15

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 42

Priority Level: ☑ ~~High~~ (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Burton

1.2.4

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Explore use of electron methods .... to notify public	Jurisdiction: Buchanan County
Action ID: 1.2.3	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		3
Will historic structures be saved or protected?		3
Could it be implemented quickly?		3
STAPLEE Score		33

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		15

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 48

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Bunton

1.2.5

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Explore use of electron methods .... to notify public	Jurisdiction: Agency
Action ID: 1.2.3	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	YES	3
T: Is it Technically feasible and potentially successful?	PROB NO	1
A: Does the jurisdiction have the administrative capacity to execute this action?	NO	Ø
P: Is it Politically acceptable?	PROB YES	2
L: Is there Legal authority to implement?	MAYBE YES	2
E: Is it Economically beneficial?	NO	Ø
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	NEUTRAL	2
Will historic structures be saved or protected?	NO	Ø
Could it be implemented quickly?	NO	Ø
STAPLEE Score		10

Mitigation Effectiveness Criteria	Evaluation Rating	Score 10
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	2
Mitigation Effectiveness Score		22

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐ High (30+ points) ☐ Medium (25-29 points) ☒ Low (less than 25 points)

Completed by (name/title/phone #): EARL HUSKAMP CLERK 816 253-9176

1.2.7

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Place warning sirens in densely populated uninc.	**Jurisdiction:** Buchanan County
Action ID: 1.2.4	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		0
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		3
Will historic structures be saved or protected?		1
Could it be implemented quickly?		1
STAPLEE Score		20

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		15

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 35

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Braxton

1.3.1

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Inform citizens what to do to help elderly & disabled...	**Jurisdiction:** Buchanan County
Action ID: 1.3.1	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	3	
T: Is it Technically feasible and potentially successful?	2	
A: Does the jurisdiction have the administrative capacity to execute this action?	3	
P: Is it Politically acceptable?	3	
L: Is there Legal authority to implement?	3	
E: Is it Economically beneficial?	3	
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	3	
Will historic structures be saved or protected?	0	
Could it be implemented quickly?	3	
STAPLEE Score		24

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		13

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 37

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Brunton

1.3.3 functional needs

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Continue to evaluate accommodating ind. w/ special needs	**Jurisdiction:** Buchanan County
Action ID: 1.3.2	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		3
Will historic structures be saved or protected?		0
Could it be implemented quickly?		3
STAPLEE Score		24

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		10

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 34

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Burns

1.3.5

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Update inventory of facilities with generators...	**Jurisdiction:** DeKalb
Action ID: 1.3.4	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	2	
T: Is it Technically feasible and potentially successful?	2	
A: Does the jurisdiction have the administrative capacity to execute this action?	2	
P: Is it Politically acceptable?	2	
L: Is there Legal authority to implement?	2	
E: Is it Economically beneficial?	0	
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	2	
Will historic structures be saved or protected?	0	
Could it be implemented quickly?	2	
STAPLEE Score		

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐High (30+ points) ☐Medium (25-29 points) ☐Low (less than 25 points)

Completed by (name/title/phone #): Usla Crockett, clerk 8166853273

2.1.1

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Continue to participate in buyout program for the highest risk properties	**Jurisdiction:** Buchanan County
Action ID: 2.1.1	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		~~0~~
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		3
Will historic structures be saved or protected?		~~0~~
Could it be implemented quickly?		~~0~~
STAPLEE Score		

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score** 18
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	~~0~~ 5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		10

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 28

Priority Level: ☐ High (30+ points) ☒ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Burnam

2.1.2

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: continue to participate in the NFIP	Jurisdiction: Agency
Action ID: 2.1.2	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	YES	3
T: Is it Technically feasible and potentially successful?	YES	3
A: Does the jurisdiction have the administrative capacity to execute this action?	MAYBE	2
P: Is it Politically acceptable?	YES	3
L: Is there Legal authority to implement?	YES	3
E: Is it Economically beneficial?	YES	3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	POSITIVE	3
Will historic structures be saved or protected?	NO	~~0~~
Could it be implemented quickly?	YES	3
STAPLEE Score		23

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score** 23
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		33

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): EARL HUSKAMP CLERK 816 253-9176

2.1.2

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Continue to participate in buyout program for the highest risk properties	**Jurisdiction:** Agency
Action ID: 2.1.1	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	YES	3
T: Is it Technically feasible and potentially successful?	YES	3
A: Does the jurisdiction have the administrative capacity to execute this action?	MAYBE	2
P: Is it Politically acceptable?	YES	3
L: Is there Legal authority to implement?	YES	3
E: Is it Economically beneficial?	YES	3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	POSITIVE	3
Will historic structures be saved or protected?	NO	0
Could it be implemented quickly?	YES	3
STAPLEE Score		23

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score** 23
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		33

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☑ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): EARL HUSKAMP CLERK 816 253-9176

2.1.3

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Continue to participate in buyout program for the highest risk properties	**Jurisdiction:** Lewis & Clark Village
Action ID: 2.1.1	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	3	3
T: Is it Technically feasible and potentially successful?	3	3
A: Does the jurisdiction have the administrative capacity to execute this action?	2	2
P: Is it Politically acceptable?	1	1
L: Is there Legal authority to implement?	2	2
E: Is it Economically beneficial?	2	2
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	3	3
Will historic structures be saved or protected?	0	0
Could it be implemented quickly?	0	0
STAPLEE Score		16

Mitigation Effectiveness Criteria	**Evaluation Rating**	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	10
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 36

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Jack Rodkey City Council

2.1.4

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: continue to participate in the NFIP	**Jurisdiction:** Buchanan County
Action ID: 2.1.2	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	3	
T: Is it Technically feasible and potentially successful?	3	
A: Does the jurisdiction have the administrative capacity to execute this action?	3	
P: Is it Politically acceptable?	3	
L: Is there Legal authority to implement?	3	
E: Is it Economically beneficial?	3	
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	3	
Will historic structures be saved or protected?	3	
Could it be implemented quickly?	3	
STAPLEE Score		27

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	10
Mitigation Effectiveness Score		20

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 47

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Burton

2.1.6

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: continue to participate in the NFIP	Jurisdiction: Lewis & Clark Village
Action ID: 2.1.2	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	3	3
T: Is it Technically feasible and potentially successful?	3	3
A: Does the jurisdiction have the administrative capacity to execute this action?	2	2
P: Is it Politically acceptable?	2	2
L: Is there Legal authority to implement?	0	0
E: Is it Economically beneficial?	3	3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	3	3
Will historic structures be saved or protected?	0	0
Could it be implemented quickly?	0	0
STAPLEE Score		16

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	10
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 36

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Jack Rodkey City Counsel

2.1.7

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Adopt the most recent edition of a model building code	**Jurisdiction:** Buchanan County
Action ID: 2.1.3	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		1
T: Is it Technically feasible and potentially successful?		1
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		1
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		0
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		2
Will historic structures be saved or protected?		2
Could it be implemented quickly?		0
STAPLEE Score		12

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		22

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 22

Priority Level: ☐ High (30+ points) ☐ Medium (25-29 points) ☒ Low (less than 25 points)

Completed by (name/title/phone #): Denise Embrey / Director / 271-1429

2.1.8

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Consider the construction of detention basins, small lakes...	**Jurisdiction:** Agency
Action ID: 2.1.4	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	YES	3
T: Is it Technically feasible and potentially successful?	YES	3
A: Does the jurisdiction have the administrative capacity to execute this action?	YES	3
P: Is it Politically acceptable?	YES	3
L: Is there Legal authority to implement?	MAYBE	2
E: Is it Economically beneficial?	YES	3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	POSITIVE	3
Will historic structures be saved or protected?	MAYBE	2
Could it be implemented quickly?	MAYBE	2
STAPLEE Score		24

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score** 24
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		34

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): EARL HUSBAND CLERK 816 253-9176

2.1.9

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Consider alternative uses for flood-prone areas	**Jurisdiction:** Agency
Action ID: 2.2.1	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	YES	3
T: Is it Technically feasible and potentially successful?	YES	3
A: Does the jurisdiction have the administrative capacity to execute this action?	MAYBE	2
P: Is it Politically acceptable?	YES	3
L: Is there Legal authority to implement?	YES	3
E: Is it Economically beneficial?	YES	3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	POSITIVE	3
Will historic structures be saved or protected?	NO	Ø
Could it be implemented quickly?	MAYBE	2
STAPLEE Score		22

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score** 22
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		32

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): EARL HUSKAMP CLERK 816 253-9176

2.1.10

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Consider alternative uses for flood-prone areas	Jurisdiction: Lewis & Clark Village
Action ID: 2.2.1	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	2	2
T: Is it Technically feasible and potentially successful?	2	2
A: Does the jurisdiction have the administrative capacity to execute this action?	1	1
P: Is it Politically acceptable?	2	2
L: Is there Legal authority to implement?	0	0
E: Is it Economically beneficial?	0	0
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	2	2
Will historic structures be saved or protected?	0	0
Could it be implemented quickly?	0	0
STAPLEE Score		9

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		10

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 19

Priority Level: ☐ High (30+ points) ☐ Medium (25-29 points) ☒ Low (less than 25 points)

Completed by (name/title/phone #): Jack Radkey City Council

2.1.14

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Continue to review needs & participate ... storm water management plan	Jurisdiction: Lewis & Clark Village
Action ID: 2.2.3	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	2	2
T: Is it Technically feasible and potentially successful?	2	2
A: Does the jurisdiction have the administrative capacity to execute this action?	1	1
P: Is it Politically acceptable?	1	1
L: Is there Legal authority to implement?	1	1
E: Is it Economically beneficial?	3	3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	3	3
Will historic structures be saved or protected?	0	0
Could it be implemented quickly?	0	0
STAPLEE Score		13

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	10
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 33

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Jack Rodkey City Counsel

2.3.3

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Ensure all local governments have the latest copies of flood insurance rate maps...	**Jurisdiction:** Buchanan County
Action ID: 2.3.4	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		2
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		3
Will historic structures be saved or protected?		0
Could it be implemented quickly?		3
STAPLEE Score		23

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	10
Mitigation Effectiveness Score		18

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 41

Priority Level: ☒ ~~High~~ (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Burton

2.3.4

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Ensure all local governments have the latest copies of flood insurance rate maps...	**Jurisdiction:** Agency
Action ID: 2.3.4	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	YES	3
T: Is it Technically feasible and potentially successful?	YES	3
A: Does the jurisdiction have the administrative capacity to execute this action?	YES	3
P: Is it Politically acceptable?	YES	3
L: Is there Legal authority to implement?	YES	3
E: Is it Economically beneficial?	YES	3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	POSITIVE	3
Will historic structures be saved or protected?	NO	0
Could it be implemented quickly?	YES	3
STAPLEE Score		24

Mitigation Effectiveness Criteria	**Evaluation Rating**	Score 24
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		34

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): EARL HUSKAMP CLERK 816 253-9176

2.3.5

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Maintain & update list of names, numbers & duties	Jurisdiction: Buchanan County
Action ID: 2.3.5	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		2
Will historic structures be saved or protected?		~~0~~
Could it be implemented quickly?		3
STAPLEE Score		23

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		10

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 33

Priority Level: ☒ ~~High~~ (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Burton

2.3.8

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Follow guidelines as suggested in MO 2002 Drought plan	**Jurisdiction:** Buchanan County
Action ID: 2.3.6	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		0
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		0
STAPLEE Score		13

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		23

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐ High (30+ points) ☐ Medium (25-29 points) ☒ Low (less than 25 points)

Completed by (name/title/phone #): Bill Burton

3.1.1

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Develop an ongoing campaign to educate community about seasonal hazards....	Jurisdiction: Buchanan County
Action ID: 3.1.1	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		3
Will historic structures be saved or protected?		~~0~~
Could it be implemented quickly?		3
STAPLEE Score		24

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		13

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 37

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Burton

3.1.3

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Conduct a public education campaign to inform citizens... of the benefits of... tornado saferooms	**Jurisdiction:** Buchanan County
Action ID: 3.1.5	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		1
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		3
STAPLEE Score		21

Mitigation Effectiveness Criteria	**Evaluation Rating**	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		13

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 34

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Bunton

3.1.4

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Conduct a public education campaign to inform citizens... of the benefits of... tornado safe rooms	Jurisdiction: Agency
Action ID: 3.1.5	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	YES	3
T: Is it Technically feasible and potentially successful?	PROB NO	1
A: Does the jurisdiction have the administrative capacity to execute this action?	NO	Ø
P: Is it Politically acceptable?	YES	3
L: Is there Legal authority to implement?	YES	3
E: Is it Economically beneficial?	MAYBE	2
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	NEUTRAL	2
Will historic structures be saved or protected?	NO	Ø
Could it be implemented quickly?	NO	Ø
STAPLEE Score		14

Mitigation Effectiveness Criteria	Evaluation Rating	Score 14
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	Ø
Mitigation Effectiveness Score		24

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐ High (30+ points) ☐ Medium (25-29 points) ☒ Low (less than 25 points)

Completed by (name/title/phone #): EARL HUSKAMP CLERK 816 253-9176

3.1.7

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Continue to expand public awareness campaigns.	Jurisdiction: Lewis & Clark Village
Action ID: 3.1.8	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	2	2
T: Is it Technically feasible and potentially successful?	2	2
A: Does the jurisdiction have the administrative capacity to execute this action?	1	1
P: Is it Politically acceptable?	3	3
L: Is there Legal authority to implement?	0	0
E: Is it Economically beneficial?	0	0
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	2	2
Will historic structures be saved or protected?	0	0
Could it be implemented quickly?	0	0
STAPLEE Score		9

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	7
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	7
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 25

Priority Level: ☐ High (30+ points) ☒ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Jack Rodkey City Council

4-1-1

Not 24 hrs. business hours

EMD 24 hr emergency number?

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: maintain a publicly accessible list of names, positions, contact info. etc....	**Jurisdiction:** Buchanan County
Action ID: 4.1.1.	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		2
T: Is it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		0
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		14

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		10

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 24

Priority Level: ☐ High (30+ points) ☐ Medium (25-29 points) ☒ Low (less than 25 points)

Completed by (name/title/phone #): Bill Burton

4.1.1

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Execute & maintain mutual aid agreements w/ relevant agencies	**Jurisdiction:** Buchanan County
Action ID: 4.1.2	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		0
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		19

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 29

Priority Level: ☐ High (30+ points) ☒ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Burton

4.1.2

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: maintain a publicly accessible list of names, positions, contact info. etc...	**Jurisdiction:** Dekalb
Action ID: 4.1.1.	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	2	
T: Is it Technically feasible and potentially successful?	2	
A: Does the jurisdiction have the administrative capacity to execute this action?	2	
P: Is it Politically acceptable?	2	
L: Is there Legal authority to implement?	2	
E: Is it Economically beneficial?	0	
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	2	
Will historic structures be saved or protected?	0	
Could it be implemented quickly?	2	
STAPLEE Score		

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐High (30+ points) ☐Medium (25-29 points) ☐Low (less than 25 points)

Completed by (name/title/phone #): Leslie Crockett, Clerk 9668532?3

4.1.4

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Execute & maintain mutual aid agreements w/ relevant agencies	**Jurisdiction:** Agency
Action ID: 4.1.2	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	YES	3
T: Is it Technically feasible and potentially successful?	YES	3
A: Does the jurisdiction have the administrative capacity to execute this action?	YES	3
P: Is it Politically acceptable?	YES	3
L: Is there Legal authority to implement?	YES	3
E: Is it Economically beneficial?	YES	3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	POSITIVE	3
Will historic structures be saved or protected?	NO	0
Could it be implemented quickly?	YES	3
STAPLEE Score		24

Mitigation Effectiveness Criteria	**Evaluation Rating**	Score 24
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	8
Mitigation Effectiveness Score		30

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: [X] High (30+ points) [ ] Medium (25-29 points) [ ] Low (less than 25 points)

Completed by (name/title/phone #): EARL HUSKAMP CLERK 816 253-9176

4.1.5

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Execute & maintain mutual aid agreements w/ relevant agencies	**Jurisdiction:** Dekalb
Action ID: 4.1.2	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	2	
T: Is it Technically feasible and potentially successful?	2	
A: Does the jurisdiction have the administrative capacity to execute this action?	2	
P: Is it Politically acceptable?	2	
L: Is there Legal authority to implement?	2	
E: Is it Economically beneficial?	1	
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	2	
Will historic structures be saved or protected?	0	
Could it be implemented quickly?	2	
STAPLEE Score		

Mitigation Effectiveness Criteria	**Evaluation Rating**	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	6
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐High (30+ points) ☐Medium (25-29 points) ☐Low (less than 25 points)

Completed by (name/title/phone #): Leslie Crockett, clerk 8166853273

4.1.7

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Execute & maintain mutual aid agreements w/ relevant agencies	**Jurisdiction:** Lewis & Clark Village
Action ID: 4.1.2	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	1	1
T: Is it Technically feasible and potentially successful?	1	1
A: Does the jurisdiction have the administrative capacity to execute this action?	0	0
P: Is it Politically acceptable?	1	1
L: Is there Legal authority to implement?	0	0
E: Is it Economically beneficial?	1	1
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	2	2
Will historic structures be saved or protected?	0	0
Could it be implemented quickly?	0	0
STAPLEE Score		6

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 16

Priority Level: ☐ High (30+ points) ☐ Medium (25-29 points) ☒ Low (less than 25 points)

Completed by (name/title/phone #): Jack Rodkey

flood map available maybe not online

4-1-8

not sure if hazard is listed

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: make all GIS ~~hazard~~ info. available online to county + municipal permitting dep....	**Jurisdiction:** Buchanan County Planning & Zoning
Action ID: 4.1.5	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		2
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		1
STAPLEE Score		17

NM DONE

MAYBE in 2017?

NOT SURE

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		10

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐ High (30+ points) ☒ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Bruton

4.1.10

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Encourage schools + responders to participate in ERIP	Jurisdiction: Lewis + Clark Village
Action ID: 4.1.12	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	3	3
T: Is it Technically feasible and potentially successful?	2	2
A: Does the jurisdiction have the administrative capacity to execute this action?	2	2
P: Is it Politically acceptable?	1	1
L: Is there Legal authority to implement?	2	2
E: Is it Economically beneficial?	0	0
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	2	2
Will historic structures be saved or protected?	0	0
Could it be implemented quickly?	5	5
STAPLEE Score		12

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	7
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	7
Mitigation Effectiveness Score		26

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐ High (30+ points) ☒ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Jack Radka

4.1.12

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: maintain offsite data backup of county records...	Jurisdiction: Buchanan County
Action ID: 4.2.1	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		3
T: Is it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		3
Will historic structures be saved or protected?		0
Could it be implemented quickly?		1
STAPLEE Score		22

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		10

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 32

Priority Level: ☒ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Bill Bunton

5.1.11

SHOW-ME COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN

Action Title: Review, prioritize, institute & monitor upgrades to critical buildings & infrastructures	Jurisdiction: Buchanan County P&Z
Action ID: 4.2.4	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?	2	
T: Is it Technically feasible and potentially successful?	2	
A: Does the jurisdiction have the administrative capacity to execute this action?	3	
P: Is it Politically acceptable?	2	
L: Is there Legal authority to implement?	3	
E: Is it Economically beneficial?	2	
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)	2	
Will historic structures be saved or protected?	2	
Could it be implemented quickly?	2	
STAPLEE Score	20	

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): 30

Priority Level: ☐ High (30+ points) ☒ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): Ron Mo

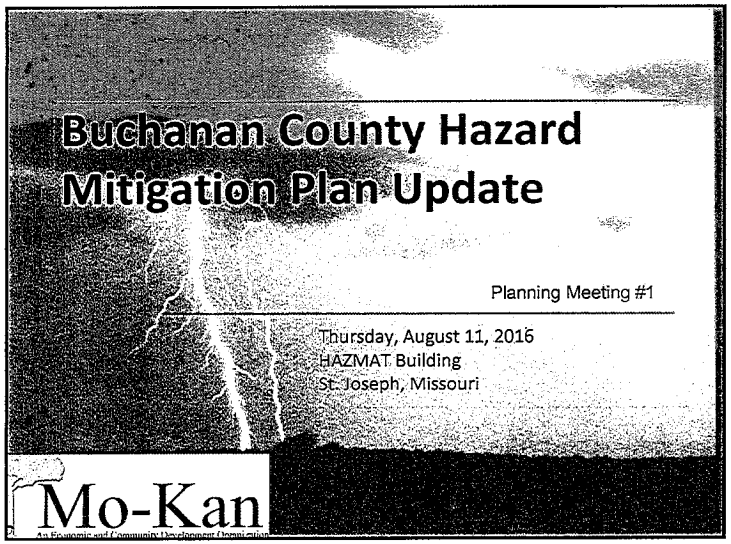
Appendix D: Public participation

Buchanan County Hazard Mitigation Plan
Buchanan County Courthouse – Commissioners' Office
March 21, 2016, 9:30 am

- Draft due Dec. 8, final due Feb. 8 (see timeline)
- Changes from the last plan:
  - Additional chapter (Chapter 5, plan maintenance)
  - All adoption resolutions must be included when submitting the draft
  - Must follow an outline template
- In-kind amount is $7,855.60
  - *Mo-Kan will facilitate meetings and encourage participation but Buchanan County is ultimately responsible for the in-kind or cash match*
  - Time from elected officials doesn't count towards match
  - Staff time providing maps and information for GIS, risk assessment, building values, etc. can count
  - Planning team
  - Public participation at meetings (in limited instances can count)
  - LEPC meetings or similar type meetings (HMP must be an agenda item)
  - Must be documented correctly to count as match (agenda, time sheet, sign in, signature, wage identification)
  - Approximately 369 hours at $21.30 volunteer wage
- Planning Committee Team
  - Jurisdictions – communities, school districts, fire districts, etc.
  - Other participants – Red Cross, industry, private sector, community groups, etc.
  - Smaller jurisdictions – how to improve participation?
  - Update previous list, who to add?
  - Three meetings (minimum)
  - Set meeting dates – letter to Planning Committee Team

Buchanan County
Hazard Mitigation Plan – Planning Meeting
Monday, March 21, 2016

	First & Last Name	Jurisdiction - Title	Phone/Email
x	HARRY ROBERTS	BUCHANAN CO – PRES COMMISSIONER	816 271-1500
	BILL BRINTON	Buchanan County EMA	816 383-0604
x	Dan Hausman	Buchanan County Commissioner	(816) 244-5678
x	Ron Hook	Buchanan County Commissioner	(816) 351-1019
	Bryce Good	Buchanan Co. GIS	816-271-1506



Meeting Agenda

- Welcome and Introductions
- Background & Purpose of the Hazard Mitigation Plan (HMP)
- Grant Programs Linked to Approved Plan
- HMP Participation Requirements & Timeline
- Public Outreach & In-kind Match
- Data Collection Questionnaires
- Discussion of Hazards
- Next Steps

Mo-Kan

Welcome & Introductions

- Please tell us your name and the community/district that you are representing

  **Please sign-in and fill out the volunteer form*

Mo-Kan

Mo-Kan's Role in HMP

- Who is Mo-Kan?
  - Mo-Kan is one of 19 regional planning commissions in Missouri
  - Mo-Kan serves six counties
    - Andrew, Buchanan, Clinton, and DeKalb in Missouri
    - Atchison and Doniphan in Kansas
  - Part of a larger, statewide organization, the Missouri Association of Council of Governments (MACOG)

Mo-Kan

Welcome & Introductions

- MACOG, SEMA & Hazard Mitigation Planning
  - In 2002, MACOG was approached by the Missouri State Emergency Management Agency (SEMA) to facilitate Hazard Mitigation Plans for Missouri counties.

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Background & Purpose of HMP

- Hazard Mitigation Planning
  - The Stafford Act, in reaction to Hurricane Andrew, established Hazard Mitigation Grant funds for local governments to lessen the effects of natural disasters.
  - For disasters declared after Nov. 1, 2003, a local government must have a hazard mitigation plan approved pursuant to section 322 in order to receive Hazard Mitigation Grant funds.
  - This plan must be updated every 5 years.

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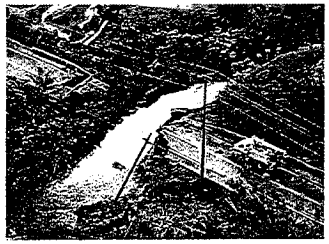
Grant Programs Linked to the Approved Plan

- Grant funds are used for any action taken to eliminate or reduce the loss of life or property as the result of a disaster event.
  - Hazard Mitigation Grant Program (HMGP)
  - Pre-disaster Mitigation Program (PDM)
  - Flood Mitigation Assistance (FMA)
  - Repetitive Flood Claims (RFC)
  - Severe Repetitive Loss (SRL)



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HMP Participation Requirements

- Jurisdiction participation
  - All local jurisdictions must adopt the completed plan, as well as document that they participated in the planning process (includes all cities and villages, school districts and universities, special districts (road, townships, etc)
  - Participation is met by a jurisdiction attending 2 of the 3 meetings and submitting requested information
  - Review current plan – update, delete & add
  - National Flood Insurance Program (NFIP)
  - Participation in NFIP must be accurately defined for all jurisdictions, not just the county

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Buchanan County Plan Update Process

- Buchanan County's Current Hazard Mitigation Plan
  - First draft of the update is due to SEMA by December 8, 2016
  - Final draft of the update is due to FEMA by February 8, 2017
  - The public must have an opportunity to comment on the draft before adopted by the county
  - All jurisdictions must adopt the HMP **prior** to submitting the draft to SEMA

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Buchanan County Plan Update Process

- Planning Committee Meetings
  - Planning Meeting #1, Today
    - Data Collection Questionnaire & discuss hazards
  - Planning Meeting #2, **August 31st, 5:00 pm, Hazmat Building (pizza provided)**
    - Risk Assessment & update mitigation goals/actions from last plan
  - Planning Meeting # 3, **September 22nd, 5:00 pm, Hazmat Building**
    - Develop new goals and actions & discuss plan maintenance
  - Planning Meeting #4 (if necessary)
    - Revise sections based on preliminary SEMA, FEMA review

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Timeline of HMP

Task	2016						2017	
	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB
Establish core planning committee								
Initial Plan Review Meeting								
Hazard Identification								
Vulnerability Assessment								
Capabilities Assessment								
Mitigation Strategies								
Implementation Strategy								
Planning Team Meetings								
Draft Plan								
Public Meetings/Outreach								
Public Hearing								
Adoption Resolutions								
Draft to SEMA								
Revise Plan								
Final HMP to FEMA								

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In-kind Match

- Buchanan County is responsible for $ **7,855.60** in-kind match
- In-kind match activities include:
  - Planning Committee (unless elected or appointed)
  - Hosting public meetings and talking to community groups
  - Researching or compiling data related to the plan
  - Donation of supplies, labor or equipment for a project in the plan
  - Time spent driving to HMP activities

All donated hours and labor must be documented on timesheet

**** All donated supplies and equipment must be on an invoice***

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Public Outreach

- Host a minimum of three meetings for public outreach
- Inform the public about the HMP and seek input
- Public Outreach can also include:
  - Family emergency plan
  - Ready-in-three campaign
- Meeting dates/locations?
  - volunteers to distribute information (in-kind match)

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Data Collection Questionnaires

- Handout
- Each local government and school district must complete
- Return prior to next meeting

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Discussion of Hazards

- Handout
- Natural disasters
- Man-made disasters

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The Next Steps

- 1st public meeting
- Schedule additional public meetings and public outreach
- Encourage people to attend and provide feedback
- 2nd Planning Committee meeting
- 3rd Planning Committee meeting

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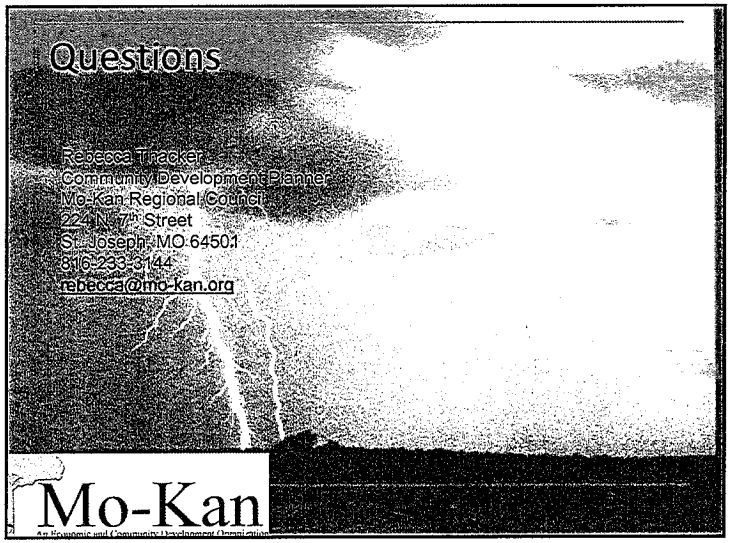
Buchanan County HMP - 1st Committee Meeting

Hazmat Building - 4950 Frederick Avenue, St. Joseph

August 11, 2016 - 5:30 pm

	Name	Agency/Organization	Mileage (Round trip)	Email Address
1	Adam Perry	Region H USRRS	30	aperry@atix.riss.net
2	Gary Leffin	City of Saint Joseph	—	gleffin@ci.st-joseph.mo.us
3	KEITH DUDLEY	CITY OF ST JOSEPH		Kdudley@ci.st-joseph.mo.us
4	Corey Sloan	SEMA	64	Corey.Sloan@sema.dps.mo.gov
5	Bryan Gabriel	Agency		
6	RON MARTIN	BUCHANAN Co		
7	Mike Neylon	SJFD	—	MNEYLON@STJOEMO.org
8	John James	MB school District		jjames@midbuchanan.k12.mo.us
9	Kevan Schneider	City of St. Joseph		kschneider@ci.st-joseph.mo.us
10	Bill Brinton	Buch Co		
11				
12				
13				


Questions
Rebecca Tracker
Community Development Planner
Mo-Kan Regional Council
224 N. 4th Street
St. Joseph, MO 64501
816-233-3144
rebecca@mo-kan.org
Mo-Kan

Mo-Kan
An Economic & Community Development Organization

Dear ,

In 2012, Mo-Kan partnered with public officials, community leaders and private citizens to update Buchanan County's Hazard Mitigation Plan (HMP). This is a federally required planning process to address potential hazards created by natural disasters, and must be updated every five years. We would like to invite you to participate in updating the 2017 HMP. **If you are unable to take part, please help by having someone from your agency/sector attend the meeting.**

The first planning committee meeting for Buchanan County's HMP update will be held on **Thursday, August 11th at 5:30 pm, at the Hazmat Building, 4950 Frederick Ave., Saint Joseph, MO 64506.** During the meeting, the planning committee will review the objectives from the last plan, begin updating community profiles and set dates for future meetings.

Federal Emergency Management Agency (FEMA) has declared mandatory participation in this planning process for local cities and villages, school districts and special road or utility districts. If a representative from your jurisdiction does not participate, future funding from FEMA for mitigation projects will be jeopardized. By participating in the planning process and formally adopting the completed plan, your jurisdiction/district will be eligible for federal funding to complete such projects as relocating properties out of a floodplain, construction of tornado saferooms, and many other preventative measures meant to protect lives and property.

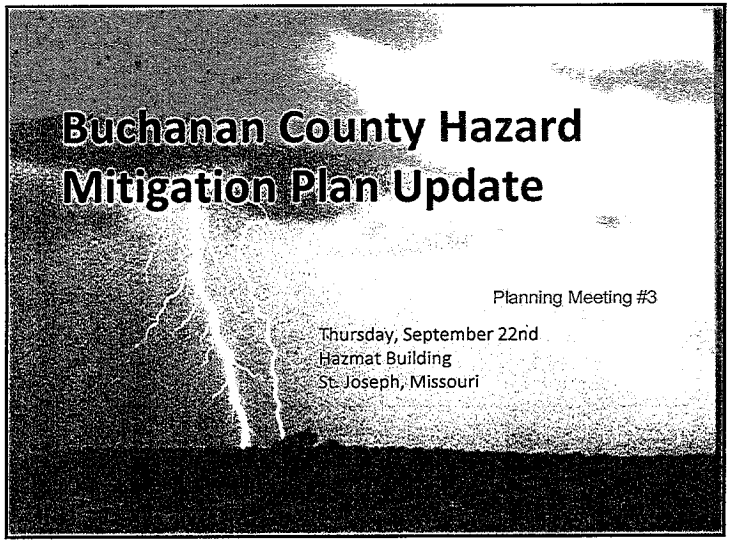
Bill Brinton, Buchanan County's Emergency Management Director, will be highly involved in the planning process. His contact information is (816) 271-1574 and bbrinton@co.buchanan.mo.us. Please contact me at 816-233-3144 or rebecca@mo-kan.org by Monday, August 8th to RSVP to the meeting.

Sincerely,

Rebecca Thacker
Community Development Planner

Enclosure

224 North 7th Street
Saint Joseph, Missouri 64501
www.mo-kan.org
Phone: (816) 233-3144
Fax: (816) 233-8498



Meeting Agenda

- Updating Mitigation Strategy
- New Actions – turn in by Mon., November 7th
- Plan Maintenance
- Plan Adoption

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Please turn in....

- Community Data Questionnaire forms
- Action evaluations
- Volunteer hours (time outside meetings spent on the HMP counts too)

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Updating Mitigation Strategy

- Goals are general guidelines that explain what you want to achieve
- Mitigation Actions are specific actions that help achieve goals

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Updating Mitigation Strategy

- Previous Actions – status updates required for ALL actions from previous plan
- Some actions may be low-cost initiatives readily adopted
- Others may be dependent on available funding or outcome of a grant application

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Updating Mitigation Strategy

- New Actions - add new actions, as appropriate
  - FEMA's Mitigation Ideas Booklet
  - Review problems from recent hazards
  - Consider problems from a potential hazard

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New Actions

- Actions should be SMART:

Specific
Measurable
Achievable
Relevant
Time-bound

- Actions need to show action. Do not use words such as encourage, explore, recommend.
- Jurisdictions are not penalized if an action is not accomplished. (Will need to explain why)

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Name of Jurisdiction:	ST. JOSEPH
	Risk / Vulnerability
Problem being Mitigated:	PUBLIC DIDN'T HAVE INFORMATION DURING EMERGENCIES & DISASTERS
Hazard(s) Addressed:	DROUGHT, FLOOD, HEAT WAVE, SEVERE WINTER WEATHER, THUNDERSTORM, TORNADO
	Action or Project
Action/Project Number:	1.1.1
Name of Action or Project:	
Action or Project Description:	HAM VIDEO & AUDIO PUBLIC SERVICE ANNOUNCEMENTS MADE, DELIVERED TO THE MEDIA & READY TO BE BROADCAST DURING EMERGENCIES & DISASTERS.
Applicable Goal Statement:	PROTECT THE LIVES, PROPERTY & LIVELIHOODS OF ALL CITIZENS
Estimated Cost:	
Benefits:	IMPORTANT INFORMATION CAN BE QUICKLY DISSEMINATED
	Plan for Implementation
Responsible Organization/Department:	EMERGENCY MANAGEMENT DIRECTOR
Action/Project Priority:	
Timeline for Completion:	
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
	Progress Report
Action Status	
Report of Progress	
Completed by:	

USE THIS SPACE IF NEEDED TO EXPLAIN WHAT WAS DONE ON THE ACTION -- PLEASE BE SPECIFIC AS POSSIBLE.

SHOW-ME COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN

Action Title:	Jurisdiction:
Action ID:	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		
T: Is it Technically feasible and potentially successful?		
A: Does the jurisdiction have the administrative capacity to execute this action?		
P: Is it Politically acceptable?		
L: Is there Legal authority to implement?		
E: Is it Economically beneficial?		
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		
Will historic structures be saved or protected?		
Could it be implemented quickly?		
STAPLEE Score		

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐High (50+ points) ☐Medium (25-29 points) ☐Low (less than 25 points)

Completed by (name/title/phone #): _____

New Actions

- Discuss new action ideas with others in your jurisdiction to assure community support of action
- Consider applying for mitigation grants
- Please turn action worksheets and STAPLEE criteria to Mo-Kan by **November 7th**

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Determine/Update Mitigation Goals

pg. 154 in 2012 HMP

- **Goal 1: Protect the Lives, Property and Livelihoods of All Citizens.**
- 1. Objective: Protect citizen's lives and property.
- 2. Objective: Provide sufficient warning of impending disasters.
- 3. Objective: Identify the citizens most vulnerable to disasters and plan accordingly.

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Determine/Update Mitigation Goals

- **Goal 2: Manage Growth in Designated Hazard Areas Through Sustainable Policies, Principles and Practices.**
- 1. Objective: Decrease the occurrence of certain disasters and reduce the damage of disasters.
- 2. Objective: Decrease the cost of the next disaster.
- 3. Objective: Increase our economic resistance to disasters.

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Determine/Update Mitigation Goals

- **Goal 3: Ensure Access to Information Regarding Hazards Preparation and Recovery.**
- 1. Objective: Increase knowledge among citizens about disaster safety and preparedness.
- **Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster.**
- 1. Objective: Increase disaster mitigation management capability in local governments.
- 2. Objective: Strengthen critical infrastructure.

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Plan Maintenance

- FEMA regulations require complete plan update every 5 years
- FEMA requires a formal plan maintenance process to ensure that the HMP is an active and relevant document

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Plan Maintenance

- Who, how and when will the plan be monitored, evaluated and updated?
  - Annual review? After hazard events?
  - Who will organize the review? Who will participate?
  - Update status of mitigation actions?
- How will the public be involved in plan maintenance?

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Plan Implementation

- How will the mitigation strategy be incorporated into other planning mechanisms?
  - Review HMP during planning process to update other plans?
    - comprehensive plans
    - capital improvement plans
    - school infrastructure or emergency plans
    - other ideas?

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Plan Adoption

- When a draft of the plan is near completion Mo-Kan will coordinate the adoption of the plan with the various jurisdictions
- Draft will be provided to jurisdiction
- Notice should be given to the public that the plan is available for review
- Adoption of the HMP at a council or board meeting

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In-Kind Match

- Buchanan is responsible for $**7,855.60** in-kind match
- In-kind match activities include:
  - Planning Committee (unless elected or appointed)
  - Public meeting attendees
  - Hosting meetings and talking to community groups
  - Researching or compiling data related to the plan
  - Mileage for driving to HMP activities

All donated hours and labor must be documented

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The Next Steps

- Host 2nd and 3rd public meetings
- Schedule additional public meetings and public outreach
- Jurisdictions have public input and adopt the plan
- Mo-Kan submits the plan to SEMA and FEMA

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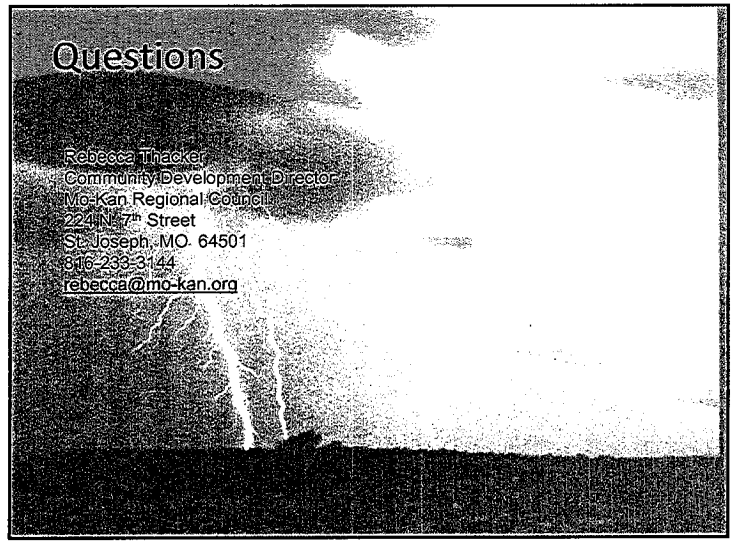


Buchanan County
Hazard Mitigation Plan – Planning Meeting 3
Thursday September 22, 2016

Name	Jurisdiction - Title	Phone or Email
Sally McDowell	City of Easton City Clerk	cityofeaston@unitedfiber.email
Mark Bush	City of DeKalb	
Tim Kissock	Missouri Western State Uni. - Risk Manager	tkissock@missouriwestern.edu 816 271 4466
✓ Mike Neylon	SWFD	262-8993
Solon Haynes	SJSD	671-4000
X Dan Hausman	Buchanan County	816-244-5678
✓ Chriss McBride	St. Joseph P.D.	Cmcbane@stjoemo.org 271-5359
Wallace N Patrick	Buchanan County ~~St Jos~~ EMS	816 271 6147
Josh Barker	East Buchanan C-1	

Buchanan County
Hazard Mitigation Plan – Planning Meeting
Thursday September 22, 2016

Name	Jurisdiction - Title	Phone or Email
Bill Brinton	BCEMA	816-383-0604
Fred Simmerman	Lewis and Clark	816 579 5728
Julie Act	St. Joseph EMD	816-262-0682
✓ Adam Perry	Region H HSRRS	816-261-7852

Mo-Kan
An Economic & Community Development Organization

Dear Adam Perry,

The third planning committee meeting for Buchanan County's HMP update will be held on **Thursday, September 22nd at 5:00 pm, at the Hazmat Building, 4950 Frederick Ave., Saint Joseph, MO 64506.** During this meeting, the planning committee will discuss creating new actions and plan maintenance. Pizza will be provided, so please RSVP so we can plan accordingly. If you represent a jurisdiction or school district please turn in evaluations of past actions and community/school data questionnaire form, if you have not already done so. It is important that these documents are submitted.

Jurisdictions must attend two of the three meetings to meet participation requirements. If you are unable to take part, please help by having someone from your agency/sector attend the meeting. Contact me immediately if no one from your jurisdiction is able to attend.

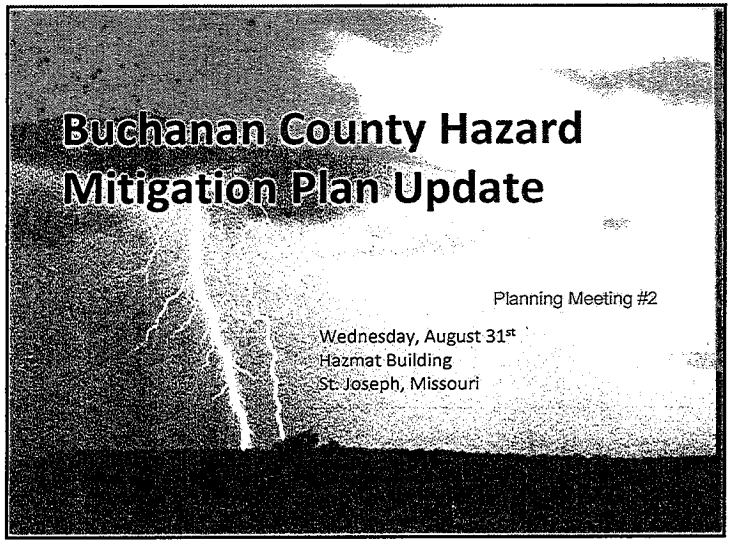
Federal Emergency Management Agency (FEMA) has declared mandatory participation in this planning process for local cities and villages, school districts and special road or utility districts. If a representative from your jurisdiction does not participate, future funding from FEMA for mitigation projects will be jeopardized. By participating in the planning process and formally adopting the completed plan, your jurisdiction/district will be eligible for federal funding to complete such projects as relocating properties out of a floodplain, construction of tornado saferooms, and many other preventative measures meant to protect lives and property.

Bill Brinton, Buchanan County's Emergency Management Director, will be highly involved in the planning process. His contact information is (816) 271-1574 and bbrinton@co.buchanan.mo.us. Please contact me at 816-233-3144 or rebecca@mo-kan.org by Monday, September 19th to RSVP to the meeting or if you have any questions.

Sincerely,

Rebecca Thacker
Community Development Planner

224 North 7th Street
Saint Joseph, Missouri 64501
www.mo-kan.org
Phone: (816) 233-3144
Fax: (816) 233-8498



Meeting Agenda

- Determine/Update Mitigation Goals
- Hazard Identification
- Vulnerability Assessment
- Risk Assessment and Probability
- Review of 2012 Mitigation Actions
- In-Kind Match
- Public Outreach
- Next Steps

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Data Collection Questionnaire forms

- Please turn in tonight. If you didn't bring it with you, please return as soon as possible.

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Determine/Update Mitigation Goals

pg. 154 in 2012 HMP

- **Goal 1: Protect the Lives, Property and Livelihoods of All Citizens.**
- 1. Objective: Protect citizen's lives and property.
- 2. Objective: Provide sufficient warning of impending disasters.
- 3. Objective: Identify the citizens most vulnerable to disasters and plan accordingly.

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Determine/Update Mitigation Goals

- **Goal 2: Manage Growth in Designated Hazard Areas Through Sustainable Policies, Principles and Practices.**
- 1. Objective: Decrease the occurrence of certain disasters and reduce the damage of disasters.
- 2. Objective: Decrease the cost of the next disaster.
- 3. Objective: Increase our economic resistance to disasters.

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Determine/Update Mitigation Goals

- **Goal 3: Ensure Access to Information Regarding Hazards Preparation and Recovery.**
- 1. Objective: Increase knowledge among citizens about disaster safety and preparedness.
- **Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster.**
- 1. Objective: Increase disaster mitigation management capability in local governments.
- 2. Objective: Strengthen critical infrastructure.

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Hazard Identification in 2012

- Dam failure
- Drought
- Earthquake
- Flooding/Levee Failure
- Heat wave
- Thunderstorm
- Tornado
- Wildfire
- Severe winter weather
- Land subsidence/sink hole

Hazard Identification in 2017

- All the above as well as....
- Hail
- Strong winds
- Any others?

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Risk Assessment & Probability

Compile a 20 year history (when possible) for each identified hazard to determine:

- how likely that hazard will occur
- the cost of each hazard
- loss of life caused by each hazard

The plan will include the future and past to include what could happen (i.e: earthquake)

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Significant Hazard Events

- What to include?

Significant Mitigation Actions

- What to include?
- Mid-Buchanan School District safe room
- Levee repairs

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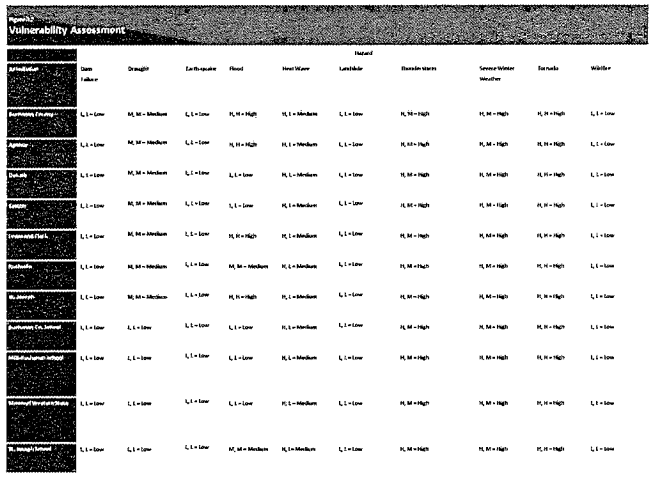
Vulnerability Assessment

Review Hazard Mitigation Actions

- Update actions that apply to your jurisdiction
  - Completed – provide date completed and funding amount if applicable
  - Delete – provide reason for deleting
  - Continue In-Progress – provide details on progress made to-date
  - Continue Not Started – provide details on any plans made to initiate action
- Discuss with other representatives from your jurisdiction.

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An Economic and Community Development Organization

Review Hazard Mitigation Actions

- **Example: pg 166 - Action 1.1.1 – Have video and audio public service announcement made, delivered to the media and ready to be broadcast during emergencies and disasters.**
- Number of action is based on goal and objective
  1. Goal 1: Protect the lives, property and livelihoods of all citizens
  1. Objective 1: Protect citizen's lives and property
  1. First action of that objective

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An Economic and Community Development Organization

Name of Jurisdiction:	ST. JOSEPH
Risk / Vulnerability	
Problem being Mitigated:	PUBLIC DIDN'T HAVE INFORMATION DURING EMERGENCIES & DISASTERS
Hazard(s) Addressed:	DROUGHT, FLOOD, HEAT WAVE, SEVERE WINTER WEATHER, THUNDERSTORM, TORNADO
Action or Project	
Action/Project Number:	1.1.1
Name of Action or Project:	
Action or Project Description:	HAVE VIDEO & AUDIO PUBLIC SERVICE ANNOUNCEMENTS MADE, DELIVERED TO THE MEDIA & READY TO BE BROADCAST DURING EMERGENCIES & DISASTERS.
Applicable Goal Statement:	PROTECT THE LIVES, PROPERTY & LIVELIHOODS OF ALL CITIZENS
Estimated Cost:	
Benefits:	IMPORTANT INFORMATION CAN BE QUICKLY DISSEMINATED
Plan for Implementation	
Responsible Organization/Department:	EMERGENCY MANAGEMENT DIRECTOR
Action/Project Priority:	
Timeline for Completion:	
Potential Fund Sources:	
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	
Report of Progress	
Completed by:	

USE THIS SPACE IF NEEDED TO EXPLAIN WHAT WAS DONE ON THE ACTION -- PLEASE BE SPECIFIC AS POSSIBLE.

SHOW-ME COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN

Action Title:	Jurisdiction:
Action ID:	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		
T: Is it Technically feasible and potentially successful?		
A: Does the jurisdiction have the administrative capacity to execute this action?		
P: Is it Politically acceptable?		
L: Is there Legal authority to implement?		
E: Is it Economically beneficial?		
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		
Will historic structures be saved or protected?		
Could it be implemented quickly?		
STAPLEE Score		

Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐High (30+ points) ☐Medium (25-29 points) ☐Low (less than 25 points)

Completed by (name/title/phone #): _____

Review Hazard Mitigation Actions

- Actions should be SMART: specific, measurable, achievable, relevant, time bound

  Specific
  Measurable
  Achievable
  Relevant
  Time-bound

- Actions need to show action! Actions from the 2012 plan with words such as encourage, explore, recommend, etc. need to be reworded.

Mo-Kan
An Economic and Community Development Organization

In-Kind Match

- Buchanan is responsible for $**7,855.60** in-kind match
- In-kind match activities include:
  - Planning Committee (unless elected or appointed)
  - Public meeting attendees
  - Hosting public meetings and talking to community groups
  - Researching or compiling data related to the plan
  - Mileage for driving to HMP activities

All donated hours and labor must be documented

Mo-Kan
An Economic and Community Development Organization

Public Outreach

- Lion's Club talk
- Joyce Raye Patterson Senior Center – table set up
- Southside Parade?
- Social media
- Booths at homecomings, events, etc.
- Speaking to civic groups, city councils, etc.

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The Next Steps

- 1st public meeting (September 16th, 5 pm)
- Schedule additional public meetings and public outreach
- 3rd Planning Committee meeting (September 22nd, 5 pm)

  Discuss/create new mitigation actions

  What has changed since the last plan?
  (new businesses, migrant population, assisted living housing, mobile home park, etc.)

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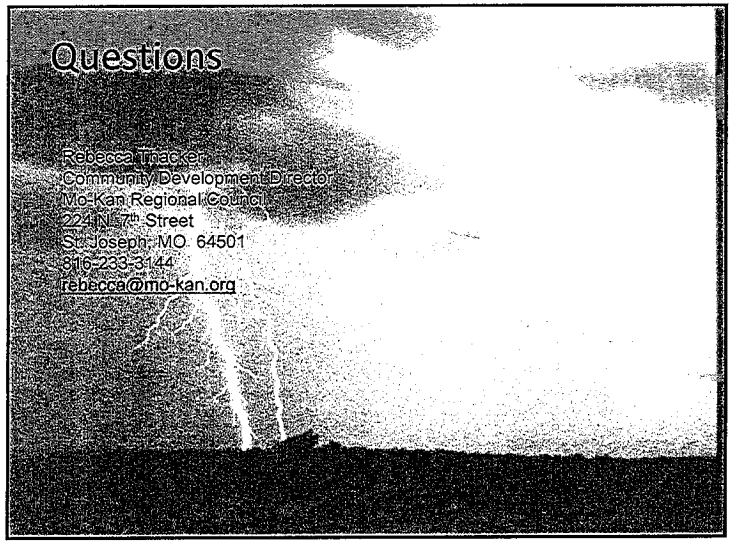

Mo-Kan
An Economic & Community Development Organization

Dear

The second planning committee meeting for Buchanan County's HMP update will be held on **Wednesday, August 31st at 5:00 pm, at the Hazmat Building, 4950 Frederick Ave., Saint Joseph, MO 64506.** During this meeting, the planning committee will discuss natural disaster risks and review actions from the previous plan. Pizza will be provided, so please RSVP so we can plan accordingly. If you represent a jurisdiction or school district please turn in the community/school data questionnaire form at the meeting.

The third and final meeting will be held on Thursday, September 22nd at 5:00 pm at the same location.

Jurisdictions must attend two of the three meetings to meet participation requirements. If you are unable to take part, please help by having someone from your agency/sector attend the meeting. Contact me immediately if no one from your jurisdiction is able to attend the meetings.

Federal Emergency Management Agency (FEMA) has declared mandatory participation in this planning process for local cities and villages, school districts and special road or utility districts. If a representative from your jurisdiction does not participate, future funding from FEMA for mitigation projects will be jeopardized. By participating in the planning process and formally adopting the completed plan, your jurisdiction/district will be eligible for federal funding to complete such projects as relocating properties out of a floodplain, construction of tornado saferooms, and many other preventative measures meant to protect lives and property.

Bill Brinton, Buchanan County's Emergency Management Director, will be highly involved in the planning process. His contact information is (816) 271-1574 and bbrinton@co.buchanan.mo.us. Please contact me at 816-233-3144 or rebecca@mo-kan.org by Monday, August 29th to RSVP to the meeting or if you have any questions.

Sincerely,

Rebecca Thacker
Community Development Planner

224 North 7th Street
Saint Joseph, Missouri 64501
www.mo-kan.org
Phone: (816) 233-3144
Fax: (816) 233-8498

Buchanan County HMP - 2nd Committee Meeting

Hazmat Building - 4950 Frederick Avenue, St. Joseph

August 31, 2016 - 5:00 pm

	Name	Agency/Organization	Mileage (Round trip)	Email Address
1	Julie Alt	St. Joseph EM		jalt@stjoemo.org
2	Josh Barker	East Buchanan C-1		barker@ebs.k12.mo.us
3	Mike Sobetski	Lifeline Foods	email Hazard Plan	msobetski@lifeline-foods.com
4	John Mitchell	Burns & McDonnell		jmitch@burnsmcd.com
5	John James	Mid-Buchanan Schools		jjames@stjoelive.com
6	Travis Dittemore	Buchanan County R-4		dittemot@bc4.k12.mo.us
7	Mike Neylon	SJFD		MNEYLON@StJoeMo.org
8	Solon Haynes	SJSD		solon.haynes@SJSD.k12.mo.us
9	Tim Kissock	MWSU		tKissock@missouriwestern.edu
10	Craig Darrough	MWSU		darrough@missouriwestern.edu
11	RON MARTIN	BUCHANAN CO.		RMARTIN@CO.BUCHANAN.MO.US
12	BILL BRINTON	Buchanan County		
13	Whitney Sybert	City of DeKalb		

Buchanan County HMP - 2nd Committee Meeting

Hazmat Building - 4950 Frederick Avenue, St. Joseph

August 31, 2016 - 5:00 pm

	Name	Agency/Organization	Mileage (Round trip)	Email Address
14	Jason Myers	Agency	20	sranyers@hotmail.com
15	Bryan Gabriel	Agency	20	Bryaneg2000@Yahoo.com
16				
17				
18				
19				
20				
21				
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23				
24				
25				
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Buchanan County Hazard Mitigation Plan Update

Public Meeting #2

Tuesday, October 4, 2016

Mo-Kan
An Economic and Community Development Organization

Background & Purpose of HMP

- Hazard Mitigation Planning
  - The Stafford Act, in reaction to Hurricane Andrew, established Hazard Mitigation Grant funds for local governments to lessen the effects of natural disasters.
  - For disasters declared after Nov. 1, 2003, a local government must have a hazard mitigation plan approved pursuant to section 322 in order to receive Hazard Mitigation Grant funds.
  - This plan must be updated every 5 years.

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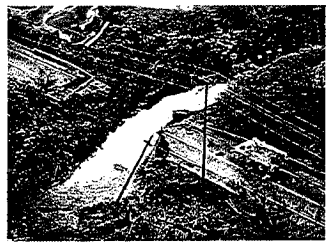
Grant Programs Linked to the Approved Plan

- Grant funds are used for any action taken to eliminate or reduce the loss of life or property as the result of a disaster event.
  - Hazard Mitigation Grant Program (HMGP)
  - Pre-disaster Mitigation Program (PDM)
  - Flood Mitigation Assistance (FMA)
  - Repetitive Flood Claims (RFC)
  - Severe Repetitive Loss (SRL)



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An Economic and Community Development Organization

Hazard Mitigation Plan

- List of hazards
- Data (history of occurrences - severity - probability)
- Analysis of cost
- Identify goals
- Evaluation of past actions
- Actions to enact
- Plan maintenance

Mo-Kan
An Economic and Community Development Organization

Hazard Identification in 2012

- Dam failure
- Drought
- Earthquake
- Flooding/Levee Failure
- Heat wave
- Thunderstorm
- Tornado
- Wildfire
- Severe winter weather
- Land subsidence/sink hole

Mo-Kan
An Economic and Community Development Organization

Determine/Update Mitigation Goals

pg. 154 in 2012 HMP

- **Goal 1: Protect the Lives, Property and Livelihoods of All Citizens.**
- 1. Objective: Protect citizen's lives and property.
- 2. Objective: Provide sufficient warning of impending disasters.
- 3. Objective: Identify the citizens most vulnerable to disasters and plan accordingly.

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An Economic and Community Development Organization

Determine/Update Mitigation Goals

- **Goal 2: Manage Growth in Designated Hazard Areas Through Sustainable Policies, Principles and Practices.**
- 1. Objective: Decrease the occurrence of certain disasters and reduce the damage of disasters.
- 2. Objective: Decrease the cost of the next disaster.
- 3. Objective: Increase our economic resistance to disasters.

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An Economic and Community Development Organization

Determine/Update Mitigation Goals

- **Goal 3: Ensure Access to Information Regarding Hazards Preparation and Recovery.**
- 1. Objective: Increase knowledge among citizens about disaster safety and preparedness.
- **Goal 4: Ensure Continued Operation of Government and Emergency Functions in a Disaster.**
- 1. Objective: Increase disaster mitigation management capability in local governments.
- 2. Objective: Strengthen critical infrastructure.

Mo-Kan
An Economic and Community Development Organization

Timeline of Updating the HMP

Task	2016						2017	
	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB
Establish core planning committee								
Initial Plan Review Meeting								
Hazard Identification								
Vulnerability Assessment								
Capabilities Assessment								
Mitigation Strategies								
Implementation Strategy								
Planning Team Meetings								
Draft Plan								
Public Meetings/Outreach								
Public Hearing								
Adoption Resolutions								
Draft to SEMA								
Revise Plan								
Final HMP to FEMA								

Mo-Kan
An Economic and Community Development Organization

HMP Participation Requirements

- Jurisdiction participation
  - All local jurisdictions must adopt the completed plan, as well as document that they participated in the planning process (includes all cities and villages, school districts and universities, special districts
  - Participation is met by a jurisdiction attending 2 of the 3 meetings
  - Complete data questionnaire form
  - Review actions – update, delete & add

Mo-Kan
An Economic and Community Development Organization

Public Outreach – Fulfill Objectives

- Objective: Identify the citizens most vulnerable to disasters and plan accordingly.
- Objective: Increase knowledge among citizens about disaster safety and preparedness.

How can we achieve this?

Mo-Kan
An Economic and Community Development Organization

Public Outreach

- Host a minimum of three meetings for public outreach
- Inform the public about the HMP and seek input
- Public Outreach can also include:
  - Family emergency plan
  - Ready-in-three campaign
- Meeting dates/locations?
  - volunteers to distribute information (in-kind match)

Mo-Kan
An Economic and Community Development Organization

In-kind Match

- Buchanan County is responsible for $ **7,855.60** in-kind match
- In-kind match activities include:
  - Planning Committee (unless elected or appointed)
  - Hosting public meetings and talking to community groups
  - Researching or compiling data related to the plan
  - Donation of supplies, labor or equipment for a project in the plan
  - Time spent driving to HMP activities

All donated hours and labor must be documented on timesheet

**** All donated supplies and equipment must be on an invoice***

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An Economic and Community Development Organization

The Next Steps

- Public meetings
- Schedule additional public meetings and public outreach
- Encourage people to attend and provide feedback
- 3rd Planning Committee meeting

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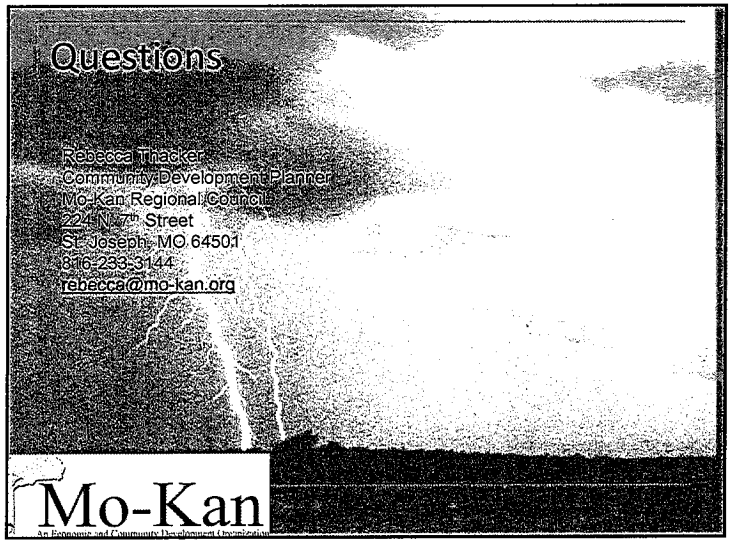
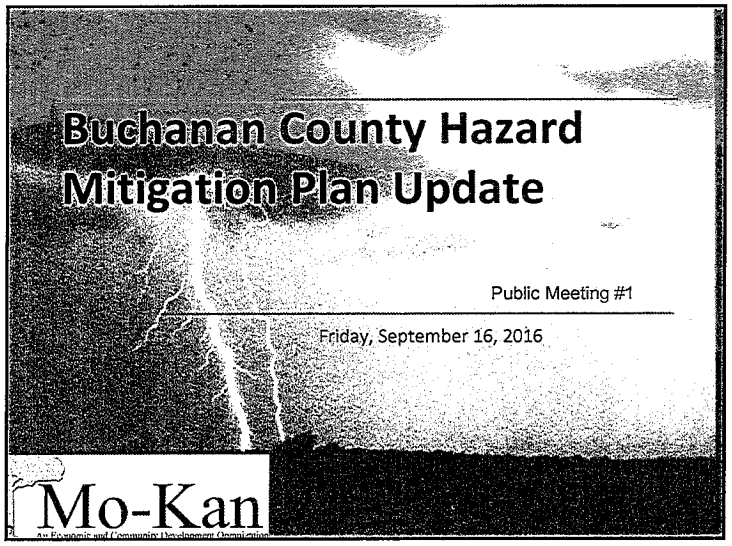
An Economic and Community Development Organization




Buchanan County Hazard Mitigation Plan Update
Public Meeting #1
Friday, September 16, 2016
Mo-Kan

Mo-Kan
An Economic & Community Development Organization

Buchanan County, MO
PRESS RELEASE

For Immediate Release

Contact: Rebecca Thacker
(816) 233-3144

BUCHANAN COUNTY HAZARD MITIGATION PLANNING COMMITTEE SEEKS INPUT

Buchanan County, MO – A planning committee comprised of representatives from Buchanan County, the incorporated cities, public school districts, the university and other stakeholders is currently updating the Buchanan County Multi-jurisdictional Hazard Mitigation Plan. The purpose of the plan is to mitigate the impact of hazards and to reduce the loss of life and property. The Buchanan County Hazard Mitigation Planning Committee is seeking public input for the plan update.

A public meeting will be held on Tuesday, October 4th at the Agency Fire Station, 911 Martin Drive, Agency, MO 64401 at 5:00 pm. The purpose of the outreach effort is to provide information to the public on the plan that is being updated as well as gain public input.

The plan update will address a comprehensive list of hazards – ranging from severe winter storms and floods to drought and tornados – and will assess the likely impacts of these hazards on communities and school districts in Buchanan County. The effort will also update current strategies and identify additional activities to reduce the vulnerability of people and property in the participating jurisdictions for the impacts of hazards. This process is necessary for participating jurisdictions to be eligible to utilize mitigation funding programs administered by the Federal Emergency Management Agency (FEMA).

Feedback from the public will be incorporated into the draft plan, which will be available for public review and comment. Upon the formal adoption by each participating jurisdiction (Buchanan County Commission, city councils and school boards) the plan will be presented to Missouri State Emergency Management Agency (SEMA) and FEMA for approval. Mo-Kan Regional Planning Commission is partnering with Buchanan County to update the plan. For more information on this project, contact Rebecca Thacker at Mo-Kan at (816) 233-3144.

###

224 North 7th Street
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www.mo-kan.org

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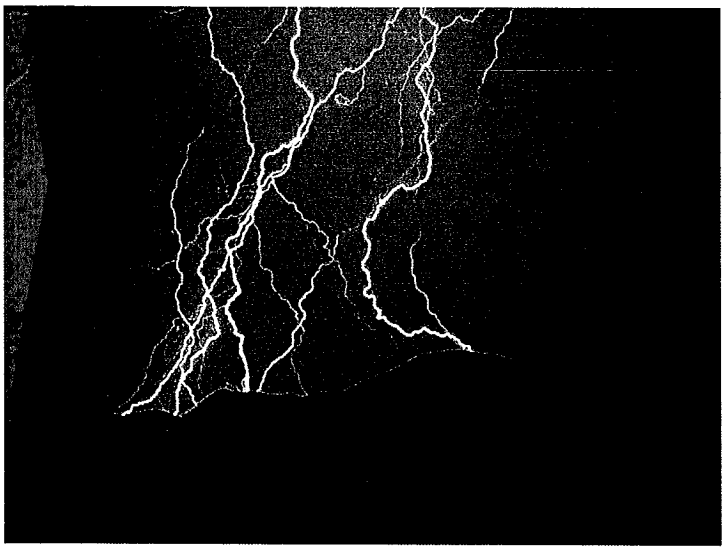
Fax: (816) 233-8498

A PUBLIC MEETING TO DISCUSS

Buchanan County 's HAZARD MITIGATION PLAN



Buchanan County is updating their Hazard Mitigation Plan and inviting the public to join the conversation. The meeting will include a discussion on how to mitigate the impact of natural disasters and the planning process for updating the plan.

Tuesday, October 4, 2016
Agency Fire Station
911 Martin Drive
Agency, MO 64401
5:00 p.m.

For more information please contact the people listed below:

Rebecca Thacker
Mo-Kan Regional Council
Tele: 816-233-3144
E-mail: rebecca@mo-kan.org

Bill Brinton
Buchanan County Emergency Management Director
Tele: 816-271-1574
E-mail: bbrinton@co.buchanan.mo.us

Buchanan County HMP - Public Meeting

Agency Fire Station

October 4, 2016 - 5:00 pm

	Name	Agency/Organization	Mileage (Round trip)	Email Address
1	Julia Black			
2	Bill Burton	BCEMA		
3	Mike Curran	SCBC Fire		
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Buchanan County Hazard Mitigation Plan Update

Public Meeting #1

Friday, September 16, 2016
HAZMAT Building
St. Joseph, Missouri

Mo-Kan
An Economic and Community Development Organization

Background & Purpose of HMP

- Hazard Mitigation Planning
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Mo-Kan
An Economic and Community Development Organization

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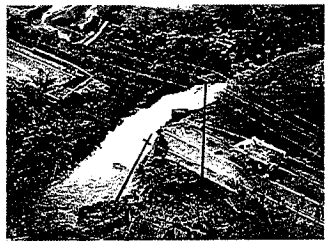

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An Economic and Community Development Organization

Hazard Mitigation Plan

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Mo-Kan
An Economic and Community Development Organization

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Mo-Kan
An Economic and Community Development Organization

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Mo-Kan
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Mo-Kan
An Economic and Community Development Organization

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Planning Team Meetings								
Draft Plan								
Public Meetings/Outreach								
Public Hearing								
Adoption Resolutions								
Draft to SEMA						Dec 1		
Revise Plan								
Final HMP to FEMA								Feb 1

Mo-Kan
An Economic and Community Development Organization

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Mo-Kan
An Economic and Community Development Organization

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Mo-Kan
An Economic and Community Development Organization

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Mo-Kan
An Economic and Community Development Organization

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  - Time spent driving to HMP activities

All donated hours and labor must be documented on timesheet

**** All donated supplies and equipment must be on an invoice***

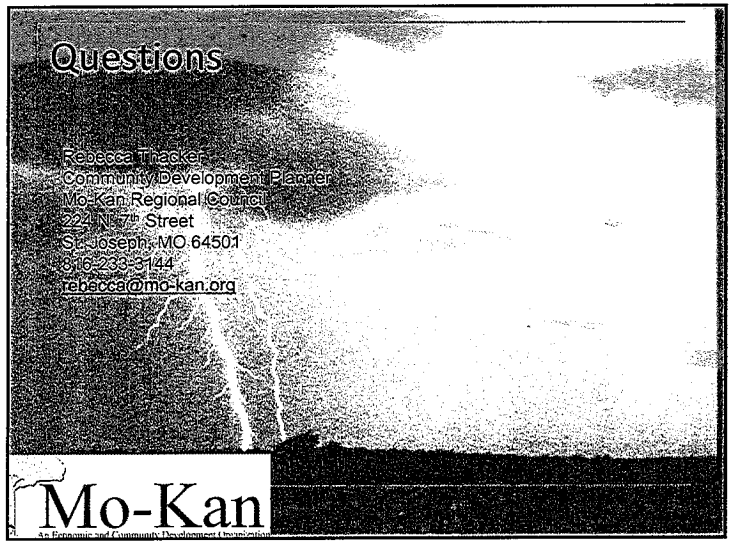
Mo-Kan

The Next Steps

- 2nd and 3rd public meetings

  (Agency – Oct. 4th/DeKalb – Oct. 18th)
- Schedule additional public meetings and public outreach
- Encourage people to attend and provide feedback
- 3rd Planning Committee meeting

Mo-Kan



Mo-Kan
An Economic & Community Development Organization

Buchanan County, MO
PRESS RELEASE

For Immediate Release

Contact: Rebecca Thacker
(816) 233-3144

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Saint Joseph, Missouri 64501

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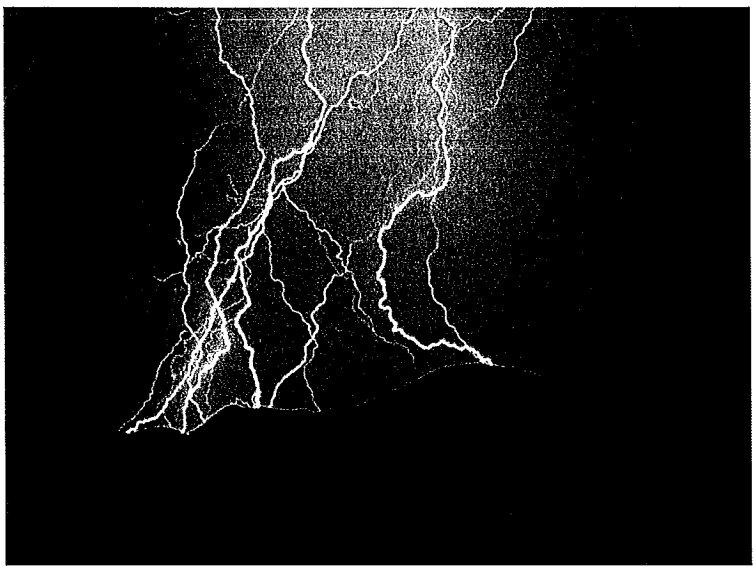
Phone: (816) 233-3144
Fax: (816) 233-8498

A PUBLIC MEETING TO DISCUSS

Buchanan County 's

HAZARD MITIGATION PLAN



Buchanan County is updating their Hazard Mitigation Plan and inviting the public to join the conversation. The meeting will include a discussion on natural disasters, how to mitigate their impact and the planning process for updating the plan.

Friday, September 16, 2016
Buchanan County Courthouse
Room 223, Tom Mann Room
411 Jules, St. Joseph, MO 64501
5:00 p.m.

For more information please contact the people listed below:

Rebecca Thacker
Mo-Kan Regional Council
Tele: 816-233-3144
E-mail: rebecca@mo-kan.org

Bill Brinton
Buchanan County Emergency Management Director
Tele: 816-271-1574
E-mail: bbrinton@co.buchanan.mo.us

Buchanan County HMP - 1st Public Meeting

411 Jules Street, Room 223

September 16 , 2016 - 5:00 pm

	Name	Agency/Organization	Mileage (Round trip)	Email Address
1	Kathy Brinton	Public	6 miles	K.brinton@hotmail.com
2	Rebecca Thacker	mo-Kan		
3	Bill BRINTON	BCEMA		
4	Jodi Blanker	United Way		jodi.blanker@stjosephunitedway.org
5	Betty Hellerich	Bartlett Center		betty@bartlettcenter.com
6				
7				
8				
9				
10				
11				
12				
13				

Buchanan County LEPC
Agenda
3/24/2016

Officers:
Chairperson: Jason Ziph ☐ Present ☐Absent
Vice Chairperson: Gary Leftin ☐ Present ☐Absent
Treasurer: Dennis Johnson ☐ Present ☐Absent
Secretary: Bill Brinton ☐ Present ☐Absent
Standing Rules Chairperson: Gerald Duty ☐ Present ☐Absent
George Albert, MERC Planner ☐ Present ☐Absent
Corey Sloan SEMA AC ☐ Present ☐Absent

Members:
Elected officials: ☐ Present ☐Absent: _____
Law Enforcement: ☐ Present ☐Absent: _____
Fire: ☐ Present ☐Absent: _____
Emergency Management: ☐ Present ☐Absent: _____
Emergency Medical: ☐ Present ☐Absent: _____
Health: ☐ Present ☐Absent: _____
Local Environmentalist: ☐ Present ☐Absent: _____
Hospital: ☐ Present ☐Absent: _____
Transportation: ☐ Present ☐Absent: _____
News Media: ☐ Present ☐Absent: _____
Industry: ☐ Present ☐Absent: _____
Community Volunteers: ☐ Present ☐Absent: _____
Public Works: ☐ Present ☐Absent: _____

Reading/Approval of Minutes from Previous Meeting:

Reading/Approval of Financial Report:

Exercise Committee Report:

Needs Committee Report:

TIER II Reports:

Region H Hazmat Update:

COAD/Long Term Recovery Committee Report:

Old Business:

Training Committee:

Emergency Management Reports:

New Business/Round Table:
Buchanan County Hazard Mitigation Plan Introduction
Southern Star Pipeline Speaker

Next Meeting: 4/28/16

Motion to Adjourn

LEPC Meeting 3/24/2016

	Name	Company	Email Address
1.	Bill Brinton		
2.	Lon Martin		
3.	Bev. Maltsberger	MU Extension	OK
X 4.	Rebecca Thacker	mo-kan	rebecca@mo-kan.org
5.	Tad Rankin	Southern Star Central Gas Pipeline	Tad.L.Rankin@sscgp.com
6.	Marty Kerr	Southern Star Central Gas Pipeline	Marty.Kerr@SSCGP.com
7.	Gary Tolle	Southern Star Central Gas Pipeline	gary.tolle@sscGP.com
8.	C Jon Hinkle	mo DHSS	SAME
9.	Lesley Schulte	City of St. Joseph Health Dpt.	Lesley.Schulte@dpha.mo.gov
10.	John Murray	Johnson Controls	john.walter.murray@jci.com
X 11.	Dan Hegeman	KCP&L	dan.hegeman@KCPL.com
12.	R.J. Turner	KCPL	ROYAL.TURNER@KCPL.com
13.	Brad Heerlein	Tyson	brad.heerlein@tyson.com
14.	Sara Wallace	Tyson * (Hillshire)	SAME
15.	Kris Nero's	139th AW/ Exec. Mgmt.	Same
16.	Logan McCorcand	139th AW Emergency Management	same
17.	Adam Perry	SCBCFD / Region H	Same
18.	Bob Vey	Hillyard Industries, Inc.	same
19.	SHELDON LYON	SJSC	SAME
20.	Jeff Wilson	SJRD	Same
21.	Dennis Johnson	Jam	Jam
22.	Jason Zirpel	SJFD	Same
X 23.	Donna Jean Boyer	City of St. Joseph	—
24.	Yvonne Meyer	MWSU	Same.

25.	Tim Kissck	MWSU
26.	Craig Darrough	MWSU
27.	Mary Gaston	St Joseph Transit
28.		
29.		
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Buchanan County LEPC
Agenda
7/28/2016

Officers:
Chairperson: Jason Ziph ☒ Present ☐ Absent
Vice Chairperson: Gary Leftin ☐ Present ☐ Absent
Treasurer: Dennis Johnson ☒ Present ☐ Absent
Secretary: Bill Brinton ☒ Present ☐ Absent
Standing Rules Chairperson: Gerald Duty ☐ Present ☐ Absent
George Albert, MERC Planner ☐ Present ☐ Absent
Corey Sloan SEMA AC ☐ Present ☐ Absent

Members:
Elected officials: ☒ Present ☐ Absent: _____
Law Enforcement: ☒ Present ☐ Absent: _____
Fire: ☒ Present ☐ Absent: _____
Emergency Management: ☒ Present ☐ Absent: _____
Emergency Medical: ☒ Present ☐ Absent: _____
Health: ☒ Present ☐ Absent: _____
Local Environmentalist: ☒ Present ☐ Absent: _____
Hospital: ☐ Present ☐ Absent: _____
Transportation: ☒ Present ☐ Absent: _____
News Media: ☐ Present ☐ Absent: _____
Industry: ☒ Present ☐ Absent: _____
Community Volunteers: ☒ Present ☐ Absent: _____
Public Works: ☒ Present ☐ Absent: _____

Reading/Approval of Minutes from Previous Meeting:

Reading/Approval of Financial Report:

Exercise Committee Report:

Needs Committee Report:

TIER II Reports:

Region H Hazmat Update:

COAD/Long Term Recovery Committee Report:

Old Business:

Training Committee:

Emergency Management Reports:

New Business/Round Table:
Buchanan County Hazard Mitigation Plan Update
Election of Vice Chairperson and Treasurer????

Next Meeting: 8/25/16

Motion to Adjourn

	LEPC Meeting 7/28/16		
	Name	Company	Email Address
1.	BILL BRINTON	BCEMA	
2.	JASON ZIPH	SJFD	
3.	Dennis Johnson	SCBC Fire	Same
4.	Ruben A Bulgin	LLF	Same
5.	Mike Sobetski	Lifeline Foods	same
6.	Jada Thomas	St Joe Police	Same
7.	Megan Schuette	US EPA	schuette.megan@epa.gov
8.	JOHN Frey	US EPA	Frey.john@epa.gov
9.	Julie Alt	St. Joseph EM	jalt@stjoemo.org
10.	JEREMY Funk	MO AIR GUARD	Same
11.	THOMAS BAUER	SECOND HARVEST	SAME
12.	April Prewitt	BCEMS / Region H HSRRS	april.prewitt.25@gmail.com
13.	Adam Perry	Region H HSRRS	Same
14.	SHELDON LYON	SJSC	SAME
15.	Jeff Wilson	SJPD	Same
16.	Ralph Dishner	RED CROSS	SAME
17.	KAELA Long	Red Cross	Same
18.	Bob Vey	Hillyard Industries	Same
19.	George Albert	MERC	will let you know :)
20.	Debra Bradley	City of St. Joseph Health Dept	Same
21.	PARIS JENKINS	SJFD	pjenkins@ci.st-joseph.mo.us
22.	rebecca Thacker	mo-kan	rebecca@mo-kan.org
23.	Bill Caldwell	Red Cross	BCALDWELL4@AOL.com
24.	Darrell Jones	COAD-LTRC	darrell@graceonthe web.org

25.	Jose Rodriguez	MODOT	jose.rodriguez@modot.mo.gov
26.	Deb Meyers	Ventura Foods	dmeyers@venturafoods.com
27.	Donna Jean Boyer	City of St. Joseph	
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	LEPC Meeting 8/25/16		
	Name	Company	Email Address
1.	Jason Zipf	SJFD	JZIPH@STJOEMO.ORG
2.	Dennis Johnson	SCBC/BIVI	same
3.	April Prewitt	BCEMS	april.prewitt.25@gmail.com
4.	Bob Vey	Hillyard Industries	same
5.	Ted McGarry	139th AW	ted.l.mcgarry.mil@mail.mil
6.	Bill Caldwell	ARC	BCALDWELL4@AOL.com
7.	Carol Baxter	KCPL	carol.baxter@kcpl.com
8.	John Murray	Johnson Controls	john.walter.murray@jci.com
9.	Craig Darrough	Mo. Western State University	darrough@missouriwestern.edu
10.	Marti Burr	MoWestern State University	mburri@missouriwestern.edu
11.	Lesley Schulte	City of St. Joseph Health Dept	Lesley.Schulte@lpha.mo.gov
12.	Susan Deering	MWSUPD	same
13.	Yvonne Meyer	MWSU PD.	same.
14.	Matt Wilka	MWSU PD	same
15.	Brian Stone	Missouri Dept of Correction	Same
16.	Jose Rodriguez	MODOT	same
17.	Ruben A. Bolgino	Life Line foods	same
18.	Rebecca Thacker	mo-kan	rebecca@mo-kan.org
19.	Adam Perry	Region H HSRRS/SCBCFD	~~apperry~~ apperry@atix.ricss.net
20.	SHELDON NYON	SJSC	ON FILE
21.	Elaine Jean Boyer	City of St. Joseph	
22.	Mary Gaston	St. Joseph Transit	on file
23.	Tim Krissack	MWSU	on file.
24.	~~Mark Reinert~~		

Buchanan County
Local Emergency Planning Committee
@ Room
Minutes of the Meeting of August 24, 2016

Officers:

Chairperson	Jason Ziph
Vice-Chairperson	Adam Perry
Treasurer	Dennis Johnson
Secretary	Bill Brinton (Absent)
Standing Rules Chairperson	Vacant
MERC Planner	Vacant
SEMA	Corey Sloan (Absent)

Members:

Elected Officials	Donna Jean Boyer, SJCC
Law Enforcement	Ted McGarry, MOANG; Yvonne Meyer & Susan Deering & Matt Waller, MWSUPD
Fire	Adam Perry, SCFPD; Jason Ziph, SJFD
Emergency Management	Brian Stone, MDOC
Environmental	Craig Darrough & Marti Burr & Tim Kissock, MWSU
Health	Leslie Schulte, SJHD
Emergency Medical	April Prewitt, BCEMS
Hospital	None
Transportation	& Marry Gaston, SJT
Industry	Bob Vey, Hillyards; Ruben Bulgin, Lifeline Foods; Dennis Johnson, Carol Baxter, KCP&L; John Murray, Johnson Controls
Community Volunteers	Sheldon Lyon, SJS&HC; Bill Caldwell, ARC; Rebecca Thacker, MO-KAN;
Public Works/Government	Jose Rodriquez, MODOT; Gary Leftin, SJS&S
News Media/PIO	None
Guests	None

There was a quorum present.

Reading of Minutes:
Bill Brinton emailed the minutes of our July 28, 2016 Meeting. There were no corrections. Bob Vey made a motion to accept the minutes as presented. Bill Caldwell seconded the motion and it passed.

It should be noted that the August LEPC Meeting was held on Wednesday, 5/24/16; due to Freshman orientation at MWSU on 5/25/16. For the first time in 13 years there was no food. Bill Brinton was contacted about the grievous offense and he was not sure what happened. He had discovered that MWSU had the meeting scheduled for 5/24/16 and he must not have conveyed to them that we changed our meeting date to 5/24/16. For that he is very sorry!

Reading/Approval of Financial Report:
Treasurer Dennis Johnson made the following report:

	LEPC	HMEP
Beginning Balance 7/27/16	**$12,968.83**	**$0**
Warrants: **8/18/16 Hilton Inn MERC Conference**	**$1,018.16**	**$0**
Ending Balance: 8/23/16	**$11,950.67**	**$0**

Matt Waller made a motion to accept the Treasurer's Report as presented. Caldwell seconded the motion and it passed as presented.

Exercise Committee Report:
- Julie Alt, Karla Long and Ralph Dishong are participating in the National Mass Care Exercise; they are assisting Region A (Kansas City)
- 9/9/16 2016 Missouri Hope Table Top Exercise
- Adam Perry assisted with an Active Shooter Exercise in Grundy County.

Needs Committee:
The 2016 MERC Symposium will be held September 29 & 30 and October 1, 2016. The Buchanan County LEPC will fund the following people: Julie Alt, Dennis Johnson, Dan Brachman, Adam Perry and April Prewitt, Ed Truitt & Kyler Oliver. Bill Brinton's attendance will be funded by the MERC.

TIER II Reports:
We are now up to 160 Tier II's.

Region H Hazmat Update:
The Missouri Air National Guard is doing a Military Exchange with Personnel from Panama. Part of this exchange includes classroom discussion related to response to natural disasters.
- 8/9/16 Bill Brinton attended the sheltering information exchange. Major Nathan VanHoof made an excellent presentation about his involvement in Louisiana in military led sheltering in Louisans during hurricanes.
- 8/12/16 The Panamanian delegation met at the hazmat building to talk about County Emergency related sheltering and to tour the hazmat team resources. They later met with the American Red Cross.
- 8/18/16 Adam Perry attended an Air Show Meeting

The Region H Hazmat team will be providing equipment for: Trails West, the 2016 Air Show and a multi-team softball tournament at Heritage Park.

Long Term Recovery Committee/COAD:
No report; the COAD will hold our Quarterly Meeting 9/22/16

Old Business: None

Training Committee Reports:

- 9/12 – 9/15/16 Members of the LEPC will be attending SWMOIST Annual Training.
- 9/15/16 Workshop in Emergency Management: Amateur Radio Resources; Troop H
- 9/22/16 EOC Emergency Operations for an All Hazard Event/Chillicothe
- 11/5/16 Hazmat Awareness Training (Trenton Fire)
- 11/12/16 & 12/3/16 Hazmat Operations Training (Trenton Fire)

Emergency Management:

Bill Brinton is on vacation: It should be noted that Adam Perry will be representing Bill Brinton at the 2016 Air Show

Julie Alt is making plans for Trails west. Adam Perry will be assisting her in this endeaver.

New Business/Introductions:

Rebecca Thacker from MO-KAN gave us an update about the Buchanan County Hazard Mitigation Plan Update. Our next meeting will be 8/31/16 at the Hazmat Building at 5:30 PM. She invited anyone who was interested to attend.

Adam Perry updated us on the white powder call that the hazmat team had in Plattsburg.

Ted McGarry & Adam Perry updated everyone on the upcoming Air Show.

Rubin Bulgin reported that Life Line Foods Tabletop and small scale exercise related to agricultural product protesters went well.

Dennis Johnson reported that the SCBCFD had lowered its ISO rating.

Next Meeting: September 22, 2016

The meeting was adjourned.

Respectfully submitted by:

April Prewitt

Acting Secretary

Buchanan County LEPC
Agenda
9/22/2016

Officers:
Chairperson: Jason Ziph [X] Present [ ] Absent
Vice Chairperson: Adam Perry [ ] Present [X] Absent
Treasurer: Dennis Johnson [X] Present [ ] Absent
Secretary: Bill Brinton [X] Present [ ] Absent
Standing Rules Chairperson: Gerald Duty [ ] Present [ ] Absent
MERC Planner [ ] Present [ ] Absent
Corey Sloan SEMA AC [ ] Present [ ] Absent

Members:
Elected officials: [ ] Present [ ] Absent: _____
Law Enforcement: [X] Present [ ] Absent: _____
Fire: [X] Present [ ] Absent: _____
Emergency Management: [X] Present [ ] Absent: _____
Emergency Medical: [X] Present [ ] Absent: _____
Health: [X] Present [ ] Absent: _____
Local Environmentalist: [X] Present [ ] Absent: _____
Hospital: [ ] Present [ ] Absent: _____
Transportation: [X] Present [ ] Absent: _____
News Media: [ ] Present [ ] Absent: _____
Industry: [X] Present [ ] Absent: _____
Community Volunteers: [X] Present [ ] Absent: _____
Public Works: [X] Present [ ] Absent: _____

Reading/Approval of Minutes from Previous Meeting:

Reading/Approval of Financial Report:

Exercise Committee Report:

Needs Committee Report:

TIER II Reports:

Region H Hazmat Update:

COAD/Long Term Recovery Committee Report:

Old Business:

Training Committee:

Emergency Management Reports:

New Business/Round Table:
Buchanan County Hazard Mitigation Plan Update

Next Meeting: 10/27/18

Motion to Adjourn

	LEPC Meeting 9/22/16		
	Name	Company	Email Address
1.	BILL BRINTON		
2.	J. ZIPM	SJFD	SAME
3.	John Murray	Johnson Controls	Same
4.	Marti Burri	MWSU	m.burri@missouri.western.edu
5.	Tom Kissack	MWSU	SAME
6.	Roger E Wolken	Mo Dept of Conservation	Same
7.	Kasey Whiteman	Mo Dept. of Conservation	same
8.	Logan McFarland	139AW EM	Same
9.	JOHN BURRIS	139AW FIRE	SAME
10.	Charlotte McElroy	St. Joseph Christian	SAME
11.	Bob Vey	Hillyard Industries	Same
12.	Wallace N. Patrick	Buchanan County EMS	wally.patrick@bc-ems.com
13.	Steve Groshong	Buchanan Co EMS	Steve.groshong@bc-ems.com
14.	Deb Meyers	Ventura Foods	dmeyers@venturafoods.com
15.	Dennis Johnson	BIUI / SCBC Fire	Same
16.	Mary Gaston	SJ Transit	same
17.	Gary Leftin	Saint Joseph Public Works	
18.	Keven Schneider	St. Joseph Public Works	kschneider@ci.st-joseph.mo.us
19.	Rebecca Thacker	mo-Kan	rebecca@mo-kan.org
20.	Brian Stone Missouri Dept of Corrections	WRDCC	Brian.Stone@doc.mo.gov
21.	Craig Darrough	MWSU	cdarrough@missouriwestern.edu
22.	Susan Deering	MWSUPD	Same
23.	Tina Brown	SEMA	tina.brown@sema.dps.mo.gov
24.	C. Jon Hinkle	MO DHSS	SAME

25.	Lesley Schulte	City of St. Joseph Health Dpt	Lesley.Schulte@lpha.mo.gov
26.	Ben Maltsberger	Univ of MO Extension	OK
27.	RALPH DISHONG	RED CROSS	SAME AS BEFORE
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IACA Meeting Agenda
October 13, 2016

Opening

Introductions

Presentation – Mary Jo Fletchall, Northwest Missouri Area Agency on Aging
Benefits Counseling for Seniors

Discussion/Questions

Opportunity for Organizations to Share

Closing

TACA
October 2012

Name	Organization/Company	Email Address
Ryan Ryan	PCS	
Frank Sinclair	Mesa 1 C	
Mary Gaston	St Joseph Transit	
Chd. Glanton	UMW Va.	
Courtney Cruz	PCS	

Meeting this Thursday!!

Hoffman, Nadienne

Sent: Mon 11/7/2016 12:05 PM

To: Rebecca Thacker; Ann Salanky; Becky Flaherty; Beth Langley; Bethany Miller; Cindy White; Courtney Cruz; Dave Howery; Fiona Hummer; Frank Sindelar; Jodi Bloemker; Judy Sabbert; Kaila Waller; Margaret Lister; Mary Gaston (transit_mgaston@ci.st-joseph.mo.us); Steve Bartlett; Tony Drummond; Tyler Graff

Retention Policy: 120 Day Delete Sent items (4 months) Expires: 3/7/2017

Please forgive me for not getting this out sooner.

We have a meeting this Thursday, November 10th at 1:30 p.m. @ Juda House.

Rebecca Thacker will be sharing with us about her project at MO-Kan. She is wanting to connect with any and all who work with seniors and the disabled as they work on a plan for safety and communication in the event of a disaster. (I hope I explained that well).

Dave did you send me the minutes from last month? I don't seem to have them.

Nadienne J. Hoffman
Director
Faith in Action
Phone: 816-271-7279
Fax: 816-271-7045

Sign-in Sheet

NOV 2016

Madonna Kissinger

Rebecca Thacker

Teresa Goldyn

Steven Weese

Stephen Black

Julia Black

Joyce Davis

Marylin L. Hustamp

Pam Johnson