TEXAS COLORADO RIVER FLOODPLAIN COALITION

Multi-Jurisdictional Hazard Mitigation Plan Update 2011-2016

Texas Colorado River Floodplain Coalition

- **With technical support from the Lower Colorado River Authority (LCRA)**

H_2O PARTNERS

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TEXAS COLORADO RIVER FLOODPLAIN COALITION

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Section 1 - Introduction

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Background

The Texas Colorado River Floodplain Coalition (TCRFC or Coalition) is a non-profit, 501 (c)(3) organization formed in June 2001 by the cities and counties of the Lower Colorado River Authority (LCRA) as a result of flood devastation requiring more coordinated damage prevention efforts. The LCRA formed the organization based on input gathered from a series of meetings held throughout the basin. Although the Coalition is directed by an Executive Committee comprised of county judges, officials, mayors and council members, the LCRA provides technical support to the Coalition and is a planning participant in this effort. LCRA members attended every workshop, provided mitigation actions, and assessed risks along with TCRFC and community members to fully participate.

The mission of the Coalition is to: "encourage comprehensive, consistent management of the floodplain along the Colorado River and its tributaries; provide a forum for data exchange; and facilitate a structured approach to managing the complex issues related to floodplain management."

The TCRFC is dedicated to preventing damage before a disaster occurs. To this end, the Coalition strives to coordinate state and federal programs, promote public awareness and provide training for stakeholders and local officials. In 2004 the Coalition developed a Hazard Mitigation Action Plan (HMAP), approved by the Federal Emergency Management Agency (FEMA) in 2004 entitled, "*Creating a Disaster Resistant Lower Colorado River Basin.*" This HMAP was formed with technical assistance provided by LCRA and H2O Partners, Inc. of Austin, Texas. The Coalition is committed to preventing damage before disaster strikes rather than responding to disaster damage. With the motto, "Working Together Makes Sense," the Coalition is creating a disaster-resistant Lower Colorado River Basin.

TCRFC Mission Statement

Encourage comprehensive, consistent management of the floodplain along the Colorado River and it s tributaries; provide a forum for data exchange; and facilitate a structured approach to managing the complex issues related to floodplain

The mitigation planning regulation of the Disaster Mitigation Act requires that mitigation plans be reviewed and revised within five (5) years of approval to maintain eligibility for mitigation grant

funding[1]. Because FEMA approved the initial HMAP for the Coalition and the LCRA in 2004, the Coalition received a Hazard Mitigation Grant in 2008 to complete an update for the 2004 plan. This Hazard Mitigation Action Plan Update (hereinafter "Plan" or "Plan Update") was prepared by the Coalition, LCRA, H2O Partners, Inc., and subcontractor PBS&J. It is an opportunity for Coalition members to evaluate successful mitigation actions and explore opportunities to avoid future disaster loss. In addition, this Plan update provides an opportunity for more communities to join the Coalition as well as develop mitigation actions for those communities that joined the TCRFC since 2004. All of the participants in the Plan are part of the LCRA, which is also participating.

Since its inception in 2001, the TCRFC has expanded, gaining more members each year, with a total of sixty-four (64) members to date. Communities are organized geographically into four regions (See Table 1-1). These member communities attend annual meetings and have access to resources through the Coalition's website, www.tcrfc.org.

Scope

The focus of the Plan Update is to mitigate those hazards classified as "high" or "moderate" risk as determined through a detailed hazard risk assessment conducted for the TCRFC. Hazards that pose a "low" or "negligible" risk will continue to be evaluated during future updates to the plan, but they may not be fully addressed until they are determined to be of high or moderate risk. This enables the Coalition and its participating jurisdictions and partners to prioritize mitigation actions based on hazards which are understood to present the greatest risk to lives and property.

Llano River in Llano County
Billy Moore, LCRA ©

Although all communities that participated in the 2004 Plan are continuing in the update process, not all TCRFC member communities are participating. Some communities have formed their own mitigation plan or have chosen not to participate[2]. Table 1-1 below illustrates the member communities that participated in the initial HMAP in 2004, while Table 1-2 displays the new member communities that are participating in the 2009 planning effort. Table 1-3 lists all sixty-one (61) participating communities participating in the Plan Update (organized by alphabetical order rather than by Region) in addition to the TCRFC and LCRA. Therefore there are a total of sixty-three (63) planning participants.

[1] 44 CFR §201.6(d)(3)

[2] Hays County, Travis County and the City of Austin are the only members of the TCRFC not participating in this effort as they are developing or have developed separate mitigation plans or mitigation plan updates.

Table 1-1. Participating TCRFC Communities in the 2004 HMAP

Region I	Region II	Region III	Region IV
Colorado County City of Columbus City of Eagle Lake Fayette County City of Carmine City of Flatonia City of LaGrange Matagorda County City of Bay City City of Palacios Wharton County City of El Campo City of Wharton	Bastrop County City of Bastrop City of Elgin City of Smithville City of Lago Vista City of Lakeway City of Mustang Ridge City of Point Venture City of San Leanna West Lake Hills Williamson County	Blanco County Johnson City Burnet County City of Bertram City of Cottonwood Shores City of Granite Shoals City of Highland Haven City of Marble Falls City of Meadowlakes Llano County City of Llano City of Sunrise Beach Village Mason County City of Mason	City of Brownwood Lampasas County City of Kempner City of Lampasas City of Lometa San Saba County City of San Saba Mills County City of Goldthwaite

The TCRFC and LCRA, along with all of the above-referenced communities are participating in the HMAP Update. In addition, several communities that have joined the Coalition since 2004 are participating in the update effort. These communities are listed in Table 1-2.

Table 1-2. New Member Communities Participating in the 2009 Update

Region I	Region II	Region III	Region IV
City of Weimar City of East Bernard	Lee County City of Giddings City of Lexington Village of Briarcliff City of Jonestown Village of Volente City of Cedar Park City of Florence City of Hutto	City of Burnet City of Horseshoe Bay	City of Brady

Table 1-3 is a combination of Tables 1-1 and 1-2, providing an alphabetical list of all participating communities in the 2009 update to the 2004 Hazard Mitigation Plan. In addition to the communities listed below the TCRFC and LCRA are both participants in this Plan Update.

Table 1-3. TCRFC Communities Participating in the Update

County	Participating Jurisdiction
Bastrop County	Bastrop County
	Bastrop
	Elgin
	Smithville
Blanco County	Blanco County
	Johnson City
Brown County	Brownwood
Burnet County	Burnet County
	Bertram
	Burnet
	Cottonwood Shores
	Granite Shoals
	Highland Haven
	Marble Falls
	Meadowlakes
Colorado County	Colorado County
	Columbus
	Eagle Lake
	Weimar
Fayette County	Fayette County
	Carmine
	Flatonia
	La Grange
Lampasas County	Lampasas County
	Kempner
	Lampasas
	Lometa
Lee County	Lee County
	Giddings
	Lexington
Llano County	Llano County
	Horseshoe Bay
	Llano
	Sunrise Beach Village

County	Participating Jurisdiction
Mason County	Mason County
	Mason
Matagorda County	Matagorda County
	Bay City
	Palacios
McCulloch County	Brady
Mills County	Mills County
	Goldthwaite
San Saba County	San Saba County
	San Saba
Travis County	Briarcliff
	Jonestown
	Lago Vista
	Lakeway
	Mustang Ridge
	Point Venture
	San Leanna
	Volente
	West Lake Hills
Wharton County	Wharton County
	East Bernard
	El Campo
	Wharton
Williamson County	Williamson County
	Cedar Park
	Florence
	Hutto

Although this is a Plan Update, all of the communities in Table 1-2 will be receiving an initial hazard mitigation plan, with the exception of the City of Brady[3]. Therefore the communities in Table 1-2 have developed mitigation actions for the first time, and will not have an analysis included for any previous actions.

[3] The City of Brady received an initial hazard mitigation plan under the Concho Valley Council of Governments Regional Plan. Since that time the City has joined as a member of the TCRFC.

Purpose

The Coalition was initially formed in response to torrential flooding, but communities in the Lower Colorado River Basin are susceptible to a multitude of natural and man-caused hazards. These hazards are discussed in further detail in Sections 6 through 18. The goal of the plan is to minimize or eliminate long-term risks to human life and property from known hazards by identifying and implementing cost-effective mitigation actions. *Mitigation* is defined by FEMA as *sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects*. The purpose of the Coalitions' mitigation plan is twofold: to protect people and structures, and to minimize the costs of disaster response and recovery.

Flooding in the Colorado River Basin - 2007
Source: LCRA

Through this update process, the Coalition seeks to:

- identify areas of potential flood impact by updating and digitizing flood maps and developing a Floodplain Map Master Plan;
- oversee basin-wide flood elevation and flood-control feasibility studies, and examine options for improved flood control;
- assess National Flood Insurance programs in member communities and encourage improvements in floodplain management;
- assist communities in qualifying for FEMA's Community Rating System, thereby reducing flood insurance premiums for citizens;
- devise legislative solutions to strengthen floodplain and emergency management within the State of Texas; and
- develop and implement comprehensive, all-hazards mitigation plan update for the TCRFC, all community members of the TCRFC and the LCRA as both the LCRA and TCRFC are participating in this Plan Update.

The overarching Mission Statement for the Update is, "*Maintaining a Disaster-Resistant Basin in order to better protect people and property in the Texas Colorado River Floodplain Coalition through the development of wise planning, effective administration, and coordinated policies.*"

Authority

The updated Hazard Mitigation Plan will result in the incorporation of newly added jurisdictions to the TCRFC. The Plan will be integrated into the existing Hazard Mitigation Plan for the Lower Colorado River Basin, utilizing a basin-wide approach. The updated plan will reflect conditions that have changed since the completion of the 2004 plan. When complete, the updated plan will comply with all requirements promulgated by the Governor's Division of Emergency Management (GDEM) and all applicable provisions of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390), and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108–264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). It will also comply with FEMA's February 26, 2002 Interim Final Rule ("the Rule") at 44 CFR Part 201 which specifies the criteria for approval of mitigation plans required in Section 322 of the DMA 2000. The updated plan will also be developed in accordance with FEMA's Community Rating System (CRS) Floodplain Management Plan standards and policies.

Summary of Sections

Sections 1 and 2 of the Plan outline the purpose of the TCRFC mitigation plan and the process of development. Section 3 describes the entire region and profiles population, economy and education. Section 4 identifies the people and property at risk, and Section 5 identifies hazards facing the TCRFC, including the process of identification and risk assessment methodologies utilized.

Sections 6 through 18 present information on individual hazards. These hazards appear generally in order of priority based on potential losses in terms of loss of life and property and other community concerns. For each hazard, the plan presents a description of the hazard, a history of historical hazard events, and the results of the vulnerability and risk assessment process.

Section 19 describes the capability assessment, findings and previously implemented mitigation measures. Section 20 presents mitigation goal revisions and objectives. Actions for the Region as a whole are presented in Section 21, while local mitigation actions organized by Region are provided in sections 21 through 25. Section 26 identifies repetitive loss properties and discusses compliance with the National Flood Insurance Program (NFIP).

Appendix A contains resolutions adopting the plan. Appendix B identifies the Advisory Committee and all members of the Planning Team. Public survey results are analyzed in Appendix C. Appendix D lists grant funding opportunities for state and federal programs. Appendix E contains documentation of meetings in the form of sign-in sheets. Appendix F contains a detailed list of

critical facilities, and Appendix G lists toxic sites for the area[4]. Appendix H contains Flood Mitigation Plans for Matagorda and Wharton County and their respective, incorporated cities.

[4] For privacy concerns, Appendix F and Appendix G will not be made available to the general public.

Section 2 – Planning Process

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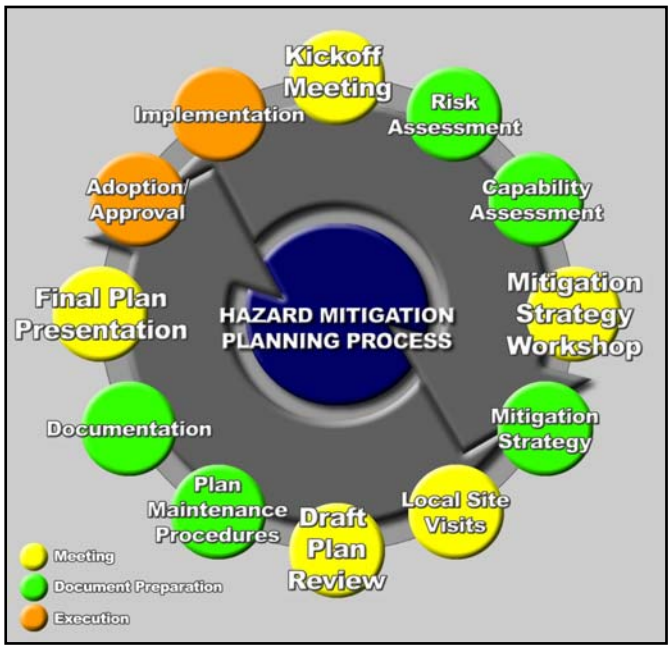
Plan Preparation and Development

Mitigation planning involves bringing together multiple components and players to create a more disaster-resistant community. This section provides an overview of the planning process, highlighting key steps as well as providing a detailed description of how stakeholders and the public were involved.

Figure 2-1. Mitigation Planning Process



Overview of the Plan Update

The Texas Colorado River Floodplain Coalition received funding under the Hazard Mitigation Grant Program to complete an update for their 2004 Plan, "*Creating a Disaster Resistant Lower Colorado River Basin.*" The purpose of this update is dual; to meet FEMA's requirement to provide updated hazard mitigation plans every five (5) years and include 13 new communities in the plan[1]. The grant funding was designated for major disaster declaration for flooding, FEMA-1709-DR.

Although many of the natural and man-caused disasters that affect the TCRFC Regions are the same for the 2004 Plan, an update is necessary to take into account all modified or revised data from the past five years, including changing demographics and mitigation strategies. This 2009 Multi-Jurisdictional Hazard Mitigation Action Plan Update began when the TCRFC received an award letter for their HMGP grant in March, 2008 and reflects current local conditions as well as newly established mitigation goals and objectives.

The TCRFC prepared the update with technical support from the LCRA and the outside consultant team of H2O Partners, Inc. and PBS&J[2]. The TCRFC and LCRA are both participating in the Plan Update in addition to the member communities listed in Table 1-3 in Section 1. In developing the plan the consultant team used the new July 2008 "*Local Multi-Hazard Mitigation Planning Guidance*" to exceed the Interim Final Rule for Local Mitigation Planning found in 44 CFR 201.6. A Local Mitigation Plan Crosswalk provides a detailed summary of FEMA's current minimum standards of acceptability for compliance with the Disaster Mitigation Act (DMA) 2000. This Crosswalk provides locations where requirements are met in the plan update.

[1] For a listing of new communities joining, please see Table 1-2 in Section 1.

[2] PBS&J is a subcontractor to H2O Partners for this planning effort.

According to 44 CFR §201.6(d)(3), the updated plan must contain a description of the process used to revise each section of the plan. The Advisory Committee, composed of TCRFC and LCRA staff, and the consultant team met in August and September 2008 to review the 2004 Plan. At these meetings the Committee determined that each section of the 2004 Plan should be revised.

At the workshops held throughout the planning process described herein, the following factors were taken into consideration when reviewing and updating the 2004 Plan:

- Whether the goals address current and expected conditions;
- If the nature/magnitude of risks have changed;
- If there are current resources appropriate for implementing the Plan;
- Whether implementation problems, such as technical, political, legal or coordination issues hinder development;
- If outcomes have occurred as expected; and
- How communities, agencies and partners participated in the implementation process.

Planning Team

Soon after the grant award, the Advisory Committee was established. The group, composed of members of the TCRFC and LCRA (both participating in the Plan Update), met with H2O Partners on April 4, 2008 to discuss strategy for community participation, stakeholder groups that should be included in the planning process, the prospective date of the first planning workshop and a timeline for the plan update. The regional Advisory Committee was joined by several key representatives from each jurisdiction in order to make up the Planning Team. Since the 2004 Plan, many communities have new positions or representatives, but some members identified in the 2004 Plan participated in the plan update process. These planning team members as well as the regional Advisory Committee can be found in Appendix B.

Planning Team Members at a Kickoff Workshop for Region III in Marble Falls, TX July 17, 2008

Some of the responsibilities of the Planning Team included: providing input regarding the identification of hazards, revising mitigation goals to reflect modified conditions, and developing new mitigation strategies. Each planning team member is also responsible for

ensuring that their jurisdiction formally adopts the plan update pending FEMA approval. Representatives from each jurisdiction were chosen based on their role in the community. Generally, members' experience and background include emergency service and support, administrative, and decision-making personnel in the community. These key positions may extend to and include those individuals involved in code enforcement, floodplain management, building inspections, planning and development, utility services, road and bridge, permitting, and public works. Many times these roles overlap and stakeholders are tasked with more than one of the above-mentioned duties, particularly in smaller jurisdictions. These ancillary roles are critical to the planning process since these individuals interface directly with residents, through permitting or utility customer service, for example, affording the opportunity to assess problems and needs as a result of natural hazards affecting the community.

Planning Process

The process used to prepare this Plan included four (4) major steps that were applied and completed over the course of approximately twelve months beginning in April 2008. Each of these planning steps resulted in critical work products and outcomes that collectively make up the updated plan.

Kickoff Workshop

The initial Kickoff Meeting was held during the Coalition's annual Spring Meeting on April 14, 2008. The TCRFC hosts meetings every fall and spring for all member communities, with members of LCRA present. This initial meeting was an opportunity to inform participating communities about the planning process with their distinct roles and responsibilities, but also to involve stakeholder groups such as the Texas Water Development Board, Texas Association of Counties and the National Weather Service. In addition to the Kickoff presentation, all communities present received presentation folders with the following information:

- background paperwork about the plan update;
- public participation survey for distribution; and
- capability assessment survey for completion

After this initial kickoff meeting, participation letters were sent out to each jurisdiction to ensure that all communities that wished to be included in the planning effort received an opportunity to be involved. As there were a number of communities unable to attend the initial workshop, a series of preliminary workshops were conducted in each TCRFC Region in July. Table 2-1 on the following page outlines the date and location for each of these workshops. A public meeting was held after each workshop[3].

[3] Sign in sheets for all workshops and public meetings are included in Appendix E.

Table 2-1. Kickoff Workshops

Date	Location	Region
April 16, 2008	Austin, TX	All Regions (TCRFC Spring Meeting)
July 17, 2008	Wharton, TX	Region I
July 17, 2008	Marble Falls, TX	Region III
July 18, 2008	Brady, TX	Region IV
July 21, 2008	Giddings, TX	Region II

Hazard Identification

The Advisory Committee met on August 26, 2008 to conduct preliminary hazard identification. At this meeting, the group reviewed and considered a full range of natural and man-caused hazards, then narrowed the list to significant hazards by reviewing the 2004 Plan, the State of Texas Hazard Mitigation Plan, and initial results from reputable sources such as federal and state agencies[4]. Based on this initial analysis, the team identified a total of thirteen (13) natural and man-caused hazards that could affect the TCRFC area.

Winter Fog on the Colorado River - Bastrop County
Billy Moore, LCRA ©

A hazard questionnaire was formed and distributed to each participating jurisdiction. This hazard questionnaire identified each hazard selected by the Advisory Committee

[4] For detailed information regarding the hazard identification process, please see Section 5.

along with hazards that were initially considered and the reason why these hazards were not identified as significant. Participating jurisdictions were asked to provide input regarding the hazard selection to determine whether they concur with the decisions made and how their risks vary from other communities and the region as a whole.

Risk Assessment

An initial risk assessment for the TCRFC was completed in November of 2008, with the final product produced in March 2009. The results of the assessment were presented at workshops in each TCRFC Region. Please see Table 2-2 for a list of dates and locations for each workshop. Participants and stakeholder groups were invited to all Risk Assessment Workshops, and meetings were held for the general public following each workshop. At these workshops, the characteristics and consequences of each hazard were evaluated to determine how much of the area would be affected, in terms of potential danger to property and citizens.

Potential dollar losses from each hazard were estimated, using the Federal Emergency Management Agency's Hazards U.S. (HAZUS) Multi-Hazards (MH) Model (HAZUS-MH) and other HAZUS-like modeling techniques. The assessments examined the impact of various hazards on the built environment, including on general building stock (e.g., residential, commercial, industrial), critical facilities, lifelines, and infrastructure. The resulting risk assessment profiled hazard events, provided information on previous occurrences, estimated probability of future events, and detailed the spatial extent and magnitude of impact on people and property. Each jurisdiction was also given a risk ranking sheet at the Risk Assessment Workshops in order to reflect unique and varied risks among jurisdictions. Participants ranked hazards in terms of the probability or frequency of occurrence, extent of spatial impact, and magnitude of impact. In conjunction with completing the risk ranking sheet, participants in each region of the Basin participated in a group exercise that involved writing down top hazards they felt were the most significant in terms of affecting their community. These were placed in a comment box and read to the group at the end of the meeting. The exercise provided an interesting contrast to hazard ranking statistics and engineering profiling provided by HAZUS-MH in conjunction with Plan development.

TEXAS COLORADO RIVER FLOODPLAIN COALITION

Hazard Ranking by Jurisdiction

Contact Information

Name: _____

Title: _____

Jurisdiction: _____

Phone: _____

Email: _____

Please indicate the level of risk for your jurisdiction for each hazard by placing a check mark in the appropriate column and row. Please refer to the "Hazard Definitions" page and the "Hazard Identification Questionnaire" and spreadsheet for guidance.

Hazard	Not Applicable (N/A)	Very Low (VL)	Low (L)	Moderate (M)	High (H)
Avalanche					
Coastal Erosion					
Dam Failure					
Drought					
Earthquake					
Expansive Soils					
Extreme Heat					

Each Community filled out a Hazard Ranking Sheet
Results were included in Section 5 – Table 5-4

The assessments were also used to set priorities for mitigation based on potential dollar losses and loss of lives. A hazard profile and vulnerability analysis for each of the 13 hazards can be found in Sections 6 through 18 in this Plan Update.

Table 2-2. Risk Assessment Workshops

Date	Location	Region
November 10, 2008	San Saba, TX	Region IV
November 12, 2008	Wharton, TX	Region I
November 12, 2008	Marble Falls, TX	Region III
November 13, 2008	Austin, TX	Region II

At the Region IV workshop in San Saba, participants expressed concern regarding the location of critical facilities. Team members from Mills County discussed the hazard of lightning and any previous occurrences. The importance of the National Flood Insurance Program (NFIP) was brought up by San Saba County and the City of San Saba. A discussion ensued concerning the importance of flood insurance. The City of Brownwood brought up issues concerning critical facility data and corrections were pointed out among the group for historical occurrences and dollar losses, which were incorporated into the risk assessment. At the Region III Workshop in Marble Falls, the City of Horseshoe Bay questioned population statistics and how the data for the risk assessment was compiled. Members from Mason County and the City of Marble Falls separated into groups for an in-depth discussion of ranking hazards. Wharton and Matagorda counties brought up the impact from hurricane, and the resulting losses from floods at the Region I Workshop. Participants brought up possible mitigation actions and began thinking of ways to address their highest-ranking hazards. The Region I Workshop in Austin held at LCRA headquarters provided an opportunity for stakeholders to ask questions regarding data. Bastrop County and the City of Bastrop requested clarification regarding oil and gas pipelines, and a narrative statement was incorporated into the document. The City of Cedar Park brought up the implications of terrorism although a previous occurrence had not occurred for the area. As with the previous workshops, team members separated into groups to rank hazards according to frequency and impact.

Mitigation Review and Development

The mitigation strategy development for the plan update involved revising mitigation goals included in the 2004 Plan, providing analyses for past actions, and developing new mitigation actions. Four Mitigation Workshops were held in each TCRFC Region in December, 2008. As with the Risk Assessment Workshops, stakeholder groups were invited to the workshops and public meetings were held at 5:30 p.m. after each workshop. A listing of the dates and location for each workshop can be found in Table 2-3 below. Documentation for workshops and meetings is found in Appendix E.

At the Mitigation Workshops, after an initial presentation regarding types and examples of actions and the importance of mitigation planning, participants, including members from LCRA and the TCRFC Board, were asked to review the mitigation goals and objectives from the 2004 Plan and determine what changes, if any, should be made. At each workshop the consensus among participants was not only to retain mitigation goals or objectives, but reorder the primary three goals, so that protecting life and property are the first two goals, followed by increasing public understanding. For a detailed review of the mitigation goals and objectives please see Section 20.

Participants also formed groups of bordering communities at each regional workshop to discuss and develop new actions for the plan update. Each participant received a copy of their mitigation actions submitted for the 2004 Plan, and provided an analysis as to whether each action should be deleted, had been completed, or should be deferred for the Plan Update.

Following the development of mitigation actions, communities were also asked to review procedures for keeping the plan up to date and devise strategies for plan maintenance.

Table 2-3. Mitigation Strategy Workshops

Date	Location	Region
December 02, 2008	Austin, TX	Region II
December 03, 2008	Marble Falls, TX	Region III
December 04, 2008	San Saba, TX	Region IV
December 08, 2008	Wharton, TX	Region I

An inclusive and structured process was used to develop and prioritize new mitigation actions for this plan update. It included the following steps:

- Review of the vision statement, mitigation goals, and objectives from the 2004 Plan.
- A "menu" of optional mitigation actions was developed based on plan reviews, studies, and interviews with Federal, state and local officials. The participants reviewed the optional mitigation actions and narrowed the list down to those that were most applicable to their area of responsibility, most cost-effective in reducing risk, could be implemented easily, and would be likely to receive institutional and community support.
- Potential Federal and State funding sources to assist implementing proposed actions were inventoried. Information was collected including the program name authority, purpose of the program, types of assistance and eligible projects, conditions on funding, types of hazards covered, matching requirements, application deadlines, and a point of contact. The information appears in the Funding Guide presented in Appendix D.
- Mitigation Planning Team members considered benefits that would result from the mitigation actions versus the cost of those projects. Detailed cost-benefit analyses were beyond the scope of this plan. However, economic evaluation was one factor that helped Team members select one mitigation action from competing actions.

Team members then selected and prioritized mitigation actions. Each Team member evaluated the mitigation action of their own jurisdiction as well as the Regional Mitigation Actions found in Section 21. The prioritization method was based on FEMA's STAPLE+E criteria and included social, technical, administrative, political, legal, economic and environmental considerations. As a result of this exercise, an overall priority was assigned to each mitigation action by each Team member. The overall priority of each action is reflected in the mitigation actions found in Sections 21 to 25.

Screenshot: www.tcrfc.org
Sections of Draft Plan Available for Comment.

Team members developed action plans identifying proposed actions, costs and benefits, the responsible organization(s), effects on new and existing buildings, implementation schedule, priority, and potential funding sources.

Finally, the draft of the Plan Update was made available on the TCRFC website for review and comment on May 15, 2009. A copy of the Plan was made available by Team Members for public inspection, review and comment within each jurisdiction. A copy of the resolution adopting the Plan is presented in Appendix A.

Review and Incorporation of Existing Plans

A variety of existing studies, plans, reports, and technical information were reviewed as part of the planning process. Sources of the information included FEMA, the United States Army Corps of Engineers (USACE), the U.S. Fire Administration, NOAA, the Texas Water Development Board, the TCEQ, the State Comptroller, the Texas State Data Center, Texas Forest Service, the Governor's Division of Emergency Management, and local hazard assessments and plans.

Section 5 and the hazard-specific sections of the Plan (Sections 6-18) summarize the findings from these information sources. Some of these documents, including those from FEMA, provided information on risk, existing mitigation actions currently underway, and ideas for possible future mitigation actions. Other documents, including those from NOAA, provided histories of disasters in the area. The USACE studies were reviewed for their assessment of risk and potential projects in the region. The Water Development Board studies were reviewed for population and other projections and for flood-related grant funding. The State Comptroller materials were reviewed for regional economic projections. State Data Center documents were used to obtain population projections. Materials from FEMA and the Governor's Division of Emergency Management were reviewed for guidance on plan development requirements. Communities included actions from other plans, such as Floodplain Management Plans, in developing actions, and Wharton County's Flood Mitigation Plan has been incorporated into this Update as Appendix H.

Process of Incorporation

Participating jurisdictions will integrate implementation of their mitigation action plans with other existing jurisdiction plans such as capital improvement, comprehensive, land use, design and construction standards, and emergency management plans. Any planning efforts by regional entities are also included. Each participating jurisdiction will review their existing plans in light of the Hazard Mitigation Action Plan and incorporate any mitigation policies and actions into these plans, as appropriate. The jurisdictions will ensure that the actions in the mitigation plans are reflected in other planning efforts. These other efforts will be used to advance mitigation strategies in participating jurisdictions.

Upon formal adoption of the updated plan, Team members will work to integrate the hazard mitigation strategies into existing plans as listed in Section 18. Participating jurisdictions will conduct periodic reviews of plans and policies and analyze the need for amendments in light of the approved hazard mitigation plan. Participating jurisdictions will ensure that future capital improvement planning will be consistent with the goals of this hazard mitigation plan to reduce the

long-term risk to life and property from all hazards by annually reviewing active plans for consistency.

Each jurisdiction is responsible for approving their respective annual budget, whether it is through commissioner's court for a county or by city council. The Planning Team member or responsible party designated in the adoption process of this plan update will discuss with their respective council or commissioner's court potential funding sources for mitigation actions during annual budget planning and approval process, thereby taking into consideration proposed funding sources for mitigation actions.

Incorporated Strategies

Coalition jurisdictions have worked to integrate the hazard mitigation strategies into existing plans as listed in Section 19 – Capability Assessment. Participating team members conducted periodic reviews of plans and policies and analyzed the need for amendments in light of the approved 2004 Plan. Specifically strategies were incorporated into the following planning mechanisms:

- Grant Applications: Communities reviewed mitigation actions included in the 2004 when developing grant applications. The Coalition reviewed the funding guide included in the 2004 Plan in preparation for the Plan Update. In addition Burnet County added an action after the torrential flooding of 2007 for the replacement of culverts in county roads. Following the submission of this action, an HMGP grant application was prepared for the County.

- Emergency Management/Operation Plans: While almost all of the participating jurisdictions from the 2004 Plan had an emergency operations or management plan in place at the time of planning, the mitigation plan was reviewed when updates or revisions were made to these plans. Fayette County utilized a mitigation strategy from the 2004 Plan in order to solicit funding for an area-wide Emergency Notification System and to improve emergency communication.

- Code Review/Inspections/Ordinances: Communities included actions in the 2004 Plan (See Sections 21-25) for the continual review and update of building codes, including setting higher standards. The majority of these actions have been deferred as they are ongoing activities.

- Flood Mitigation Plans and Drainage Plans: Matagorda and Wharton County have developed flood mitigation plans for their respective communities (See Appendix H). In preparing flood mitigation actions and a flood risk study, the 2004 Plan was reviewed and studied at length in order to incorporate mitigation strategies into the flood plans. The City of El Campo utilized the mitigation action from the 2004 Plan in developing their Master Drainage Plan, which has almost been completed (See Past Action 5, Section 22, page 218).

Public and Stakeholder Involvement

An important component of mitigation planning is public participation and stakeholder involvement. Input from individual citizens and the community as a whole provides the planning team with a greater understanding of local concerns and increases the likelihood of successfully implemented mitigation actions. If citizens and stakeholders, such as local businesses, non-profits, hospitals and schools, are involved, they are more likely to gain a greater appreciation of the hazards present in their community and take steps to reduce their impact.

THE HAZARD IDENTIFICATION PROCESS IS NOT COMPLETE WITHOUT YOUR FEEDBACK!

THE PUBLIC IS INVITED AND ENCOURAGED TO ATTEND.

WHAT: HAZARD MITIGATION PLAN UPDATE

WHEN: NOVEMBER 12, 2008
5:30–6:30 P.M.

WHERE: CANEY CHURCH
118 MILAM STREET
WHARTON, TX 77488

WHY: THE PUBLIC'S INPUT IS CRUCIAL

The Texas Colorado River Floodplain Coalition (TCRFC or Coalition) will hold the second in a series of public meetings as part of the Coalition's ongoing efforts to update the 2004 Hazard Mitigation Plan. The purpose of this open meeting is to update the community on our progress in developing the plan and to solicit information that can help the project team in identifying and analyzing hazards affecting residents of the participating jurisdictions and in recommending possible actions that can be taken to reduce the impact of those hazards.

To find out more information about this initiative or if you cannot attend the public meeting, information about the planning process and a public participation survey are available at www.tcrfc.org

TEXAS COLORADO RIVER FLOODPLAIN COALITION

Public Meeting Flyer – Region I
Nov. 12, 2008

Public Participation

Public involvement in the development of the Coalition's Hazard Mitigation Plan Update was sought at three separate periods of the planning process: (1) during the immediate beginning of the planning process, (2) during the drafting stage of the Plan, and (3) upon completion of a final draft Plan but prior to official plan approval and adoption. Public input was sought using three methods: (1) open public meetings, (2) survey instruments, and (3) making copies of draft Plan deliverables available for public review on the Coalition's website as well as government offices and public libraries.

Two series of open public meetings were held during the development of this Plan, as described below. Sign-in sheets from public meetings and workshops can be found in Appendix E.

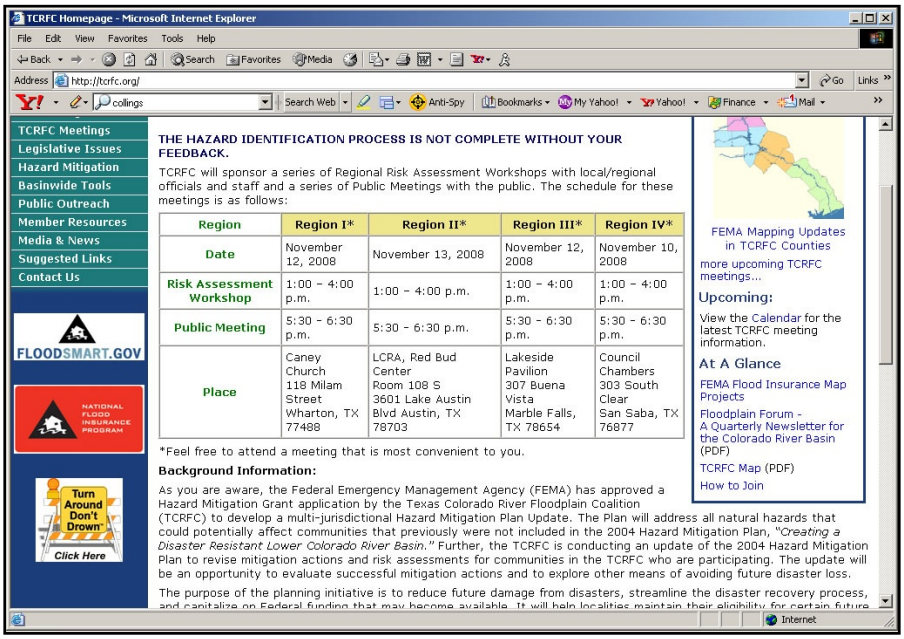
First Series of Public Meetings

The first series of open public meetings were held after the Regional Kickoff Workshops in July of 2008. The meetings were advertised through a variety of means including newspaper ads, flyers at meeting locations, notices on the TCRFC website, and invitations sent to TCRFC's e-mail distribution list of community members.

Although attendance was low, members of the general public did attend each of the public meetings held following the kickoff presentation. At this time the consultant team introduced themselves and described the purpose of the plan update and the planning process as a whole. Public surveys were distributed and attendees were asked to sign in so that they could be invited to future public meetings.

Second Series of Public Meetings

The second series of open public meetings were held after the Regional Risk Assessment Workshops in November of 2008. As with the initial public meetings, this second round of meetings were advertised through local newspaper ads, flyers at meeting locations, notices on the TCRFC website, and invitations sent to TCRFC's e-mail distribution list of community members. In addition, members of the public who attended the first series of public meetings were also invited and encouraged to attend.

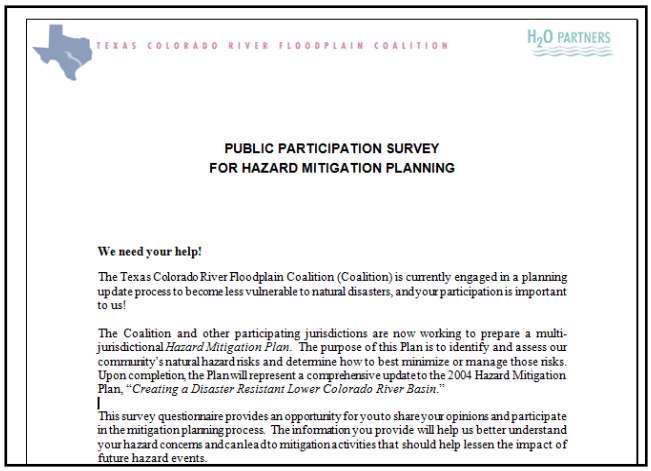


Screenshot: www.tcrfc.org
Announcement for Risk Assessment Workshops and Second Series of Public

Attendance varied for the second series of meetings with Region IV receiving the largest amount of attendance. For this series of meetings, the consultant team provided an update on the planning process and surveys collected. As surveys were still being processed, a detailed analysis of results could not be presented at this time. The upcoming mitigation workshops were discussed, and in Region IV several members of the community expressed an interest in developing mitigation plans. Members of the public interested in participating in the process were instructed to forward any ideas for mitigation to their local planning team member.

Public Participation Survey

In addition to the open public meetings, the TCRFC was able to get input from citizens and stakeholders through the use of a public participation survey. This survey was designed to obtain data and information from residents of each of the TCRFC Regions.



Front Page of Public Participation Survey

Copies of the Public Participation Survey were distributed by local officials and made available for citizens to download from the TCRFC website. A total of 293 responses to the survey were

submitted, which provided valuable input for the TCRFC to further consider in developing the plan update. A summary of the survey findings is provided in Appendix C.

Stakeholder Involvement

Stakeholders provide an essential service in hazard mitigation planning; therefore, throughout the planning process, members of state and federal agencies, non-profit and community groups, local businesses, schools and academia, and hospitals were invited to workshops held in each of the four TCRFC Regions. State and federal agencies and local businesses were invited to workshops throughout the planning process. These groups are depicted in Table 2-4. Sign in sheets are found in Appendix E.

Table 2-4. Stakeholder Invitees

State Agencies/Govt. Units	Federal Agencies	Businesses	Non-Profit Groups	Academia
Capital Area Council of Governments	Department of Homeland Security	CivilTech Engineering, Inc.	American Red Cross	University of Texas at Austin
Governor's Division of Emergency Management	National Oceanic and Atmospheric Administration	Grounds Anderson, LLC	Save Our Springs Alliance	Austin Community College
North Central Texas Council of Governments	National Weather Service	Halff Associates, Inc.	Hill Country Community Foundation	Wharton County Junior College
Office of Rural and Community Affairs	U.S. Army Corps of Engineers	Hyatt Hotels & Resorts	Farmers Mutual Insurance Association	Texas State Technical College
Texas Association of Counties	U.S. Fish & Wildlife	Lake Austin Spa & Resort	Rotary International	
Texas Department of Insurance		Michael Baker Corporation		
Texas Forest Service		Stanberry & Associates		
Texas Legislature		Sutron Hydrologic, Meteorologic & Oceanic Real-Time Data Collection		
Texas Water Development Board		Wallingford Software, Inc.		
Texas Windstorm		Watershed		

State Agencies/Govt. Units	Federal Agencies	Businesses	Non-Profit Groups	Academia
Association		Concepts		

Presentations were also given to individual stakeholder groups as outlined in Table 2-5.

Table 2-5. Stakeholder Meetings

Stakeholder Group	Date
Homeland Security Task Force (CAPCOG)	June 5, 2008
Llano and San Saba River Advisory Panel	July 18, 2008
Colorado, Wharton and Matagorda Lower Basin Panel Meeting	August 11, 2008
Buchanan and Inks Lake Advisory Panel	August 25, 2008
Pedernales River Advisory Panel	August 26, 2008
Austin and Travis Lake Advisory Panel Meeting	August 26, 2008

Plan Maintenance Procedures

The following is an explanation of how the participating jurisdictions in the TCRFC, the TCRFC Board and the LCRA will implement the updated plan, and continue to evaluate and enhance it over time. Continual public involvement is also addressed. The sustained hazard mitigation planning process consists of three main parts:

- Implementation
- Monitoring and Evaluation
- Continued Public Involvement

Members of the Llano and San Saba River Advisory Panel Stakeholder Meeting: July 18, 2008

Implementation

Each participating jurisdiction and designated department within the TCRFC and LCRA will be responsible for further development and/or implementation of mitigation action plans. Each action has been assigned to a specific organization within the jurisdiction.

The potential funding sources listed for each identified action may be used when the jurisdiction begins to seek funds to implement actions. An implementation time period or a specific implementation date has been assigned to each action as an incentive for completing each task and gauge whether actions are implemented in a timely manner.

Monitoring and Evaluation

Periodic revisions of the updated plan are required to ensure that the goals, objectives, and mitigation action plans are kept current. More important, revisions may be necessary to ensure that the updated plan is in full compliance with Federal regulations and State statutes. This portion outlines the procedures for completing such revisions and updates.

Monitoring

Designated Hazard Mitigation Team Members (see Appendix B) are responsible for yearly monitoring of components of the hazard mitigation plan that pertain to their jurisdiction. Each community, the TCRFC and LCRA shall have one department or office designated to adopt the plan. The person that holds this title shall be responsible for monitoring the plan by providing yearly updates to their respective jurisdiction regarding the implementation of any mitigation actions or any meetings held to discuss the mitigation action plan.

Evaluation

As part of the evaluation process, Team members will assess any changes in risk, determine whether implementation of mitigation actions is on schedule or if there are any implementation problems (such as technical, political, legal or coordination issues), and reflect changes in land development or programs that affect mitigation priorities in their respective jurisdictions.

On an annual basis, Team members will identify any needed changes in the updated plan based upon their evaluation activities. This yearly evaluation process will help determine if any further updates are necessary.

Plan Amendments

At any time, minor technical changes may be made to the plan to keep it updated. However, any material changes in the overall direction of the plan or the policies contained within it must be subject to formal adoption by the Governing Bodies of participating jurisdictions. Any amendment to the plan must undergo an open public process. Participating jurisdictions, the TCRFC and LCRA

will seek public input on any material change to the plan during a formal review and comment period of not less than 30 days.

At the end of the comment period, the proposed amendment and all comments will be forwarded to the Governing Bodies of each participating jurisdiction. If no comments are received from the reviewing parties within the specified review period, this will also be noted. The Governing Bodies will then review the proposed amendment and comments received and vote to accept, reject, or amend the proposed change. Upon ratification, the amendment will be transmitted to the Texas Division of Emergency Management.

In determining whether to recommend approval or denial of a plan amendment request, the following factors will be considered:

- Errors or omissions made in the identification of issues or needs during the preparation of the plan;
- New issues or needs that were not adequately addressed in the plan; and
- Changes in information, data, or assumptions from those on which the plan was based.

Five (5) Year Review

The Plan will be thoroughly reviewed by the Planning Team every five years to determine whether there have been any significant changes in the area that may necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, an increased exposure to hazards, disaster declarations, the increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the content of the updated plan.

The plan review provides the TCRFC, LCRA and local officials with an opportunity to evaluate those actions that have been successful and to explore documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned.

Following the five-year review, any revisions deemed necessary will be summarized and utilized according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the revised plan will be submitted to the Governor's Division of Emergency Management for final review and approval in coordination with FEMA.

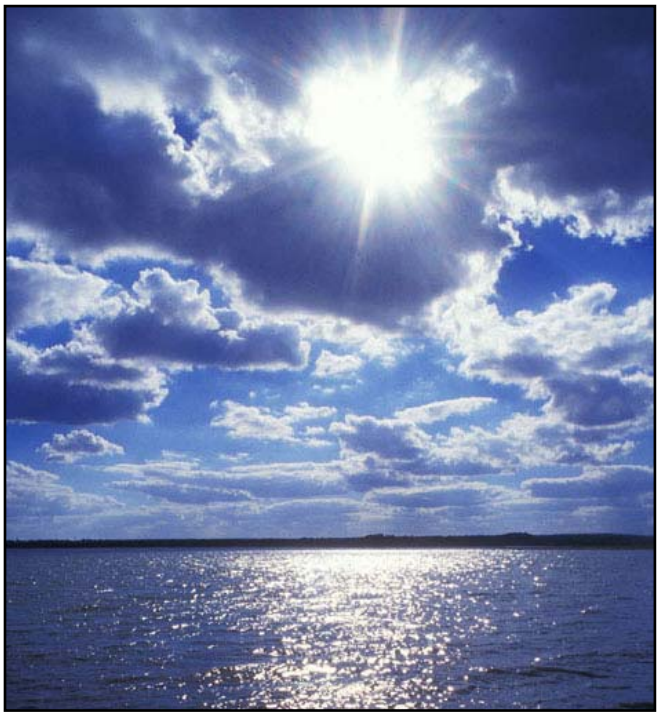
Continued Public Involvement

The TCRFC and LCRA have maintained public involvement since FEMA approval of the 2004 Plan in a variety of ways. The Coalition implemented a public education campaign that detailed the

natural and man-caused or technological threats included in the 2004 Plan, informing the public about hazards and steps to take in preparation for a hazard event. Specific activities conducted over the last five years for the TCRFC and LCRA include:

- Developing and implementing a campaign regarding extreme heat and drought safety.
- Working with TxDOT, DPS and county emergency services for member jurisdictions to ensure the public is notified of available contra-flow routes in disaster events, including hurricane, terrorism and hazardous materials releases.
- Distributing emergency preparedness kits and educating the public regarding actions to take in preparation of a disaster.
- Implementing an area-wide telephone Emergency Notification System to inform the public regarding actions to take in the event a disaster occurs.
- Educating the public regarding water conservation techniques, including xeriscape plantings.
- Assisting TCRFC communities in achieving designation by the National Weather Service as "Storm Ready" communities.

One of the top hazards facing the Lower Colorado River Basin is flooding. Since 2004, the TCRFC has placed a strong emphasis on implementing a number of flood-related projects and garnering public input on how these projects affect residents living in the Region. As an example, the Coalition facilitated inter-jurisdictional review of basin-wide Federal flood studies to identify projects to achieve flood damage reduction. The Coalition also obtained public input on the U.S. Corp of Engineers Lower Colorado River Basin study to analyze the potential impact of each flood-reduction alternative on local jurisdictions. Additional public education programs included:



Lake Travis
Billy Moore, LCRA ©

- Conducting a community education and outreach program on availability of flood insurance through the "Cover the Basin" campaign.
- Purchasing and installing "Turn Around, Don't Drown" signs at 200 area low-water crossings.
- Educating the public about the dangers of low-water crossings and mitigation activities as part of the Texas Flash Flood Alley War Council.
- Purchasing and making available NOAA "All Hazards" radios for early flood warning and post-disaster event information.

Throughout the past five years, the Coalition has also kept the 2004 Plan available on their website for download for citizens.

Input from the public was also an integral part of the preparation of this updated plan and will continue to be essential as the plan grows and changes. As noted above, a significant change to this plan will require opportunities for the public to make its views known.

This plan will be posted on the TCRFC website, www.tcrfc.org, where officials and the public are invited to provide ongoing feedback. Copies of the updated plan also will be kept for public review in the offices of each participating jurisdiction.

Further, if necessary, the TCRFC can designate voluntary citizens or willing members of the private sectors as members of the Planning Team as well as utilize local media to direct the public to the TCRFC website and notify the public of any maintenance or periodic review activities taking place.

Section 3 – Regional Profile

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Travis County 40

Wharton County 42

Williamson County 44

Overview

The Texas Colorado River Floodplain Coalition covers an 18-county[1] area along the Colorado River. Each of these counties is also part of the Lower Colorado River Authority's statutory district. The Colorado River extends for over 600 miles, but the specific areas discussed in this Plan cover only the participating TCRFC jurisdictions that span from the Gulf Coast in Matagorda County to the City of Brownwood in Brown County.

Though the area is diverse, each community faces the natural and man-caused hazards discussed in Sections 6-18. This section looks at a general profile of the region as a whole, providing data where available for each jurisdiction, but otherwise by county, including individual profiles of each county. The topics discussed in this section include:

- Population and Demographics;
- Land Use;
- Lakes and Dams; and
- Economy and Industry

Pedernales River
Billy Moore, LCRA ©

Population and Demographics

The 2000 Census population for the sixty-one (61) jurisdictions[2] in the planning area is depicted in Table 3-1 below.

Williamson County growth for the planning area can be attributed to the cities of Cedar Park and Hutto. According to the Texas State Demographer, both Cedar Park and Hutto have more than doubled in population from 2000 to the estimated population for 2008 (See Table 3-1).

Estimated population development from 2010 to 2040 is shown by county in Table 3-2. The largest amounts of growth are predicted for Bastrop, Travis and Williamson counties. The growth in Travis County is mainly due to the impact of the City of Austin. Although the City of Austin is a member of the Coalition, the City is developing their own update separate from this Plan. Even though the

[1] Not all counties in the TCRFC are participating in the HMAP Update. For a full list see Section 1, Table 1-3
[2] Although there are 61 communities a total of 63 planning participants are included as the TCRFC and LCRA are also participating in the Plan Update.

TCRFC and LCRA are participating in this effort, population and demographic information is listed for communities as the TCRFC and LCRA are made up of the participating communities described herein.

Table 3-1. Population for 2000 and Estimates for 2007 and 2008

County	Participating Jurisdiction	Population		
		2000	2007 Estimate	2008 Projection
Bastrop County	Bastrop County	57,733	72,320	72,620
	Bastrop	5,933	8,261	8,359
	Elgin	6,063	8,951	9,133
	Smithville	4,383	4,770	4,953
Blanco County	Blanco County	8,418	9,407	9,420
	Johnson City	1,247	1,496	1,502
Brown County	Brownwood	19,091	19,706	19,565
Burnet County	Burnet County	34,147	42,472	43,433
	Bertram	1,000	1,370	1,369
	Burnet	4,755	5,812	5,907
	Cottonwood Shores	704	1,107	1,118
	Granite Shoals	2,303	2,476	2,532
	Highland Haven	453	549	592
	Marble Falls	5,070	6,859	7,038
	Meadowlakes	1,278	1,855	1,972
Colorado County	Colorado County	20,390	21,691	21,725
	Columbus	3,506	3,928	3,903
	Eagle Lake	3,453	3,612	3,626
	Weimar	1,965	2,069	2,073
Fayette County	Fayette County	21,804	23,943	24,037
	Carmine	184	239	238
	Flatonia	1,377	1,434	1,436
	La Grange	4,456	4,830	4,841
Lampasas County	Lampasas County	17,762	20,860	21,062
	Kempner	970	1,127	1,143
	Lampasas	6,818	7,964	8,031
	Lometa	767	865	871
Lee County	Lee County	15,657	17,188	17,391
	Giddings	1,166	5,681	5743

County	Participating Jurisdiction	Population		
		2000	2007 Estimate	2008 Projection
	Lexington	5,103	1,323	1,334
Llano County	Llano County	17,044	19,127	19,220
	Horseshoe Bay	2,648	3,517	3,567
	Llano	3,311	3,826	3,840
	Sunrise Beach Village	704	773	790
Mason County	Mason County	3,738	3,689	3,676
	Mason	2,103	2,162	2,168
Matagorda County	Matagorda County	37,957	36,923	36,862
	Bay City	18,709	18,372	18,520
	Palacios	4,819	5,183	5,174
McCulloch County	Brady	5,308	5,516	5,519
Mills County	Mills County	5,151	5,221	5,213
	Goldthwaite	1,795	1,809	1,794
San Saba County	San Saba County	6,186	6,074	6,062
	San Saba	2,498	2,678	2,706
Travis County	Briarcliff	862	912	919
	Jonestown	1,553	2,355	2,544
	Lago Vista	4,213	6,082	6,328
	Lakeway	8,130	10,551	11,399
	Mustang Ridge	983	982	996
	Point Venture	420	471	473
	San Leanna	384	512	527
	Volente	363	393	398
	West Lake Hills	2,875	3,214	3,259
Wharton County	Wharton County	41,188	42,253	42,262
	East Bernard	1,729	2,227	2,261
	El Campo	10,604	11,113	11,065
	Wharton	8,887	9,312	9,264
Williamson County	Williamson County	249,967	370,616	381,461
	Cedar Park	25,617	51,062	52,809
	Florence	1,054	1,340	1,370
	Hutto	1,134	11,962	13,498
Totals		**731,890**	**944,392**	**962,911**

Source: Texas State Demographer; US Census Bureau. Census 2000

Table 3-2. Population Projections by County 2010-2040

County	Population Projections			
	2010	2020	2030	2040
Bastrop County	76,150	99,329	127,167	159,776
Blanco County	10,042	11,901	13,609	15,051
Brown County	39,836	41,518	42,149	41,959
Burnet County	42,675	52,851	63,445	73,892
Colorado County	21,696	23,113	24,062	24,779
Fayette County	23,335	25,746	27,981	29,919
Lampasas County	20,333	22,995	25,064	26,549
Lee County	18,106	21,069	23,867	26,243
Llano County	16,599	16,137	15,697	15,562
Mason County	3,677	3,596	3,378	3,116
Matagorda County	41,409	44,714	47,060	48,652
McCulloch County	8,441	8,722	8,685	8,484
Mills County	5,283	5,657	5,795	5,860
San Saba County	6,474	6,884	7,210	7,425
Travis County	966,129	1,112,034	1,257,213	1,394,738
Wharton County	44,284	47,377	49,645	50,962
Williamson County	344,667	458,587	599,805	760,632

Source: Texas State Demographer

The population projections in Table 3-2 above are based on a scenario assuming a migration pattern one-half of what the State experienced from 1990 to 2000. This is slow, but steady growth. The reason for using the selected time period rather than 2000 to 2004 or 2004 to 2007 is because of the purpose of this Plan Update. This HMAP Update is to serve as a basis for long-term planning and the further development of mitigation activities. The State of Texas experienced a large economic and population growth from 1990 to 2000, whereas the years between 2000 and 2004 reflected a time of slow job growth. From 2004 to 2007, Hurricane Katrina impacted the population growth for the State. Because many people lost their homes in Katrina, the state experienced an increase in population due to people leaving Louisiana and Mississippi. There is a lack of sufficient historical data to trend migration rates accurately for the years 2000 to 2007.

Ethnicity and Education

Ethnicity and language spoken at home is depicted in Table 3-3 below. Table 3-4 provides information regarding the level of educational attainment for communities as derived from the U.S. Census Bureau where available.

Table 3-3. Race and Language Spoken at Home[3]

County	Community	Race			Lang. Spoken at Home	
		White	Black	Other	English	Other
Bastrop County	Bastrop County	80.2%	8.8%	24.6%	77.7%	16.9%
	Bastrop	72.3%	17.0%	19.5%	83.1%	16.9%
	Elgin	70%	15.5%	47.7%	56.1%	43.9%
	Smithville	78.0%	14.5%	20.80	87.3%	12.7%
Blanco County	Blanco County	91.0%	.7%	23.8%	83.5%	16.5%
	Johnson City	90.7%	0%	29.8%	79.2%	20.8
Brown County	Brownwood	82.7%	5.5%	30.4%	83.3%	16.7%
Burnet County	Burnet County	89.6%	1.5%	22.1%	86.5%	13.5%
	Bertram	88.2%	.9%	31.0%	80.6%	19.4%
	Burnet	83.8%	5.3%	28.5%	85.5%	14.5%
	Cottonwood Shores	88.6%	1.0%	27.7%	83.2%	16.8%
	Granite Shoals	87.5%	1.1%	32.3%	82.6%	17.4%
	Highland Haven	98.0%	0%	5.9%	95.1%	4.9%
	Marble Falls	85.8%	2.5%	32.2%	80.0%	20.%
	Meadowlakes	97.8%	.2%	2.5%	96.2%	3.8%
Colorado County	Colorado County	72.8%	14.8%	30.3	80.1%	19.9%
	Columbus	66.5%	19.9%	28.8%	80.5%	19.5%
	Eagle Lake	52.8%	23.4%	65.4%	60.1%	39.9%
	Weimar	67.9%	21.8%	23.5%	85.1%	14.9%
Fayette County	Fayette County	84.6%	7.0%	20.2%	79.7%	20.3%
	Carmine	90.4%	1.8%	17.9%	79.3%	20.7%
	Flatonia	74.7%	7.5%	53.9%	59.2%	40.8%
	La Grange	74.3%	10.4%	34.2%	75.8%	24.2%

[3] 2000 U.S. Census. Adds to more than 100% because some individuals indicate more than one race.

County	Community	Race			Lang. Spoken at Home	
		White	Black	Other	English	Other
Lampasas County	Lampasas County	86.8%	3.1%	23.2%	84.1%	15.9%
	Kempner	84.9%	6.4%	14.2%	84.2%	15.8%
	Lampasas	84.8%	2.0%	34.6%	79.3%	20.7%
	Lometa	83.1%	2.3%	42.4%	73.1%	26.9%
Lee County	Lee County	76.6%	12.1%	27.8%	79.9%	20.1%
	Giddings	66.0%	13.3%	52.3%	67.5%	32.5%
	Lexington	79.9%	10.9%	17.8%	94.5%	5.5%
Llano County	Llano County	96.3%	.3%	7.7%	93.3%	6.7%
	Horseshoe Bay	96.2%	.3%	6.2%	93.8%	6.2%
	Llano	94.3%	.6%	13.2%	91.2%	8.8%
	Sunrise Beach Village	98.7%	.3%	1.3%	94.9%	5.1%
Mason County	Mason County	91.6%	.1%	27.4%	81.3%	18.7%
	Mason	88.1%	.2%	38.8%	77.6%	22.4%
Matagorda County	Matagorda County	67.8%	12.7%	48.4%	73.4%	23.6%
	Bay City	61.6%	17.3%	53.2%	71.9%	28.1%
	Palacios	57.1%	4.7%	86.4%	50.1%	49.9%
McCulloch County	Brady	81.4%	2.2%	47.2%	75.5%	24.5%
Mills County	Mills County	89.2%	1.3%	21.2%	87.7%	12.3%
	Goldthwaite	87.0%	.4%	29.6%	81.2%	18.8%
San Saba County	San Saba County	84.5%	2.7%	33.2%	80.4%	19.6%
	San Saba	78.5%	.6%	50.6%	69.5%	30.5%
Travis County	Briarcliff	95.3%	.4%	10.1%	86.1%	13.9%
	Jonestown	92.3%	.8%	14.0%	91.2%	8.8%
	Lago Vista	94.0%	.8%	11.4%	90.1%	9.9%
	Lakeway	96.4%	.8%	6.1%	93.1%	6.9%
	Mustang Ridge	67.5%	4.1%	74.5%	54.2%	45.8%
	Point Venture	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
	San Leanna	90.6%	.8%	18.7%	92.4%	7.6
	Volente	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable
	West Lake Hills	95.6%	.3%	6.2%	90.4%	9.6%
Wharton County	Wharton County	69.0%	15.0%	45.7%	73.3%	26.7%
	East Bernard	81.4%	2.7%	41.3%	78.3%	21.7%
	El Campo	69.1%	11.9%	56.0%	67.8%	32.2%
	Wharton	56.3%	26.4%	46.6%	73.3%	26.7%

County	Community	Race			Lang. Spoken at Home	
		White	Black	Other	English	Other
Williamson County	Williamson County	82.4%	5.1%	25.26%	82.8%	17.2%
	Cedar Park	86.4%	3.3%	19.0%	86.8%	13.2%
	Florence	89.3%	.9%	27.9%	85.4%	14.6%
	Hutto	76.5%	5.4%	43.1%	80.4%	19.6%

Source: US Census Bureau. Census 2000

Table 3-4. Education

County	Participating Jurisdiction	H.S. Diploma or Higher	B.A. or Higher
Bastrop County	Bastrop County	76.9%	17.0
	Bastrop	80.7%	26.7%
	Elgin	64.1%	14.7%
	Smithville	74.9%	17.8%
Blanco County	Blanco County	80.6%	22.2%
	Johnson City	74.1%	16.2%
Brown County	Brownwood	72.3%	16.7%
Burnet County	Burnet County	77.8%	17.4%
	Bertram	64.7%	6.3%
	Burnet	67.8%	8.4%
	Cottonwood Shores	71.8%	10.%
	Granite Shoals	73.2%	13.4%
	Highland Haven	92.0%	24.7%
	Marble Falls	77.1%	15.5%
	Meadowlakes	95.0%	43.2%
Colorado County	Colorado County	69.1%	14.4%
	Columbus	66.3%	16.7%
	Eagle Lake	56.7%	10.8%
	Weimar	65.1%	14.8%
Fayette County	Fayette County	71.3%	14.6%
	Carmine	72.5%	18.8%
	Flatonia	52.7%	9.2%
	La Grange	70.1%	12.8%
Lampasas County	Lampasas County	78.8%	16.2%

County	Participating Jurisdiction	H.S. Diploma or Higher	B.A. or Higher
	Kempner	87.5%	9.0%
	Lampasas	69.7%	14.0%
	Lometa	57.3%	11.4%
Lee County	Lee County	71.7%	13.1%
	Giddings	61.1%	10.8%
	Lexington	78.2%	15.1%
Llano County	Llano County	83.5%	21.0%
	Horseshoe Bay	95.0%	41.7%
	Llano	78.7%	17.8%
	Sunrise Beach Village	90.5%	28.4%
Mason County	Mason County	78.1%	18.7%
	Mason	72.1%	13.7%
Matagorda County	Matagorda County	70.3%	12.5%
	Bay City	69.4%	12.4%
	Palacios	57.2%	12.6%
McCulloch County	Brady	66.6%	11.5%
Mills County	Mills County	76.7%	20.2%
	Goldthwaite	71.0%	21.3%
San Saba County	San Saba County	70.0%	15.8%
	San Saba	57.8%	9.5%
Travis County	Briarcliff	95.6%	36.6%
	Jonestown	84.7%	19.1%
	Lago Vista	90.8%	33.2%
	Lakeway	97.8%	56.6%
	Mustang Ridge	62.4%	5.4%
	Point Venture	Unavailable	Unavailable
	San Leanna	92.6%	33.1%
	Volente	Unavailable	Unavailable
	West Lake Hills	98.6%	77.7%
Wharton County	Wharton County	69.8%	14.3%
	East Bernard	78.6%	12.6%
	El Campo	67.3%	14.7%
	Wharton	70.9%	17.6%
Williamson County	Williamson County	88.8%	33.6%
	Cedar Park	93.7%	33.6%

County	Participating Jurisdiction	H.S. Diploma or Higher	B.A. or Higher
	Florence	76.2%	11.4%
	Hutto	84.8%	14.9%

Land Use

The TCRFC covers an expansive area along the Colorado River. The total planning area has increased in size from 14,861.2 square miles in 2004 to 16,568.2 square miles. The total for the updated plan is larger due to the addition of Lee and McCulloch counties[4]. Table 3-5 on the following page displays the total land area per county, and Table 3-6 provides agricultural land use per county. All county information has been updated using the 2007 Census of Agriculture.

Table 3-5. Land Area for Counties in the TCRFC

County	Land Area (sq. mi.)
Blanco	711.3
Brown	956.9
Burnet	1020
Lampasas	713.9
Lee	634
Llano	966.1
Mason	932.2
McCulloch	1073
Mills	749.8
San Saba	1,138.2
Bastrop	895.9
Fayette	950.1
Travis	1,022.1
Williamson	1,124.4

[4] Only the City of Brady in McCulloch County and the City of Brownwood in Brown County are participating.

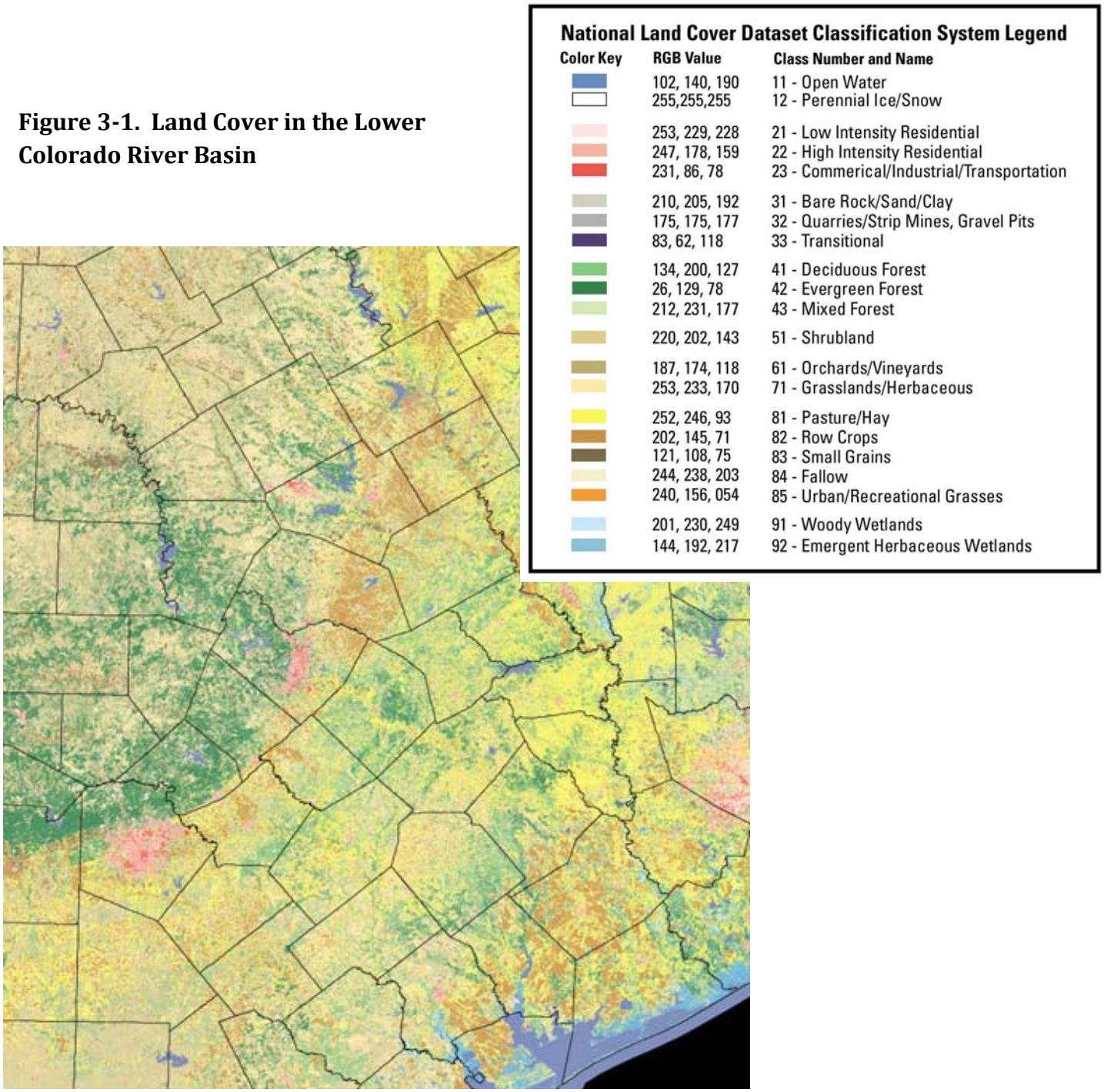
County	Land Area (sq. mi.)
Colorado	973.6
Matagorda	1,114.5
Wharton	1,094.5
Total Land Area	**16,070.5**

Table 3-6. Agricultural Land Use[5]

County	Number of Farms	Land in Farms (acres)	Harvested cropland (acres)	Irrigated land (acres)
Bastrop	2,207	402,079	43,373	2,469
Blanco	888	395,667	9,943	1,019
Brown	1,726	560,065	39,036	3,738
Burnet	1,531	482,149	15,516	1,251
Colorado	1,790	527,393	75,713	31,545
Fayette	2,991	565,708	77,515	1,313
Lampasas	966	416,018	26,054	437
Lee	1,844	325,643	1,010	1,433
Llano	791	538,890	7,211	257
Mason	647	536,402	10,891	4,207
Matagorda	903	577,594	121,997	35,771
McCulloch	694	612,627	54,319	890
Mills	971	474,226	29,512	4,878
San Saba	725	717,790	38,108	3,760
Travis	1,214	262,481	49,061	1,583
Wharton	1,506	618,581	264,431	61,717
Williamson	2,728	541,618	182,479	964

[5] GovStats, Census of Agriculture, 2007.

Figure 3-1. Land Cover in the Lower Colorado River Basin



Source: USGS

Major Lakes and Dams[6]

Texas has more inland water than any other state, with lakes covering 6,784 square miles of the State. The TCRFC region is home to about 78,000 surface acres of that total. Table 3-7 below shows major lakes for the area.

Table 3-7. Major Lakes and Reservoirs in the Basin Plan Area[7]

Name	Surface Area (acres)	Storage Capacity (acre-ft.)	River or Creek	Counties
Lake Buchanan	23,100	922,000	Colorado River	Burnet, Llano, San Saba
Lake Travis	18,930	1,172,600	Colorado River	Burnet, Travis
Lake Brownwood	7,300	143,400	Pecan Bayou	Brown
South Texas Project Reservoir	7,000	202,600	Colorado River	Matagorda
Lake Lyndon B. Johnson	6,380	138,000	Colorado River	Burnet, Llano
Granger Lake	4,400	82,000	San Gabriel River	Williamson
Cedar Creek Reservoir	2,420	74,080	Cedar Creek	Fayette
Lake Austin	1,830	21,000	Colorado River	Travis
Lake Georgetown	1,310	37,100	San Gabriel River	Williamson
Lake Walter E. Long	1,269	33,940	Decker Creek	Travis
Eagle Lake	1,200	9,600	Colorado River	Colorado
Lake Bastrop	906	16,590	Spicer Creek	Bastrop
Inks Lake	803	17,500	Colorado River	Burnet, Llano
Marble Falls Lake	780	8,760	Colorado River	Burnet

[6] For more information on lakes and dams in the area, please see Section 6: Flooding and Section 15: Dam Failure.
[7] Texas Almanac

Name	Surface Area (acres)	Storage Capacity (acre-ft.)	River or Creek	Counties
Lake Austin	469	6,248	Colorado River	Travis

The Lower Colorado River Authority owns and operates the six major dams that create the "Highland Lakes," including Lake Buchanan, Inks Lake, Lake LBJ, Lake Marble Falls, Lake Travis, and Lake Austin.

Figure 3-2. LCRA Dams and the Highland Lakes

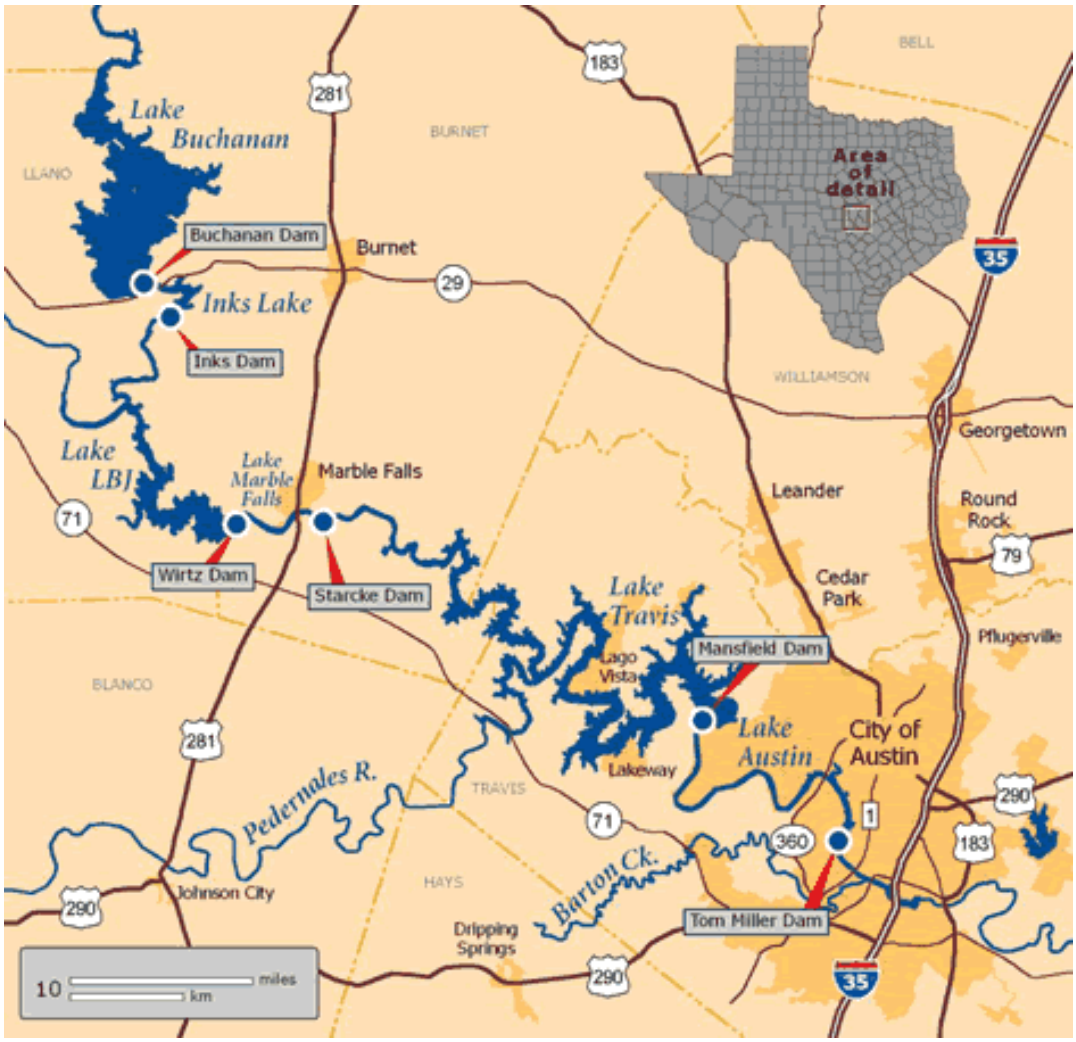


Table 3-8. Major LCRA Dams in the Lower Colorado River Basin

Name	County	Built	Dam Photo	River mi. from Gulf
Buchanan	Burnet	1937		414
Inks	Burnet	1938		409
Alvin Wirtz	Burnet	1950		387
Max Starcke	Burnet	1951		382
Mansfield	Travis	1941		318
Tom Miller	Travis	1940		298

Economy and Industry

With a growing population and now expanding planning area, the economics and industry of the communities in the TCRFC have continued to develop despite the recent economic downturn. With the exception of San Saba County, all counties in the TCRFC have seen steady economic growth from 2005 to 2008. The following tables show the current economic status of each county along with recent economic growth and development with a focus on industry. Table 3-9 below is indicative of the economic growth in the TCRFC by providing the percentage of employment growth per county.

Table 3-9. Employment Growth per County[8]

County	2005	2006	2007	2008
Bastrop	2.4%	1.6%	3.1%	1.3%
Blanco	-2.2%	-.8%	4.3%	3.0%
Brown	2.6%	1.9%	-1.7%	1.5%
Burnet	-1.1%	5.1%	2.8%	3.7%
Colorado	.9%	3.5%	.1%	2.7%
Fayette	-.5%	-.1%	1%	1.7%
Lampasas	-3.9%	5.9%	.9%	1.4%
Lee	-.7%	1.8%	1.9%	2.4%
Llano	1.8%	1.6%	1.7%	3.6%
Mason	5.2%	1.5%	-1.8%	.2%
Matagorda	-2.7%	-1.3%	5.5%	2.8%
McCulloch	-1.5%	-1.1%	2.4%	3.9%
Mills	-5.2%	-6.1%	-5.4%	.2%
San Saba	-4.1%	-3.4%	-3.7%	-6.7%
Travis	2.6%	2.8%	3.1%	1.3%

[8] Table is not seasonally adjusted; NA= Not Applicable;

County	2005	2006	2007	2008
Wharton	-2.5%	-.8%	.5%	1.2%
Williamson	5.2%	5.2%	3.1%	1.3%

Source: FDIC

Bastrop County

For Bastrop County, the average non-family household size is 2.77 persons compared to an average family size of 3.23 persons. In 2007 educational services was the largest of 20 major sectors. It had an average wage per job of $33,058. Per capita income grew by 15.8% between 1996 and 2006 (adjusted for inflation).

Table 3-10. Bastrop County – Economic Overview

People & Income Overview (By Place of Residence)	Value
Population (2008)	73,491
Growth (%) since 1990	92.1%
Households (2000)	20,097
Labor Force (persons) (2007)	35,115
Unemployment Rate (2007)	4.1
Per Capita Personal Income (2006)	$25,830
Median Household Income (2007)	$51,563
Poverty Rate (2007)	12.6
H.S. Diploma or More - % of Adults 25+ (2000)	76.9
Bachelor's Deg. or More - % of Adults 25+ (2000)	17.0

Table 3-11. Bastrop County – Industry Overview

Industry Overview (2007) (By Place of Work)	Value
Covered Employment	13,335
Avg wage per job	$30,404
Manufacturing - % all jobs in County	9.5%
Avg wage per job	$35,888
Transportation & Warehousing - % all jobs in County	0.7%
Avg wage per job	$44,229
Health Care, Social Assist. - % all jobs in County	11.8%
Avg wage per job	$26,793
Finance and Insurance - % all jobs in County	3.1%
Avg wage per job	$36,904

Blanco County

The average household size is 2.50 persons compared to an average family size of 2.96 persons. In 2007 construction was the largest of 20 major sectors. It had an average wage per job of $33,585. Per capita income grew by 38.7% between 1996 and 2006 (adjusted for inflation).

Table 3-12. Blanco County – Economic Overview

People & Income Overview (By Place of Residence)	Value
Population (2008)	9,082

People & Income Overview (By Place of Residence)	**Value**
Growth (%) since 1990	52.1%
Households (2000)	3,303
Labor Force (persons) (2007)	4,854
Unemployment Rate (2007)	3.4
Per Capita Personal Income (2006)	$34,287
Median Household Income (2007)	$49,320
Poverty Rate (2007)	10.6
H.S. Diploma or More - % of Adults 25+ (2000)	80.6
Bachelor's Deg. or More - % of Adults 25+ (2000)	22.2

Table 3-13. Blanco County – Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	2,626
Avg wage per job	$32,374
Manufacturing - % all jobs in County	2.8%
Avg wage per job	$29,873
Transportation & Warehousing - % all jobs in County	3.1%

Industry Overview (2007) (By Place of Work)	**Value**
Avg wage per job	$35,161
Health Care, Social Assist. - % all jobs in County	4.7%
Avg wage per job	$24,305
Finance and Insurance - % all jobs in County	4.8%
Avg wage per job	$38,709

Brown County

The average household size in Brown County is 2.48 persons compared to an average family size of 2.98 persons. In 2007 manufacturing was the largest of 20 major sectors of employment, and the average wage per job was $44,205. Per capita income grew by 18.2% between 1996 and 2006.

Table 3-14. Brown County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	38,379
Growth (%) since 1990	11.7%
Households (2000)	14,306
Labor Force (persons) (2007)	18,715
Unemployment Rate (2007)	4.2
Per Capita Personal Income (2006)	$25,458

People & Income Overview (By Place of Residence)	Value
Median Household Income (2007)	$37,664
Poverty Rate (2007)	18.9
H.S. Diploma or More - % of Adults 25+ (2000)	74.6
Bachelor's Deg. or More - % of Adults 25+ (2000)	15.0

Table 3-15. Brown County – Industry Overview

Industry Overview (2007) (By Place of Work)	Value
Covered Employment	15,605
Avg wage per job	$29,940
Manufacturing - % all jobs in County	22.0%
Avg wage per job	$44,205
Transportation & Warehousing - % all jobs in County	1.5%
Avg wage per job	$36,052
Health Care, Social Assist. - % all jobs in County	N/A
Avg wage per job	N/A
Finance and Insurance - % all jobs in County	2.3%

Industry Overview (2007) (By Place of Work)	**Value**
Avg wage per job	$37,020

Burnet County

The average household size in Burnet County is 2.53 persons compared to an average family size of 2.94 persons. In 2007 retail trade was the largest sector of employment, with an average wage per job of $24,762. Per capita income grew by 24.1% between 1996 and 2006.

Table 3-16. Burnet County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	44,488
Growth (%) since 1990	96.2%
Households (2000)	13,133
Labor Force (persons) (2007)	21,855
Unemployment Rate (2007)	3.5
Per Capita Personal Income (2006)	$32,023
Median Household Income (2007)	$48,510
Poverty Rate (2007)	10.0
H.S. Diploma or More - % of Adults 25+ (2000)	77.8
Bachelor's Deg. or More - % of	17.4

People & Income Overview (By Place of Residence)	**Value**
Adults 25+ (2000)	

Table 3-17. Burnet County – Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	12,514
Avg wage per job	$32,341
Manufacturing - % all jobs in County	8.6%
Avg wage per job	$42,765
Transportation & Warehousing - % all jobs in County	0.4%
Avg wage per job	$54,310
Health Care, Social Assist. - % all jobs in County	D
Avg wage per job	D
Finance and Insurance - % all jobs in County	3.9%
Avg wage per job	$38,497

Colorado County

The average household size for Colorado County is 2.56 persons compared to an average family size of 3.08 persons. In 2007 manufacturing was the largest employment sector with an average wage per job of $44,063. Per capita income grew by 18.8% between 1996 and 2006.

Table 3-18. Colorado County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	20,734
Growth (%) since 1990	12.8%
Households (2000)	7,641
Labor Force (persons) (2007)	10,663
Unemployment Rate (2007)	3.7
Per Capita Personal Income (2006)	$30,062
Median Household Income (2007)	$39,317
Poverty Rate (2007)	14.9
H.S. Diploma or More - % of Adults 25+ (2000)	69.1
Bachelor's Deg. or More - % of Adults 25+ (2000)	14.4

Table 3-19. Colorado County – Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	6,662
Avg wage per job	$31,811
Manufacturing - % all jobs in County	17.1%

Industry Overview (2007) (By Place of Work)	**Value**
Avg wage per job	$44,063
Transportation & Warehousing - % all jobs in County	5.3%
Avg wage per job	$44,407
Health Care, Social Assist. - % all jobs in County	D
Avg wage per job	D
Finance and Insurance - % all jobs in County	2.5%
Avg wage per job	$37,307

Fayette County

The average household size is 2.44 persons compared to an average family size of 2.97 persons. In 2007 manufacturing was the largest of 20 major sectors. It had an average wage per job of $30,701. Per capita income grew by 28.7% between 1996 and 2006 (adjusted for inflation).

Table 3-20. Fayette County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	22,698
Growth (%) since 1990	13.0%
Households (2000)	8,722
Labor Force (persons) (2007)	12,103
Unemployment Rate (2007)	3.3

People & Income Overview (By Place of Residence)	**Value**
Per Capita Personal Income (2006)	$33,352
Median Household Income (2007)	$45,005
Poverty Rate (2007)	12.4
H.S. Diploma or More - % of Adults 25+ (2000)	71.3
Bachelor's Deg. or More - % of Adults 25+ (2000)	14.6

Table 3-21. Fayette County – Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	8,727
Avg wage per job	$33,562
Manufacturing - % all jobs in County	13.7%
Avg wage per job	$30,701
Transportation & Warehousing - % all jobs in County	2.7%
Avg wage per job	$58,932
Health Care, Social Assist. - % all jobs in County	D
Avg wage per job	D
Finance and Insurance - % all jobs in	5.1%

Industry Overview (2007) (By Place of Work)	**Value**
County	
Avg wage per job	$44,610

Lampasas County

The average household size is 2.66 persons compared to an average family size of 3.08 persons. In 2007 construction was the largest of 20 major sectors. It had an average wage per job of $30,665. Per capita income grew by 53.5% between 1996 and 2006 (adjusted for inflation).

Table 3-22. Lampasas County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	21,197
Growth (%) since 1990	56.8%
Households (2000)	6,554
Labor Force (persons) (2007)	10,592
Unemployment Rate (2007)	3.6
Per Capita Personal Income (2006)	$33,381
Median Household Income (2007)	$45,107
Poverty Rate (2007)	13.6
H.S. Diploma or More - % of Adults 25+ (2000)	78.8
Bachelor's Deg. or More - % of	16.2

People & Income Overview (By Place of Residence)	**Value**
Adults 25+ (2000)	

Table 3-23. Lampasas County – Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	4,872
Avg wage per job	$28,513
Manufacturing - % all jobs in County	13.7%
Avg wage per job	$30,874
Transportation & Warehousing - % all jobs in County	1.9%
Avg wage per job	$36,011
Health Care, Social Assist. - % all jobs in County	D
Avg wage per job	D
Finance and Insurance - % all jobs in County	2.9%
Avg wage per job	$32,678

Lee County

The average household size is 2.65 persons compared to an average family size of 3.15 persons. In 2007 construction was the largest of 20 major sectors. It had an average wage per job of $43,364. Per capita income grew by 30.4% between 1996 and 2006 (adjusted for inflation).

Table 3-24. Lee County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	16,400
Growth (%) since 1990	27.6%
Households (2000)	5,663
Labor Force (persons) (2007)	8,953
Unemployment Rate (2007)	3.5
Per Capita Personal Income (2006)	$28,842
Median Household Income (2007)	$44,875
Poverty Rate (2007)	12.3
H.S. Diploma or More - % of Adults 25+ (2000)	71.7
Bachelor's Deg. or More - % of Adults 25+ (2000)	13.1

Table 3-25. Lee County – Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	5,519
Avg wage per job	$33,642

Industry Overview (2007) (By Place of Work)	**Value**
Manufacturing - % all jobs in County	7.7%
Avg wage per job	$39,704
Transportation & Warehousing - % all jobs in County	0.5%
Avg wage per job	$43,254
Health Care, Social Assist. - % all jobs in County	D
Avg wage per job	D
Finance and Insurance - % all jobs in County	3.9%
Avg wage per job	$39,979

Llano County

The average household size is 2.13 persons compared to an average family size of 2.56 persons. In 2007 retail trade was the largest of 20 major sectors. It had an average wage per job of $17,984. Per capita income grew by 21.7% between 1996 and 2006 (adjusted for inflation).

Table 3-26. Llano County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	18,400
Growth (%) since 1990	58.2%
Households (2000)	7,879
Labor Force (persons) (2007)	8,250

People & Income Overview (By Place of Residence)	**Value**
Unemployment Rate (2007)	4.1
Per Capita Personal Income (2006)	$30,039
Median Household Income (2007)	$41,521
Poverty Rate (2007)	12.4
H.S. Diploma or More - % of Adults 25+ (2000)	83.5
Bachelor's Deg. or More - % of Adults 25+ (2000)	21.0

Table 3-27. Llano County – Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	4,396
Avg wage per job	$31,092
Manufacturing - % all jobs in County	2.6%
Avg wage per job	$31,649
Transportation & Warehousing - % all jobs in County	1.0%
Avg wage per job	$34,363
Health Care, Social Assist. - % all jobs in County	D
Avg wage per job	D

Industry Overview (2007) (By Place of Work)	**Value**
Finance and Insurance - % all jobs in County	5.0%
Avg wage per job	$41,455

Mason County

The average household size is 2.31 persons compared to an average family size of 2.83 persons. In 2007 health care and social assistance was the largest of 20 major sectors. It had an average wage per job of $16,564. Per capita income grew by 42.8% between 1996 and 2006 (adjusted for inflation).

Table 3-28. Mason County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	3,882
Growth (%) since 1990	13.4%
Households (2000)	1,607
Labor Force (persons) (2007)	2,391
Unemployment Rate (2007)	2.8
Per Capita Personal Income (2006)	$27,300
Median Household Income (2007)	$37,846
Poverty Rate (2007)	14.5
H.S. Diploma or More - % of Adults 25+ (2000)	78.1

People & Income Overview (By Place of Residence)	**Value**
Bachelor's Deg. or More - % of Adults 25+ (2000)	18.7

Table 3-29. Mason County – Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	1,099
Avg wage per job	$22,658
Manufacturing - % all jobs in County	D
Avg wage per job	D
Transportation & Warehousing - % all jobs in County	0.9%
Avg wage per job	$36,647
Health Care, Social Assist. - % all jobs in County	15.1%
Avg wage per job	$16,564
Finance and Insurance - % all jobs in County	5.0%
Avg wage per job	$33,700

Matagorda County

The average household size is 2.70 persons compared to an average family size of 3.25 persons. In 2007 retail trade was the largest of 20 major sectors. It had an average wage per job of $19,840. Per capita income grew by 10.3% between 1996 and 2006 (adjusted for inflation).

Table 3-30. Matagorda County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	37,265
Growth (%) since 1990	0.9%
Households (2000)	13,901
Labor Force (persons) (2007)	16,719
Unemployment Rate (2007)	6.0
Per Capita Personal Income (2006)	$24,962
Median Household Income (2007)	$38,680
Poverty Rate (2007)	22.5
H.S. Diploma or More - % of Adults 25+ (2000)	70.3
Bachelor's Deg. or More - % of Adults 25+ (2000)	12.5

Table 3-31. Matagorda County – Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	10,833
Avg wage per job	$37,659
Manufacturing - % all jobs in County	4.1%
Avg wage per job	$60,124
Transportation & Warehousing - % all jobs in County	2.9%
Avg wage per job	$45,690
Health Care, Social Assist. - % all jobs in County	D
Avg wage per job	D
Finance and Insurance - % all jobs in County	1.8%
Avg wage per job	$41,728

McCulloch County

The average household size is 2.47 persons compared to an average family size of 3.01 persons. In 2007 retail trade was the largest of 20 major sectors. It had an average wage per job of $20,865. Per capita income grew by 18.7% between 1996 and 2006 (adjusted for inflation).

Table 3-32. McCulloch County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	7,943
Growth (%) since 1990	-9.5%

People & Income Overview (By Place of Residence)	**Value**
Households (2000)	3,277
Labor Force (persons) (2007)	3,787
Unemployment Rate (2007)	3.9
Per Capita Personal Income (2006)	$25,738
Median Household Income (2007)	$31,681
Poverty Rate (2007)	22.8
H.S. Diploma or More - % of Adults 25+ (2000)	70.5
Bachelor's Deg. or More - % of Adults 25+ (2000)	14.0

Table 3-33. McCulloch County – Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	2,826
Avg wage per job	$30,320
Manufacturing - % all jobs in County	13.6%
Avg wage per job	$52,110
Transportation & Warehousing - % all jobs in County	6.1%

Industry Overview (2007) (By Place of Work)	**Value**
Avg wage per job	$36,838
Health Care, Social Assist. - % all jobs in County	7.9%
Avg wage per job	$23,044
Finance and Insurance - % all jobs in County	3.0%
Avg wage per job	$31,307

Mills County

The average household size is 2.43 persons compared to an average family size of 2.90 persons. In 2007 health care and social assistance was the largest of 20 major sectors. It had an average wage per job of $24,854. Per capita income grew by 20.5% between 1996 and 2006 (adjusted for inflation).

Table 3-34. Mills County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	4,998
Growth (%) since 1990	10.3%
Households (2000)	2,001
Labor Force (persons) (2007)	2,279
Unemployment Rate (2007)	3.9
Per Capita Personal Income (2006)	$26,358
Median Household Income	$35,725

People & Income Overview (By Place of Residence)	**Value**
(2007)	
Poverty Rate (2007)	17.2
H.S. Diploma or More - % of Adults 25+ (2000)	76.7
Bachelor's Deg. or More - % of Adults 25+ (2000)	20.2

Table 3-35. Mills County – Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	1,440
Avg wage per job	$24,092
Manufacturing - % all jobs in County	5.0%
Avg wage per job	$24,629
Transportation & Warehousing - % all jobs in County	1.0%
Avg wage per job	$32,651
Health Care, Social Assist. - % all jobs in County	17.5%
Avg wage per job	$24,854
Finance and Insurance - % all jobs in County	D

Industry Overview (2007) (By Place of Work)	**Value**
Avg wage per job	D

San Saba County

The average household size is 2.45 persons compared to an average family size of 2.97 persons. In 2007 public administration was the largest of 20 major sectors. It had an average wage per job of $33,377. Per capita income grew by 12.3% between 1996 and 2006 (adjusted for inflation).

Table 3-36. San Saba County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	5,881
Growth (%) since 1990	8.9%
Households (2000)	2,289
Labor Force (persons) (2007)	2,469
Unemployment Rate (2007)	4.8
Per Capita Personal Income (2006)	$22,821
Median Household Income (2007)	$34,908
Poverty Rate (2007)	19.8
H.S. Diploma or More - % of Adults 25+ (2000)	70.0
Bachelor's Deg. or More - % of Adults 25+ (2000)	15.8

Table 3-37. San Saba County – Industry Overview

Industry Overview (2007) (By Place of Work)	Value
Covered Employment	1,823
Avg wage per job	$24,690
Manufacturing - % all jobs in County	2.1%
Avg wage per job	$15,159
Transportation & Warehousing - % all jobs in County	2.4%
Avg wage per job	$28,781
Health Care, Social Assist. - % all jobs in County	9.9%
Avg wage per job	$16,961
Finance and Insurance - % all jobs in County	2.1%
Avg wage per job	$31,768

Travis County

The average household size is 2.47 persons compared to an average family size of 3.15 persons. In 2007 retail trade was the largest of 20 major sectors. It had an average wage per job of $29,551. Per capita income grew by 24.0% between 1996 and 2006 (adjusted for inflation).

Table 3-38. Travis County – Economic Overview

People & Income Overview (By Place of Residence)	Value
Population (2008)	998,543

People & Income Overview (By Place of Residence)	**Value**
Growth (%) since 1990	73.2%
Households (2000)	320,766
Labor Force (persons) (2007)	530,410
Unemployment Rate (2007)	3.6
Per Capita Personal Income (2006)	$39,781
Median Household Income (2007)	$53,209
Poverty Rate (2007)	14.6
H.S. Diploma or More - % of Adults 25+ (2000)	84.7
Bachelor's Deg. or More - % of Adults 25+ (2000)	40.6

Table 3-39. Travis County – Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	569,200
Avg wage per job	$49,015
Manufacturing - % all jobs in County	8.2%
Avg wage per job	$89,366
Transportation & Warehousing - %	1.8%

Industry Overview (2007) (By Place of Work)	**Value**
all jobs in County	
Avg wage per job	$40,919
Health Care, Social Assist. - % all jobs in County	8.9%
Avg wage per job	$45,156
Finance and Insurance - % all jobs in County	4.2%
Avg wage per job	$68,710

Wharton County

The average household size is 2.73 persons compared to an average family size of 3.26 persons. In 2007 retail trade was the largest of 20 major sectors. It had an average wage per job of $23,342. Per capita income grew by 16.1% between 1996 and 2006 (adjusted for inflation).

Table 3-40. Wharton County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	40,791
Growth (%) since 1990	2.1%
Households (2000)	14,799
Labor Force (persons) (2007)	20,630
Unemployment Rate (2007)	4.3
Per Capita Personal Income (2006)	$28,152

People & Income Overview (By Place of Residence)	**Value**
Median Household Income (2007)	$40,185
Poverty Rate (2007)	15.7
H.S. Diploma or More - % of Adults 25+ (2000)	69.8
Bachelor's Deg. or More - % of Adults 25+ (2000)	14.3

Table 3-41. Wharton County - Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	15,361
Avg wage per job	$29,329
Manufacturing - % all jobs in County	11.0%
Avg wage per job	$31,106
Transportation & Warehousing - % all jobs in County	2.9%
Avg wage per job	$43,507
Health Care, Social Assist. - % all jobs in County	D
Avg wage per job	D
Finance and Insurance - % all jobs in	3.2%

Industry Overview (2007) (By Place of Work)	**Value**
County	
Avg wage per job	$48,336

Williamson County

The average household size is 2.82 persons compared to an average family size of 3.21 persons. In 2007 retail trade was the largest of 20 major sectors. It had an average wage per job of $27,022. Per capita income grew by 13.3% between 1996 and 2006 (adjusted for inflation).

Table 3-42. Williamson County – Economic Overview

People & Income Overview (By Place of Residence)	**Value**
Population (2008)	394,193
Growth (%) since 1990	182.5%
Households (2000)	86,766
Labor Force (persons) (2007)	194,149
Unemployment Rate (2007)	3.7
Per Capita Personal Income (2006)	$33,691
Median Household Income (2007)	$68,320
Poverty Rate (2007)	6.0
H.S. Diploma or More - % of Adults 25+ (2000)	88.8
Bachelor's Deg. or More - % of	33.6

People & Income Overview (By Place of Residence)	**Value**
Adults 25+ (2000)	

Table 3-43. Williamson County - Industry Overview

Industry Overview (2007) (By Place of Work)	**Value**
Covered Employment	117,842
Avg wage per job	$43,533
Manufacturing - % all jobs in County	6.2%
Avg wage per job	$52,648
Transportation & Warehousing - % all jobs in County	2.1%
Avg wage per job	$50,632
Health Care, Social Assist. - % all jobs in County	7.4%
Avg wage per job	$35,723
Finance and Insurance - % all jobs in County	4.6%
Avg wage per job	$58,837

Section 4 – People and Property at Risk

Coverage of this Plan Update 1

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Critical Facilities and Infrastructure 19

Coverage of this Plan Update

The scope of this Plan covers people and property located in seventeen counties[1] and selected incorporated cities within those counties. Participating jurisdictions are listed in Table 4-1. Although participating in the Plan Update, the TCRFC and LCRA are not shown herein as both entities are made up of the counties and communities participating in the Plan Update. As both share the same geographic area, county maps are shown.

Study Area Definition

Hazard identification consists of (1) defining the study area in terms of scale and coverage; and (2) collecting and compiling a list of prevalent hazards in the study area to help narrow the analysis focus. This section of the updated plan defines the study area in terms of population, assets at risk and critical facilities. Overall, the maps and tables included in the risk assessment show county-level results with jurisdiction-level details for uniformity in dealing with the TCRFC area. Clarifications highlight only the participating communities. For example, maps show non-participating communities in white and no data is shown for those areas.

Figure 4-1 on the following page displays the extent of the TCRFC area, as well as the population density distribution (based on Census 2000) in the 17 counties. Figures 4-2 through 4-18 show the population density in each of the counties and incorporated jurisdictions. Table 4-1 provides a numeric breakdown of the population by jurisdiction.

[1] Only 14 counties are participating in the plan; however cities in the non-participating counties of Brown, McCulloch and Travis are shown by way of County maps.

Figure 4-1. Population Distribution for the TCRFC Region

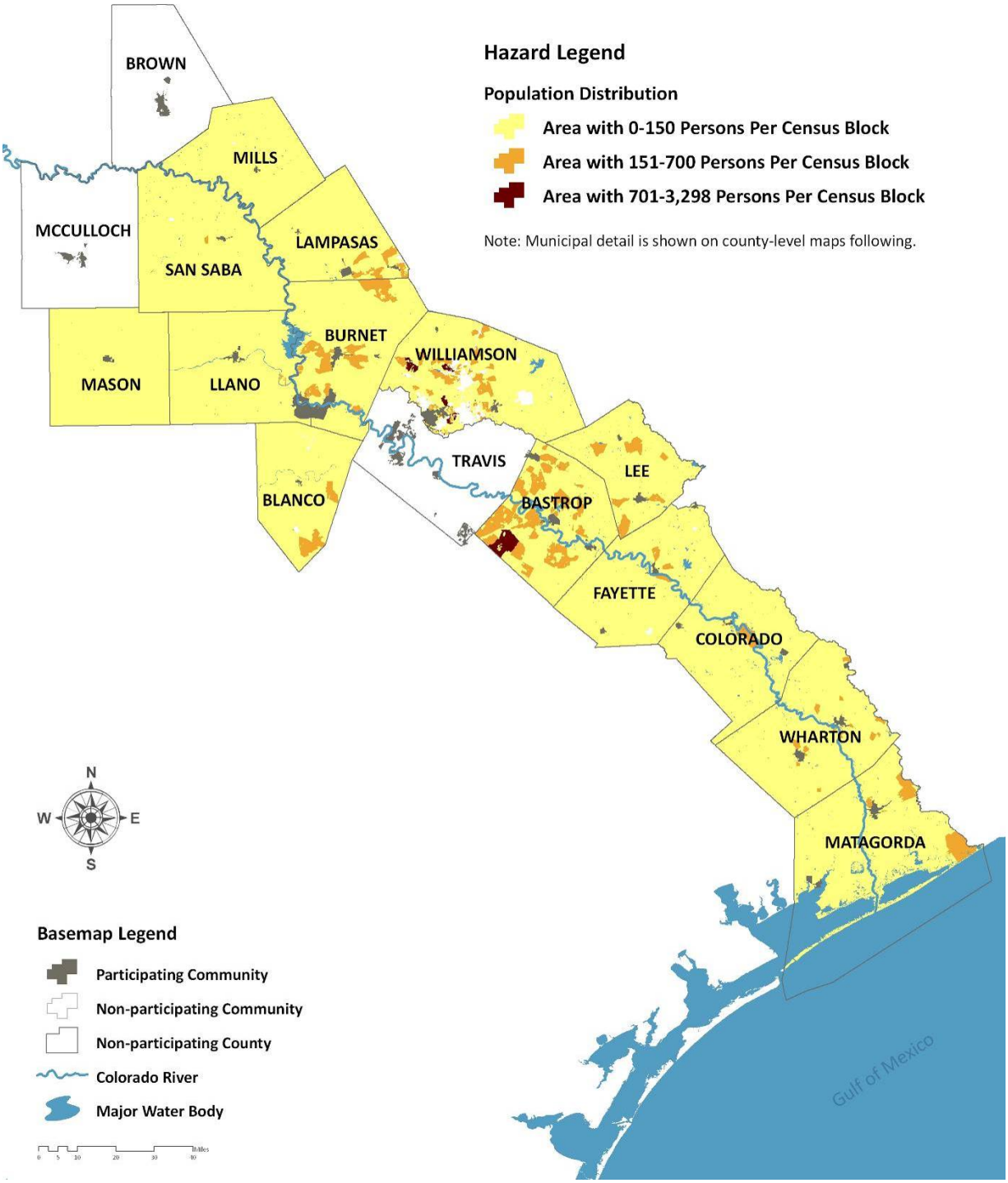
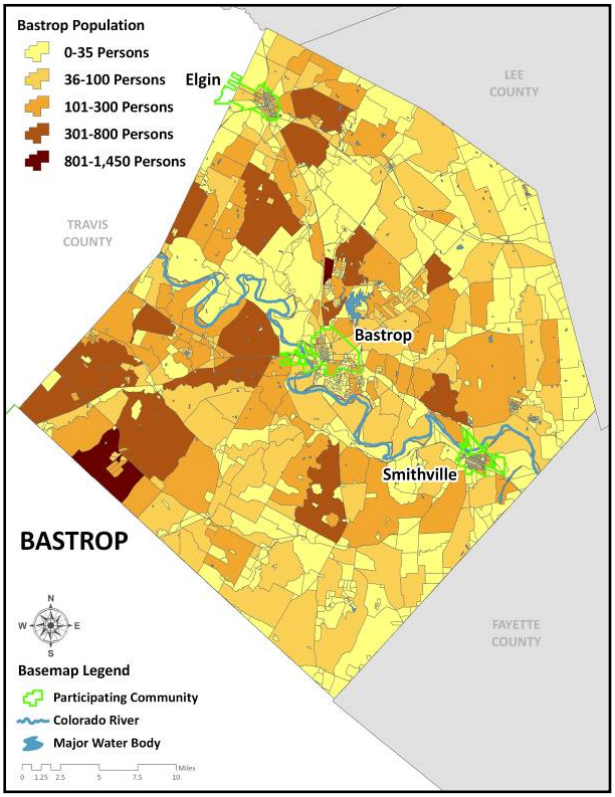


Figure 4-2. Population Distribution for Bastrop County



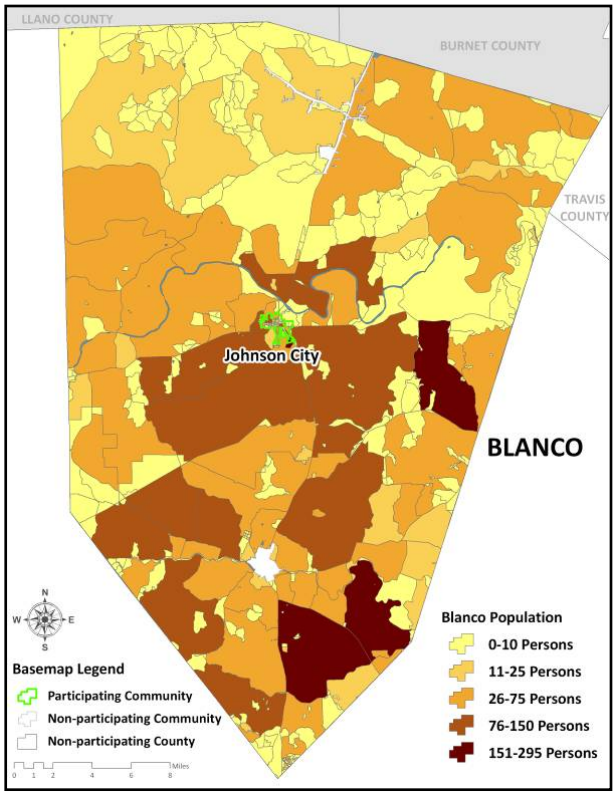
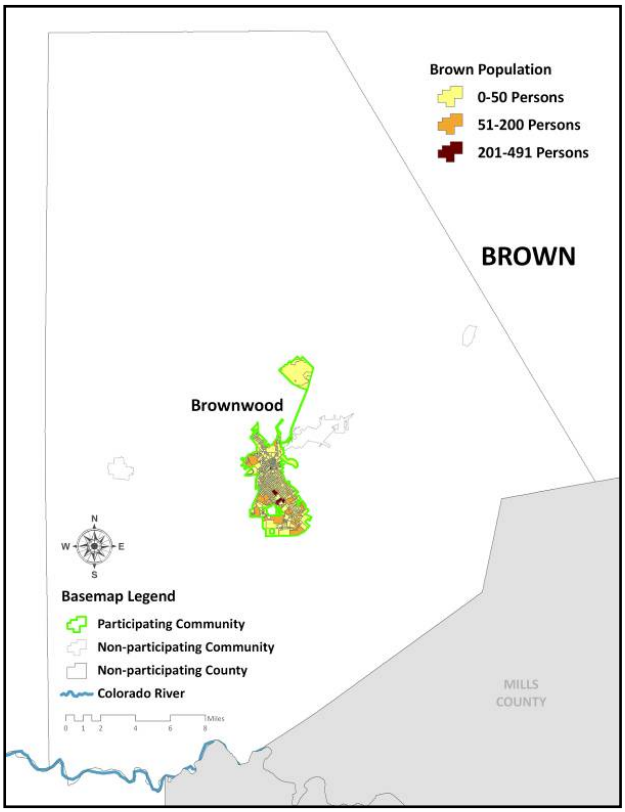


Figure 4-3. Population Distribution for Blanco County

Figure 4-4. Population Distribution for Brown County-Participating Jurisdiction Only



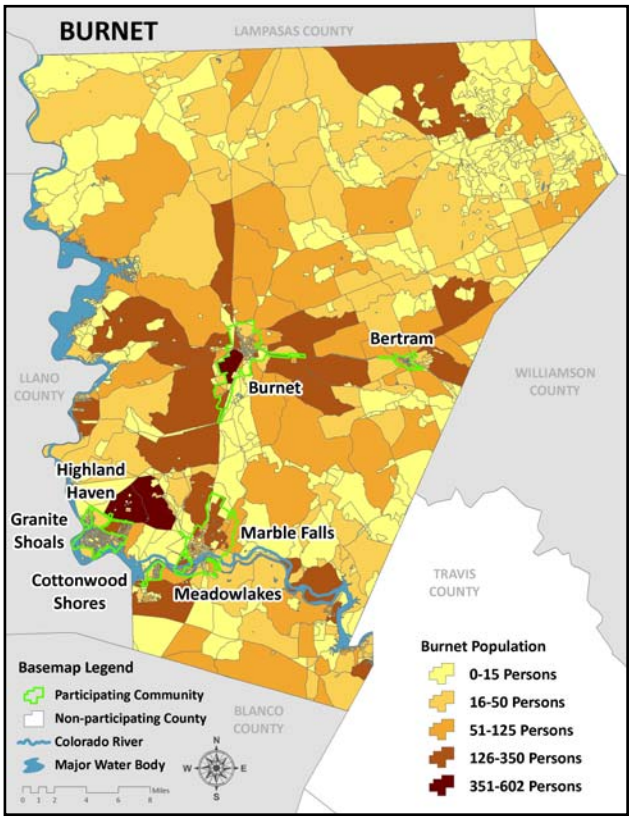
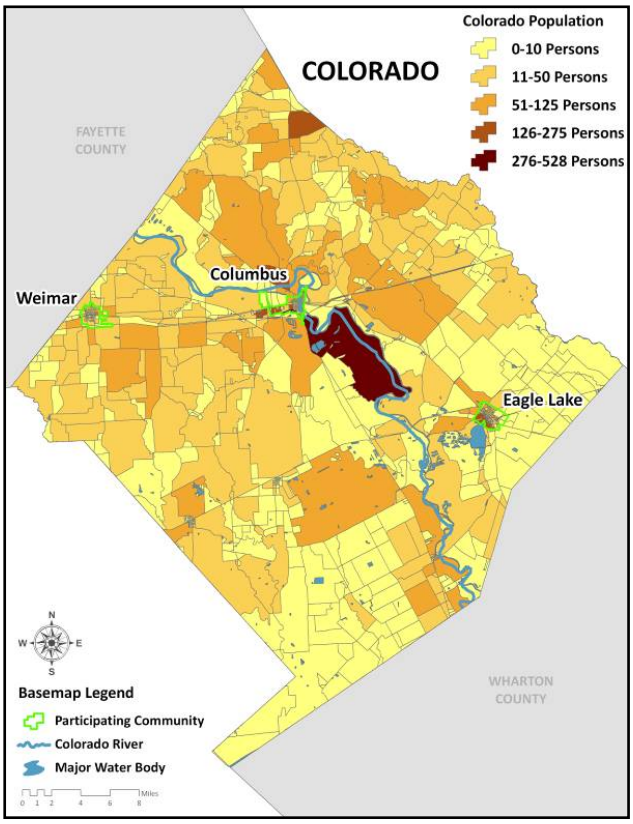


Figure 4-5. Population Distribution for Burnet County

Figure 4-6. Population Distribution for Colorado County



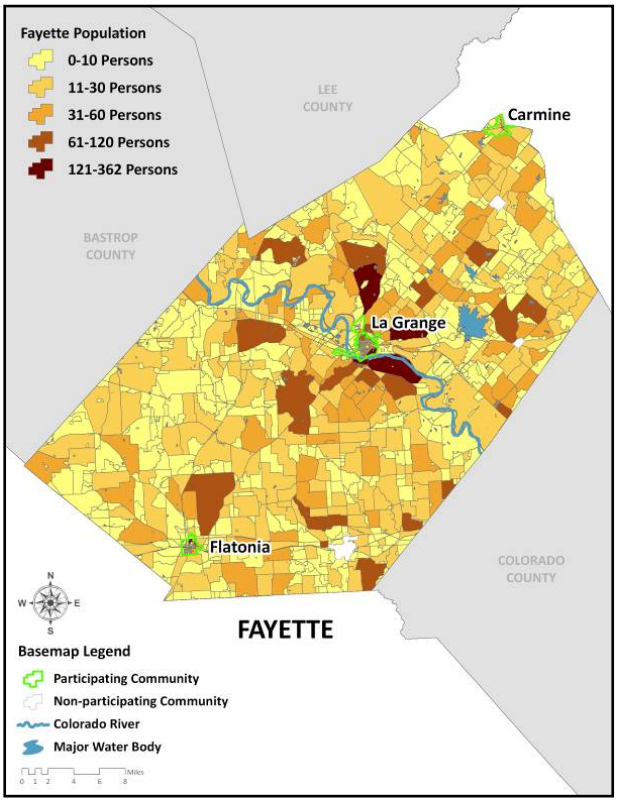
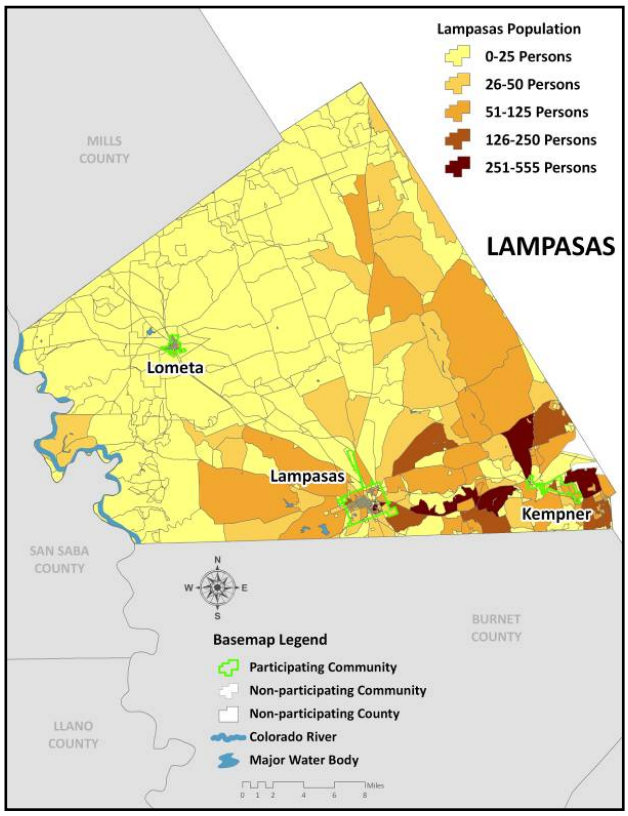


Figure 4-7. Population Distribution for Fayette County

Figure 4-8. Population Distribution for Lampasas County



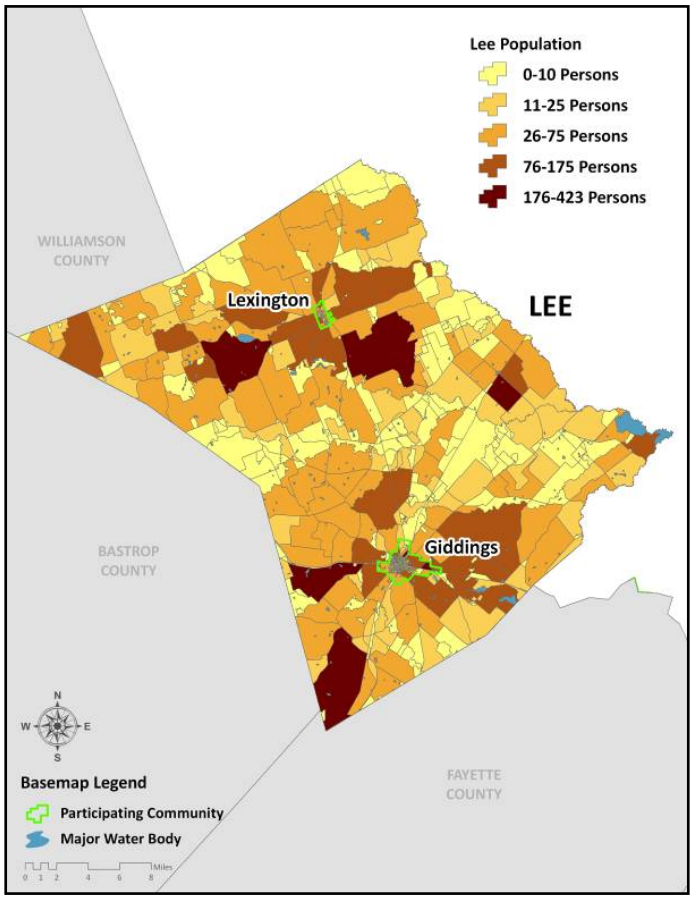
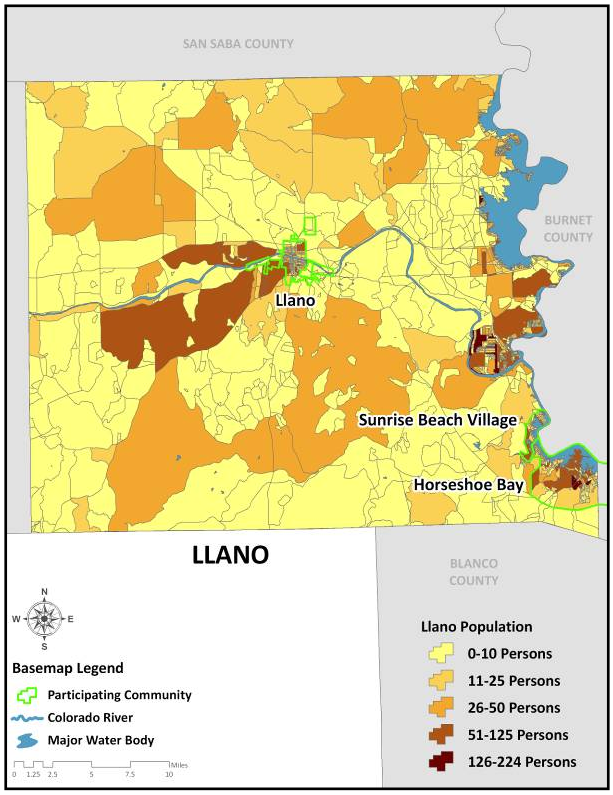


Figure 4-9. Population Distribution for Lee County

Figure 4-10. Population Distribution for Llano County



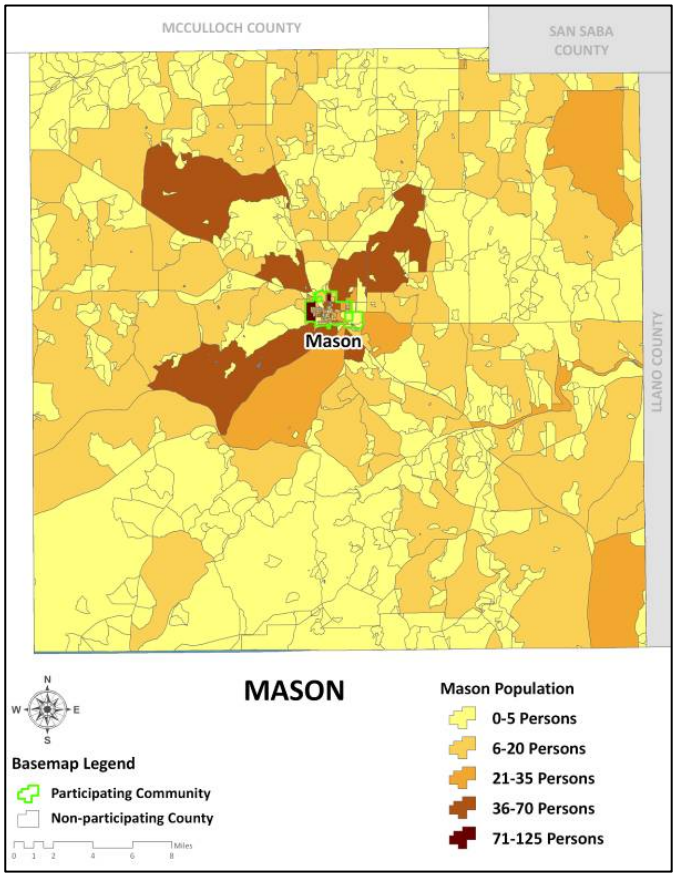
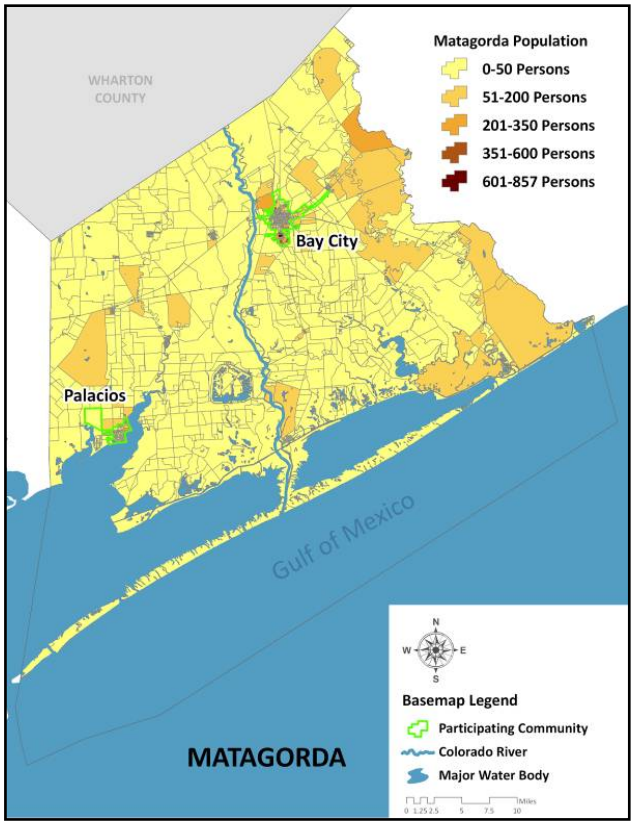


Figure 4-11. Population Distribution for Mason County

Figure 4-12. Population Distribution for Matagorda County



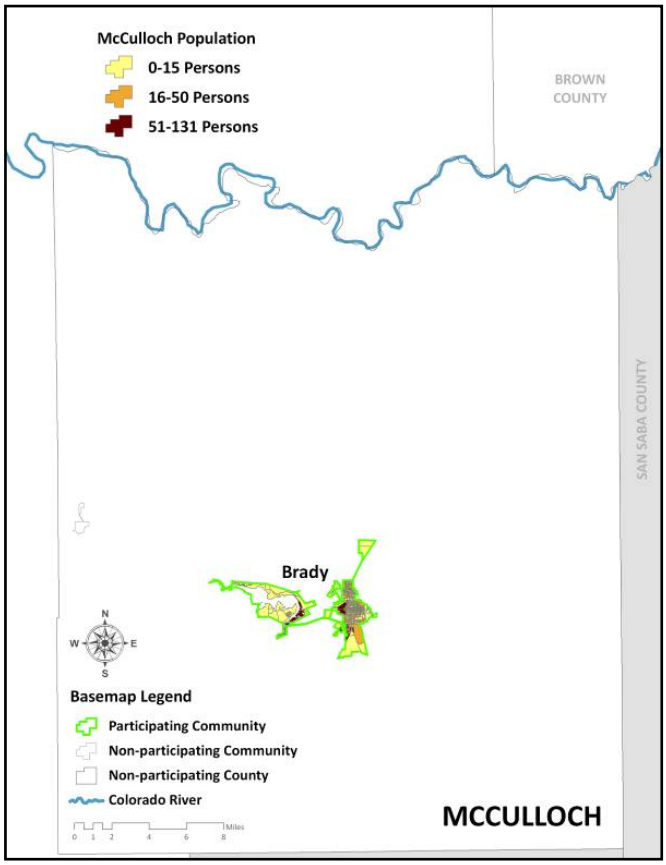
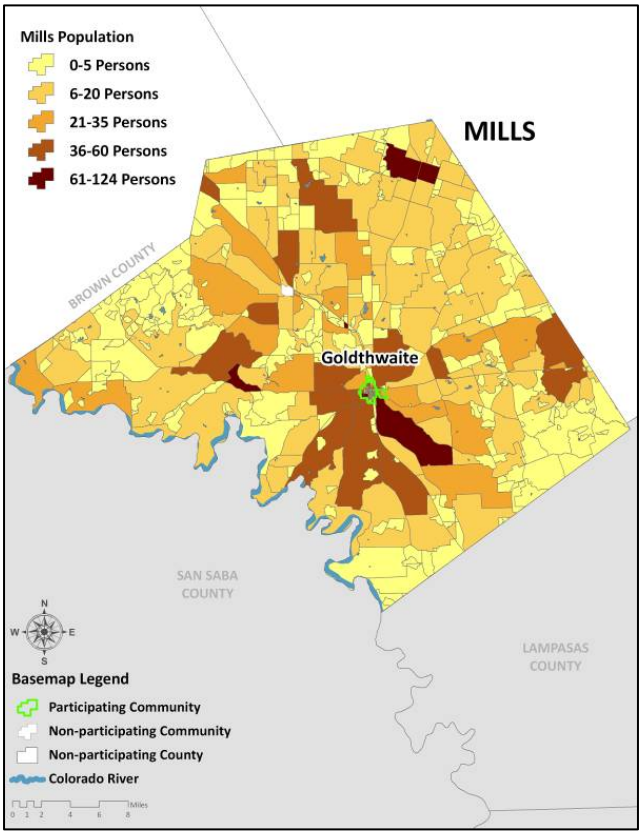


Figure 4-13. Population Distribution for McCulloch County-Participating Jurisdiction Only

Figure 4-14. Population Distribution for Mills County



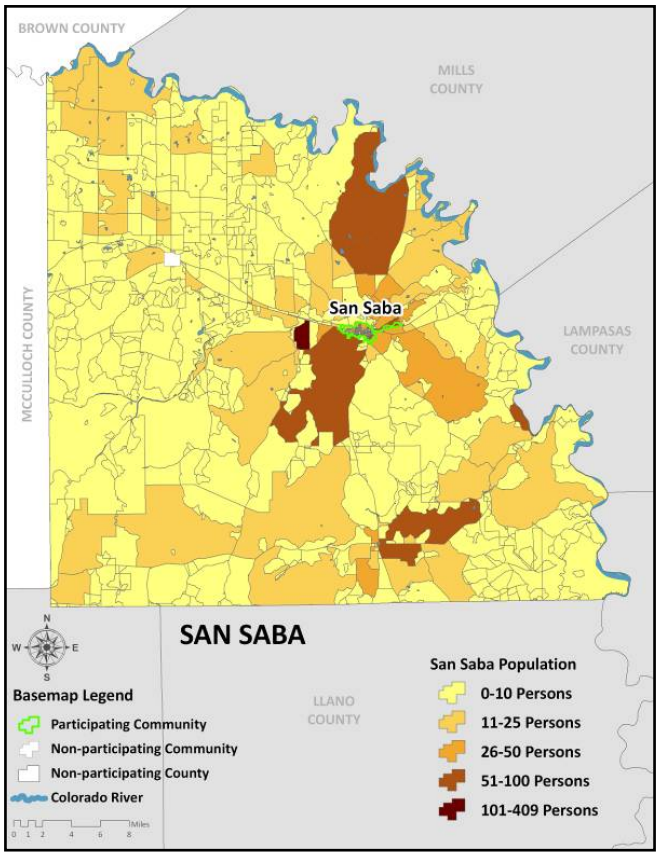
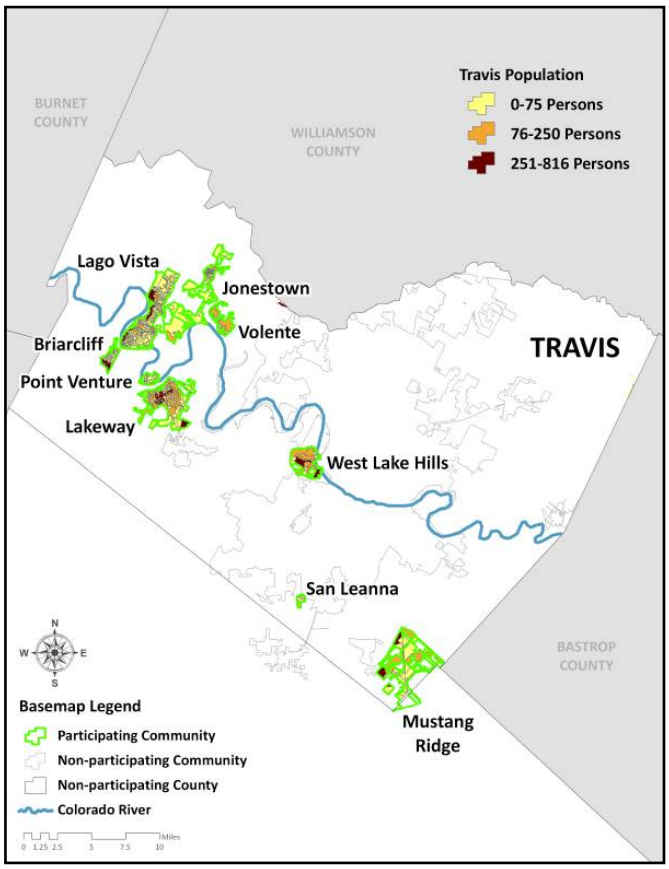


Figure 4-15. Population Distribution for San Saba County

Figure 4-16. Population Distribution for Travis County-Participating Jurisdictions Only



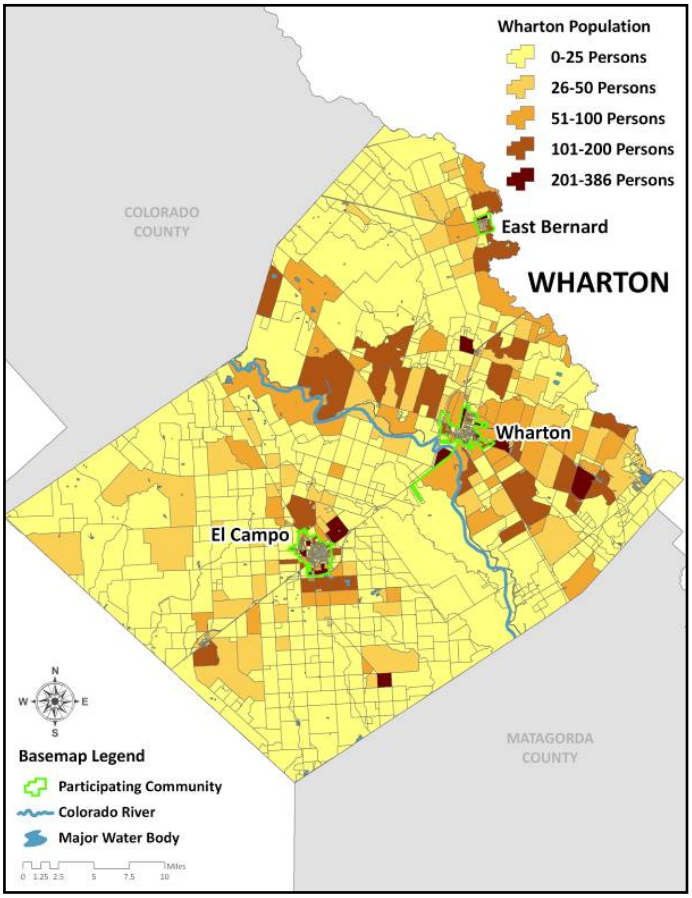


Figure 4-17. Population Distribution for Wharton County

Figure 4-18. Population Distribution for Williamson County

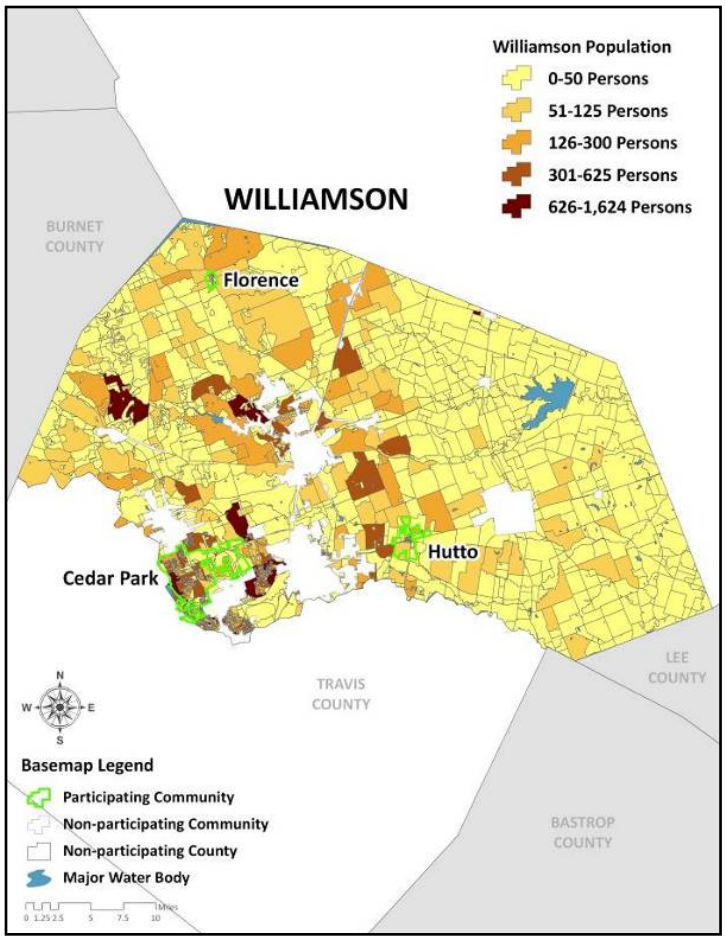


Table 4-1. Population by Jurisdiction

JURISDICTION	TOTAL POPULATION[2]	SPECIAL NEEDS POPULATION	
		Elderly (Over 65)	Low Income (</= $20K)
Bastrop County	**41,354**	**1,626**	**1,004**
Bastrop	5,933	318	241
Elgin	6,063	347	282
Smithville	4,383	261	261
Blanco County	**5,591**	**416**	**177**
Johnson City	1,247	80	41
Brown County	**Not Participating**		
Brownwood	19,091	1,081	1,315
Burnet County	**18,584**	**1,452**	**463**
Bertram	1,000	65	22
Burnet	4,755	295	177
Cottonwood Shores	704	46	19
Granite Shoals	2,303	139	71
Highland Haven	453	90	3
Marble Falls	5,070	330	255
Meadowlakes	1,278	203	23
Colorado County	**11,466**	**920**	**542**

[2] County populations include the amount of people in the County separate from the totals for participating communities within that County. For population totals, please see Section 3.

JURISDICTION	TOTAL POPULATION[2]	SPECIAL NEEDS POPULATION	
		Elderly (Over 65)	Low Income (</= $20K)
Columbus	3,506	263	205
Eagle Lake	3,453	190	179
Weimar	1,965	202	120
Fayette County	**15,787**	**1,450**	**729**
Carmine	184	21	5
Flatonia	1,377	88	75
La Grange	4,456	343	244
Lampasas County	**8,940**	**535**	**257**
Kempner	970	29	13
Lampasas	6,818	469	392
Lometa	767	30	37
Lee County	**9,388**	**589**	**411**
Lexington	1,166	69	50
Giddings	5,103	250	187
Llano County	**10,381**	**1,490**	**407**
Llano	3,311	254	116
Horseshoe Bay	2,648	546	58
Sunrise Beach Village	704	107	25
Mason County	**1,635**	**241**	**46**
Mason	2,103	116	150
Matagorda County	**14,429**	**821**	**656**

JURISDICTION	TOTAL POPULATION[2]	SPECIAL NEEDS POPULATION	
		Elderly (Over 65)	Low Income (</= $20K)
Bay City	18,709	920	1,126
Palacios	4,819	263	275
McCulloch County	**Not Participating**		
Brady	5,308	383	464
Mills County	**3,177**	**330**	**175**
Goldthwaite	1,795	175	149
San Saba County	**3,338**	**237**	**134**
San Saba	2,498	209	110
Travis County	**Not Participating**		
Briarcliff	862	55	15
Jonestown	1,553	60	9
Lago Vista	4,213	369	24
Lakeway	8,130	619	84
Mustang Ridge	983	35	16
Point Venture	420	27	1
San Leanna	384	19	10
Volente	363	9	13
West Lake Hills	2,875	163	35
Wharton County	**19,968**	**1,123**	**766**
East Bernard	1,729	95	53
El Campo	10,604	567	548

JURISDICTION	TOTAL POPULATION[2]	SPECIAL NEEDS POPULATION	
		Elderly (Over 65)	Low Income (</= $20K)
Wharton	8,887	483	643
Williamson County	**94,616**	**2,717**	**824**
Cedar Park	25,617	438	102
Florence	1,054	51	25
Hutto	1,134	28	6
TOTALS FOR STUDY AREA	**451,402**	**25,147**	**14,865**

Source: HAZUS-MH

Assets and Land Use

Table 4-3 provides building count and the total estimated dollar exposure (i.e., replacement value) by key occupancy and critical facilities. This demographic and building stock data serves as the basis of the risk assessment presented in this report.

Table 4-3. Building Distribution by Key Occupancy

JURISDICTION	RESIDENTIAL		COMMERCIAL		INDUSTRIAL		ESSENTIAL FACILITIES	
	Number	Value ($)	Number	Value ($)	Number	Value ($)	Number	Value ($)
Bastrop County	**16,132**	**1,702,080,000**	**525**	**113,610,000**	**198**	**42,496,000**	**4**	**2,529,580**
Bastrop	2,931	315,650,000	441	211,567,000	57	12,768,000	17	56,073,350
Elgin	2,441	265,710,000	130	44,766,000	34	11,971,000	9	30,229,150
Smithville	2,480	215,688,000	124	33,612,000	31	7,944,000	8	26,461,480

JURISDICTION	RESIDENTIAL		COMMERCIAL		INDUSTRIAL		ESSENTIAL FACILITIES	
	Number	Value ($)	Number	Value ($)	Number	Value ($)	Number	Value ($)
Blanco County	**3,381**	**346,919,000**	**130**	**48,609,000**	**47**	**12,087,000**	**4**	**9,322,490**
Johnson City	878	59,467,000	40	14,292,000	8	834,000	5	8,043,930
Brown County	**Not Participating**							
Brownwood	9,627	869,500,000	485	192,910,000	97	42,865,000	17	76,730,600
Burnet County	**9,784**	**990,895,000**	**310**	**87,231,000**	**132**	**27,414,000**	**4**	**5,227,680**
Bertram	546	46,334,000	24	4,529,000	9	2,893,000	2	3,979,350
Burnet	2,289	184,261,000	160	47,162,000	44	7,273,000	10	34,113,230
Cottonwood Shores	339	30,443,000	22	8,870,000	4	599,000	2	1,780,000
Granite Shoals	1,881	114,532,000	34	6,832,000	13	1,796,000	2	5,535,650
Highland Haven	303	31,132,000	13	1,596,000	4	255,000	0	0
Marble Falls	2,572	223,384,000	298	113,623,000	69	15,065,000	8	32,329,120
Meadowlakes	653	87,567,000	31	6,583,000	7	628,000	0	0
Colorado County	**5,847**	**572,522,000**	**136**	**41,918,000**	**44**	**18,051,000**	**0**	**0**
Columbus	1,839	170,470,000	172	65,131,000	30	66,226,000	10	28,917,090
Eagle Lake	1,731	128,851,000	91	25,886,000	20	5,389,000	7	14,508,620
Weimar	1,088	105,595,000	95	31,512,000	29	25,918,000	7	16,877,170
Fayette County	**9,672**	**899,156,000**	**505**	**129,311,000**	**163**	**73,680,000**	**0**	**0**
Carmine	107	12,365,000	13	3,438,000	2	122,000	1	1,138,900
Flatonia	797	51,654,000	31	9,647,000	10	3,840,000	5	8,483,210
La Grange	2,279	209,212,000	188	73,586,000	39	6,725,000	9	31,679,55

JURISDICTION	RESIDENTIAL		COMMERCIAL		INDUSTRIAL		ESSENTIAL FACILITIES	
	Number	Value ($)	Number	Value ($)	Number	Value ($)	Number	Value ($)
								0
Lampasas County	**4,342**	**417,116,000**	**69**	**17,407,000**	**32**	**6,951,000**	**0**	**0**
Kempner	427	36,574,000	11	5,722,000	4	2,530,000	1	534,000
Lampasas	3,499	315,747,000	264	70,748,000	64	16,892,000	10	34,915,080
Lometa	607	31,526,000	19	4,904,000	4	933,000	3	3,798,840
Lee County	**4,746**	**421,452,000**	**103**	**34,330,000**	**59**	**20,907,000**	**0**	**0**
Lexington	718	57,789,000	22	5,118,000	5	779,000	5	10,679,850
Giddings	2,841	181,647,000	213	84,449,000	62	26,347,000	11	22,747,880
Llano County	**7,925**	**667,023,000**	**249**	**63,446,000**	**76**	**13,545,000**	**2**	**1,068,000**
Llano	2,057	155,244,000	148	41,337,000	26	3,350,000	8	24,142,930
Horseshoe Bay	2,677	372,812,000	60	18,393,000	21	6,191,000	2	1,780,000
Sunrise Beach Village	868	103,681,000	17	3,319,000	7	783,000	1	534,000
Mason County	**1,475**	**133,919,000**	**30**	**7,609,000**	**14**	**4,418,000**	**0**	**0**
Mason	1,348	102,299,000	40	8,735,000	4	695,000	4	8,262,400
Matagorda County	**9,617**	**778,439,000**	**181**	**88,512,000**	**59**	**32,708,000**	**2**	**1,321,740**
Bay City	7,719	775,778,000	463	168,228,000	68	20,596,000	15	62,508,330
Palacios	2,277	182,777,000	111	28,948,000	18	5,859,000	8	19,544,360
McCulloch County	**Not Participating**							
Brady	3,518	208,846,000	175	52,364,000	35	13,091,000	8	20,705,76

JURISDICTION	RESIDENTIAL		COMMERCIAL		INDUSTRIAL		ESSENTIAL FACILITIES	
	Number	Value ($)	Number	Value ($)	Number	Value ($)	Number	Value ($)
								0
Mills County	**1,891**	**166,555,000**	**35**	**13,802,000**	**14**	**11,866,000**	**0**	**0**
Goldthwaite	1,092	91,429,000	59	21,242,000	4	342,000	5	7,398,750
San Saba County	**2,382**	**179,547,000**	**21**	**6,418,000**	**12**	**2,052,000**	**0**	**0**
San Saba	1,445	109,790,000	112	29,289,000	14	2,624,000	**7**	**14,402,770**
Travis County	**Not Participating**							
Briarcliff	649	69,338,000	36	6,364,000	12	1,304,000	0	0
Jonestown	837	103,134,000	51	9,705,000	21	1,701,000	2	1,068,000
Lago Vista	2,317	294,677,000	165	71,508,000	56	10,381,000	6	10,608,960
Lakeway	3,809	919,317,000	247	112,070,000	78	14,801,000	2	4,204,420
Mustang Ridge	338	33,145,000	21	3,576,000	7	753,000	1	1,246,000
Point Venture	375	44,728,000	19	3,898,000	1	71	0	0
San Leanna	163	22,588,000	13	4,374,000	6	603,000	0	0
Volente	274	26,837,000	20	6,074,000	5	715,000	0	0
West Lake Hills	1124	295,573,000	170	215,377,000	33	12,629,000	5	8,523,500
Wharton County	**8,780**	**831,843,000**	**280**	**113,135,000**	**105**	**73,041,000**	**0**	**0**
East Bernard	791	66,729,000	48	12,795,000	10	2,784,000	5	8,916,890
El Campo	5,189	447,495,000	320	113,860,000	72	19,095,000	11	49,352,620
Wharton	3,746	360,645,000	271	88,793,000	38	8,666,000	10	54,664,400
Williamson County	**32,666**	**5,599,168,000**	**1883**	**551,189,000**	**699**	**209,509,000**	**0**	**0**
Cedar Park	8637	1,534,881,000	580	220,871,000	150	36,113,000	14	69,286,12

JURISDICTION	RESIDENTIAL		COMMERCIAL		INDUSTRIAL		ESSENTIAL FACILITIES	
	Number	Value ($)	Number	Value ($)	Number	Value ($)	Number	Value ($)
								0
Florence	500	46,890,000	21	5,743,000	11	2,003,000	7	15,712,490
Hutto	486	64,259,000	37	16,320,000	14	4,754,000	4	11,325,230
TOTALS FOR STUDY AREA	**213,749**	**23,884,624,000**	**10,582**	**3,346,193,000**	**3,011**	**979,150,071**	**290**	**947,111,160**

Source: HAZUS-MH MR3

Critical Facilities and Infrastructure

This section of the Plan includes information on critical infrastructure, lifelines, and hazardous materials at risk by jurisdiction. Table 4-4 includes the amount (km) of oil and gas pipelines, highways and railways, and number of hazardous materials sites (i.e., includes geo-referenced TRI and Tier II sites) in the study region. This demographic and building stock data serves as the foundation of the risk assessment presented in this report. Table 4-4 provides information for participating jurisdictions, but a complete and detailed listing of essential facilities for the TCRFC area can be found in Appendix F.

Table 4-4. Infrastructure, Lifelines, and Hazardous Materials

JURISDICTION	INFRASTRUCTURE AND LIFELINES				HAZARDOUS MATERIALS FACILITIES
	Oil Pipe (km)	Gas Pipe (km)	Highway (km)	Railroad (km)	Number of Sites
Bastrop County	**162.8**	**623.7**	**224.0**	**154.0**	**81**
Bastrop	0.0	0.0	18.3	3.9	3
Elgin	0.0	0.0	8.4	7.0	4

JURISDICTION	INFRASTRUCTURE AND LIFELINES				HAZARDOUS MATERIALS FACILITIES
	Oil Pipe (km)	Gas Pipe (km)	Highway (km)	Railroad (km)	Number of Sites
Smithville	0.0	0.0	5.2	6.1	0
Blanco County	**71.7**	**85.6**	**96.6**	**0.0**	**13**
Johnson City	0.0	0.0	4.1	0.0	1
Brown County	**Not Participating**				
Brownwood	0.0	0.0	13.4	2.3	3
Burnet County	**105.8**	**73.9**	**163.9**	**79.3**	**13**
Bertram	0.0	0.0	2.4	1.5	2
Burnet	0.0	0.0	13.1	6.1	4
Cottonwood Shores	0.0	0.0	0.0	0.0	0
Granite Shoals	0.0	0.0	0.0	0.0	0
Highland Haven	0.0	0.0	0.0	0.0	0
Marble Falls	0.0	0.0	8.2	1.7	6
Meadowlakes	0.0	0.0	0.0	0.0	0
Colorado County	**215.9**	**1,103.2**	**179.9**	**179.7**	**62**
Columbus	0.0	0.0	7.8	2.7	2
Eagle Lake	0.0	0.0	2.5	9.2	2
Weimar	0.3	0.0	2.2	1.9	3
Fayette County	**250.7**	**3,245.5**	**284.6**	**161.3**	**136**
Carmine	0.0	0.0	2.1	2.7	0
Flatonia	0.0	0.0	4.0	4.2	0
La Grange	0.0	0.0	12.7	5.2	1
Lampasas County	**2.7**	**72.2**	**133.6**	**101.2**	**23**

JURISDICTION	INFRASTRUCTURE AND LIFELINES				HAZARDOUS MATERIALS FACILITIES
	Oil Pipe (km)	Gas Pipe (km)	Highway (km)	Railroad (km)	Number of Sites
Kempner	0.0	0.0	1.7	0.9	0
Lampasas	0.0	0.0	10.6	4.2	1
Lometa	0.0	0.0	0.5	2.9	1
Lee County	**161.4**	**1,626.0**	**114.2**	**71.6**	**67**
Lexington	0.0	0.0	0.6	0.0	1
Giddings	0.0	0.0	9.2	10.9	5
Llano County	**0.0**	**73.3**	**180.3**	**34.0**	**9**
Llano	0.0	0.0	**7.3**	4.1	2
Horseshoe Bay	0.0	0.0	0.0	0.0	2
Sunrise Beach Village	0.0	0.0	0.0	0.0	0
Mason County	**50.4**	**50.2**	**141.6**	**0.0**	**4**
Mason	0.0	0.0	6.1	0.0	0
Matagorda County	**388.6**	**2,478.8**	**167.6**	**196.6**	**111**
Bay City	4.5	0.0	11.7	15.7	3
Palacios	0.0	0.0	4.2	2.3	2
McCulloch County	**Not Participating**				
Brady	0.0	0.0	11.6	6.5	1
Mills County	**45.4**	**33.4**	**149.1**	**54.8**	**3**
Goldthwaite	0.0	0.0	2.4	2.0	0
San Saba County	**140.3**	**60.2**	**110.2**	**59.4**	**2**
San Saba	0.0	0.0	**5.6**	4.1	1
Travis County	**Not Participating**				

JURISDICTION	INFRASTRUCTURE AND LIFELINES				HAZARDOUS MATERIALS FACILITIES
	Oil Pipe (km)	Gas Pipe (km)	Highway (km)	Railroad (km)	Number of Sites
Briarcliff	0.0	0.0	0.0	0.0	0
Jonestown	0.0	0.0	0.0	0.0	1
Lago Vista	0.0	0.0	0.0	0.0	6
Lakeway	0.0	0.0	0.0	0.0	5
Mustang Ridge	0.4	0.0	8.0	0.0	1
Point Venture	0.0	0.0	0.0	0.0	0
San Leanna	0.0	0.0	0.0	0.0	0
Volente	0.0	0.0	0.0	0.0	0
West Lake Hills	213.2	2539.1	200.0	186.2	**218**
Wharton County	**0.0**	**0.0**	**0.0**	**1.8**	**0**
East Bernard	0.0	0.0	12.4	3.0	3
El Campo	0.0	0.0	7.6	10.2	1
Wharton	163.7	211.2	292.0	185.0	**71**
Williamson County	**0.0**	**0.0**	**6.1**	**5.8**	**7**
Cedar Park	0.0	0.0	2.2	0.0	0
Florence	6.7	0.0	2.9	2.5	1
Hutto	0.0	0.0	0.0	0.0	0
TOTALS FOR STUDY AREA	**1,984.5**	**12,276.3**	**2,652.7**	**1,594.5**	**888**

Figure 4-19 shows the critical facilities in the 17 counties forming the overall TCRFC study area generated by HAZUS-MH MR3. Figures 4-20 through 4-36 show the critical facilities in each of the 17 counties and jurisdictions within the study area.

Figure 4-19. Critical Facilities in the TCRFC Region

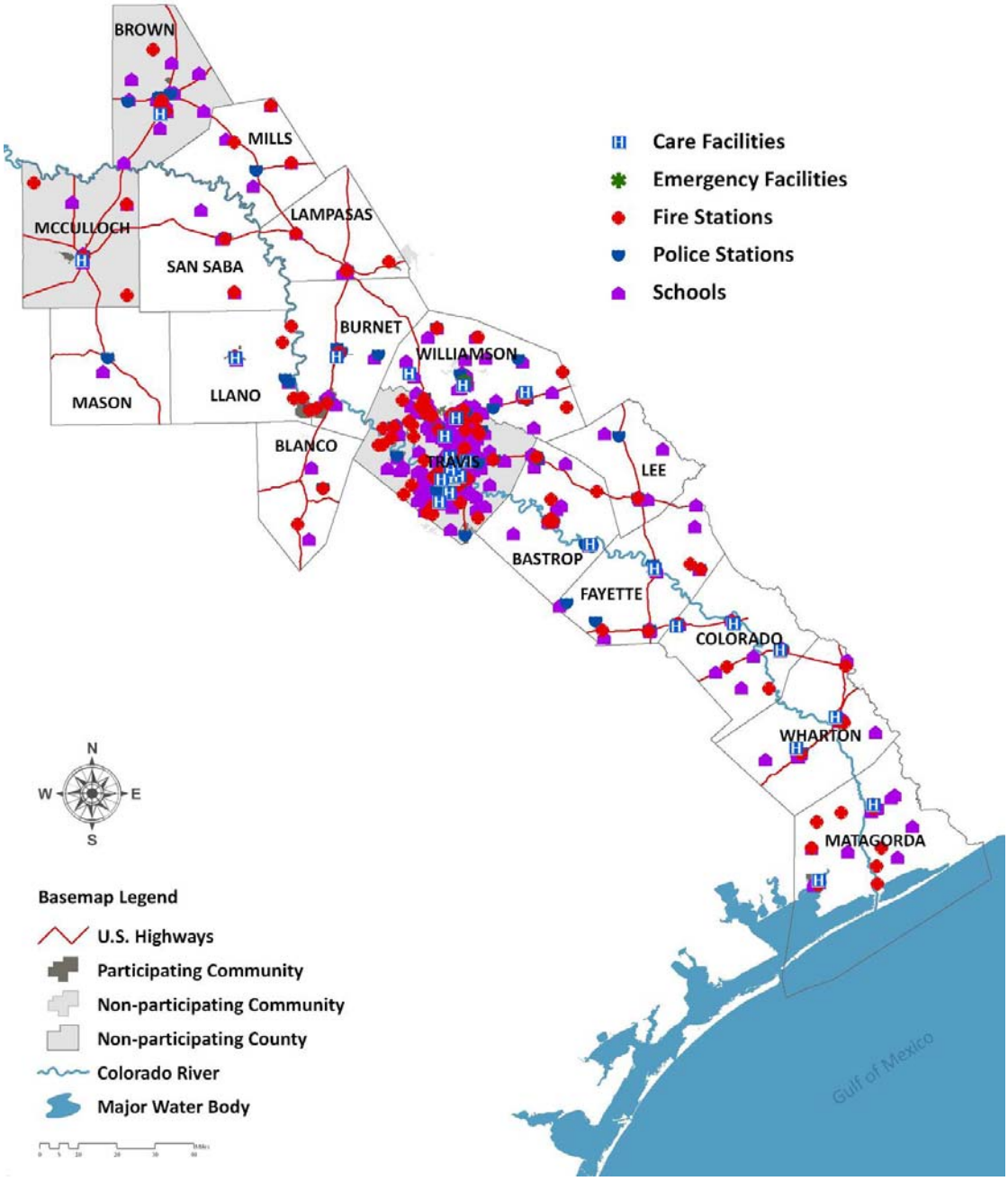
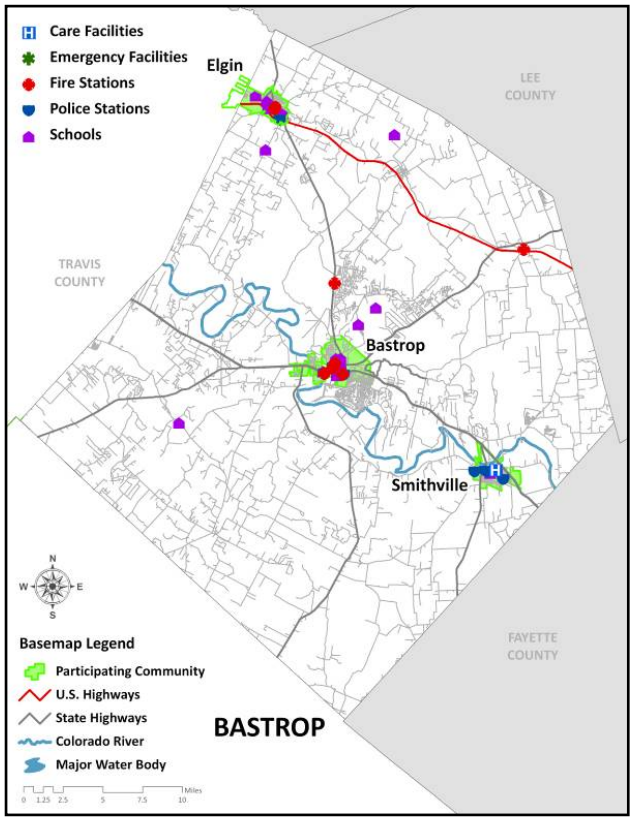


Figure 4-20. Critical Facilities in Bastrop County



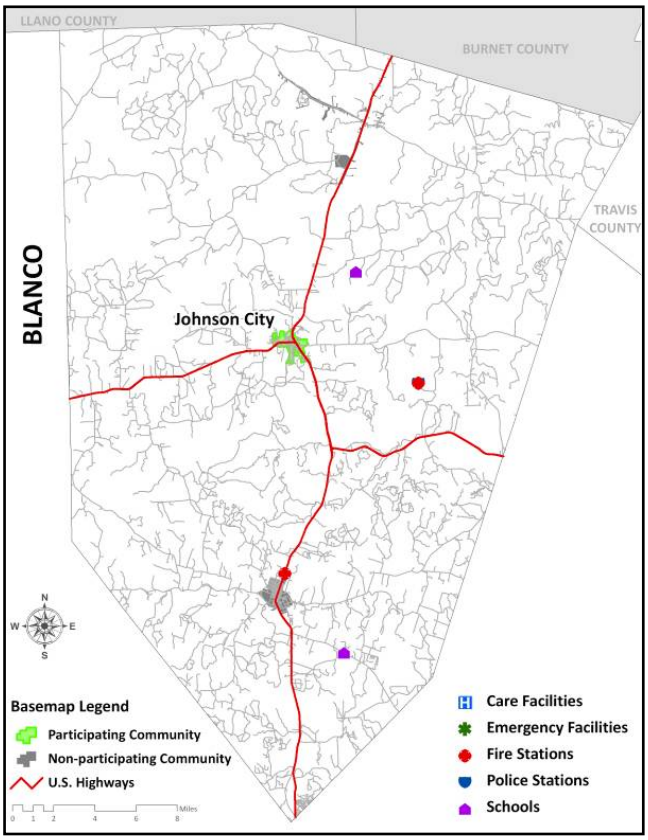
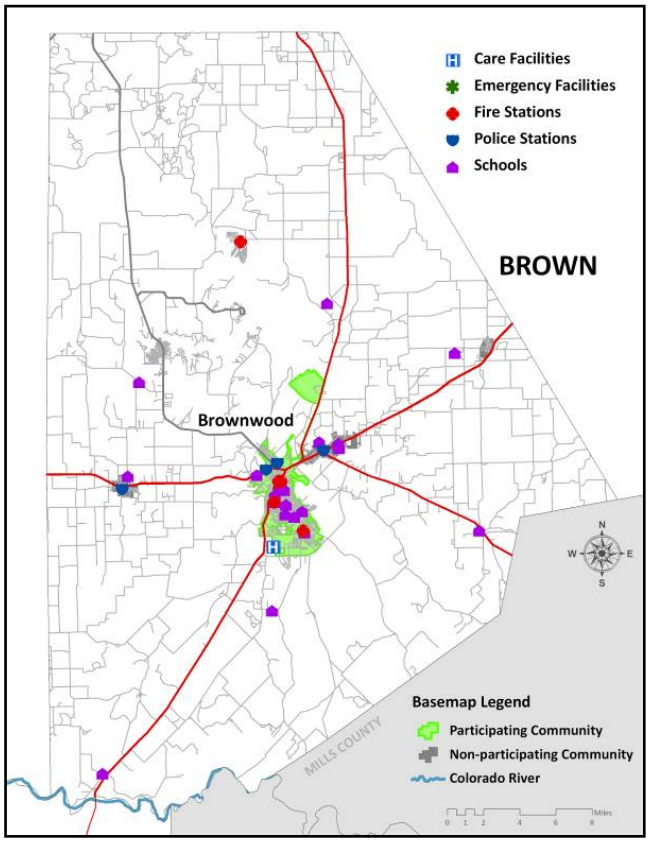


Figure 4-21. Critical Facilities in Blanco County

Figure 4-22. Critical Facilities in Brown County-Participating Jurisdiction Only



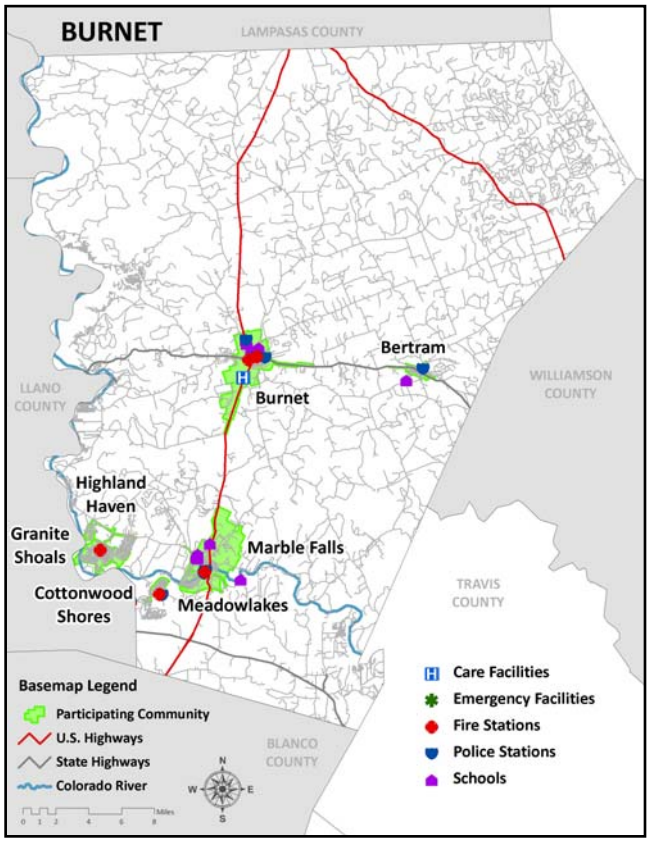
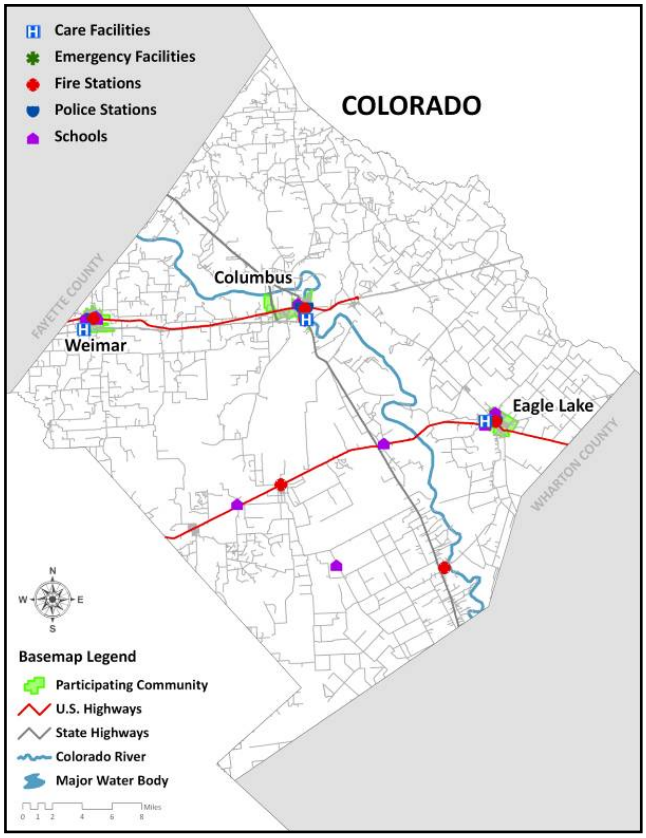


Figure 4-23. Critical Facilities in Burnet County

Figure 4-24. Critical Facilities in Colorado County



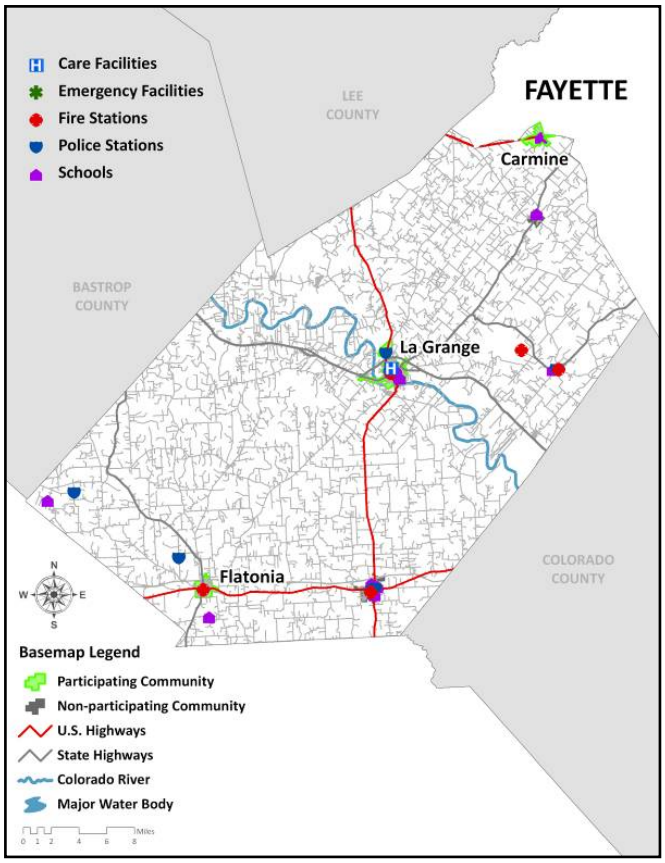
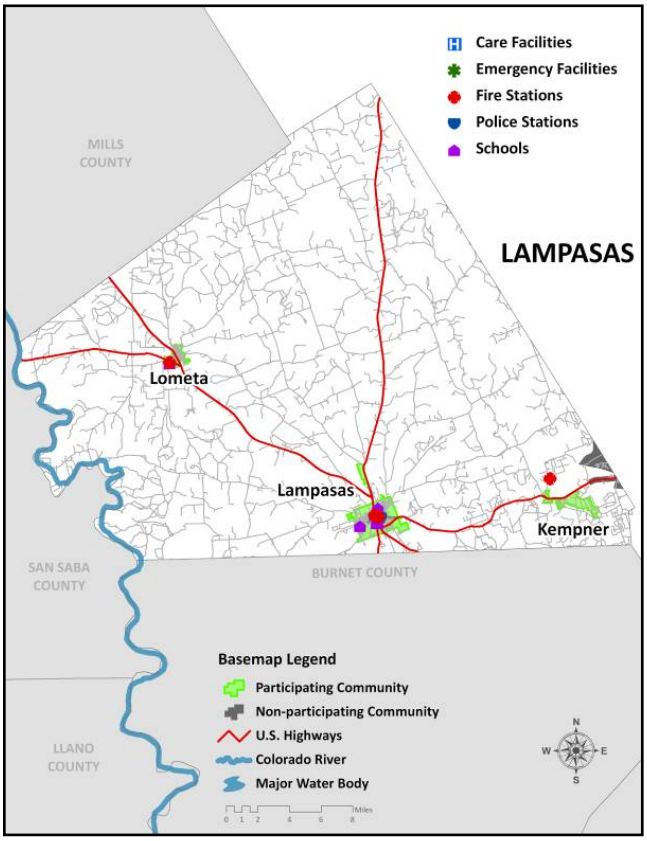


Figure 4-25. Critical Facilities in Fayette County

Figure 4-26. Critical Facilities in Lampasas County



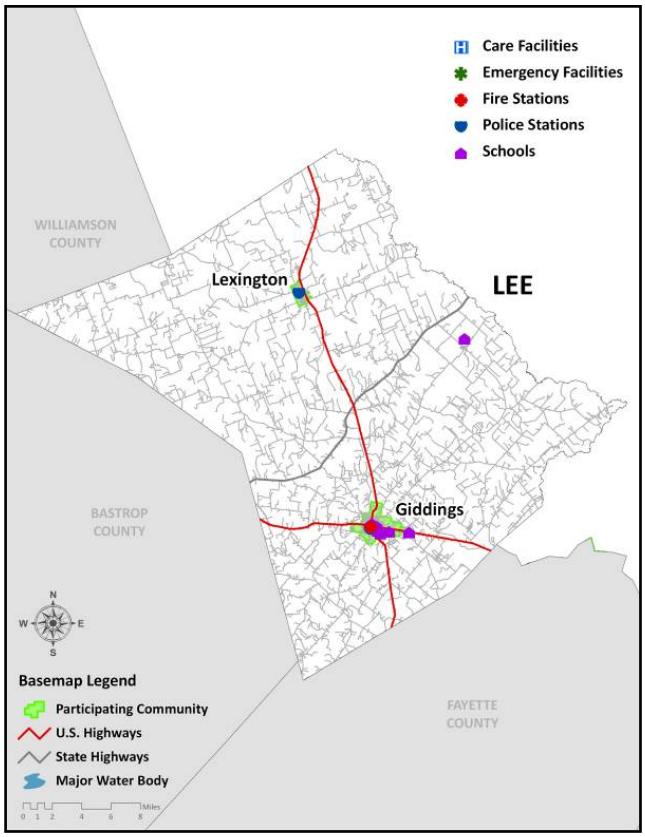
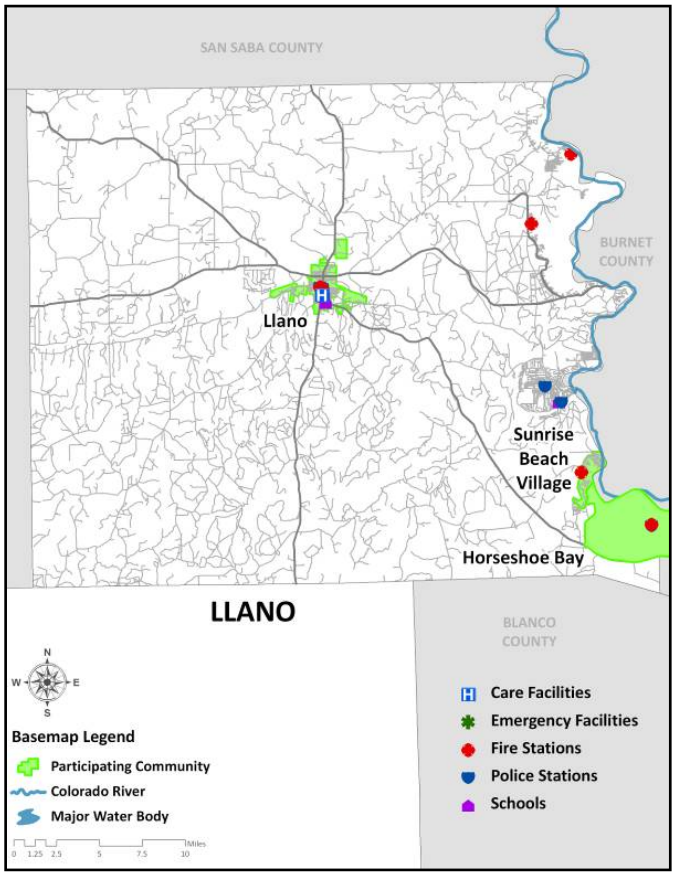


Figure 4-27. Critical Facilities in Lee County

Figure 4-28. Critical Facilities in Llano County



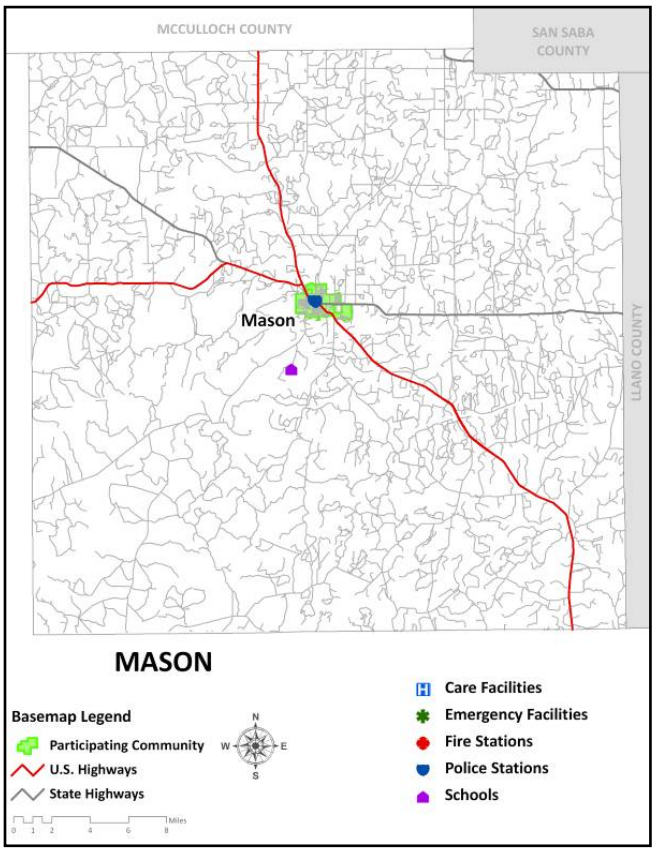
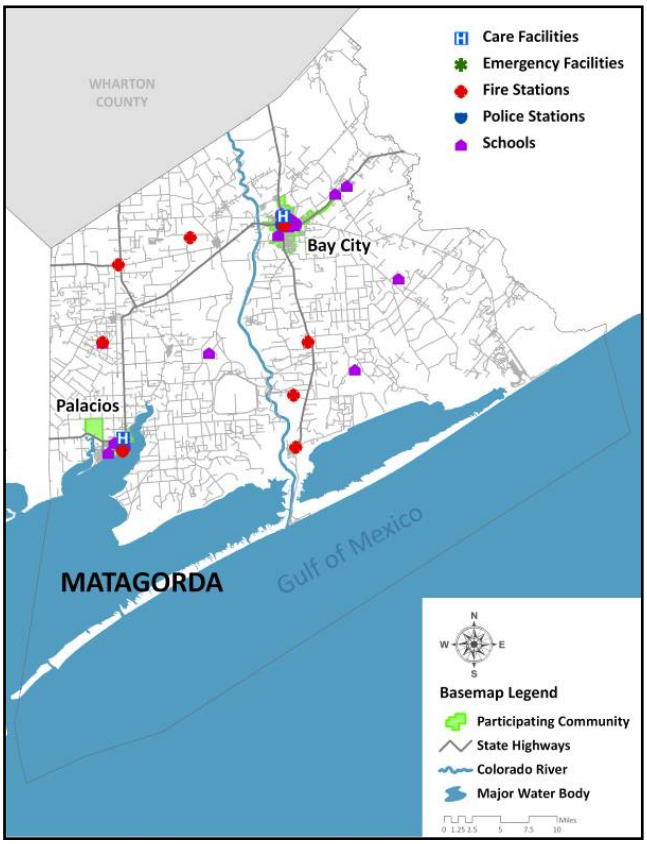


Figure 4-29. Critical Facilities in Mason County

Figure 4-30. Critical Facilities in Matagorda County



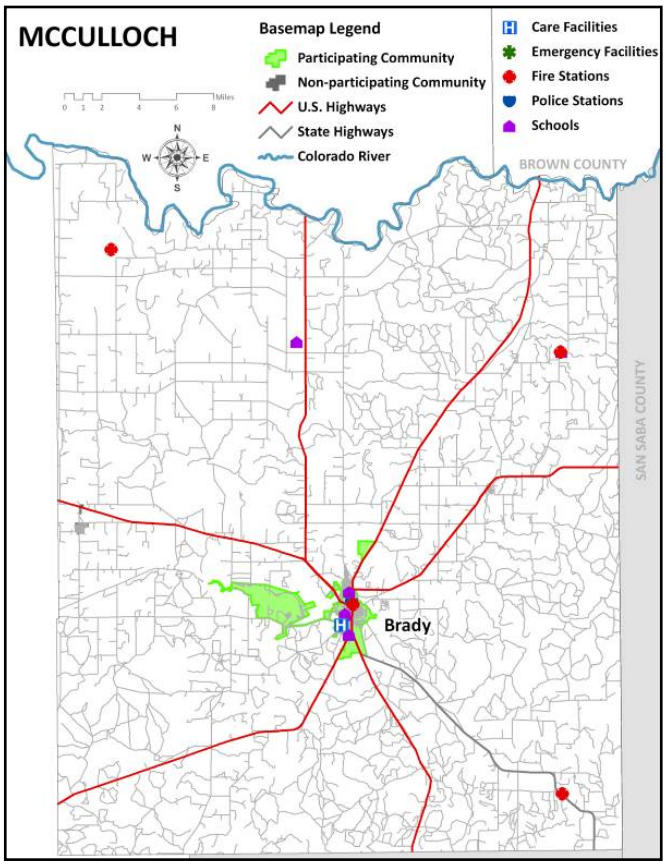
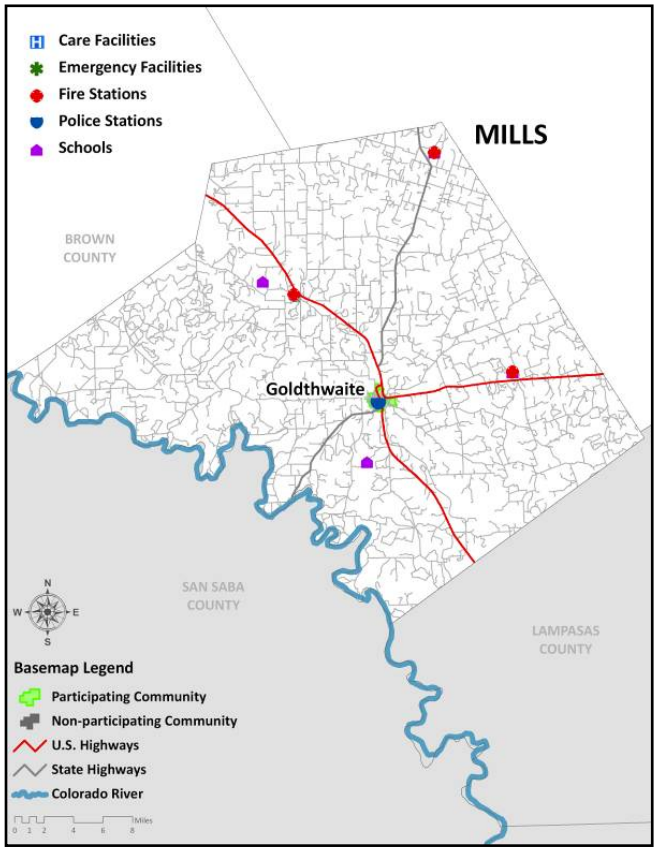


Figure 4-31. Critical Facilities in McCulloch County- Participating Jurisdiction Only

Figure 4-32. Critical Facilities in Mills County



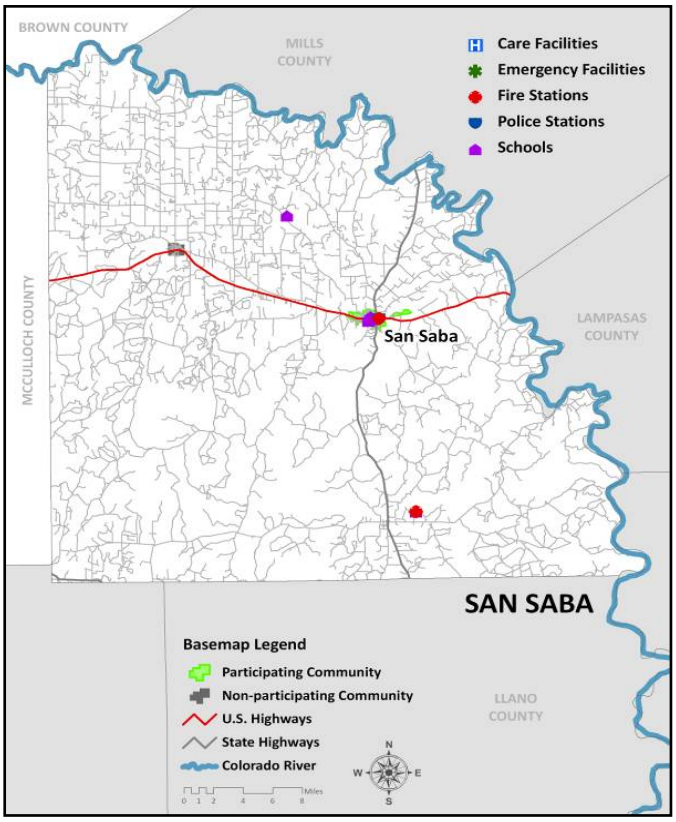
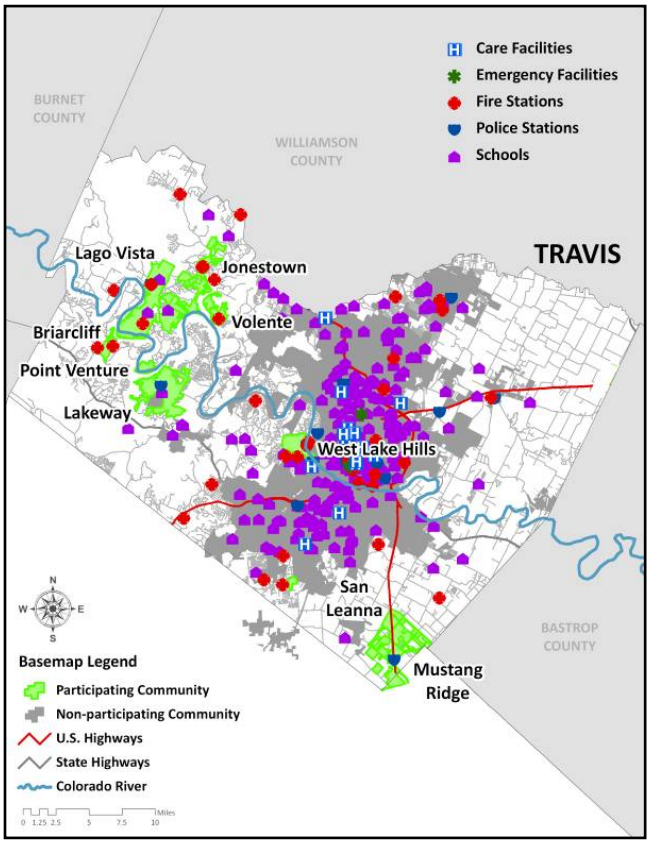


Figure 4-33. Critical Facilities in San Saba County

Figure 4-34. Critical Facilities in Travis County-Participating Jurisdictions Only



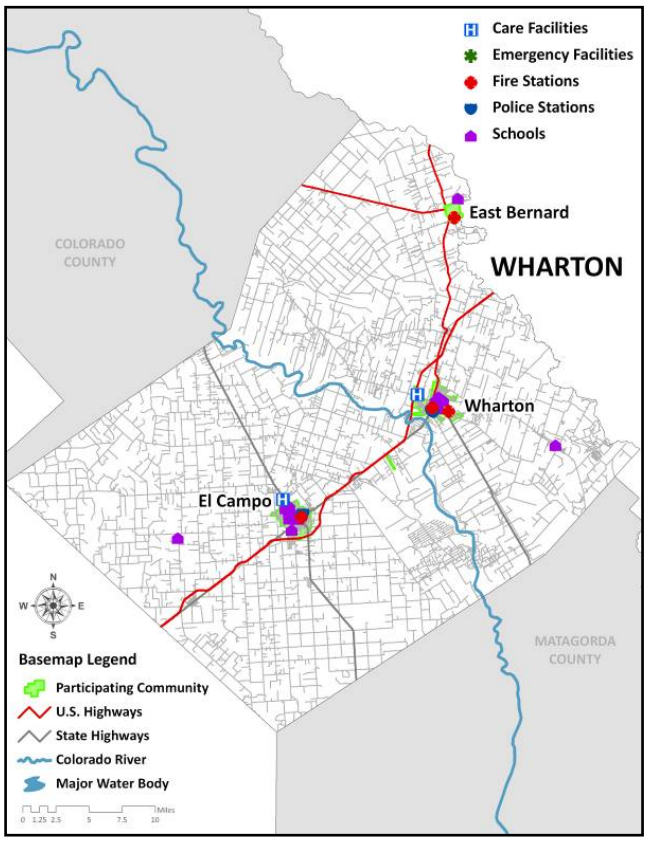
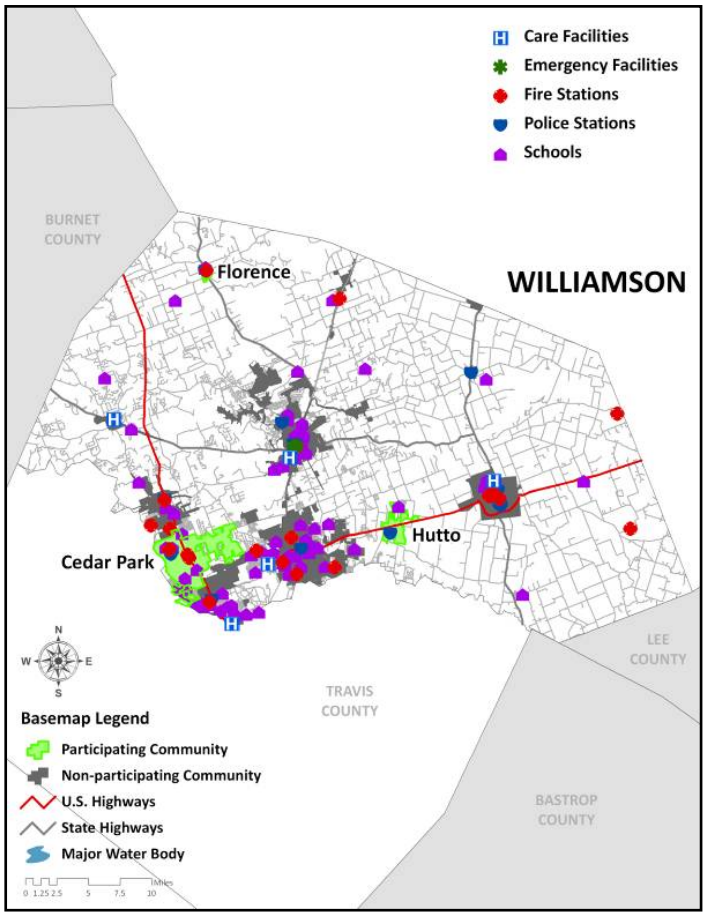


Figure 4-35. Critical Facilities in Wharton County

Figure 4-36. Critical Facilities in Williamson County



Section 5 – Overview of Hazards

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Hazard Identification

This section presents a hazard overview for the multi-hazard risk assessment conducted for the Texas Colorado River Floodplain Coalition. The TCRFC consists of 17 counties that intersect with the Colorado River basin, ranging from Matagorda County at the southeast end to Mills County at its northern-most end. The risk assessment is part of the TCRFC Plan Update and is intended to support long-term hazard mitigation planning efforts.

The risk assessment effort was conducted between September 2008 and March 2009 following the requirements of the Disaster Mitigation Act of 2000 (DMA2000) and prepared in accordance with guidance outlined in the State of Texas Mitigation Handbook; FEMA's *State and Local Mitigation Planning How-To-Guide: Understanding Your Risks—Identifying Hazards and Estimating Losses*; and FEMA's *A Guide to Using HAZUS for Mitigation*.

The framework for the risk assessment was developed to provide a basis for activities proposed during mitigation planning efforts for participating communities. The results are used to identify and prioritize appropriate mitigation actions in an effort to minimize potential losses from hazards identified in this study.

Disaster Declarations

Of the 1,806 major disaster declarations that have been issued between 1953 and 2008 in the 50 U.S. states, the District of Columbia, and nine U.S. territories, the State of Texas claims the highest number of disaster declarations—at 83—for any state or territory. A careful examination of hazard event profiles relevant to the TCRFC study area serves to define historic hazard trends and provides a reference point for understanding potential impacts from future predicted events.

A total of 21 Presidential and 22 Small Business Administration Disaster Declarations have been issued since 1961 for the Lower Colorado River basin. All of these were for weather-related hazard events except for one fire. The basin has experienced many additional disasters that were not severe enough to be declared by the President but nevertheless resulted in millions of dollars in direct and indirect costs to governments, businesses, and residents and caused significant human suffering, injuries, and deaths.

Table 5-1. Disaster Declarations for the TCRFC Region

Dates	Counties	Event	Type of Declaration	Declaration Number
1961	Matagorda	Hurricane Carla	Presidential, SBA	OEP 118 DR
10/05/67	Matagorda	Hurricane Beulah	Presidential, SBA	DR 232
05/30/72	Fayette	Central Texas Flood	Presidential, SBA	DR 333
03/19/73	Burnet	Tornado	Presidential, SBA	DR 365
11/30/74	Williamson	Flood, Tornado	Presidential, SBA	DR 454
09/25/79	Matagorda	Corpus Flood	Presidential, SBA	DR 603
1981	Travis	Memorial Day Flood	SBA	1992
08/19/83	Matagorda	Hurricane Alicia	Presidential, SBA	DR 689

Dates	Counties		Event	Type of Declaration	Declaration Number
05/04/89-06/15/89	Blanco Brown Burnet	Mason Williamson	Spring Storms	Presidential, SBA	DR 828
04/15/90-06/04/90	Brown Mills	Wharton	Flood, Tornadoes	Presidential, SBA	DR 863
12/20/91-01/14/92	Bastrop Brown Burnet Fayette Lampasas Llano	Mason Matagorda Mills Travis Wharton Williamson	Christmas Flood	Presidential, SBA	DR 930
10/14/94-11/08/94	Bastrop Colorado Fayette	Matagorda Wharton	Southeast Texas Flood	Presidential, SBA	DR 1041
1997	Williamson		Jarrell Tornado	SBA	2953
06/21/97-07/15/97	Blanco Burnet Llano	Mason San Saba Travis	Central Texas Flood	Presidential, SBA	DR 1179
1998	Bastrop		Fire	Presidential	FSA 2228
09/09/98-10/05/98	Matagorda		Tropical Storm Frances	Presidential, SBA	DR 1245
10/17/98-11/15/98	Bastrop Blanco Colorado Fayette	Matagorda Wharton Travis	Oct./Nov. Floods	Presidential, SBA	DR 1257
2002	Travis		Severe Storms Flood/Tornado	SBA	3390
06/29/02-07/31/02	Blanco Brown	San Saba Travis	Severe Storms Floods	Presidential, SBA	DR 1425

Dates	Counties		Event	Type of Declaration	Declaration Number
	Burnet				
09/06/02-09/30/02	Matagorda Wharton		Tropical Storm Fay	Presidential, SBA	DR 1434
7/15/03	Matagorda		Hurricane Claudette	Presidential	DR 1479
1/11/06	Bastrop		Extreme Wildfire Threat	Presidential, SBA	DR 1624
6/29/07	Brown Burnet Lampasas Llano Mason	McCulloch Mills San Saba Travis Williamson	Severe Storms, Tornados, and Flooding	Presidential, SBA	DR 1709
9/13/08	Matagorda Wharton		Hurricane Ike	Presidential, SBA	DR 1791

Source: FEMA

Hazard Identification Questionnaire

The communities in the TCRFC are vulnerable to a wide range of natural and man-caused hazards that threaten life and property. FEMA's current regulations and interim guidance under the Disaster Mitigation Act of 2000 (DMA 2000) require, at a minimum, evaluation of a full range of natural hazards. Although an evaluation of human-caused hazards (i.e., technological hazards, terrorism, etc.) is not required, the participating jurisdictions in the TCRFC have focused on both natural and human-caused hazards for this Plan Update.

Upon review of the full range of natural hazards suggested under FEMA planning guidance, the TCRFC identified a number of hazards that need to be addressed in its Multi-jurisdictional Hazard Mitigation Plan Update. These hazards were identified through an extensive process that utilized input from planning team members, research of past disaster declarations in the area, review of the TCRFC's 2004 Plan, and a review of the current State of Texas Hazard Mitigation Plan. Readily available online information from reputable sources such as federal and state agencies was also evaluated to supplement information from these key sources.

Table 5-2 documents the evaluation process used for determining which of the initially identified hazards are considered significant enough for further evaluation through the TCRFC's hazard risk assessment. For each hazard considered, the table indicates whether or not the hazard was identified as a significant hazard to be further assessed, how this determination was made, and why this determination was made. The table works to summarize not only those hazards that were identified (and why) but also those that were not identified (and why not). Hazard events not identified for inclusion at this time may be addressed during future evaluations and updates of the risk assessment if deemed necessary by planning team members.

Table 5-2. Hazard Identification Process

National Hazard Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time?	How was this determination made?	Why was this determination made?
Avalanche	NO	Review of the State Hazard Mitigation Plan, review of US Forest Service National Avalanche Center web Site and review of FEMA's Multi -Hazard Identification and Risk Assessment	There is no risk of avalanche events in the TCRFC area. The United Stated avalanche hazard is limited to mountainous western states. The topography and climate in the TCRFC regions would not support conditions needed for an avalanche to occur.
Dam Failure	YES	Review of the State Hazard Mitigation Plan and review of the United States Army Corps of Engineers (USACE) in the National Inventory of Dams.	There are a total of 517 dams, of which 69 are classified as "high hazard" dams, in the TCRFC Regions. Dams assigned the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life.
Drought	YES	Review of the State Hazard Mitigation Plan and review of NOAA National Climatic Data Center (NCDC)	The State Hazard Mitigation Plan identifies drought as a concern in the TCRFC regions and the NCDC shows a history of drought in the regions.

National Hazard Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time?	How was this determination made?	Why was this determination made?
Earthquake	NO	Review of the State Hazard Mitigation Plan, the 2004 HMAP for the TCRFC and the University of Texas Institute of Geophysics (UTIG).	Earthquakes with epicenters within this region are rare and small; perhaps 10-20 earthquakes with magnitudes between 3 and 4.5 will occur each century. A significant fraction of these earthquakes are induced by human activities, notably petroleum production. These events pose little or no risk unless their foci are extremely close to poorly built or very sensitive structures.
Expansive Soils	NO	Review of the State Hazard Mitigation Plan and the 2004 HMAP for the TCRFC.	While expansive soils are listed as a threat in the State Plan for coastal counties, the impact of this hazard is limited and the frequency is occasional.
Extreme Heat	YES	Review of the State Hazard Mitigation Plan and review of NOAA National Climatic Data Center (NCDC)	During the summer months, much of the TCRFC region experiences severe heat. This has resulted in both injuries and deaths according to the NCDC.
Flood	YES	Review of the State Hazard Mitigation Plan, review of the NOAA NCDC Storm Events Database, Review of FEMA's National Flood Insurance Program Loss Statistics.	The potential economic impact for a flood event for the TCRFC region as a whole totals more than $27,762,240,000 with 451,402 people at risk.
Hail	YES	Review of the State Hazard Mitigation Plan and review of NOAA NCDC storm events database.	In reports from the NOAA's NCDC there were 1151 hailstorm events reported. Potential Annualized losses are estimated at $29,575,276,000.

National Hazard Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time?	How was this determination made?	Why was this determination made?
Hazardous Material Release	YES	Review of the Texas Department of State Health Services Tier 2 Chemical Reporting Program.	Hazardous materials or toxic releases can have a substantial impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage.
Hurricane and Tropical Storm	YES	Review of the State Hazard Mitigation Plan, review of NOAA National Climatic Data Center (NCDC) and the 2004 HMAP for the TCRFC.	Hurricanes, tropical storms and hurricane winds can have a substantial impact. Annualized losses for the region could reach $27,762,240,000.
Land Subsidence	NO	Review of the Texas State Hazard Mitigation Plan, NOAA NCDC database, the U.S. Geological Survey (USGS), and the Department of Energy (DOE)	There is no historical occurrence of land subsidence for the TCRFC area. The impact would be limited and the frequency of occurrence is unlikely according to the State Plan.
Landslide	NO	Review of the State Hazard Mitigation Plan, the NOAA NCDC database and the University of Texas Institute of Geophysics (UTIG).	There are no known historical occurrences of a landslide for this region.

National Hazard Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time?	How was this determination made?	Why was this determination made?
Lightning	NO	Review of the State Hazard Mitigation Plan and review of NOAA National Climatic Data Center (NCDC)	The State of Texas Plan does not address lightning as a separate, significant hazard. In addition there have been no disaster declarations for the TCRFC region for lightning, and according to the NCDC, since 1950, there have been only 10 events in the region resulting in a total of 4 minor injuries and property damage.
Pipeline Failure	YES	Review of the Railroad Commission of Texas Pipeline data.	Because of the multitude of pipelines that are found in this region, pipeline failure will be addressed in the TCRFC Plan.
Terrorism	YES	Review of the State Hazard Mitigation Plan, the NOAA National Climatic Data Center (NCDC), and the Federal Emergency Management Agency (FEMA) website	Although a terrorist attack is rare, the impact can be substantial with minimal warning time.
Thunderstorm	YES	Review of the Texas State Hazard Mitigation Plan and NOAA NCDC database	Historical records state that there were 803 reported storms that caused $3,194,623.00 worth of damage between 1950-2008 throughout the TCRFC Region.
Tornado	YES	Review of the Texas State Hazard Mitigation Plan and NOAA NCDC database	Historical records state that there were 377 reported tornados that caused $6,073,540.00 worth of damage throughout the TCRFC Region.

National Hazard Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time?	How was this determination made?	Why was this determination made?
Tsunami	NO	Review of the State Hazard Mitigation Plan, the NOAA NCDC database and the University of Texas Institute of Geophysics (UTIG).	There is no record of any tsunami occurrence for the State of Texas.
Volcano	NO	Review of the State Hazard Mitigation Plan, the NOAA NCDC database and the University of Texas Institute of Geophysics (UTIG).	No active or dormant volcanoes occur in or near Texas.
Wildfire	YES	Review of the State Hazard Mitigation Plan and data from the Texas Forrest Service	Records for the Texas Forest Service and HAZUS MH that there are 356,189 people at risk; 177,824 buildings at risk; and an estimated value of the buildings at risk total $23,735,599,000.00
Windstorm	NO	Review of the Texas State Hazard Mitigation Plan and NOAA NCDC database	The NCDC does not list a historical hazard windstorm event for the region separate from hurricane winds or winds associated with severe thunderstorms. The State Plan indicates this region is at low risk and that a windstorm would result in limited impact.

National Hazard Considered	Was this hazard identified as a significant hazard to be addressed in the plan at this time?	How was this determination made?	Why was this determination made?
Winter Storm	YES	Review of the Texas State Hazard Mitigation Plan and NOAA NCDC database.	Historical records state that there were 125 reported storms that caused $373,000,713.00 between1950-2008 in the TCRFC regions.

Below is a summary of the hazard identification and evaluation process noting which of the initially identified hazards are considered significant enough for further evaluation through the hazard risk assessment. While further evaluation was not conducted for the other hazards, they will continue to be reassessed during annual plan updates. Members of the TCRFC and LCRA were integral in identifying hazards; however neither organization is listed separately in the results of the Risk Assessment as the risks are not unique from the jurisdictions included in the Plan Update.

Thirteen hazards were selected for the TCRFC Risk Assessment:

- Flood
- Hurricane and Tropical Storm
- Thunderstorms
- Tornado
- Hail
- Winter Storms
- Drought
- Extreme Heat
- Wildfire

- Dam Failure
- Hazardous Material Release
- Pipeline Failure
- Terrorism

Risk Ranking

To assess risks and rank the hazards in priority order, the Team[1] then:

- Profiled hazard events, providing information on previous occurrences;
- Ranked the hazards according to their likelihood, spatial extent, and potential impact;
- Developed a description of general vulnerability of the region to the hazard events;
- Conducted an inventory of assets at risk in terms of buildings and critical facilities, lifelines and infrastructure utilizing data in FEMA's Hazards United States-Multi-Hazards (HAZUS-MH) model;
- Mapped those hazards that have a distinct geographic boundary utilizing GIS technology;
- Performed risk assessments for selected hazards using FEMA's two distinct methodologies, FEMA's loss estimation software, HAZUS MH, and a statistical risk assessment methodology;
- Ranked the highest priority hazards *across* the jurisdictions, in terms of the risk of the hazard affecting one jurisdiction in comparison to the risk of the hazard affecting another jurisdiction in the region (see Table 5-3). The basis for this ranking was exposure, annualized losses, or annualized loss ratios depending upon the available data; and
- Ranked the hazards *within* each jurisdiction in terms of high, medium, low, and very low based on jurisdictional concerns about risk (Table 5-4).

Hazard ranking depends on the severity, area of impact, and probability of occurrence (return period). Table 5-3 provides the hazard ranking by jurisdiction for each hazard. For each jurisdiction, each hazard was given a rating of high (H), moderate (M), low (L), very low (VL), or not applicable (N/A) based on how vulnerable they are to that hazard or how probable that hazard is to impact the jurisdiction. The rating of N/A was used if the results for loss or potential impacts were zero. The rating is based on a combination of factors such as population and building exposure, or annualized loss ratio (or ALRs) when available.

[1] Although the TCRFC and LCRA are participating in this effort, they are not listed separately in the Risk Assessment sections as the geographic area of both regions is covered by the participating member communities. Therefore the LCRA and TCRFC do not have risks unique of the jurisdictions included in the Plan Update.

ALRs were used to develop the ratings for coastal flood, drought, inland flooding, hail, hurricane wind, thunderstorm, tornados, and winter storm hazards. Potentially impacted population results and historical occurrences were analyzed to develop ratings for dam failure, pipeline (oil and gas), HAZMAT (fixed and mobile) releases and wildfire. Additionally, drought results were only available at the county level, therefore any jurisdiction within the county was assumed to have the same rating as the county.

Table 5-3 Risk Ranking Presented by Jurisdictions HAZUS-MH Analysis[2]

JURISDICTION[3]	Dam Failure	Drought	Flood	Hail	Hazmat	Hurricane/Tropical Storm	Pipeline Failure	Thunderstorm	Tornado	Wildfire	Winter Storm
Bastrop County	M	M	M	L	M	L	M	L	L	H	L
Bastrop	M	M	H	L	H	L	M	L	L	H	L
Elgin	N/A	M	L	L	H	L	M	L	L	M	L
Smithville	VL	M	H	L	H	L	M	L	L	H	L
Blanco County	L	H	L	L	M	L	L	L	M	H	L
Johnson City	N/A	-	L	L	H	L	N/A	L	L	H	L
Brown County	**Not Participating**										
Brownwood	N/A	H	H	L	H	VL	M	L	L	H	L
Burnet County	M	H	L	L	M	VL	VL	L	L	H	L
Bertram	N/A	H	L	L	H	VL	H	L	L	H	L
Burnet	M	H	M	L	H	VL	M	L	L	H	L
Cottonwood Shores	H	H	L	L	M	VL	N/A	L	L	H	L
Granite Shoals	H	H	H	L	L	VL	VL	L	L	H	L
Highland Haven	L	H	L	L	M	VL	N/A	L	L	H	L

[2] Risk Ranking through HAZUS is not available for Extreme Heat or Terrorism as these hazards have no geographic boundary or annualized losses.

[3] The TCRFC and LCRA are not listed separately as both entities are composed of the jurisdictions included herein. Therefore, although participating, neither entity has risks unique of the jurisdictions that are listed throughout the Risk Assessment.

JURISDICTION[3]	Dam Failure	Drought	Flood	Hail	Hazmat	Hurricane/Tropical Storm	Pipeline Failure	Thunderstorm	Tornado	Wildfire	Winter Storm
Marble Falls	H	H	L	L	H	VL	VL	L	L	H	L
Meadowlakes	H	H	L	L	H	VL	N/A	L	L	H	L
Colorado County	VL	H	L	L	M	M	H	L	L	M	L
Columbus	N/A	H	H	L	H	M	M	L	L	M	L
Eagle Lake	N/A	H	L	L	H	M	H	L	L	VL	L
Weimar	N/A	H	L	L	H	M	H	L	L	H	L
Fayette County	VL	L	L	L	M	M	H	L	L	H	L
Carmine	N/A	L	L	L	H	M	M	L	L	M	L
Flatonia	N/A	L	L	L	H	M	M	L	L	H	L
La Grange	N/A	L	L	L	M	M	M	L	L	H	L
Lampasas County	L	H	L	L	M	VL	VL	L	L	H	M
Kempner	N/A	H	L	L	L	VL	N/A	L	L	H	M
Lampasas	M	H	M	L	H	VL	L	L	L	H	M
Lometa	N/A	H	L	L	H	VL	M	M	L	H	M
Lee County	N/A	H	L	L	M	L	M	L	L	M	M
Lexington	N/A	H	L	L	H	L	L	L	L	H	M
Giddings	N/A	H	L	L	H	L	M	L	L	L	M
Llano County	M	H	M	L	L	VL	VL	L	L	H	M
Llano	N/A	H	M	L	H	VL	L	L	L	H	M
Horseshoe Bay	H	H	M	L	M	VL	M	L	L	H	M
Sunrise Beach Village	N/A	H	H	L	H	VL	N/A	L	L	H	M
Mason County	N/A	M	H	L	M	VL	VL	L	L	H	M
Mason	N/A	M	M	L	H	VL	N/A	L	L	H	M
Matagorda County	N/A	L	M	L	M	H	H	L	L	H	M

JURISDICTION[3]	Dam Failure	Drought	Flood	Hail	Hazmat	Hurricane/Tropical Storm	Pipeline Failure	Thunderstorm	Tornado	Wildfire	Winter Storm
Bay City	N/A	L	L	L	H	H	H	L	L	VL	M
Palacios	N/A	L	L	L	H	H	M	L	L	H	M
McCulloch County	**Not Participating**										
Brady	H	H	H	L	H	VL	L	L	L	H	M
Mills County	VL	H	H	L	L	VL	L	L	L	M	M
Goldthwaite	N/A	H	L	L	M	VL	M	L	L	H	M
San Saba County	VL	M	H	L	L	VL	L	L	L	H	M
San Saba	N/A	M	L	L	M	VL	M	L	L	H	M
Travis County	**Not Participating**										
Briarcliff	N/A	H	H	L	VL	L	N/A	L	L	VL	L
Jonestown	N/A	H	M	L	VL	L	N/A	L	L	H	L
Lago Vista	N/A	H	H	L	M	L	N/A	L	L	H	L
Lakeway	N/A	H	M	L	M	L	N/A	L	L	H	L
Mustang Ridge	N/A	H	L	L	M	L	M	L	L	H	L
Point Venture	N/A	H	H	L	VL	L	N/A	L	L	H	L
San Leanna	N/A	H	M	L	H	L	N/A	L	L	H	L
Volente	N/A	H	L	L	VL	L	N/A	L	L	H	L
West Lake Hills	N/A	H	L	L	L	L	N/A	L	L	H	L
Wharton County	N/A	L	L	L	M	H	M	L	L	M	L
East Bernard	N/A	L	L	L	M	H	M	L	L	L	L
El Campo	N/A	L	M	L	H	H	M	L	L	VL	L
Wharton	N/A	L	L	L	H	H	M	L	L	M	L
Williamson County	M	L	M	L	M	L	L	L	L	H	L
Cedar Park	L	L	L	L	M	L	M	L	L	H	L

JURISDICTION[3]	Dam Failure	Drought	Flood	Hail	Hazmat	Hurricane/Tropical Storm	Pipeline Failure	Thunderstorm	Tornado	Wildfire	Winter Storm
Florence	N/A	L	M	L	H	L	N/A	L	L	H	L
Hutto	N/A	L	L	L	H	L	H	L	L	M	L

Table 5-4 Risk Ranking Within Each Jurisdiction[4]

JURISDICTION	Dam Failure	Drought	Extreme Heat	Flood	Hail	Hazmat	Hurricane/ Tropical Strom	Pipeline Failure	Terrorism	Thunderstorm	Tornado	Wildfire	Winter Storm
Bastrop County	L	M	M	H	VL	L	L	M	VL	M	M	H	L
Bastrop	L	H	H	H	M	H	M	M	L	H	H	H	M
Elgin	VL	M	M	VL	VL	L	L	M	VL	M	M	H	L
Smithville	VL	M	M	H	VL	L	L	M	VL	M	M	H	L
Blanco County	VL	H	H	L	M	L	L	VL	VL	M	L	H	M
Johnson City	VL	H	H	L	M	L	L	VL	VL	M	L	H	M
Brown County	**Not Participating**												
Brownwood	M	M	M	H	M	M	M	M	L	H	M	M	M
Burnet County	M	H	H	H	H	L	M	L	L	M	L	M	L
Bertram	VL	M	L	L	M	M	VL	L	L	M	M	H	L
Burnet	VL	H	H	H	M	L	M	M	VL	M	L	VL	M
Cottonwood Shores	H	H	M	H	H	M	VL	VL	H	H	H	H	M
Granite Shoals	L	M	M	L	M	VL	VL	VL	L	M	VL	L	VL
Highland Haven	M	M	L	H	L	M	M	N/A	L	L	L	M	VL
Marble Falls	VL	M	M	H	M	M	M	M	L	M	M	H	VL
Meadowlakes	M	M	M	M	M	L	VL	N/A	VL	M	M	VL	L

[4] Table 5-4 includes the additional hazards of Extreme Heat and Terrorism as this table reflects ranking selections by jurisdiction.

JURISDICTION	Dam Failure	Drought	Extreme Heat	Flood	Hail	Hazmat	Hurricane/ Tropical Strom	Pipeline Failure	Terrorism	Thunderstorm	Tornado	Wildfire	Winter Storm
Colorado County	M	H	M	M	M	H	H	M	M	M	M	H	L
Columbus	M	H	H	L	H	M	M	L	L	M	L	H	H
Eagle Lake	N/A	L	M	H	M	H	M	VL	M	H	L	L	VL
Weimar	VL	M	M	VL	VL	L	L	L	M	L	L	M	L
Fayette County	H	H	M	H	L	M	H	H	VL	M	L	H	VL
Carmine	M	M	M	H	L	M	L	H	M	M	M	H	L
Flatonia	N/A	H	H	M	H	H	H	H	L	H	H	M	H
La Grange	M	H	H	H	M	M	M	H	VL	M	M	H	VL
Lampasas County	L	H	L	M	L	M	VL	VL	L	M	M	M	L
Kempner	N/A	M	H	H	M	H	L	VL	H	M	M	VL	H
Lampasas	M	H	M	M	M	H	VL	L	M	H	L	H	VL
Lometa	N/A	H	L	L	M	VL	M	M	L	H	M	M	H
Lee County	VL	H	H	M	VL	L	VL	L	VL	H	L	M	M
Lexington	N/A	H	L	VL	L	L	M	L	L	M	L	M	VL
Giddings	N/A	M	M	L	M	M	N/A	M	M	M	M	M	L
Llano County	H	H	M	H	M	M	M	M	M	H	H	H	L
Llano	VL	M	M	H	H	L	L	VL	VL	M	L	M	L
Horseshoe Bay	H	M	M	M	M	VL	M	H	L	L	M	H	VL
Sunrise Beach Village	H	M	M	H	H	H	M	L	L	H	H	M	L
Mason County	N/A	H	M	H	M	M	L	L	L	M	M	H	M
Mason	N/A	H	M	H	M	M	L	L	L	M	M	H	M
Matagorda County	H	H	H	H	M	H	H	H	H	H	M	H	L
Bay City	H	H	H	H	M	H	H	M	H	H	M	H	L
Palacios	N/A	M	M	H	L	H	H	M	L	H	H	H	M

JURISDICTION	Dam Failure	Drought	Extreme Heat	Flood	Hail	Hazmat	Hurricane/ Tropical Strom	Pipeline Failure	Terrorism	Thunderstorm	Tornado	Wildfire	Winter Storm
McCulloch County	**Not Participating**												
Brady	H	M	M	H	M	M	VL	M	L	H	H	M	M
Mills County	M	H	M	M	M	M	L	M	L	H	M	H	M
Goldthwaite	L	H	H	M	M	L	N/A	L	L	H	M	H	M
San Saba County	L	H	H	H	M	M	N/A	L	L	M	L	M	M
San Saba	VL	H	H	M	M	VL	L	L	L	H	H	H	L
Travis County	**Not Participating**												
Briarcliff	L	L	L	L	L	L	N/A	L	VL	L	L	M	L
Jonestown	L	M	M	H	M	VL	L	VL	L	M	L	H	M
Lago Vista	L	H	H	H	M	L	M	L	VL	H	M	M	M
Lakeway	VL	L	N/A	VL	VL	VL	VL	N/A	N/A	L	L	M	VL
Mustang Ridge	N/A	H	L	M	M	VL	M	M	L	M	L	L	L
Point Venture	VL	VL	L	H	M	VL	VL	VL	VL	H	H	H	L
San Leanna	N/A	H	H	H	M	VL	M	L	VL	H	M	M	M
Volente	H	H	H	H	H	VL	L	N/A	VL	M	L	H	VL
West Lake Hills	N/A	M	L	L	L	H	L	M	H	H	VL	H	M
Wharton County	H	H	VL	H	H	H	H	H	M	H	M	M	M
East Bernard	VL	L	M	H	M	M	H	M	H	H	H	L	M
El Campo	N/A	L	M	M	L	M	M	L	VL	M	M	VL	VL
Wharton	H	H	VL	H	H	H	H	H	M	H	M	M	M
Williamson County	M	H	H	H	M	H	L	M	L	H	H	H	H
Cedar Park	H	H	M	H	M	H	H	L	M	H	H	H	H
Florence	M	M	H	M	H	H	L	N/A	VL	H	M	L	VL
Hutto	M	H	H	M	M	M	M	H	M	M	M	M	M

Methodologies Used

This multi-jurisdictional risk assessment was conducted with two distinct methodologies, utilizing GIS-based analysis and a statistical risk assessment methodology. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation, including historical occurrence information. The results of the multi-jurisdictional risk assessment are provided for each hazard immediately following the summary of information provided through the hazard identification and analysis, as listed above.

A GIS-based analysis was conducted for five hazards:

- Hurricane and tropical storm (including coastal flooding for Matagorda County);
- Flood;
- Pipeline Failure;
- Hazardous Materials Incidents (fixed and mobile); and
- Wildfire

A statistical risk assessment approach was used to analyze three hazards:

- Hail;
- Tornado; and
- Drought

An analysis of historical data or knowledge of potential hazards impacts was used to analyze three hazards:

- Thunderstorm;
- Winter Storm; and
- Dam Failure.

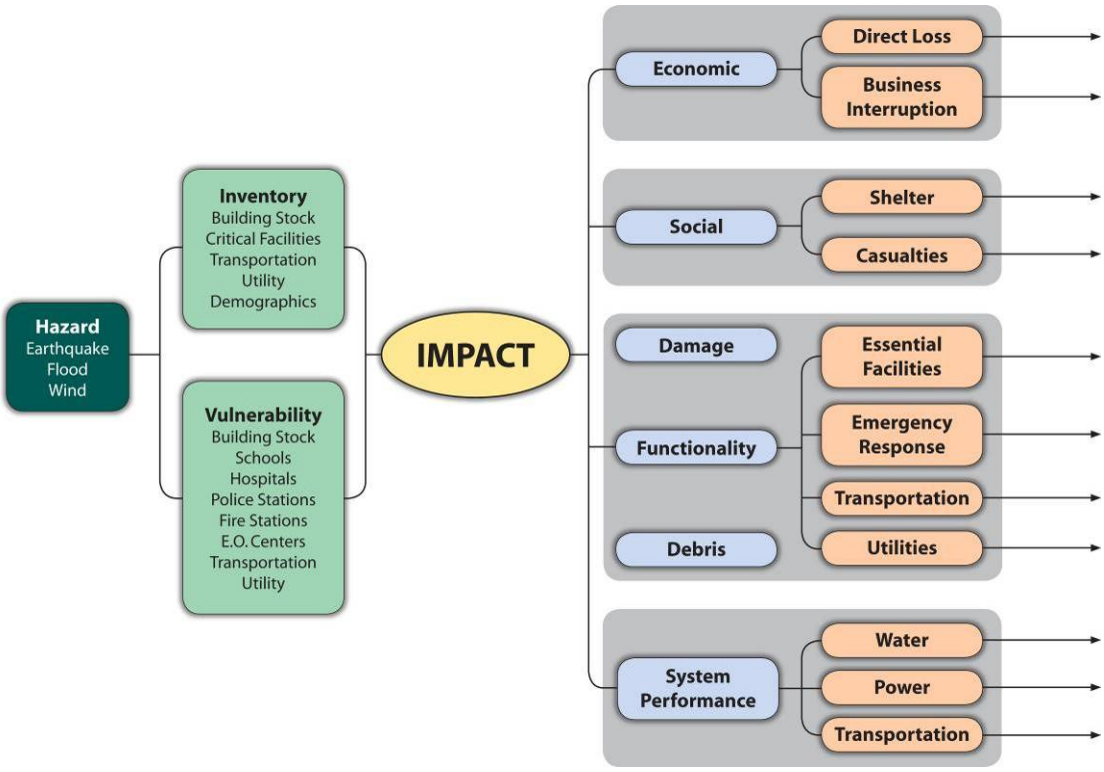
HAZUS-MH

This risk assessment was conducted using two different methods HAZUS-MH (FEMA's loss estimation software) and a statistical approach. The HAZUS-MH software was used to estimate

losses from the riverine and coastal flood and wind (hurricane) hazards. The HAZUS-MH driven methodology uses a statistical approach and mathematical modeling of risk to predict a hazard's frequency of occurrence and estimated impacts based on recorded or historic damage information. The statistical risk assessment methodology was applied to analyze hazards of concern that were outside the scope of the HAZUS-MH software. Following is a brief description of both approaches.

HAZUS-MH is FEMA's standardized loss estimation software program built upon an integrated GIS platform (Figure 5-1) to conduct analysis at a regional level (i.e., not on a structure-by-structure basis). The HAZUS-MH risk assessment methodology is parametric, in that distinct hazard and inventory parameters (e.g., wind speed and building types) were modeled using the HAZUS-MH software to determine the impact (i.e., damages and losses) on the built environment. This risk assessment applied HAZUS-MH to produce countywide profiles and estimate losses for three hazards at the jurisdictional level. At the time this analysis was completed, HAZUS-MH MR-3 (September 2007) was used to estimate potential losses from hurricane winds, riverine flood and coastal flood using HAZUS-MH default building stock inventory data. The results of the HAZUS-MH model analysis include annualized loss estimates for each participating jurisdiction so that potential loss values may be compared to one another throughout the study area.

Figure 5-1. Conceptual Model of HAZUS-MH Methodology



Statistical Risk Assessment Methodology

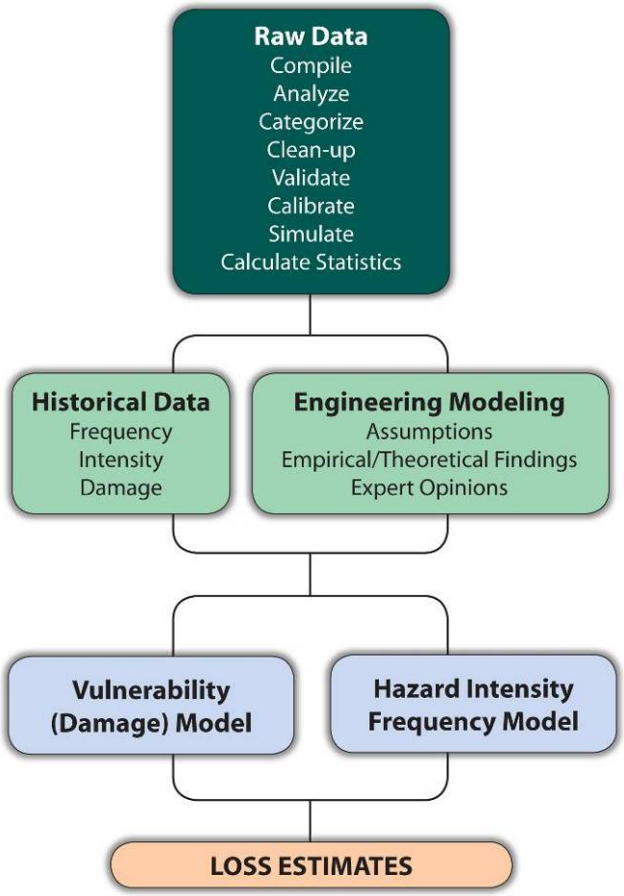
Risks associated with other natural and anthropogenic[5] hazards were analyzed using a statistical assessment methodology developed and used specifically for this effort. Historical data for each hazard was used along with statistical evaluations performed using manual calculations. The general steps used in the statistical risk assessment methodology are summarized below:

1. Compile data from the following sources:
    a. Local
    b. National
2. Clean up data:
    a. Remove duplication
    b. Update losses (for inflation)
3. Identify patterns in:
    a. Frequency
    b. Intensity
    c. Vulnerability
    d. Loss
4. Statistically and probabilistically extrapolate the patterns
5. Produce meaningful results:
    a. Development of annualized loss estimates

Figure 5- 2 illustrates a conceptual model of the statistical risk assessment methodology as applied to the TCRFC.

[5] An anthropogenic hazard is one that involves effects, processes, objects or materials that are derived from human activities, as opposed to those occurring in natural environments without human influences.

Figure 5-2. Conceptual Model of the Statistical Risk Assessment Methodology



The economic loss results are presented here using two interrelated risk indicators:

1) The Annualized Loss (AL), which is the estimated long-term weighted average value of losses to property in any single year in a specified geographic area (e.g., county or municipality).

2) The Annualized Loss Ratio (ALR), which expresses estimated annualized loss normalized by property replacement value.

The AL addresses the key idea of risk: the probability of the loss occurring in the study area (largely a function of building construction type and quality). By annualizing estimated losses, the AL factors in historic patterns of frequent smaller events with infrequent but larger events, provide a balanced presentation of the risk.

The ALR represents the AL as a fraction of the replacement value of the local inventory. This ratio is calculated using the following formula:

ALR = Annualized Losses / Total Exposure

The ALR gauges the relationship between average annualized loss and replacement value. This ratio can be used as a measure of vulnerability and, since it is normalized by replacement value, it can be directly compared across different geographic units such as metropolitan areas or counties.

Loss Estimates

It is important to note that loss estimates calculated for the risk assessment are approximate, based upon available data and methodologies. These estimates should be used to understand relative risk from hazards and potential losses and are not intended to be predictive of precise results. Uncertainties are inherent in any loss estimation methodology arising in part from incomplete scientific knowledge concerning natural and human-caused hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications necessary for a comprehensive analysis (e.g., incomplete or outdated inventory, or demographic or economic parameter data). These factors can result in a range of uncertainty in loss estimates produced by this analysis, possibly at a factor of two or more.

Loss estimates are presented in terms of annualized losses, where possible. In general, presenting results in the annualized form is highly useful on three fronts:

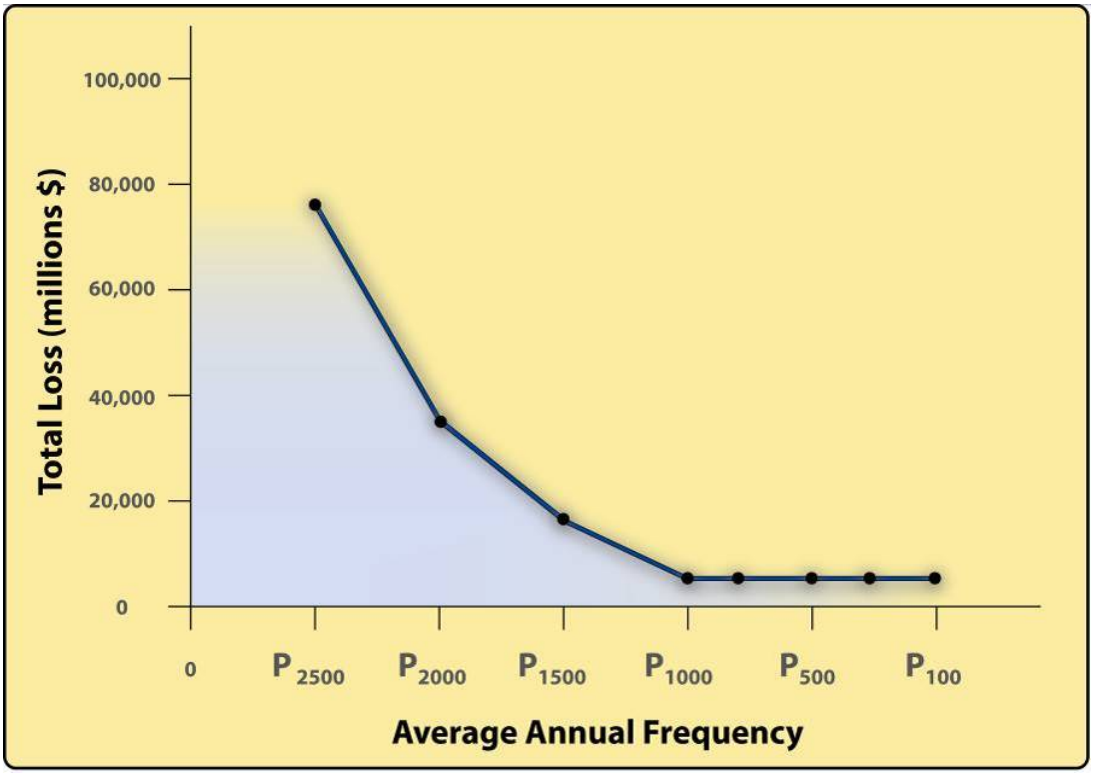
- Contribution of potential losses from all future disasters is accounted for with this approach;
- Results in this form from different hazards are readily comparable and hence easier to rank; and
- When evaluating mitigation alternatives, use of annualized losses is the most objective approach for this purpose.

Annualized losses for the hazards where the parametric approach is utilized are computed in a three-step process:

- Compute/estimate losses for a number of scenario events with different return periods (e.g., 10-year, 100-year, 200-year, 500-year, etc.);
- Approximate the Probability versus Loss Curve through curve fitting; and
- Calculate the area under the fitted curve to obtain annualized losses.

This approach is illustrated graphically in Figure 5-3 on the following page. For other hazards where the statistical approach was used, the computations are based primarily on observed historical losses.

Figure 5-3. Graphical Representation of the Annualized Loss Methodology



Economic Impact

Using the previously described methodology, results were obtained for different hazards profiled in this risk assessment. The economic results are summarized in Table 5-5 and Table 5-6.

The economic loss results are presented here using Annualized Loss (AL), which is the estimated long-term value of losses to the general building stock in any single year in a specified geographic area (e.g., county or municipality). The estimated AL addresses three key components of risk: the probability of the hazard occurring in the study area, the consequences of the hazard, (largely a function of building construction type and quality) and the intensity of the hazard event. By annualizing estimated losses, the AL factors in historic patterns of frequent smaller events with infrequent but larger events to provide a balanced presentation of the risk.

Table 5-5. Summary of Annualized Loss Estimates

JURISDICTION	DROUGHT[1]	INLAND FLOODING	HAIL	HURRICANE WIND	THUNDER-STORM	TORNADOES	WINTER STORM
Bastrop County	**11,104,260**	**6,920,000**	**Negligible**	**251,053**	**11,800**	**77,959**	**34,701**
Bastrop	-	3,822,000	Negligible	76,209	6,323	Negligible	-
Elgin	-	31,000	Negligible	45,522	Negligible	Negligible	-
Smithville	-	1,053,000	Negligible	35,948	Negligible	Negligible	-
Blanco County	**11,104,260**	**1,121,000**	**Negligible**	**26,901**	**7,525**	**1,125,442**	**170,391**
Johnson City	-	10,000	Negligible	4,688	Negligible	Negligible	-
Brown County	**16,015,989***	**Not Participating**					**128,607***
Brownwood	-	2,590,000	Negligible	9,092	45,850	10,544	-
Burnet County	**11,104,260**	**2,999,000**	**Negligible**	**32,341**	**7,093**	**77,200**	**36,552**
Bertram	-	Negligible	Negligible	Negligible	Negligible	Negligible	-
Burnet	-	607,000	Negligible	7,228	12,608	Negligible	-
Cottonwood Shores	-	14,000	Negligible	Negligible	Negligible	Negligible	-
Granite Shoals	-	782,000	Negligible	Negligible	Negligible	Negligible	-
Highland Haven	-	67,000	Negligible	Negligible	Negligible	Negligible	-
Marble Falls	-	856,000	15,222	10,660	5,079	122,531	-
Meadowlakes	-	43,000	Negligible	Negligible	Negligible	Negligible	-
Colorado County	**18,415,933**	**3,781,000**	**10,966**	**489,380**	**6,537**	**709,089**	**23,478**
Columbus	-	1,823,000	5,353	194,986	6,186	Negligible	-
Eagle Lake	-	Negligible	Negligible	126,536	8,462	Negligible	-
Weimar	-	Negligible	Negligible	128,734	Negligible	Negligible	-
Fayette County	**11,104,260**	**1,805,000**	**Negligible**	**391,525**	**8,673**	**112,746**	**57,316**
Carmine	-	Negligible	Negligible	5,811	Negligible	Negligible	-
Flatonia	-	Negligible	Negligible	25,183	Negligible	Negligible	-
La Grange	-	181,000	Negligible	105,425	Negligible	Negligible	-

JURISDICTION	DROUGHT[1]	INLAND FLOODING	HAIL	HURRICANE WIND	THUNDER-STORM	TORNADOES	WINTER STORM
Lampasas County	**119,529,540**	**1,250,000**	**Negligible**	**11,976**	**6,457**	**5,699**	**1,547,618**
Kempner	-	24,000	Negligible	Negligible	Negligible	Negligible	-
Lampasas	-	1,234,000	Negligible	11,391	Negligible	Negligible	-
Lometa	-	Negligible	12,741	Negligible	122,531	Negligible	-
Lee County	**11,104,260**	**1,526,000**	**Negligible**	**88,820**	**10,601**	**153,462**	**34,701**
Lexington	-	Negligible	Negligible	12,299	6,232	Negligible	-
Giddings	-	Negligible	15,333	55,971	13,210	Negligible	-
Llano County	**11,104,260**	**5,110,000**	**Negligible**	**21,173**	**24,920**	**18,369**	**36,552**
Llano	-	383,000	Negligible	6,045	7,226	Negligible	-
Horseshoe Bay	-	1,835,000	Negligible	11,158	Negligible	Negligible	-
Sunrise Beach Village	-	1,886,000	Negligible	Negligible	Negligible	Negligible	-
Mason County	**16,015,989**	**430,000**	**Negligible**	**Negligible**	**Negligible**	**144,741**	**Negligible**
Mason	-	365,000	Negligible	Negligible	12,103	Negligible	-
Matagorda County	**18,415,933**	**4,572,000**	**Negligible**	**5,186,792**	**Negligible**	**307,946**	**Negligible**
Bay City	-	224,000	Negligible	5,597,002	Negligible	Negligible	-
Palacios	-	32,000	Negligible	1,309,613	Negligible	Negligible	-
McCulloch County	**16,015,989***	**Not Participating**					**1,231,463***
Brady	-	679,000	Negligible	Negligible	10,214	7,417	-
Mills County	**125,423,429**	**495,000**	**Negligible**	**Negligible**	**Negligible**	**5,961**	**1,547,332**
Goldthwaite	-	Negligible	Negligible	Negligible	Negligible	Negligible	-
San Saba County	**5,981,970**	**1,281,000**	**13,906**	**Negligible**	**19,971**	**8,249**	**1,231,387**
San Saba	-	95,000	Negligible	Negligible	Negligible	Negligible	-
Travis County	**11,104,260***	**Not Participating**					**170,391***
Briarcliff	-	1,368,000	Negligible	17,593	Negligible	Negligible	-

JURISDICTION	DROUGHT[1]	INLAND FLOODING	HAIL	HURRICANE WIND	THUNDER-STORM	TORNADOES	WINTER STORM
Jonestown	-	243,000	Negligible	25,784	Negligible	Negligible	-
Lago Vista	-	2,363,000	2,038,158	85,408	Negligible	Negligible	-
Lakeway	-	2,077,000	Negligible	236,145	Negligible	339,225	-
Mustang Ridge	-	94,000	Negligible	8,534	Negligible	Negligible	-
Point Venture	-	399,000	Negligible	10,997	Negligible	Negligible	-
San Leanna	-	57,000	Negligible	6,187	Negligible	Negligible	-
Volente	-	112,000	Negligible	7,757	Negligible	Negligible	-
West Lake Hills	-	69,000	Negligible	122,062	14,295	Negligible	-
Wharton County	**18,415,933**	**2,308,000**	**121,355**	**2,990,969**	**10,845**	**73,938**	**Negligible**
East Bernard	-	119,000	Negligible	262,953	Negligible	Negligible	-
El Campo	-	1,509,000	Negligible	1,815,032	118,163	Negligible	-
Wharton	-	53,000	Negligible	1,414,037	6,267	Negligible	-
Williamson County	**11,104,260**	**6,726,000**	**7,255**	**377,089**	**75,287**	**1,189,973**	**34,701**
Cedar Park	-	134,000	Negligible	Negligible	Negligible	1,583,049	-
Florence	-	203,000	Negligible	Negligible	Negligible	Negligible	-
Hutto	-	103,000	Negligible	5,301	23,825	Negligible	-

Losses and results of the Risk Assessment are not listed separately for the TCRFC or LCRA, although both entities are participating, as these numbers are composed from each participating jurisdiction within the TCRFC and LCRA. The TCRFC and LCRA have no unique risks than the jurisdictions participating in the Plan Update.

Table 5-6. Summary of the Annualized Loss Ratios (ALR)

(Calculated as Annualized Losses Divided by the Total Exposure at Risk)

JURISDICTION	DROUGHT[1]	INLAND FLOODING	HAIL	HURRICANE WIND	THUNDER-STORM	TORNADOES	WINTER STORM
Bastrop County	**39.91%**	**0.50%**	**0.00%**	**0.01%**	**0.00%**	**0.00%**	**0.00%**
Bastrop	-	3.91%	0.00%	0.01%	0.00%	0.00%	-
Elgin	-	0.05%	0.00%	0.01%	0.00%	0.00%	-
Smithville	-	1.95%	0.00%	0.01%	0.00%	0.00%	-
Blanco County	**92.15%**	**0.059%**	**0.00%**	**0.01%**	**0.00%**	**0.25%**	**0.03%**
Johnson City	-	0.03%	0.00%	0.01%	0.00%	0.00%	-
Brown County	**62.25%***	**Not Participating**					**0.01%***
Brownwood	-	1.28%	0.00%	0.00%	0.00%	0.00%	-
Burnet County	**108.26%**	**0.36%**	**0.00%**	**0.00%**	**0.00%**	**0.01%**	**0.00%**
Bertram	-	0.00%	0.00%	0.00%	0.00%	0.00%	-
Burnet	-	0.54%	0.00%	0.00%	0.00%	0.00%	-
Cottonwood Shores	-	0.21%	0.00%	0.00%	0.00%	0.00%	-
Granite Shoals	-	1.06%	0.00%	0.00%	0.00%	0.00%	-
Highland Haven	-	0.24%	0.00%	0.00%	0.00%	0.00%	-
Marble Falls	-	0.43%	0.00%	0.00%	0.00%	0.03%	-
Meadowlakes	-	0.19%	0.00%	0.00%	0.00%	0.00%	-
Colorado County	**44.28%**	**0.77%**	**0.00%**	**0.08%**	**0.00%**	**0.11%**	**0.00%**
Columbus	-	1.23%	0.00%	0.08%	0.00%	0.00%	-
Eagle Lake	-	0.00%	0.00%	0.08%	0.01%	0.00%	-
Weimar	-	0.00%	0.00%	0.08%	0.00%	0.00%	-

JURISDICTION	DROUGHT[1]	INLAND FLOODING	HAIL	HURRICANE WIND	THUNDER-STORM	TORNADOES	WINTER STORM
Fayette County	**21.48%**	**0.27%**	**0.00%**	**0.03%**	**0.00%**	**0.01%**	**0.00%**
Carmine	-	0.00%	0.00%	0.03%	0.00%	0.00%	-
Flatonia	-	0.00%	0.00%	0.03%	0.00%	0.00%	-
La Grange	-	0.30%	0.00%	0.03%	0.00%	0.00%	-
Lampasas County	**893.68%**	**0.37%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.16%**
Kempner	-	0.08%	0.00%	0.00%	0.00%	0.00%	-
Lampasas	-	0.86%	0.00%	0.00%	0.00%	0.00%	-
Lometa	-	0.00%	0.03%	0.00%	0.29%	0.00%	-
Lee County	**48.39%**	**0.44%**	**0.00%**	**0.02%**	**0.00%**	**0.03%**	**0.00%**
Lexington	-	0.00%	0.01%	0.02%	0.01%	0.00%	-
Giddings	-	0.00%	0.00%	0.02%	0.00%	0.00%	-
Llano County	**94.59%**	**0.97%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
Llano	-	0.84%	0.00%	0.00%	0.00%	0.00%	-
Horseshoe Bay	-	0.69%	0.00%	0.00%	0.00%	0.00%	-
Sunrise Beach Village	-	1.99%	0.00%	0.00%	0.00%	0.00%	-
Mason County	**35.75%**	**11.32%**	**0.00%**	**0.00%**	**0.00%**	**0.09%**	**0.00%**
Mason	-	0.70%	0.00%	0.00%	0.01%	0.00%	-
Matagorda County	**15.91%**	**0.72%**	**0.00%**	**0.55%**	**0.00%**	**0.03%**	**0.00%**
Bay City	-	0.06%	0.00%	0.55%	0.00%	0.00%	-
Palacios	-	0.04%	0.00%	0.55%	0.00%	0.00%	-
McCulloch County	**123.52%***	**Not Participating**					**0.27%***
Brady	-	1.94%	0.00%	0.00%	0.00%	0.00%	-

JURISDICTION	DROUGHT[1]	INLAND FLOODING	HAIL	HURRICANE WIND	THUNDER-STORM	TORNADOES	WINTER STORM
Mills County	**570.44%**	**6.99%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.47%**
Goldthwaite	-	0.00%	0.00%	0.00%	0.00%	0.00%	-
San Saba County	**26.08%**	**1.21%**	**0.01%**	**0.00%**	**0.01%**	**0.00%**	**0.33%**
San Saba	-	0.15%	0.00%	0.00%	0.00%	0.00%	-
Travis County	**64.88%***	**Not Participating**					**0.00%***
Briarcliff	-	2.87%	0.00%	0.02%	0.00%	0.00%	-
Jonestown	-	0.57%	0.00%	0.02%	0.00%	0.00%	-
Lago Vista	-	1.13%	0.53%	0.02%	0.00%	0.00%	-
Lakeway	-	0.64%	0.00%	0.02%	0.00%	0.03%	-
Mustang Ridge	-	0.33%	0.00%	0.02%	0.00%	0.00%	-
Point Venture	-	1.33%	0.00%	0.02%	0.00%	0.00%	-
San Leanna	-	0.82%	0.00%	0.02%	0.00%	0.00%	-
Volente	-	0.40%	0.00%	0.02%	0.00%	0.00%	-
West Lake Hills	-	0.02%	0.00%	0.02%	0.00%	0.00%	-
Wharton County	**12.58%**	**0.29%**	**0.01%**	**0.28%**	**0.00%**	**0.01%**	**0.00%**
East Bernard	-	0.46%	0.00%	0.28%	0.00%	0.00%	-
El Campo	-	0.76%	0.00%	0.28%	0.02%	0.00%	-
Wharton	-	0.01%	0.00%	0.28%	0.00%	0.00%	-
Williamson County	**23.93%**	**0.26%**	**0.00%**	**0.01%**	**0.00%**	**0.02%**	**0.00%**
Cedar Park	-	0.02%	0.00%	0.01%	0.00%	0.08%	-
Florence	-	0.86%	0.00%	0.01%	0.00%	0.00%	-
Hutto	-	0.23%	0.00%	0.01%	0.03%	0.00%	-

Conclusion

The results of this study are useful in at least three ways:

- Improving understanding of the risks associated with natural hazards in the TCRFC through better understanding of the complexities and dynamics of risk, how levels of risk can be measured and compared, and the myriad factors that influence risk. An understanding of these relationships is critical in making balanced and informed decisions on managing potential hazards.

- Providing a baseline for policy development and comparison of mitigation alternatives. The data used for this analysis present a current picture of risk in the TCRFC area. Updating this risk "snapshot" with future data will enable comparison of the changes in risk with time. Baselines of this type can support the objective analysis of policy and program options for risk reduction in the region.

- Comparing the risk among the natural hazards addressed. The ability to quantify the risk to all these hazards relative to one another helps in a balanced, multi-hazard approach to risk management at each level of governing authority. This ranking provides a systematic framework to compare and prioritize the very disparate natural hazards that are present in the TCRFC. This final step in risk assessment provides the necessary information for each jurisdiction to craft a mitigation strategy to focus resources on only those hazards that pose the most threat to the region.

Section 6 – Flood

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Hazard Profile

Flooding is the most frequent and costly natural hazard in the United States, a hazard that has caused more than 10,000 deaths since 1900. Nearly 90 percent of presidential disaster declarations result from natural events where flooding was a major component.

Floods generally result from excessive precipitation, and can be classified under two categories: general floods, precipitation over a given river basin for an extended period of time combined with storm-induced wave or tidal action; flash floods, the product of heavy localized precipitation in a short time period. The severity of a flooding event is typically determined by a combination of several major factors, including: stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surface. Generally floods are long-term events that may last for several days. The primary types of general flooding include riverine, coastal and urban flooding.

Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Riverine flooding is natural and inevitable as it is the overbank flooding of rivers and streams, typically resulting from large-scale weather systems that generate prolonged rainfall over a wide geographic area. Some river floods occur seasonally when winter or spring rainfalls fill river basins with too much water, too quickly. Torrential rains from decaying hurricanes or tropical systems can also produce river flooding.

Coastal flooding[1] is typically a result of storm surge, wind-driven waves and heavy rainfall produced

[1] Coastal Flooding is discussed with Hurricane and Tropical Storms.

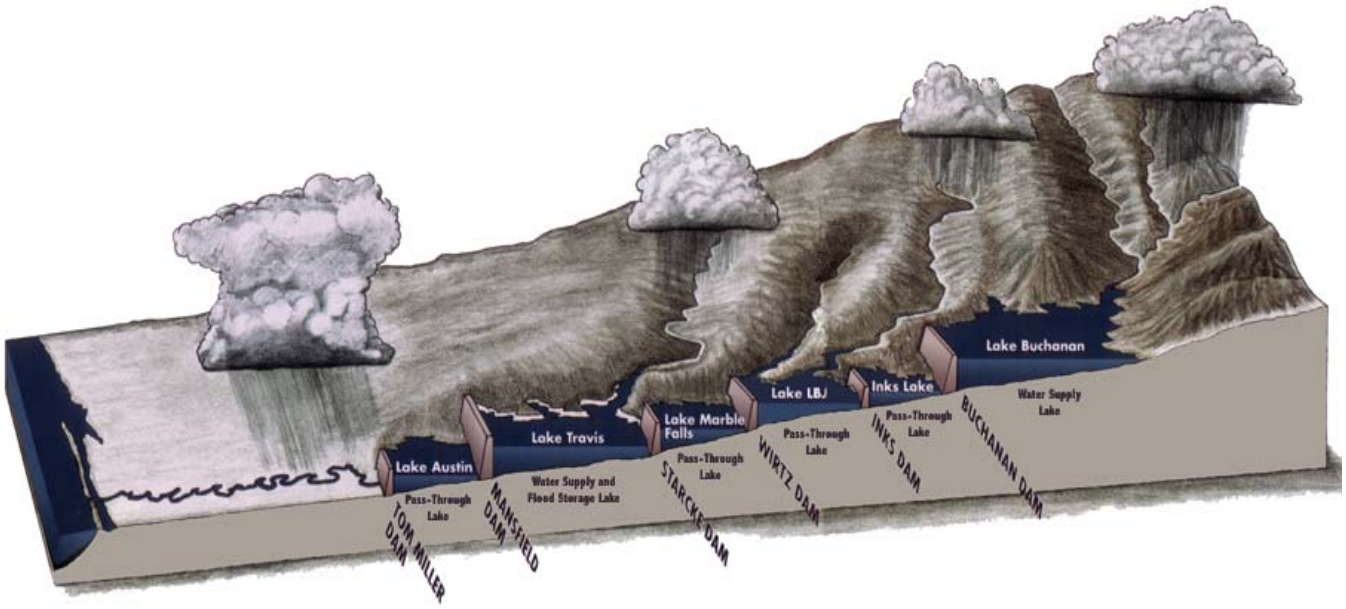
by hurricanes, tropical storms, and other large coastal storms. Urban flooding occurs where manmade development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff. Urban flooding occurs as land is converted from fields or woodlands to roads, buildings and parking lots and when the natural land loses its ability to absorb rainfall. Urbanization changes the natural hydrologic systems of a basin, increasing runoff two to six times over what would occur on natural terrain. During periods of urban flooding, streets can become swift-moving rivers, while highway underpasses and underground parking garages can become death traps as they fill with water.

Most flash flooding is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. However, flash flooding events may also occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall, or from a sudden release of water held by a retention basin or other stormwater control facility. Although flash flooding occurs most often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces.

Most flood deaths in the TCRFC region are due to flash floods. The National Weather Service characterizes the Hill County watershed of the Lower Colorado River as "Flash Flood Alley," saying it is one of the regions in the United States at greatest risk for flash floods. Several factors contribute to giving it this dubious distinction. These factors include its proximity to the moisture-laden Gulf atmosphere; its record rainfall intensity and duration; its thin, easily saturated soils; location in and proximity to the uneven terrain of the Hill Country; and increasing urbanization that reduces the land's natural ability to absorb water and causes rainfall to rush off buildings and pavement. The Hill Country watersheds of the Colorado River and its tributaries cover several thousand square miles. That means the Highland Lakes can receive rain and runoff from storms that occur hundreds of miles away. These factors can transform heavy rains into walls of fast-moving water with great destructive potential.

Flooding in the Colorado River Basin
Source: LCRA

Figure 6-1. Potential Dam Overtopping



Most flash flooding is caused by slow-moving thunderstorms, thunderstorms repeatedly moving over the same area, or heavy rains from hurricanes and tropical storms. Flash floods can occur within a few minutes or after hours of excessive rainfall. Flash floods can roll boulders, tear out trees, destroy buildings and bridges, and carve out new channels. Rapidly rising water can reach heights of thirty feet or more. Flash flood-producing rains can also trigger catastrophic mudslides. Often there is no warning that flash floods are coming. Hill Country flash floods devastated the river basin in the early days and are a major reason why the Lower Colorado River Authority located Mansfield Dam and Lake Travis—the flood control components of the Highland Lake chain – upstream of Austin.

Flash flooding poses a deadly danger to residents of the Lower Colorado River Basin. A number of roads run through low-lying areas that are prone to sudden and frequent flooding during heavy rains. Motorists often attempt to drive through barricaded or flooded roadways. It takes only 18-to-24-inches of water moving across a roadway to carry away most vehicles. Floating cars easily get swept downstream, making rescues difficult and dangerous.

The periodic flooding of lands adjacent to rivers, streams and shorelines (land known as floodplain) is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of particular magnitude or an equal or larger flood. Flood magnitude increases with increasing recurrence interval.

Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 10-year flood and the 100-year floodplain by the 100-year flood. Flood frequencies such as the 100-year flood are determined by plotting a graph of all known flood sizes for an area and determining how often floods of a particular size occur. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1 percent chance of occurring in any given year. The 500-year flood has a 0.2 percent chance of occurring in any given year.

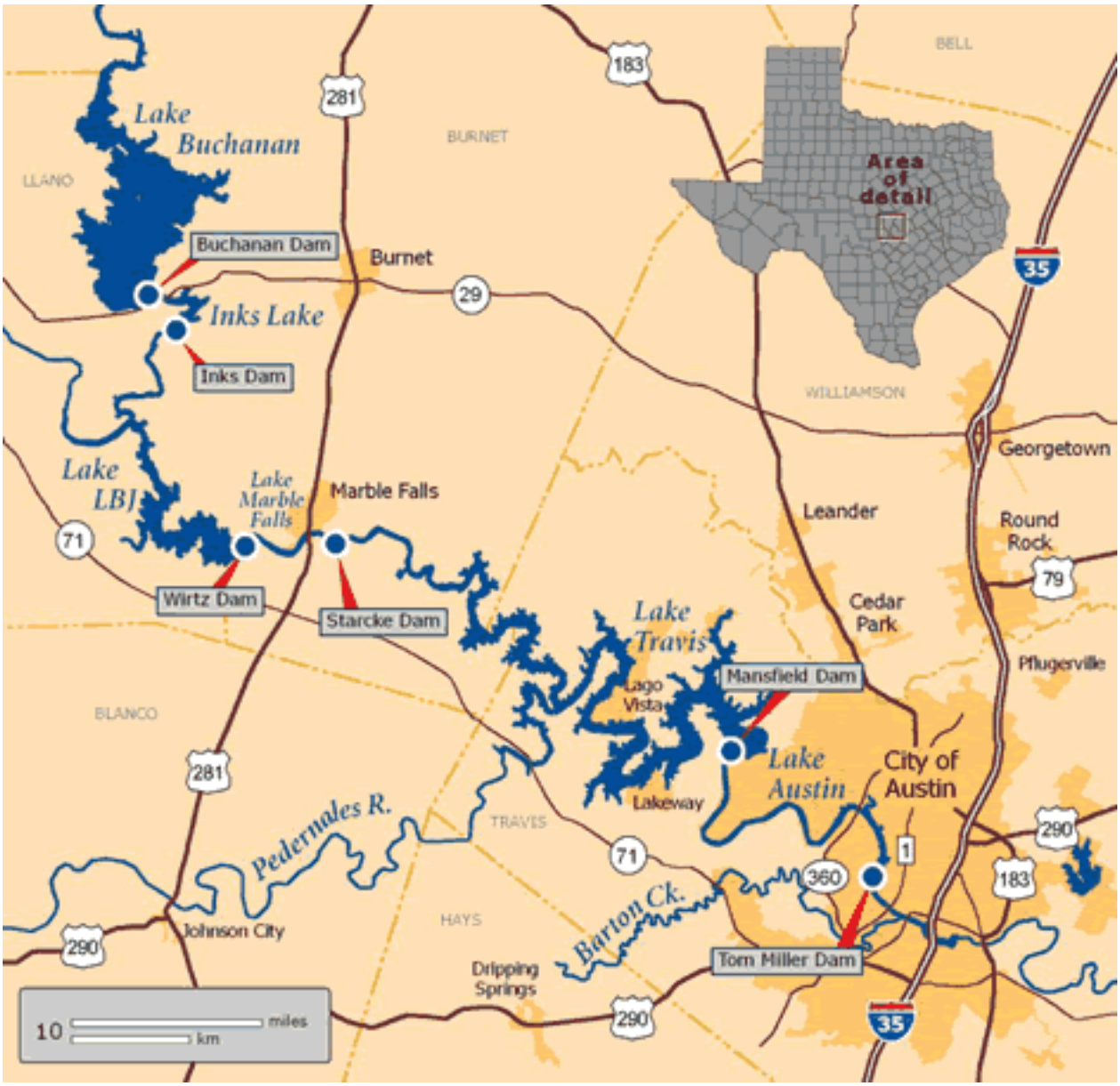
Managing Floodwaters

Of the six Highland Lakes, only Lake Travis is designed to store and hold floodwaters. Mansfield Dam, which forms Lake Travis, creates a storage area called a "flood pool" to contain runoff from Hill County storms that would otherwise inundate Austin and downstream communities. Lake Travis is in its flood pool whenever it is above its full elevation of 681 feet above mean sea level (msl). The flood pool extends past 714 feet msl, which is also the elevation of the spillway at Mansfield Dam. The 100 year floodplain or 1% Annual Chance Event (ACE) for Lake Travis is 722 feet msl.

Lakes Travis and Buchanan serve as the two major water storage reservoirs in the Highland Lake chain. Unlike Travis, Buchanan has no flood pool – it has very little additional capacity when it is at full elevation. And the smaller "pass through" lakes (Inks, LBJ, Marble Falls and Austin) have no extra capacity. When heavy rains and floods occur in the Hill Country, LCRA's goal is to capture the runoff in Lakes Travis and Buchanan. Rains and floods are the only way these lakes can be refilled.

Lake Buchanan Water Falls
Source: LCRA

Figure 6-2. The Highland Lakes and Dams, Lower Colorado River Authority



While all of the Highland Lakes dams except Inks have floodgates, LCRA uses the gates only when absolutely necessary to manage floodwaters. Many times, LCRA passes storm runoff through the hydroelectric power stations at the dams, gaining additional benefit by using the water to generate electricity. LCRA opens floodgates only when it needs to pass through more water than the hydroelectric power stations can accommodate.

Figure 6-3. Estimated Flow Times for Floodwaters, Lower Colorado River Authority

The LCRA operates Lake Travis and Mansfield Dam during floods under guidelines developed by LCRA, FEMA, and the U.S. Army Corps of Engineers. The guidelines determine how much water LCRA may release, depending on the amount of water in the Lake Travis storage pool, as well as downstream conditions. In all but the most catastrophic flood scenarios, the goal is to keep the downstream river at or below flood stage by monitoring "control points" at Austin, Bastrop and Columbus.

Thanks to the Highland Lakes, Austin and other downstream communities along the Colorado River have not experienced the frequency of devastating floods typical of the 19th and early 20th centuries. The Highland Lakes dams can minimize or prevent many potential floods, but they cannot prevent all floods. If storms pour more water into a lake than the dam can release, the lake will rise. And the dams cannot control storms or floods that occur downstream.

This Lower Colorado River Basin is still at risk for floods, mainly from heavy rains that fall downstream of Mansfield Dam, beyond the reach of the dam's flood control capabilities. Downstream of Austin, major floods occur less frequently than before the Highland Lakes were created. When they occur, they may take hours or days to reach their peak, as opposed to the sudden flash flooding that can occur in the Hill Country. Even so, floods can be widespread and cause significant damage, such as the October 1998 flood that inundated several areas along the river, including parts of Wharton.

Location

The following figures depict the flood zones where there is potential for damage to property and/or loss of life for participating jurisdictions in the TCRFC. Figures 6-4 displays the 1-percent annual chance flood hazard for the TCRFC region as a whole, and Figures 6-5 through 6-21 provide flood zones in each of the 17 counties and jurisdictions participating in the Coalition's update plan. Data was available for the 1-percent annual chance flood hazard, also known as a "100-year" flood event, but not available for the ½-percent annual chance flood hazard, also known as a "500-year" flood event. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated special flood hazard areas.

Flooding in Matagorda County
Source: LCRA

Figure 6-4. Flood Zones in the TCRFC Region

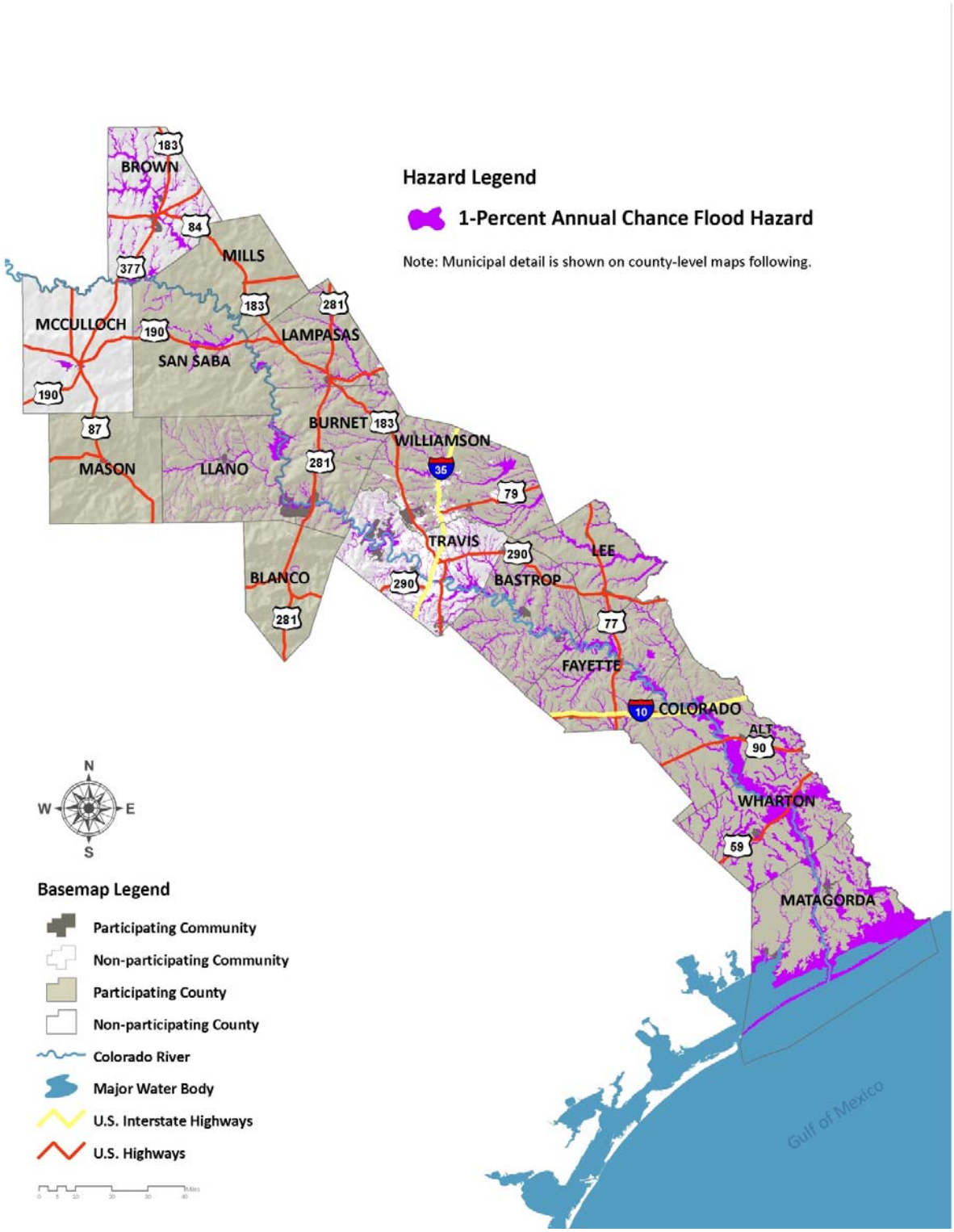


Figure 6-5. Flood Zones for Bastrop County

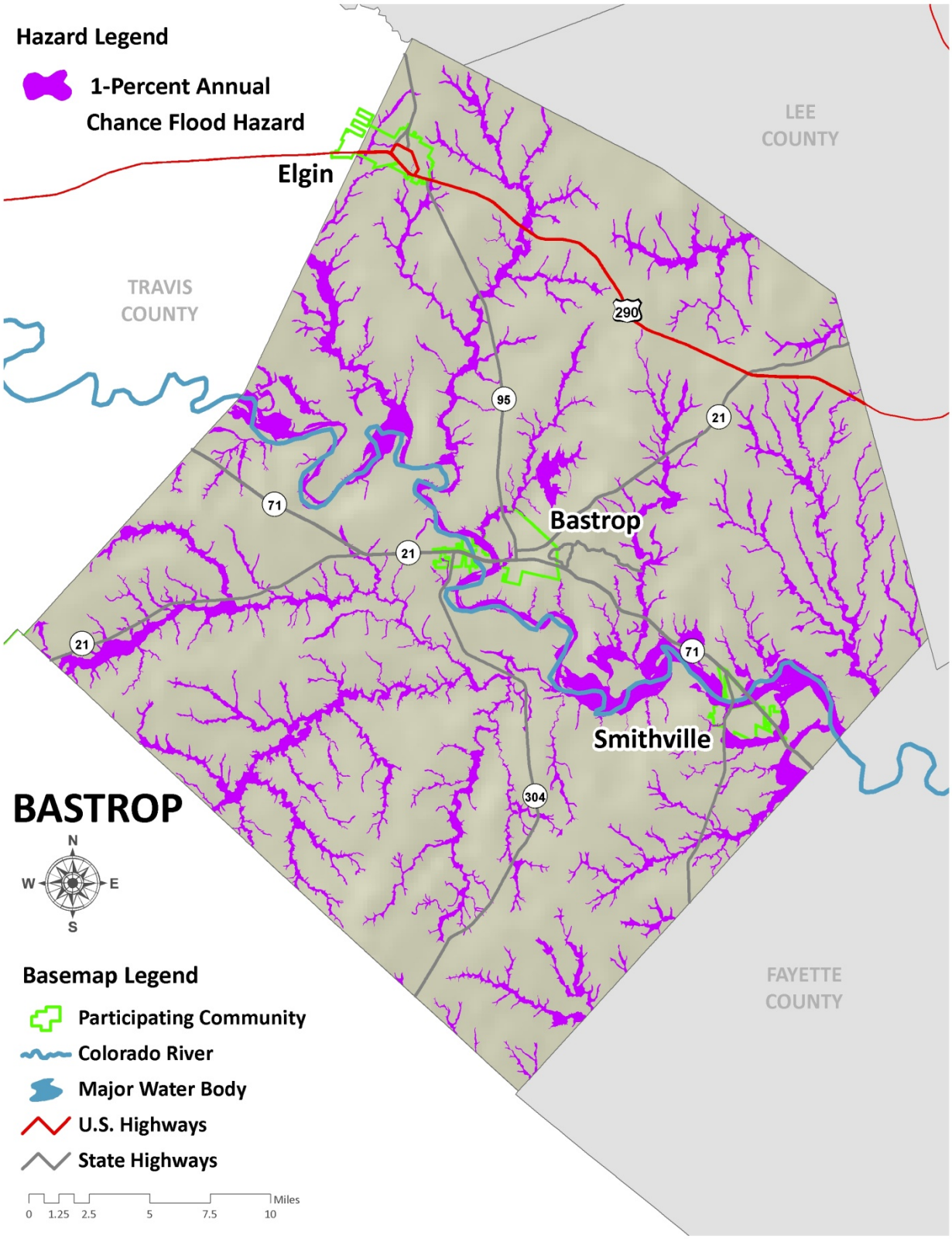


Figure 6-6. Flood Zones for the City of Bastrop

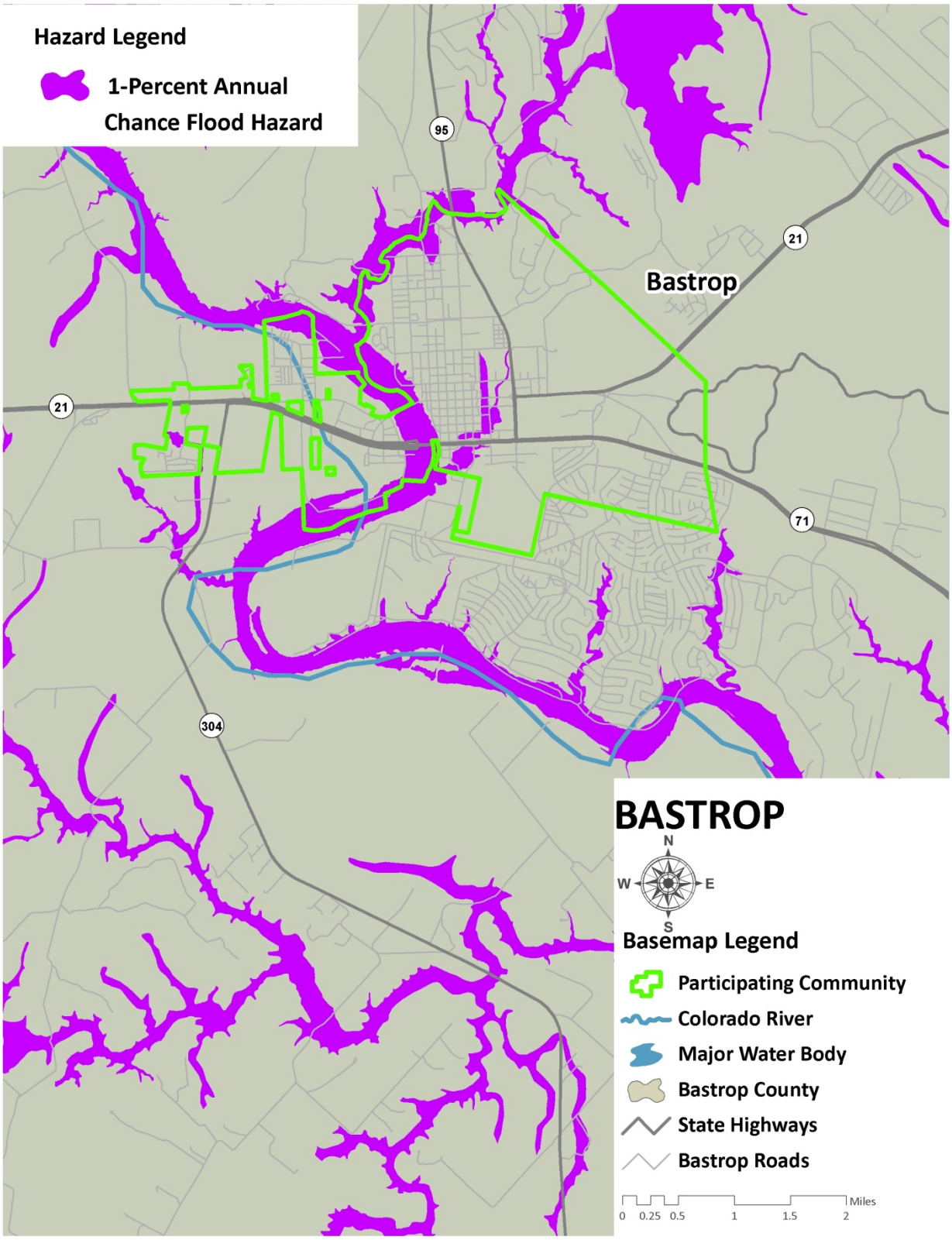


Figure 6-7. Flood Zones for the City of Elgin

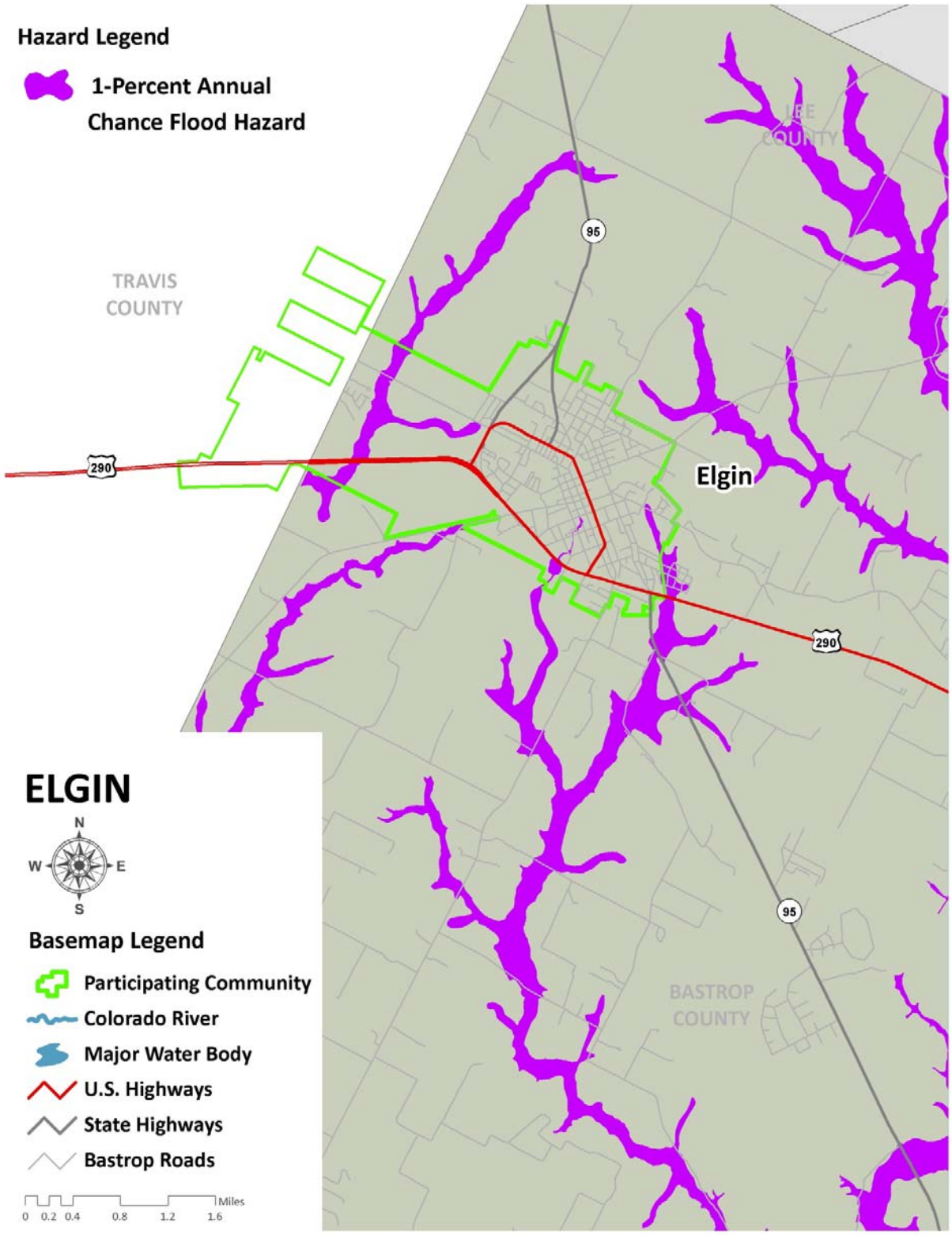


Figure 6-8. Flood Zones for the City of Smithville

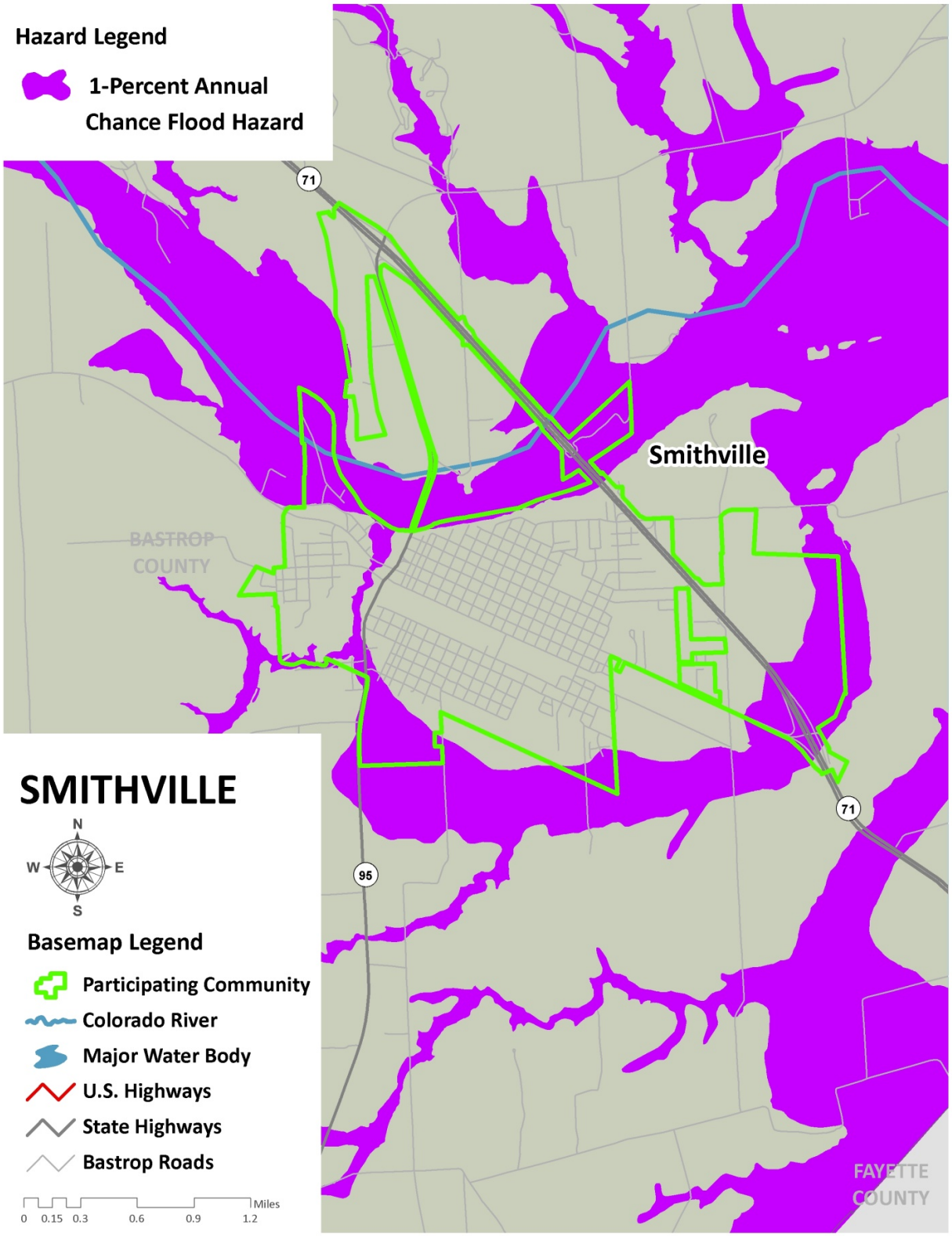


Figure 6-9. Flood Zones for Blanco County

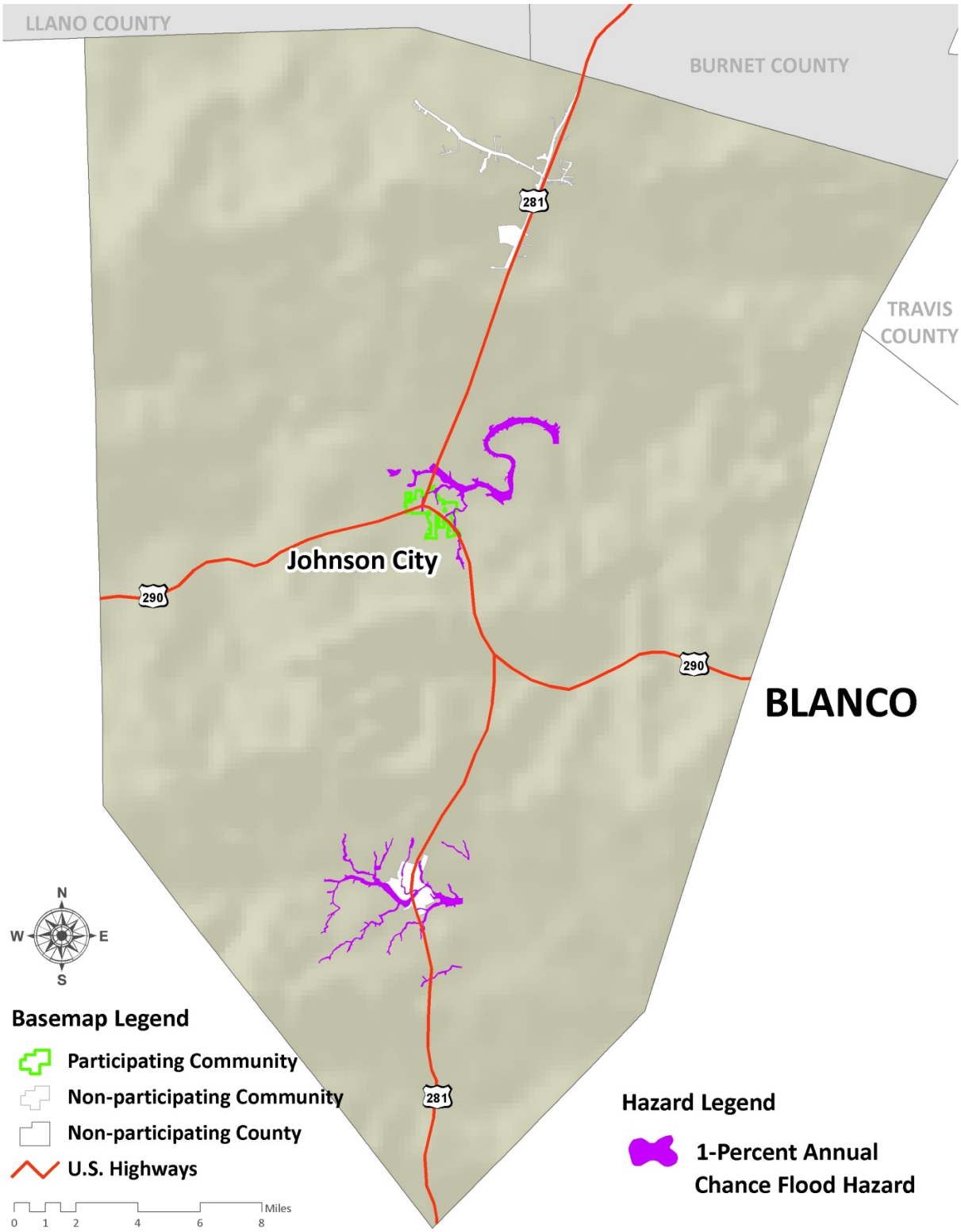


Figure 6-10. Flood Zones for Johnson City

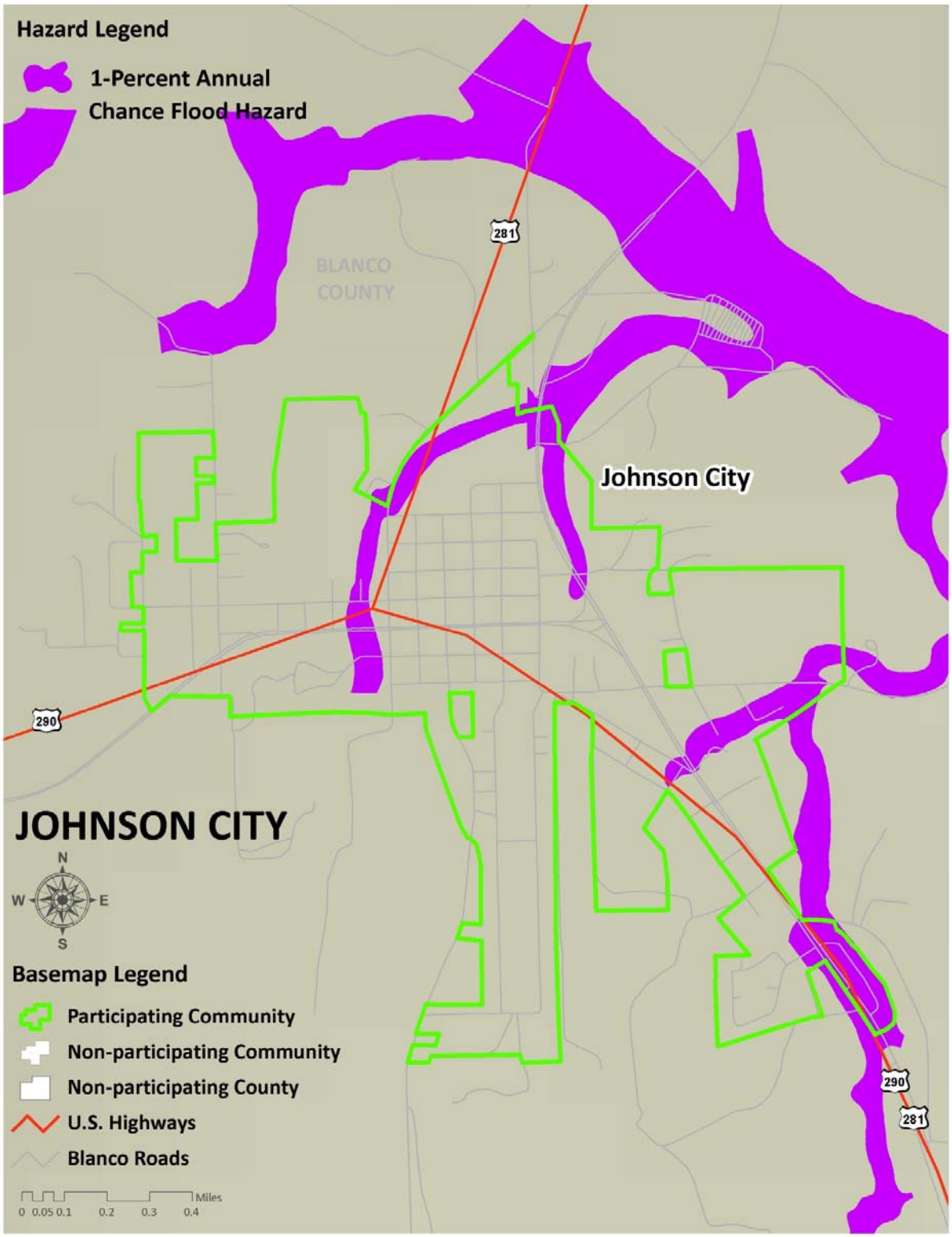


Figure 6-11. Flood Zones for Brown County

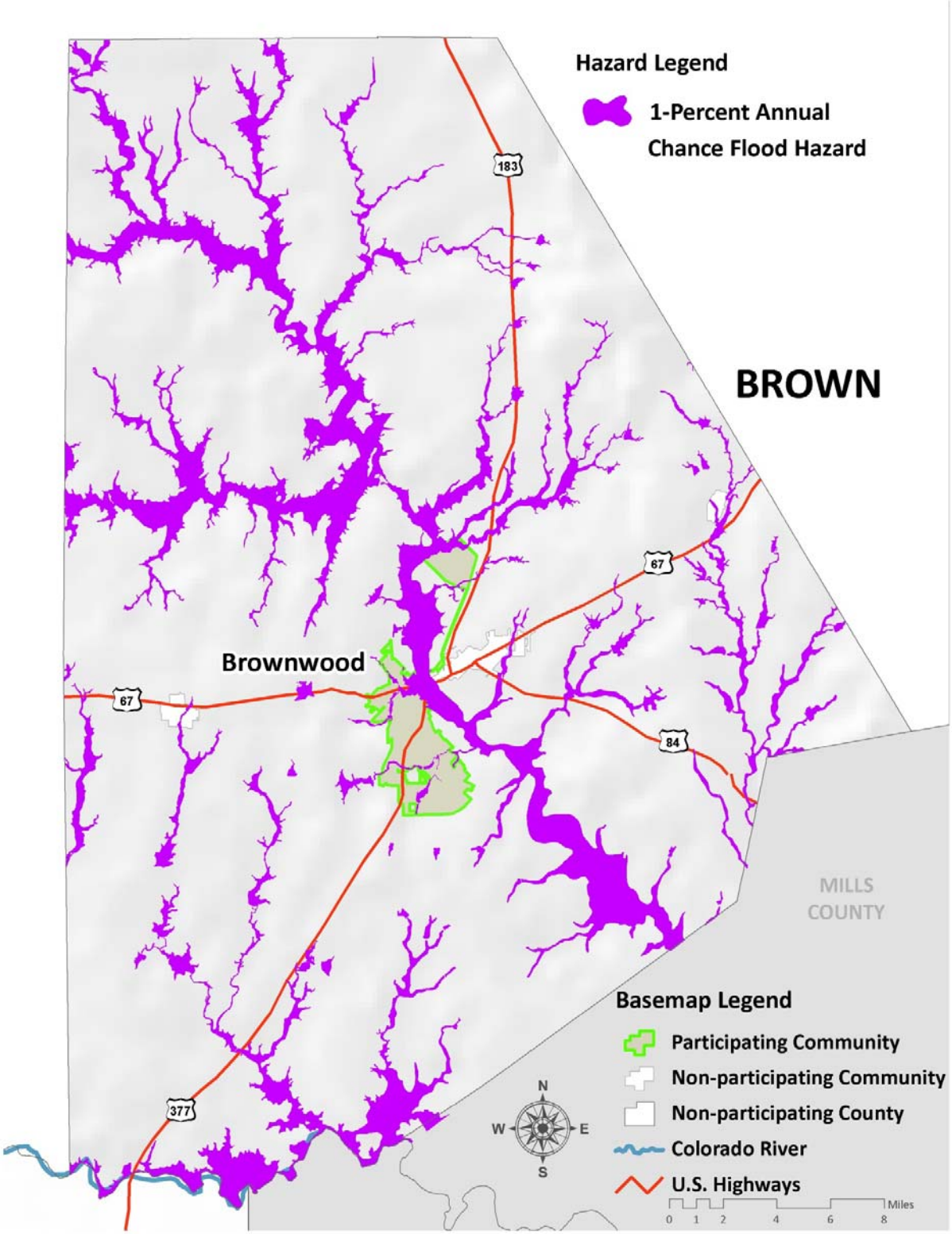


Figure 6-12. Flood Zones for the City of Brownwood

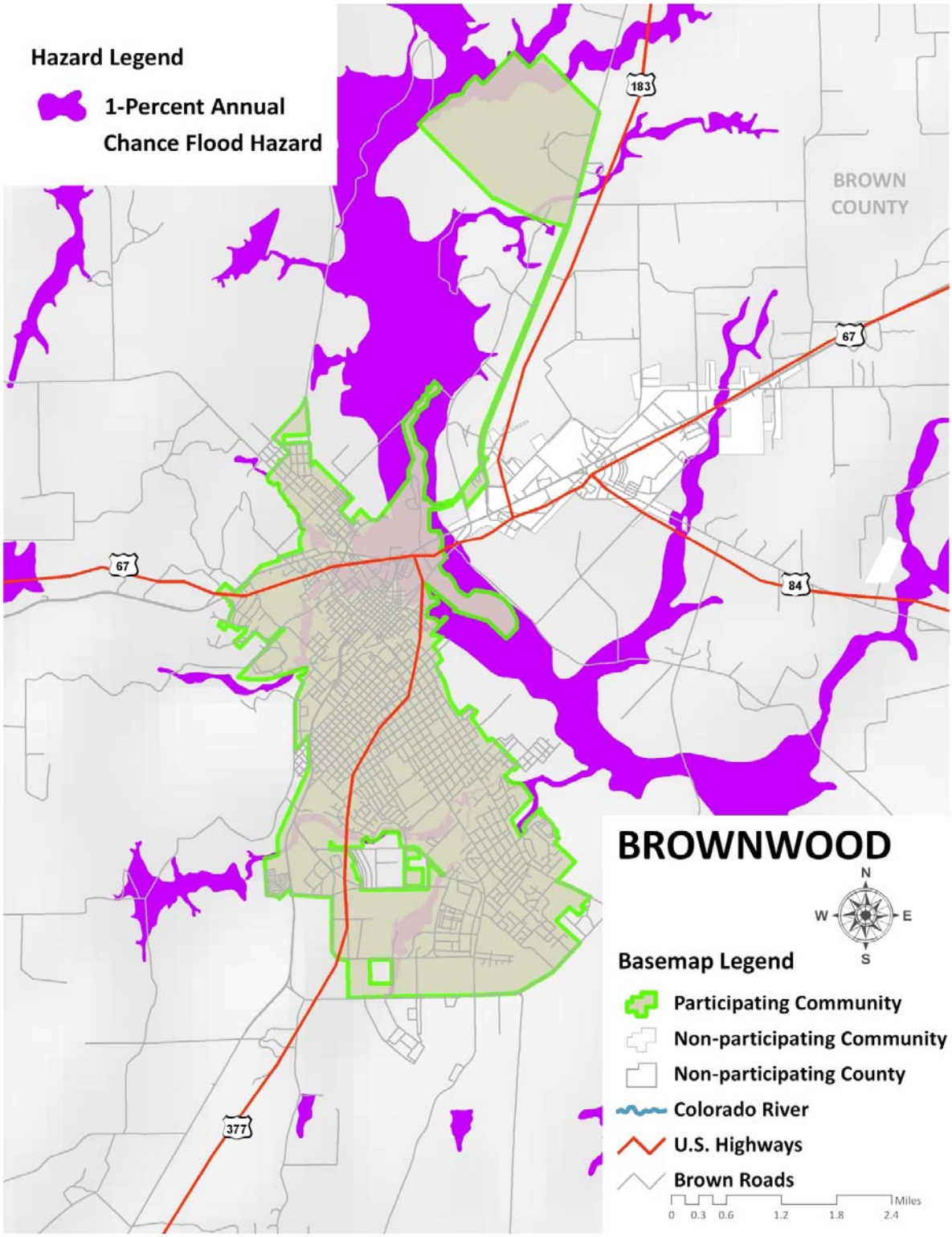


Figure 6-13. Flood Zones for Burnet County

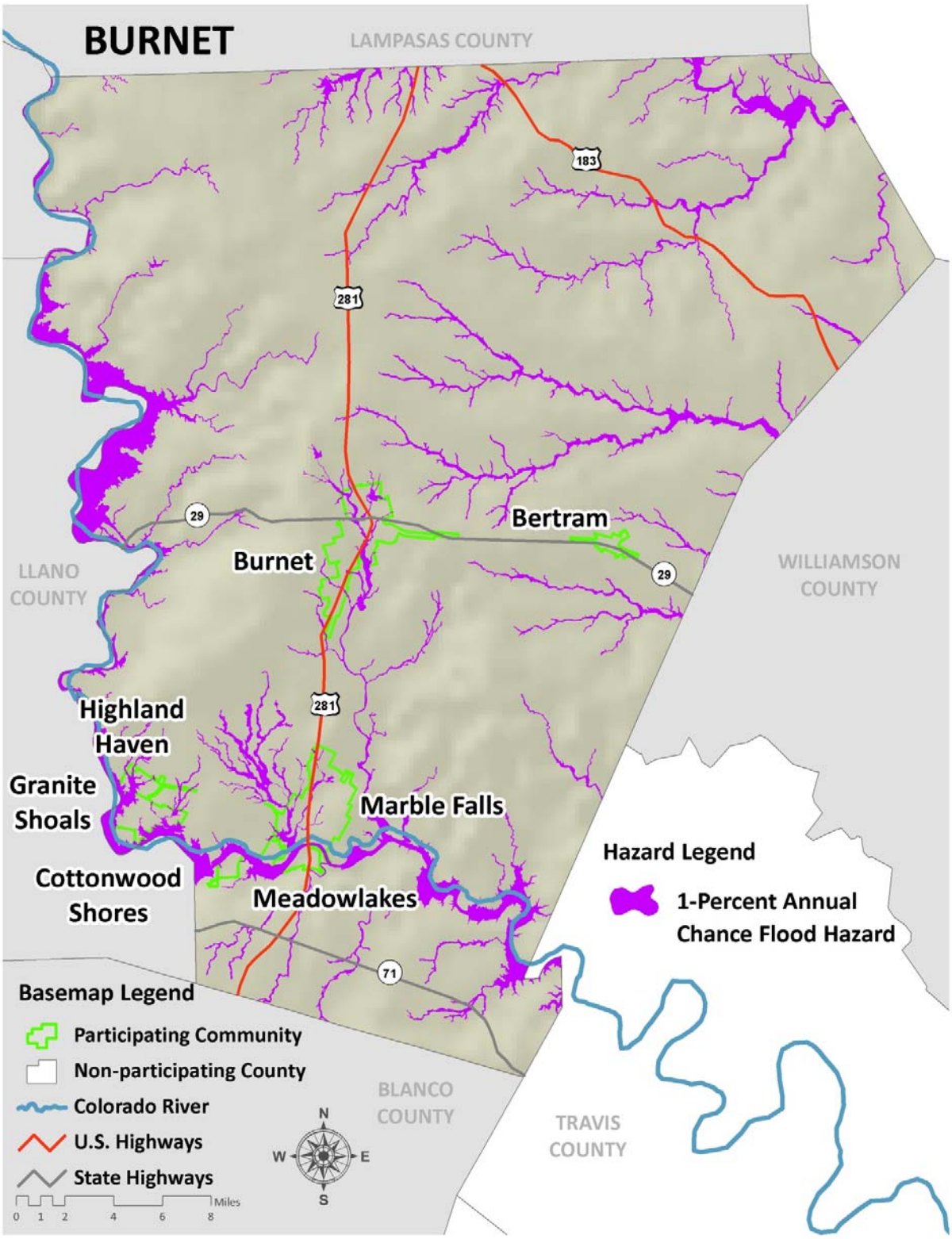


Figure 6-14. Flood Zones for the City of Bertram

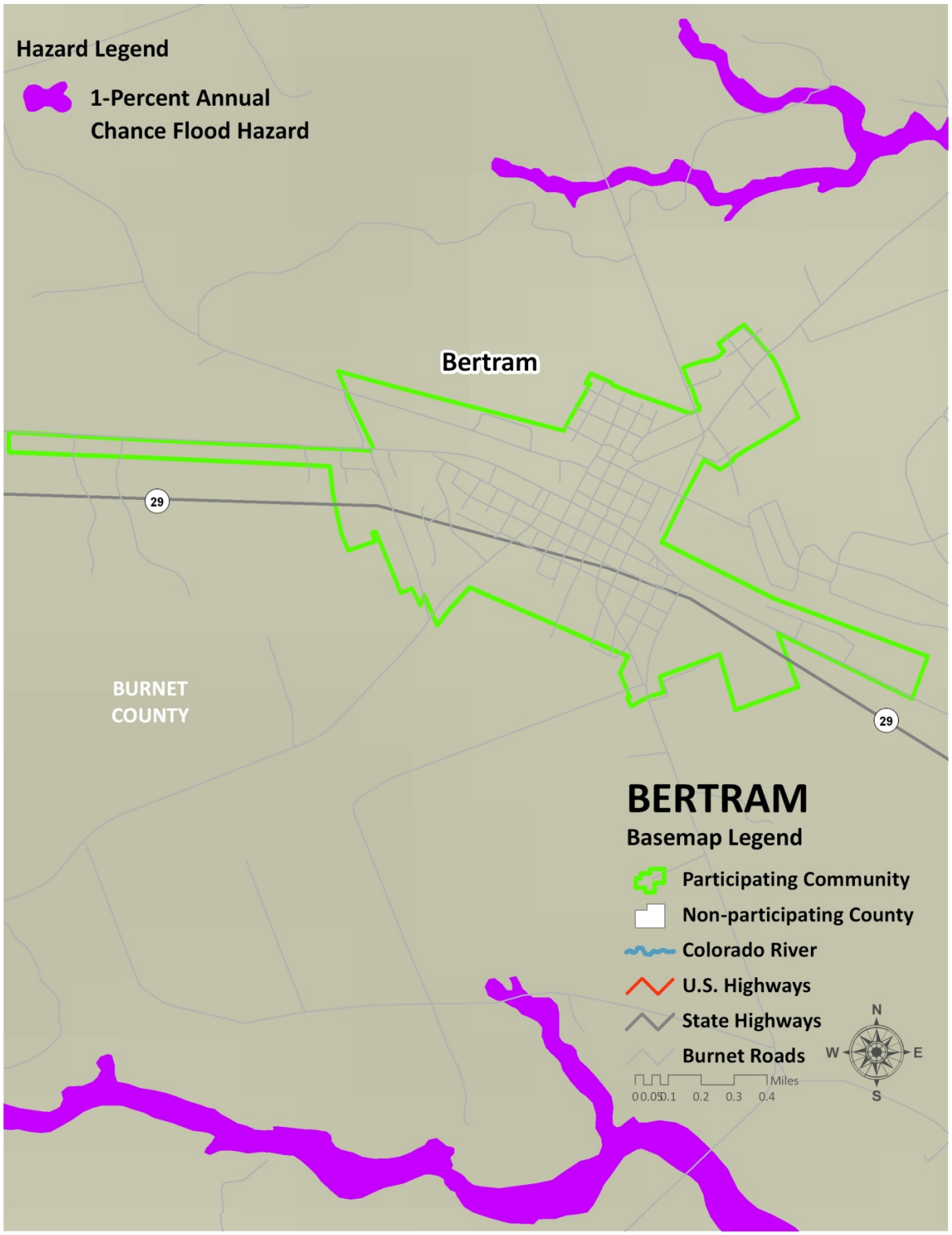


Figure 6-15. Flood Zones for the City of Burnet

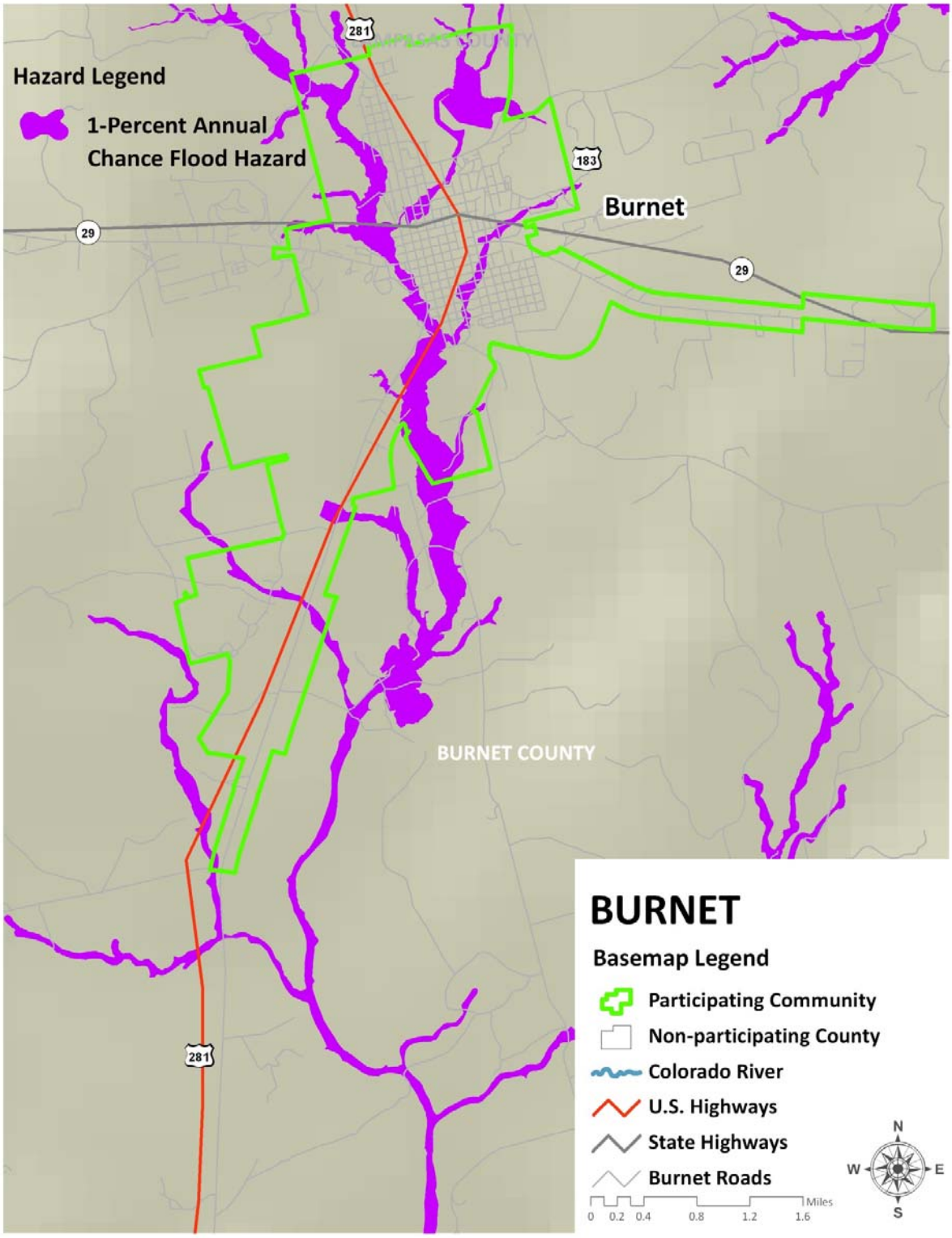


Figure 6-16. Flood Zones for the City of Marble Falls

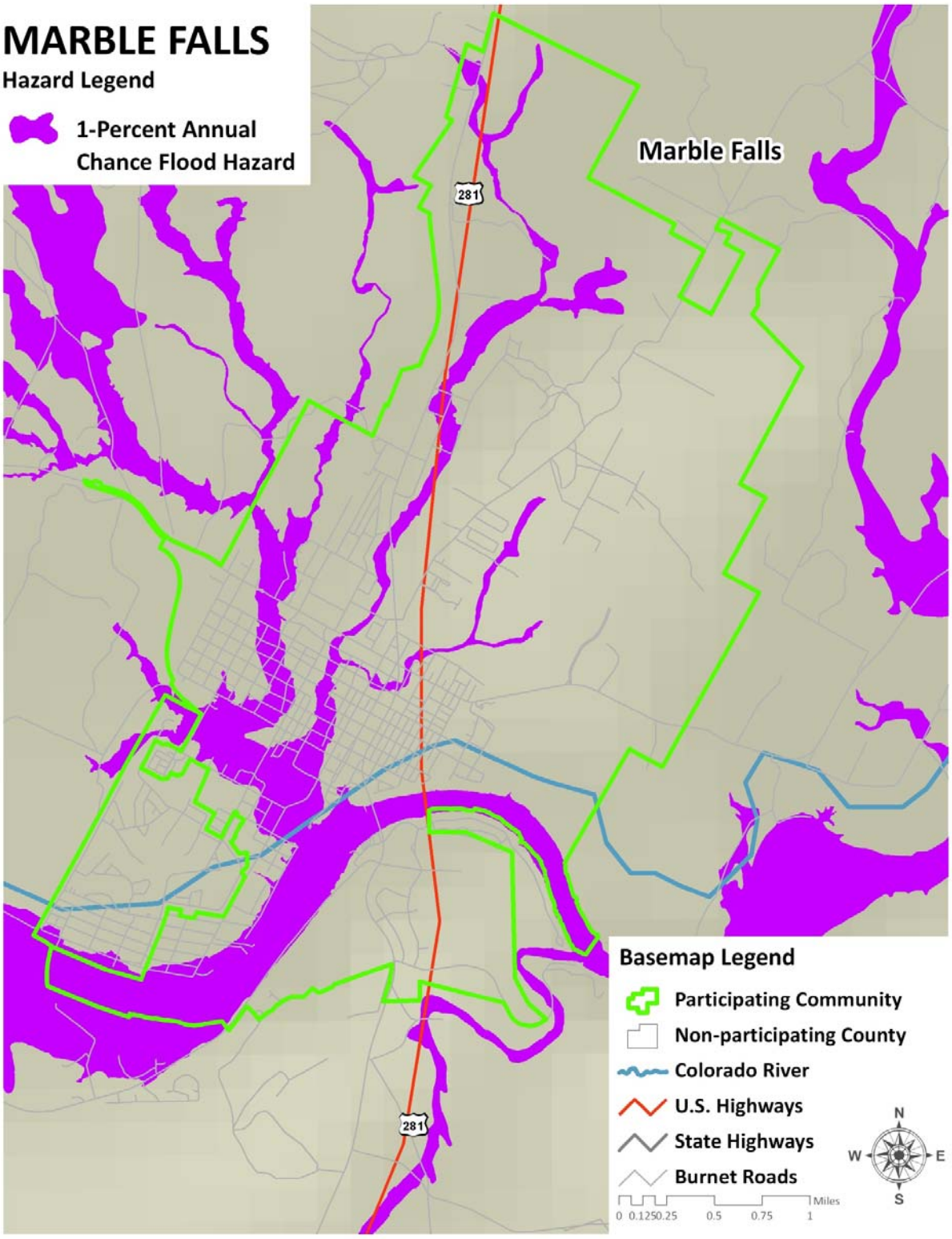


Figure 6-17. Flood Zones for the City of Meadowlakes

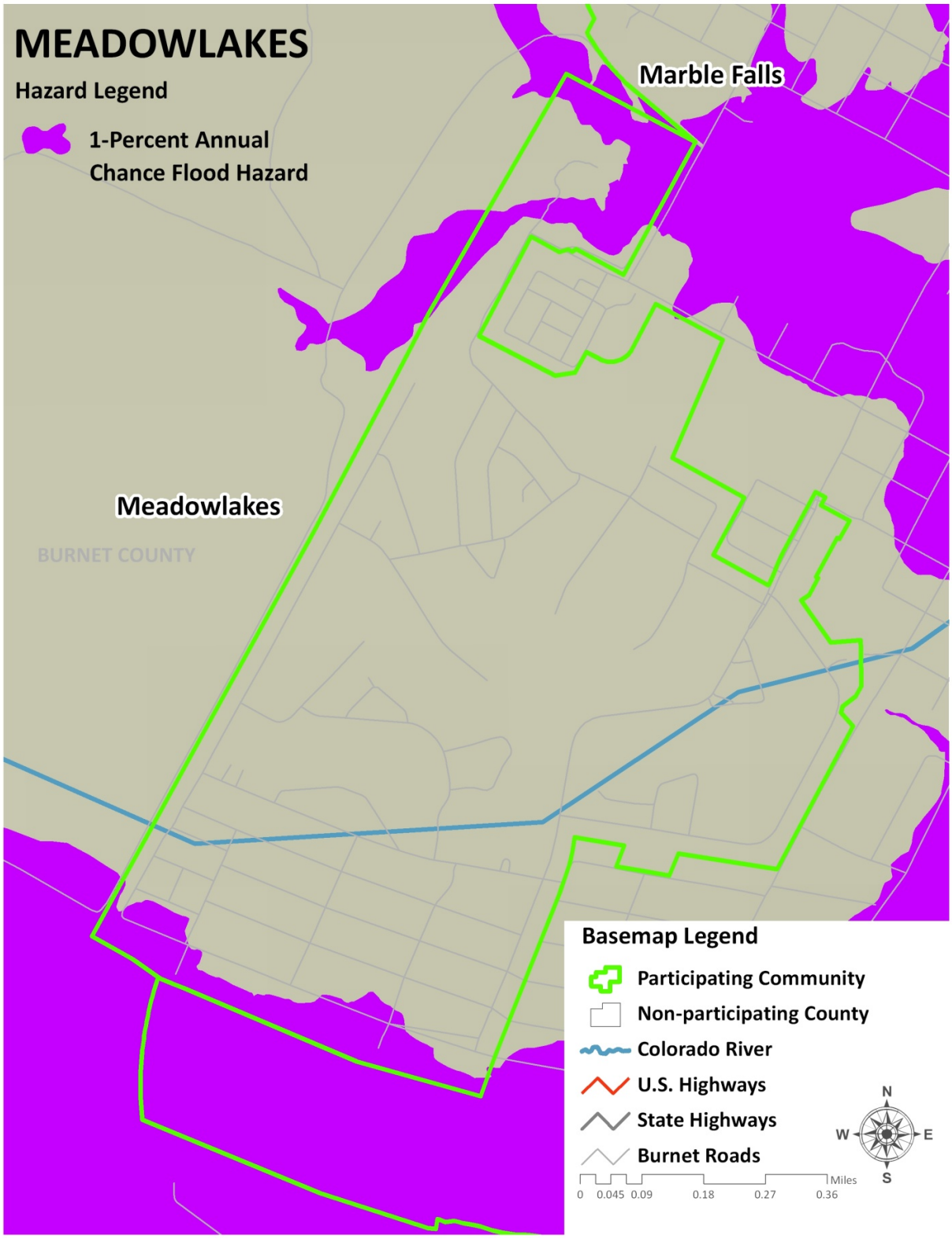


Figure 6-18. Flood Zones for the City of Cottonwood Shores

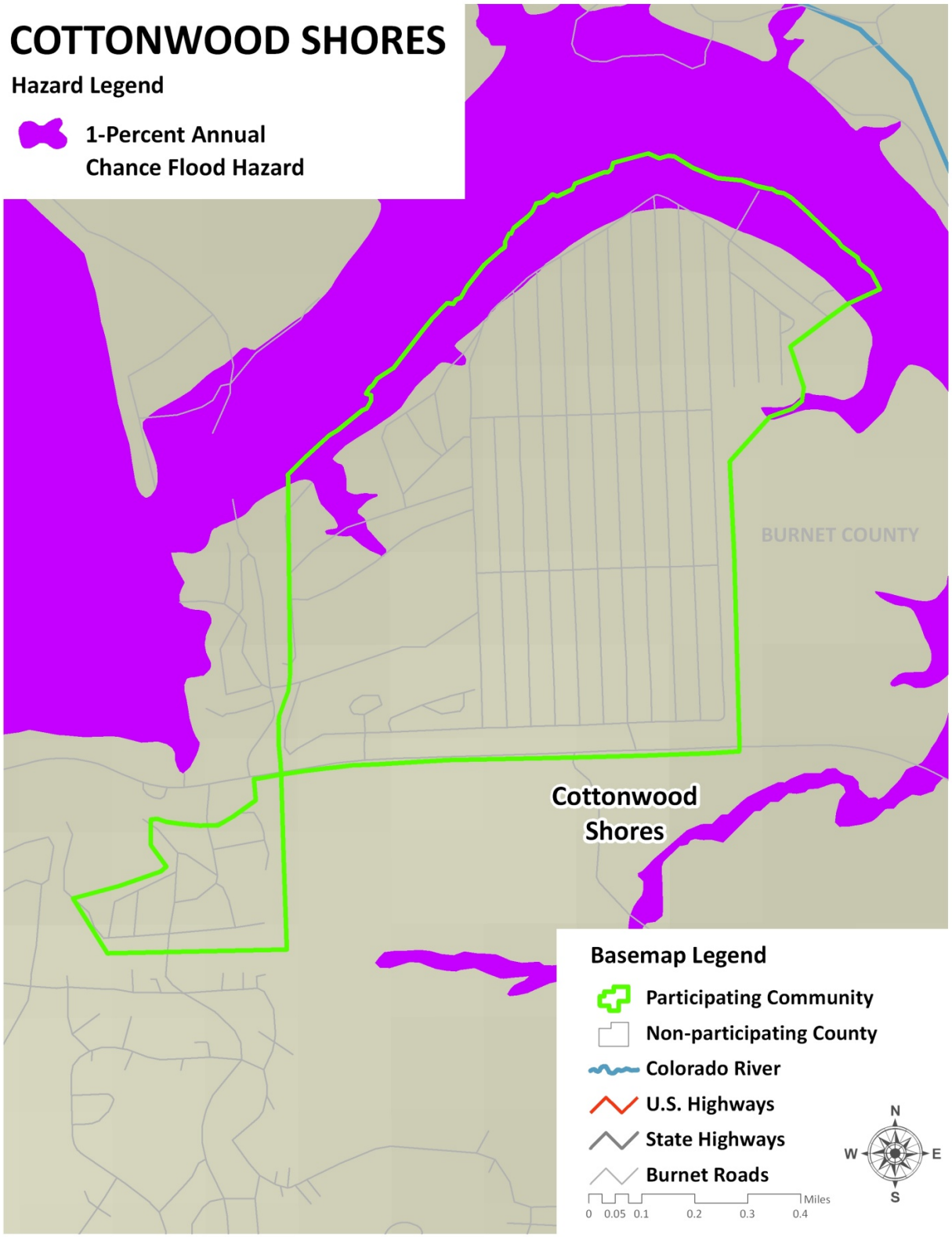


Figure 6-19. Flood Zones for the City of Granite Shoals

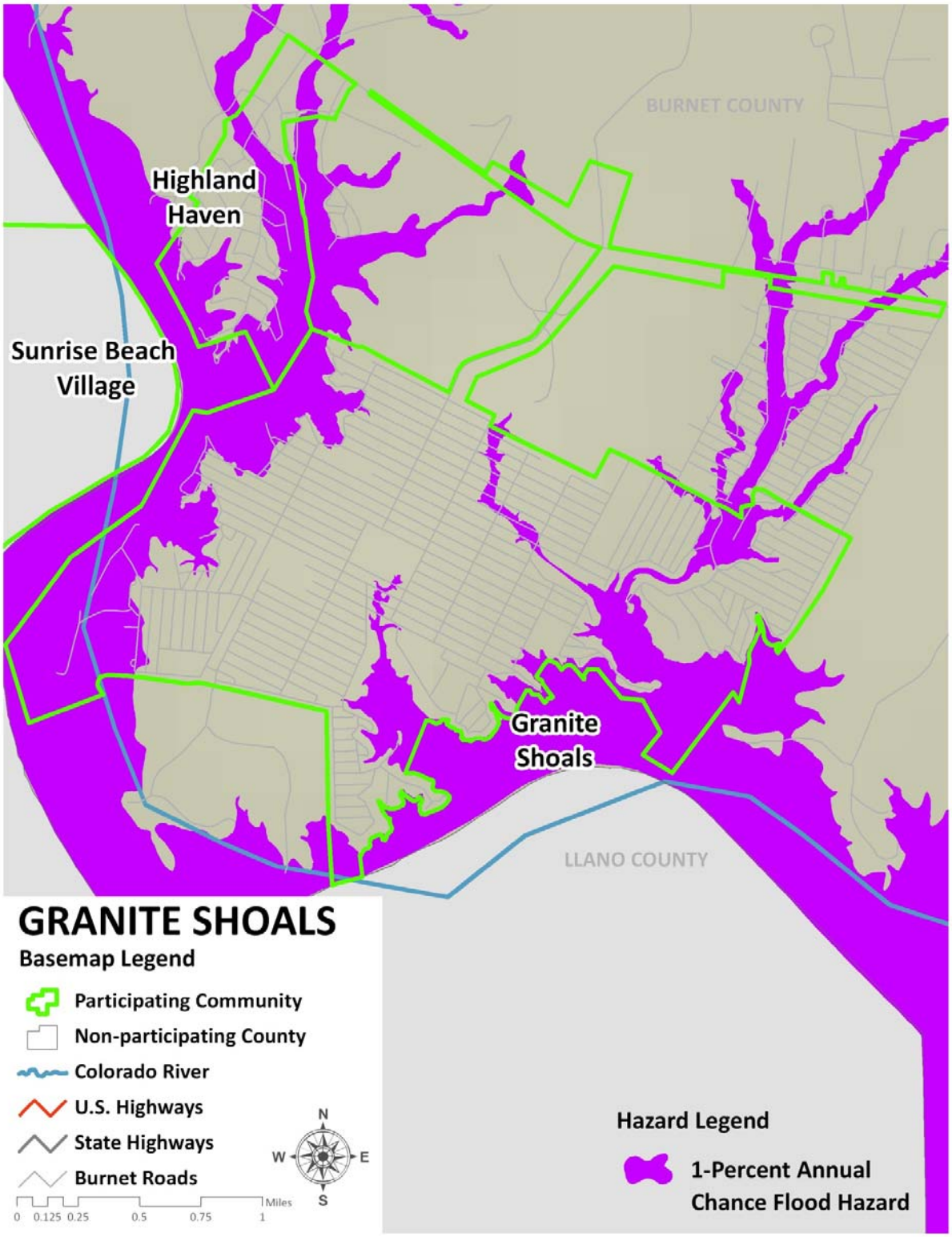


Figure 6-20. Flood Zones for the City of Highland Haven

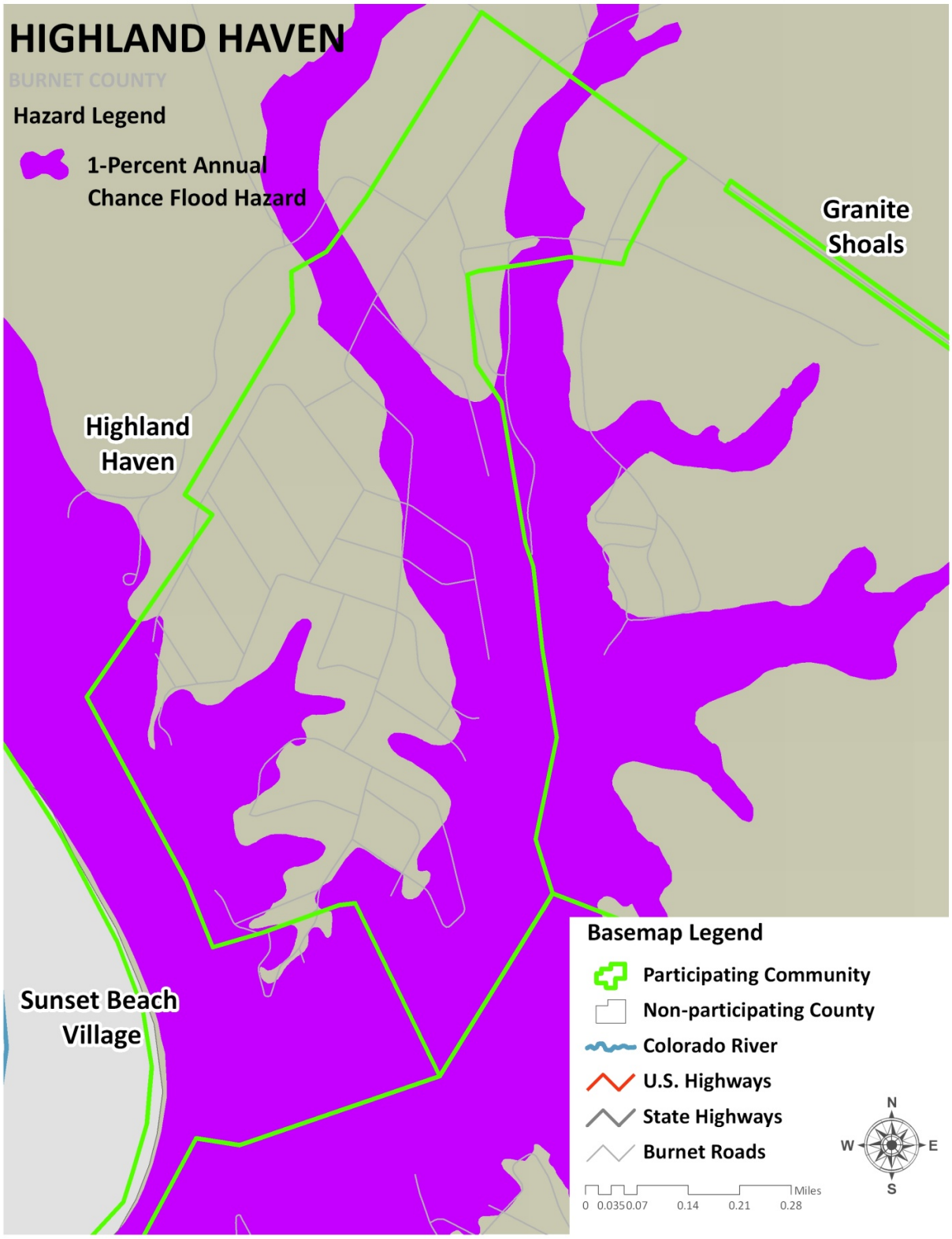


Figure 6-21. Flood Zones for Colorado County

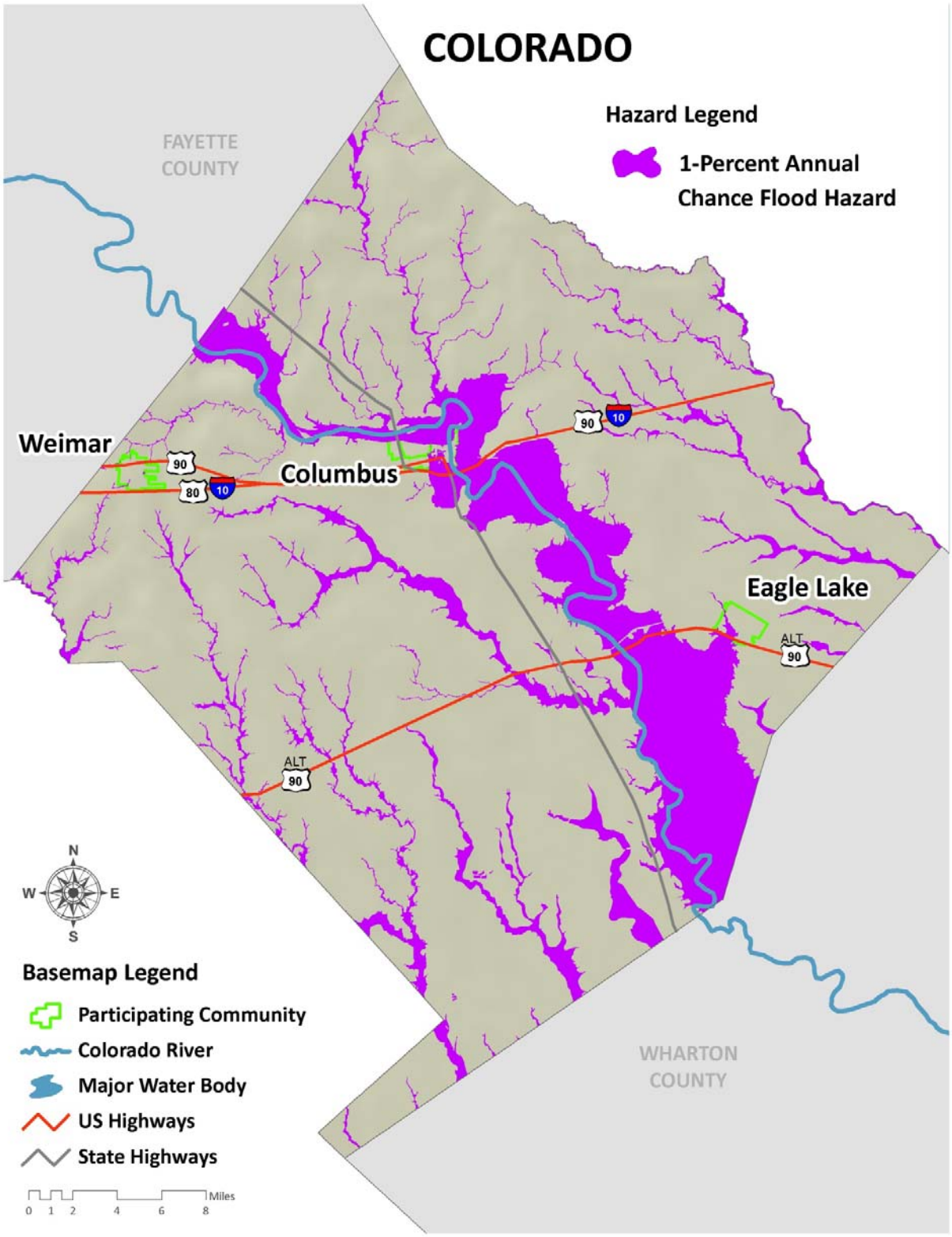


Figure 6-22. Flood Zones for the City of Columbus

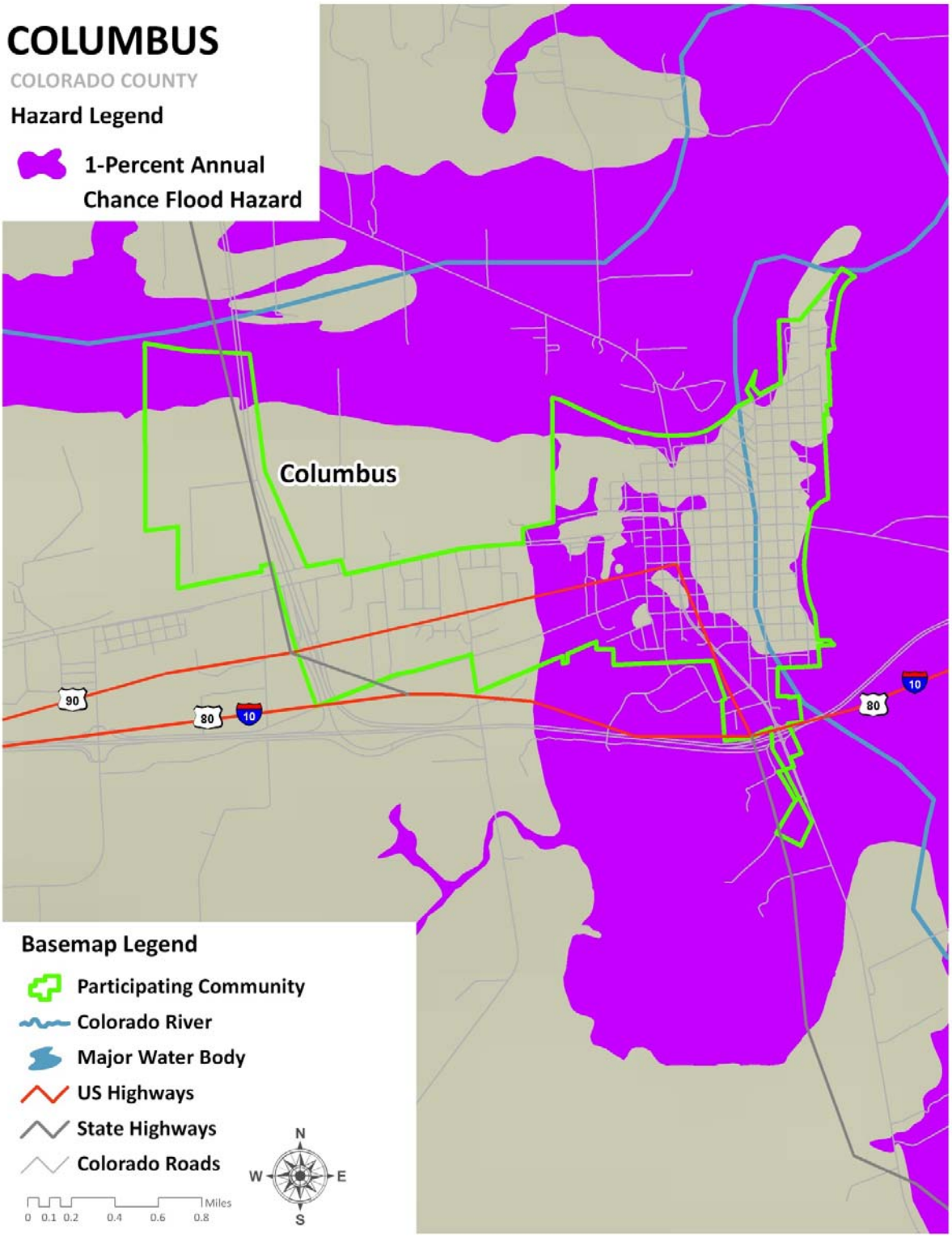


Figure 6-23. Flood Zones for the City of Eagle Lake

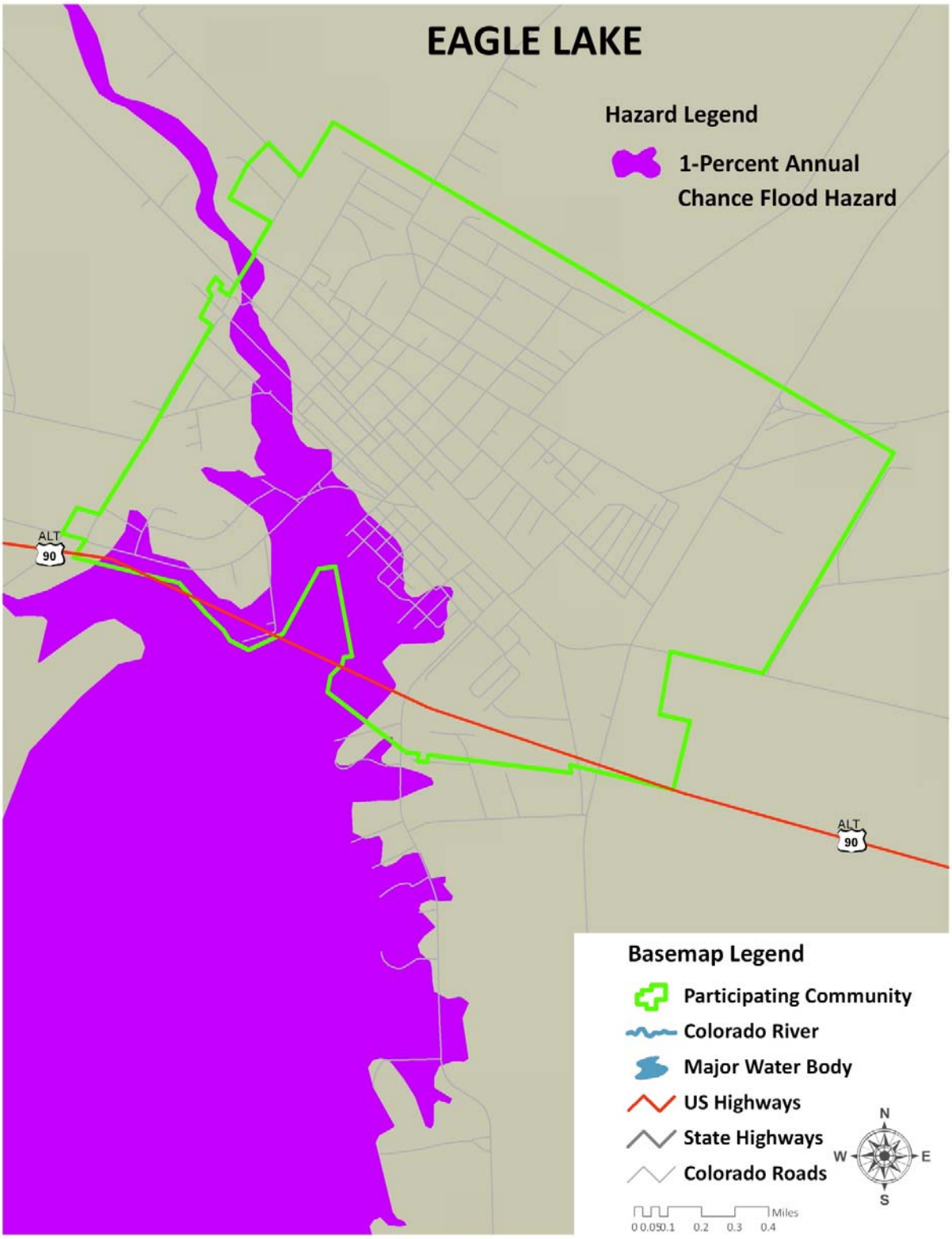


Figure 6-24. Flood Zones for the City of Weimar

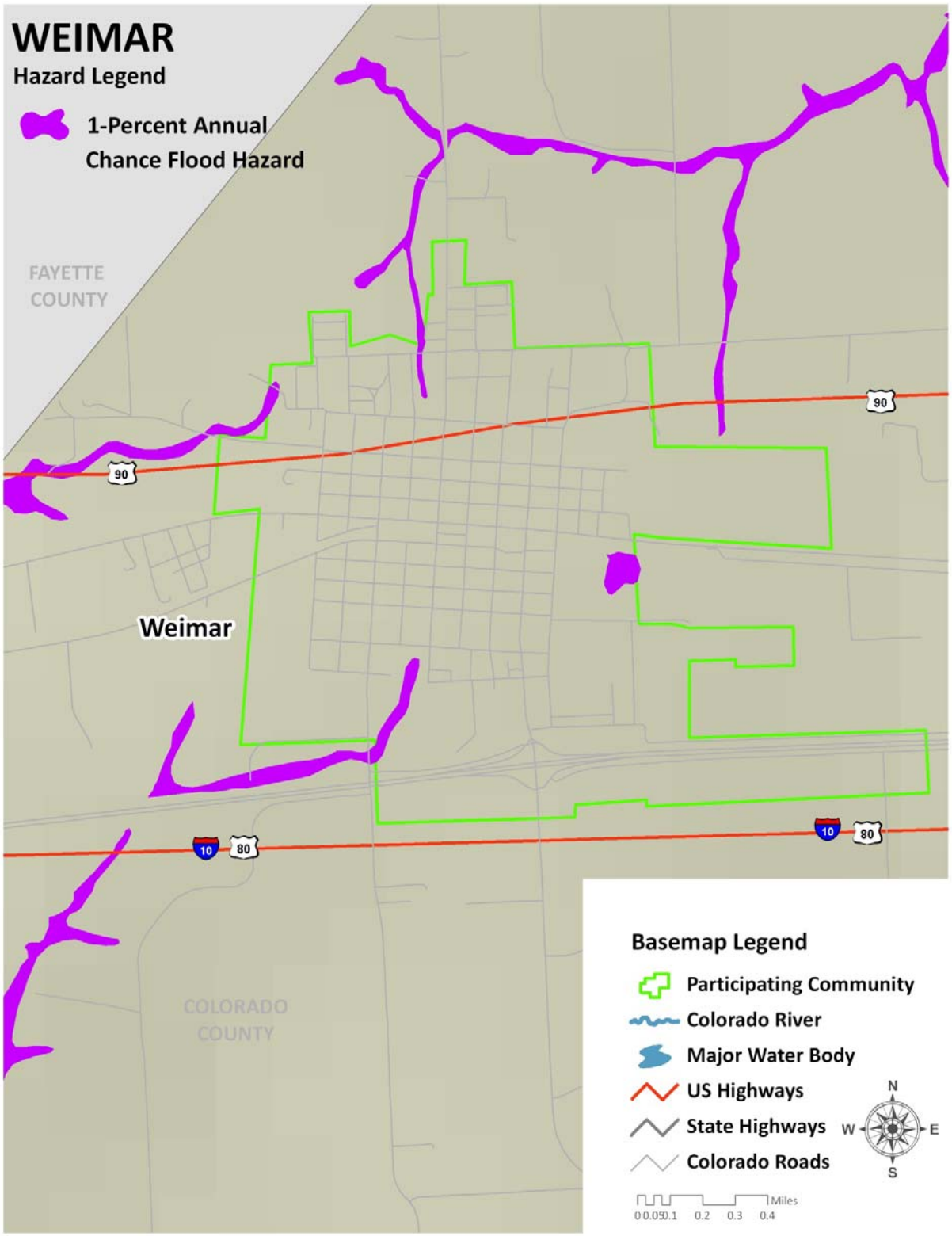


Figure 6-25. Flood Zones for Fayette County

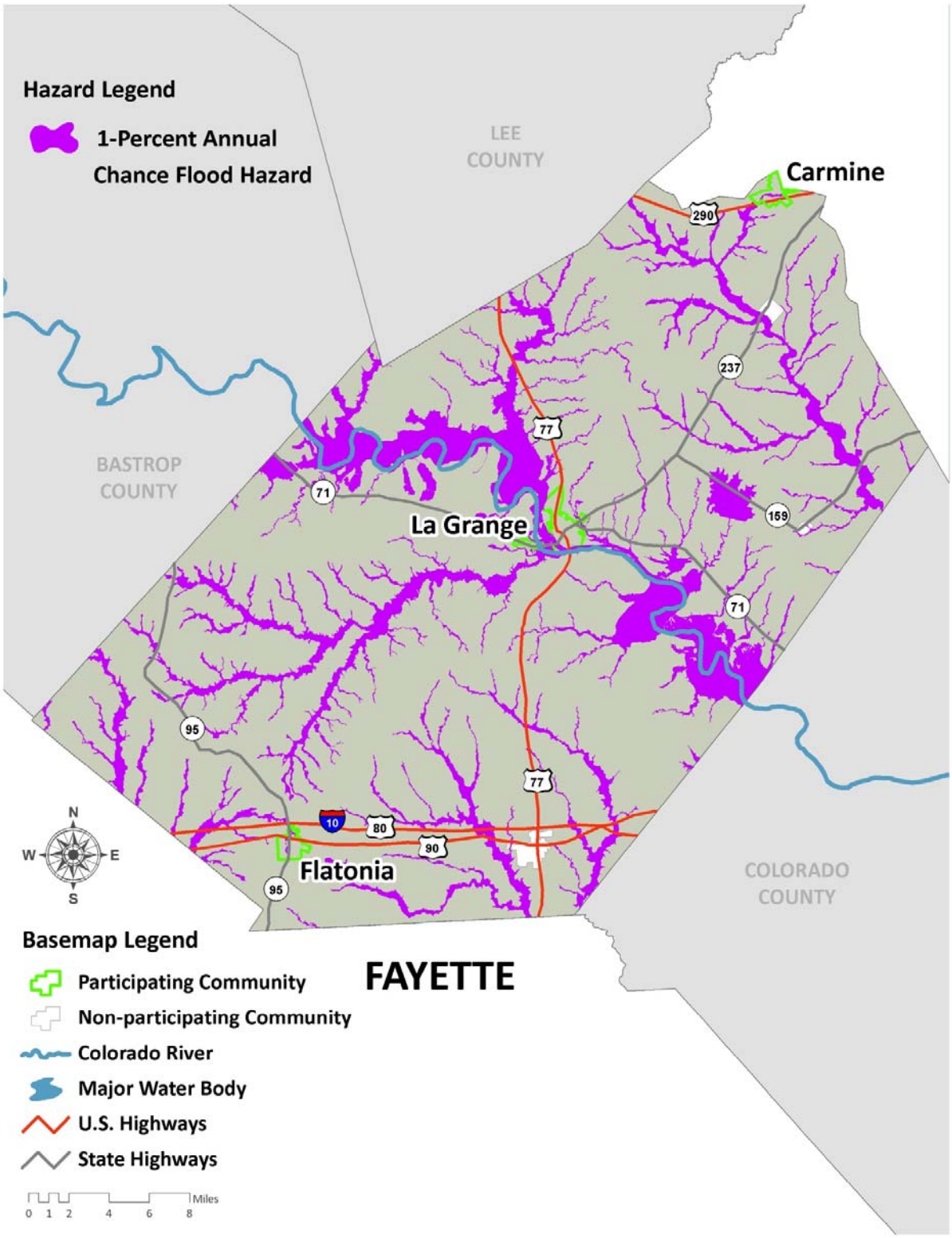


Figure 6-26. Flood Zones for the City of Carmine

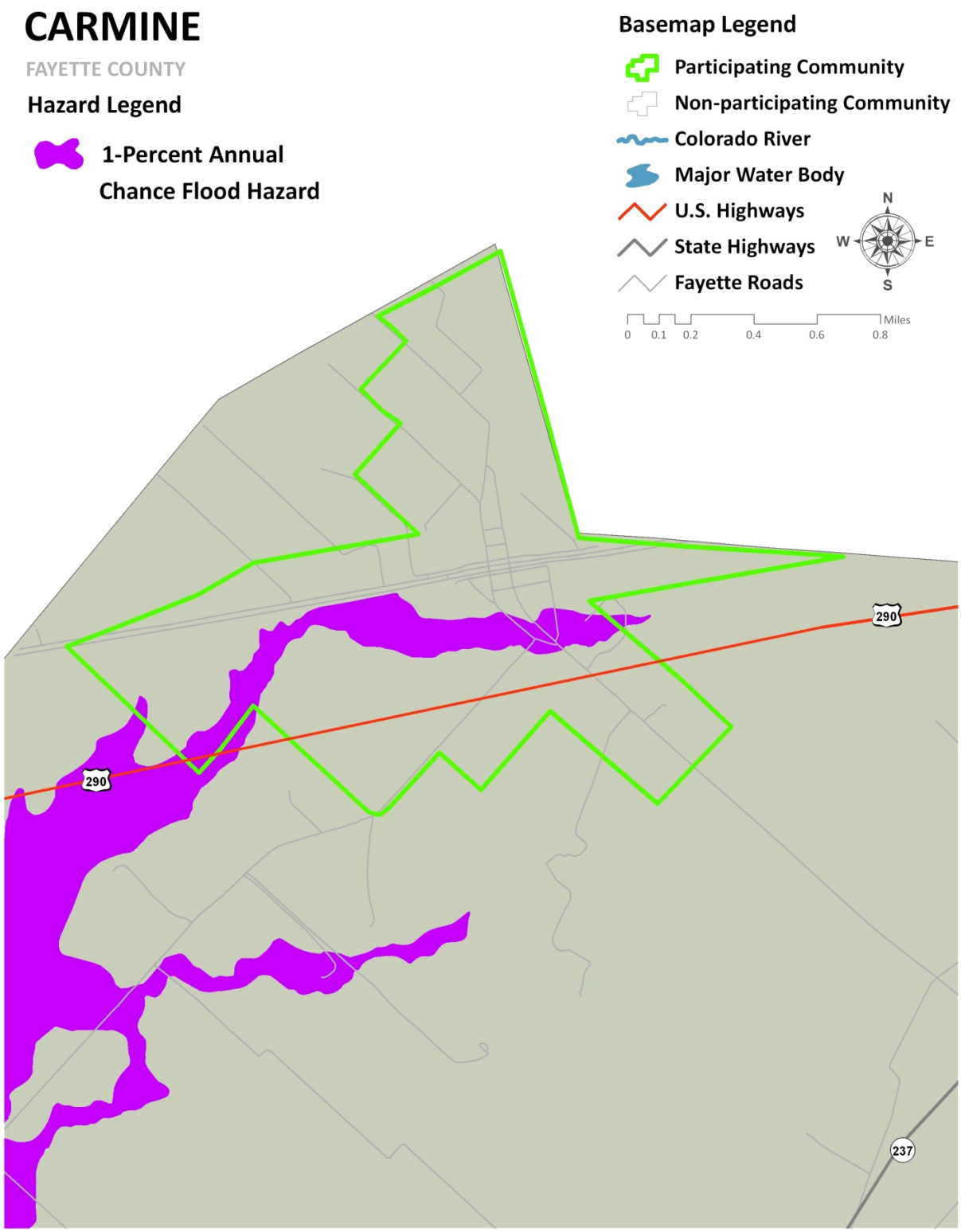


Figure 6-27. Flood Zones for the City of Flatonia

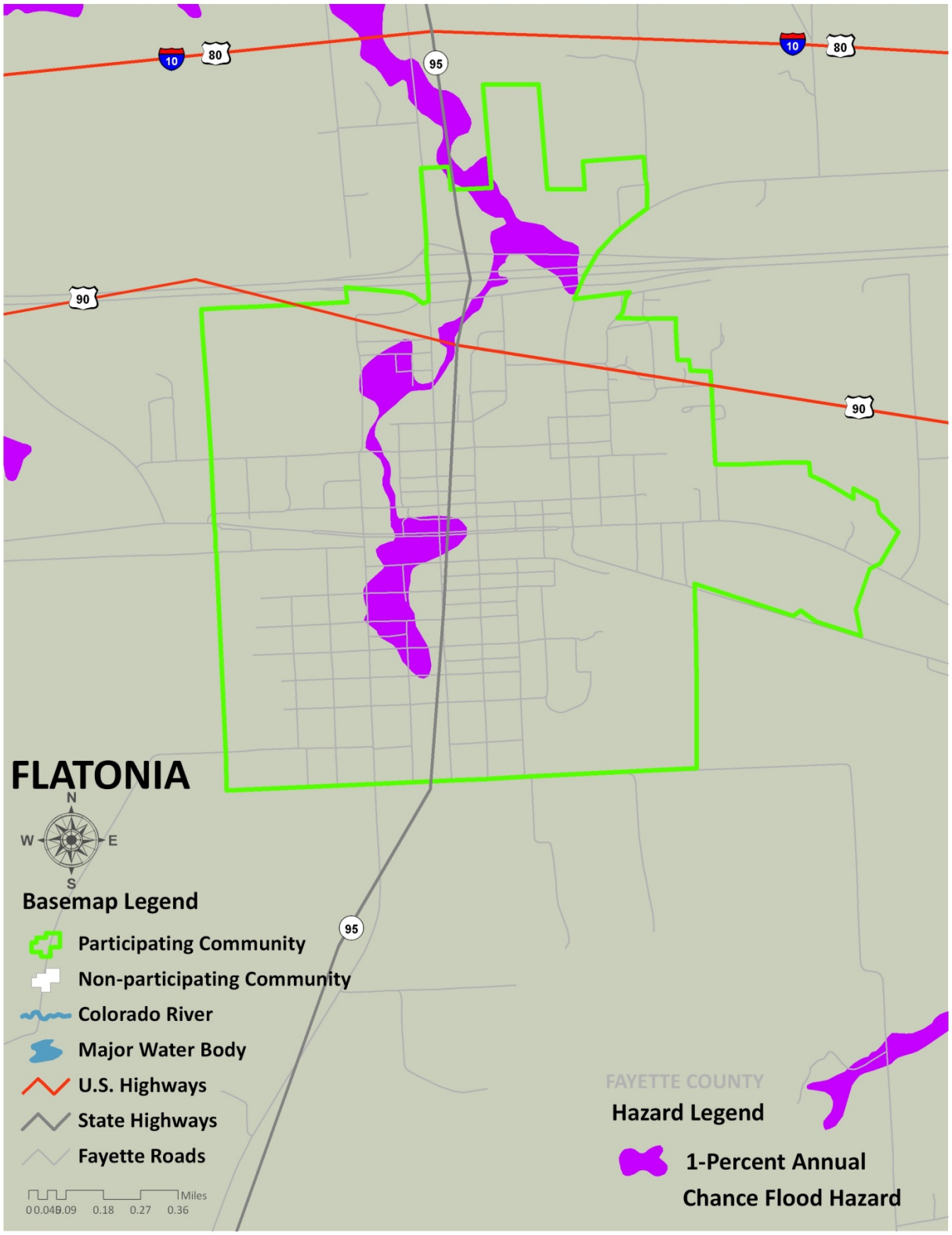


Figure 6-28. Flood Zones for the City of La Grange

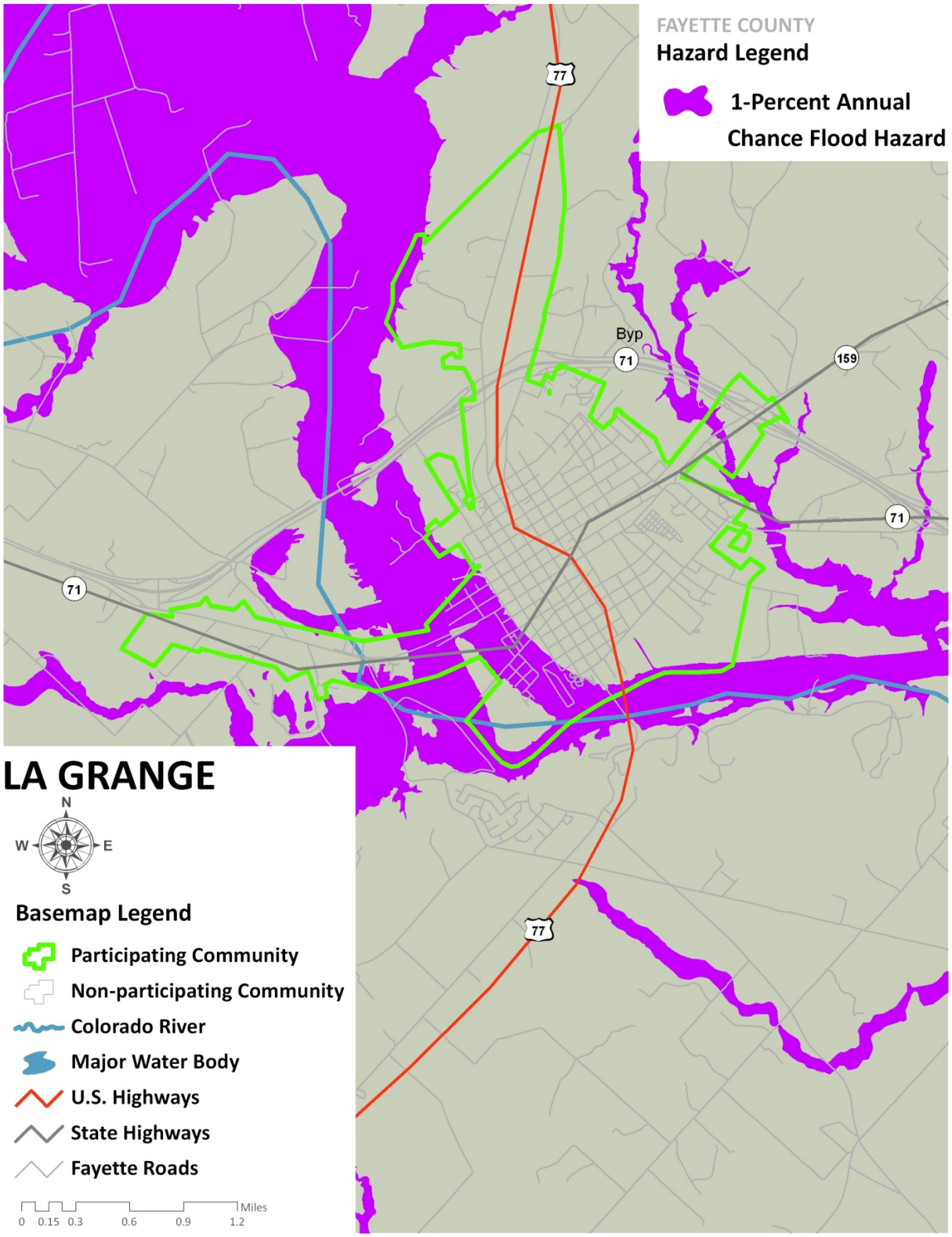


Figure 6-29. Flood Zones for Lampasas County

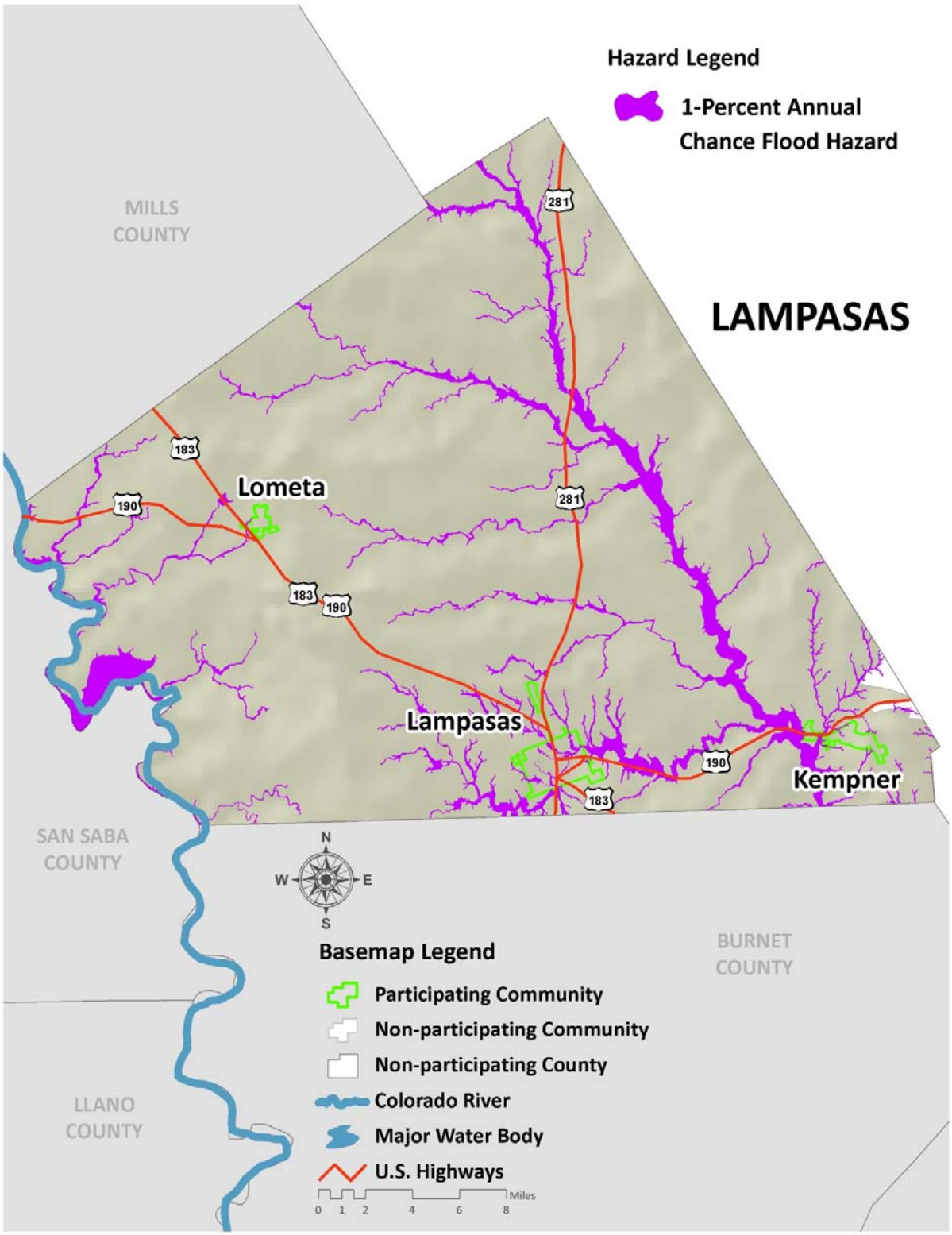


Figure 6-30. Flood Zones for the City of Kempner

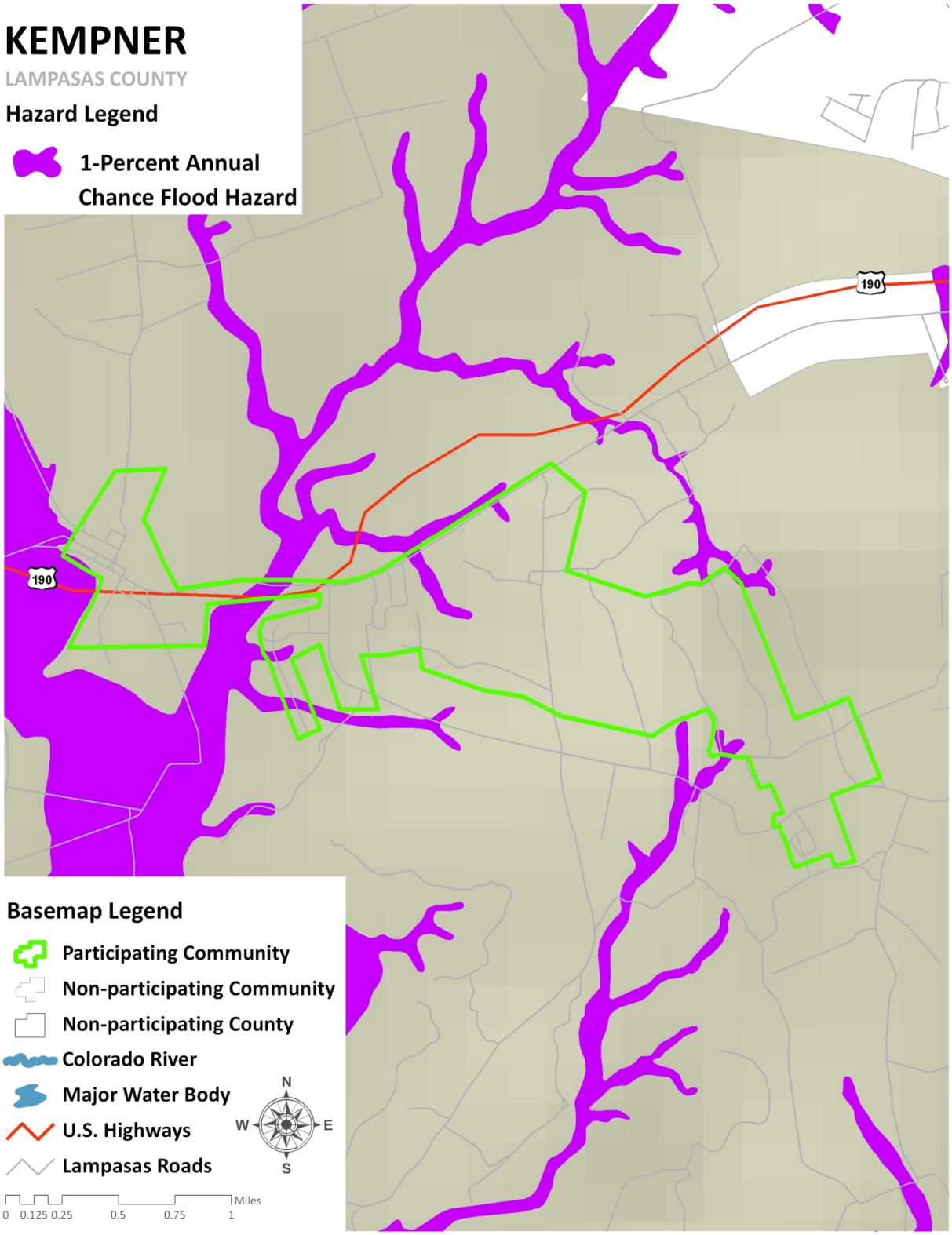


Figure 6-31. Flood Zones for the City of Lampasas

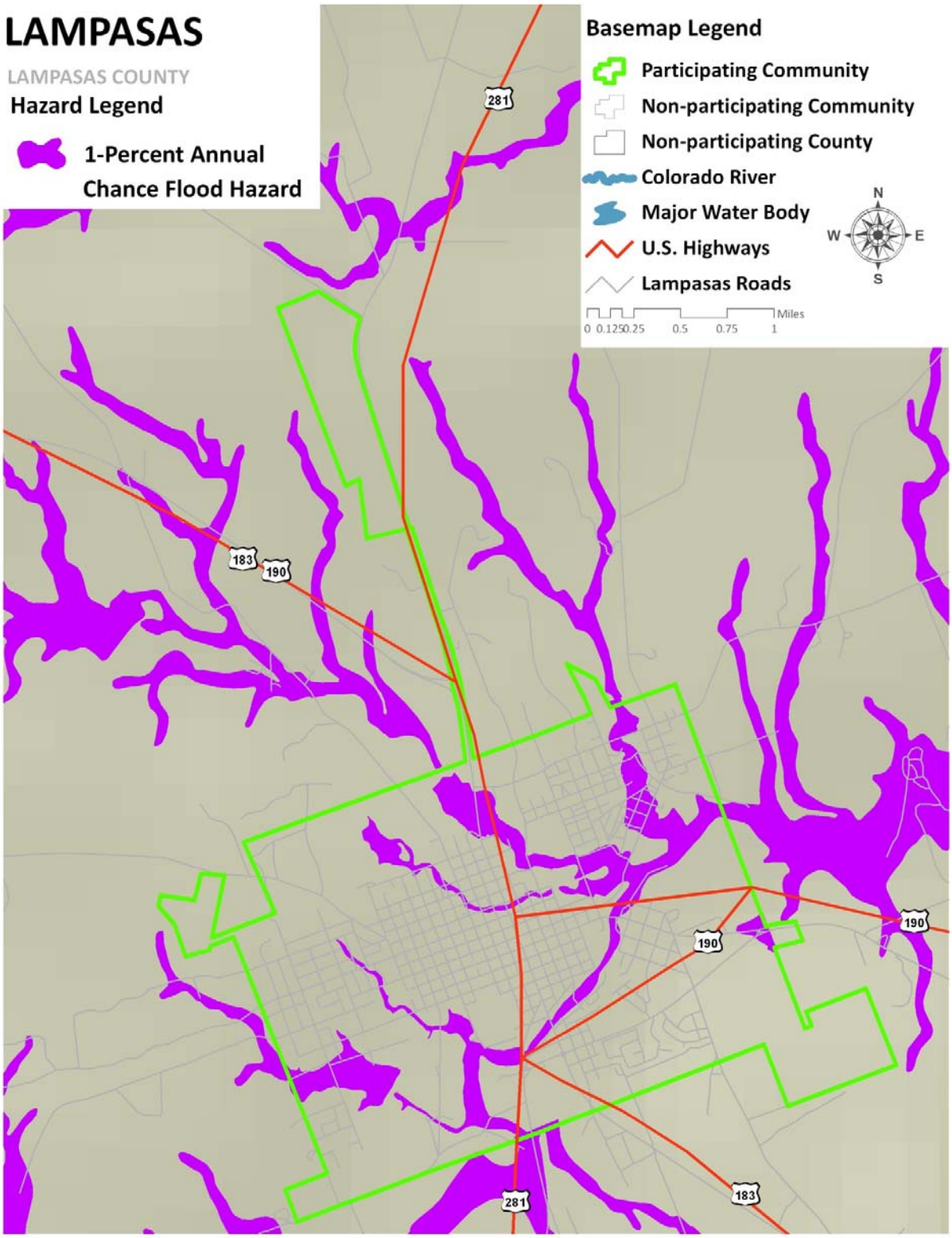


Figure 6-32. Flood Zones for the City of Lometa

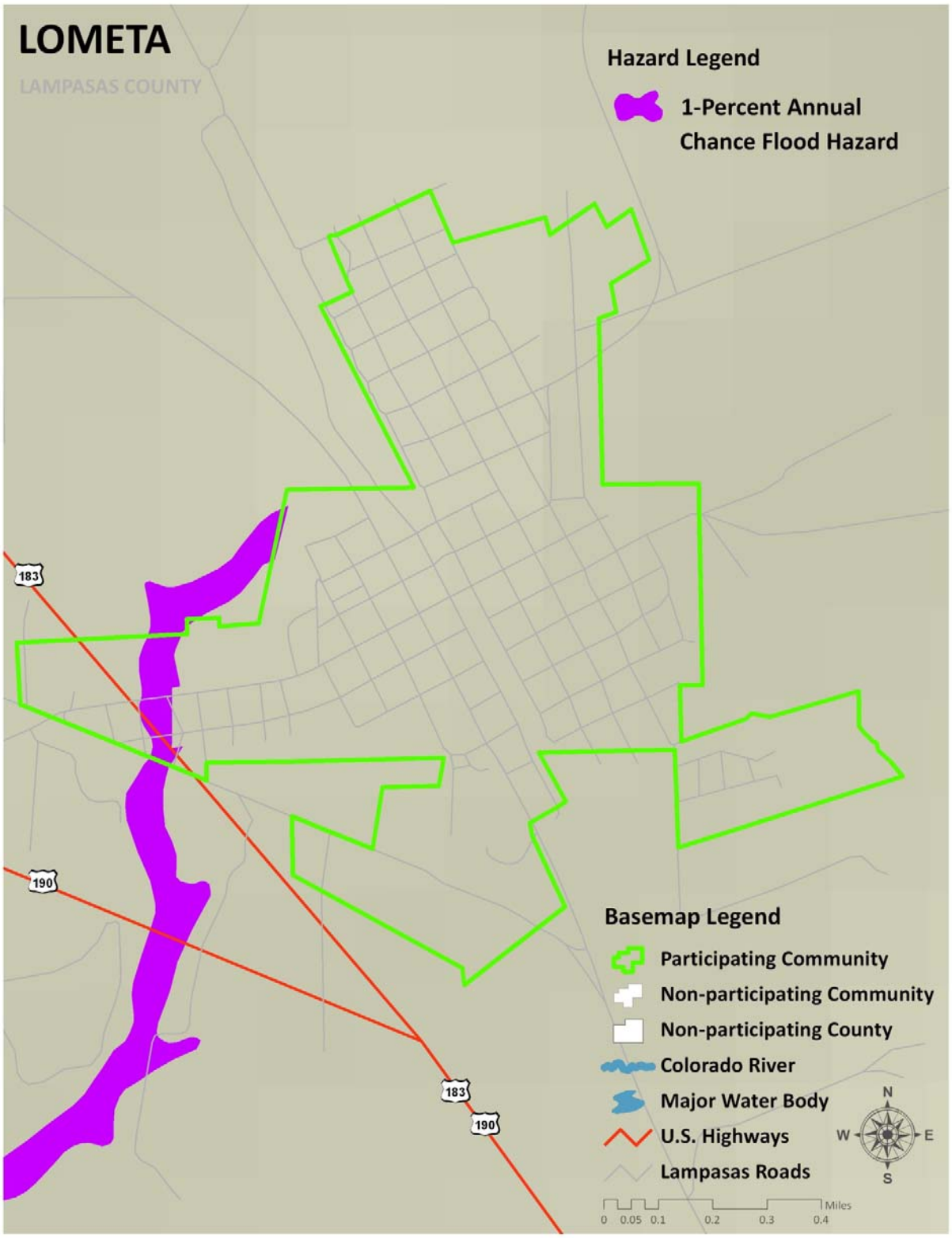


Figure 6-33. Flood Zones for Lee County

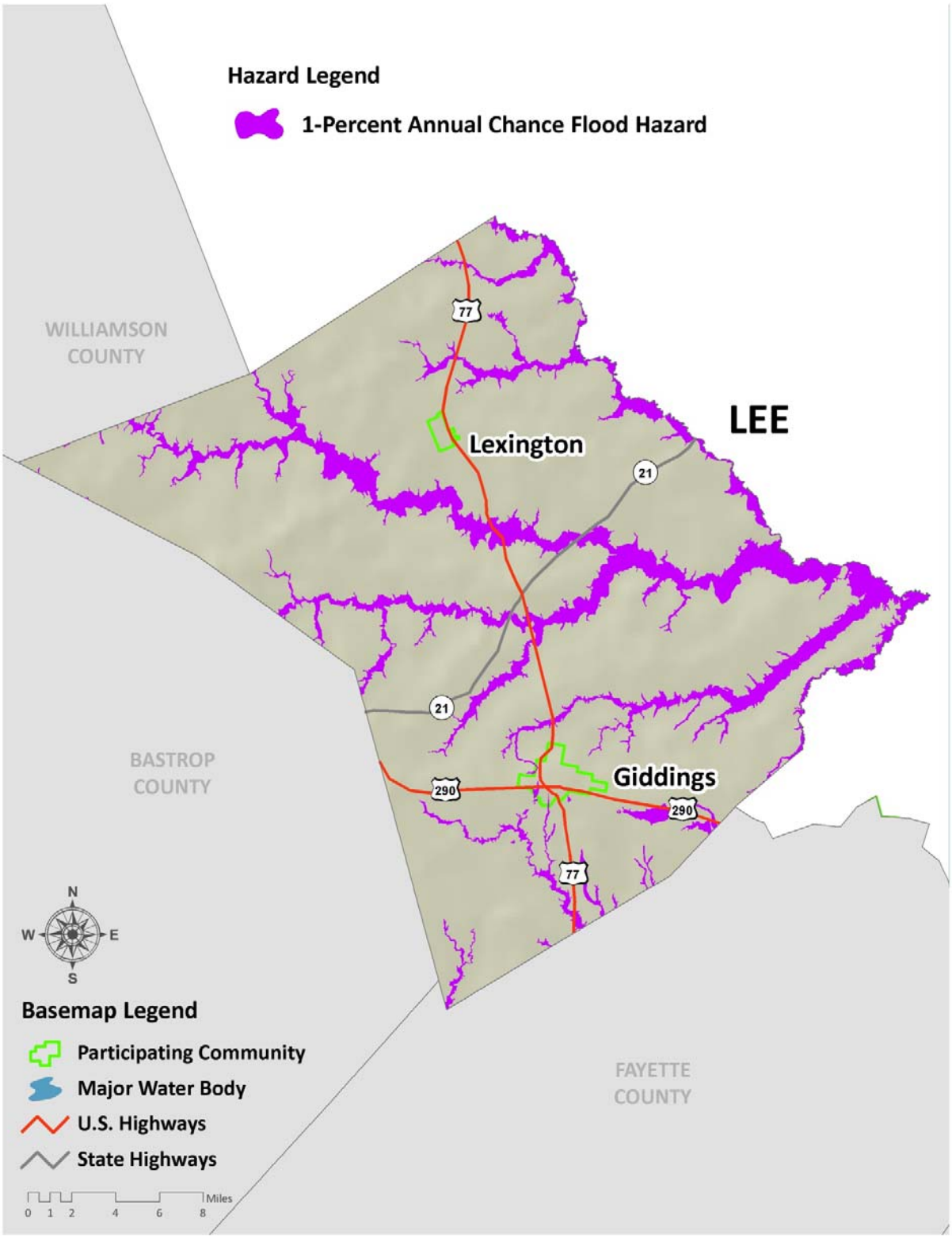


Figure 6-34. Flood Zones for the City of Giddings

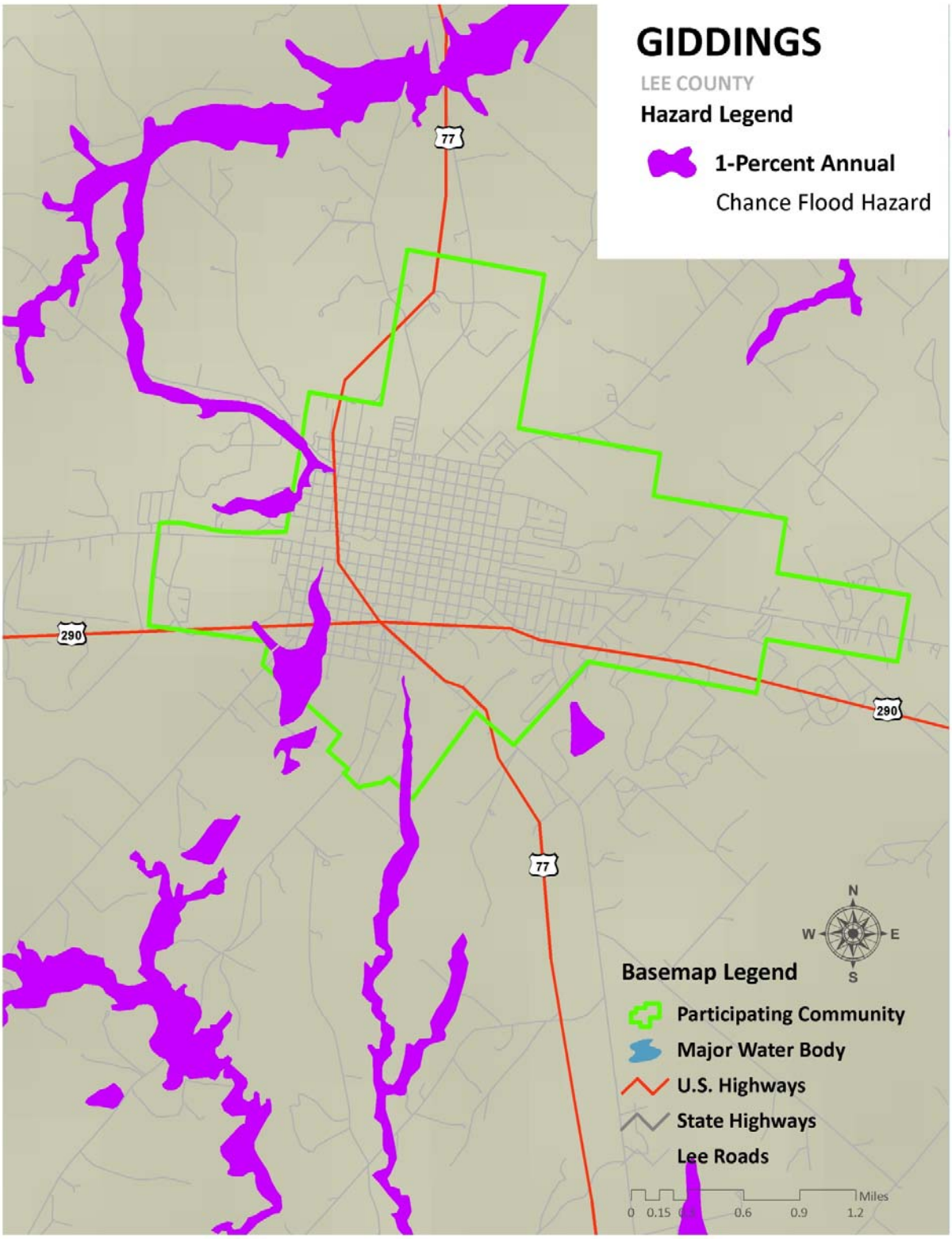


Figure 6-35. Flood Zones for the City of Lexington

Figure 6-36. Flood Zones for Llano County

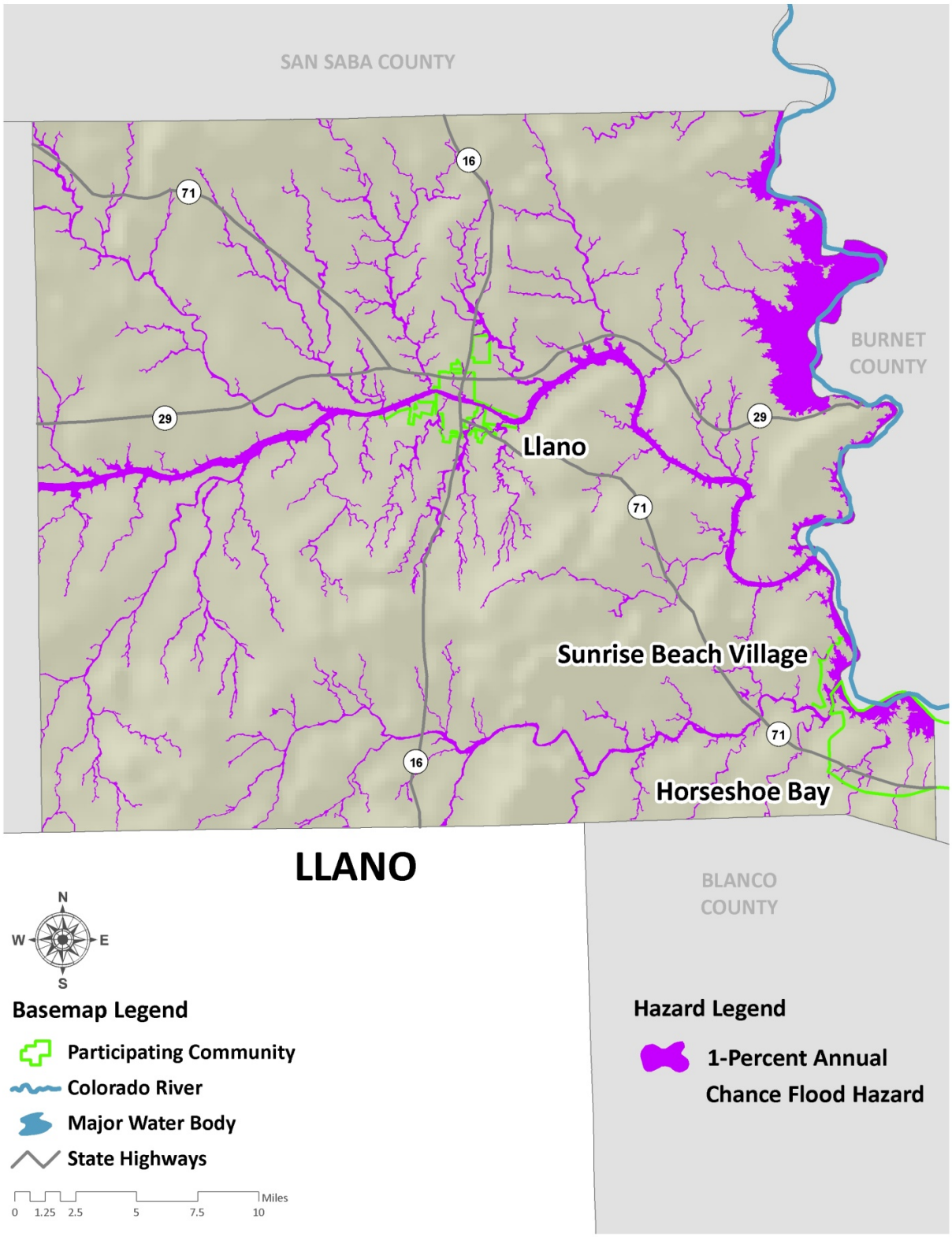


Figure 6-37. Flood Zones for the City of Horseshoe Bay

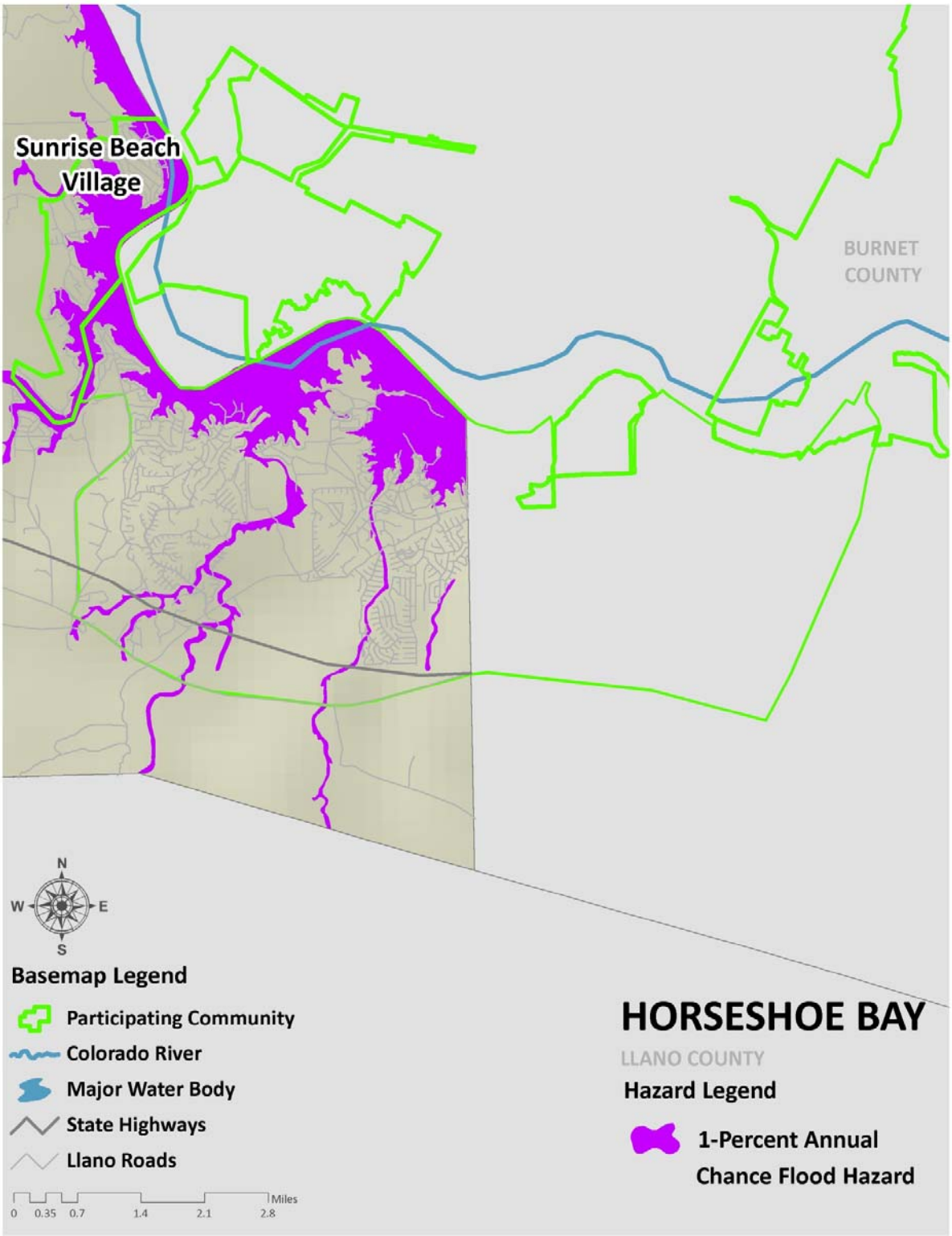


Figure 6-38. Flood Zones for the City of Llano

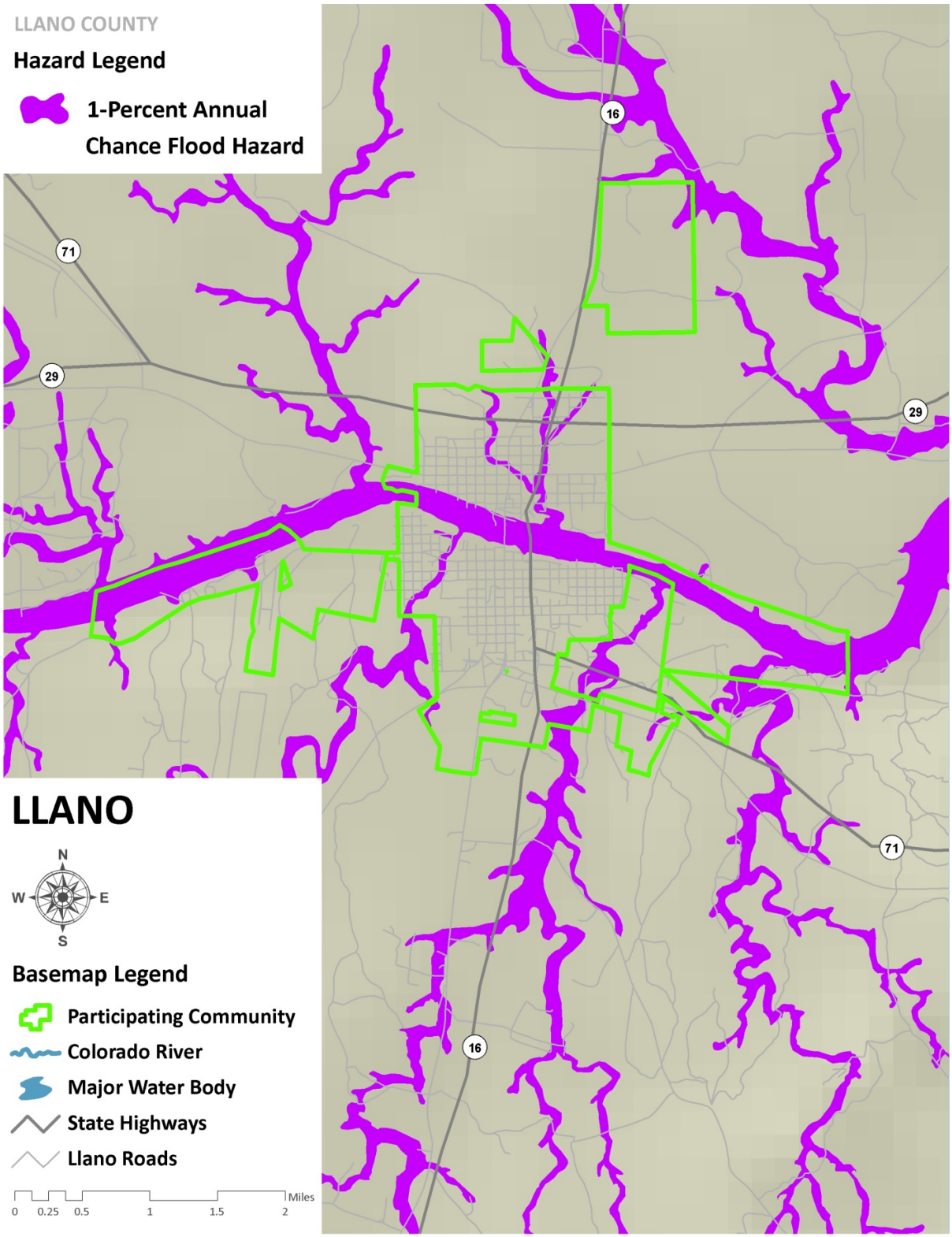


Figure 6-39. Flood Zones for the City of Sunrise Beach Village

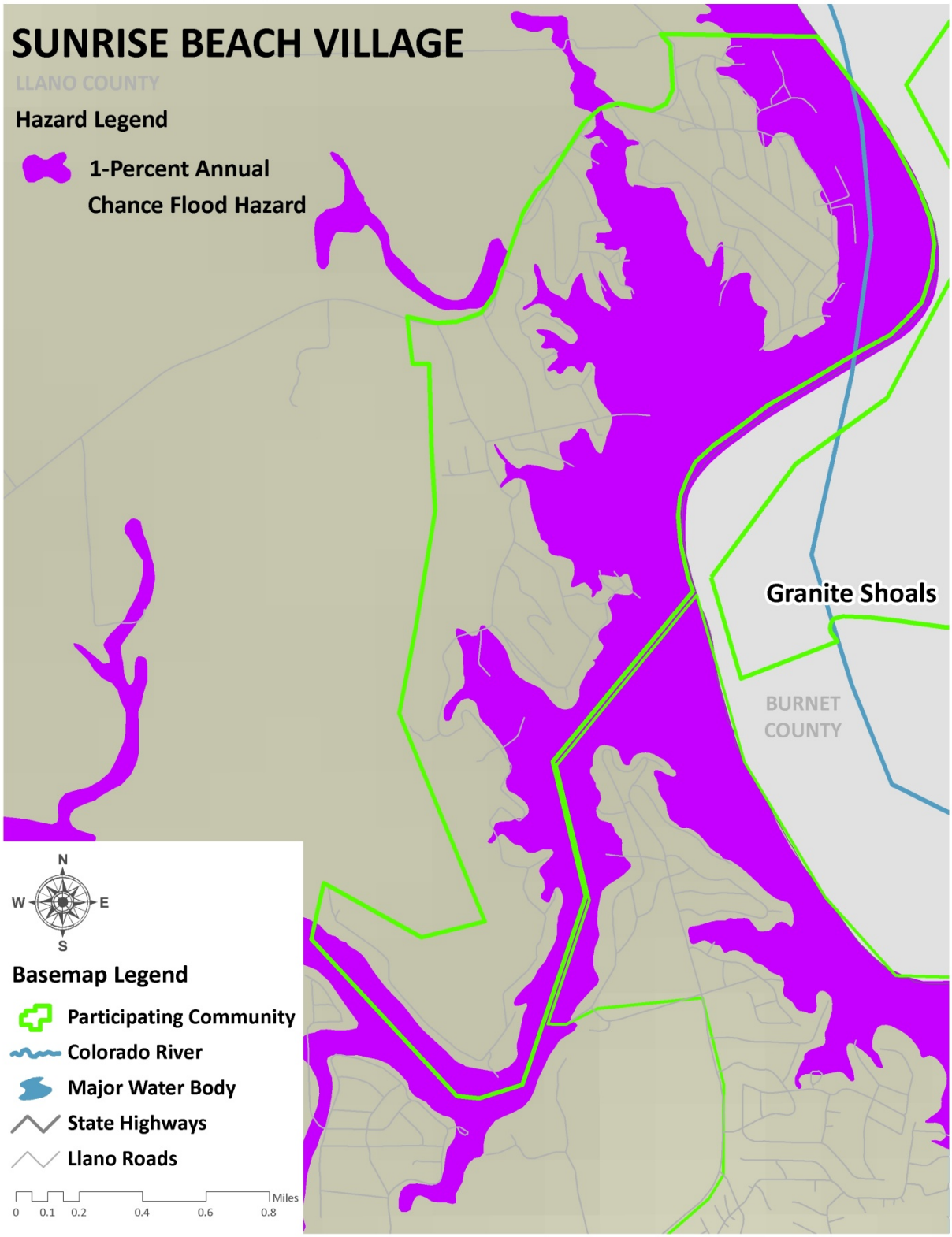


Figure 6-40. Flood Zones for Mason County

Figure 6-41. Flood Zones for the City of Mason

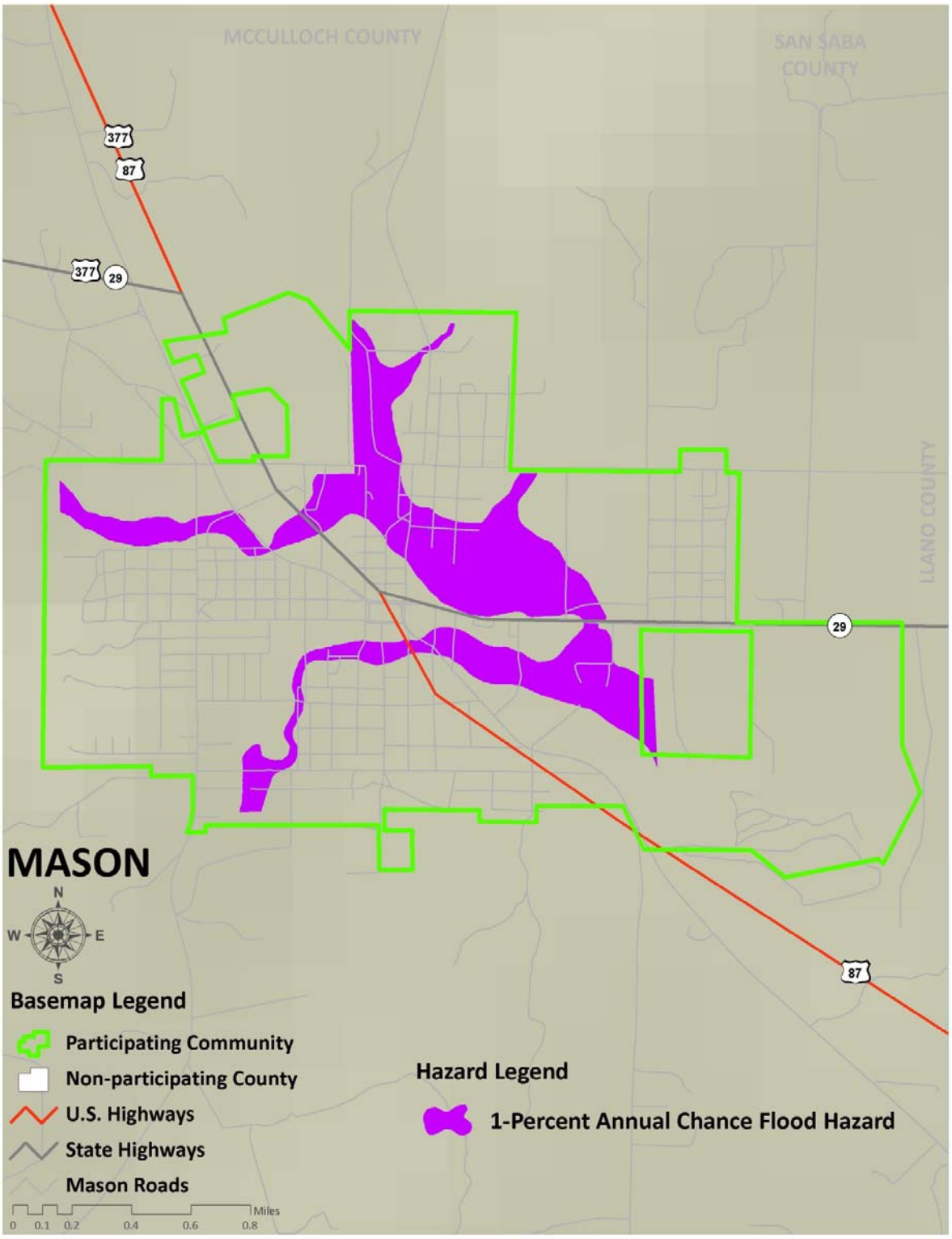


Figure 6-42. Flood Zones for Matagorda County

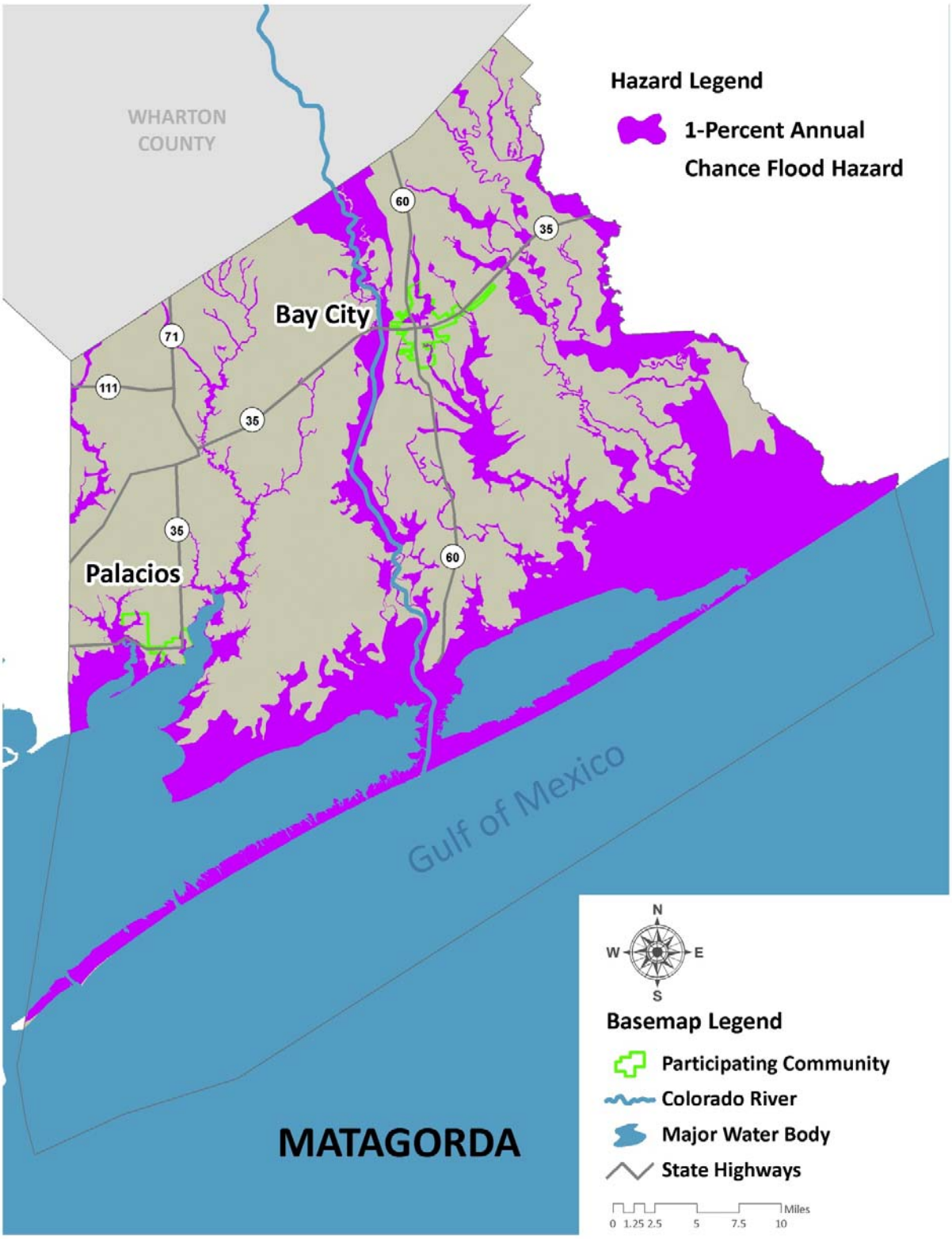


Figure 6-43. Flood Zones for the City of Bay City

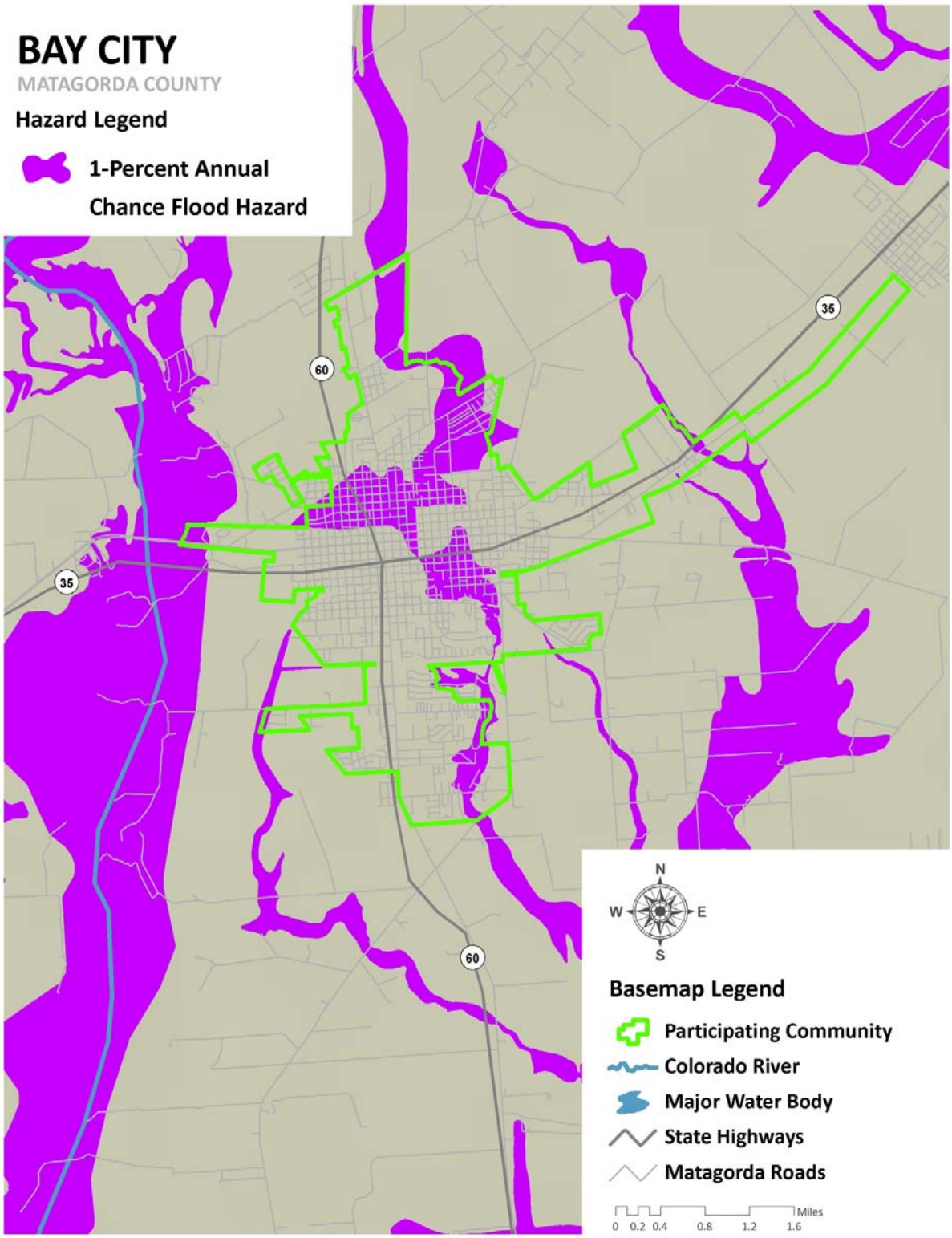


Figure 6-44. Flood Zones for the City of Palacios

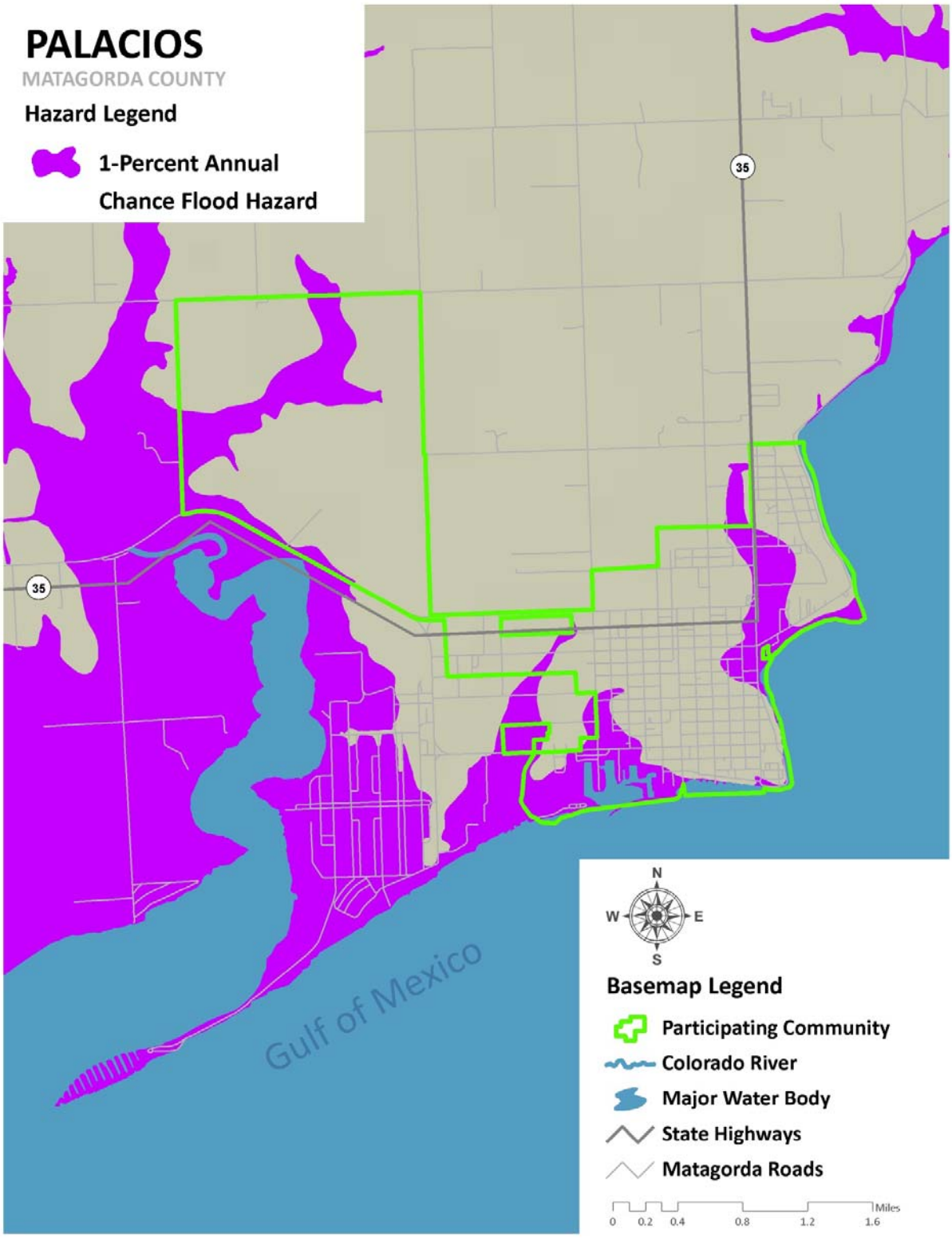


Figure 6-45. Flood Zones for McCulloch County

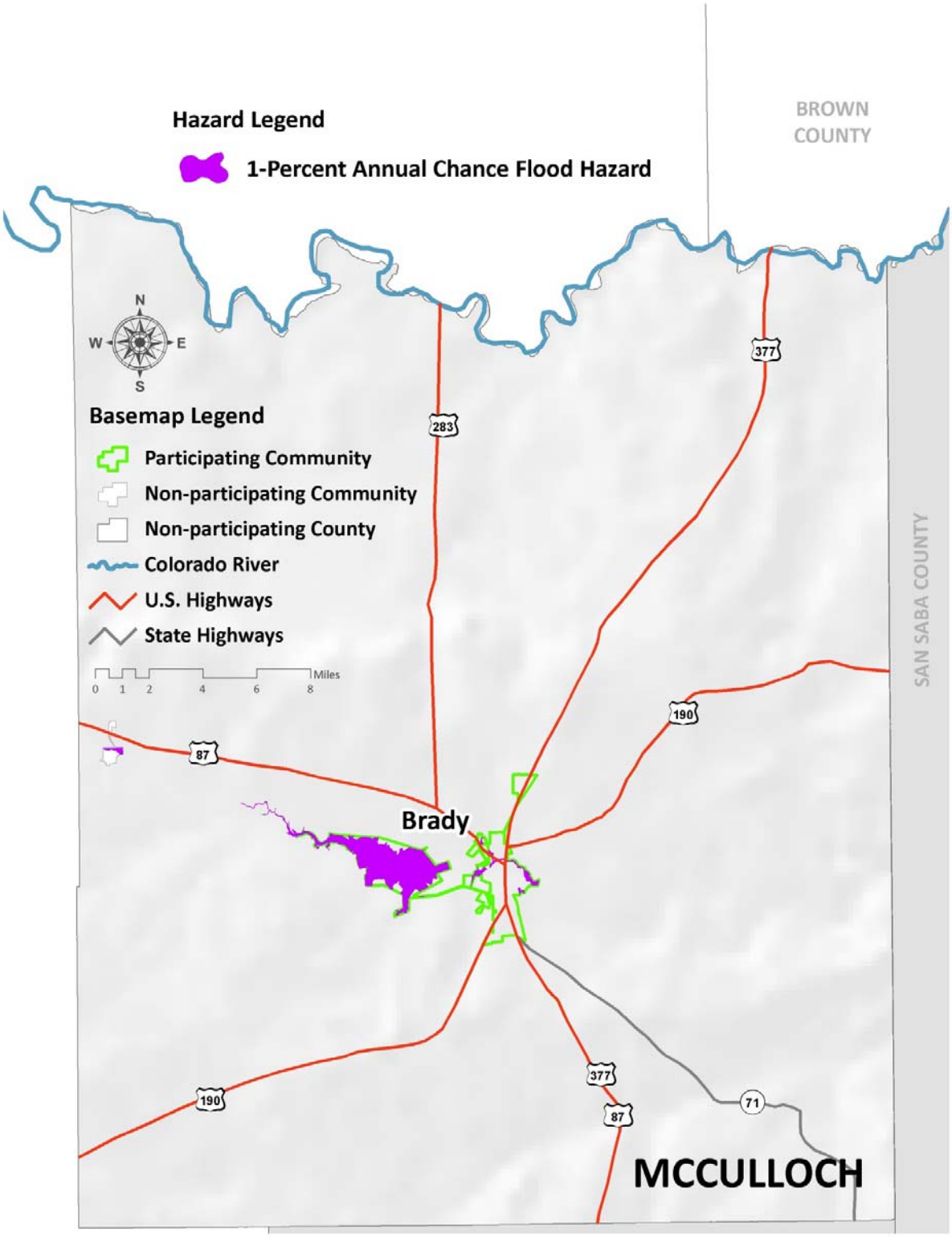


Figure 6-46. Flood Zones for the City of Brady

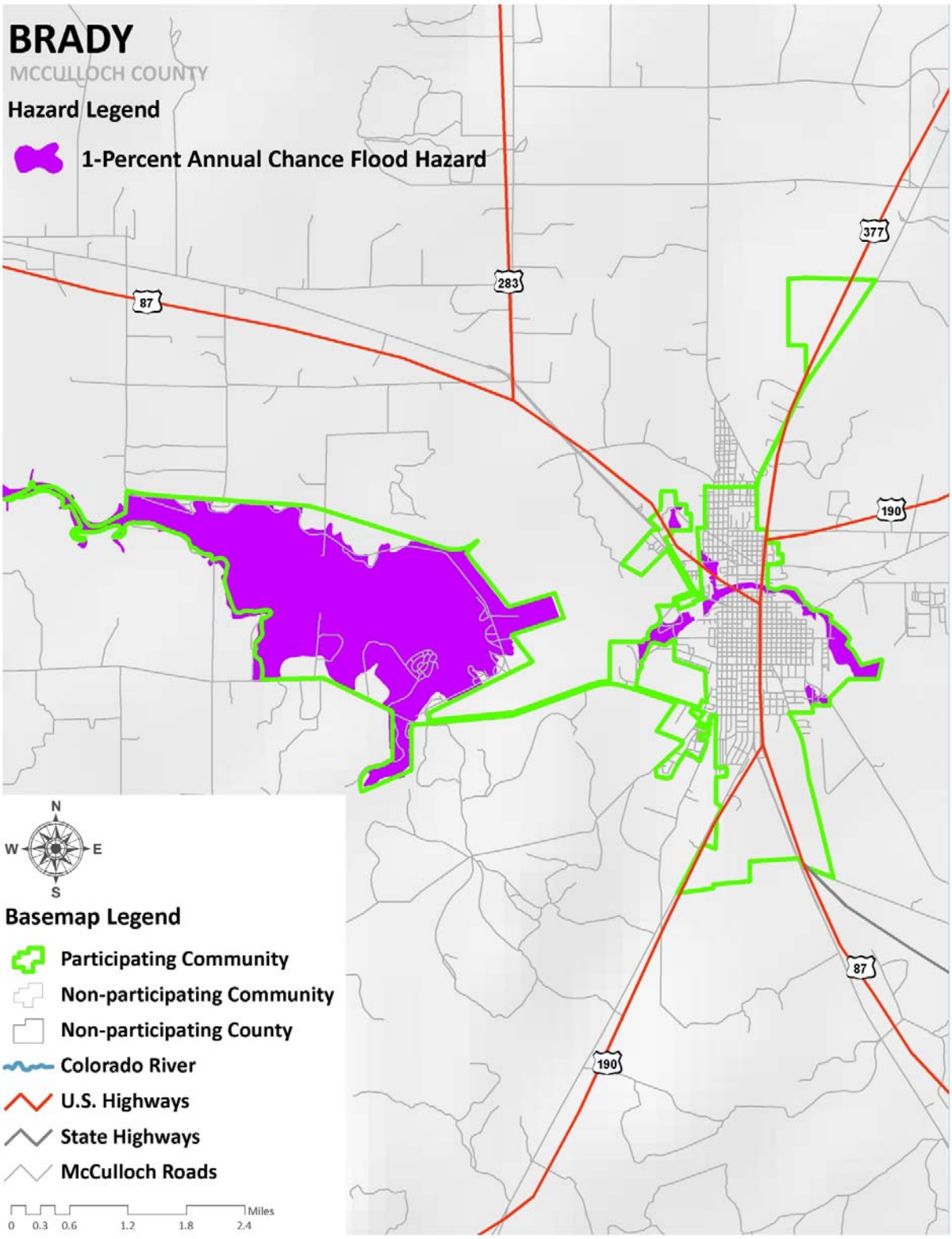


Figure 6-47. Flood Zones for Mills County

Figure 6-48. Flood Zones for the City of Goldthwaite

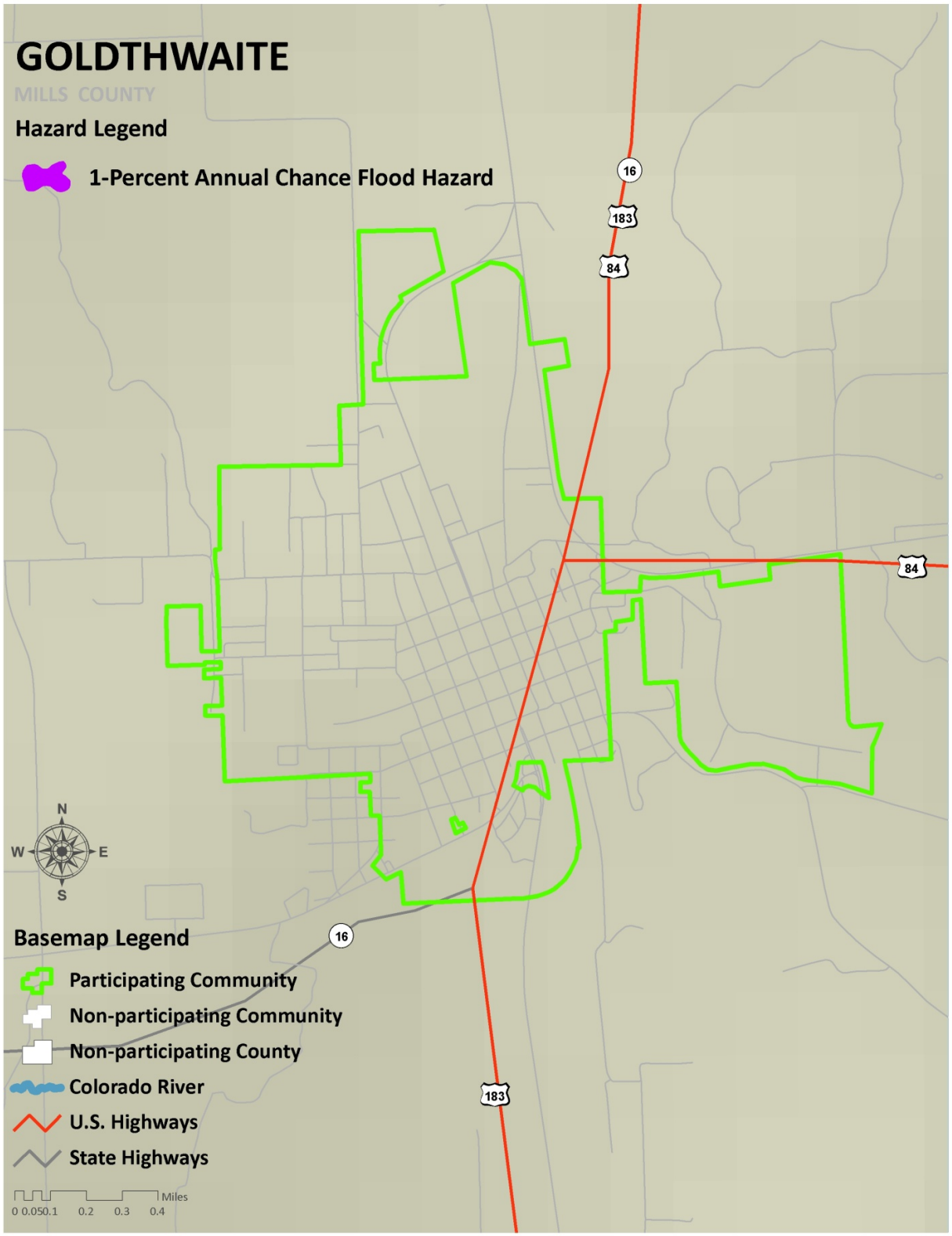


Figure 6-49. Flood Zones for San Saba County

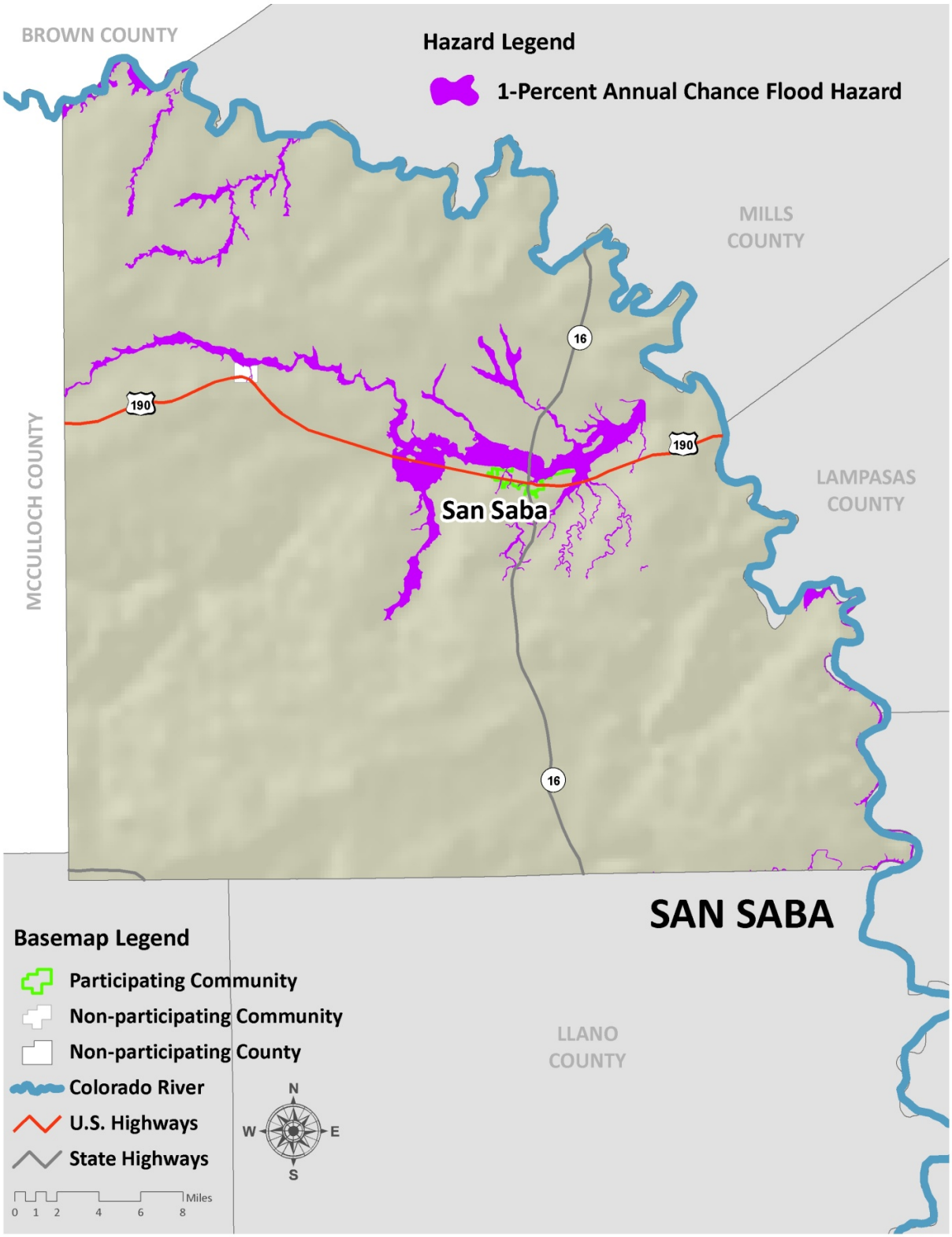


Figure 6-50. Flood Zones for the City of San Saba

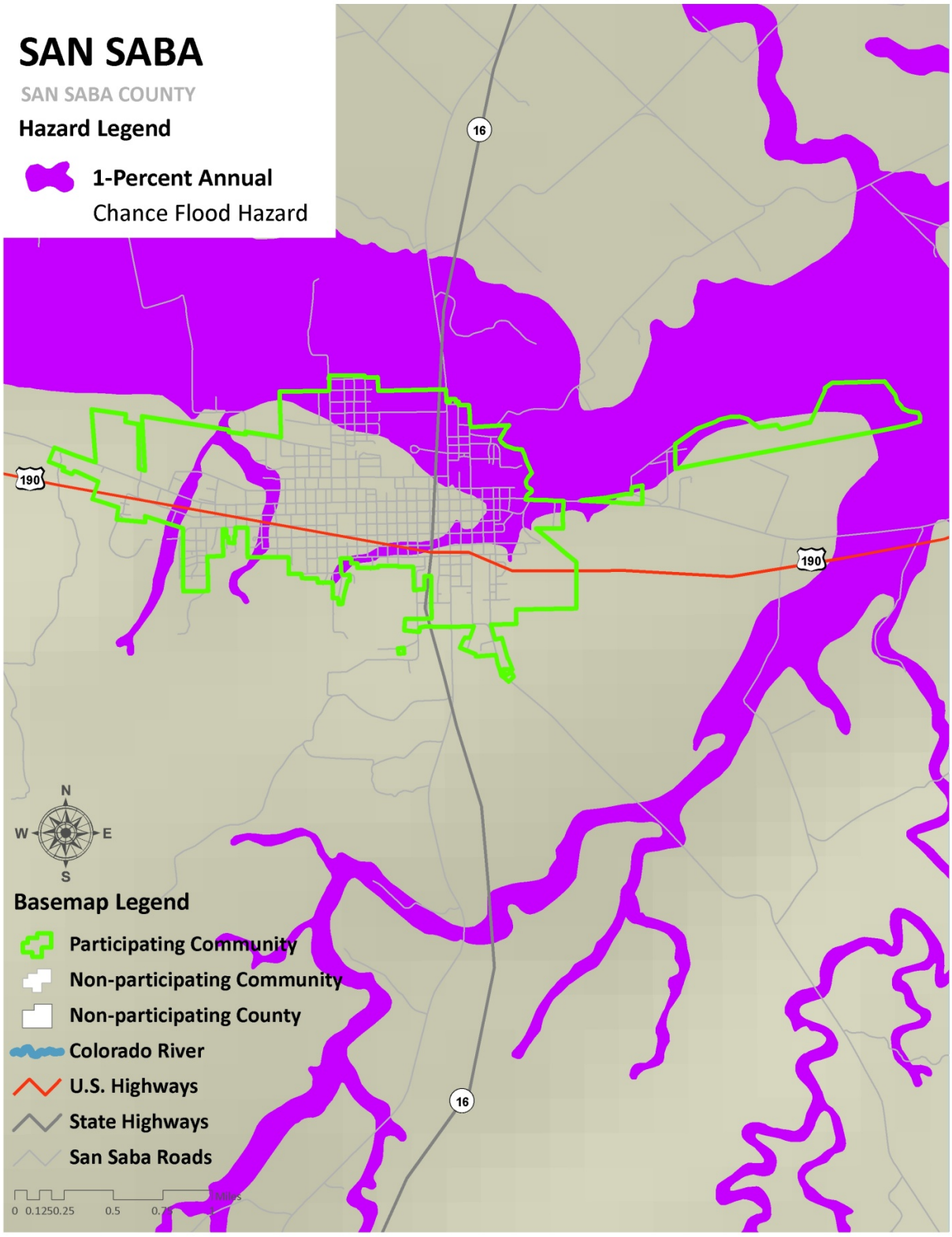


Figure 6-51. Flood Zones for Travis County

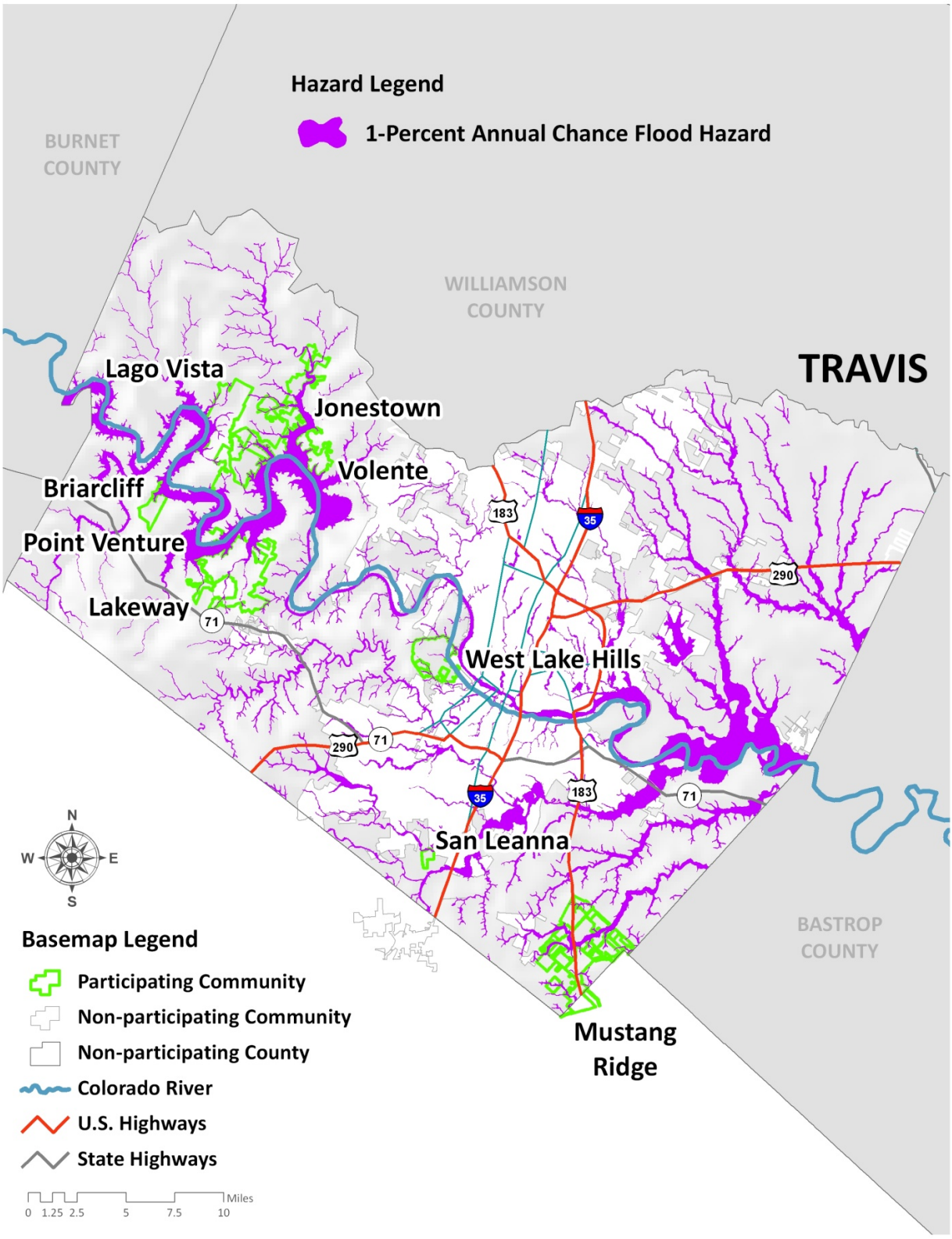


Figure 6-52. Flood Zones for the City of Mustang Ridge

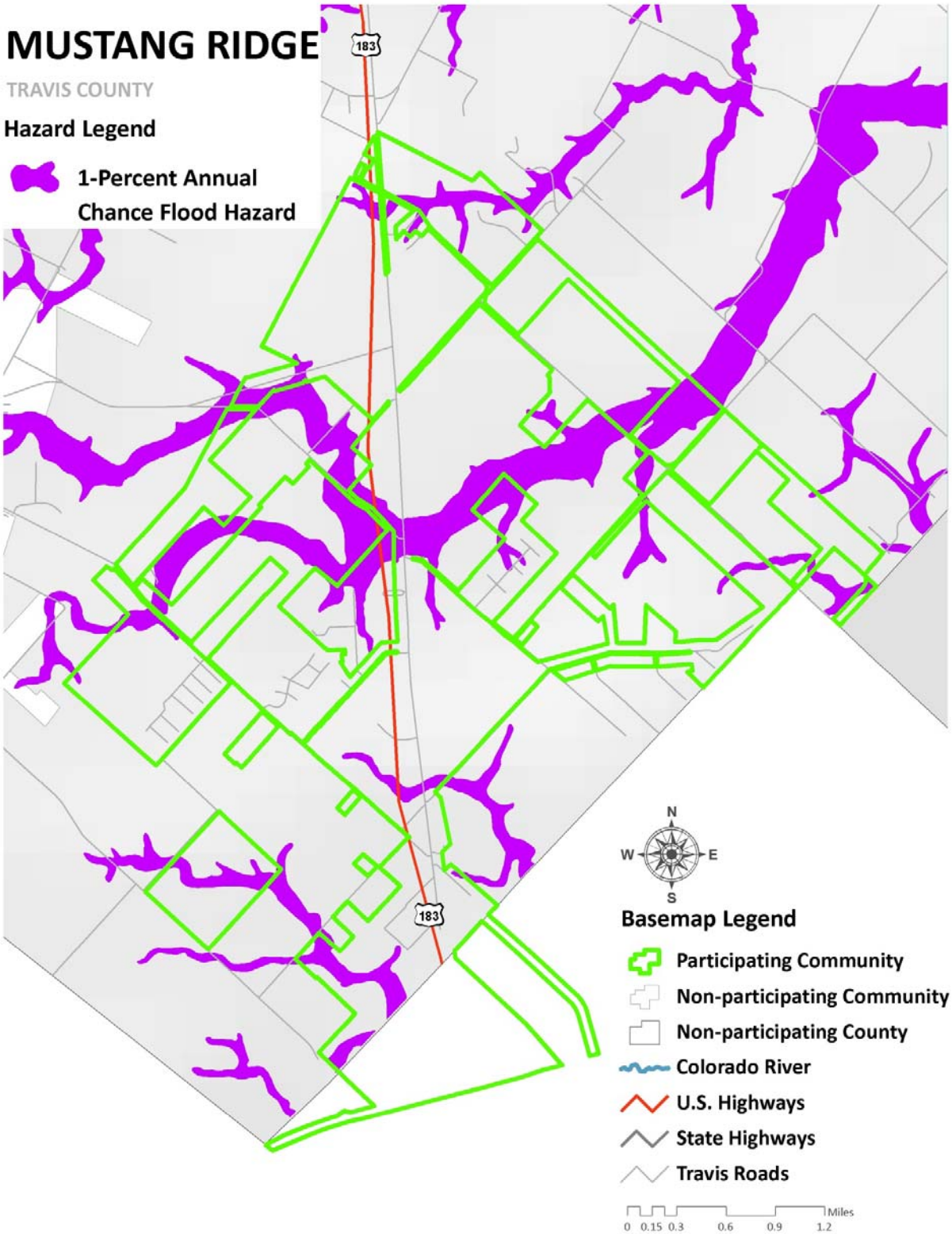


Figure 6-53. Flood Zones for the Village of San Leanna

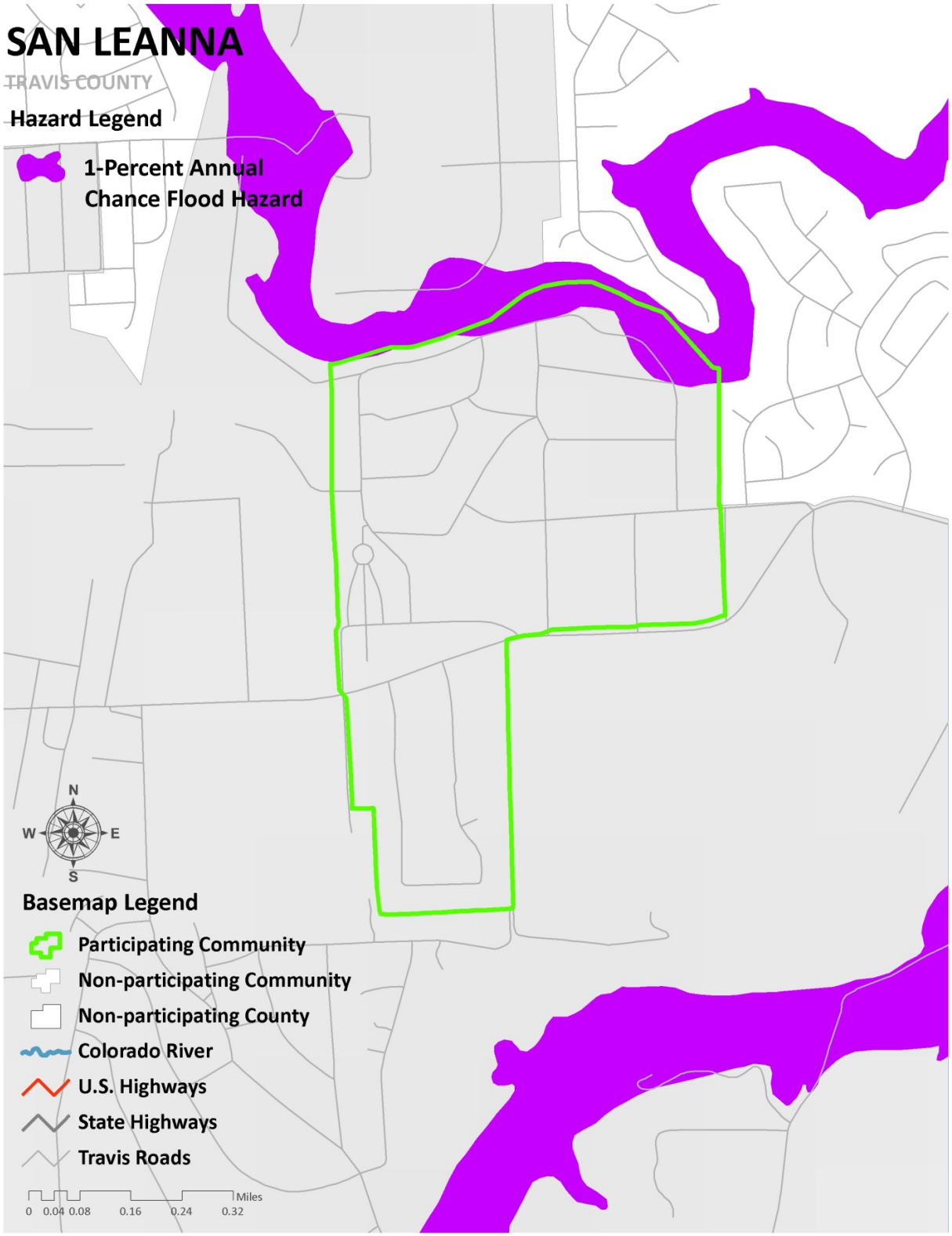


Figure 6-54. Flood Zones for the City of West Lake Hills

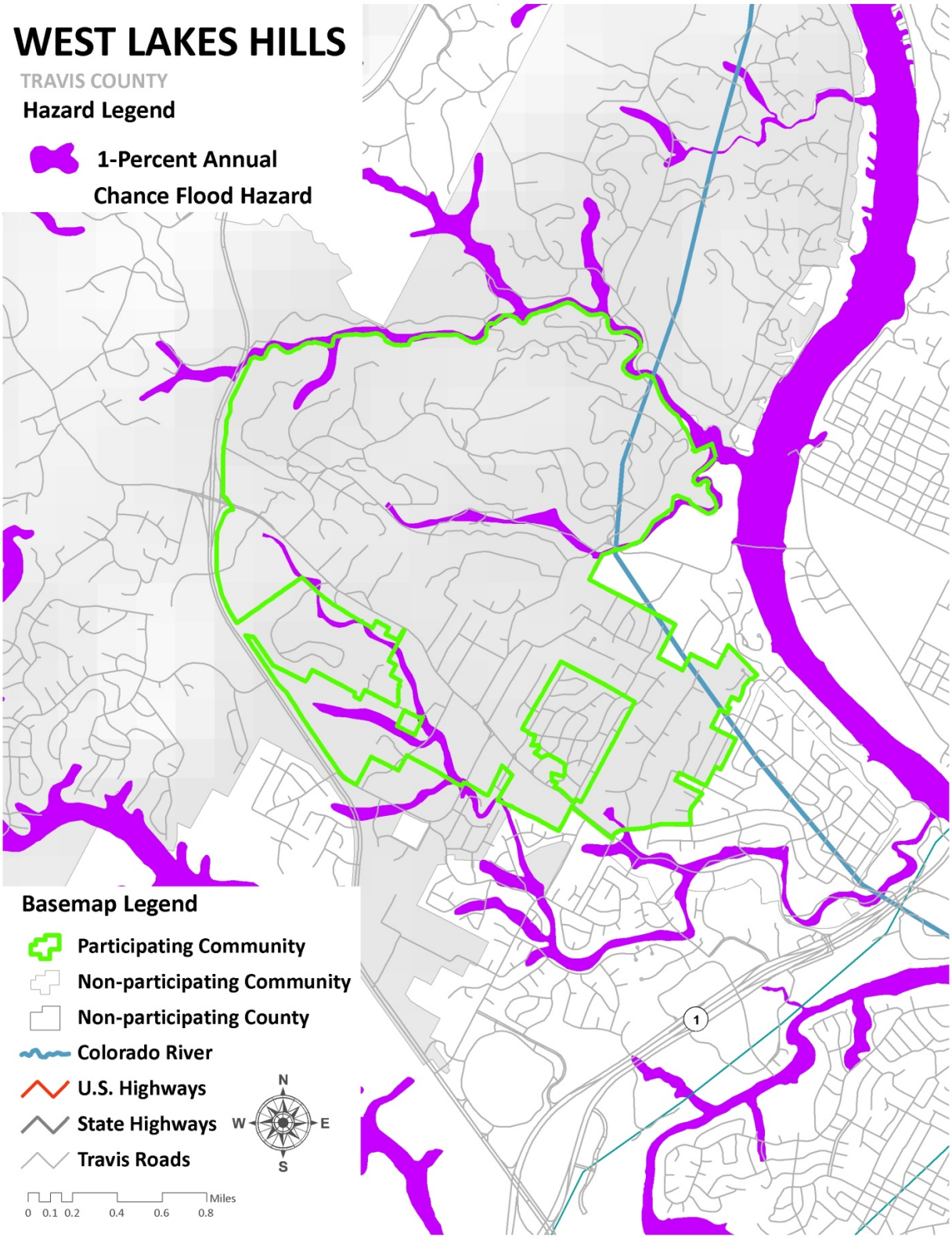


Figure 6-55. Flood Zones for the City of Lakeway

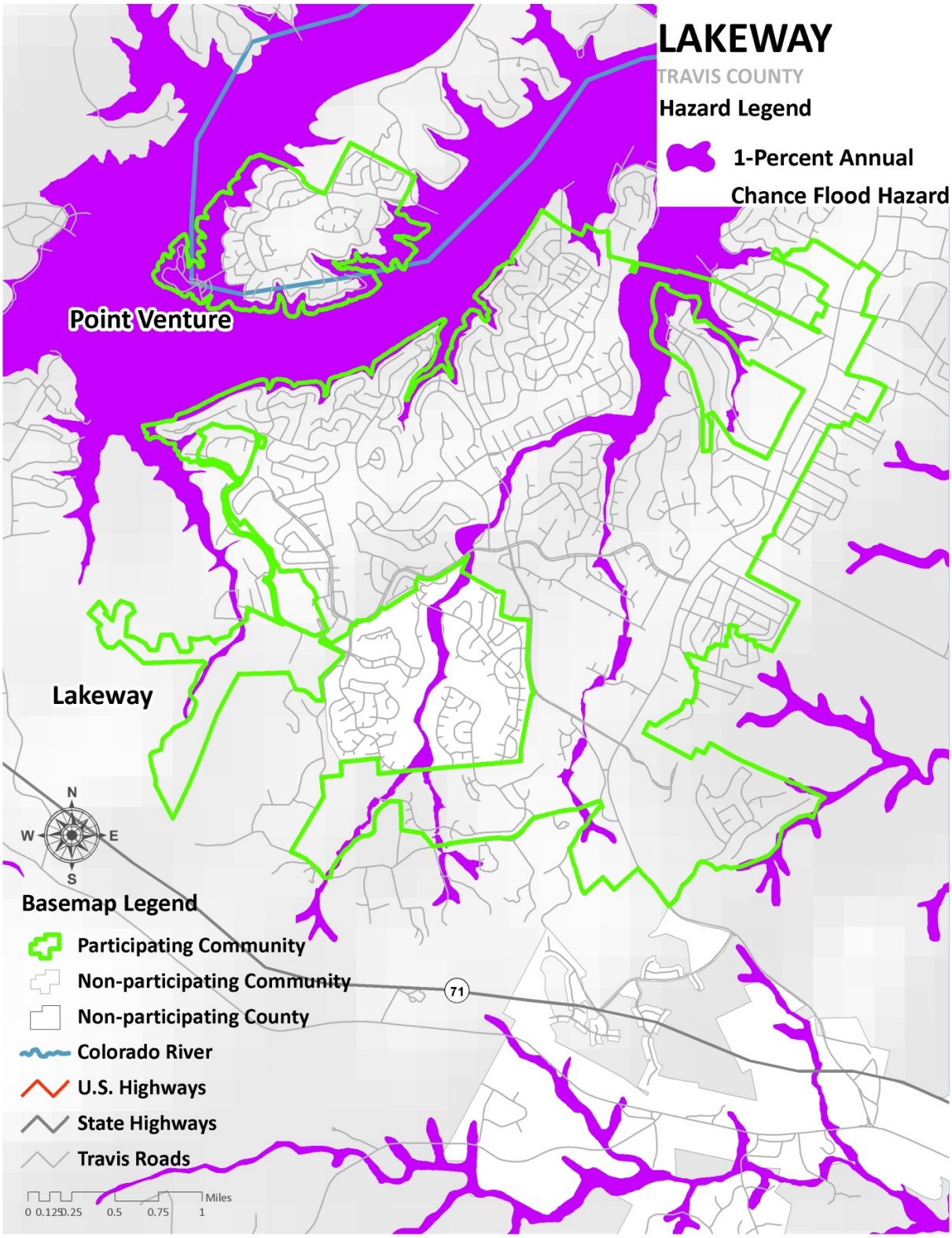


Figure 6-56. Flood Zones for the Village of Point Venture

Figure 6-57. Flood Zones for the City of Lago Vista

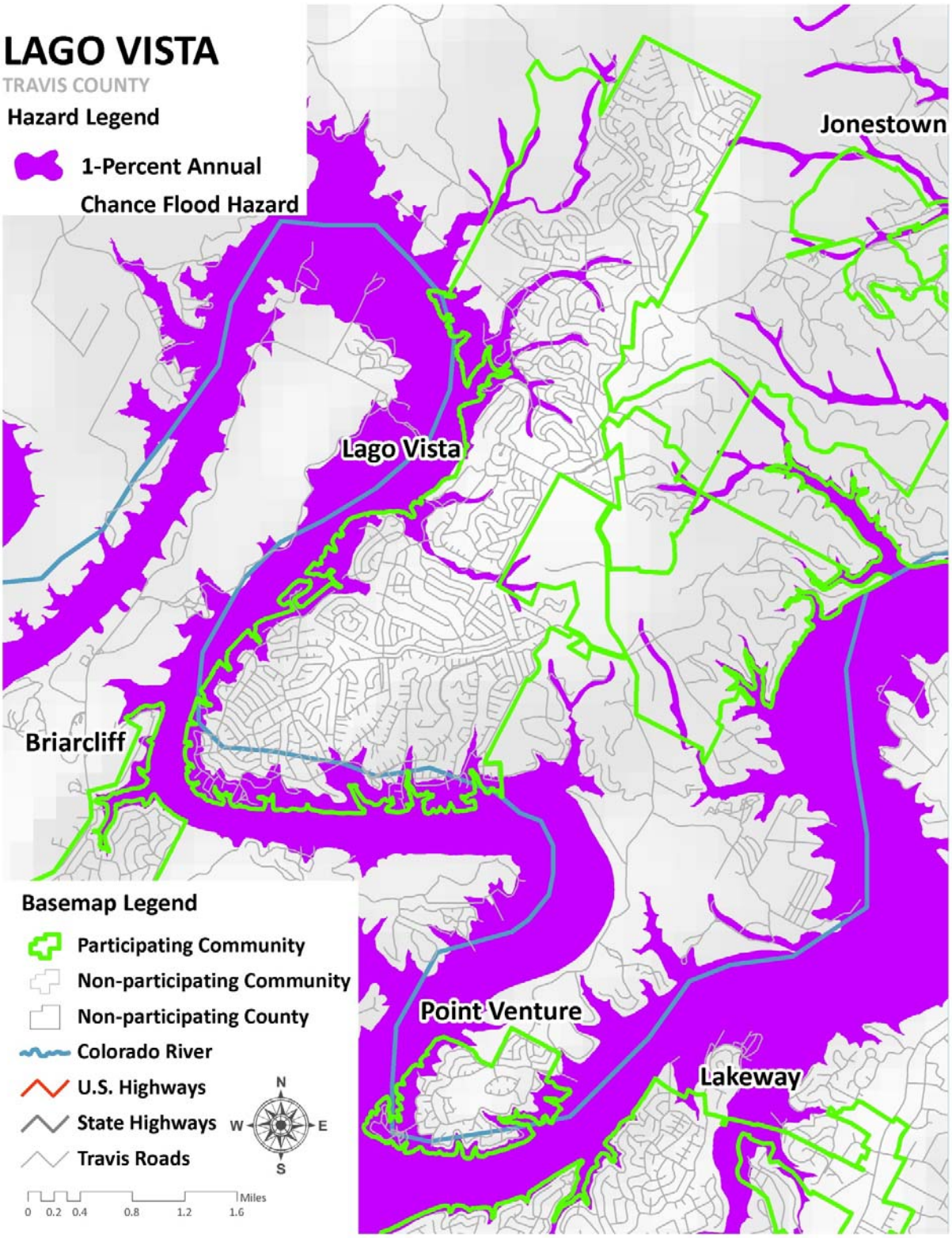


Figure 6-58. Flood Zones for the Village of Briarcliff

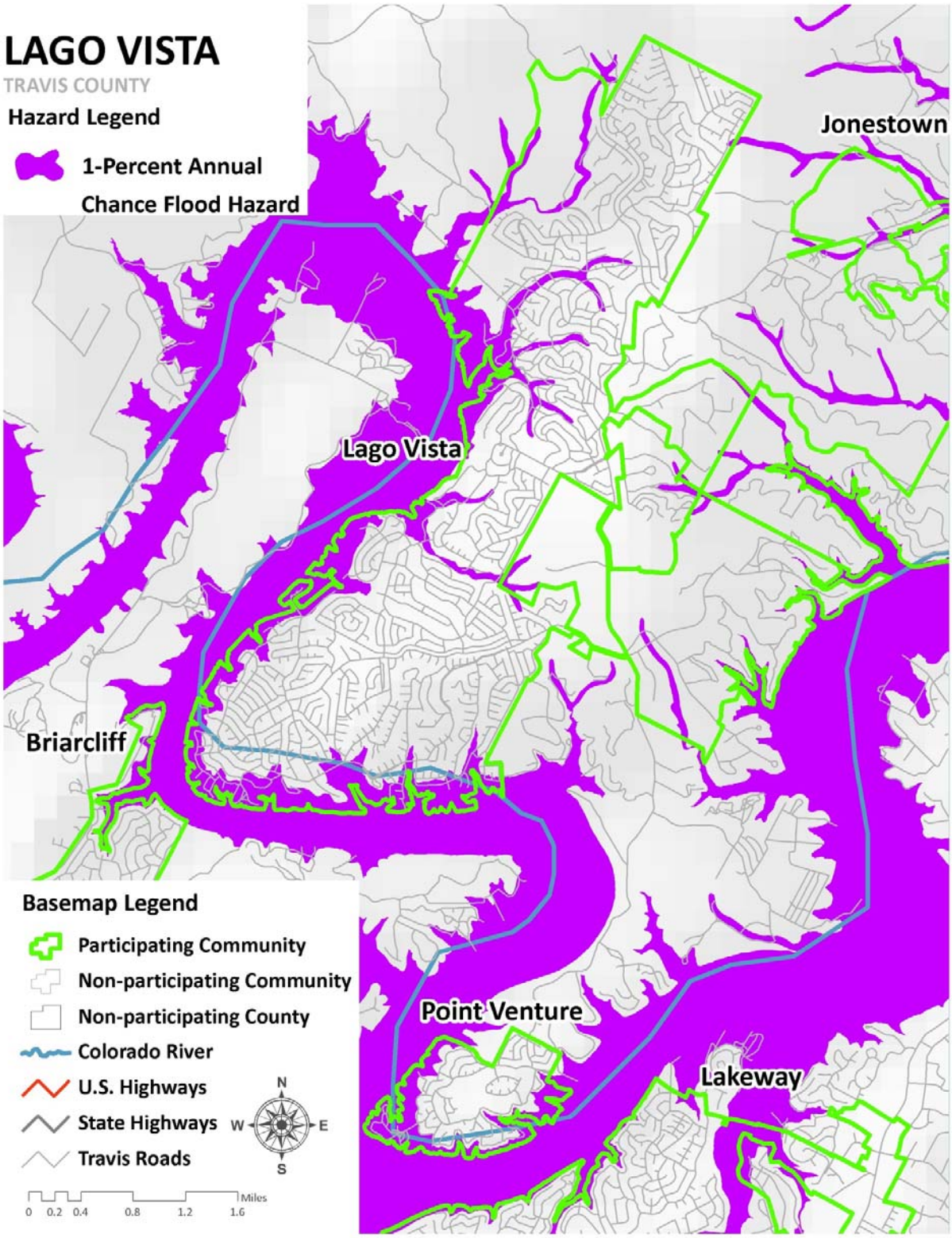


Figure 6-59. Flood Zones for the City of Jonestown

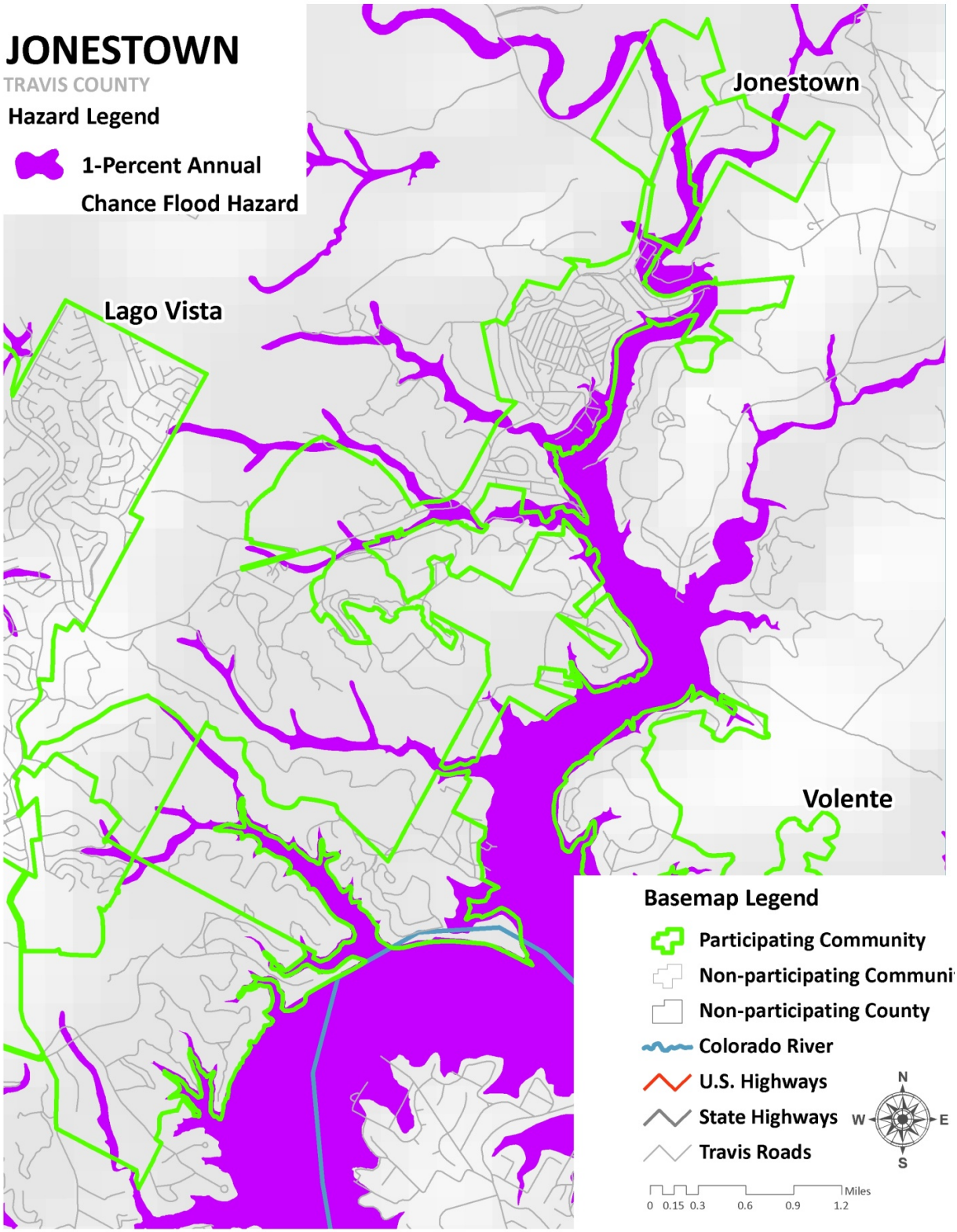


Figure 6-60. Flood Zones for the Village of Volente

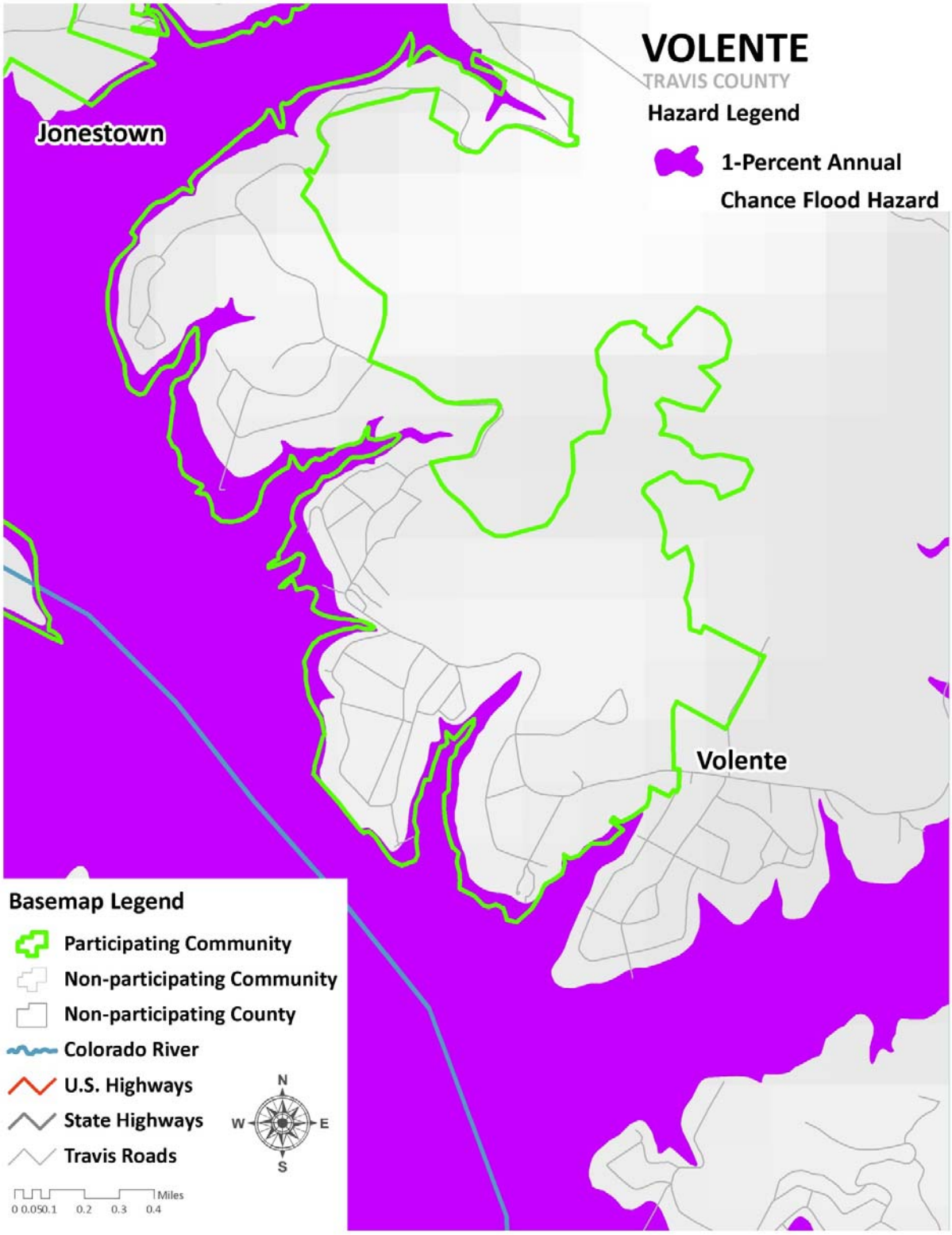


Figure 6-61. Flood Zones for Wharton County

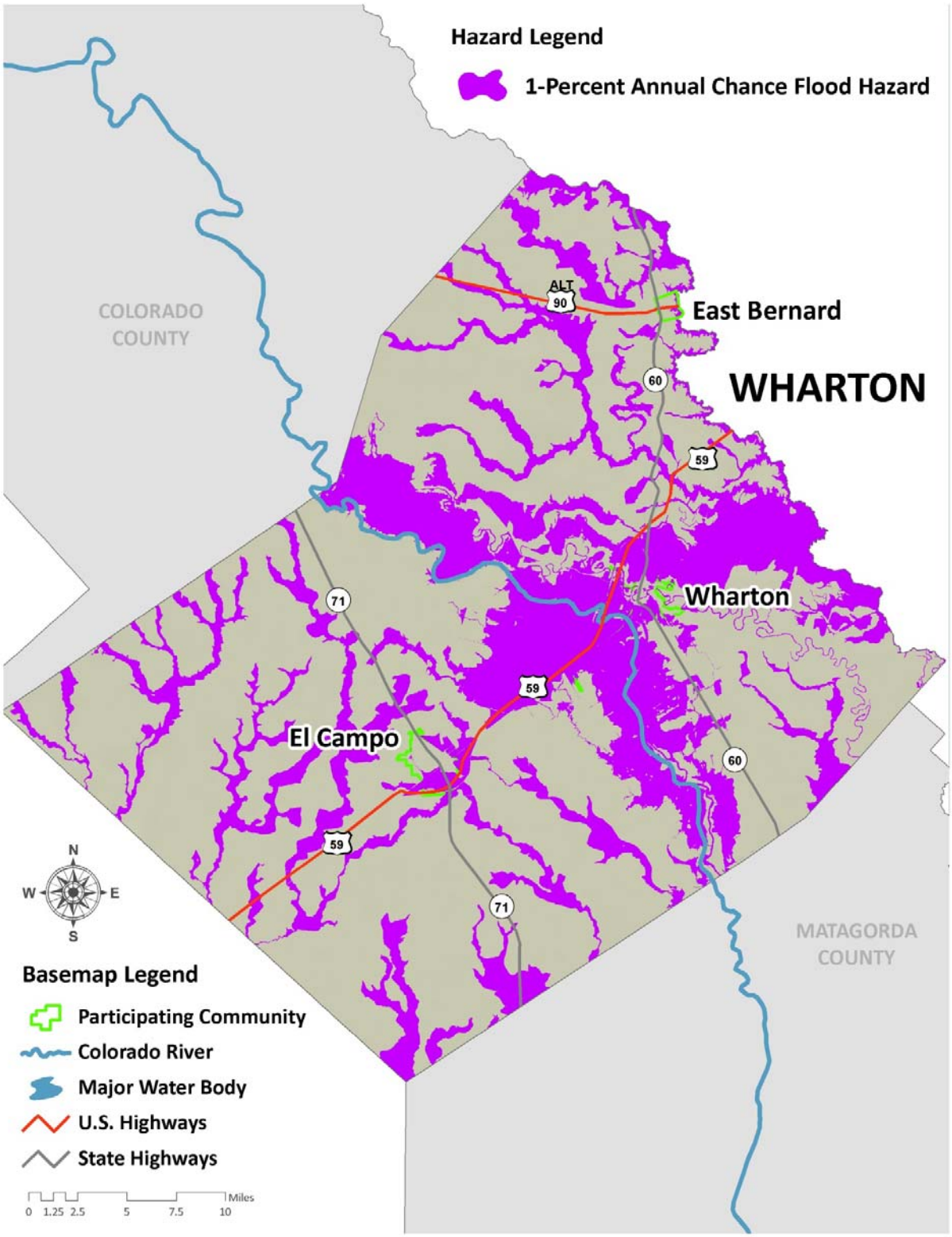


Figure 6-62. Flood Zones for the City of East Bernard

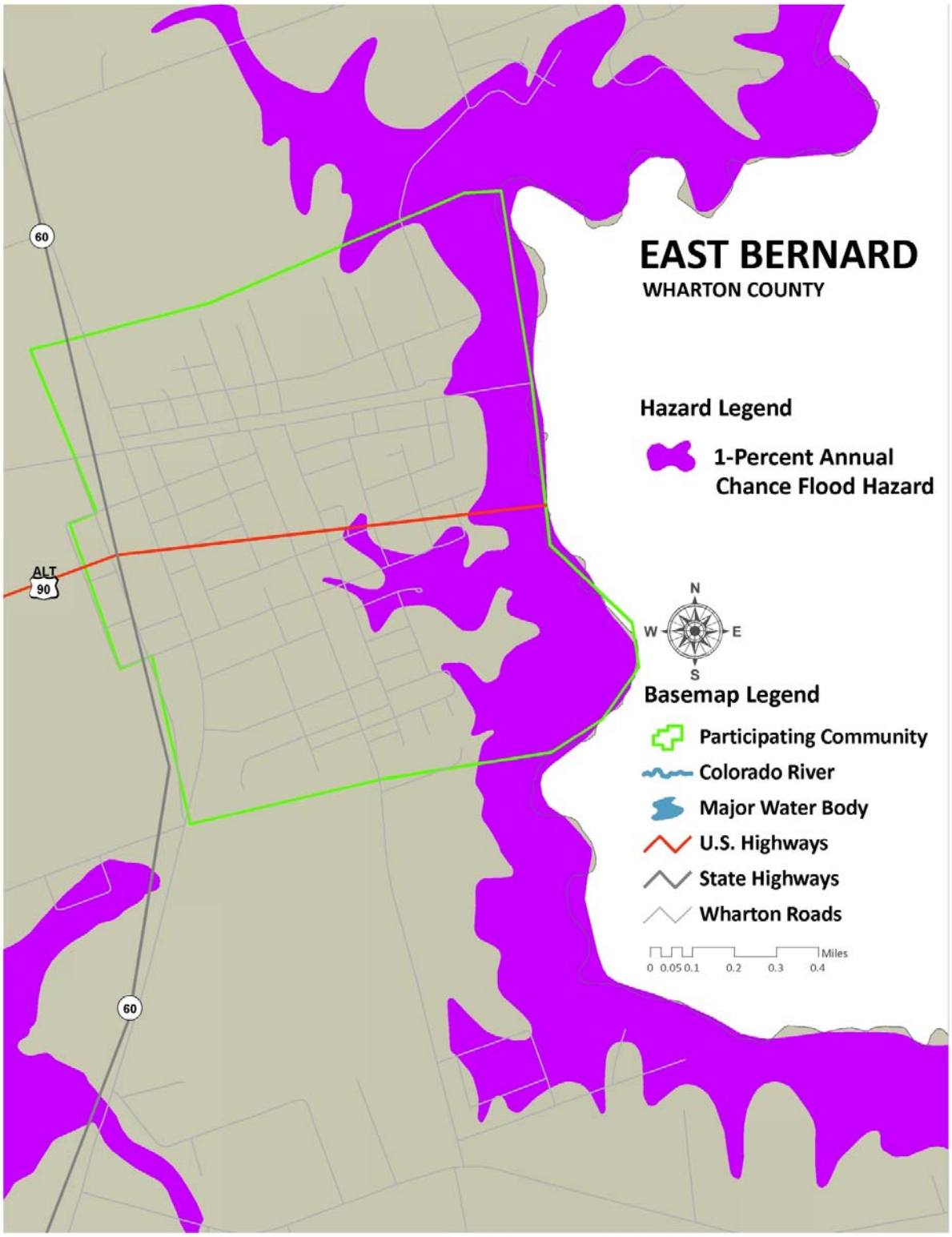


Figure 6-63. Flood Zones for the City of El Campo

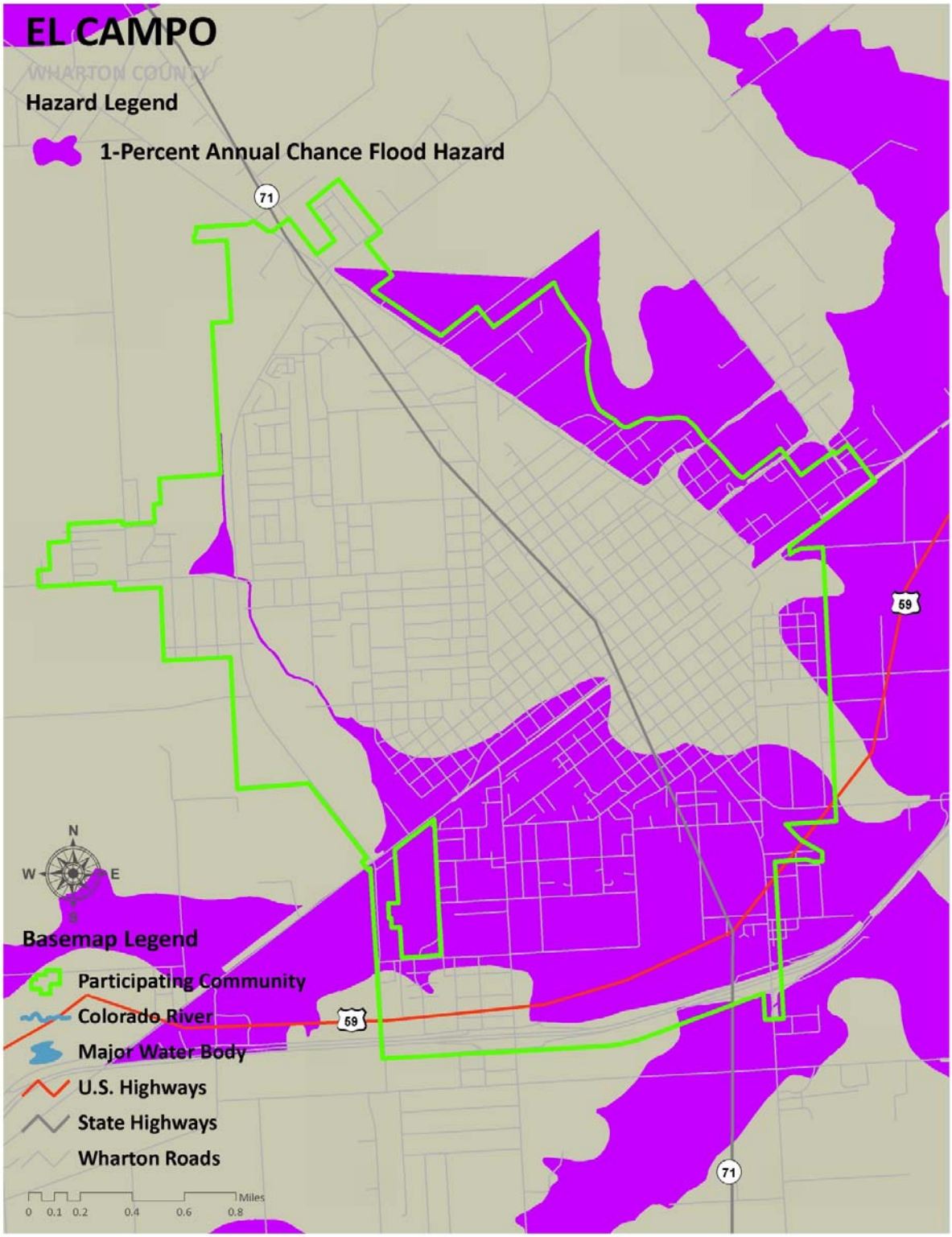


Figure 6-64. Flood Zones for the City of Wharton

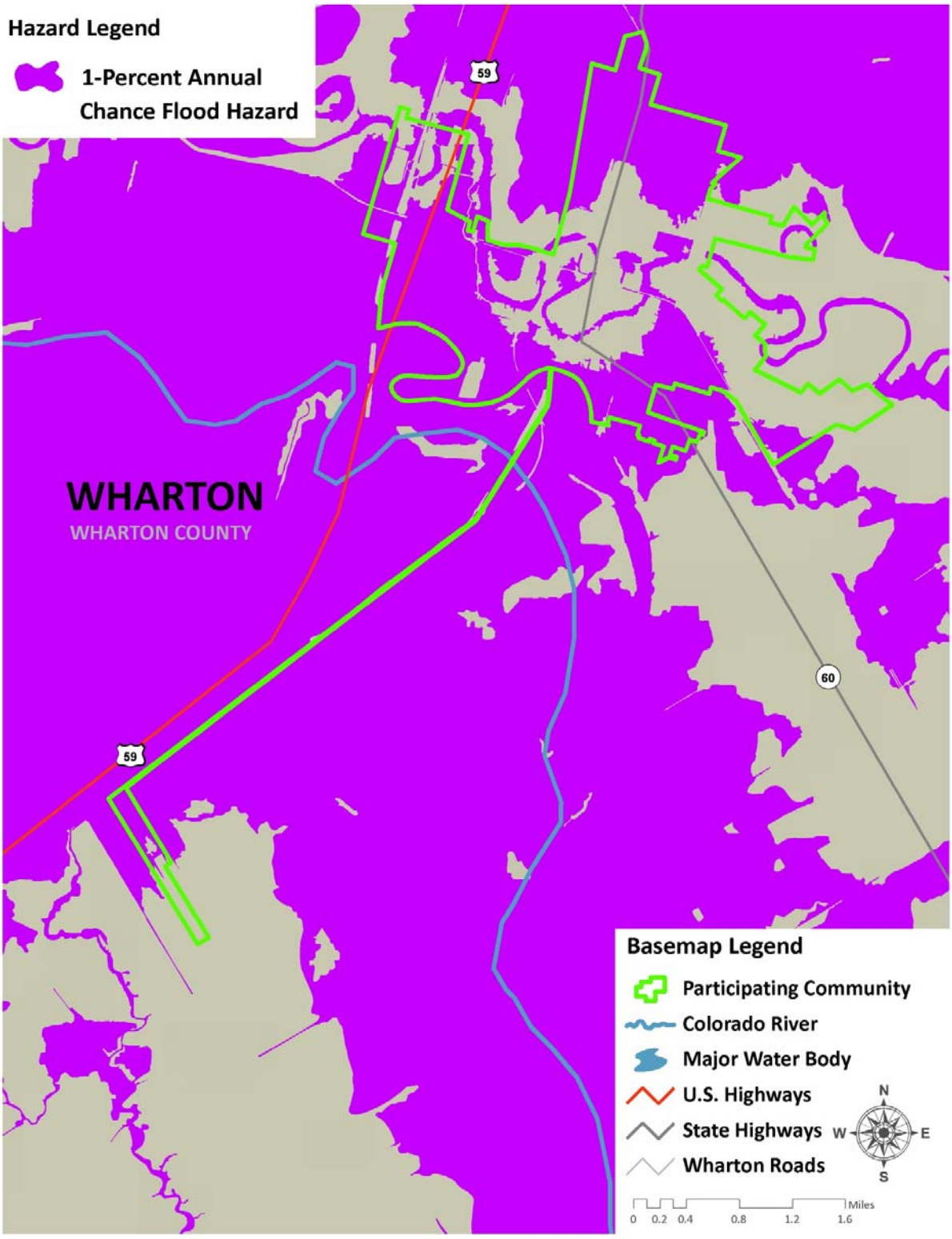


Figure 6-65. Flood Zones for Williamson County

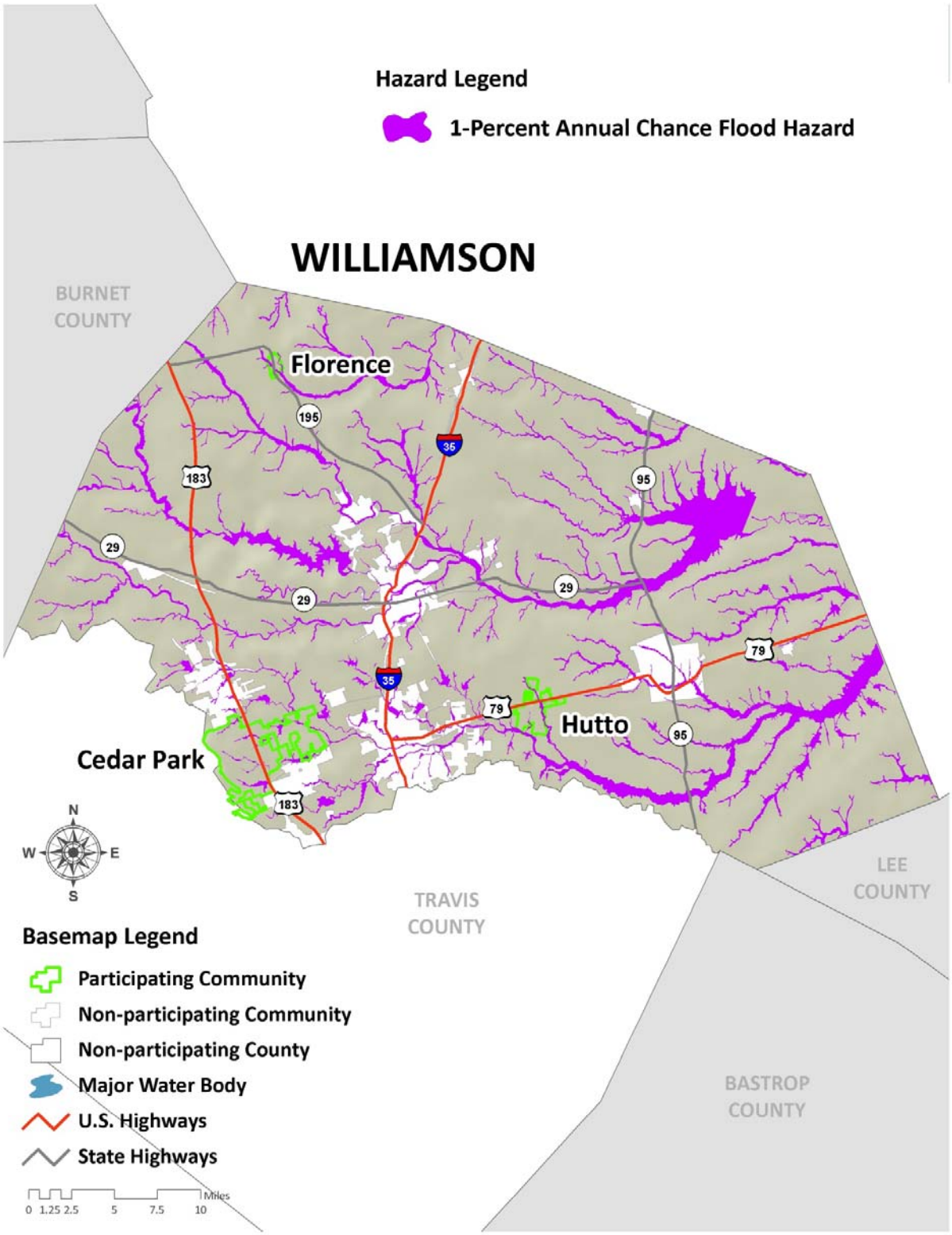


Figure 6-66. Flood Zones for the City of Cedar Park

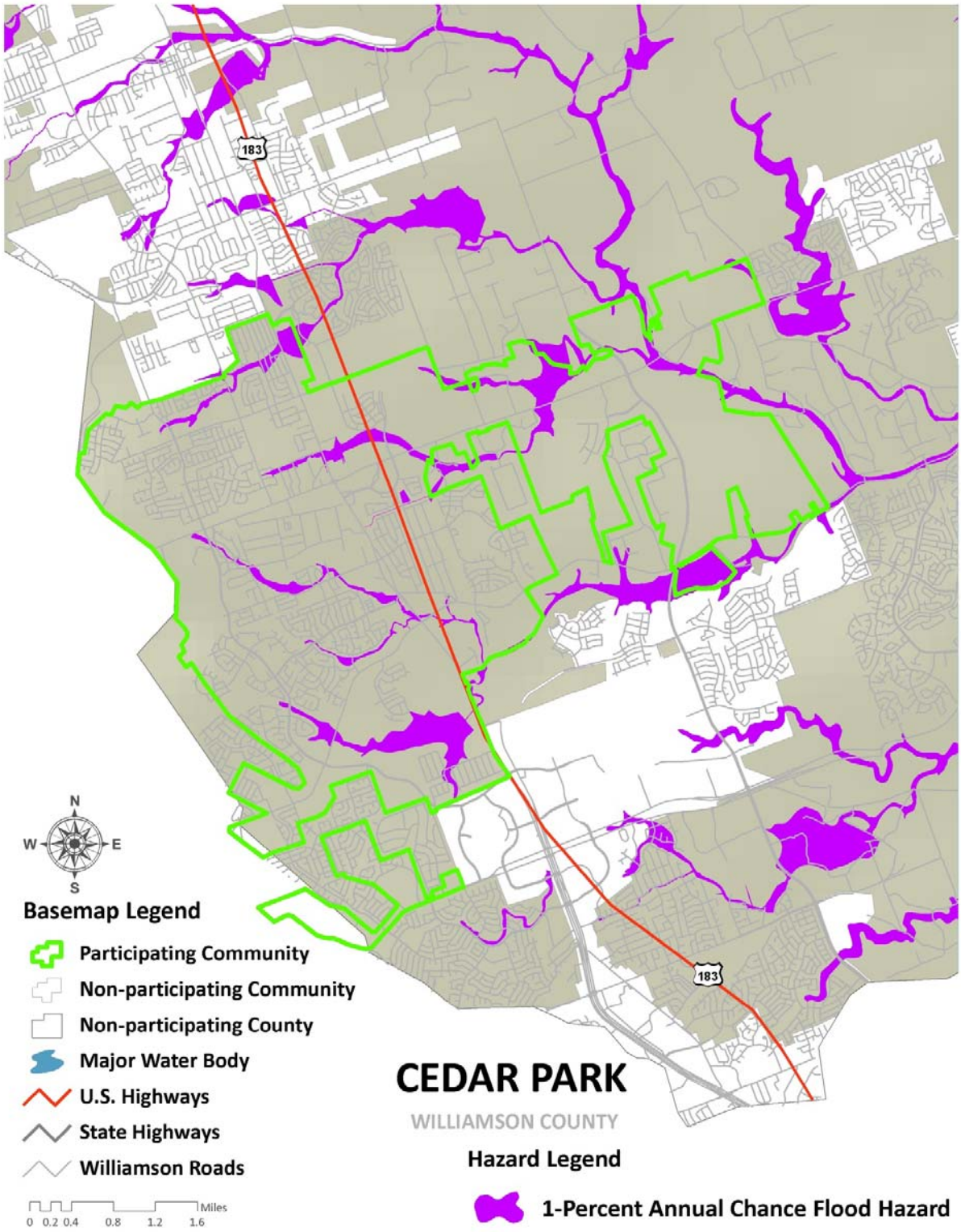


Figure 6-67. Flood Zones for the City of Florence

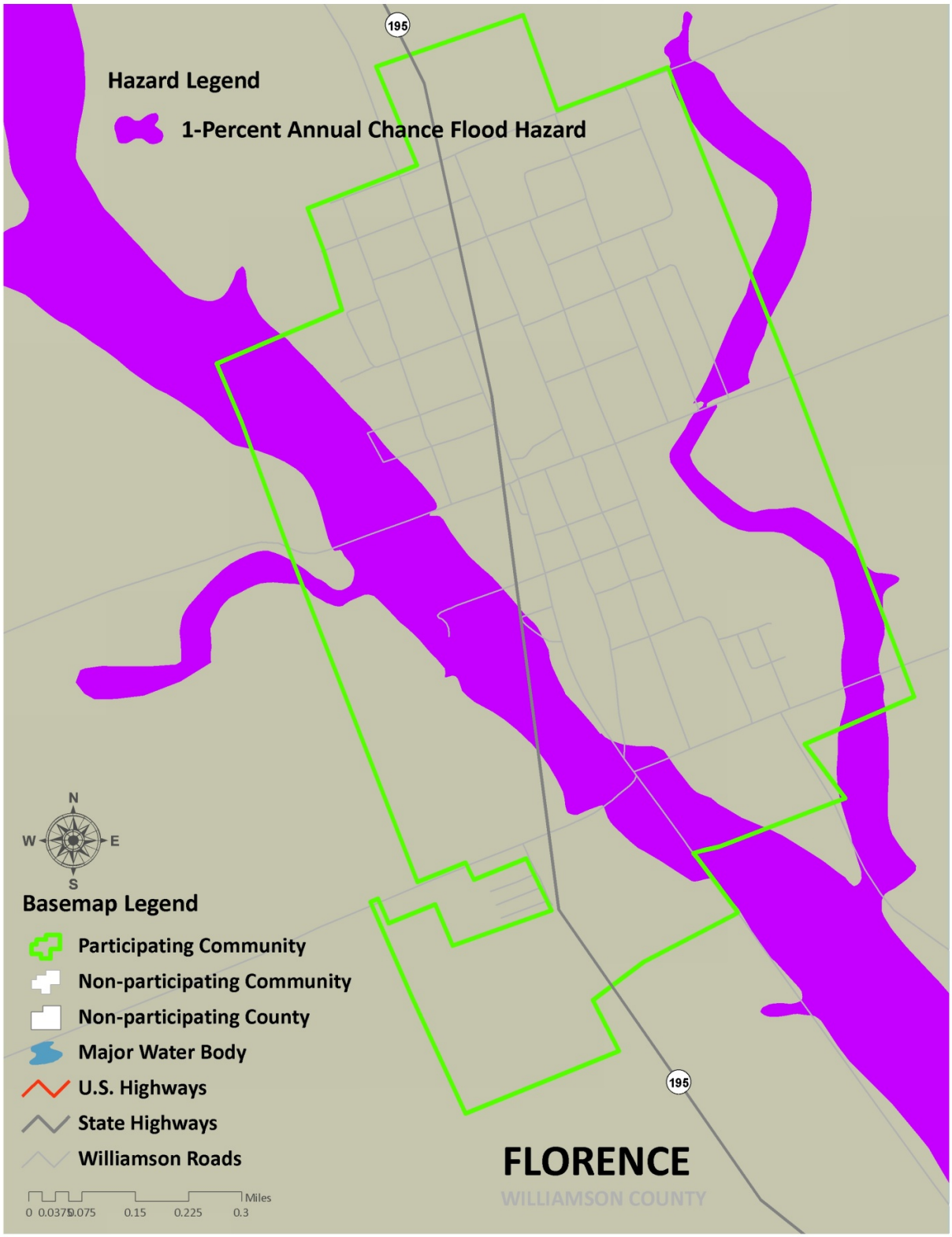
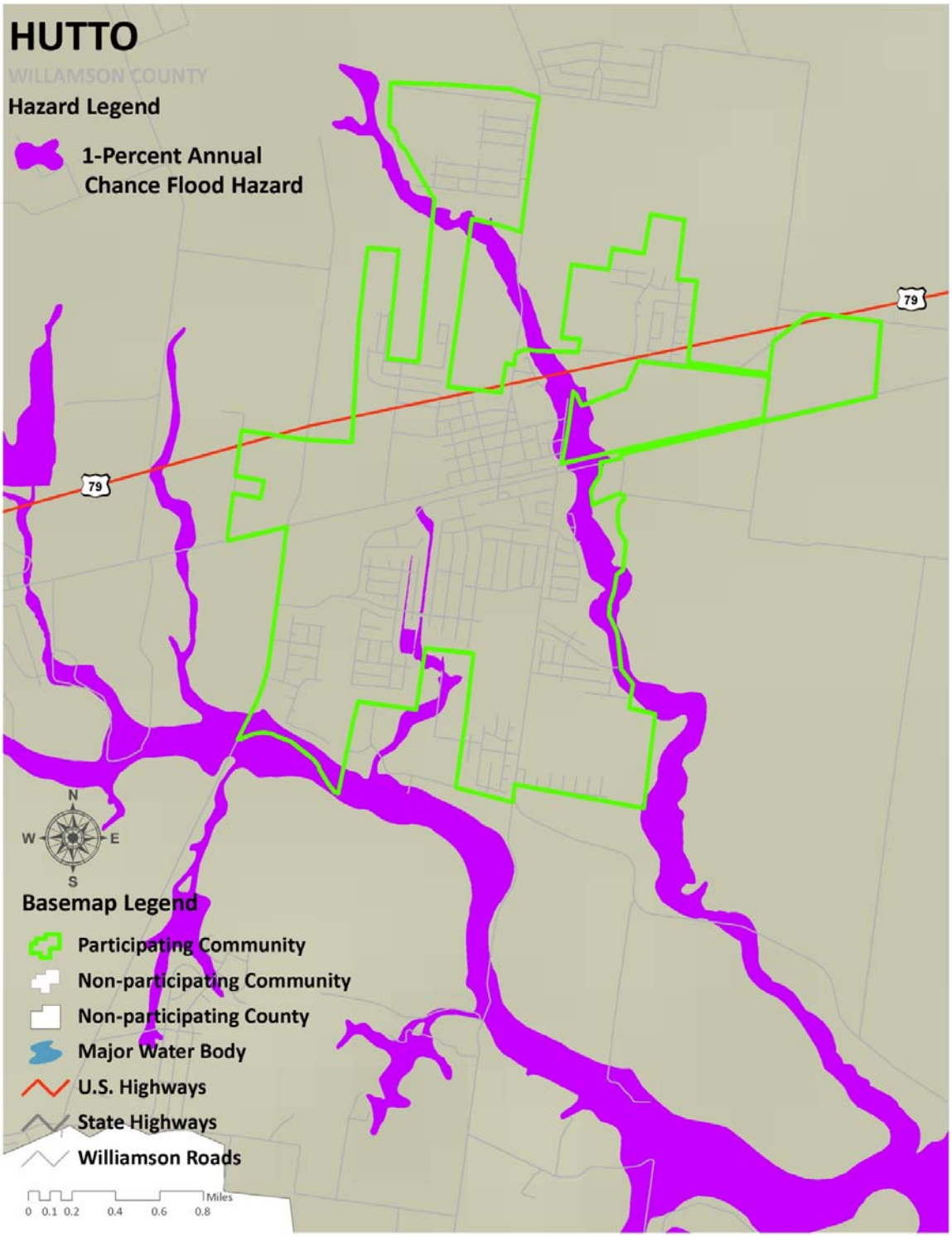


Figure 6-68. Flood Zones for the City of Hutto



Extent

Determining the intensity and magnitude of a flood event is dependent upon the average level of flood risk to be mitigated for an area. Table 6-1 below describes the potential magnitude of an event while Table 6-2 provides by county, the typical extent to be mitigated in the range of intensity.

Table 6-1. Extent Scale – Water Depth (Mean Sea Level, MSL)

SEVERITY	MSL (IN FEET)	DESCRIPTION
BELOW FLOOD STAGE	0 to 15	Water begins to exceed low sections of banks and the lowest sections of the floodplain.
ACTION STAGE	16 to 23	Flow is well into the floodplain, minor lowland flooding reaches low areas of the floodplain. Livestock should be moved from low lying areas.
FLOOD STAGE	24 to 28	Homes are threatened and properties downstream of river flows or in low lying areas begin to flood.
MODERATE FLOOD STAGE	29 to 32	At this stage the lowest homes downstream flood. Roads and bridges in the floodplain flood severely and are dangerous to motorists.
MAJOR FLOOD STAGE	33 and above	Major flooding approaches homes in the floodplain. Primary and secondary roads and bridges are severely flooded and very dangerous. Major flooding extends well into the floodplain, destroying property, equipment and livestock.

Source: National Weather Service

Table 6-2. Extent by County

PARTICIPATING COUNTY	AVERAGE SEVERITY PER FLOOD EVENT
Bastrop County	Flood Stage, 24-28 feet
Blanco County	Action Stage, 16-23 feet

PARTICIPATING COUNTY	AVERAGE SEVERITY PER FLOOD EVENT
Brown County	Major Flood Stage, 33 feet and above
Burnet County	Moderate Flood Stage, 29 to 32 feet
Colorado County	Moderate Flood Stage, 29 to 32 feet
Fayette County	Moderate Flood Stage, 29 to 32 feet
Lampasas County	Action Stage, 16-23 feet
Lee County	Action Stage, 16-23 feet
Llano County	Moderate Flood Stage, 29 to 32 feet
Mason County	Major Flood Stage, 33 feet and above
Matagorda County	Moderate Flood Stage, 29 to 32 feet
McCulloch County	Major Flood Stage, 33 feet and above
Mills County	Major Flood Stage, 33 feet and above
San Saba County	Major Flood Stage, 33 feet and above
Travis County	Major Flood Stage, 33 feet and above
Wharton County	Moderate Flood Stage, 29 to 32 feet
Williamson County	Moderate Flood Stage, 29 to 32 feet

The water depths depicted in Table 6-1 are an approximation based on elevation data (above sea level rather than above ground) and stream gauge data provided by the National Weather Service. This level of risk is determined by the levels of area streams and rivers.

According to Tables 6-1 and 6-2, the expected extent to mitigate for Wharton County is from 29 to 32 feet, compared to 33 feet and above for Travis County. Reading the maps at Figures 6-5 through 6-68 in conjunction with the extent scales at Table 6-1 and 6-2, indicates that the intensity of a flood event for the TCRFC planning area ranges from low to high risk.

Historical Occurrences

The Lower Colorado River Basin has experienced devastating floods, from isolated floods that affected local areas, to basin-wide floods spawned by unusually heavy rainfalls. Table 6-3 describes some of the major flood to have affected the area as a whole, followed by Tables 6-4 through 6-20, which provides the history of flooding from January 1, 1950 to December 30, 2008 by county.

Table 6-3. Major Flood Events in the Region

Date	Description
July 1869	This flood is considered to be the worst on record. The Colorado River crests at 51 feet at Austin, 60.3 feet at Bastrop, 56.7 feet at La Grange, 51.6 feet at Columbus, 51.9 feet at Wharton and 56.1 feet at Bay City. Bastrop and La Grange were completely inundated. Reports described the rainfall as incessant for 64 hours. Damage was estimated at $3 million.
April 1900	Floodwaters from the Hill Country storms destroyed the first Austin Dam build in 1893, claiming 47 lives and causing $14 million in damages. The dam was not successfully rebuilt until the late 1930s.
December 1913	Floodwaters joined the Colorado and Brazos rivers below Columbus, forming a lake 65 miles wide at the Gulf of Mexico and flooding half a million acres.
1935 and 1936	Floodwaters from heavy Hill Country rains in June 1935 caused the Colorado river to crest at 50 feet in Austin, one foot below the 1869 record. The river overwhelmed the Congress Avenue Bridge, cutting Austin in half. The Llano River rose to a record height at 41.5 feet. In September 1936 heavy rains throughout the basin powered through the Colorado River for a 20-day period cresting 31.4 feet.
July 1938	Twenty inches of rain poured more than 3 million acre-feet of floodwaters into newly completed Lake Buchanan, forcing the

Date	Description
	LCRA to open 22 of Buchanan Dam's 37 floodgates.
September 1952	Rains of up to 25 inches produced the greatest flood of record and washed out the Highway 281 bridge over the Pedernales River at Johnson City. The floodwaters filled Lake Travis by more than 50 feet within a 24-hour period.
May 1957	Downstream flooding restricts the amount of water the LCRA can release from Mansfield Dam, which results in Lake Travis rising to a high of 707.38.
August 1978	Tropical Storm Amelia stalled over the Hill Country, dropping 30 inches of rain. The Pedernales River crests at 41.6 feet south of Fredericksburg, its highest stage in more than 70 years.
June 1987	Floodwaters cause Lake Travis to rise to a level of 693.48, its fifth highest all-time record elevation.
December 1991	The "Christmas Flood" was triggered by a chain of storms that fell on an already saturated ground throughout the basin. The storm lingered for several days, and Lake Travis rose to an all-time high of 710.44. Flooding downstream causes the Colorado River to reach its highest stages since the completion of Mansfield Dam in 1941. The majority of the basin is in flood or near flood conditions for more than two months.
June 1997	Rains of 16 inches or more hammered the Hill Country and the downstream basin, resulting in flooding in downstream communities and rising lake levels. Floodwaters damaged approximately 300 homes, and the force of the floodwaters passing through the floodgates at Wirtz Dam carve a hole into the bedrock of Lake Marble Falls. The LCRA spent more than $4 million to repair the hole and protect the lakebed from future flood damage.
October 1998	Rains centered in and downstream of Austin raise the Colorado River. Wharton is hit hardest with portions of the residential and downtown areas inundated.
November 2000	Heavy Hill Country storms poured more than 250 billion gallons of water into Lakes Buchanan and Travis, almost doubling the

Date	Description
	amount of water in the two lakes and pushing them out of 16-year lows.
November 2001	After several hours of steady rain, a "super cell" thunderstorm slammed Central Texas, producing up to 15 inches of rain and heavy wind damage. Private property losses were estimated at 15 million.
June 2002	A low-pressure system from Florida combined with tropical moisture from the Gulf. The system hit a wall of high pressure and stalled over Central and South Texas. For the first time since it filled in 1968, Canyon Lake poured over its spillway, adding to the flooding in the Guadalupe River. The flooding affected about 80 counties in Texas with a total of 12 deaths and 48,000 damaged homes
June 2007	In the summer of 2007, Central Texas experienced torrential flooding, with the City of Marble Falls receiving as much as 18 inches of rain in a matter of hours.

Table 6-4. Flood Events for Bastrop County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 BASTROP	10/16/1994	1800	Flooding	N/A	0	0	80K	20K
2 BASTROP	11/06/1994	0200	Flash Flooding	N/A	0	0	0	5K
3 Countywide	04/25/1997	02:00 PM	Flash Flood	N/A	0	0	10K	0K
4 Countywide	06/06/1997	04:30 PM	Flash Flood	N/A	0	0	5K	0
5 Countywide	06/21/1997	11:00 AM	Flash Flood	N/A	0	0	5K	0
6 Countywide	06/22/1997	02:00 AM	Flood	N/A	0	0	5K	50K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
7 TXZ193 - 209	10/17/1998	10:00 AM	Flood	N/A	0	15	8.2M	150K
8 Countywide	10/17/1998	10:00 AM	Flood	N/A	0	100	3.0M	100K
9 Elgin	05/02/2000	12:30 AM	Flash Flood	N/A	0	0	10K	0
10 North Portion	11/02/2000	08:30 PM	Flash Flood	N/A	0	0	15K	0
11 Countywide	11/03/2000	12:00 PM	Flash Flood	N/A	0	0	10K	0
12 West Portion	11/23/2000	10:30 PM	Flash Flood	N/A	0	0	5K	0
13 West Portion	05/06/2001	10:30 PM	Flash Flood	N/A	0	0	10K	0
14 Northwest Portion	11/15/2001	06:00 PM	Flash Flood	N/A	0	5	80K	0
15 Southeast Portion	04/08/2002	03:00 AM	Flash Flood	N/A	1	0	20K	0
16 South Portion	07/02/2002	07:30 AM	Flash Flood	N/A	0	0	0	0
17 South Portion	10/09/2002	12:30 AM	Flash Flood	N/A	0	0	30K	0
18 South Portion	10/24/2002	01:00 PM	Flash Flood	N/A	0	0	0	0
19 Countywide	11/04/2002	02:00 PM	Flash Flood	N/A	0	0	0	0
20 Bastrop	11/05/2002	05:15 AM	Flash Flood	N/A	1	0	0	0
21 South Portion	12/04/2002	04:30 AM	Flash Flood	N/A	0	0	10K	0
22 Countywide	02/20/2003	10:00	Flash Flood	N/A	0	0	10K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		AM						
23 East Portion	06/13/2003	08:00 PM	Flash Flood	N/A	0	0	5K	0
24 Countywide	01/16/2004	07:00 PM	Flash Flood	N/A	0	0	3K	0
25 Countywide	05/13/2004	02:30 PM	Flash Flood	N/A	0	0	0	0
26 Bastrop	06/09/2004	03:30 PM	Flash Flood	N/A	0	0	0	0
27 Countywide	06/29/2004	10:00 AM	Flash Flood	N/A	0	0	0	0
28 North Portion	07/29/2004	04:30 PM	Flash Flood	N/A	0	0	0	0
29 Bastrop	10/02/2004	09:00 AM	Flash Flood	N/A	0	0	0	0
30 Countywide	11/17/2004	10:30 AM	Flash Flood	N/A	0	0	0	0
31 Countywide	11/21/2004	01:30 PM	Flash Flood	N/A	0	0	0	0
32 East Portion	11/22/2004	03:30 AM	Flash Flood	N/A	0	0	0	0
33 TXZ193	11/22/2004	07:01 AM	Flood	N/A	0	0	0	0
34 TXZ193	11/22/2004	08:00 AM	Flood	N/A	0	0	0	0
35 Rosanky	09/17/2006	07:00 PM	Flash Flood	N/A	0	0	0	0
36 Utley	10/18/2006	21:00 PM	Flash Flood	N/A	0	0	0K	0K
37 Elgin	01/13/2007	09:30 AM	Flood	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
38 Red Rock	03/11/2007	23:00 PM	Flash Flood	N/A	0	0	0K	0K
39 Cedar Creek	06/03/2007	21:30 PM	Flash Flood	N/A	0	0	0K	0K
40 Cedar Creek	06/20/2007	10:00 AM	Flash Flood	N/A	0	0	30K	0K
41 Elgin	06/20/2007	20:00 PM	Flood	N/A	0	0	0K	0K
42 Elgin	07/05/2007	09:00 AM	Flash Flood	N/A	0	0	0K	0K
43 Red Rock	07/06/2007	02:00 AM	Flash Flood	N/A	0	0	0K	0K
44 Bastrop	07/24/2007	12:00 PM	Flash Flood	N/A	0	0	0K	0K
45 Red Rock	07/25/2007	13:00 PM	Flash Flood	N/A	0	0	0K	0K
46 Paige	08/02/2007	15:30 PM	Flash Flood	N/A	0	0	0K	0K
47 Bastrop	08/16/2007	07:30 AM	Flash Flood	N/A	0	0	0K	0K
				TOTALS:	2	120	11.543M	325K

Table 6-5. Flood Events for Blanco County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 Countywide	05/29/1995	0400	Flash Flood	N/A	0	0	0	0
2 Countywide	06/29/1995	0010	Flash Flood	N/A	0	0	5K	5K
3 TXZ190	04/04/1997	07:00 AM	Flood	N/A	0	0	8K	0K
4 Countywide	04/25/1997	10:30	Flash Flood	N/A	0	0	3K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		AM						
5 Countywide	05/19/1997	09:15 PM	Flash Flood	N/A	0	0	10K	0K
6 Countywide	05/27/1997	07:30 PM	Flash Flood	N/A	0	0	10K	0K
7 Countywide	06/06/1997	02:30 PM	Flash Flood	N/A	0	0	5K	0
8 Countywide	06/08/1997	10:30 PM	Flood	N/A	0	0	100K	20K
9 Countywide	06/09/1997	07:30 AM	Flash Flood	N/A	0	0	3K	0
10 Countywide	06/21/1997	10:30 AM	Flash Flood	N/A	0	0	10K	0
11 Countywide	06/22/1997	01:30 AM	Flood	N/A	0	0	1.0M	100K
12 Countywide	03/16/1998	01:30 AM	Flash Flood	N/A	0	0	15K	0
13 Countywide	03/30/1998	08:00 PM	Flash Flood	N/A	0	0	0	0
14 West Portion	07/04/1998	02:00 PM	Flash Flood	N/A	0	0	3K	0
15 Countywide	07/04/1998	12:30 AM	Flash Flood	N/A	0	0	10K	0
16 Countywide	10/17/1998	07:00 AM	Flash Flood	N/A	0	0	50K	50K
17 South Portion	11/02/2000	07:00 PM	Flash Flood	N/A	0	0	10K	0
18 North Portion	11/03/2000	12:00 PM	Flash Flood	N/A	0	0	5K	0
19 South Portion	08/31/2001	07:30 PM	Flash Flood	N/A	0	0	20K	20K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
20 Countywide	09/05/2001	05:00 PM	Flash Flood	N/A	0	0	20K	0
21 Countywide	11/15/2001	07:30 AM	Flash Flood	N/A	1	10	100K	0
22 TXZ190	11/15/2001	11:00 AM	Flood	N/A	0	0	0	0
23 TXZ190	06/30/2002	02:00 PM	Flood	N/A	0	0	0	0
24 Countywide	06/30/2002	06:00 AM	Flash Flood	N/A	0	0	30K	0
25 South Portion	07/02/2002	04:00 AM	Flash Flood	N/A	0	0	0	0
26 TXZ190	07/02/2002	10:09 AM	Flood	N/A	0	0	0	0
27 Countywide	07/03/2002	03:00 AM	Flash Flood	N/A	0	0	0	0
28 West Portion	07/03/2002	10:30 PM	Flash Flood	N/A	0	0	0	0
29 Countywide	07/05/2002	12:00 AM	Flash Flood	N/A	0	0	0	0
30 South Portion	10/24/2002	11:00 AM	Flash Flood	N/A	0	0	0	0
31 Countywide	02/20/2003	08:00 AM	Flash Flood	N/A	0	0	5K	0
32 Countywide	02/21/2003	05:00 AM	Flash Flood	N/A	0	0	5K	0
33 South Portion	06/13/2003	06:30 PM	Flash Flood	N/A	0	0	5K	0
34 North Portion	04/06/2004	05:30 AM	Flash Flood	N/A	0	0	0	0
35 Countywide	06/08/2004	08:30	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		PM						
36 South Portion	06/27/2004	03:00 PM	Flash Flood	N/A	0	0	0	0
37 South Portion	06/28/2004	10:30 AM	Flash Flood	N/A	0	0	0	0
38 South Portion	06/29/2004	11:00 AM	Flash Flood	N/A	0	0	0	0
39 Countywide	07/25/2004	07:30 PM	Flash Flood	N/A	0	0	0	0
40 South Portion	07/29/2004	04:30 PM	Flash Flood	N/A	0	0	0	0
41 South Portion	10/02/2004	08:30 AM	Flash Flood	N/A	0	0	0	0
42 South Portion	10/23/2004	03:30 AM	Flash Flood	N/A	0	0	0	0
43 Johnson City	11/01/2004	01:00 AM	Flash Flood	N/A	0	0	0	0
44 Countywide	11/16/2004	09:30 PM	Flash Flood	N/A	0	0	0	0
45 TXZ190	11/17/2004	12:00 AM	Flood	N/A	0	0	0	0
46 Blanco	04/18/2006	08:00 PM	Flash Flood	N/A	0	0	0	0
47 Twin Sisters	05/06/2006	04:00 AM	Flash Flood	N/A	0	0	0	0
48 Cypress Mill	05/08/2006	01:30 AM	Flash Flood	N/A	0	0	0	0
49 Hye	10/10/2006	08:00 AM	Flash Flood	N/A	0	0	0K	0K
50 Johnson City	01/13/2007	12:00 PM	Flash Flood	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
51 Twin Sisters	03/11/2007	22:00 PM	Flash Flood	N/A	0	0	0K	0K
52 Hye	03/13/2007	14:30 PM	Flash Flood	N/A	0	0	0K	0K
53 Hye	03/26/2007	12:00 PM	Flash Flood	N/A	0	0	0K	0K
54 Blanco	03/30/2007	10:30 AM	Flash Flood	N/A	0	0	0K	0K
55 Johnson City	05/02/2007	22:00 PM	Flash Flood	N/A	1	0	0K	0K
56 Johnson City	05/25/2007	00:15 AM	Flood	N/A	0	0	0K	0K
57 Round Mtn	06/03/2007	20:00 PM	Flash Flood	N/A	0	0	0K	0K
58 Cypress Mill	06/27/2007	02:00 AM	Flash Flood	N/A	0	0	100K	0K
59 Johnson City	07/03/2007	15:30 PM	Flash Flood	N/A	0	0	0K	0K
60 Blanco	07/20/2007	13:30 PM	Flash Flood	N/A	0	0	0K	0K
61 Twin Sisters	08/16/2007	17:30 PM	Flash Flood	N/A	0	0	100K	0K
62 Blanco	08/17/2007	05:00 AM	Flash Flood	N/A	0	0	0K	0K
				TOTALS:	2	10	1.632M	195K

Table 6-6. Flood Events for Brown County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 May	05/11/1994	2130	Flash	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
			Flooding					
2 Central Brown	05/13/1994	0820	Flash Flooding	N/A	0	0	0	0
3 Brownwood	05/13/1994	0933	Flash Flooding	N/A	0	0	0	0
4 Brownwood	04/04/1995	0530	Flash Flooding	N/A	0	0	0	0
5 Brownwood	09/17/1995	1830	Flash Flood	N/A	0	0	0	0
6 Brownwood	06/04/1996	12:15 AM	Flash Flood	N/A	0	0	0	0
7 Brownwood	09/15/1996	12:50 AM	Flash Flood	N/A	0	0	25K	0K
8 Brookesmith	06/06/1997	05:30 AM	Flash Flood	N/A	0	0	50K	0
9 Brownwood	06/10/1997	04:00 AM	Flash Flood	N/A	0	0	50K	10K
10 Brownwood	06/22/1997	10:30 PM	Flood	N/A	1	0	250K	50K
11 Zephyr	10/08/1997	07:05 PM	Flash Flood	N/A	0	0	8K	5K
12 Brownwood	05/26/1998	10:45 PM	Flash Flood	N/A	0	0	0	0
13 Brownwood	07/04/1998	10:20 AM	Flash Flood	N/A	0	0	0	0
14 Brownwood	07/04/1998	11:40 AM	Flash Flood	N/A	0	0	5K	0
15 Brownwood	04/26/1999	05:00 AM	Flash Flood	N/A	0	0	0	0
16 Brownwood	05/09/1999	10:30 PM	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
17 Brownwood	04/11/2000	08:30 PM	Flash Flood	N/A	0	0	0	0
18 Brownwood	06/15/2000	02:55 AM	Flash Flood	N/A	0	0	7.5M	0
19 East Central Portion	10/23/2000	09:05 PM	Flash Flood	N/A	0	0	0	0
20 Brownwood	10/29/2000	05:20 AM	Flash Flood	N/A	0	0	5K	0
21 Countywide	11/03/2000	12:00 PM	Flash Flood	N/A	0	0	0	0
22 Brownwood	04/22/2001	10:40 PM	Flash Flood	N/A	0	0	0	0
23 Brownwood	08/13/2001	06:00 PM	Flash Flood	N/A	0	0	0	0
24 North Portion	07/03/2002	02:30 AM	Flash Flood	N/A	0	0	7K	0
25 West Portion	07/04/2002	02:00 AM	Flash Flood	N/A	0	0	5K	0
26 Countywide	07/06/2002	01:40 AM	Flood	N/A	0	0	42.0M	0
27 Brownwood	06/05/2003	04:40 AM	Flash Flood	N/A	0	0	0	0
28 Brownwood	06/08/2003	08:28 AM	Flash Flood	N/A	0	0	0	0
29 Lake Brownwood	06/11/2003	09:00 PM	Flash Flood	N/A	0	0	10K	0
30 Countywide	06/13/2003	02:55 PM	Flash Flood	N/A	0	0	0	0
31 Brownwood	09/14/2003	04:30 AM	Flash Flood	N/A	0	0	10K	0
32 Brownwood	10/09/2003	08:15	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		AM						
33 Brownwood	10/10/2003	04:00 PM	Flash Flood	N/A	0	0	0	0
34 Early	06/04/2004	07:41 PM	Flash Flood	N/A	0	0	0	0
35 East Portion	06/09/2004	09:30 AM	Flash Flood	N/A	0	0	0	0
36 Early	08/19/2004	03:30 PM	Flash Flood	N/A	0	0	0	0
37 Lake Brownwood	08/19/2004	08:30 AM	Flash Flood	N/A	0	0	0	0
38 Brownwood	08/20/2004	03:00 AM	Flash Flood	N/A	0	0	0	0
39 Brownwood	08/21/2004	10:09 AM	Flash Flood	N/A	0	0	0	0
40 Brownwood	02/23/2005	12:35 AM	Flash Flood	N/A	0	0	0	0
41 Brownwood	08/10/2005	03:00 AM	Flash Flood	N/A	0	0	0	0
42 Brownwood	05/05/2006	11:10 PM	Flash Flood	N/A	0	0	0	0
43 Brownwood	05/01/2007	02:30 AM	Flash Flood	N/A	0	0	35K	0K
44 Bangs	05/27/2007	16:00 PM	Flash Flood	N/A	0	0	0K	0K
45 Brownwood	06/17/2007	05:05 AM	Flash Flood	N/A	0	0	10K	0K
46 Brownwood	06/26/2007	03:00 AM	Flash Flood	N/A	0	0	0K	0K
47 Thrifty	06/28/2007	06:00 AM	Flash Flood	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
48 Brownwood	06/28/2007	23:00 PM	Flood	N/A	0	0	0K	0K
				TOTALS:	1	0	49.970M	65K

Table 6-7. Flood Events for Burnet County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 Countywide	05/29/1995	0400	Flash Flood	N/A	0	0	0	0
2 Countywide	06/28/1995	2300	Flash Flooding	N/A	0	0	5K	5K
3 Countywide	09/20/1996	01:00 AM	Flash Flood	N/A	0	0	0	0
4 Countywide	10/27/1996	10:00 PM	Flash Flood	N/A	0	0	3K	0K
5 TXZ171>172 - 192	10/28/1996	08:00 AM	Flood	N/A	0	0	250K	70K
6 Countywide	04/25/1997	09:20 AM	Flash Flood	N/A	0	0	5K	0K
7 Countywide	04/25/1997	11:30 AM	Flash Flood	N/A	0	0	3K	0K
8 Countywide	06/06/1997	09:00 AM	Flash Flood	N/A	0	0	5K	0
9 Countywide	06/08/1997	11:30 PM	Flash Flood	N/A	0	0	30K	0
10 Countywide	06/22/1997	01:30 AM	Flood	N/A	0	0	1.0M	50K
11 Countywide	12/20/1997	03:30 PM	Flash Flood	N/A	0	0	20K	0K
12 Countywide	03/16/1998	01:30 AM	Flash Flood	N/A	0	0	15K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
13 Countywide	07/04/1998	03:00 AM	Flash Flood	N/A	0	0	10K	0
14 Countywide	10/17/1998	12:00 PM	Flash Flood	N/A	0	0	10K	0K
15 Countywide	05/10/1999	01:30 PM	Flash Flood	N/A	0	0	10K	0
16 Countywide	05/28/1999	09:30 AM	Flash Flood	N/A	0	0	10K	0
17 Countywide	11/03/2000	01:00 PM	Flash Flood	N/A	0	0	5K	0
18 Northwest Portion	11/05/2000	06:30 PM	Flash Flood	N/A	0	0	10K	0
19 East Portion	04/17/2001	02:45 AM	Flash Flood	N/A	0	0	20K	0
20 Countywide	11/15/2001	06:45 AM	Flash Flood	N/A	0	0	50K	0
21 South Portion	06/30/2002	09:30 AM	Flash Flood	N/A	0	0	10K	0
22 South Portion	07/02/2002	04:00 AM	Flash Flood	N/A	0	0	0	0
23 Countywide	07/03/2002	08:00 AM	Flash Flood	N/A	0	0	0	0
24 Countywide	07/04/2002	02:30 AM	Flash Flood	N/A	0	0	0	0
25 Countywide	07/05/2002	12:00 AM	Flash Flood	N/A	0	0	0	0
26 North Portion	07/13/2002	03:30 PM	Flash Flood	N/A	0	0	0	0
27 Countywide	09/07/2002	08:15 PM	Flash Flood	N/A	0	0	20K	0
28 Countywide	09/08/2002	10:00	Flash Flood	N/A	0	0	30K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		AM						
29 Countywide	02/21/2003	05:00 AM	Flash Flood	N/A	0	0	5K	0
30 Countywide	01/16/2004	06:30 PM	Flash Flood	N/A	0	0	3K	0
31 South Portion	04/06/2004	06:30 AM	Flash Flood	N/A	0	0	0	0
32 North Portion	06/09/2004	01:00 PM	Flash Flood	N/A	0	0	0	0
33 South Portion	06/29/2004	11:30 AM	Flash Flood	N/A	0	0	0	0
34 Countywide	11/17/2004	12:30 AM	Flash Flood	N/A	0	0	0	0
35 South Portion	11/23/2004	09:00 AM	Flash Flood	N/A	0	0	0	0
36 North Portion	07/29/2005	06:00 PM	Flash Flood	N/A	0	0	0	0
37 Oakalla	08/09/2005	09:00 AM	Flash Flood	N/A	0	0	0	0
38 Burnet	08/10/2005	09:00 AM	Flash Flood	N/A	0	0	0	0
39 Burnet	09/16/2005	09:15 AM	Flash Flood	N/A	0	0	0	0
40 North Portion	05/06/2006	01:30 AM	Flash Flood	N/A	0	0	0	0
41 Oakalla	06/24/2006	06:30 AM	Flash Flood	N/A	0	0	0	0
42 Spicewood	03/11/2007	20:30 PM	Flash Flood	N/A	0	0	0K	0K
43 Marble Falls	03/13/2007	14:30 PM	Flash Flood	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
44 Buchanan Lake	03/26/2007	12:00 PM	Flash Flood	N/A	0	0	0K	0K
45 Marble Falls	03/30/2007	13:30 PM	Flash Flood	N/A	0	0	0K	0K
46 Burnet	05/21/2007	21:30 PM	Flash Flood	N/A	0	0	0K	0K
47 Bertram	05/24/2007	18:45 PM	Flash Flood	N/A	0	0	0K	0K
48 Marble Falls	06/26/2007	02:00 AM	Flood	N/A	0	0	0K	0K
49 Marble Falls	06/26/2007	22:30 PM	Flash Flood	N/A	2	0	137.0M	0K
50 Marble Falls	06/28/2007	08:30 AM	Flash Flood	N/A	0	0	0K	0K
51 Marble Falls	07/02/2007	18:30 PM	Flash Flood	N/A	0	0	0K	0K
52 Burnet	07/03/2007	15:00 PM	Flash Flood	N/A	0	0	0K	0K
				TOTALS:	2	0	138.529M	125K

Table 6-8 Flood Events for Colorado County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 COLORADO	05/05/1993	0850	Flood	N/A	0	0	5K	0
2 COLORADO	10/18/1994	0000	Flash Flood/flood	N/A	0	0	500K	50K
3 COLORADO	12/18/1995	0306	Flash Flood	N/A	0	0	3K	0
4 Eagle Lake	12/18/1995	0506	Flash Flood	N/A	0	0	5K	0
5 Countywide	02/20/1997	03:05 PM	Flash Flood	N/A	0	0	5K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
6 Garwood	03/12/1997	01:47 AM	Flash Flood	N/A	0	0	2K	0
7 Eagle Lake	06/06/1997	10:00 PM	Flash Flood	N/A	0	0	10K	0
8 North Portion	10/13/1997	04:00 AM	Flash Flood	N/A	0	0	5K	0
9 East Portion	10/17/1998	10:45 PM	Flash Flood	N/A	0	0	25K	0
10 TXZ176 - 196 - 198>200 - 210 - 213 - 226>227 - 235>237	10/17/1998	12:00 PM	River Flooding	N/A	1	0	0	0
11 Countywide	10/18/1998	07:06 AM	Flash Flood	N/A	0	0	15K	0
12 Countywide	10/18/1998	11:02 AM	Flash Flood	N/A	0	0	0	0
13 Countywide	11/12/1998	09:54 PM	Flash Flood	N/A	0	0	5K	0
14 TXZ176 - 178>179 - 196 - 199>200 - 210 - 213 - 226>227 - 235>237	11/12/1998	12:00 PM	River Flooding	N/A	0	0	0	0
15 Countywide	11/13/1998	01:00 AM	Flash Flood	N/A	0	0	5K	0
16 Countywide	11/14/1998	05:30 AM	Flash Flood	N/A	0	0	5K	0
17 West Portion	09/09/2001	09:30 AM	Flash Flood	N/A	0	0	35K	0
18 Countywide	11/04/2002	08:45	Flash Flood	N/A	0	0	20K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		PM						
19 Countywide	11/22/2004	02:11 PM	Flash Flood	N/A	0	0	0	0
20 Bernardo	01/13/2007	21:15 PM	Flash Flood	N/A	0	0	0K	0K
21 Sheridan	04/30/2007	15:30 PM	Flash Flood	N/A	0	0	10K	0K
22 Weimar	05/26/2007	09:20 AM	Flash Flood	N/A	0	0	0K	0K
23 Weimar	05/28/2007	14:40 PM	Flash Flood	N/A	0	0	70K	0K
				TOTALS:	1	0	725K	50K

Table 6-9. Flood Events for Fayette County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 FAYETTE	10/16/1994	2000	Flooding	N/A	0	0	100K	10K
2 Schulenburg	06/26/1996	11:00 AM	Flash Flood	N/A	0	0	0	0
3 Countywide	04/25/1997	03:00 PM	Flash Flood	N/A	0	0	5K	0K
4 Countywide	06/06/1997	05:00 PM	Flash Flood	N/A	0	0	15K	0
5 Countywide	10/10/1997	05:00 PM	Flash Flood	N/A	0	0	30K	0K
6 Countywide	10/13/1997	01:00 AM	Flash Flood	N/A	0	0	20K	0K
7 Southeast Portion	06/05/1998	07:00 PM	Flash Flood	N/A	0	0	5K	0
8 Countywide	10/17/1998	03:30	Flood	N/A	0	10	300K	200K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		PM						
9 TXZ193 - 209	10/17/1998	10:00 AM	Flood	N/A	0	15	8.2M	150K
10 South Portion	11/12/1998	10:00 PM	Flash Flood	N/A	0	0	40K	50K
11 South Portion	11/14/1998	02:00 AM	Flash Flood	N/A	0	0	20K	0K
12 Countywide	01/01/1999	10:30 PM	Flash Flood	N/A	0	0	5K	0
13 Countywide	05/28/1999	01:00 AM	Flash Flood	N/A	0	0	10K	0
14 Countywide	11/03/2000	06:00 PM	Flash Flood	N/A	0	0	5K	0
15 Countywide	11/05/2000	09:30 PM	Flash Flood	N/A	0	0	5K	0
16 TXZ209	11/16/2001	11:00 AM	Flood	N/A	0	0	0	0
17 South Portion	07/02/2002	07:00 AM	Flash Flood	N/A	0	0	0	0
18 South Portion	07/16/2002	08:30 AM	Flash Flood	N/A	0	0	0	0
19 West Portion	10/09/2002	12:30 AM	Flash Flood	N/A	0	0	30K	0
20 Countywide	10/24/2002	12:30 PM	Flash Flood	N/A	0	0	0	0
21 Countywide	11/04/2002	02:30 PM	Flash Flood	N/A	0	0	15K	0
22 TXZ209	11/05/2002	06:02 AM	Flood	N/A	0	0	0	0
23 Countywide	02/20/2003	05:00 PM	Flash Flood	N/A	0	0	15K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
24 TXZ209	02/21/2003	03:29 AM	Flood	N/A	0	0	0	0
25 West Portion	06/13/2003	08:30 PM	Flash Flood	N/A	0	0	5K	0
26 South Portion	04/10/2004	04:45 PM	Flash Flood	N/A	0	0	0	0
27 Northeast Portion	04/25/2004	10:30 AM	Flash Flood	N/A	0	0	0	0
28 Countywide	05/13/2004	03:00 PM	Flash Flood	N/A	0	0	0	0
29 Schulenburg	06/08/2004	07:30 PM	Flash Flood	N/A	0	0	0	0
30 Countywide	06/08/2004	09:30 AM	Flash Flood	N/A	0	0	0	0
31 West Portion	06/09/2004	05:00 PM	Flash Flood	N/A	0	0	0	0
32 East Portion	06/15/2004	02:00 PM	Flash Flood	N/A	0	0	0	0
33 West Portion	06/25/2004	02:30 PM	Flash Flood	N/A	0	0	0	0
34 Flatonia	06/27/2004	03:00 PM	Flash Flood	N/A	0	0	0	0
35 South Portion	06/30/2004	08:30 AM	Flash Flood	N/A	0	0	0	0
36 Muldoon	07/29/2004	08:30 PM	Flash Flood	N/A	0	0	0	0
37 Countywide	10/02/2004	08:30 AM	Flash Flood	N/A	0	0	0	0
38 Northeast Portion	11/21/2004	03:00 PM	Flash Flood	N/A	0	0	0	0
39 Countywide	11/22/2004	04:00	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		AM						
40 TXZ209	11/22/2004	05:00 AM	Flood	N/A	0	0	0	0
41 Ledbetter	08/05/2005	05:00 PM	Flash Flood	N/A	0	0	0	0
42 Northeast Portion	08/08/2005	09:00 PM	Flash Flood	N/A	0	0	0	0
43 La Grange	09/17/2006	07:00 PM	Flash Flood	N/A	0	0	0	0
44 Cistern	09/23/2006	08:30 PM	Flash Flood	N/A	0	0	0	0
45 Muldoon	03/31/2007	04:00 AM	Flash Flood	N/A	0	0	0K	0K
46 Muldoon	05/03/2007	01:00 AM	Flash Flood	N/A	0	0	0K	0K
47 Muldoon	05/26/2007	06:30 AM	Flash Flood	N/A	0	0	0K	0K
48 La Grange	05/27/2007	07:00 AM	Flash Flood	N/A	0	0	0K	0K
49 La Grange	05/27/2007	22:45 PM	Flood	N/A	0	0	0K	0K
50 Cistern	05/28/2007	08:00 AM	Flash Flood	N/A	0	0	0K	0K
51 La Grange	06/03/2007	22:20 PM	Flash Flood	N/A	0	0	30K	0K
52 Fayetteville	07/15/2007	01:00 AM	Flash Flood	N/A	0	0	0K	0K
53 Cistern	07/25/2007	15:30 PM	Flash Flood	N/A	0	0	0K	0K
54 Flatonia	11/17/2007	20:00 PM	Flash Flood	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
55 La Grange	11/17/2007	20:00 PM	Flash Flood	N/A	0	0	0K	0K
56 La Grange	11/18/2007	07:00 AM	Flash Flood	N/A	0	0	0K	0K
57 Schulenburg	11/18/2007	07:00 AM	Flash Flood	N/A	0	0	0K	0K
				TOTALS:	0	25	8.855M	410K

Table 6-10. Flood Events for Lampasas County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 Lampasas	02/20/1997	02:20 PM	Flash Flood	N/A	0	0	0	0
2 Lameta	02/20/1997	03:00 PM	Flash Flood	N/A	0	0	0	0
3 Lampasas	03/02/1997	07:15 AM	Flash Flood	N/A	0	0	0	0
4 Countywide	03/16/1998	04:40 AM	Flash Flood	N/A	0	0	0	0
5 Countywide	03/16/1998	05:50 AM	Flash Flood	N/A	0	0	0	0
6 Kempner	11/05/2000	07:05 PM	Flash Flood	N/A	0	0	0	0
7 Lampasas	06/09/2004	03:45 PM	Flash Flood	N/A	0	0	0	0
8 Kempner	08/20/2004	04:00 AM	Flash Flood	N/A	0	0	5K	0
9 Lampasas	11/17/2004	06:29 AM	Flash Flood	N/A	0	0	0	0
10 Lampasas	07/29/2005	06:29	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		PM						
11 Adamsville	08/08/2005	03:00 PM	Flash Flood	N/A	0	0	0	0
12 Lampasas	03/30/2007	14:49 PM	Flash Flood	N/A	0	0	50K	0K
13 Lampasas	03/30/2007	22:00 PM	Flash Flood	N/A	0	0	0K	0K
14 Lampasas	05/22/2007	01:17 AM	Flash Flood	N/A	0	0	300K	0K
15 Lampasas	05/24/2007	17:25 PM	Flash Flood	N/A	0	0	5K	0K
16 Lometa	05/31/2007	04:00 AM	Flash Flood	N/A	0	0	0K	0K
17 Kempner	06/17/2007	17:00 PM	Flash Flood	N/A	0	0	0K	0K
18 Kempner	06/26/2007	21:15 PM	Flash Flood	N/A	0	0	0K	0K
19 Adamsville	06/28/2007	05:44 AM	Flash Flood	N/A	0	0	0K	0K
20 Lampasas	06/28/2007	10:19 AM	Flash Flood	N/A	0	0	0K	0K
21 Lometa	07/03/2007	13:30 PM	Flash Flood	N/A	0	0	0K	0K
				TOTALS:	0	0	360K	0

Table 6-11. Flood Events for Lee County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 LEE	10/16/1994	1800	Flooding	N/A	0	0	100K	50K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
2 Countywide	09/12/1995	2330	Flash Flood	N/A	0	0	0	0
3 Countywide	06/01/1996	05:30 PM	Flash Flood	N/A	0	0	0	0
4 Countywide	10/13/1997	12:30 AM	Flash Flood	N/A	0	0	15K	0K
5 Countywide	10/17/1998	06:00 PM	Flash Flood	N/A	0	0	20K	20K
6 South Portion	11/12/1998	11:30 PM	Flash Flood	N/A	0	0	40K	50K
7 Countywide	12/11/1998	11:00 AM	Flash Flood	N/A	0	0	5K	0
8 Countywide	06/25/1999	06:30 AM	Flash Flood	N/A	0	0	5K	20K
9 Lincoln	07/11/1999	02:00 PM	Flash Flood	N/A	0	0	6K	0
10 South Portion	07/13/1999	03:00 PM	Flash Flood	N/A	0	0	5K	0
11 Old Dime Box	06/10/2000	03:30 PM	Flash Flood	N/A	0	0	5K	0
12 Northwest Portion	11/02/2000	06:00 PM	Flash Flood	N/A	0	0	5K	0
13 West Portion	05/06/2001	11:00 PM	Flash Flood	N/A	0	0	5K	0
14 West Portion	11/15/2001	06:00 PM	Flash Flood	N/A	0	10	50K	0
15 West Portion	07/02/2002	04:00 PM	Flash Flood	N/A	0	0	0	0
16 Countywide	07/14/2002	01:30 PM	Flash Flood	N/A	0	0	0	0
17 Countywide	11/04/2002	01:00 PM	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
18 West Portion	12/04/2002	04:30 AM	Flash Flood	N/A	0	0	5K	0
19 Countywide	02/20/2003	10:00 AM	Flash Flood	N/A	0	0	10K	0
20 South Portion	06/13/2003	08:00 PM	Flash Flood	N/A	0	0	5K	0
21 Countywide	06/09/2004	05:00 PM	Flash Flood	N/A	0	0	0	0
22 Countywide	06/25/2004	07:00 PM	Flash Flood	N/A	0	0	0	0
23 South Portion	06/29/2004	01:00 PM	Flash Flood	N/A	0	0	0	0
24 Countywide	10/02/2004	06:30 AM	Flash Flood	N/A	0	0	0	0
25 Countywide	11/21/2004	03:00 PM	Flash Flood	N/A	0	0	0	0
26 Countywide	11/22/2004	07:00 AM	Flash Flood	N/A	0	0	0	0
27 Fedor	05/08/2005	02:00 PM	Flash Flood	N/A	0	0	0	0
28 Giddings	08/08/2005	09:00 PM	Flash Flood	N/A	0	0	0	0
29 Lexington	08/09/2005	09:30 AM	Flash Flood	N/A	0	0	0	0
30 Giddings	10/18/2006	21:00 PM	Flash Flood	N/A	0	0	0K	0K
31 Fedor	03/13/2007	16:30 PM	Flash Flood	N/A	0	0	0K	0K
32 Serbin	05/02/2007	23:00 PM	Flash Flood	N/A	0	0	0K	0K
33 Giddings	05/26/2007	07:00	Flash Flood	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		AM						
34 Lexington	05/28/2007	09:30 AM	Flash Flood	N/A	0	0	0K	0K
35 Giddings	06/17/2007	11:30 AM	Flash Flood	N/A	0	0	0K	0K
36 Fedor	06/27/2007	03:30 AM	Flash Flood	N/A	0	0	50K	0K
37 Fedor	07/06/2007	03:30 AM	Flash Flood	N/A	0	0	0K	0K
38 Serbin	07/25/2007	16:30 PM	Flash Flood	N/A	0	0	0K	0K
				TOTALS:	0	10	331K	140K

Table 6-12. Flood Events for Llano County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 Southern Half	05/29/1995	2230	Flash Flood	N/A	0	2	2.5M	0
2 TXZ171>172 - 192	10/28/1996	08:00 AM	Flood	N/A	0	0	250K	70K
3 Countywide	10/28/1996	12:30 AM	Flash Flood	N/A	0	0	2K	0K
4 TXZ171	02/20/1997	10:00 AM	Flood	N/A	2	0	2.0M	50K
5 Countywide	02/20/1997	10:00 AM	Flash Flood	N/A	0	0	50K	20K
6 Countywide	04/25/1997	12:00 PM	Flash Flood	N/A	0	0	100K	20K
7 Countywide	06/22/1997	07:30 AM	Flood	N/A	0	0	5.0M	100K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
8 Countywide	06/24/1997	07:00 PM	Flash Flood	N/A	0	0	10K	0
9 Llano	01/06/1998	09:30 AM	Flash Flood	N/A	0	0	3K	0K
10 Countywide	03/16/1998	01:30 AM	Flash Flood	N/A	0	0	5K	0
11 Countywide	07/04/1998	04:30 AM	Flash Flood	N/A	0	0	10K	0
12 Countywide	03/18/1999	10:00 AM	Flash Flood	N/A	0	0	5K	0
13 Countywide	05/10/1999	01:30 PM	Flash Flood	N/A	0	0	10K	0
14 Countywide	05/11/1999	05:30 PM	Flash Flood	N/A	0	0	10K	0
15 Countywide	05/28/1999	09:30 AM	Flash Flood	N/A	0	0	10K	0
16 North Portion	07/12/1999	05:00 PM	Flash Flood	N/A	0	0	5K	0
17 East Portion	05/01/2000	09:00 PM	Flash Flood	N/A	0	0	10K	0
18 TXZ171	10/24/2000	10:00 AM	Flood	N/A	0	0	0	0
19 West Portion	11/03/2000	03:00 PM	Flash Flood	N/A	0	0	5K	0
20 TXZ171	11/04/2000	01:00 AM	Flood	N/A	0	0	0	0
21 Countywide	11/05/2000	06:00 PM	Flash Flood	N/A	0	0	20K	0
22 TXZ171	11/06/2000	04:00 AM	Flood	N/A	0	0	0	0
23 Southeast	03/27/2001	12:00	Flash Flood	N/A	0	0	5K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
Portion		PM						
24 TXZ171	11/15/2001	06:00 PM	Flood	N/A	0	0	0	0
25 Countywide	11/15/2001	06:30 AM	Flash Flood	N/A	1	20	100K	0
26 West Portion	04/13/2002	05:00 PM	Flash Flood	N/A	0	0	30K	0
27 Countywide	07/02/2002	06:30 AM	Flash Flood	N/A	0	0	0	0
28 East Portion	07/04/2002	02:30 AM	Flash Flood	N/A	0	0	0	0
29 Countywide	09/07/2002	08:30 PM	Flash Flood	N/A	0	0	0	0
30 Countywide	09/08/2002	10:00 AM	Flash Flood	N/A	0	0	0	0
31 East Portion	09/11/2003	05:00 PM	Flash Flood	N/A	0	0	3K	0
32 West Portion	01/16/2004	06:30 PM	Flash Flood	N/A	0	0	3K	0
33 West Portion	05/13/2004	06:30 PM	Flash Flood	N/A	0	0	0	0
34 Southeast Portion	06/09/2004	04:30 AM	Flash Flood	N/A	0	0	0	0
35 TXZ171	06/09/2004	11:00 AM	Flood	N/A	0	0	0	0
36 Northwest Portion	06/29/2004	12:00 PM	Flash Flood	N/A	0	0	0	0
37 Countywide	10/04/2004	04:30 PM	Flash Flood	N/A	0	0	50K	0
38 Countywide	11/16/2004	07:00 PM	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
39 TXZ171	11/17/2004	08:41 AM	Flood	N/A	0	0	0	0
40 Llano	05/08/2005	06:00 AM	Flash Flood	N/A	0	0	0	0
41 Castell	05/09/2005	05:30 PM	Flash Flood	N/A	0	0	0	0
42 Valley Spgs	07/07/2005	06:30 PM	Flash Flood	N/A	0	0	0	0
43 Tow	07/07/2005	07:00 PM	Flash Flood	N/A	0	0	0	0
44 Southeast Portion	07/14/2005	03:00 PM	Flash Flood	N/A	0	0	0	0
45 Southwest Portion	07/14/2005	03:30 PM	Flash Flood	N/A	0	0	0	0
46 Llano	07/23/2005	01:00 PM	Flash Flood	N/A	0	0	0	0
47 Kingsland	07/23/2005	01:30 PM	Flash Flood	N/A	0	0	0	0
48 Kingsland	03/11/2007	22:00 PM	Flash Flood	N/A	0	0	0K	0K
49 Oxford	03/26/2007	10:30 AM	Flash Flood	N/A	0	0	0K	0K
50 Castell	05/01/2007	18:30 PM	Flash Flood	N/A	0	0	0K	0K
51 Llano	05/24/2007	18:30 PM	Flash Flood	N/A	0	0	0K	0K
52 Llano	05/31/2007	06:30 AM	Flash Flood	N/A	0	0	0K	0K
53 Kingsland	06/03/2007	19:00 PM	Flash Flood	N/A	0	0	30K	0K
54 Llano	06/26/2007	03:30	Flood	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		AM						
55 Llano	06/27/2007	00:30 AM	Flash Flood	N/A	0	0	100K	0K
56 Kingsland	06/27/2007	05:15 AM	Flood	N/A	0	0	0K	0K
57 Oxford	06/27/2007	08:00 AM	Flood	N/A	0	0	0K	0K
58 Kingsland	06/28/2007	08:30 AM	Flash Flood	N/A	0	0	0K	0K
59 Kingsland	07/03/2007	14:30 PM	Flash Flood	N/A	0	0	0K	0K
60 Llano	08/16/2007	20:00 PM	Flash Flood	N/A	0	0	0K	0K
61 Valley Spgs	08/17/2007	06:00 AM	Flash Flood	N/A	0	0	0K	0K
				TOTALS:	3	22	10.326M	260K

Table 6-13. Flood Events for Mason County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 Countywide	05/29/1995	2130	Flash Flood	N/A	0	0	0	0
2 TXZ169>170	09/19/1996	01:00 AM	Flood	N/A	0	0	0	0
3 TXZ169>170	10/28/1996	06:00 AM	Flood	N/A	0	0	3.0M	100K
4 Mason	10/28/1996	06:00 AM	Flash Flood	N/A	0	0	50K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
5 TXZ170	02/20/1997	06:00 AM	Flood	N/A	0	0	25K	0K
6 Mason	02/20/1997	09:10 AM	Flash Flood	N/A	0	0	0	0
7 TXZ170	03/09/1997	10:30 PM	Flood	N/A	0	0	100K	100K
8 TXZ066 - 155 - 169>170	06/21/1997	11:00 PM	Flood	N/A	0	0	2.0M	1.0M
9 Mason	06/22/1997	02:00 AM	Flood	N/A	0	0	2.0M	1.0M
10 Mason	02/25/1998	07:25 PM	Flash Flood	N/A	0	0	0	0
11 Countywide	06/04/2000	02:00 AM	Flash Flood	N/A	0	0	0	0
12 TXZ169>170	10/23/2000	03:00 PM	Flood	N/A	0	0	0	0
13 Countywide	10/23/2000	05:40 PM	Flash Flood	N/A	0	0	0	0
14 TXZ169>170	11/03/2000	02:00 PM	Flood	N/A	0	0	0	0
15 Countywide	11/03/2000	09:00 AM	Flash Flood	N/A	1	0	15K	0
16 TXZ170	11/15/2001	05:00 PM	Flood	N/A	0	0	0	0
17 Countywide	07/05/2002	10:30 AM	Flash Flood	N/A	0	0	100K	0
18 Mason	05/01/2003	07:35 PM	Flash Flood	N/A	0	0	0	0
19 Countywide	09/11/2003	04:45 PM	Flash Flood	N/A	0	0	1K	0
20 Mason	10/10/2003	03:40	Flash	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		PM	Flood					
21 Mason	05/13/2004	05:35 PM	Flash Flood	N/A	0	0	0	0
22 East Portion	06/09/2004	07:07 AM	Flash Flood	N/A	0	0	15K	0
23 Mason	06/28/2007	04:32 AM	Flash Flood	N/A	0	0	0K	0K
24 Koockville	08/17/2007	03:07 AM	Flash Flood	N/A	0	0	0K	0K
				TOTALS:	1	0	7.306M	2.200M

Table 6-14. Flood Events for Matagorda County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 Palacios	03/15/1993	2115	Flash Flood	N/A	0	0	0	0
2 MATAGORDA	10/18/1994	1300	Flash Flood	N/A	0	0	500K	50K
3 Bay City	12/17/1995	1030	Flash Flood	N/A	0	0	35K	0
4 Countywide	09/21/1996	12:45 AM	Flash Flood	N/A	0	0	5K	0
5 Matagorda	10/24/1996	01:25 PM	Flash Flood	N/A	0	0	15K	0
6 County	05/09/1997	02:59 PM	Flash Flood	N/A	0	0	5K	0
7 Wadsworth	09/10/1998	09:10 PM	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
8 TXZ176 - 196 - 198>200 - 210 - 213 - 226>227 - 235>237	10/17/1998	12:00 PM	River Flooding	N/A	1	0	0	0
9 TXZ176 - 178>179 - 196 - 199>200 - 210 - 213 - 226>227 - 235>237	11/12/1998	12:00 PM	River Flooding	N/A	0	0	0	0
10 Countywide	08/31/2001	08:30 AM	Flash Flood	N/A	0	0	50K	0
11 Northwest Portion	09/01/2001	06:30 AM	Flash Flood	N/A	0	0	20K	0
12 Sargent	09/06/2002	09:45 PM	Flash Flood	N/A	0	0	500K	0
13 Bay City	09/06/2002	11:20 PM	Flash Flood	N/A	0	0	75K	0
14 Bay City	09/10/2002	01:10 AM	Flash Flood	N/A	0	0	30K	0
15 Countywide	11/05/2002	01:20 AM	Flash Flood	N/A	0	0	20K	0
16 Matagorda	09/01/2003	03:45 AM	Flash Flood	N/A	0	0	30K	0
17 Markham	05/13/2004	07:35 PM	Flash Flood	N/A	0	0	7K	0
18 Bay City	06/23/2004	12:15 AM	Flash Flood	N/A	0	0	8K	0
19 Bay City	06/24/2004	06:55 AM	Flash Flood	N/A	0	0	25K	0
20 Blessing	11/02/2004	03:02 AM	Flash Flood	N/A	0	0	3K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
21 Palacios	11/02/2004	04:45 AM	Flash Flood	N/A	0	0	4K	0
22 Matagorda	06/20/2006	05:30 AM	Flash Flood	N/A	0	0	0	0
23 Midfield	07/26/2006	05:30 PM	Flash Flood	N/A	0	0	4K	0
24 Matagorda	07/04/2007	07:10 AM	Flash Flood	N/A	0	0	0K	0K
				TOTALS:	1	0	1.336M	50K

Table 6-15. Flood Events for McCulloch County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 Lohn	05/26/1994	1337	Flash Flooding	N/A	0	0	0	0
2 Brady	06/22/1997	06:00 PM	Flood	N/A	0	0	200K	100K
3 Brady	09/16/1998	03:45 PM	Flash Flood	N/A	0	0	0	0
4 Brady	05/26/1999	01:00 PM	Flash Flood	N/A	0	0	0	0
5 Brady	07/10/1999	11:15 AM	Flash Flood	N/A	0	0	0	0
6 TXZ154	06/03/2000	11:00 AM	Flood	N/A	0	0	0	0
7 Countywide	06/03/2000	11:50 PM	Flash Flood	N/A	0	0	0	0
8 Countywide	06/18/2000	09:20 AM	Flash Flood	N/A	0	0	0	0
9 Countywide	10/23/2000	05:40	Flash	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		PM	Flood					
10 TXZ154>155 - 168	11/03/2000	02:00 PM	Flood	N/A	0	0	160K	0
11 Countywide	11/03/2000	09:12 AM	Flash Flood	N/A	0	0	15K	0
12 Brady	03/19/2002	05:20 PM	Flash Flood	N/A	0	0	2K	0
13 Lohn	05/04/2002	10:00 PM	Flash Flood	N/A	0	0	0	0
14 Lohn	05/25/2002	07:21 PM	Flash Flood	N/A	0	0	0	0
15 Brady	05/27/2002	09:45 PM	Flash Flood	N/A	0	0	0	0
16 Lohn	06/03/2003	10:10 PM	Flash Flood	N/A	0	0	0	0
17 East Portion	09/14/2003	08:00 AM	Flash Flood	N/A	0	0	0	0
18 Brady	09/25/2003	05:44 PM	Flash Flood	N/A	0	0	0	0
19 Countywide	08/21/2004	02:54 PM	Flash Flood	N/A	0	0	0	0
20 Voca	08/21/2004	11:18 AM	Flash Flood	N/A	0	0	0	0
21 Brady	03/26/2007	07:36 AM	Flash Flood	N/A	0	0	1K	0K
22 Pear Vly	03/26/2007	09:00 AM	Flash Flood	N/A	0	0	0K	0K
23 Placid	03/26/2007	09:20 AM	Flash Flood	N/A	0	0	0K	0K
24 Salt Gap	05/07/2007	07:00	Flash	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		AM	Flood					
25 Brady	05/09/2007	18:15 PM	Flash Flood	N/A	0	0	0K	0K
26 Melvin	05/27/2007	14:46 PM	Flash Flood	N/A	0	0	0K	0K
27 Melvin	05/27/2007	15:20 PM	Flash Flood	N/A	0	0	0K	0K
28 Voca	06/03/2007	19:15 PM	Flash Flood	N/A	0	0	5K	0K
29 Brady	06/27/2007	05:01 AM	Flash Flood	N/A	0	0	7K	0K
30 Brady	07/14/2007	10:55 AM	Flash Flood	N/A	0	0	20K	0K
				TOTALS:	0	0	410K	100K

Table 6-16. Flood Events for Mills County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 Goldthwaite	07/15/1996	08:57 AM	Flash Flood	N/A	0	0	0	0
2 Priddy	08/29/1996	05:10 AM	Flash Flood	N/A	0	0	0	0
3 Goldthwaite	02/20/1997	04:00 PM	Flash Flood	N/A	0	0	2.0M	0
4 Priddy	02/20/1997	07:33 AM	Flash Flood	N/A	0	0	0	0
5 Goldthwaite	02/20/1997	12:07 PM	Flash Flood	N/A	0	0	0	0
6 Democrat	03/09/1997	08:24 PM	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
7 Goldthwaite	03/09/1997	09:00 PM	Flash Flood	N/A	0	0	0	0
8 Goldthwaite	03/09/1997	09:30 PM	Flash Flood	N/A	0	0	0	0
9 Goldthwaite	06/22/1997	07:30 PM	Flash Flood	N/A	0	0	0	0
10 Goldthwaite	06/22/1997	08:16 PM	Flash Flood	N/A	0	0	0	0
11 Goldthwaite	06/22/1997	11:46 PM	Flash Flood	N/A	0	0	0	0
12 Priddy	06/09/2004	08:44 AM	Flash Flood	N/A	0	0	0	0
13 Countywide	06/09/2004	12:07 PM	Flash Flood	N/A	0	0	0	0
14 Priddy	02/23/2005	01:00 AM	Flash Flood	N/A	0	0	0	0
15 Goldthwaite	08/09/2005	08:51 AM	Flash Flood	N/A	0	0	0	0
16 North Portion	08/10/2005	04:18 AM	Flash Flood	N/A	0	0	0	0
17 TXZ141>142 - 158 - 160 - 160	08/10/2005	07:25 AM	Flood	N/A	2	0	50K	0
18 Priddy	08/15/2005	05:55 PM	Flash Flood	N/A	0	0	0	0
19 Mullin	05/05/2006	11:45 PM	Flash Flood	N/A	0	0	15K	0
20 Goldthwaite	05/25/2007	18:00 PM	Flash Flood	N/A	0	0	0K	0K
21 Star	05/31/2007	03:44 AM	Flash Flood	N/A	0	0	0K	0K
22 Priddy	06/26/2007	00:05	Flash	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		AM	Flood					
23 Priddy	06/27/2007	00:05 AM	Flash Flood	N/A	0	0	0K	0K
				TOTALS:	2	0	2.065M	0

Table 6-17. Flood Events for San Saba County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 San Saba	06/07/1996	05:10 AM	Flash Flood	N/A	0	0	0	0
2 San Saba	07/15/1996	08:00 AM	Flash Flood	N/A	0	0	0	0
3 TXZ155	02/20/1997	03:00 PM	Flood	N/A	0	0	50K	50K
4 San Saba	02/20/1997	09:02 AM	Flash Flood	N/A	0	0	0	0
5 Cherokee	05/30/1997	04:20 PM	Flash Flood	N/A	0	0	0	0
6 Richland Spgs	06/06/1997	05:30 AM	Flood	N/A	0	0	800K	400K
7 TXZ066 - 155 - 169>170	06/21/1997	11:00 PM	Flood	N/A	0	0	2.0M	1.0M
8 Cherokee	06/22/1997	06:30 PM	Flood	N/A	0	0	150K	75K
9 San Saba	05/11/1999	04:30 PM	Flash Flood	N/A	0	0	0	0
10 Northwest Portion	10/23/2000	07:33 PM	Flash Flood	N/A	0	0	5K	0
11 TXZ154>155 - 168	11/03/2000	02:00 PM	Flood	N/A	0	0	160K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
12 Countywide	11/03/2000	12:00 PM	Flash Flood	N/A	0	0	25K	0
13 TXZ155	11/04/2000	02:00 PM	Flood	N/A	0	0	0	0
14 TXZ155	11/06/2000	05:00 PM	Flood	N/A	0	0	0	0
15 TXZ155	11/15/2001	11:00 PM	Flood	N/A	0	0	0	0
16 Countywide	07/03/2002	12:00 AM	Flash Flood	N/A	0	0	5K	0
17 Northeast Portion	07/05/2002	04:10 AM	Flash Flood	N/A	0	0	5K	0
18 Countywide	07/14/2002	07:45 AM	Flash Flood	N/A	0	0	0	0
19 Countywide	06/05/2003	06:17 AM	Flash Flood	N/A	0	0	0	0
20 Northwest Portion	09/14/2003	08:30 AM	Flash Flood	N/A	0	0	0	0
21 Countywide	06/09/2004	08:00 AM	Flash Flood	N/A	0	0	800K	0
22 San Saba	08/21/2004	08:10 AM	Flash Flood	N/A	0	0	0	0
23 San Saba	08/21/2004	11:42 AM	Flash Flood	N/A	0	0	0	0
24 TXZ155	11/18/2004	06:30 AM	Flood	N/A	0	0	6K	0
				TOTALS:	0	0	4.006M	1.525M

Table 6-18. Flood Events for Travis County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 TRAVIS	10/07/1994	2000	Flash Flood	N/A	0	0	5K	0
2 TRAVIS	10/07/1994	2000	Flash Flood	N/A	0	0	50K	3K
3 Eastern Portion	12/16/1994	2230	Flash Flood	N/A	0	0	20K	5K
4 TRAVIS	12/22/1994	2200	Flash Flood	N/A	0	0	5K	0
5 Countywide	05/29/1995	0230	Flash Flood	N/A	0	0	40K	5K
6 Countywide	05/30/1995	0030	Flash Flood	N/A	0	0	0	0
7 Northwest Portion	06/29/1995	0000	Flash Flood	N/A	0	0	10K	10K
8 North Austin	08/24/1996	10:30 AM	Flash Flood	N/A	0	0	10K	0
9 Austin	08/24/1996	11:30 AM	Flash Flood	N/A	0	0	30K	0
10 Northwest Part	09/18/1996	07:15 PM	Flash Flood	N/A	0	0	3K	0K
11 TXZ171>172 - 192	10/28/1996	08:00 AM	Flood	N/A	0	0	250K	70K
12 Countywide	04/04/1997	06:30 AM	Flash Flood	N/A	0	0	15K	0K
13 Countywide	04/25/1997	02:30 PM	Flash Flood	N/A	0	0	5K	0K
14 Countywide	04/26/1997	04:30 AM	Flash Flood	N/A	0	0	5K	0K
15 Countywide	05/23/1997	05:00 PM	Flash Flood	N/A	0	0	50K	0K
16 Austin	05/27/1997	04:00	Flash	N/A	1	0	5K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		PM	Flood					
17 Countywide	06/06/1997	04:00 PM	Flash Flood	N/A	0	0	15K	0
18 Countywide	06/08/1997	11:30 PM	Flash Flood	N/A	1	10	100K	0
19 Austin	06/17/1997	04:30 AM	Flash Flood	N/A	0	0	10K	0
20 Countywide	06/22/1997	01:00 PM	Flood	N/A	0	0	1.0M	50K
21 Austin	07/30/1997	06:00 PM	Flash Flood	N/A	0	0	50K	0
22 Countywide	12/20/1997	08:45 PM	Flash Flood	N/A	1	0	50K	0K
23 Countywide	02/21/1998	06:00 PM	Flash Flood	N/A	0	0	10K	0
24 Countywide	10/17/1998	08:30 AM	Flash Flood	N/A	1	50	1.5M	100K
25 TXZ192	10/17/1998	10:00 AM	Flood	N/A	0	50	1.0M	50K
26 Countywide	06/21/1999	02:00 PM	Flash Flood	N/A	0	0	10K	0
27 North Portion	07/10/1999	06:30 PM	Flash Flood	N/A	0	0	5K	0
28 Southwest Portion	06/09/2000	12:30 PM	Flash Flood	N/A	0	0	30K	0
29 Countywide	11/02/2000	03:50 PM	Flash Flood	N/A	0	0	20K	0
30 Countywide	11/03/2000	10:30 AM	Flash Flood	N/A	0	0	20K	0
31 East Portion	11/23/2000	10:30 PM	Flash Flood	N/A	0	0	15K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
32 West Portion	05/06/2001	07:00 PM	Flash Flood	N/A	0	0	10K	0
33 East Portion	05/06/2001	10:00 PM	Flash Flood	N/A	0	0	20K	0
34 Countywide	05/20/2001	08:30 PM	Flash Flood	N/A	0	5	60K	0
35 Countywide	08/26/2001	07:15 PM	Flash Flood	N/A	0	0	30K	0
36 Austin	08/31/2001	09:00 PM	Flash Flood	N/A	0	0	20K	0
37 TXZ192 - 192	11/15/2001	08:00 PM	Flood	N/A	0	0	0	0
38 Countywide	11/15/2001	10:00 AM	Flash Flood	N/A	2	50	500K	0
39 West Portion	07/01/2002	09:30 PM	Flash Flood	N/A	0	0	0	0
40 TXZ192	07/02/2002	03:33 PM	Flood	N/A	1	0	0	0
41 TXZ192	07/02/2002	03:57 PM	Flood	N/A	0	0	0	0
42 Countywide	07/02/2002	07:30 AM	Flash Flood	N/A	0	0	0	0
43 Countywide	07/03/2002	06:00 AM	Flash Flood	N/A	0	0	0	0
44 West Portion	07/05/2002	04:30 AM	Flash Flood	N/A	0	0	0	0
45 Countywide	08/10/2002	02:40 PM	Flash Flood	N/A	0	0	0	0
46 Countywide	09/07/2002	07:30 PM	Flash Flood	N/A	0	0	0	0
47 Countywide	09/08/2002	09:15	Flash	N/A	0	2	30K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		AM	Flood					
48 South Portion	10/24/2002	12:00 PM	Flash Flood	N/A	0	0	0	0
49 Countywide	11/04/2002	01:15 PM	Flash Flood	N/A	0	0	10K	0
50 Countywide	02/20/2003	08:30 AM	Flash Flood	N/A	0	0	15K	0
51 Countywide	01/16/2004	06:00 PM	Flash Flood	N/A	0	0	10K	0
52 North Portion	04/06/2004	05:30 AM	Flash Flood	N/A	0	4	0	0
53 East Portion	06/05/2004	12:30 AM	Flash Flood	N/A	0	0	0	0
54 Countywide	06/09/2004	01:00 PM	Flash Flood	N/A	0	0	0	0
55 TXZ192	06/09/2004	11:00 AM	Flood	N/A	0	0	0	0
56 Northeast Portion	06/25/2004	01:30 PM	Flash Flood	N/A	0	0	0	0
57 West Portion	06/26/2004	05:30 PM	Flash Flood	N/A	0	0	0	0
58 Austin	06/27/2004	11:30 AM	Flash Flood	N/A	0	0	0	0
59 Countywide	06/29/2004	09:30 AM	Flash Flood	N/A	0	0	0	0
60 Austin	09/14/2004	04:00 PM	Flash Flood	N/A	0	0	0	0
61 East Portion	10/02/2004	04:30 AM	Flash Flood	N/A	0	0	0	0
62 Austin	11/01/2004	01:00 AM	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
63 Austin	11/01/2004	06:00 AM	Flash Flood	N/A	0	0	0	0
64 Countywide	11/16/2004	11:00 PM	Flash Flood	N/A	0	0	0	0
65 Countywide	11/22/2004	01:00 AM	Flash Flood	N/A	0	0	0	0
66 TXZ192	11/22/2004	03:15 AM	Flood	N/A	0	0	0	0
67 TXZ192	11/22/2004	05:00 AM	Flood	N/A	0	0	0	0
68 Countywide	11/22/2004	10:00 AM	Flash Flood	N/A	0	0	0	0
69 Southeast Portion	11/23/2004	10:00 AM	Flash Flood	N/A	0	0	0	0
70 Creedmoor	05/29/2005	10:00 PM	Flash Flood	N/A	0	0	0	0
71 Austin	07/27/2005	10:00 PM	Flash Flood	N/A	0	0	0	0
72 Pflugerville	08/05/2005	07:30 AM	Flash Flood	N/A	0	0	0	0
73 Oak Hill	08/05/2005	08:00 AM	Flash Flood	N/A	0	0	0	0
74 Austin	08/10/2005	11:30 AM	Flash Flood	N/A	0	0	0	0
75 Beecaves	09/11/2005	11:00 AM	Flash Flood	N/A	0	0	0	0
76 Austin	03/28/2006	08:30 AM	Flash Flood	N/A	0	0	0	0
77 Pflugerville	04/20/2006	04:30 PM	Flash Flood	N/A	0	0	0	0
78 Countywide	05/04/2006	09:50	Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
		PM						
79 West Portion	05/06/2006	03:30 AM	Flash Flood	N/A	0	0	0	0
80 Austin	05/06/2006	06:40 PM	Flash Flood	N/A	0	0	0	0
81 Countywide	05/06/2006	06:40 PM	Flood	N/A	0	0	0	0
82 West Portion	07/04/2006	05:00 PM	Flash Flood	N/A	0	0	0	0
83 Jonestown	10/10/2006	08:30 AM	Flash Flood	N/A	0	0	0K	0K
84 Austin	01/13/2007	07:00 AM	Flash Flood	N/A	0	0	0K	0K
85 Austin	01/13/2007	08:45 AM	Flood	N/A	0	0	0K	0K
86 Austin	01/13/2007	09:30 AM	Flood	N/A	0	0	0K	0K
87 Lago Vista	03/11/2007	21:30 PM	Flash Flood	N/A	0	0	0K	0K
88 Creedmoor	03/13/2007	16:00 PM	Flash Flood	N/A	0	0	0K	0K
89 Four Pts	05/03/2007	01:00 AM	Flash Flood	N/A	0	0	0K	0K
90 Oak Hill	06/03/2007	20:50 PM	Flash Flood	N/A	0	0	50K	0K
91 Creedmoor	06/20/2007	09:00 AM	Flash Flood	N/A	0	0	0K	0K
92 Pflugerville	06/25/2007	13:00 PM	Flash Flood	N/A	0	0	30K	0K
93 Pflugerville	06/28/2007	00:00 AM	Flash Flood	N/A	0	0	50K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
94 Beecaves	07/06/2007	19:00 PM	Flash Flood	N/A	1	0	0K	0K
95 Pflugerville	07/20/2007	10:00 AM	Flash Flood	N/A	0	0	0K	0K
96 Austin	07/21/2007	03:55 AM	Flood	N/A	0	0	0K	0K
97 Austin	07/26/2007	07:30 AM	Flash Flood	N/A	0	0	0K	0K
98 Austin	07/26/2007	08:00 AM	Flood	N/A	0	0	0K	0K
99 Beecaves	08/16/2007	19:30 PM	Flash Flood	N/A	0	0	0K	0K
100 Austin	09/11/2007	06:00 AM	Flash Flood	N/A	0	0	0K	0K
101 Austin Mabry	04/25/2008	21:07 PM	Flash Flood	N/A	0	0	0K	0K
102 Oak Hill	04/27/2008	06:20 AM	Flash Flood	N/A	0	0	0K	0K
103 Vinson	04/27/2008	06:45 AM	Flash Flood	N/A	0	0	0K	0K
104 Del Valle	04/27/2008	07:10 AM	Flash Flood	N/A	0	0	0K	0K
105 Vinson	04/27/2008	07:10 AM	Flash Flood	N/A	0	0	0K	0K
106 Austin Mabry	04/27/2008	08:25 AM	Flash Flood	N/A	0	0	0K	0K
				TOTALS:	8	171	5.173M	293K

Table 6-19. Flood Events for Wharton County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 WHARTON	10/18/1994	0600	Flash Flood/flood	N/A	0	0	6	50K
2 Lane City	12/29/1996	11:30 PM	Flash Flood	N/A	0	0	5K	0
3 El Campo	04/04/1997	05:00 AM	Flash Flood	N/A	0	0	50K	0
4 Wharton	04/11/1997	01:28 AM	Flash Flood	N/A	0	0	15K	0
5 Countywide	04/11/1997	08:25 AM	Flash Flood	N/A	0	0	10K	0
6 Countywide	10/13/1997	03:00 AM	Flash Flood	N/A	0	0	10K	0
7 Wharton	10/06/1998	06:30 AM	Flash Flood	N/A	0	0	2K	0
8 Countywide	10/17/1998	11:00 PM	Flash Flood	N/A	0	0	50K	0
9 TXZ176 - 196 - 198>200 - 210 - 213 - 226>227 - 235>237	10/17/1998	12:00 PM	River Flooding	N/A	1	0	0	0
10 Countywide	10/18/1998	07:06 AM	Flash Flood	N/A	0	0	15K	0
11 Countywide	10/18/1998	11:02 AM	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
12 Countywide	11/12/1998	09:54 PM	Flash Flood	N/A	0	0	3K	0
13 TXZ176 - 178>179 - 196 - 199>200 - 210 - 213 - 226>227 - 235>237	11/12/1998	12:00 PM	River Flooding	N/A	0	0	0	0
14 Countywide	11/13/1998	01:00 AM	Flash Flood	N/A	0	0	5K	0
15 Countywide	11/14/1998	05:30 AM	Flash Flood	N/A	0	0	5K	0
16 Countywide	08/30/2001	10:15 PM	Flash Flood	N/A	0	0	75K	0
17 West Portion	09/01/2001	06:30 AM	Flash Flood	N/A	0	0	20K	0
18 Hungerford	07/13/2002	08:50 PM	Flash Flood	N/A	0	0	25K	0
19 Countywide	07/15/2002	07:52 AM	Flash Flood	N/A	0	0	3K	0
20 Wharton	09/07/2002	02:55 AM	Flash Flood	N/A	0	0	95K	0
21 Wharton	10/28/2002	06:45 PM	Flash Flood	N/A	0	0	7K	0
22 Wharton	11/17/2003	12:33 PM	Flash Flood	N/A	0	0	15K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
23 Wharton	06/23/2004	03:25 PM	Flash Flood	N/A	0	0	70K	0
24 Wharton	06/24/2004	03:25 AM	Flash Flood	N/A	0	0	15K	0
25 Countywide	11/21/2004	02:24 AM	Flash Flood	N/A	0	0	2.1M	0
26 El Campo	11/22/2004	09:30 PM	Flash Flood	N/A	0	0	0	0
				TOTALS:	1	0	2.595M	50K

Table 6-20. Flood Events for Williamson County

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
1 Countywide	09/08/1994	0500	Flash Flood	N/A	0	0	30K	10K
2 Taylor	05/29/1995	0130	Flash Flood	N/A	0	0	30K	0
3 Countywide	06/28/1995	2200	Flash Flood	N/A	0	0	0	0
4 Countywide	08/01/1995	1930	Flash Flood	N/A	0	0	0	0
5 Countywide	08/31/1996	08:00 PM	Flash Flood	N/A	0	0	5K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
6 Countywide	09/18/1996	06:00 PM	Flash Flood	N/A	0	0	3K	0K
7 Countywide	09/19/1996	10:00 PM	Flash Flood	N/A	0	0	3K	0K
8 Countywide	04/04/1997	06:30 AM	Flash Flood	N/A	0	0	10K	0K
9 Countywide	04/04/1997	12:30 AM	Flash Flood	N/A	0	0	10K	0K
10 Countywide	04/25/1997	02:00 PM	Flash Flood	N/A	0	0	5K	0K
11 Countywide	06/08/1997	11:30 PM	Flash Flood	N/A	0	0	50K	0
12 Countywide	06/22/1997	01:00 PM	Flood	N/A	0	0	500K	50K
13 Countywide	12/20/1997	08:00 PM	Flash Flood	N/A	0	0	0K	0K
14 Countywide	07/04/1998	03:30 AM	Flash Flood	N/A	0	0	5K	0
15 Countywide	10/17/1998	08:00 AM	Flood	N/A	0	0	50K	10K
16 TXZ173	10/17/1998	10:00 AM	Flood	N/A	0	0	30K	10K
17 Countywide	05/10/1999	01:30 PM	Flash Flood	N/A	0	0	15K	0
18 East Portion	05/11/1999	08:30 PM	Flash Flood	N/A	0	0	10K	0
19 Georgetown	06/13/1999	02:30 PM	Flash Flood	N/A	0	0	3K	0
20 Countywide	06/21/1999	03:00 PM	Flash Flood	N/A	0	0	8K	0
21 Countywide	07/10/1999	06:00 PM	Flash Flood	N/A	0	0	20K	0
22 Countywide	07/12/1999	06:00 PM	Flash	N/A	0	0	5K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
			Flood					
23 Countywide	05/01/2000	11:30 PM	Flash Flood	N/A	0	0	40K	0
24 South Portion	11/23/2000	10:00 PM	Flash Flood	N/A	0	0	15K	0
25 East Portion	05/06/2001	10:00 PM	Flash Flood	N/A	0	0	15K	0
26 East Portion	07/01/2001	09:15 AM	Flash Flood	N/A	0	0	50K	0
27 South Portion	08/26/2001	07:45 PM	Flash Flood	N/A	0	0	10K	0
28 TXZ173	11/15/2001	05:45 PM	Flood	N/A	0	0	0	0
29 Countywide	11/15/2001	10:30 AM	Flash Flood	N/A	2	10	500K	0
30 Countywide	07/02/2002	10:00 AM	Flash Flood	N/A	0	0	0	0
31 Countywide	07/03/2002	08:30 AM	Flash Flood	N/A	0	0	0	0
32 Northwest Portion	07/13/2002	03:30 PM	Flash Flood	N/A	0	0	0	0
33 Countywide	09/07/2002	07:45 PM	Flash Flood	N/A	0	0	0	0
34 Countywide	09/08/2002	09:30 AM	Flash Flood	N/A	0	0	0	0
35 Countywide	11/04/2002	04:00 PM	Flash Flood	N/A	0	0	0	0
36 Countywide	02/20/2003	08:30 AM	Flash Flood	N/A	0	0	10K	0
37 Cedar Park	05/12/2003	12:15 PM	Flash Flood	N/A	0	0	10K	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
38 West Portion	01/16/2004	06:00 PM	Flash Flood	N/A	0	0	5K	0
39 Countywide	04/06/2004	05:30 AM	Flash Flood	N/A	0	0	0	0
40 East Portion	05/11/2004	08:30 AM	Flash Flood	N/A	0	0	0	0
41 East Portion	06/09/2004	02:00 PM	Flash Flood	N/A	0	0	0	0
42 Countywide	06/25/2004	07:00 PM	Flash Flood	N/A	0	0	0	0
43 South Portion	06/29/2004	10:00 AM	Flash Flood	N/A	0	0	0	0
44 North Portion	08/19/2004	09:30 PM	Flash Flood	N/A	0	0	0	0
45 Liberty Hill	10/26/2004	08:00 PM	Flash Flood	N/A	0	0	100K	0
46 Countywide	11/16/2004	11:30 PM	Flash Flood	N/A	0	0	0	0
47 TXZ173	11/17/2004	01:30 AM	Flood	N/A	0	0	0	0
48 Countywide	11/22/2004	01:00 AM	Flash Flood	N/A	0	0	0	0
49 East Portion	11/22/2004	10:00 AM	Flash Flood	N/A	0	0	0	0
50 Granger	08/05/2005	01:00 AM	Flash Flood	N/A	0	0	0	0
51 Florence	08/05/2005	07:30 AM	Flash Flood	N/A	0	0	0	0
52 Jarrell	08/05/2005	12:30 AM	Flash Flood	N/A	0	0	0	0
53 West Portion	08/09/2005	07:30 AM	Flash Flood	N/A	0	0	0	0

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
54 Countywide	08/10/2005	09:00 AM	Flash Flood	N/A	0	0	0	0
55 North Portion	05/06/2006	02:00 AM	Flash Flood	N/A	0	0	0	0
56 Florence	05/08/2006	01:00 AM	Flash Flood	N/A	0	0	0	0
57 Round Rock	07/04/2006	04:30 PM	Flash Flood	N/A	0	0	0	0
58 West Portion	09/11/2006	04:00 PM	Flash Flood	N/A	0	0	0	0
59 Georgetown	10/10/2006	08:30 AM	Flash Flood	N/A	0	0	0K	0K
60 Taylor	01/13/2007	10:00 AM	Flash Flood	N/A	0	0	0K	0K
61 Georgetown	03/12/2007	00:24 AM	Flash Flood	N/A	0	0	0K	0K
62 Liberty Hill	03/13/2007	18:00 PM	Flash Flood	N/A	1	0	0K	0K
63 Liberty Hill	05/24/2007	19:45 PM	Flash Flood	N/A	0	0	0K	0K
64 Round Rock	06/03/2007	20:15 PM	Flash Flood	N/A	0	0	10K	0K
65 Coupland	06/20/2007	09:00 AM	Flash Flood	N/A	0	0	0K	0K
66 Florence	06/26/2007	22:00 PM	Flash Flood	N/A	0	0	500K	0K
67 Georgetown	06/27/2007	01:30 AM	Flood	N/A	0	0	0K	0K
68 Andice	06/28/2007	00:00 AM	Flash Flood	N/A	0	0	150K	0K
69 Thrall	07/03/2007	14:00 PM	Flash Flood	N/A	0	0	0K	0K

Location or County	Date	Time	Type	Magnitude	Death	Injury	Property Damage	Crop Damage
70 Thrall	07/05/2007	09:30 AM	Flash Flood	N/A	0	0	0K	0K
71 Liberty Hill	07/07/2007	18:00 PM	Flash Flood	N/A	0	0	0K	0K
72 Bartlett	07/14/2007	09:00 AM	Flash Flood	N/A	0	0	0K	0K
73 Jarrell	07/20/2007	09:30 AM	Flash Flood	N/A	0	0	0K	0K
74 Cedar Park	07/23/2007	17:30 PM	Flash Flood	N/A	0	0	0K	0K
75 Granger	07/25/2007	17:30 PM	Flash Flood	N/A	0	0	0K	0K
76 Florence	08/02/2007	15:00 PM	Flash Flood	N/A	0	0	0K	0K
				TOTALS:	3	10	2.207M	80K

Probability of Future Events

Flood events will remain a frequent occurrence for participating communities; therefore, the future probability of occurrence in the TCRFC region is highly likely, which means that an event is probable in the next year. The annual probability of observing a 100-year flood is one-percent. The annual probability of observing a 500-year flood event is 0.2 percent. These risk areas are shown on FEMA Flood Insurance Rate Maps (FIRMs).

Vulnerability Analysis

Any structure or property that is located in a floodplain is vulnerable to flooding. A property's vulnerability to a flood depends on its location in, or its location in proximity to the floodplain. Structures that lie along banks of a waterway are the most vulnerable and are often repetitive loss structures.

Structures built in the Special Flood Hazard Area (SFHA), which are areas that will be inundated by the flood event having a one percent chance of being equaled or exceeded in any given year, are

subject to damage by rising waters and floating debris. Moving flood water exerts pressure on everything in its path and causes erosion of soil and scour around solid objects. Utility systems, such as heating, ventilation, air conditioning, fuel, electrical systems, sewage maintenance systems and water systems, if not elevated above base flood elevation, may also be damaged.

The TCRFC basin has experienced rapid growth, a greatly expanded number of homes and businesses in the floodplain and devastating floods that have reoccurred in the basin. More than 80 major floods have been recorded in the lower Colorado River basin since the early 1800s, often with devastating results. Even with the Highland Lakes dams in place, the risk of flooding continues today.

Impact

Major flooding and flash flooding events would have a substantial severity of impact as floods can cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or suffer major damage.

Flooding in the Colorado River Basin
Source: LCRA

Flooding occurs in seasonal patterns. Thunderstorms form when warm, moist air collides with cooler, drier air. Since these masses tend to come together during the transition from summer to winter, most thunderstorms and resulting flooding occur during the spring (April, May and June) and fall (October, November, and December).

Flood hazard areas are determined using statistical analyses of records of riverflow, storm tides, and rainfall; information obtained through consultation with the community, floodplain topographic surveys, and hydrological and hydraulic analyses. FEMA's FIRMs identify areas subject to flood hazard, including SFHAs. The one-percent-annual-chance flood is also referred to as the base flood or 100-year flood. Moderate flood hazard areas are also shown on the FIRM, and are the areas between the limits of the base flood and the .2 percent-annual-chance (or 500-year) flood.

In order to assess flood risk, flood areas were modeled for the 100-year event. Flood depth was estimated at the pixel level for affected areas, along with a portion of the area affected within the census block. HAZUS-MH was utilized to estimate floodplain boundaries and potential exposure for the 100-year event frequency.

Many people do not understand how risky the floodplain can be. There is a 26 percent chance that a non-elevated home in the floodplain will be damaged during a 30-year mortgage. The chance that a major fire will occur during the same period is only one percent.

The following presents the vulnerability of the participating jurisdictions in the TCRFC region for the risk of the flood hazard. Table 6-21 shows the estimated number and value of buildings and the number of people potentially at risk to flooding by jurisdiction. Table 6-22 shows potential annualized losses by jurisdiction. Table 6-23 shows critical facilities and infrastructure potentially damaged by jurisdiction. "Negligible" indicates a dollar value less than $5,000 or a number of persons fewer than 50.

Table 6-21. Potential Affected Exposure for 100-Year Flood

JURISDICTION	TOTAL EXPOSURE ($)	TOTAL POPULATION IN JURISDICTION	NUMBER OF PEOPLE AT RISK	NUMBER OF BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Bastrop County	**1,898,937,000**	**41,354**	**29,633**	**12,426**	**1,371,293,000**
Bastrop	576,435,000	5,933	1,575	767	97,639,000
Elgin	344,327,000	6,063	1,422	554	67,386,000
Smithville	271,908,000	4,383	993	522	53,993,000
Blanco County	**448,775,000**	**5,591**	**2,069**	**1,209**	**190,023,000**
Johnson City	78,214,000	1,247	518	278	33,925,000
Brown County	**Not Participating**				
Brownwood	1,160,816,000	19,091	2,350	1,261	202,878,000
Burnet County	**1,142,430,000**	**18,584**	**13,800**	**7,539**	**843,700,000**
Bertram	55,114,000	1,000	Negligible	Negligible	Negligible
Burnet	255,342,000	4,755	2,266	1,015	112,593,000
Cottonwood Shores	41,613,000	704	101	52	6,651,000
Granite Shoals	124,784,000	2,303	1,099	1,042	73,742,000

JURISDICTION	TOTAL EXPOSURE ($)	TOTAL POPULATION IN JURISDICTION	NUMBER OF PEOPLE AT RISK	NUMBER OF BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Highland Haven	33,235,000	453	375	269	28,140,000
Marble Falls	376,568,000	5,070	2,871	1,593	197,802,000
Meadowlakes	94,973,000	1,278	308	158	22,312,000
Colorado County	**652,241,000**	**11,466**	**8,572**	**4,507**	**490,308,000**
Columbus	259,875,000	3,506	1,925	1045	147,847,000
Eagle Lake	168,646,000	3,453	758	381	41,338,000
Weimar	171,576,000	1,965	180	108	25,426,000
Fayette County	**1,143,993,000**	**15,787**	**9,392**	**6,045**	**662,525,000**
Carmine	16,978,000	184	85	56	7,911,000
Flatonia	73,581,000	1,377	247	166	19,574,000
La Grange	308,041,000	4,456	1,179	539	60,841,000
Lampasas County	**451,748,000**	**8,940**	**6,952**	**3,279**	**334,270,000**
Kempner	47,851,000	970	527	233	29,821,000
Lampasas	429,672,000	6,818	2,249	1,066	144,313,000
Lometa	41,863,000	767	63	40	2,335,000
Lee County	**491,147,000**	**9,388**	**6,522**	**3,296**	**350,278,000**
Lexington	68,009,000	1,166	Negligible	Negligible	Negligible
Giddings	309,504,000	5,103	376	235	26,679,000
Llano County	**762,494,000**	**10,381**	**6,416**	**5,456**	**525,968,000**
Llano	217,712,000	3,311	750	413	45,760,000
Horseshoe Bay	401,845,000	2,648	1,533	1,722	266,340,000
Sunrise Beach Village	108,772,000	704	578	766	94,895,000
Mason County	**152,814,000**	**1,635**	**51**	**49**	**3,799,000**
Mason	114,666,000	2,103	906	561	51,783,000
Matagorda County	**937,051,000**	**14,429**	**8,600**	**6,542**	**631,357,000**

JURISDICTION	TOTAL EXPOSURE ($)	TOTAL POPULATION IN JURISDICTION	NUMBER OF PEOPLE AT RISK	NUMBER OF BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Bay City	1,011,160,000	18,709	7,060	2,918	366,482,000
Palacios	236,596,000	4,819	1,477	706	85,670,000
McCulloch County	**Not Participating**				
Brady	296,230,000	5,308	565	417	35,008,000
Mills County	**200,103,000**	**3,177**	**121**	**84**	**7,083,000**
Goldthwaite	120,497,000	1,795	Negligible	Negligible	Negligible
San Saba County	**195,326,000**	**3,338**	**1,814**	**1,016**	**105,824,000**
San Saba	157,499,000	2,498	968	673	64,665,000
Travis County	**Not Participating**				
Briarcliff	78,826,000	862	489	335	47,697,000
Jonestown	115,523,000	1,553	495	312	42,694,000
Lago Vista	382,670,000	4,213	2,066	1,105	208,525,000
Lakeway	1,058,045,000	8,130	2,249	1,221	326,903,000
Mustang Ridge	38,236,000	983	725	268	28,389,000
Point Venture	49,272,000	420	183	224	29,964,000
San Leanna	27,719,000	384	101	54	6,918,000
Volente	34,753,000	363	294	168	27,779,000
West Lake Hills	546,896,000	2,875	1,791	765	279,761,000
Wharton County	**1,056,683,000**	**19,968**	**14,930**	**6,836**	**805,227,000**
East Bernard	92,899,000	1,729	531	222	26,111,000
El Campo	641,235,000	10,604	4,212	2,008	199,765,000
Wharton	499,567,000	8,887	7,457	3,381	399,953,000
Williamson County	**6,478,980,000**	**94,616**	**38,060**	**15,113**	**2,623,329,000**
Cedar Park	59,444,000	25,617	7,749	2,868	596,720,000
Florence	59,444,000	1,054	496	219	23,709,000

JURISDICTION	TOTAL EXPOSURE ($)	TOTAL POPULATION IN JURISDICTION	NUMBER OF PEOPLE AT RISK	NUMBER OF BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Hutto	91,087,000	1,134	473	207	43,902,000
TOTALS FOR STUDY AREA	**27,762,240,000**	**451,402**	**211,547**	**106,310**	**13,647,523,000**

Source: HAZUS-MH MR3; FEMA Q3

Table 6-22. Potential Annualized Losses by Jurisdiction (Flood)

JURISDICTION	VALUE OF BUILDINGS AT RISK ($)	ANNUALIZED LOSSES FOR AT-RISK RESIDENTIAL ($)	ANNUALIZED LOSSES FOR AT-RISK COMMERCIAL ($)	TOTAL ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Bastrop County	**1,371,293,000**	**6,130,000**	**790,000**	**6,920,000**	**0.50%**
Bastrop	97,639,000	2,274,000	1,548,000	3,822,000	3.91%
Elgin	67,386,000	18,000	13,000	31,000	0.05%
Smithville	53,993,000	888,000	165,000	1,053,000	1.95%
Blanco County	**190,023,000**	**1,003,000**	**118,000**	**1,121,000**	**.059%**
Johnson City	33,925,000	10,000	Negligible	10,000	0.03%
Brown County	**Not Participating**				
Brownwood	202,878,000	1,562,000	1,028,000	2,590,000	1.28%
Burnet County	**843,700,000**	**2,781,000**	**218,000**	**2,999,000**	**0.36%**
Bertram	Negligible	Negligible	Negligible	Negligible	0.00%
Burnet	112,593,000	431,000	176,000	607,000	0.54%
Cottonwood Shores	6,651,000	13,000	Negligible	14,000	0.21%
Granite Shoals	73,742,000	758,000	24,000	782,000	1.06%
Highland Haven	28,140,000	63,000	Negligible	67,000	0.24%
Marble Falls	197,802,000	750,000	106,000	856,000	0.43%

JURISDICTION	VALUE OF BUILDINGS AT RISK ($)	ANNUALIZED LOSSES FOR AT-RISK RESIDENTIAL ($)	ANNUALIZED LOSSES FOR AT-RISK COMMERCIAL ($)	TOTAL ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Meadowlakes	22,312,000	40,000	Negligible	43,000	0.19%
Colorado County	**490,308,000**	**3,464,000**	**317,000**	**3,781,000**	**0.77%**
Columbus	147,847,000	1,328,000	495,000	1,823,000	1.23%
Eagle Lake	41,338,000	Negligible	Negligible	Negligible	0.00%
Weimar	25,426,000	Negligible	Negligible	Negligible	0.00%
Fayette County	**662,525,000**	**1,636,000**	**169,000**	**1,805,000**	**0.27%**
Carmine	7,911,000	Negligible	Negligible	Negligible	0.00%
Flatonia	19,574,000	Negligible	Negligible	Negligible	0.00%
La Grange	60,841,000	164,000	17,000	181,000	0.30%
Lampasas County	**334,270,000**	**1,199,000**	**51,000**	**1,250,000**	**0.37%**
Kempner	29,821,000	8,000	16,000	24,000	0.08%
Lampasas	144,313,000	868,000	366,000	1,234,000	0.86%
Lometa	2,335,000	Negligible	Negligible	Negligible	0.00%
Lee County	**350,278,000**	**1,476,000**	**50,000**	**1,526,000**	**0.44%**
Lexington	Negligible	Negligible	Negligible	Negligible	0.00%
Giddings	26,679,000	Negligible	Negligible	Negligible	0.00%
Llano County	**525,968,000**	**4,830,000**	**280,000**	**5,110,000**	**0.97%**
Llano	45,760,000	314,000	69,000	383,000	0.84%
Horseshoe Bay	266,340,000	1,752,000	83,000	1,835,000	0.69%
Sunrise Beach Village	94,895,000	1,819,000	67,000	1,886,000	1.99%
Mason County	**3,799,000**	**399,000**	**31,000**	**430,000**	**11.32%**
Mason	51,783,000	326,000	39,000	365,000	0.70%
Matagorda County	**631,357,000**	**4,237,000**	**335,000**	**4,572,000**	**0.72%**
Bay City	366,482,000	214,000	10,000	224,000	0.06%

JURISDICTION	VALUE OF BUILDINGS AT RISK ($)	ANNUALIZED LOSSES FOR AT-RISK RESIDENTIAL ($)	ANNUALIZED LOSSES FOR AT-RISK COMMERCIAL ($)	TOTAL ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Palacios	85,670,000	30,000	Negligible	32,000	0.04%
McCulloch County	**Not Participating**				
Brady	35,008,000	592,000	87,000	679,000	1.94%
Mills County	**7,083,000**	**483,000**	**12,000**	**495,000**	**6.99%**
Goldthwaite	Negligible	Negligible	Negligible	Negligible	0.00%
San Saba County	**105,824,000**	**1,268,000**	**13,000**	**1,281,000**	**1.21%**
San Saba	64,665,000	86,000	9,000	95,000	0.15%
Travis County	**Not Participating**				
Briarcliff	47,697,000	1,286,000	82,000	1,368,000	2.87%
Jonestown	42,694,000	216,000	27,000	243,000	0.57%
Lago Vista	208,525,000	1,332,000	1,031,000	2,363,000	1.13%
Lakeway	326,903,000	1,825,000	252,000	2,077,000	0.64%
Mustang Ridge	28,389,000	81,000	13,000	94,000	0.33%
Point Venture	29,964,000	374,000	25,000	399,000	1.33%
San Leanna	6,918,000	45,000	12,000	57,000	0.82%
Volente	27,779,000	93,000	19,000	112,000	0.40%
West Lake Hills	279,761,000	53,000	16,000	69,000	0.02%
Wharton County	**805,227,000**	**2,143,000**	**165,000**	**2,308,000**	**0.29%**
East Bernard	26,111,000	115,000	Negligible	119,000	0.46%
El Campo	199,765,000	1,248,000	261,000	1,509,000	0.76%
Wharton	399,953,000	48,000	5,000	53,000	0.01%
Williamson County	**2,623,329,000**	**5,891,000**	**835,000**	**6,726,000**	**0.26%**
Cedar Park	596,720,000	57,000	77,000	134,000	0.02%
Florence	23,709,000	203,000	Negligible	203,000	0.86%

JURISDICTION	VALUE OF BUILDINGS AT RISK ($)	ANNUALIZED LOSSES FOR AT-RISK RESIDENTIAL ($)	ANNUALIZED LOSSES FOR AT-RISK COMMERCIAL ($)	TOTAL ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Hutto	43,902,000	40,000	63,000	103,000	0.23%

Source: HAZUS-MH MR3

Table 6-23. Critical Facilities and Infrastructure Potentially Damaged by Jurisdiction (100-Year Flood)

JURISDICTION	NUMBER AT-RISK ESSENTIAL FACILITIES	INFRASTRUCTURE AND LIFELINES			
		Oil Pipe (km)	Gas Pipe (km)	Highway (km)	Railroad (km)
Bastrop County	**1**	**19.47**	**63.86**	**22.42**	**5.51**
Bastrop	2	-	0.32	1.53	0.09
Elgin	0	-	-	0.41	-
Smithville	0	-	0.05	0.83	0.15
Blanco County	**0**	**0.49**	**0.02**	**2.09**	**-**
Johnson City	0	-	-	0.77	-
Brown County	**Not Participating**				
Brownwood	0	-	0.58	-	-
Burnet County	**1**	**2.86**	**2.70**	**9.12**	**6.71**
Bertram	0	-	-	-	-
Burnet	0	-	0.92	2.07	0.55
Cottonwood Shores	0	-	-	-	-
Granite Shoals	0	-	-	-	-
Highland Haven	0	-	-	-	-
Marble Falls	0	-	-	1.18	1.42

JURISDICTION	NUMBER AT-RISK ESSENTIAL FACILITIES	INFRASTRUCTURE AND LIFELINES			
		Oil Pipe (km)	Gas Pipe (km)	Highway (km)	Railroad (km)
Meadowlakes	0	-	-	-	-
Colorado County	**0**	**29.77**	**123.58**	**25.67**	**38.18**
Columbus	2	-	0.15	3.74	0.69
Eagle Lake	0	-	-	0.96	0.32
Weimar	0	-	-	-	-
Fayette County	**0**	**32.43**	**446.51**	**26.94**	**11.16**
Carmine	0	-	1.71	0.15	-
Flatonia	0	-	-	0.26	0.3
La Grange	0	-	0.83	1.09	-
Lampasas County	**0**	**-**	**8.78**	**13.31**	**12.09**
Kempner	0	-	-	0.28	-
Lampasas	1	-	-	1.04	1.26
Lometa	0	-	-	-	-
Lee County	**0**	**14.55**	**155.76**	**9.69**	**1.96**
Lexington	0	-	-	-	-
Giddings	0	-	0.49	0.24	-
Llano County	0	-	2.90	11.59	9.56
Llano	0	-	0.27	1.13	1.31
Horseshoe Bay	0	-	0.21	0.78	-
Sunrise Beach Village	0	-	-	-	-
Mason County	**0**	**-**	**-**	**0.34**	
Mason	0	-	-	0.34	-
Matagorda County	**2**	**50.82**	**512.53**	**16.49**	**19.32**

JURISDICTION	NUMBER AT-RISK ESSENTIAL FACILITIES	INFRASTRUCTURE AND LIFELINES			
		Oil Pipe (km)	Gas Pipe (km)	Highway (km)	Railroad (km)
Bay City	2	0.76	3.22	1.67	3.43
Palacios	1	-	1.32	1.11	-
McCulloch County	**Not Participating**				
Brady	0	-	1.5	-	-
Mills County	**0**	**-**	**-**	**-**	**0.49**
Goldthwaite	0	-	-	-	-
San Saba County	**0**	**1.87**	**6.78**	**8.66**	**12.65**
San Saba	2	-	-	1.38	1.35
Travis County	**Not Participating**				
Briarcliff	0	-	-	-	-
Jonestown	0	-	-	-	-
Lago Vista	0	-	-	-	-
Lakeway	1	-	-	-	-
Mustang Ridge	0	-	0.59	-	-
Point Venture	0	-	-	-	-
San Leanna	0	-	-	-	-
Volente	0	-	-	-	-
West Lake Hills	0	-	-	-	-
Wharton County	**0**	**62.92**	**720.49**	**64.56**	**47.87**
East Bernard	0	-	0.64	0.38	0.32
El Campo	1	-	1.67	4.51	1.64
Wharton	2	-	3.67	4.44	3.88
Williamson County	**0**	**9.34**	**17.77**	**22.89**	**15.16**

JURISDICTION	NUMBER AT-RISK ESSENTIAL FACILITIES	INFRASTRUCTURE AND LIFELINES			
		Oil Pipe (km)	Gas Pipe (km)	Highway (km)	Railroad (km)
Cedar Park	0	-	0.26	0.27	0.53
Florence	0	-	-	0.33	-
Hutto	0	0.21	-	0.18	0.33

Source: HAZUS-MH MR3; GIS Analysis

Section 7 – Hurricane and Tropical Storm

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Hazard Profile

Once a tropical depression intensifies until maximum sustained winds are between 35-64 knots (39 – 73 mph), it becomes a tropical storm. At these wind speeds the storm becomes more organized and circular in shape – resembling a hurricane. The rotation of a tropical storm is more recognizable than for tropical depression. Tropical storms can cause many problems even without becoming a hurricane. However, most of the problems a tropical storm causes stem from heavy rainfall and high winds.

According to the National Oceanic and Atmospheric Administration (NOAA), a hurricane is an intense tropical weather system of strong thunderstorms with well-defined surface circulation and maximum sustained winds of 74 mph or higher. A hurricane is accompanied by thunderstorms and, in the Northern Hemisphere, a counterclockwise circulation of winds near the earth's surface.

Hurricanes are categorized according to the strength of their winds using the Saffir-Simpson Hurricane Scale. A Category 1 storm has the lowest wind speeds, while a Category 5 hurricane has the highest. However, these are relative terms because lower category storms can inflict greater damage than higher category storms, depending on where they strike and particular hazards they bring. In fact, tropical storms can produce significant damage and loss of life, due primarily to flooding.

The ingredients for a hurricane include a pre-existing weather disturbance, warm tropical oceans, moisture, and relatively light winds aloft. If the right conditions persist long enough, they can combine to produce the violent winds, destructive waves, torrential rains, and powerful floods associated with this phenomenon.

Each year, an average of 10 tropical storms develops over the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico. Many of these remain over the water and never impact the U.S. coastline. In an average year, six of these storms become hurricanes. In an average three-year period, roughly five hurricanes strike the US coastline, killing approximately 50 to 100 people anywhere from Texas to Maine. Of these, two are typically "major" or "intense" hurricanes (a Category 3 or higher storm on the Saffir-Simpson Hurricane Scale).

Storm Surge

According to the National Hurricane Center, the greatest potential for loss of life related to a hurricane is from the storm surge.

Storm surge is water that is pushed toward shore by the wind force swirling around the storm. This advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the mean water level 15 feet or more. In addition, wind driven waves are superimposed on the storm tide. This rise in water level can cause severe flooding in coastal areas, particularly when the storm tide coincides with normal high tides. Because much of the United States' densely populated Atlantic and Gulf Coast coastlines lie less than 10 feet above mean sea level, the danger from storm tides is tremendous.

SLOSH, which stands for Sea, Lake, and Overland Surge from Hurricanes, is a modeling tool used to estimate storm surge based upon data from historical, hypothetical, or predicted hurricanes. In this analysis, color-coded storm surge inundation areas were created and overlaid with census block data, defining the potential maximum surge for coastal locations in Matagorda County.

For Matagorda County, the Matagorda Bay Texas (PSX) SLOSH basin was used. In these analyses, color-coded storm surge inundation areas were created and overlaid with census block data, defining the potential maximum surge for coastal locations for each category of hurricane, as well as exposed populations, structures, and critical facilities located in those areas. A GIS analysis was conducted to verify that the surge boundaries and depths estimated by HAZUS-MH reasonably correspond with the boundaries in the NOAA data, and HAZUS-MH inventory was used to estimate exposure and potential losses.

For developing the depth grid files, the SLOSH data was used in combination with ground elevation data from the USGS National Elevation Dataset (NED). The MOM value (Maximum of the Maximum Envelopes of Water; a composite measure that expresses the maximum flood elevation) for each hurricane Category on the Saffir-Simpson Scale from SLOSH data was used to determine the “surge” or water elevation. A GRID digital map of floor elevation was produced from the SLOSH shape file data. A simple GIS operation of subtraction was performed with the ground elevation data set to determine water depth.

Location

Figures 7-1 to 7-6 depict the inundation from coastal flooding due to a hurricane or tropical storm event. Because Matagorda County is the only coastal county participating, the coastal flood/inundation data was only conducted for the county and the communities participating therein.

Figure 7-1. Coastal Flood (Storm Surge) Inundation Zones in Matagorda County

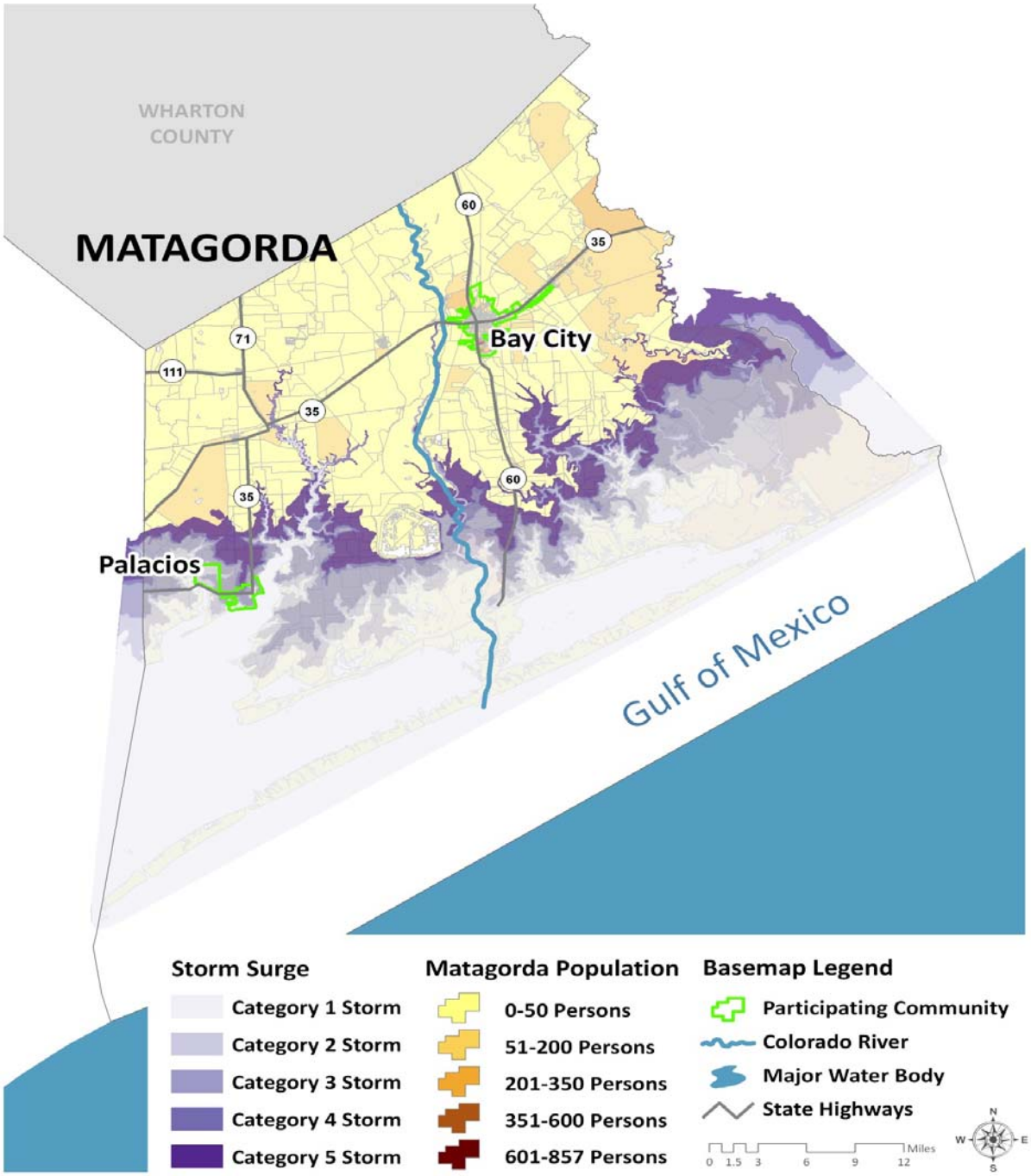


Figure 7-2. Coastal Flood (Storm Surge) Inundation Zones in Bay City

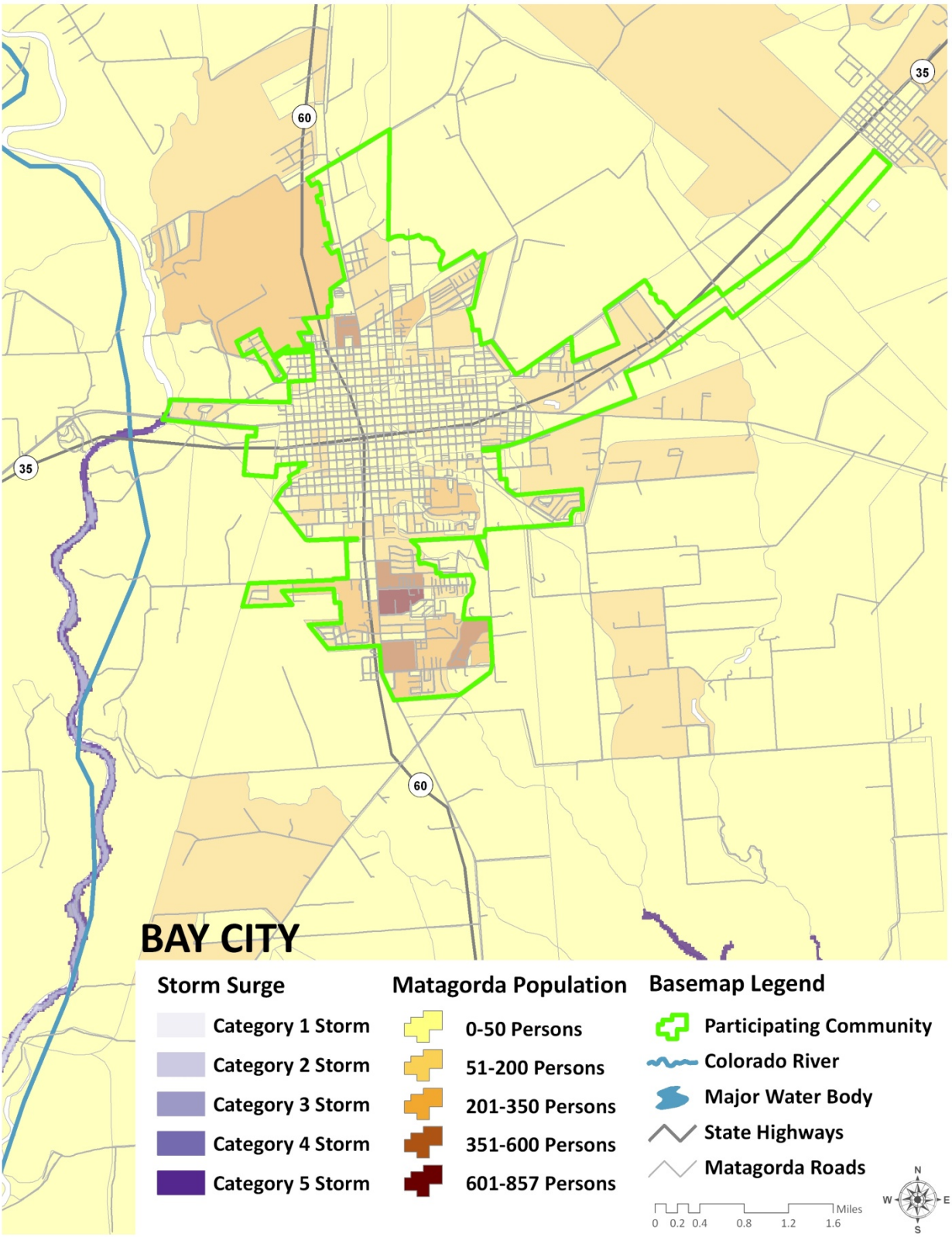


Figure 7-3. Coastal Flood (Storm Surge) Inundation Zones in Palacios

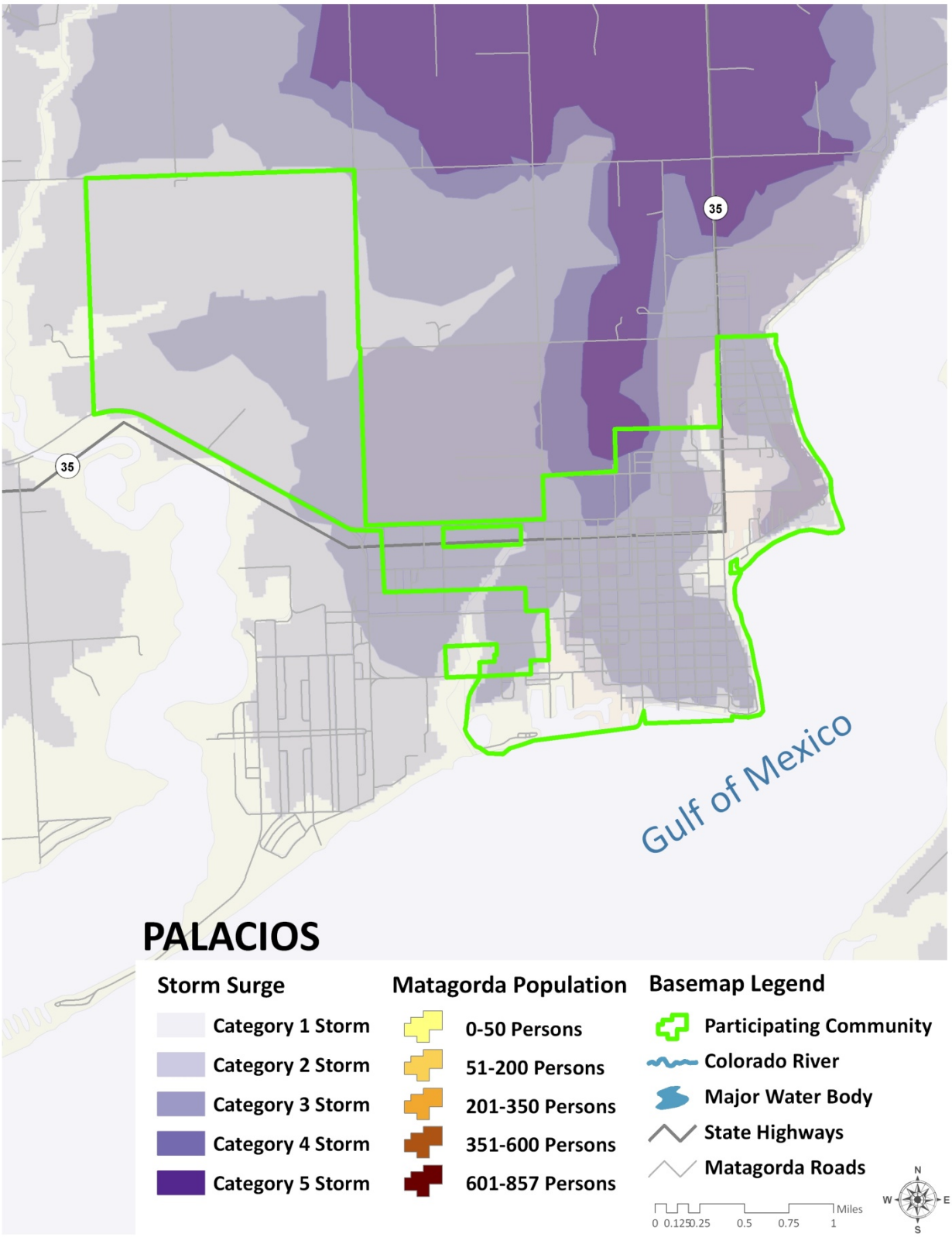


Figure 7-4. Category 1 Storm Surge, Matagorda County

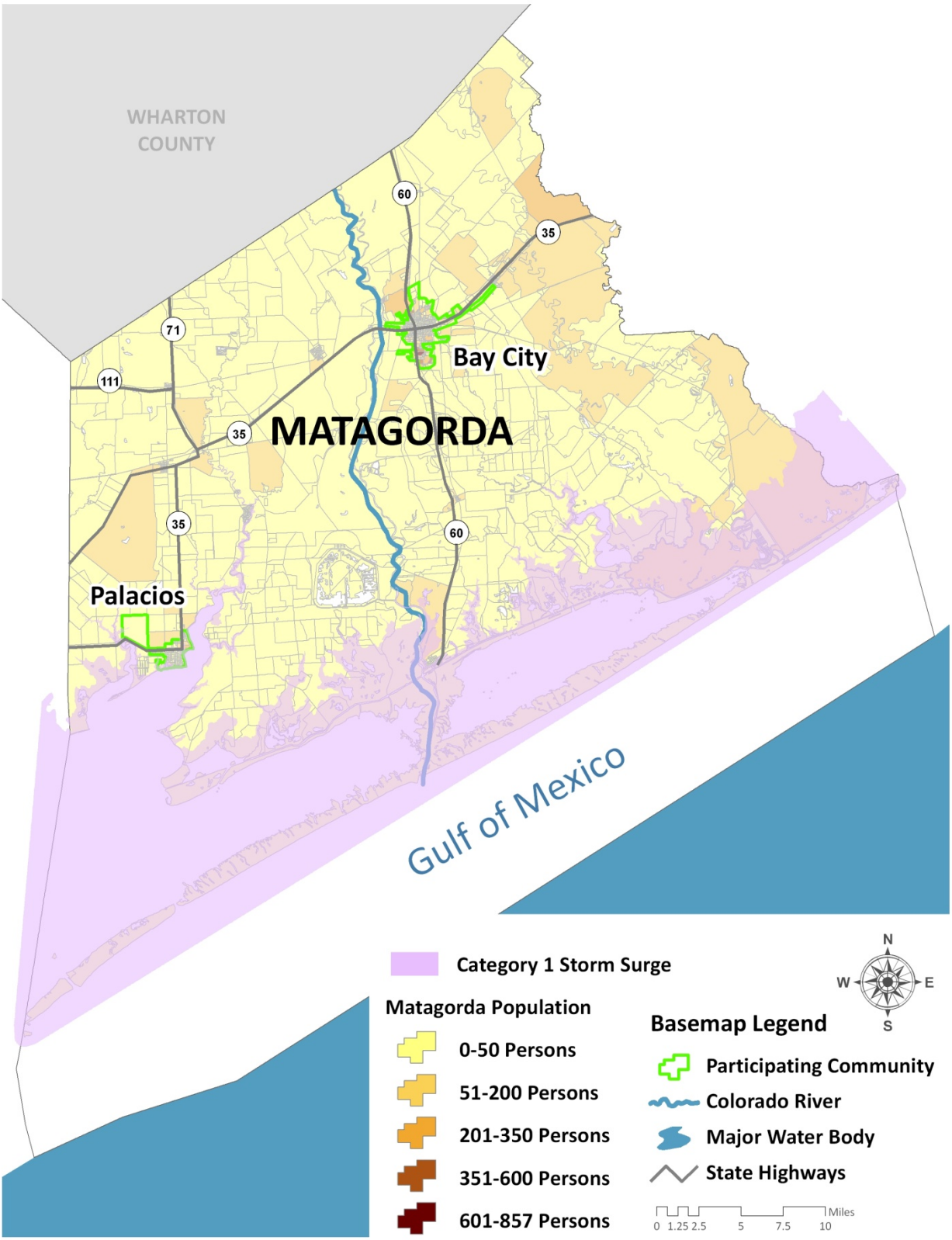


Figure 7-5. Category 1 Storm Surge in Bay City

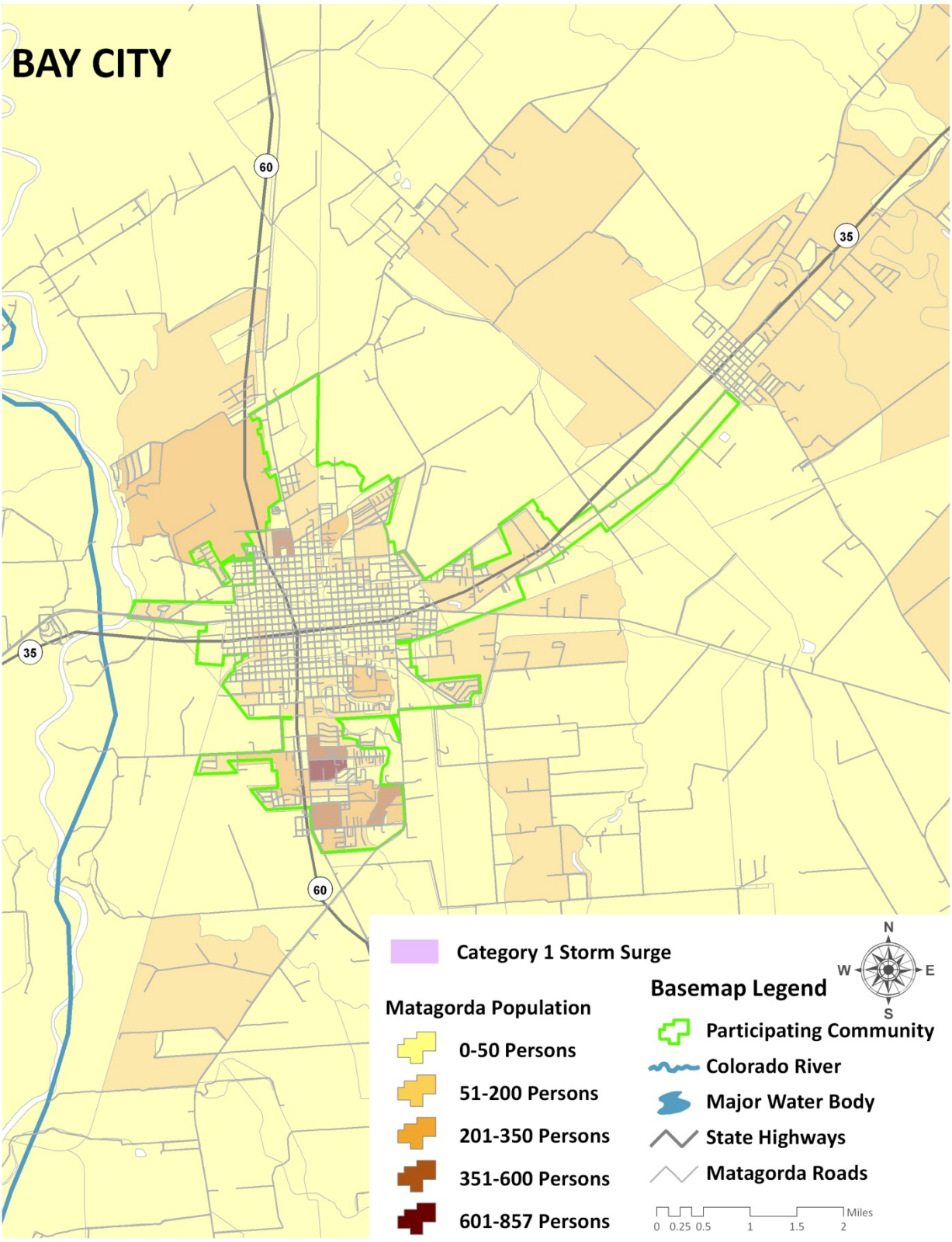
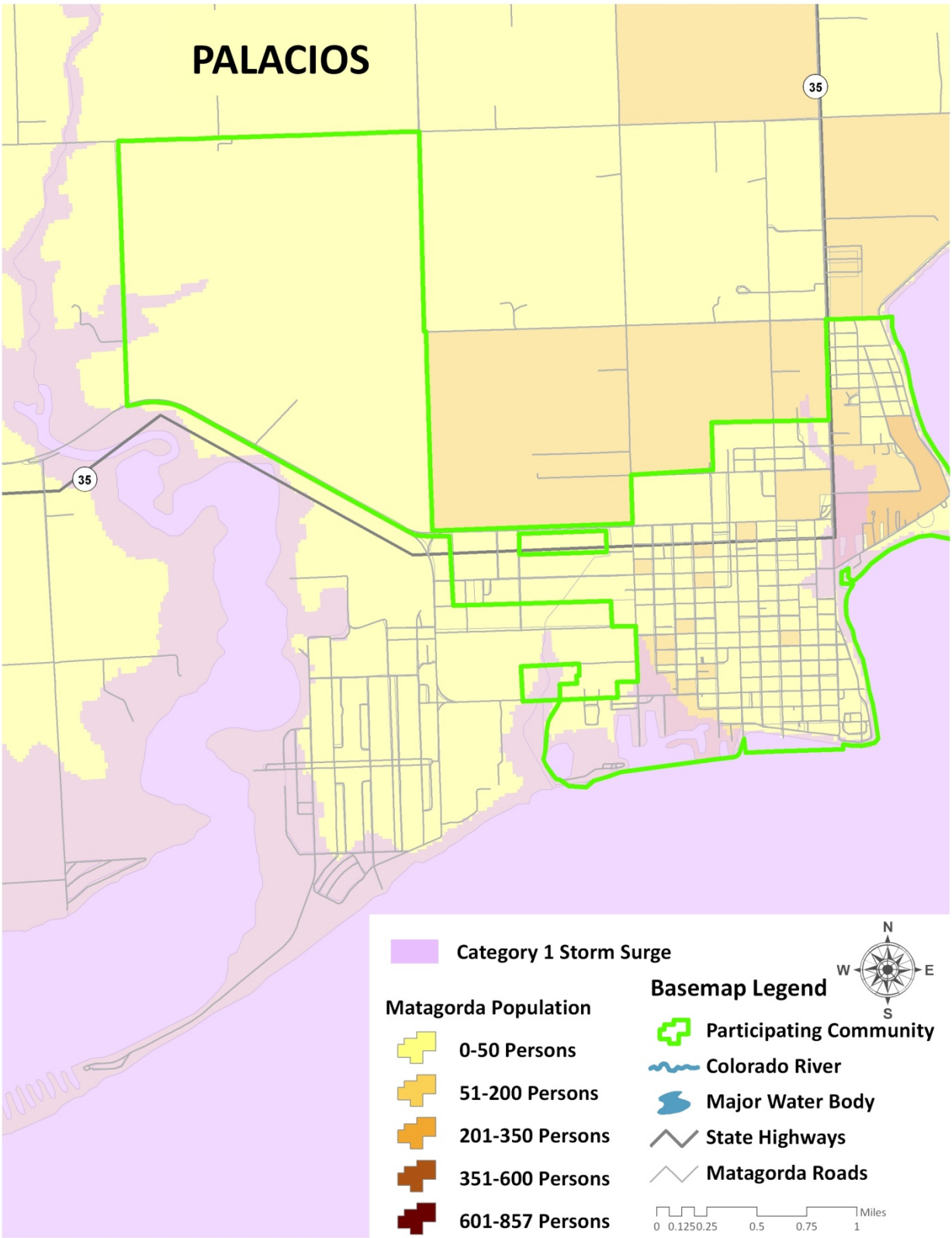


Figure 7-6. Category 1 Storm Surge in Palacios



Extent

Table 7-1 shows wind speeds and characteristics by type and classification of hurricane. As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 mph, the system is designated a tropical storm, given a name and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 mph the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Scale (Table 7-2), which rates hurricane intensity in categories on a scale of 1 to 5, with category 5 being the most intense.

Table 7-1. Hurricane Classifications and Examples

Event	Wind Speed	Characteristics	Example
Tropical Storm	39-73 mph	High wind, but not as severe as hurricane winds.	Allison 2001
Category 1 Hurricane	74-95 mph (64-82 knots [kts])	No serious damage to buildings. Damage to unanchored mobile homes. Some damage to poorly constructed signs. Some coastal flooding and minor pier damage.	Irene 1999 and Allison 1995
Category 2 Hurricane	96-110 mph (83-95 kts)	Some damage to building roofs, doors, and windows. Considerable damage to mobile homes. Flooding damage piers and small craft in unprotected moorings may break their moorings. Some trees blown down.	Bonnie 1998, Georges(FL & LA) 1998 and Gloria 1985
Category 3 Hurricane	111-130 mph (96-113 kts)	Some structural damage to small residences and utility	Rita 2005, Keith 2000, Fran 1996, Opal 1995, Alicia 1983 and Betsy

Event	Wind Speed	Characteristics	Example
		buildings. Large trees blown down. Mobile homes and poorly built signs destroyed. Flooding near the coast destroys smaller structures, and larger structures damaged by floating debris. Terrain may be flooded well inland.	1965
Category 4 Hurricane	131-155 mph (114-135 kts)	More extensive curtain wall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland.	Hugo 1989, Donna 1960 and Katrina 2005
Category 5 Hurricane	156 mph and up (135+ kts)	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required.	Andrew(FL) 1992, Camille 1969 and Labor Day 1935

Table 7-2. Saffir-Simpson Scale

CATEGORY	MAXIMUM SUSTAINED WINDSPEED (MPH)	MINIMUM SURFACE PRESSUMER (MILLIBARS)	STORM SURGE (FEET)
1	74–95	Greater than 980	3–5
2	96–110	979–965	6–8
3	111–130	964–945	9–12
4	131–155	944–920	13–18
5	155 +	Less than 920	19+

Source: National Hurricane Center

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds, barometric pressure and storm surge potential, which are combined to estimate potential damage. Categories 3, 4 and 5 are classified as "major" hurricanes, and while hurricanes within this range comprise only 20 percent of total tropical cyclone landfalls, they account for over 70 percent of the damage in the United States. Table 7-1 describes possible damage expected for each category of hurricane. Damage during hurricanes might also result from spawned tornadoes, storm surge and inland flooding associated with the heavy rainfall that usually accompanies these storms.

Table 7-3 on the following page, profiles the potential winds speeds (in miles per hour) that could be expected in the TCRFC study area during a hurricane event.

Table 7-3. Average Hurricane Wind Speeds by Jurisdiction

JURISDICTION	WIND SPEED (MPH) PER RETURN PERIOD						
	10-Year	20-Year	50-Year	100-Year	200-Year	500-Year	1,000-Year
Bastrop County	**43**	**56**	**71**	**81**	**89**	**100**	**106**
Bastrop	41	54	68	77	86	96	102
Elgin	38	50	64	74	82	91	98
Smithville	43	56	71	80	89	99	106

JURISDICTION	WIND SPEED (MPH) PER RETURN PERIOD						
	10-Year	20-Year	50-Year	100-Year	200-Year	500-Year	1,000-Year
Blanco County	**32**	**44**	**59**	**68**	**76**	**87**	**95**
Johnson City	30	43	56	65	74	84	91
Brown County	**Not Participating**						
Brownwood	0	25	39	49	58	68	74
Burnet County	**28**	**41**	**54**	**63**	**71**	**82**	**89**
Bertram	28	41	54	63	71	81	88
Burnet	27	40	53	62	71	81	87
Cottonwood Shores	29	42	55	64	72	83	90
Granite Shoals	27	40	53	62	70	81	88
Highland Haven	27	40	53	62	70	81	88
Marble Falls	28	41	54	63	71	82	89
Meadowlakes	27	40	54	63	71	81	88
Colorado County	**55**	**71**	**89**	**99**	**108**	**117**	**124**
Columbus	52	67	84	94	103	111	118
Eagle Lake	55	71	89	99	108	117	124
Weimar	51	66	82	92	101	110	117
Fayette County	**49**	**63**	**79**	**89**	**98**	**107**	**114**
Carmine	46	59	75	84	93	102	108
Flatonia	46	59	75	85	93	104	110
La Grange	46	60	75	85	94	103	110
Lampasas County	**24**	**37**	**51**	**60**	**68**	**77**	**84**
Kempner	24	36	50	59	68	77	83
Lampasas	24	37	51	60	69	78	84

JURISDICTION	WIND SPEED (MPH) PER RETURN PERIOD						
	10-Year	20-Year	50-Year	100-Year	200-Year	500-Year	1,000-Year
Lometa	22	34	48	58	66	75	82
Lee County	**44**	**58**	**73**	**82**	**90**	**100**	**106**
Lexington	39	52	66	75	84	93	100
Giddings	43	56	71	81	89	98	105
Llano County	**28**	**40**	**54**	**63**	**71**	**81**	**88**
Llano	23	36	50	59	68	78	84
Horseshoe Bay	28	40	54	63	71	81	88
Sunrise Beach Village	24	37	51	60	69	79	85
Mason County	**0**	**32**	**46**	**55**	**64**	**74**	**81**
Mason	0	31	46	55	64	74	80
Matagorda County	**68**	**88**	**110**	**123**	**132**	**145**	**153**
Bay City	67	86	109	121	131	143	152
Palacios	67	86	109	122	133	145	155
McCulloch County	**Not Participating**						
Brady	0	28	43	52	61	71	78
Mills County	**0**	**30**	**45**	**54**	**62**	**72**	**78**
Goldthwaite	0	30	45	54	62	72	78
San Saba County	**0**	**32**	**46**	**55**	**64**	**74**	**80**
San Saba	0	32	45	55	63	73	80
Travis County	**Not Participating**						
Briarcliff	32	44	58	67	75	86	93
Jonestown	32	45	58	67	75	86	92
Lago Vista	32	45	58	67	75	86	92

JURISDICTION	WIND SPEED (MPH) PER RETURN PERIOD						
	10-Year	20-Year	50-Year	100-Year	200-Year	500-Year	1,000-Year
Lakeway	33	46	59	68	77	87	94
Mustang Ridge	38	51	65	74	83	93	99
Point Venture	32	45	58	67	75	86	92
San Leanna	36	49	63	72	81	91	98
Volente	33	45	59	68	76	87	92
West Lake Hills	35	48	61	70	79	89	96
Wharton County	**63**	**81**	**101**	**114**	**123**	**134**	**141**
East Bernard	58	74	93	104	112	122	129
El Campo	63	81	101	114	123	134	141
Wharton	62	79	99	111	120	130	137
Williamson County	**36**	**49**	**63**	**72**	**81**	**90**	**96**
Cedar Park	33	45	59	68	76	87	93
Florence	30	42	56	65	73	83	89
Hutto	34	47	60	69	78	87	94

Source: HAZUS-MH MR3

Historical Occurrences

Table 7-4 lists hurricanes that have affected the TCRFC planning region beginning in 1854. From 1858 to 2008, NOAA reports 10 hurricanes to have affected the Lower Colorado River Basin and 275 fatalities.

Table 7-4. Hurricanes That Have Affected the Lower Colorado River Basin, NOAA

Event	Year	Date	Deaths	Comments
Unnamed hurricane	1854	19 Sep	4	Almost all buildings in Matagorda were destroyed.

Event	Year	Date	Deaths	Comments
Unnamed hurricane	1886	19 Aug	0	Storm surge of 15 feet inundated the region, covering the base of the Matagorda Island lighthouse with 4 feet of water.
Unnamed hurricane	1888	16 Jun	0	
Unnamed hurricane	1891	5 Jul	0	
Unnamed hurricane	1921	22 Jun	0	Category 2
Unnamed hurricane	1929	28 Jun	0	Category 1
Unnamed hurricane	1941	23 Sep	4	$6.5 million in damages.
Unnamed hurricane	1942	21 Aug	8	Category 3. Property damage $11.5 M Crop damage $15 M
Unnamed hurricane	1945	30 Aug	8	Category 2. Two-thirds of the Texas coast saw winds of hurricane force. Damages $20 M.
Hurricane Carla	1961	14 Sep	34	Hurricane force gusts were seen along almost the entire Texas Coast.
Hurricane Beulah	1967	20 Sep	15	115 tornadoes were spawned by the system. A tornado near Louise in Wharton County caused one death.
Hurricane Fern	1971	10 Sep	2	Category 1. $30 million in damages.
Tropical storm Dean	1995	30 Jul	0	
Tropical storm Charley	1998	21 Aug	0	Matagorda Locks measured gusts to 69 mph.

Event	Year	Date	Deaths	Comments
Tropical storm Frances	1998	7 Sep	3	Tides ran as high as 8 feet at the Matagorda Locks.
Tropical storm Fay	2002	5 Sep	0	
Hurricane Claudette	2003	15 Jul	2	Category 1 hitting Port O'Connor in Matagorda Bay, causing destruction in a 15-county area. Sustained winds of 97 miles per hour. The Insurance Council of Texas estimates structural and auto damage of $60 - $80 million.
Tropical storm Grace	2003	1 Sep	0	Heavy rains before and after landfall resulted in flash flooding across mainly upper Texas coastal areas. The Corps of Engineers at the Matagorda River Locks (Matagorda, Matagorda County) reported 9 inches of rain between 1 am and 7 am
Hurricane Ike	2008	12 Sep	195	Hurricane Ike devastated Galveston County and the Texas Gulf coast. The height of the storm tide ranged from 4 to 6 feet in Matagorda county. Collectively, damage amounts are estimated to be near 14 billion dollars over the counties of Harris, Chambers, Galveston, Liberty, Polk, Matagorda, Brazoria, Fort Bend, San Jacinto, and Montgomery. Wharton County was also affected.

Probability of Future Events

Hurricanes occur in seasonal patterns, with hurricane season occurring between June 1 and November 30. Based on previous occurrences and weather patterns in the area, the probability of occurrence is occasional with an event possible in the next five years.

Vulnerability Analysis

Due to the Lower Colorado River Basin's geographic location, this area of the State is vulnerable to damage from hurricane winds and inland impact of coastal storms. Matagorda County experiences the greatest impact as it is located on the coast, but counties in close proximity, including Fayette and Colorado counties would experience greater intensity and wind speeds in a hurricane event than jurisdictions located further inland.

Tropical storm-force winds are strong enough to be dangerous to those caught in them. For this reason, emergency managers plan on having evacuations complete and personnel sheltered before the onset of tropical storm-force winds, not hurricane-force winds.

Hurricane-force winds can easily destroy poorly constructed buildings and mobile homes. Debris such as signs, roofing material, and small items left outside become extremely hazardous in hurricanes. Extensive damage to trees, towers, water and underground utility lines (from uprooted trees), and fallen poles cause considerable civic disruption.

Structures along the beachfront or in coastal areas face the primary impact of hurricane winds; however, hurricanes and their secondary hazards can affect the entire TCRFC region. The effects of a hurricane or tropical storm begin to diminish as it moves inland, although effects may be far-reaching. For example, winds alone from Hurricane Ike covered 120 miles, stretching well beyond the coastal area.

Impact

Hurricanes can have a substantial severity of impact. They can cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or suffer major damage.

Tables 7-5 through 7-9 show the potential affected exposure for coastal flooding in Matagorda County for a Category 1-5 Storm Surge. Table 7-10 provides potential annualized losses due to coastal flooding and Table 7-11 provides information on critical facilities and potentially damaged infrastructure due to coastal flooding.

Table 7-5. Potential Affected Exposure for Category 1 Storm Surge in Matagorda County

JURISDICTION	TOTAL EXPOSURE	TOTAL POPULATION IN JURISDICTION	NUMBER OF PEOPLE AT RISK	NUMBER OF BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK
Matagorda County	**$937,051,000**	**14,429**	**3,644**	**4,309**	**$397,715,000**
Bay City	$1,011,160,000	18,709	0	0	$0
Palacios	$236,596,000	4,819	813	392	$47,897,000
TOTALS FOR STUDY AREA	**$2,184,807,000**	**37,957**	**4,457**	**4,701**	**$445,612,000**

Source: HAZUS-MH MR3; FEMA Q3

Table 7-6. Potential Affected Exposure for Category 2 Storm Surge in Matagorda County

JURISDICTION	TOTAL EXPOSURE	TOTAL POPULATION IN JURISDICTION	NUMBER OF PEOPLE AT RISK	NUMBER OF BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK
Matagorda County	**$937,051,000**	**14,429**	**5,719**	**5,658**	**$516,633,000**
Bay City	$1,011,160,000	18,709	0	0	$0
Palacios	$236,596,000	4,819	2,009	1,030	$113,135,000
TOTALS FOR STUDY AREA	**$2,184,807,000**	**37,957**	**7,728**	**6,688**	**$629,768,000**

Table 7-7. Potential Affected Exposure for Category 3 Storm Surge in Matagorda County

JURISDICTION	TOTAL EXPOSURE	TOTAL POPULATION IN JURISDICTION	NUMBER OF PEOPLE AT RISK	NUMBER OF BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK
Matagorda County	**$937,051,000**	**14,429**	**10,071**	**7,770**	**$709,175,000**
Bay City	$1,011,160,000	18,709	0	0	$0
Palacios	$236,596,000	4,819	4,875	2,483	$243,003,000
TOTALS FOR STUDY AREA	**$2,184,807,000**	**37,957**	**14,946**	**10,253**	**$952,178,000**

Table 7-8. Potential Affected Exposure for Category 4 Storm Surge in Matagorda County

JURISDICTION	TOTAL EXPOSURE	TOTAL POPULATION IN JURISDICTION	NUMBER OF PEOPLE AT RISK	NUMBER OF BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK
Matagorda County	**$937,051,000**	**14,429**	**10,220**	**7,860**	**$717,604,000**
Bay City	$1,011,160,000	18,709	0	0	$0
Palacios	$236,596,000	4,819	4,875	2,483	$243,003,000
TOTALS FOR STUDY AREA	**$2,184,807,000**	**37,957**	**15,095**	**10,343**	**$960,607,000**

Table 7-9. Potential Affected Exposure for Category 5 Storm Surge in Matagorda County

JURISDICTION	TOTAL EXPOSURE	TOTAL POPULATION IN JURISDICTION	NUMBER OF PEOPLE AT RISK	NUMBER OF BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK
Matagorda County	**$937,051,000**	**14,429**	**10,705**	**8,147**	**$742,745,000**
Bay City	$1,011,160,000	18,709	0	0	$0
Palacios	$236,596,000	4,819	4,875	2,483	$243,003,000
TOTALS FOR STUDY AREA	**$2,184,807,000**	**37,957**	**15,580**	**10,630**	**$985,748,000**

Table 7-10. Critical Facilities Exposed to Storm Surge in Matagorda County (Countywide)

Storm Surge Based on Saffir Simpson Scale	Total Number and Value of Critical Facilities		Number and Value of Exposed Facilities	
	#	Value	#	Value
Category 1	8	$109,296,884	2	$688,830
Category 2			3	$1,493,770
Category 3			7	$4,141,400
Category 4			7	$5,590,570
Category 5			8	$10,136,920

Source: HAZUS-MH; GIS Analysis

Table 7-11. Potential Annualized Losses Due to Storm Surge for Matagorda County (Countywide)

Storm Surge Based on Saffir Simpson Scale	Expected Property Losses for Residential Buildings	Expected Property Losses for Commercial Buildings	Total Annualized Expected Property Losses	Annualized Percent Loss Ratio
Annualized Losses	$186,089,000	$14,297,000	$200,386,000	9.17%

Source: HAZUS-MH

HAZUS-MH wind speed data, inventory and damage functions, and methodology were used to determine the annual expected loss at the county level. Table 7-12 shows annualized property losses and annualized percent loss ratios by jurisdiction and Table 7-13 shows the expected damage to critical facilities by jurisdiction. "Negligible" indicates that the annualized expected property losses are less than $5,000.

Table 7-12. Potential Annualized Losses by Jurisdiction (Hurricane Wind)

JURISDICTION	TOTAL EXPOSURE ($)	ANNUALIZED LOSSES FOR AT-RISK RESIDENTIAL ($)	ANNUALIZED LOSSES FOR AT-RISK COMMERCIAL ($)	TOTAL ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Bastrop County	**1,898,937,000**	**231,792**	**12,886**	**251,053**	**0.01%**
Bastrop	576,435,000	70,362	Negligible	76,209	0.01%
Elgin	344,327,000	42,030	Negligible	45,522	0.01%
Smithville	271,908,000	33,190	Negligible	35,948	0.01%
Blanco County	**448,775,000**	**23,423**	**Negligible**	**26,901**	**0.01%**
Johnson City	78,214,000	4,082	Negligible	4,688	0.01%
Brown County	**Not Participating**				
Brownwood	1,160,816,000	8,666	Negligible	9,092	0.00%

JURISDICTION	TOTAL EXPOSURE ($)	ANNUALIZED LOSSES FOR AT-RISK RESIDENTIAL ($)	ANNUALIZED LOSSES FOR AT-RISK COMMERCIAL ($)	TOTAL ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Burnet County	**1,142,430,000**	**30,428**	**Negligible**	**32,341**	**0.00%**
Bertram	55,114,000	Negligible	Negligible	Negligible	0.00%
Burnet	255,342,000	6,801	Negligible	7,228	0.00%
Cottonwood Shores	41,613,000	Negligible	Negligible	Negligible	0.00%
Granite Shoals	124,784,000	Negligible	Negligible	Negligible	0.00%
Highland Haven	33,235,000	Negligible	Negligible	Negligible	0.00%
Marble Falls	376,568,000	10,030	Negligible	10,660	0.00%
Meadowlakes	94,973,000	Negligible	Negligible	Negligible	0.00%
Colorado County	**652,241,000**	**424,574**	**37,813**	**489,380**	**0.08%**
Columbus	259,875,000	169,165	15,066	194,986	0.08%
Eagle Lake	168,646,000	109,780	9,777	126,536	0.08%
Weimar	171,576,000	111,687	9,947	128,734	0.08%
Fayette County	**1,143,993,000**	**342,759**	**26,781**	**391,525**	**0.03%**
Carmine	16,978,000	5,087	Negligible	5,811	0.03%
Flatonia	73,581,000	22,046	Negligible	25,183	0.03%
La Grange	308,041,000	92,294	7,211	105,425	0.03%
Lampasas County	**451,748,000**	**11,245**	**Negligible**	**11,976**	**0.00%**
Kempner	47,851,000	Negligible	Negligible	Negligible	0.00%
Lampasas	429,672,000	10,695	397	11,391	0.00%
Lometa	41,863,000	Negligible	Negligible	Negligible	0.00%
Lee County	**491,147,000**	**78,167**	**6,420**	**88,820**	**0.02%**

JURISDICTION	TOTAL EXPOSURE ($)	ANNUALIZED LOSSES FOR AT-RISK RESIDENTIAL ($)	ANNUALIZED LOSSES FOR AT-RISK COMMERCIAL ($)	TOTAL ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Lexington	68,009,000	10,824	Negligible	12,299	0.02%
Giddings	309,504,000	49,258	Negligible	55,971	0.02%
Llano County	**762,494,000**	**20,312**	**Negligible**	**21,173**	**0.00%**
Llano	217,712,000	5,800	Negligible	6,045	0.00%
Horseshoe Bay	401,845,000	10,705	Negligible	11,158	0.00%
Sunrise Beach Village	108,772,000	Negligible	Negligible	Negligible	0.00%
Mason County	**152,814,000**	**Negligible**	**Negligible**	**Negligible**	**0.00%**
Mason	114,666,000	Negligible	Negligible	Negligible	0.00%
Matagorda County	**937,051,000**	**4,477,205**	**448,788**	**5,186,792**	**0.55%**
Bay City	1,011,160,000	4,831,296	484,281	5,597,002	0.55%
Palacios	236,596,000	1,130,450	113,314	1,309,613	0.55%
McCulloch County	**Not Participating**				
Brady	296,230,000	Negligible	Negligible	Negligible	0.00%
Mills County	**200,103,000**	**Negligible**	**Negligible**	**Negligible**	**0.00%**
Goldthwaite	120,497,000	Negligible	Negligible	Negligible	0.00%
San Saba County	**195,326,000**	**Negligible**	**Negligible**	**Negligible**	**0.00%**
San Saba	157,499,000	Negligible	Negligible	Negligible	0.00%
Travis County	**Not Participating**				
Briarcliff	78,826,000	15,786	Negligible	17,593	0.02%
Jonestown	115,523,000	23,135	Negligible	25,784	0.02%
Lago Vista	382,670,000	76,635	5,651	85,408	0.02%

JURISDICTION	TOTAL EXPOSURE ($)	ANNUALIZED LOSSES FOR AT-RISK RESIDENTIAL ($)	ANNUALIZED LOSSES FOR AT-RISK COMMERCIAL ($)	TOTAL ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Lakeway	1,058,045,000	211,888	15,625	236,145	0.02%
Mustang Ridge	38,236,000	7,657	Negligible	8,534	0.02%
Point Venture	49,272,000	9,867	Negligible	10,997	0.02%
San Leanna	27,719,000	5,551	Negligible	6,187	0.02%
Volente	34,753,000	6,960	Negligible	7,757	0.02%
West Lake Hills	546,896,000	109,524	8,076	122,062	0.02%
Wharton County	**1,056,683,000**	**2,512,133**	**264,296**	**2,990,969**	**0.28%**
East Bernard	92,899,000	220,856	23,236	262,953	0.28%
El Campo	641,235,000	1,524,457	160,385	1,815,032	0.28%
Wharton	499,567,000	1,187,659	124,951	1,414,037	0.28%
Williamson County	**6,478,980,000**	**347,206**	**21,668**	**377,089**	**0.01%**
Cedar Park	59,444,000	Negligible	Negligible	Negligible	0.01%
Florence	59,444,000	Negligible	Negligible	Negligible	0.01%
Hutto	91,087,000	Negligible	Negligible	5,301	0.01%
TOTALS FOR STUDY AREA	**27,762,240,000**	**18,633,467**	**1,796,569**	**21,665,310**	**N/A**

Source: HAZUS-MH MR3

Table 7-13. Essential Facilities Potentially Damaged by Jurisdiction (Hurricane Wind)

JURISDICTION	100-YEAR HURRICANE WIND			500-YEAR HURRICANE WIND		
	Loss Of Function (of at least 1 day)	Partially Functional	Fully Functional	Loss Of Function (of at least 1 day)	Partially Functional	Fully Functional
Bastrop County	**0**	**0**	**4**	**4**	**0**	**0**
Bastrop	0	0	17	17	0	0
Elgin	0	0	9	9	0	0
Smithville	0	0	8	8	0	0
Blanco County	**0**	**0**	**4**	**0**	**0**	**4**
Johnson City	0	0	5	0	0	5
Brown County	**Not Participating**					
Brownwood	0	0	17	0	0	17
Burnet County	**0**	**0**	**4**	**0**	**0**	**4**
Bertram	0	0	1	0	0	1
Burnet	0	0	10	0	0	0
Cottonwood Shores	0	0	2	2	0	0
Granite Shoals	0	0	2	2	0	0
Highland Haven	0	0	0	0	0	0
Marble Falls	0	0	8	8	0	0
Meadowlakes	0	0	0	0	0	0
Colorado County	**0**	**0**	**0**	**0**	**0**	**0**
Columbus	10	0	0	10	0	0

JURISDICTION	100-YEAR HURRICANE WIND			500-YEAR HURRICANE WIND		
	Loss Of Function (of at least 1 day)	Partially Functional	Fully Functional	Loss Of Function (of at least 1 day)	Partially Functional	Fully Functional
Eagle Lake	7	0	0	7	0	0
Weimar	7	0	0	7	0	0
Fayette County	**0**	**0**	**0**	**0**	**0**	**0**
Carmine	0	0	1	1	0	0
Flatonia	5	0	0	5	0	0
La Grange	8	0	1	9	0	0
Lampasas County	**0**	**0**	**0**	**0**	**0**	**0**
Kempner	0	0	1	0	0	1
Lampasas	0	0	10	0	0	10
Lometa	0	0	3	0	0	3
Lee County	**0**	**0**	**0**	**0**	**0**	**0**
Lexington	0	0	5	0	0	5
Giddings	0	0	11	11	0	0
Llano County	**0**	**0**	**2**	**0**	**0**	**2**
Llano	0	0	8	6	0	2
Horseshoe Bay	0	0	2	0	0	2
Sunrise Beach Village	0	0	1	0	0	1
Mason County	**0**	**0**	**0**	**0**	**0**	**0**
Mason	0	0	4	0	0	4
Matagorda County	**2**	**0**	**0**	**2**	**0**	**0**

JURISDICTION	100-YEAR HURRICANE WIND			500-YEAR HURRICANE WIND		
	Loss Of Function (of at least 1 day)	Partially Functional	Fully Functional	Loss Of Function (of at least 1 day)	Partially Functional	Fully Functional
Bay City	15	0	0	15	0	0
Palacios	8	0	0	8	0	0
McCulloch County	**Not Participating**					
Brady	0	0	8	0	0	8
Mills County	**0**	**0**	**0**	**0**	**0**	**0**
Goldthwaite	0	0	5	0	0	5
San Saba County	**0**	**0**	**0**	**0**	**0**	**0**
San Saba	0	0	7	0	0	7
Travis County	**Not Participating**					
Briarcliff	0	0	0	0	0	0
Jonestown	0	0	2	2	0	0
Lago Vista	0	0	6	6	0	0
Lakeway	0	0	2	2	0	0
Mustang Ridge	0	0	1	1	0	0
Point Venture	0	0	0	0	0	0
San Leanna	0	0	0	0	0	0
Volente	0	0	0	0	0	0
West Lake Hills	0	0	5	5	0	0
Wharton County	**0**	**0**	**0**	**0**	**0**	**0**
East Bernard	5	0	0	5	0	0

JURISDICTION	100-YEAR HURRICANE WIND			500-YEAR HURRICANE WIND		
	Loss Of Function (of at least 1 day)	Partially Functional	Fully Functional	Loss Of Function (of at least 1 day)	Partially Functional	Fully Functional
El Campo	11	0	0	11	0	0
Wharton	10	0	0	10	0	0
Williamson County	**0**	**0**	**0**	**0**	**0**	**0**
Cedar Park	0	0	14	0	0	14
Florence	0	0	7	0	0	7
Hutto	0	0	4	0	0	4

Source: HAZUS-MH MR3

Section 8 – Severe Thunderstorms

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Hazard Profile

Thunderstorms are created when heat and moisture near the Earth's surface is transported to the upper levels of the atmosphere. By-products of this process are the clouds, precipitation, and wind that become the thunderstorm.

All thunderstorms, regardless of severity, must have three conditions present in order to form. The first necessary condition is moisture in the lower to mid levels of the atmosphere. As air rises in a thunderstorm updraft, moisture condenses into small water drops which form clouds (and eventually precipitation). When the moisture condenses, heat is released into the air, making it warmer and less dense than its surroundings. The added heat allows the air in the updraft to continue rising.

The second necessary condition is instability. If the airmass is unstable, air which is pushed upward by some force will continue upward. An unstable airmass usually contains relatively warm (usually moist) air near the earth's surface and relatively cold (usually dry) air in the mid and upper levels of the atmosphere. As the low-level air rises in an updraft, it becomes less dense than surrounding air and continues to rise. This process is often augmented by added heat due to condensation as discussed above. The air will continue to move upward until it becomes colder and denser than its surroundings.

The third necessary condition is a source of lift. Lift is the mechanism used for starting an updraft in a moist, unstable airmass. The lifting source can take on several forms. The most common source is called differential heating. As the sun heats the earth's surface, portions of the surface (and the air just above the surface) will warm more readily than nearby areas. These "warm pockets" are less dense than the surrounding air and will rise. If unstable air has sufficient moisture, a thunderstorm may form.

According to the National Weather Service (NWS), a thunderstorm occurs when thunder accompanies rainfall. Radar observers use the intensity of radar echos to distinguish between rain showers and thunderstorms. Along with rolling thunder, lightning detection networks routinely track cloud-to-ground flashes to help track thunderstorms.

There are four different types of thunderstorms: Single Cell, Multicell Cluster, Multicell Line, and Super Cell. All are discussed below.

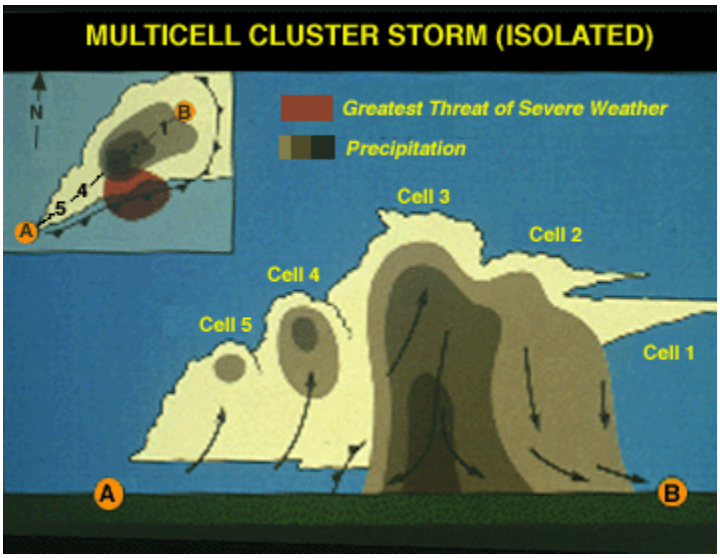
Single Cell Storm

Single cell thunderstorms have lifetimes of 20-30 minutes. Typically, they are not strong enough to produce severe weather. A true single cell storm is rare. Even with separate appearing storms in weak vertical wind shear, the gust front of one cell often triggers the growth of another cell some distance away.

Although most single cell storms are non-severe, some single cell storms may produce brief severe weather events. These storms, known as pulse severe storms, tend to form in more unstable environments than the non-severe single cell storm. Brief heavy rainfall and occasional weak tornadoes can also be expected. Because single cell storms are poorly organized and seem to occur at random times and locations, it is difficult to forecast exactly when and where this type of severe weather will occur.

Multicell Cluster Storm

The multicell cluster is the most common type of thunderstorm. The multicell cluster consists of a group of cells moving along as one unit with each cell in a different phase of the thunderstorm life cycle. As the cluster moves, each cell takes its turn as the dominant cell in the cluster. New cells tend to form at the upwind (usually western or southwestern) edge of the cluster. Mature cells are usually found at the center of the cluster with dissipating cells at the downwind (usually eastern or northeastern) edge of the cluster.



Although each cell in a multicell cluster lasts only about 20 minutes (as with a single cell storm), the multicell cluster itself may persist for several hours. Multicell clusters are usually more intense than single cell storms but weaker than supercell storms. Multicell cluster storms can produce heavy rainfall, downbursts (wind speeds up to about 80 miles an hour), moderate-sized hail (developing up

to golfball size), and occasional weak tornadoes. Severe weather will tend to occur where updrafts and downdrafts are close to each other (i.e., near the updraft- downdraft interface (UDI) associated with mature cells).

Multicell Line Storm

The multicell line storm consists of a long line of storms with a continuous, well-developed gust front at the leading edge of the line. The string of storms can be solid or there can be breaks in the line. As the gust front moves forward, the cold outflow forces warm unstable air into the updraft usually at the leading (eastern) edge of the storm, with the heaviest rain and largest hail just behind (to the west of) the updraft. Lighter rain, associated with older cells, often covers a large area behind the active leading edge of the squall line.

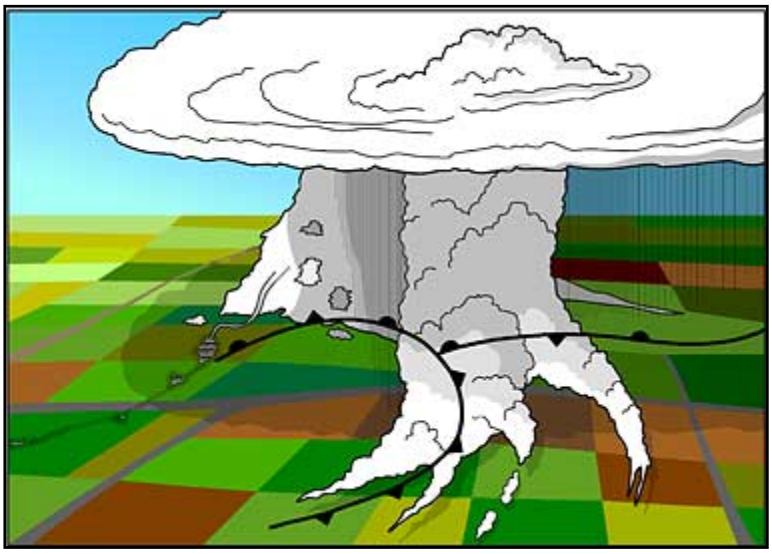
Thunderstorm Clouds on Lake Travis
Source: LCRA

Squall lines can produce hail up to about golf ball size, heavy rainfall and weak tornadoes, but they are best known as prolific downburst producers. Occasionally, an extremely strong downburst will accelerate a portion of the squall line ahead of the rest of the line. This produces what is called a bow echo. Bow echoes are easily detected on radar but are difficult (or impossible) to observe visually.

As with multicell cluster storms, squall lines usually produce severe weather near the UDI. Recall that this is near the leading (eastern) edge of the storm. If tornadoes are associated with a squall line, they will usually develop in cells that are just north of a break in the line or in the line's southemmost cell (sometimes called the "anchor cell"). Cells in these locations tend to behave more like supercells than typical squall line cells.

Supercell Storm

The supercell is a highly organized thunderstorm. Although supercells are rare, they pose an inordinately high threat to life and property. Like the single cell storm, the supercell consists of one main updraft. However, the updraft in a supercell is extremely strong, reaching estimated speeds of 150-175 miles an hour. The main characteristic which sets the supercell apart from the other thunderstorms already discussed is the element of rotation. The rotating updraft of a supercell, called a mesocyclone helps the supercell produce extreme severe weather events, such as giant hail (more than 2 inches in diameter), strong downbursts of 80 miles an hour or more, and strong to violent tornadoes.



Supercell Storm – View from Above
Source: NOAA

The supercell environment is characterized by high instability, strong winds in the mid and upper atmosphere, and veering of winds with height in the lowest mile or so. This environment is a contributing factor to the supercell's organization. As precipitation is produced in the updraft, the strong upper level winds literally blow the precipitation downwind. Relatively little precipitation falls back down through the updraft, so the storm can survive for long periods of time with only minor variations in strength. The leading edge of a supercell's precipitation area is characterized by light rain. Heavier rain falls closer to the updraft with torrential rain and/ or large hail immediately north and east of the main updraft. The area near the main updraft (typically towards the rear of the storm) is the central area of severe weather formation.

Location

Thunderstorms are generally localized events that do not follow specific boundaries. It is not possible to predict the exact location where a thunderstorm may occur, therefore the entire planning region is susceptible to an event uniformly.

Extent

A severe thunderstorm is measured in terms of intensity based on the strength of the wind speeds or significant winds associated with the thunderstorm event. Table 8-1 depicts intensity for thunderstorms according to wind magnitude published by the World Meteorological Organization (WMO).

Table 8-1. Beaufort Wind Scale

FORCE	WIND (KNOTS)	WMO CLASSIFICATION	APPEARANCE OF WIND EFFECTS
0	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	19-24	Fresh Breeze	Small trees in leaf begin to sway
6	25-31	Strong Breeze	Larger tree branches moving, whistling in wires
7	32-38	Near Gale	Whole trees moving, resistance felt walking against wind
8	39-46	Gale	Whole trees in motion, resistance felt walking against wind
9	47-54	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	55-63	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	64-72	Violent Storm	If experienced on land, widespread damage
12	73+	Hurricane	Violence and destruction

Severe thunderstorm events affect the area uniformly based on the past occurrences. On average, an intense wind event to be mitigated for each of the jurisdictions could have wind speeds ranging from 50 miles per hour, a Force 9 from the Beaufort Wind Scale, up to 100 miles per hour, a Force 12, at the greatest.

Historical Occurrences

Historical evidence shows that most of the TCRFC area is susceptible to thunderstorm activity; however, past reported property damages indicate that, while thunderstorm events do occur, their economic impacts are typically not severe. It is important to note that only thunderstorm events that have been reported have been factored into this risk assessment, and in most cases NCDC data is limited to severe thunderstorm events that are noteworthy for specific reasons (high winds, deaths, injuries, property or crop damages, lightning strikes, etc.). It is likely that a high number of occurrences have gone unreported over the past 50+ years. Table 8-2 shows aggregated historical information by jurisdiction.

Table 8-2. Historical Thunderstorm Impact by Jurisdiction (NCDC, 1950-2008)

JURISDICTION	NUMBER OF REPORTED EVENTS	MAXIMUM WIND SPEED RECORDED (KNOTS)	DEATHS	INJURIES	PROPERTY DAMAGE (2008 DOLLARS)
Bastrop County	**36**	**100**	**0**	**0**	**644,180**
Bastrop	10	70	0	0	366,483
Elgin	5	60	0	0	280,430
Smithville	5	60	0	0	70,722
Blanco County	**17**	**70**	**0**	**0**	**425,790**
Johnson City	2	60	0	0	57,964
Brown County	**Not Participating**				
Brownwood	46	70	1	2	2,733,646
Burnet County	**44**	**73**	**0**	**0**	**413,739**
Bertram	0	N/A	0	0	0
Burnet	11	65	0	0	688,503
Cottonwood Shores	0	N/A	0	0	0
Granite Shoals	2	N/A	0	0	75,437
Highland Haven	0	N/A	0	0	0
Marble Falls	12	70	0	0	278,324

JURISDICTION	NUMBER OF REPORTED EVENTS	MAXIMUM WIND SPEED RECORDED (KNOTS)	DEATHS	INJURIES	PROPERTY DAMAGE (2008 DOLLARS)
Meadowlakes	0	N/A	0	0	0
Colorado County	**22**	**65**	**0**	**0**	**371,394**
Columbus	14	80	0	4	362,246
Eagle Lake	7	65	0	0	457,667
Weimar	12	55	0	0	238,953
Fayette County	**25**	**70**	**0**	**0**	**481,209**
Carmine	0	N/A	0	0	0
Flatonia	2	N/A	0	0	33,402
La Grange	7	70	0	0	158,058
Lampasas County	**26**	**65**	**0**	**2**	**359,758**
Kempner	5	52	0	0	80,773
Lampasas	15	61	0	0	167,894
Lometa	5	56	0	6	7,351,867
Lee County	**30**	**86**	**0**	**6**	**577,843**
Lexington	7	70	0	0	338,488
Giddings	10	70	0	0	745,076
Llano County	**31**	**87**	**0**	**0**	**1,354,003**
Llano	11	61	0	0	416,651
Horseshoe Bay	2	N/A	0	0	69,402
Sunrise Beach Village	0	N/A	0	0	0
Mason County	**7**	**86**	**0**	**0**	**4,008**
Mason	10	61	0	0	724,295
Matagorda County	**54**	**95**	**3**	**2**	**89,781**
Bay City	10	60	0	0	222,975

JURISDICTION	NUMBER OF REPORTED EVENTS	MAXIMUM WIND SPEED RECORDED (KNOTS)	DEATHS	INJURIES	PROPERTY DAMAGE (2008 DOLLARS)
Palacios	3	52	0	1	191,049
McCulloch County	**Not Participating**				
Brady	22	61	0	0	604,526
Mills County	**24**	**61**	**0**	**0**	**42,855**
Goldthwaite	12	61	0	0	41,118
San Saba County	**17**	**70**	**0**	**0**	**1,079,165**
San Saba	13	70	0	1	211,884
Travis County	**Not Participating**				
Briarcliff	0	N/A	0	0	0
Jonestown	0	N/A	0	0	0
Lago Vista	0	N/A	0	0	0
Lakeway	1	N/A	0	0	0
Mustang Ridge	0	N/A	0	0	0
Point Venture	0	N/A	0	0	0
San Leanna	0	N/A	0	0	0
Volente	0	N/A	0	0	0
West Lake Hills	1	68	0	0	142,949
Wharton County	**52**	**70**	**0**	**1**	**598,036**
East Bernard	4	51	0	0	209,964
El Campo	12	65	0	4	79,642
Wharton	19	65	0	0	353,836
Williamson County	**113**	**80**	**0**	**2**	**4,255,096**
Cedar Park	5	69	0	0	182,629
Florence	2	65	0	0	131,425

JURISDICTION	NUMBER OF REPORTED EVENTS	MAXIMUM WIND SPEED RECORDED (KNOTS)	DEATHS	INJURIES	PROPERTY DAMAGE (2008 DOLLARS)
Hutto	1	N/A	0	0	1,429,488
TOTALS FOR STUDY AREA	**803**	**2,921**	**4**	**31**	**30,194,623**

Source: NCDC

Probability of Future Events

Most thunderstorms occur during the spring (March, April and May) and fall, during the month of September. The frequency of occurrence for a thunderstorm event is highly likely, meaning that an event is probable in the next year.

Vulnerability Assessment

Thunderstorms can occur at different strength levels, in random locations and can create relatively narrow paths of destruction. Due to the randomness of this event, the entire population and all existing and future structures, facilities in the TCRFC planning area could potentially be impacted and remain vulnerable to possible injury and/or property loss from lightning and strong winds associated with thunderstorms.

Manufactured homes are most vulnerable to strong winds associated with thunderstorms, but if wind speeds are high enough even reinforced structures can be damaged from wind or flying debris.

In an extreme event, severe thunderstorms can lead to flooding, road closures and agricultural damage. Utility failures can result from downed trees and power lines leading to power outages and damage to buildings and property.

Impact

The severity of impact of thunderstorms is considered to be limited as they generally result in injuries treatable with first aid, shut down of critical facilities and services for 24 hours or less, and less than ten percent of affected properties are destroyed or suffer major damage.

To estimate thunderstorm losses, NOAA historical thunderstorm loss data was used to develop a thunderstorm stochastic model. In this model, losses were scaled to account for inflation and expected annualized losses were calculated through a non-linear regression of historical data. Table 8-3 shows potential annualized losses by county. "Negligible" indicates that the annualized expected property losses are less than $5,000.

Table 8-3. Potential Annualized Losses by County (Thunderstorm)

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Bastrop County	**1,898,937,000**	**11,800**	**0.00%**
Bastrop	576,435,000	6,323	0.00%
Elgin	344,327,000	Negligible	0.00%
Smithville	271,908,000	Negligible	0.00%
Blanco County	**448,775,000**	7,525	**0.00%**
Johnson City	78,214,000	Negligible	0.00%
Brown County	**Not Participating**		
Brownwood	1,160,816,000	45,850	0.00%
Burnet County	**1,142,430,000**	**7,093**	**0.00%**
Bertram	55,114,000	Negligible	0.00%
Burnet	255,342,000	12,608	0.00%
Cottonwood Shores	41,613,000	Negligible	0.00%
Granite Shoals	124,784,000	Negligible	0.00%
Highland Haven	33,235,000	Negligible	0.00%
Marble Falls	376,568,000	5,079	0.00%
Meadowlakes	94,973,000	Negligible	0.00%
Colorado County	**652,241,000**	**6,537**	**0.00%**
Columbus	259,875,000	6,186	0.00%
Eagle Lake	168,646,000	8,462	0.01%
Weimar	171,576,000	Negligible	0.00%
Fayette County	**1,143,993,000**	**8,673**	**0.00%**

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Carmine	16,978,000	Negligible	0.00%
Flatonia	73,581,000	Negligible	0.00%
La Grange	308,041,000	Negligible	0.00%
Lampasas County	**451,748,000**	**6,457**	**0.00%**
Kempner	47,851,000	Negligible	0.00%
Lampasas	429,672,000	Negligible	0.00%
Lometa	41,863,000	122,531	0.29%
Lee County	**491,147,000**	**10,601**	**0.00%**
Lexington	68,009,000	6,232	0.01%
Giddings	309,504,000	13,210	0.00%
Llano County	**762,494,000**	**24,920**	**0.00%**
Llano	217,712,000	7,226	0.00%
Horseshoe Bay	401,845,000	Negligible	0.00%
Sunrise Beach Village	108,772,000	Negligible	0.00%
Mason County	**152,814,000**	**Negligible**	**0.00%**
Mason	114,666,000	12,103	0.01%
Matagorda County	**937,051,000**	**Negligible**	**0.00%**
Bay City	1,011,160,000	Negligible	0.00%
Palacios	236,596,000	Negligible	0.00%
McCulloch County	**Not Participating**		
Brady	296,230,000	10,214	0.00%
Mills County	**200,103,000**	**Negligible**	**0.00%**
Goldthwaite	120,497,000	Negligible	0.00%
San Saba County	**195,326,000**	**19,971**	**0.01%**

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
San Saba	157,499,000	Negligible	0.00%
Travis County	**Not Participating**		
Briarcliff	78,826,000	Negligible	0.00%
Jonestown	115,523,000	Negligible	0.00%
Lago Vista	382,670,000	Negligible	0.00%
Lakeway	1,058,045,000	Negligible	0.00%
Mustang Ridge	38,236,000	Negligible	0.00%
Point Venture	49,272,000	Negligible	0.00%
San Leanna	27,719,000	Negligible	0.00%
Volente	34,753,000	Negligible	0.00%
West Lake Hills	546,896,000	14,295	0.00%
Wharton County	**1,056,683,000**	**10,845**	**0.00%**
East Bernard	92,899,000	Negligible	0.00%
El Campo	641,235,000	118,163	0.02%
Wharton	499,567,000	6,267	0.00%
Williamson County	**6,478,980,000**	**75,287**	**0.00%**
Cedar Park	1,872,480,000	Negligible	0.00%
Florence	59,444,000	Negligible	0.00%
Hutto	91,087,000	23,825	0.03%
TOTALS FOR STUDY AREA	**29,575,276,000**	**608,283**	**N/A**

Source: HAZUS-MH MR3 (exposure values) and NCDC (property losses)

Section 9– Tornado

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Hazard Profile

Tornadoes are among the most violent storms on the planet. A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 miles per hour or more. In extreme cases, winds may approach 300 miles per hour. Damage paths can be in excess of one mile wide and 50 miles long.

The most powerful tornadoes are produced by "super-cell thunderstorms[1]." These storms are affected by horizontal wind shears (winds moving in different directions at different altitudes) that begin to rotate the storm. This horizontal rotation can be tilted vertically by violent updrafts, and the rotation radius can shrink, forming a vertical column of very quickly swirling air. This rotating air can eventually reach the ground, forming a tornado.

The Lower Colorado River Basin is known for frequent severe weather and thunderstorms. Thunderstorms form when warm, moist air collides with cooler, drier air. Since these masses tend to come together during the transition from summer to winter, most thunderstorms occur during the spring and fall months. Severe

[1] For a discussion on super-cell thunderstorms, please see the Section 8: *"Thunderstorms"*

thunderstorms can produce tornadoes, high winds, and hail—any of which can cause extensive property damage and loss of life.

Tornadoes occasionally accompany tropical storms and hurricanes that move over land. Tornadoes are the most common to the right and front of the storm center path as it comes ashore. Tornadoes vary in terms of duration, wind speed and the toll that they take, as shown in Table 9-1.

Table 9-1. Variations Among Tornadoes

Weak Tornadoes	Strong Tornadoes	Violent Tornadoes
• 69% of all tornadoes • Less than 5% of tornado deaths • Lifetime 1-10+ minutes • Winds less than 110 mph	• 29% of all tornadoes • Nearly 30% of all tornado deaths • May last 20 minutes or longer • Winds 110 – 205 mph	• 2% of all tornadoes • 70% of all tornado deaths • Lifetime can exceed one hour • Winds greater than 205 mph

Location

Tornadoes do not have a specific geographic boundary and an exact location for where a tornado may occur cannot be predicted. Tornadoes do not follow specific boundaries, but location can be viewed based on historical occurrences. Figure 9-1 on the following page presents an overview of the planning area, and Figures 9-2 through 9-18 depict previous locations of tornadoes through GIS maps for each of the participating jurisdictions.

Figure 9-1. Tornado Event Locations in TCRFC (NCDC, 1950-2008)

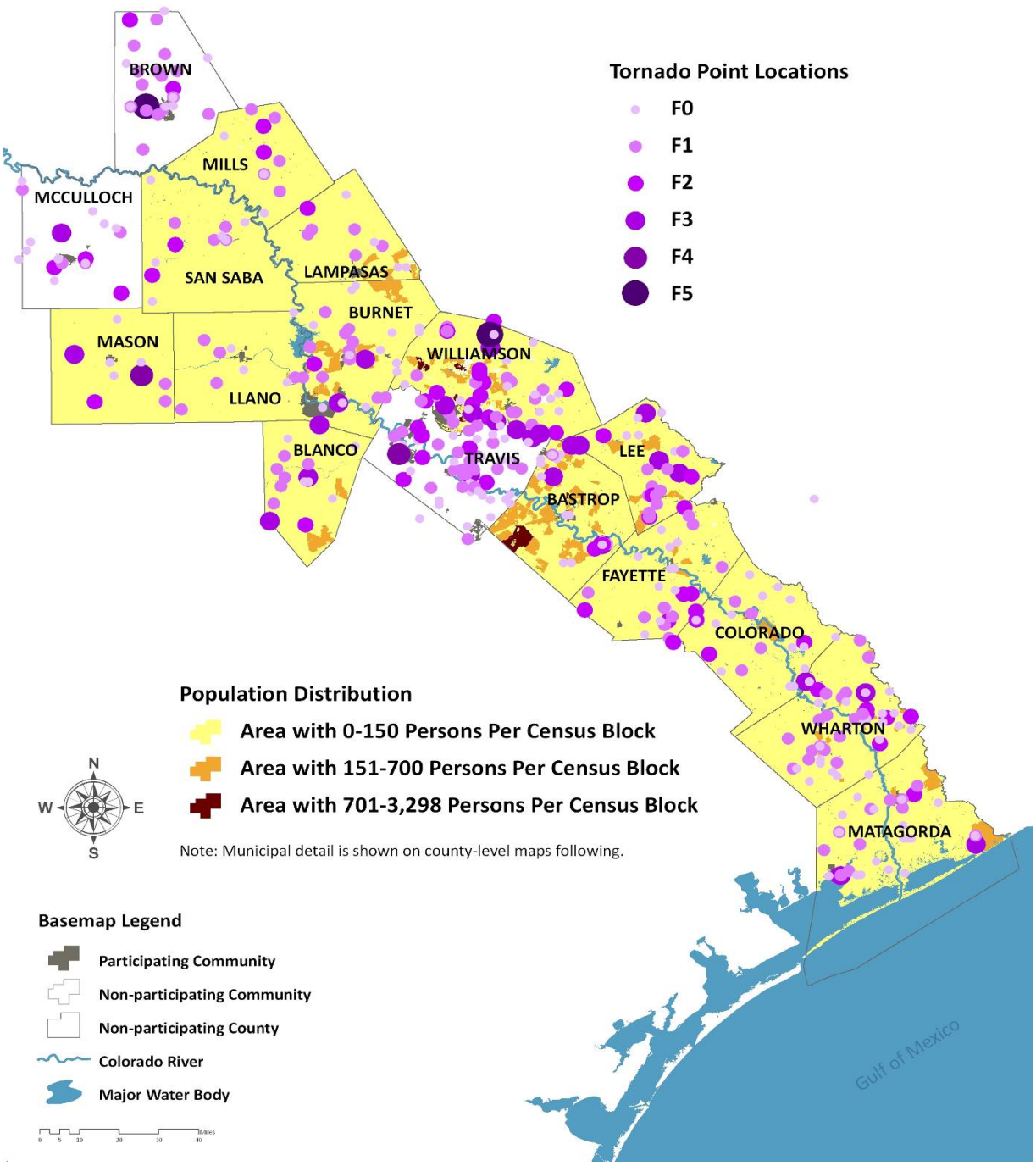


Figure 9-2. Tornado Event Locations in Bastrop County

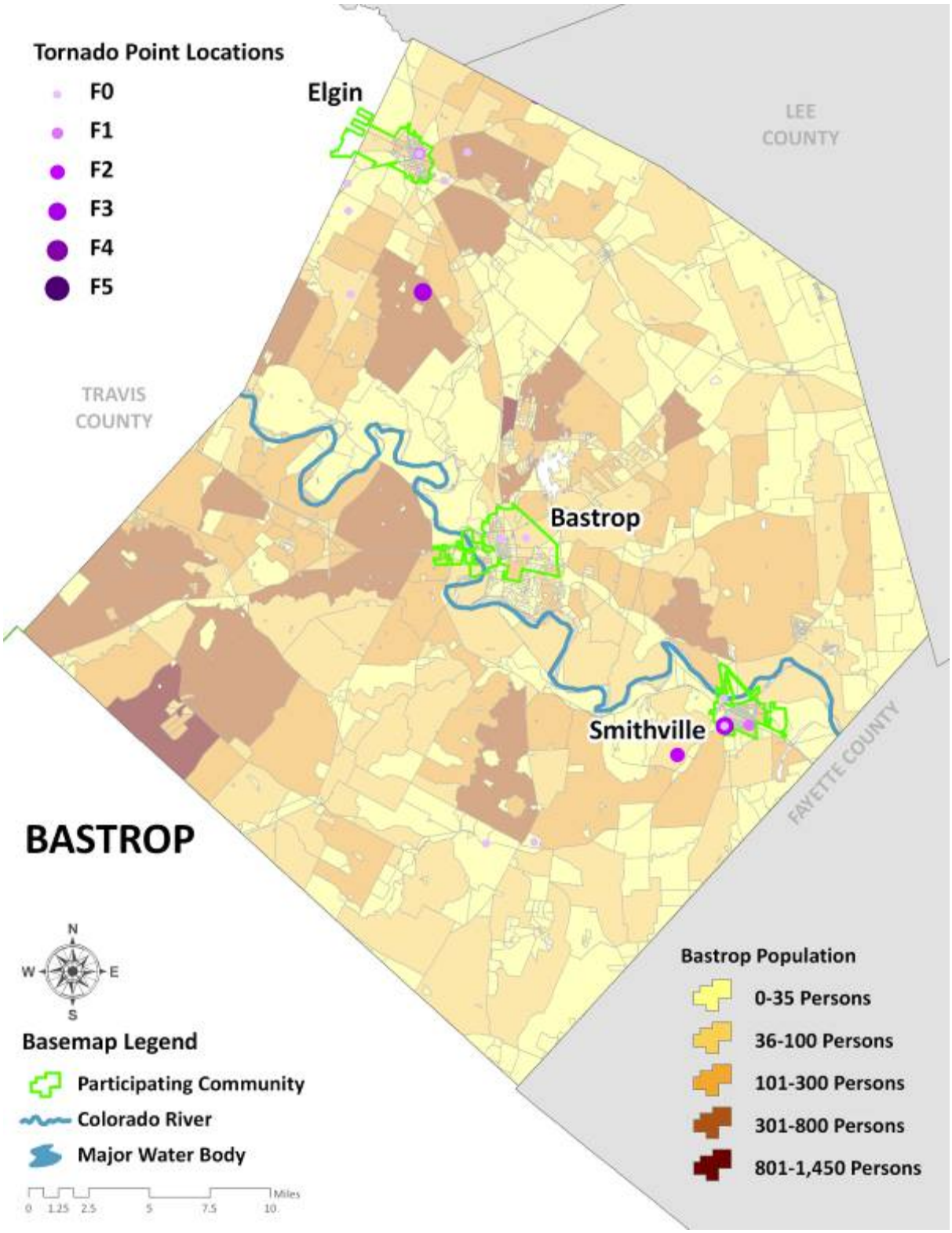


Figure 9-3. Tornado Event Locations in Blanco County

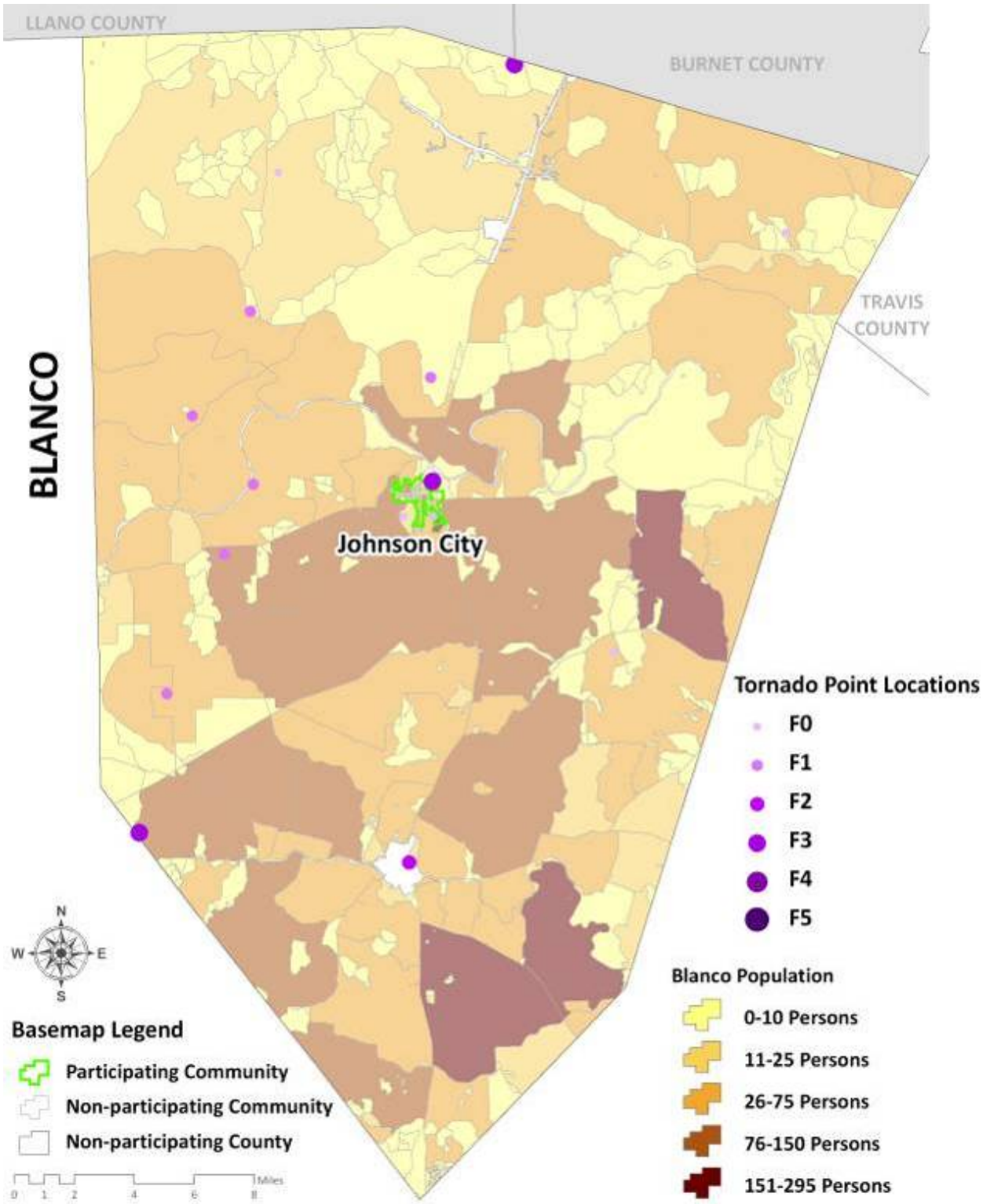


Figure 9-4. Tornado Event Locations in Brown County

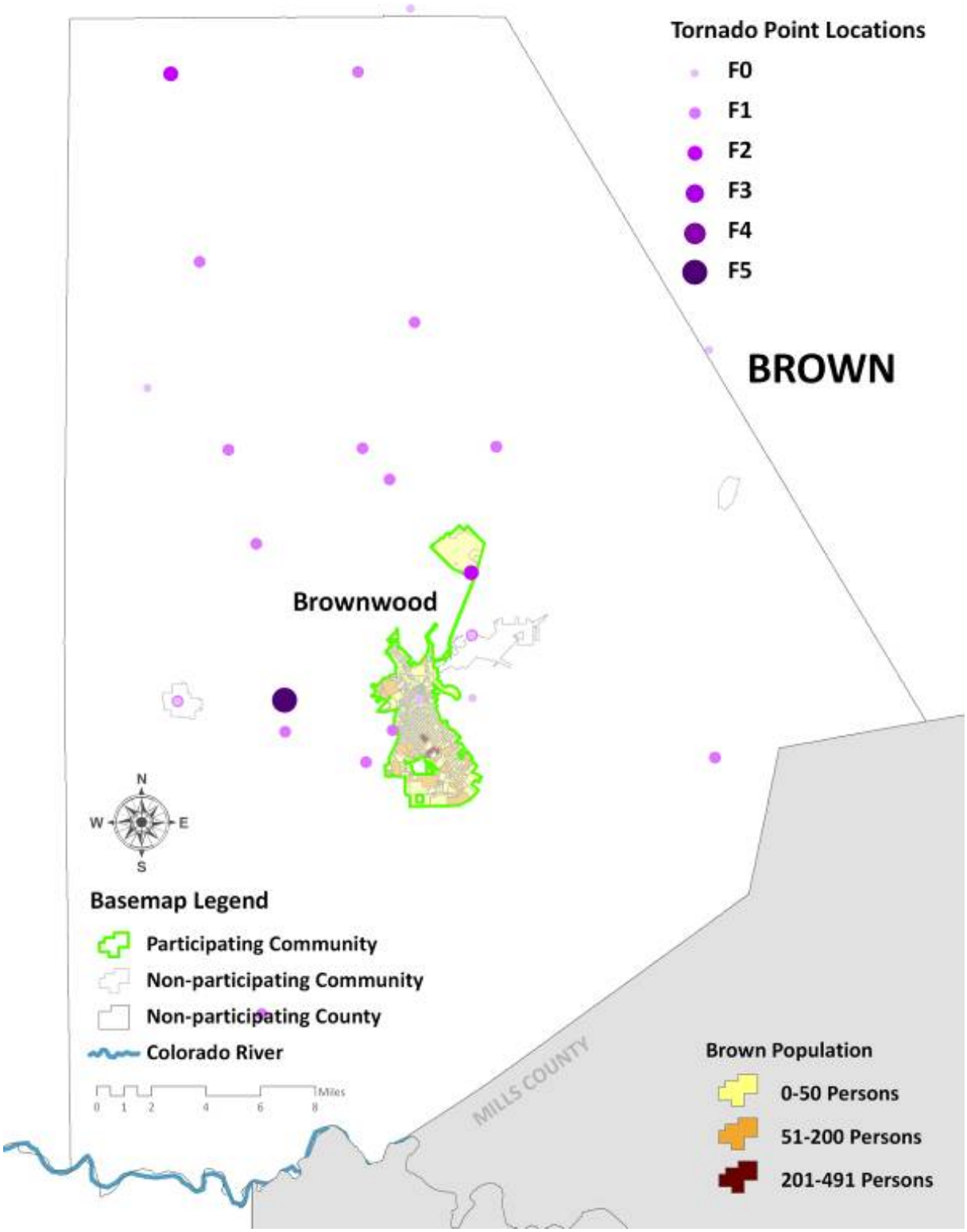


Figure 9-5. Tornado Event Locations in Burnet County

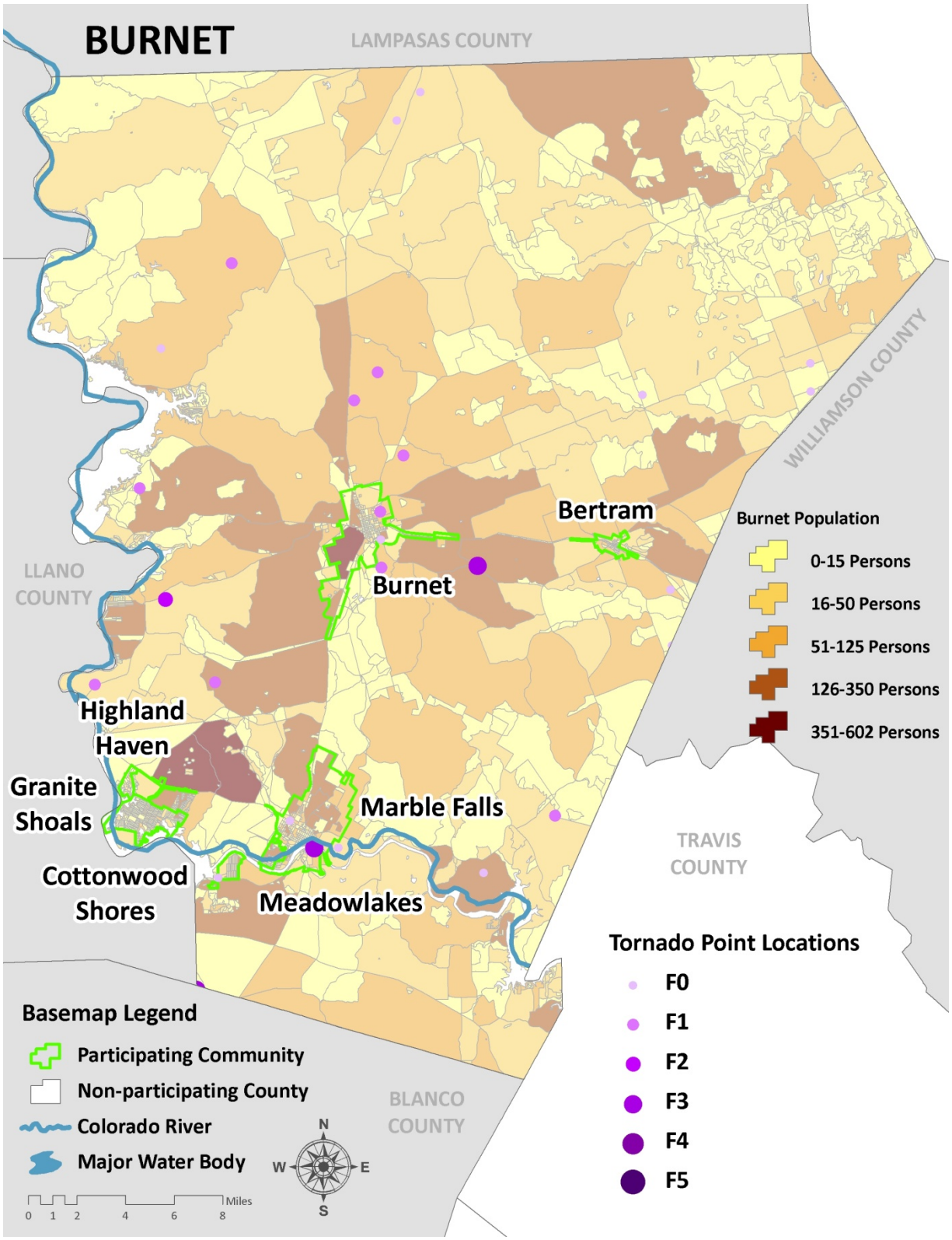


Figure 9-6. Tornado Event Locations in Colorado County

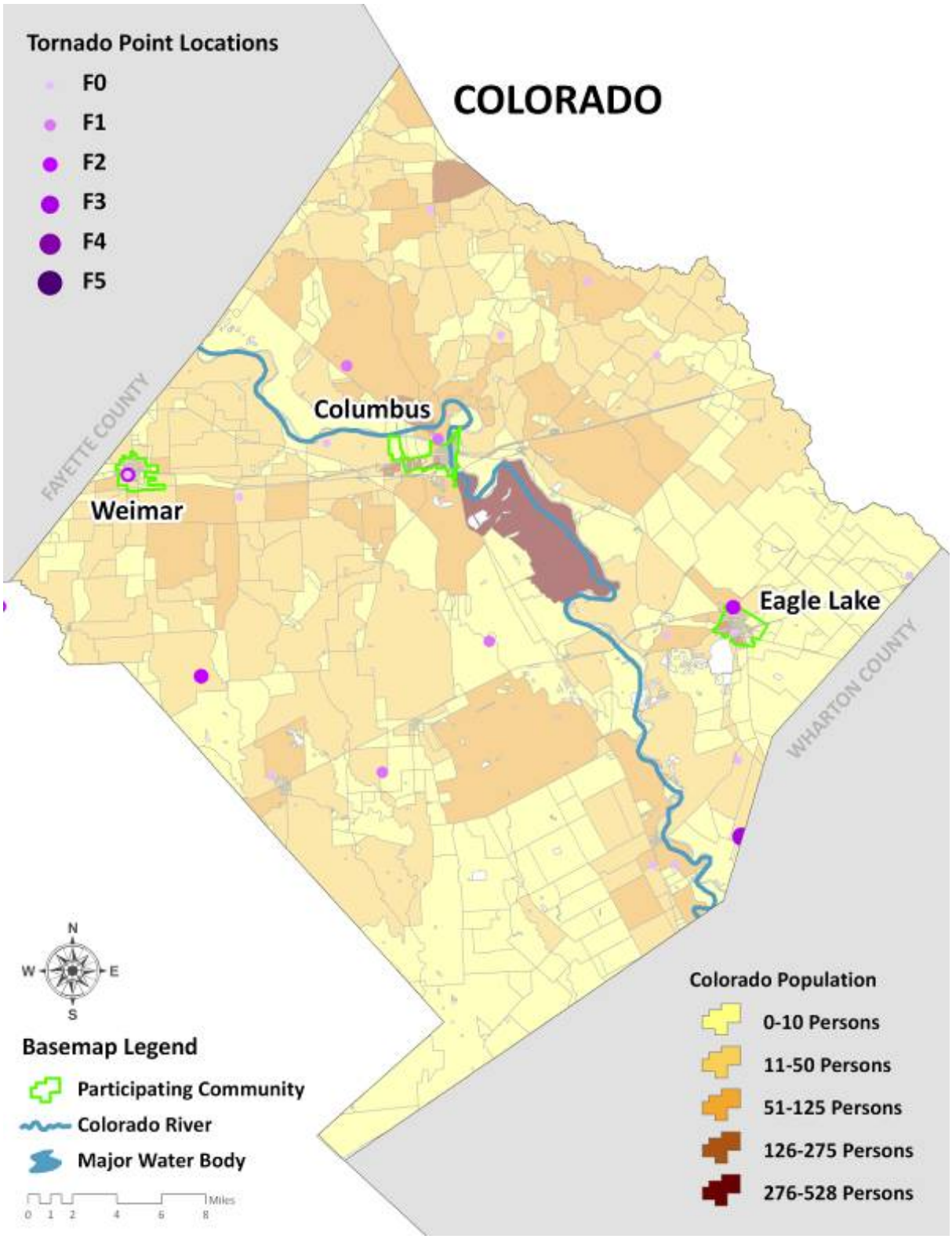


Figure 9-7. Tornado Event Locations in Fayette County

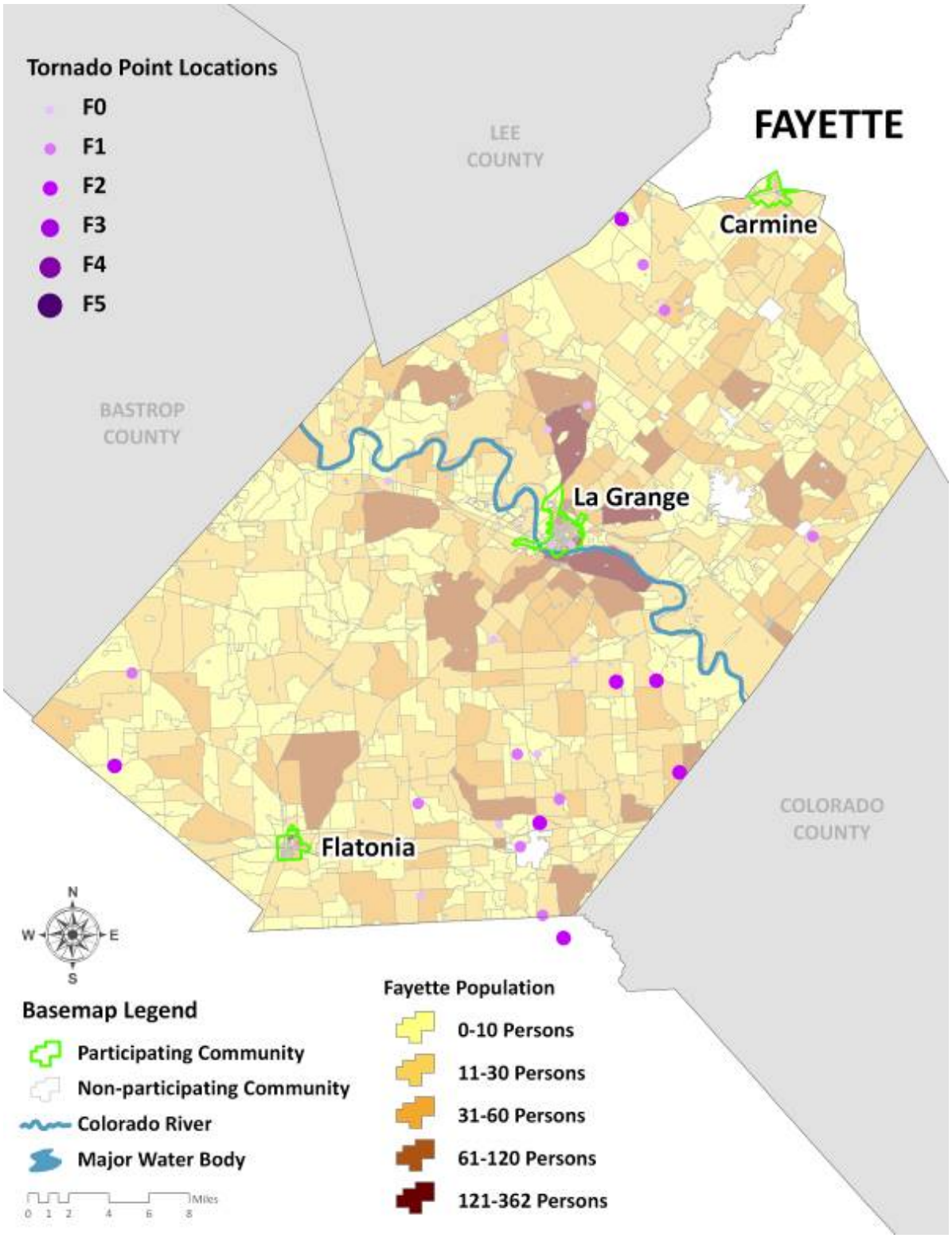


Figure 9-8. Tornado Event Locations in Lampasas County

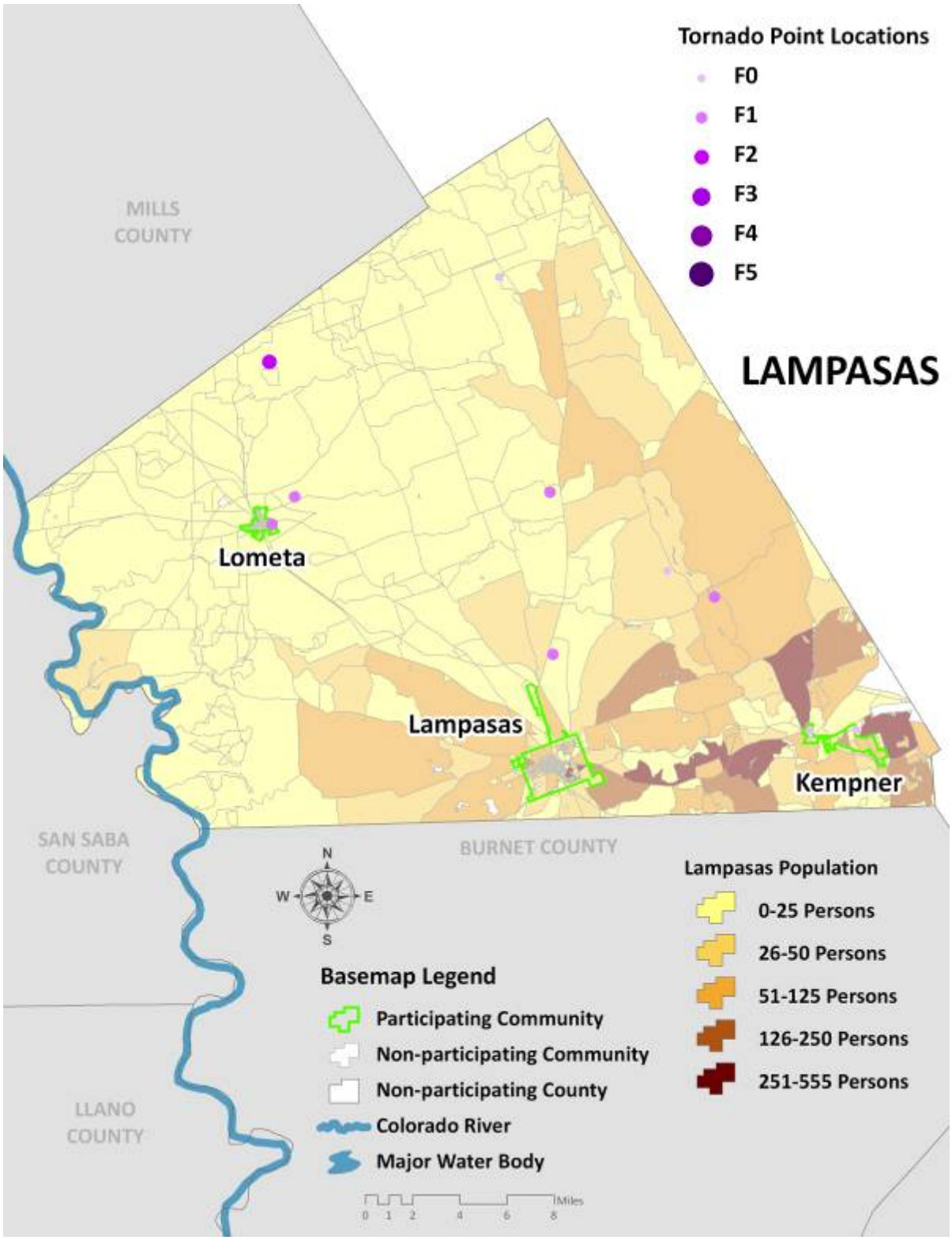


Figure 9-9. Tornado Event Locations in Lee County

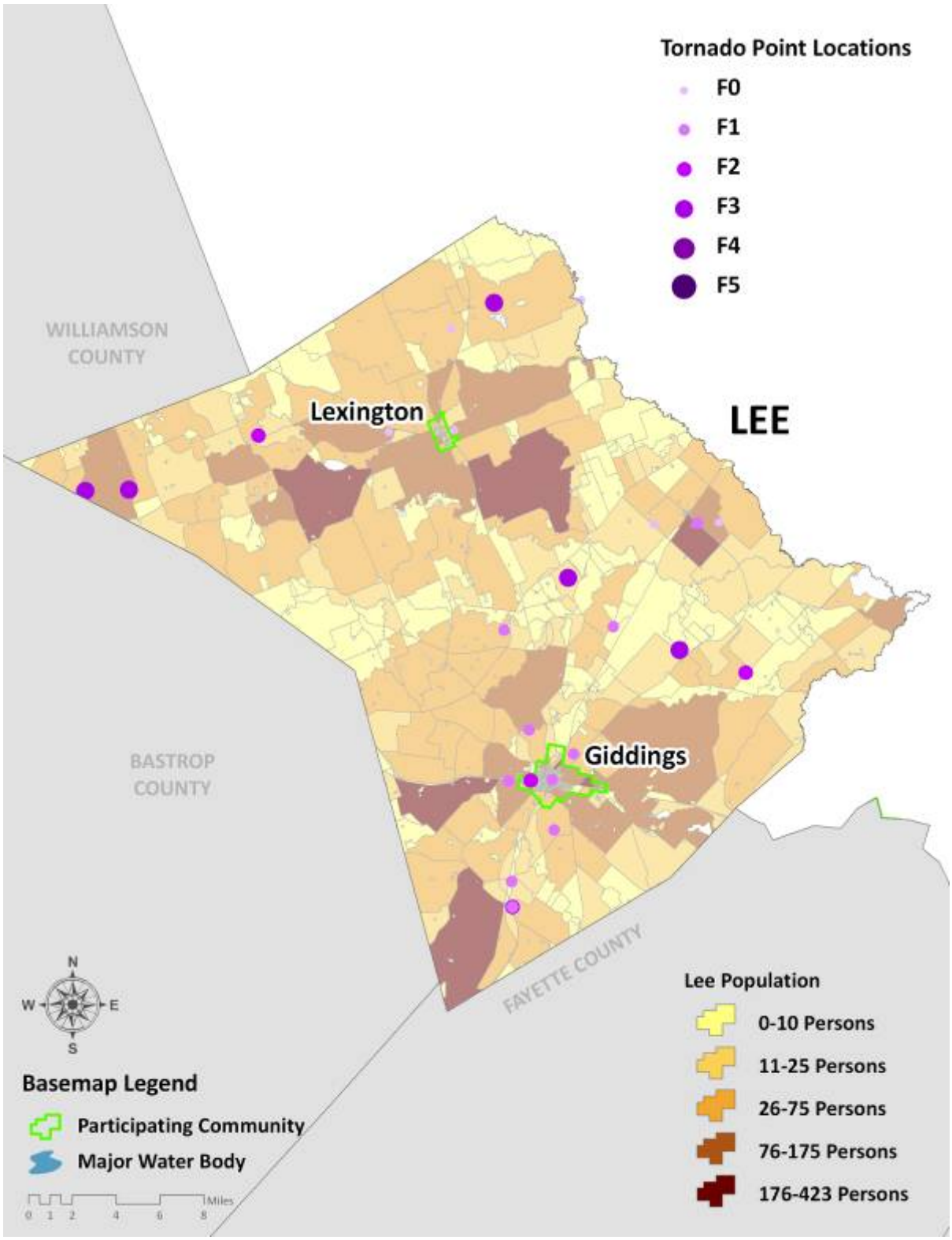


Figure 9-10. Tornado Event Locations in Llano County

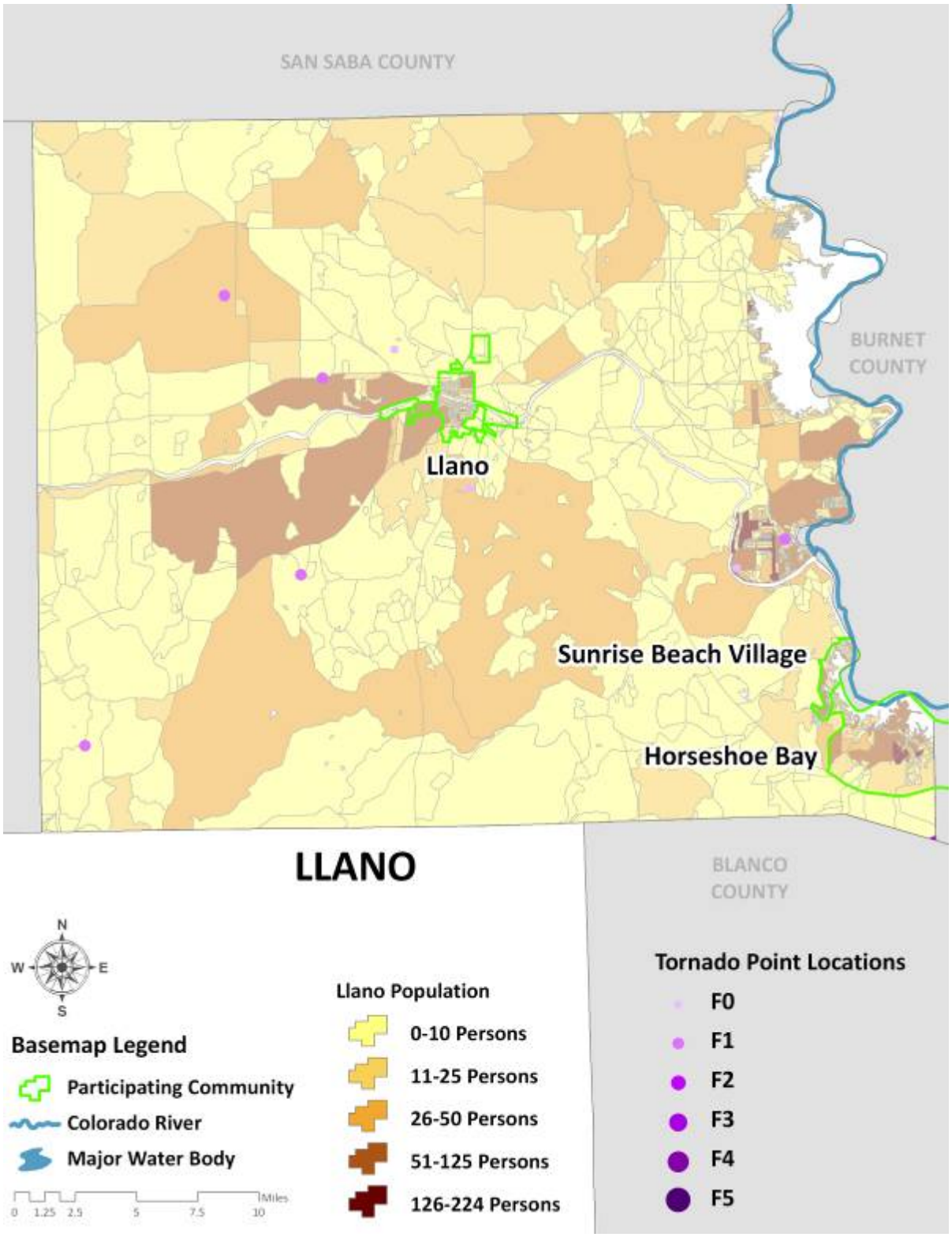


Figure 9-11. Tornado Event Locations in Mason County

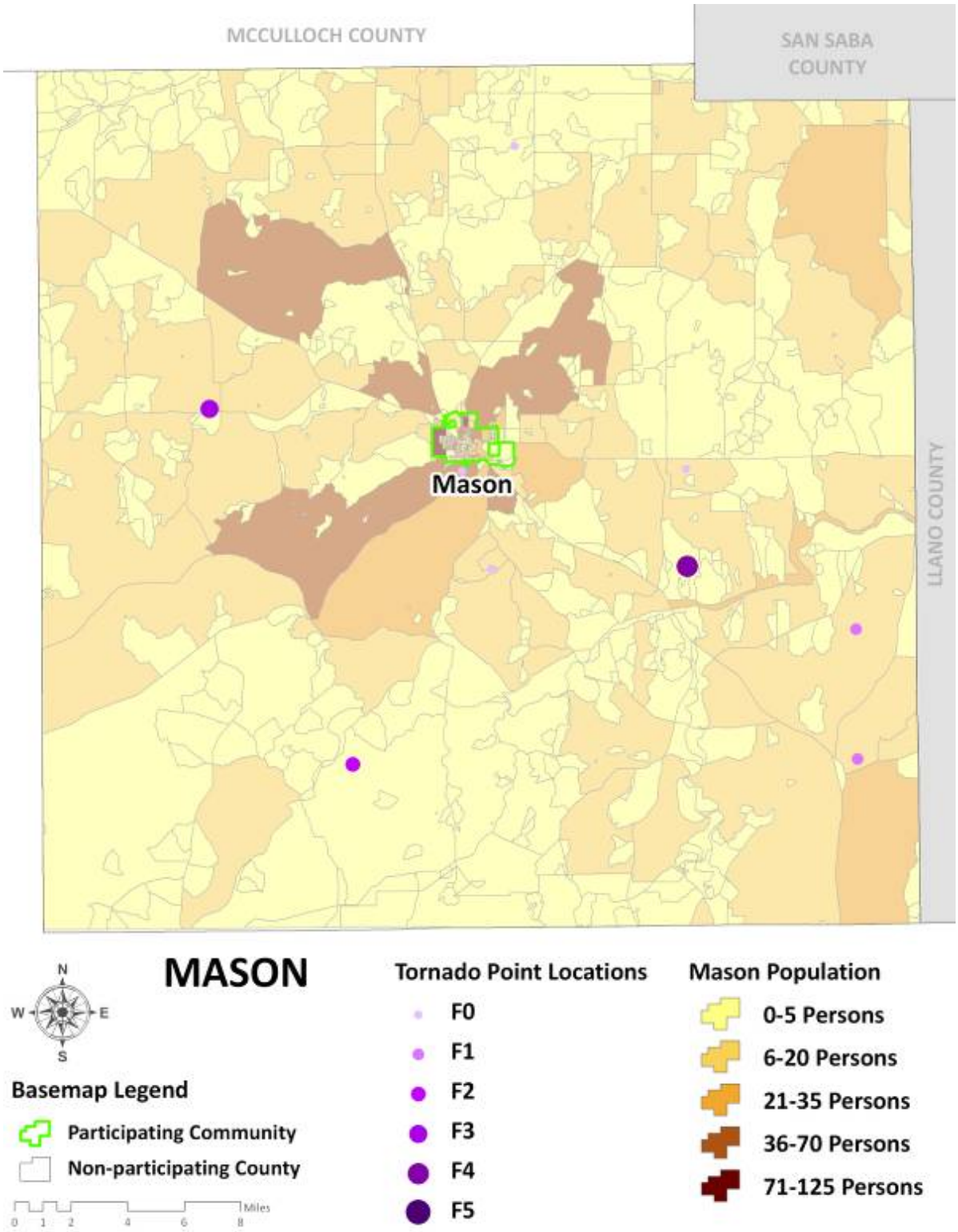


Figure 9-12. Tornado Event Locations in Matagorda County

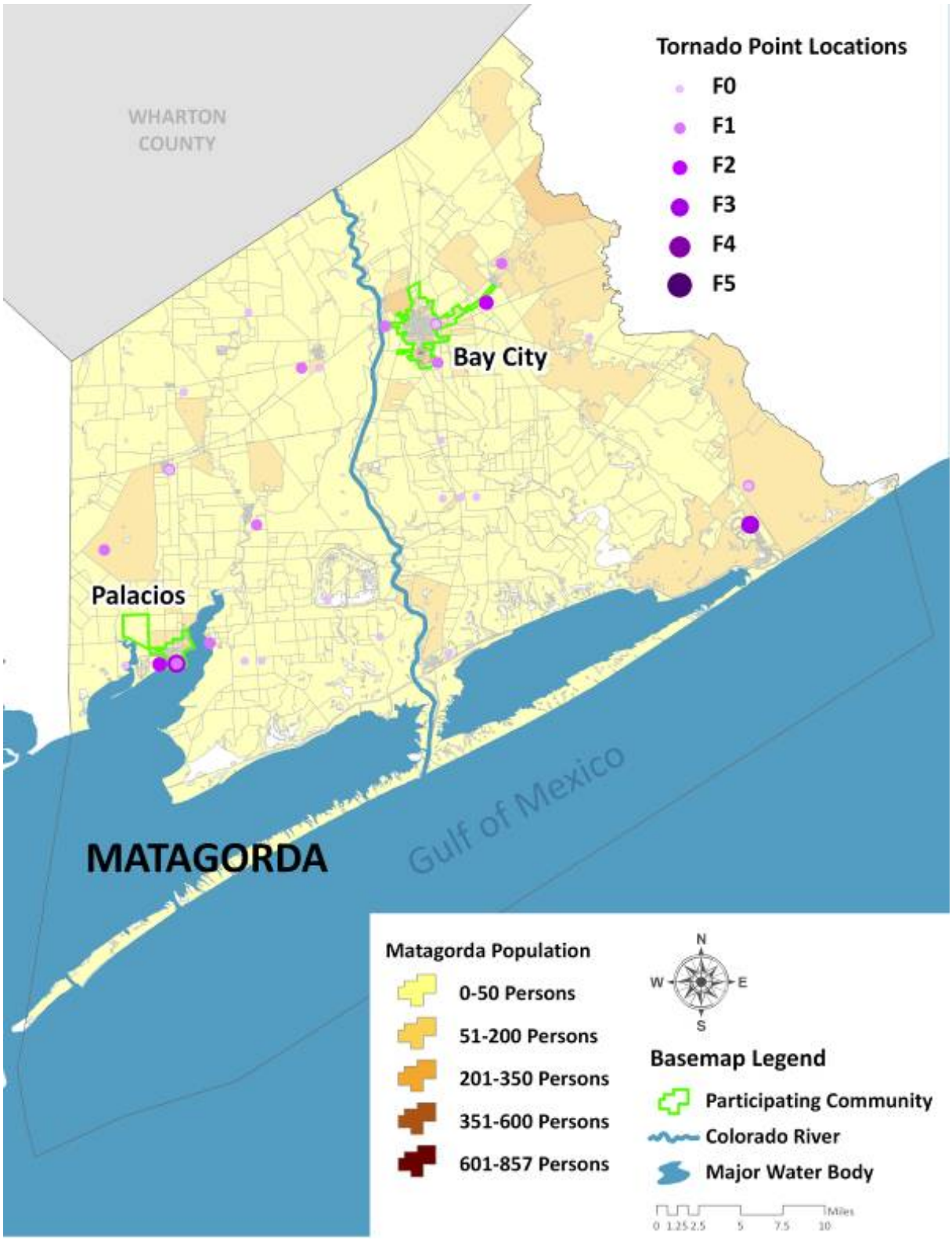


Figure 9-13. Tornado Event Locations in McCulloch County

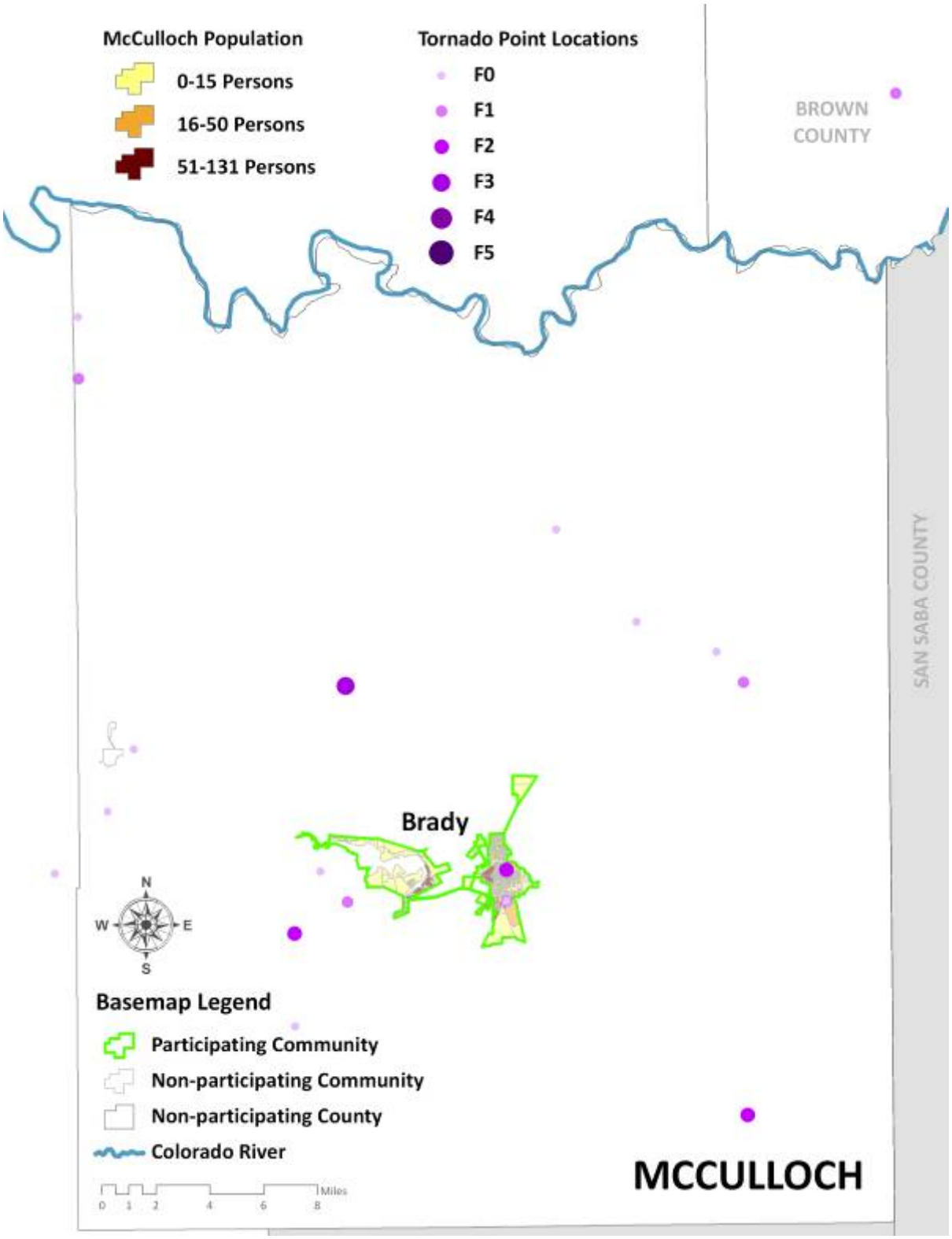


Figure 9-14. Tornado Event Locations in Mills County

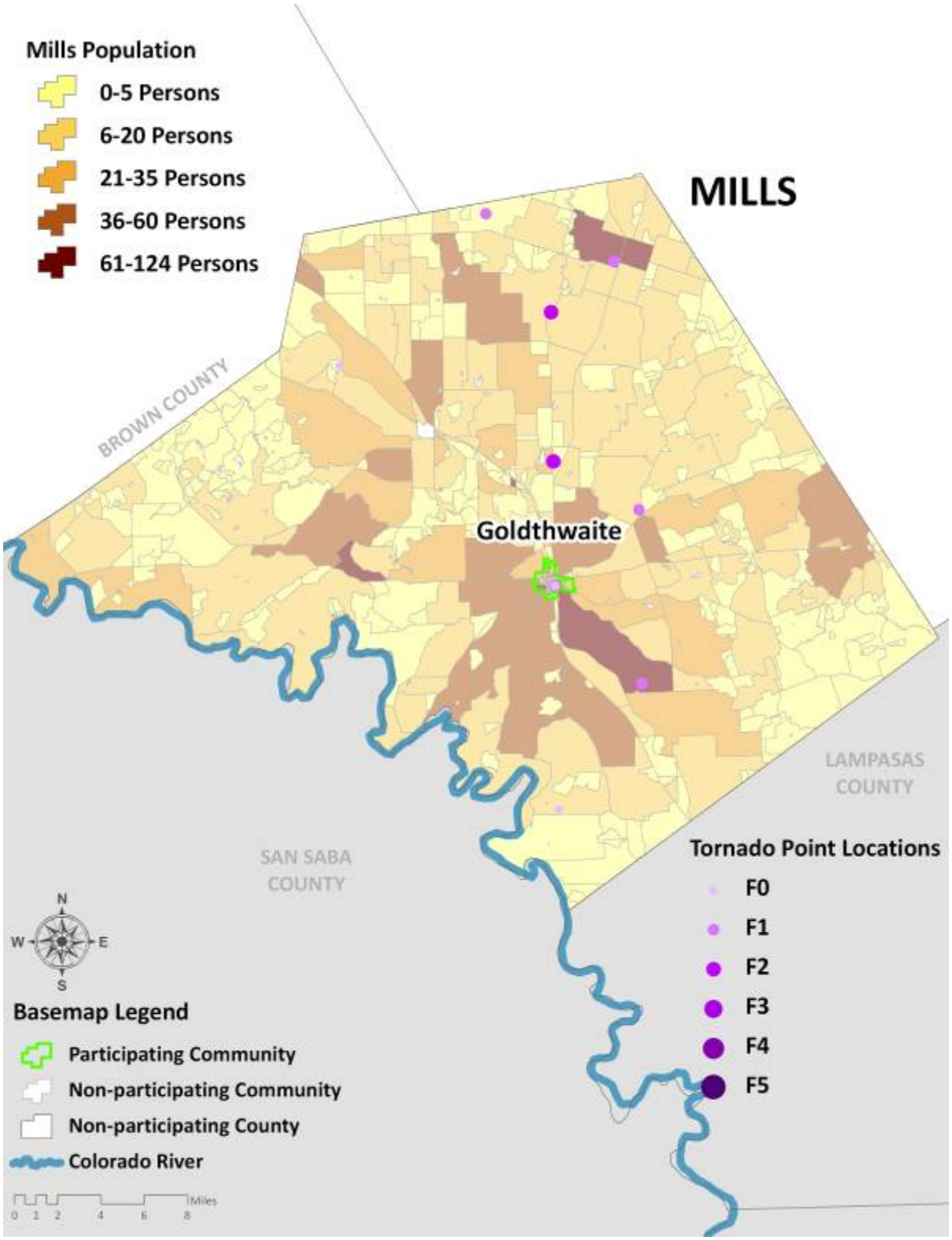


Figure 9-15. Tornado Event Locations in San Saba County

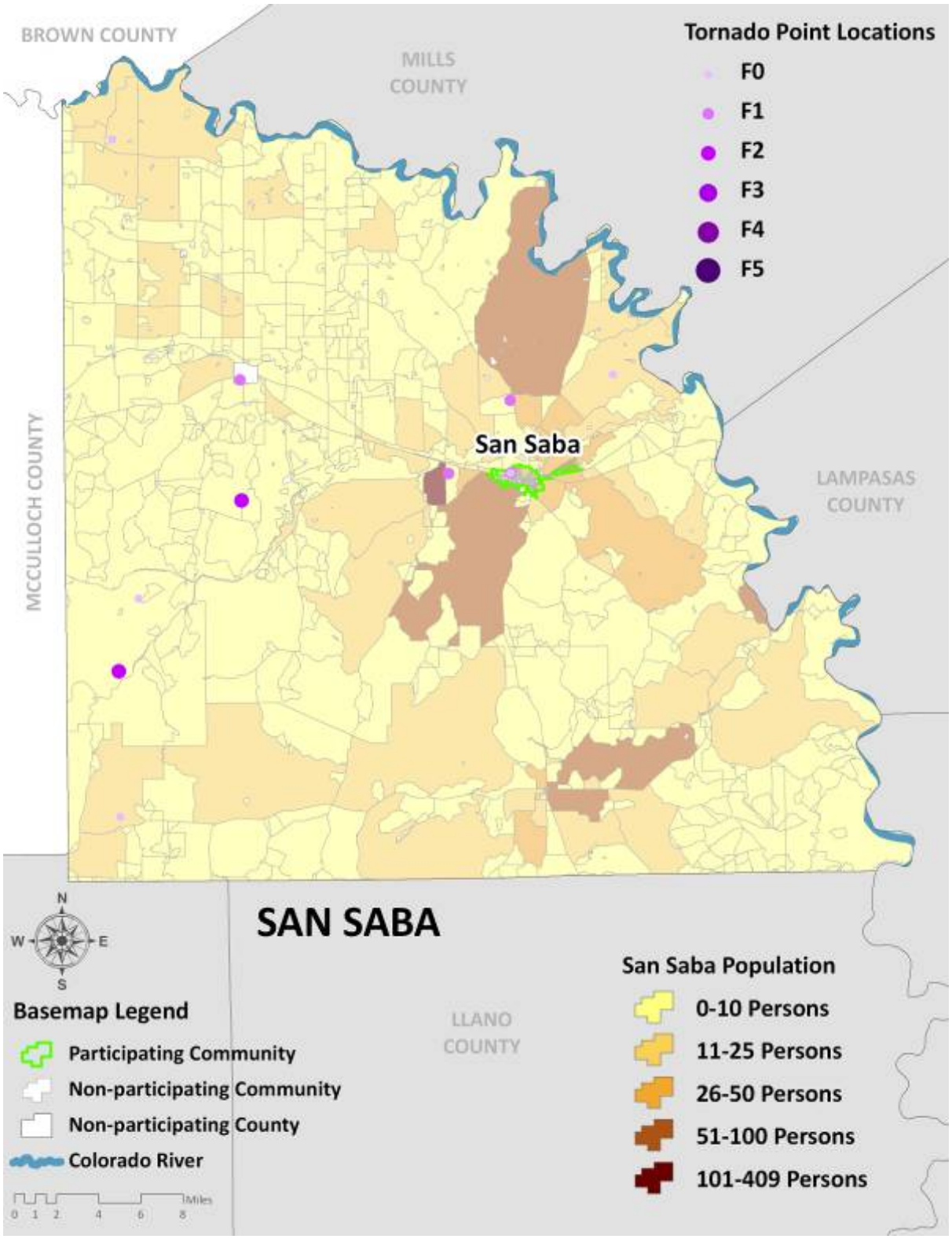


Figure 9-16. Tornado Event Locations in Travis County

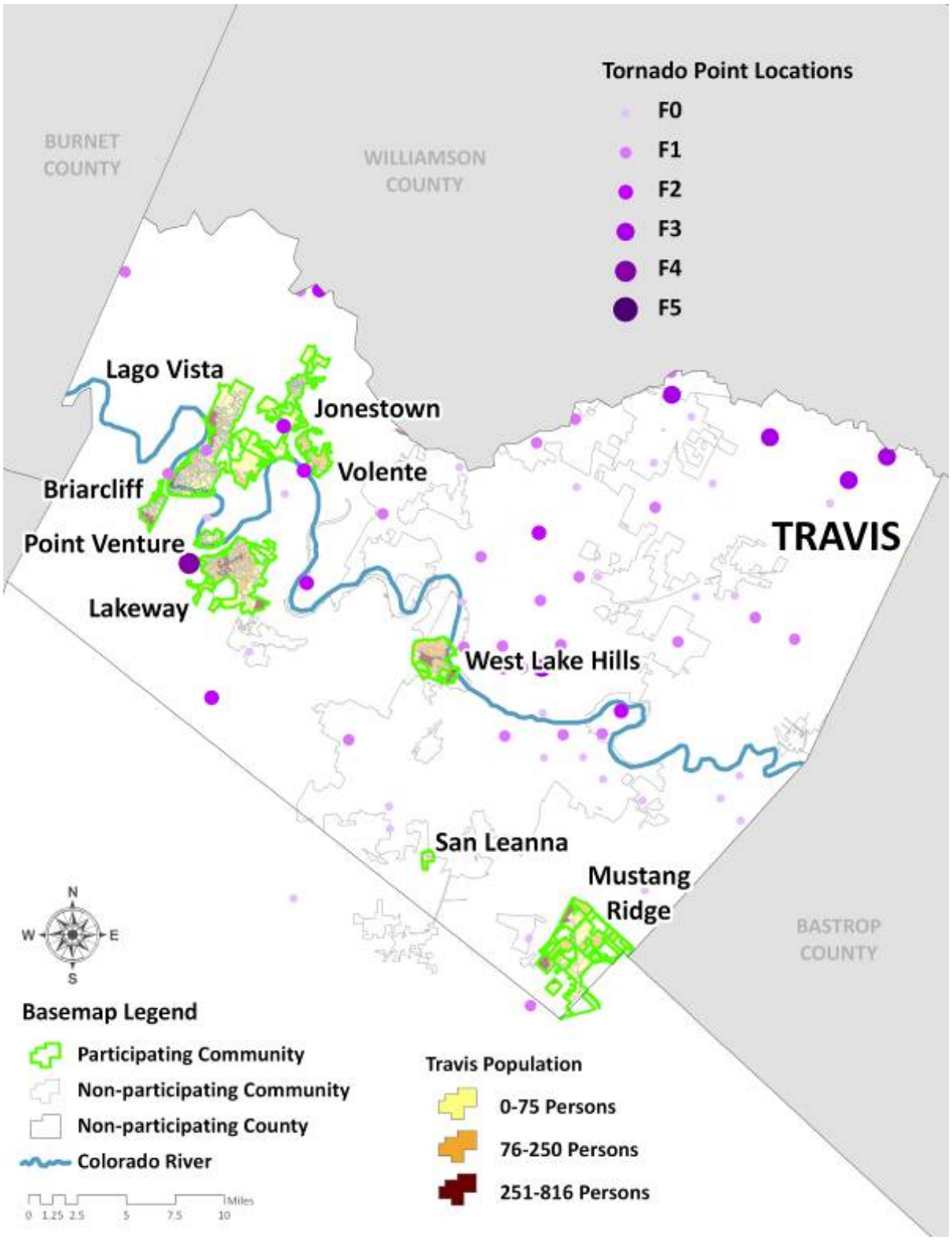


Figure 9-17. Tornado Event Locations in Wharton County

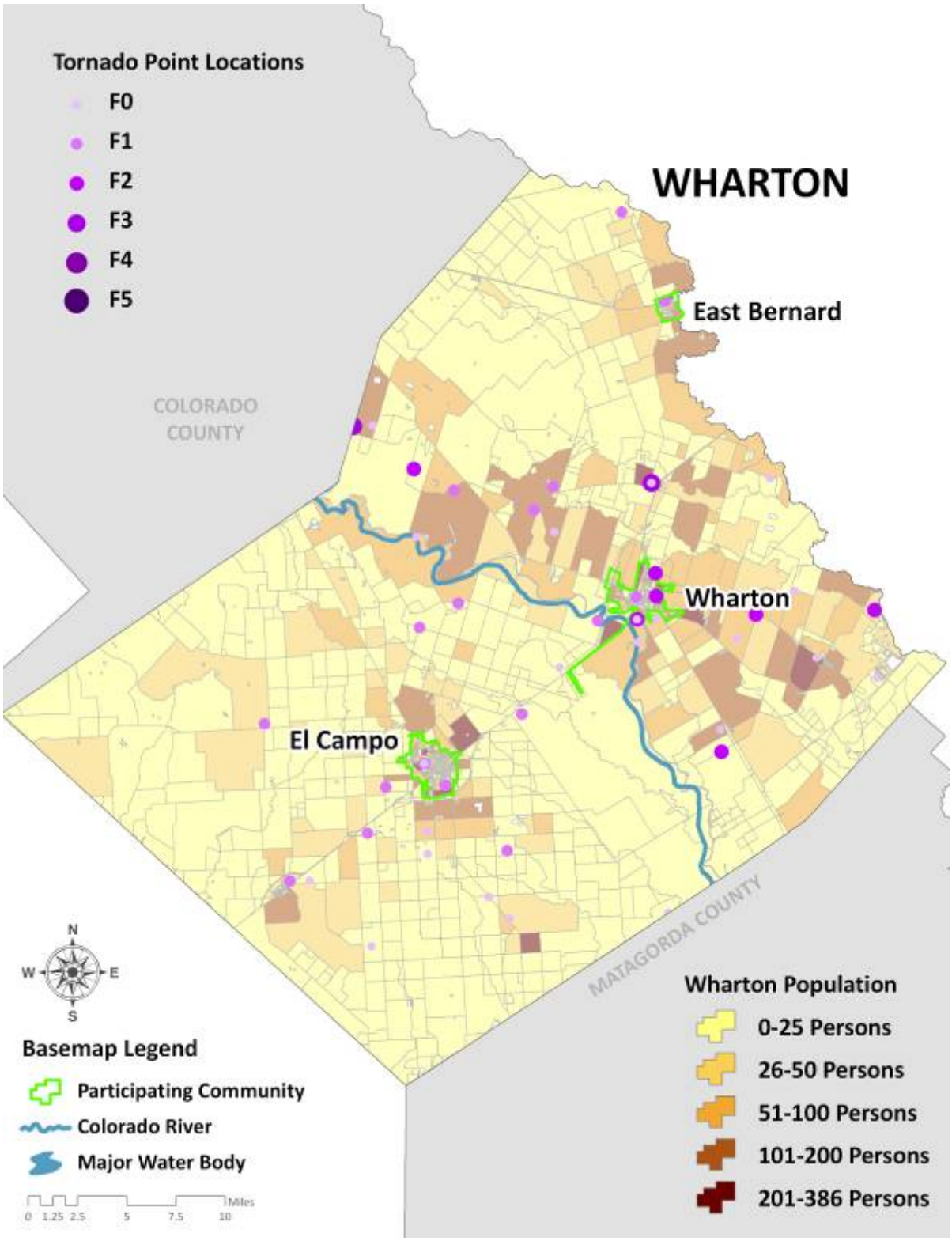
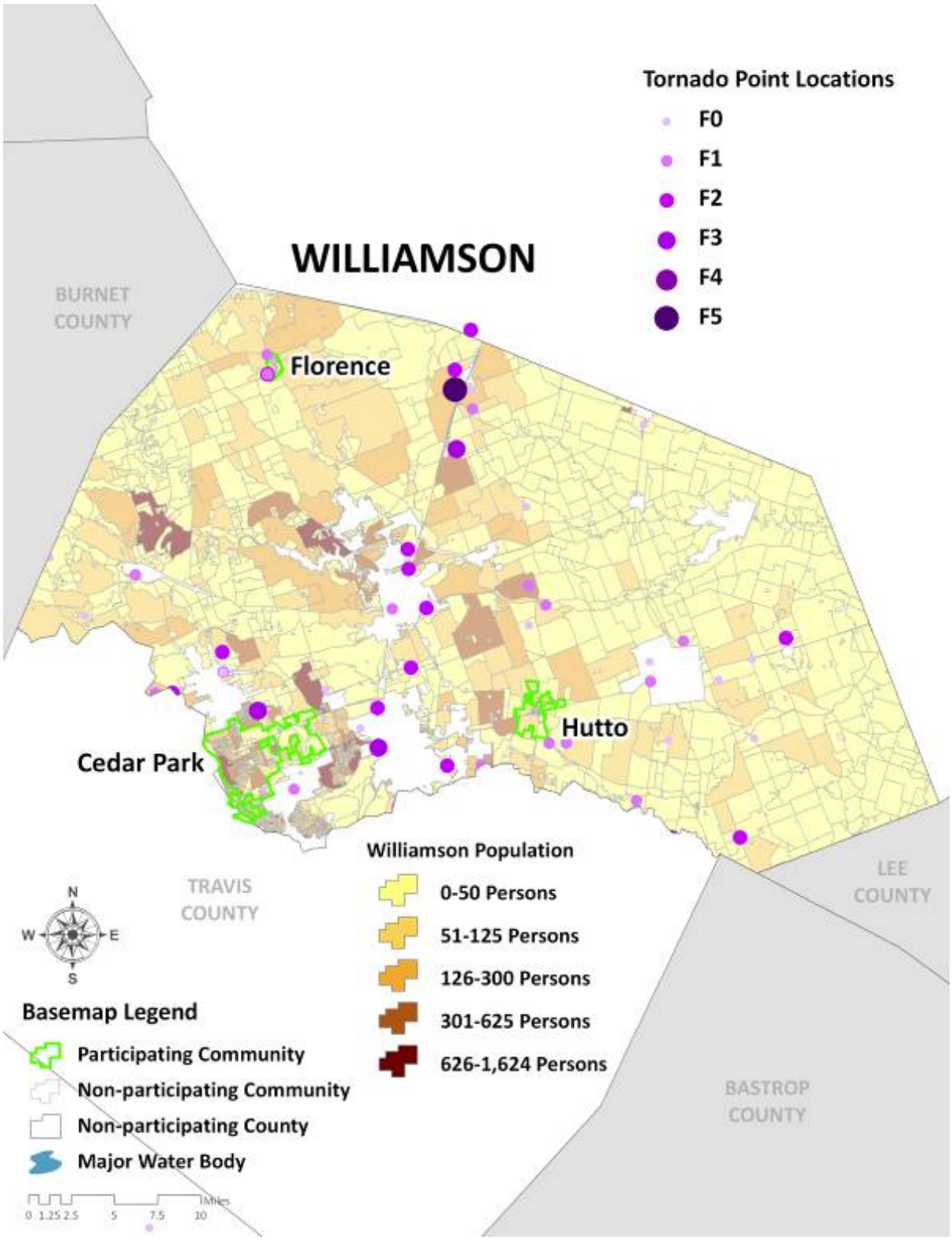


Figure 9-18. Tornado Event Locations in Williamson County



Extent

A tornado is given a Fujita rating of 0-5, based on the most intense damage along its path. Wind velocities necessary to produce center damage are often associated with the Fujita category, but that practice is often misleading. The Fujita wind estimates are intended to be based upon the expected damage to a well-built residential structure. Poorly built structures can suffer significant structural damage under lesser winds than the Fujita Scale might suggest. Commercial properties may or may not experience the same failures under high wind speeds as a residence. Thus, the Fujita scale is largely a residential scale, with much more care required in assessment after wind damage to a commercial structure. A wider range of construction techniques and materials can be found in a building section classified as commercial. For example, a concrete/steel reinforced building is much more durable than a typical community convenience store, yet both may be considered commercial in city land use/appraisal data sets.

Table 9-2. The Fujita Tornado Scale

F-Scale Number	Intensity	Wind Speed (mph)	Type of Damage Done	Percent of Appraised Structure Value Lost Due to Damage
F0	Gale tornado	40-72	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.	None Estimated
F1	Moderate tornado	73-112	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off roads; attached garages may be destroyed.	0% - 20%
F2	Significant tornado	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.	50% - 100%
F3	Severe tornado	158-206	Roof and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted.	100%
F4	Devastating tornado	207-260	Well-constructed homes leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.	100%
F5	Incredible tornado	261-318	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles flying through the air in excess of 330 yards; trees debarked; steel reinforced concrete badly damaged.	100%

Source: http://www.tornadoproject.com/fscale/fscale.htm

Since February 2007, the Fujita scale has been replaced by the Enhanced Fujita scale which retains the same basic design as its predecessor with six strength categories. The newer scale reflects more

refined assessments of tornado damage surveys, standardization, and damage consideration to a wider range of structures. Tornadoes occasionally accompany tropical storms and hurricanes that move over land.

Table 9-3. Enhanced Fujita Scale for Tornadoes

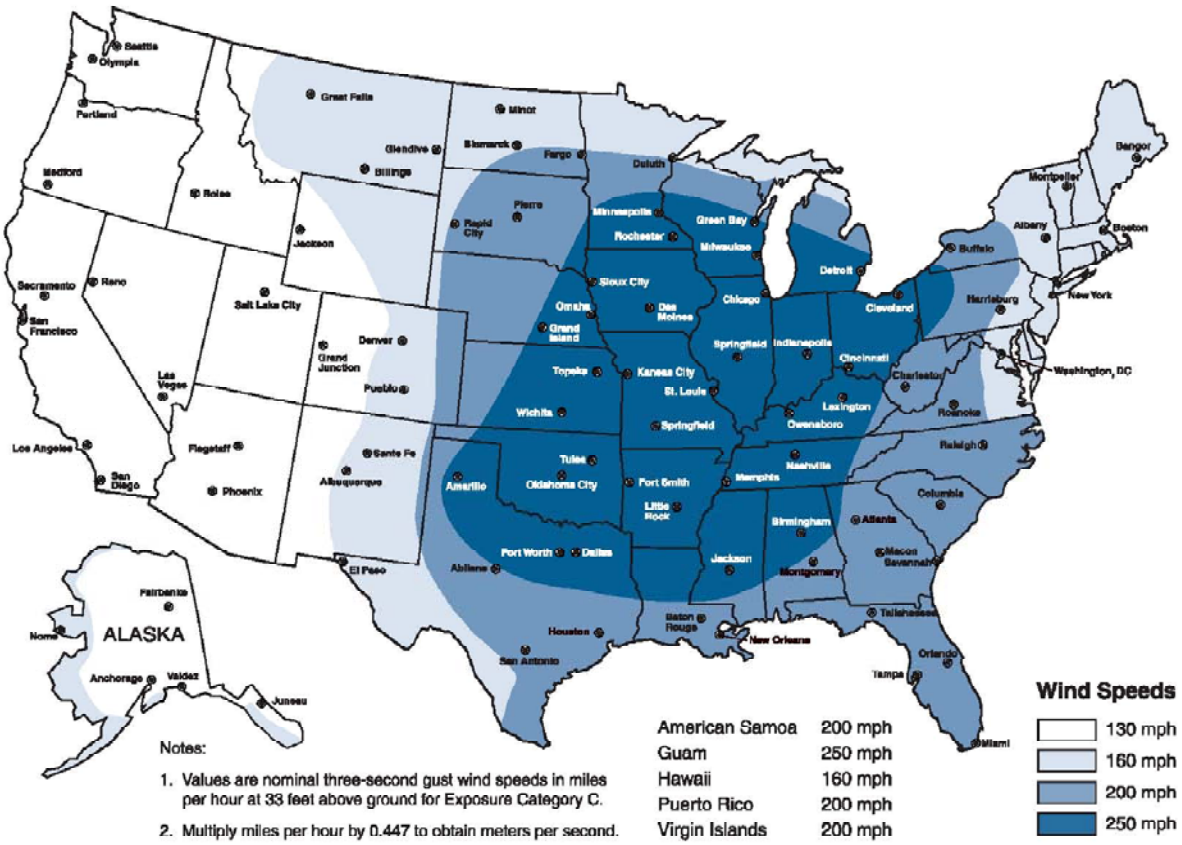
Storm Category	Damage Level	3 Second Gust (mph)	Description of Damages	Photo Example
EF0	GALE	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.	
EF1	WEAK	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages might be destroyed.	
EF2	STRONG	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.	
EF3	SEVERE	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.	
EF4	DEVASTATING	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.	
EF5	INCREDIBLE	200+	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.	

The range of intensity for a tornado for TCRFC jurisdictions can be anywhere from as low as an EF0, with gusts up to 85 miles per hour, to an EF5, which is an incredible storm with winds at over 200 miles per hour.

The jurisdictions in the planning area experience a uniform range of intensity for a tornado as evidenced by the location and historical occurrences. Figure 9-19 below shows the average wind

speeds for the area. All of the TCRFC participating jurisdictions are uniformly exposed to wind speeds up to 200 miles per hour or an EF4.

Figure 9-19. Extent - Average Wind Speeds[2]



Historical Occurrences

Table 9-4 displays the number of events and the magnitude of each event by jurisdiction for all participating communities in the TCRFC planning area. Data is compiled from the NCDC from 1950 to 2008.

[2] Source: Federal Emergency Management Agency (FEMA). *Design and Construction Guidance for Safe Rooms*, FEMA 361, 2008.

Table 9-4. Historical Tornado Impact by Jurisdiction (NCDC, 1950-2008)

JURISDICTION	NUMBER OF EVENTS	MAGNITUDE (FUJITA-SIMPSON SCALE)						MAXIMUM F SCALE
		F0	F1	F2	F3	F4	F5	
Bastrop County (All areas not detailed below.)	**21**	**13**	**1**	**4**	**3**	**0**	**0**	**F3**
Bastrop	0	0	0	0	0	0	0	-
Elgin	4	2	2	0	0	0	0	F1
Smithville	0	0	0	0	0	0	0	-
Blanco County (All areas not detailed below.)	**12**	**5**	**4**	**1**	**2**	**0**	**0**	**F3**
Johnson City	3	1	2	0	0	0	0	F1
Brown County	**Not Participating**							
Brownwood	3	1	2	0	0	0	0	F1
Burnet County (All areas not detailed below.)	**21**	**9**	**10**	**0**	**2**	**0**	**0**	**F3**
Bertram	1	1	0	0	0	0	0	F0
Burnet	5	4	1	0	0	0	0	F1
Cottonwood Shores	0	0	0	0	0	0	0	-
Granite Shoals	0	0	0	0	0	0	0	-
Highland Haven	0	0	0	0	0	0	0	-
Marble Falls	2	1	0	0	1	0	0	F3
Meadowlakes	0	0	0	0	0	0	0	-
Colorado County (All areas not detailed below.)	**27**	**17**	**4**	**5**	**1**	**0**	**0**	**F3**
Columbus	0	0	0	0	0	0	0	-
Eagle Lake	1	1	0	0	0	0	0	F0
Weimar	1	1	0	0	0	0	0	F0
Fayette County (All areas not detailed below.)	**24**	**8**	**11**	**5**	**0**	**0**	**0**	**-**
Carmine	0	0	0	0	0	0	0	-
Flatonia	0	0	0	0	0	0	0	-

JURISDICTION	NUMBER OF EVENTS	MAGNITUDE (FUJITA-SIMPSON SCALE)						MAXIMUM F SCALE
		F0	F1	F2	F3	F4	F5	
La Grange	3	3	0	0	0	0	0	F0
Lampasas County (All areas not detailed below.)	**6**	**0**	**5**	**1**	**0**	**0**	**0**	**F2**
Kempner	3	3	0	0	0	0	0	F0
Lampasas	2	2	0	0	0	0	0	F0
Lometa	1	1	0	0	0	0	0	F0
Lee County (All areas not detailed below.)	**20**	**3**	**9**	**4**	**4**	**0**	**0**	**F3**
Lexington	3	3	0	0	0	0	0	F0
Giddings	2	0	2	0	0	0	0	F1
Llano County (All areas not detailed below.)	**8**	**4**	**4**	**0**	**0**	**0**	**0**	**F1**
Llano	2	1	1	0	0	0	0	F1
Horseshoe Bay	0	0	0	0	0	0	0	-
Sunrise Beach Village	0	0	0	0	0	0	0	-
Mason County (All areas not detailed below.)	**8**	**3**	**2**	**1**	**1**	**1**	**0**	**F4**
Mason	2	2	0	0	0	0	0	F0
Matagorda County (43)	**42**	**25**	**13**	**2**	**2**	**0**	**0**	**F3**
Bay City	0	0	0	0	0	0	0	-
Palacios	1	0	1	0	0	0	0	F1
McCulloch County	**Not Participating**							
Brady	7	6	0	1	0	0	0	F2
Mills County (All areas not detailed below.)	**9**	**3**	**4**	**2**	**0**	**0**	**0**	**F2**
Goldthwaite	3	2	1	0	0	0	0	F1
San Saba County (All areas not detailed below.)	**12**	**6**	**4**	**2**	**0**	**0**	**0**	**F2**
San Saba	**2**	**2**	**0**	**0**	**0**	**0**	**0**	**F0**
Travis County	**Not Participating**							

JURISDICTION	NUMBER OF EVENTS	MAGNITUDE (FUJITA-SIMPSON SCALE)						MAXIMUM F SCALE
		F0	F1	F2	F3	F4	F5	
Briarcliff	0	0	0	0	0	0	0	-
Jonestown	0	0	0	0	0	0	0	-
Lago Vista	1	0	1	0	0	0	0	F1
Lakeway	1	0	0	0	0	1	0	F4
Manor	2	0	2	0	0	0	0	F1
Mustang Ridge	0	0	0	0	0	0	0	-
Point Venture	0	0	0	0	0	0	0	-
San Leanna	1	0	1	0	0	0	0	F1
Volente	0	0	0	0	0	0	0	-
West Lake Hills	0	0	0	0	0	0	0	-
Wharton County (All areas not detailed below.)	**50**	**20**	**21**	**8**	**1**	**0**	**0**	**F3**
East Bernard	0	0	0	0	0	0	0	-
El Campo	2	2	0	0	0	0	0	F0
Wharton	7	5	2	0	0	0	0	F1
Williamson County (All areas not detailed below.)	**51**	**15**	**20**	**11**	**4**	**0**	**1**	**F5**
Cedar Park	1	0	0	0	1	0	0	F3
Florence	0	0	0	0	0	0	0	-
Hutto	1	1	0	0	0	0	0	F0
TOTALS FOR STUDY AREA	**378**	**176**	**130**	**47**	**22**	**2**	**1**	**F5**

Probability of Future Events

Based on historical events, the probability of a future tornado for jurisdictions in the TCRFC planning area is occasional, indicating that an event is possible in the next five years. Seasonal patterns are relevant to tornadoes. Thunderstorms form when warm, moist air collides with cooler, drier air. Since these masses tend to come together during the transition from summer to winter, most thunderstorms and resulting tornadoes occur during the spring (April, May and June) and fall (October, November, and December).

Vulnerability Assessment

Because tornadoes often cross jurisdictional boundaries, all existing and future buildings, facilities and populations in the TCRFC region are considered to be exposed to this hazard and could potentially be impacted. However, it is important to note that only reported tornadoes with georeferenced point data have been factored into this risk assessment.

The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Consequently, vulnerability of humans and property is difficult to evaluate since tornadoes form at different strengths, in random locations, and create relatively narrow paths of destruction. Although tornadoes strike at random, making all buildings vulnerable, three types of structures are more likely to suffer damage:

- Manufactured homes;
- Homes on crawlspaces (more susceptible to lift); and
- Buildings with large spans, such as shopping malls, gymnasiums, and factories

Impact

The impact of tornadoes can be substantial. They can cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or suffer major damage.

Table 9-5 shows potential annualized property losses for each jurisdiction. "Negligible" indicates that the annualized expected property losses are less than $5,000.

Table 9-5. Potential Annualized Losses by Jurisdiction (Tornado)

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Bastrop County	**1,898,937,000**	**77,959**	**0.00%**
Bastrop	576,435,000	Negligible	0.00%
Elgin	344,327,000	Negligible	0.00%
Smithville	271,908,000	Negligible	0.00%
Blanco County	**448,775,000**	1,125,442	**0.25%**
Johnson City	78,214,000	Negligible	0.00%

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Brown County	**Not Participating**		
Brownwood	1,160,816,000	10,544	0.00%
Burnet County	**1,142,430,000**	77,200	**0.01%**
Bertram	55,114,000	Negligible	0.00%
Burnet	255,342,000	Negligible	0.00%
Cottonwood Shores	41,613,000	Negligible	0.00%
Granite Shoals	124,784,000	Negligible	0.00%
Highland Haven	33,235,000	Negligible	0.00%
Marble Falls	376,568,000	122,531	0.03%
Meadowlakes	94,973,000	Negligible	0.00%
Colorado County	**652,241,000**	**709,089**	**0.11%**
Columbus	259,875,000	Negligible	0.00%
Eagle Lake	168,646,000	Negligible	0.00%
Weimar	171,576,000	Negligible	0.00%
Fayette County	**1,143,993,000**	**112,746**	**0.01%**
Carmine	16,978,000	Negligible	0.00%
Flatonia	73,581,000	Negligible	0.00%
La Grange	308,041,000	Negligible	0.00%
Lampasas County	**451,748,000**	**5,699**	**0.00%**
Kempner	47,851,000	Negligible	0.00%
Lampasas	429,672,000	Negligible	0.00%
Lometa	41,863,000	Negligible	0.00%
Lee County	**491,147,000**	**153,462**	**0.03%**

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Lexington	68,009,000	Negligible	0.00%
Giddings	309,504,000	Negligible	0.00%
Llano County	**762,494,000**	**18,369**	**0.00%**
Llano	217,712,000	Negligible	0.00%
Horseshoe Bay	401,845,000	Negligible	0.00%
Sunrise Beach Village	108,772,000	Negligible	0.00%
Mason County	**152,814,000**	**144,741**	**0.09%**
Mason	114,666,000	Negligible	0.00%
Matagorda County	**937,051,000**	**307,946**	**0.03%**
Bay City	1,011,160,000	Negligible	0.00%
Palacios	236,596,000	Negligible	0.00%
McCulloch County	**Not Participating**		
Brady	296,230,000	7,417	0.00%
Mills County	**200,103,000**	**5,961**	**0.00%**
Goldthwaite	120,497,000	Negligible	0.00%
San Saba County	**195,326,000**	**8,249**	**0.00%**
San Saba	157,499,000	Negligible	0.00%
Travis County	**Not Participating**		
Briarcliff	78,826,000	Negligible	0.00%
Jonestown	115,523,000	Negligible	0.00%
Lago Vista	382,670,000	Negligible	0.00%
Lakeway	1,058,045,000	339,225	0.03%
Mustang Ridge	38,236,000	Negligible	0.00%

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Point Venture	49,272,000	Negligible	0.00%
San Leanna	27,719,000	Negligible	0.00%
Volente	34,753,000	Negligible	0.00%
West Lake Hills	546,896,000	Negligible	0.00%
Wharton County	**1,056,683,000**	**73,938**	**0.01%**
East Bernard	92,899,000	Negligible	0.00%
El Campo	641,235,000	Negligible	0.00%
Wharton	499,567,000	Negligible	0.00%
Williamson County	**6,478,980,000**	**1,189,973**	**0.02%**
Cedar Park	1,872,480,000	1,583,049	0.08%
Florence	59,444,000	Negligible	0.00%
Hutto	91,087,000	Negligible	0.00%
TOTALS FOR STUDY AREA	**29,575,276,000**	**6,073,540**	**N/A**

Sources: HAZUS-MH MR3 (total exposure) and NCDC (annualized losses)

Section 10 – Hail

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Hazard Profile

Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and subsequent cooling of the air mass. Frozen droplets gradually accumulate into ice crystals until they fall as precipitation—as round or irregularly shaped masses of ice greater than 0.75 inches in diameter. The size of hailstones is a direct result of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a byproduct of heating on the Earth's surface. Higher temperature gradients above Earth's surface result in increased suspension time and hailstone size.

Location

Hailstorms vary tremendously in terms of size, location, intensity and duration but are considered frequent occurrences throughout all four TCRFC Regions. While it all of the jurisdictions are exposed to hail events, Figures 10-1 through 10-18, beginning on the following page, depict hail point locations through GIS maps for each of the participating counties and communities therein.

Figure 10-1. Hail Point Locations – TCRFC Planning Area

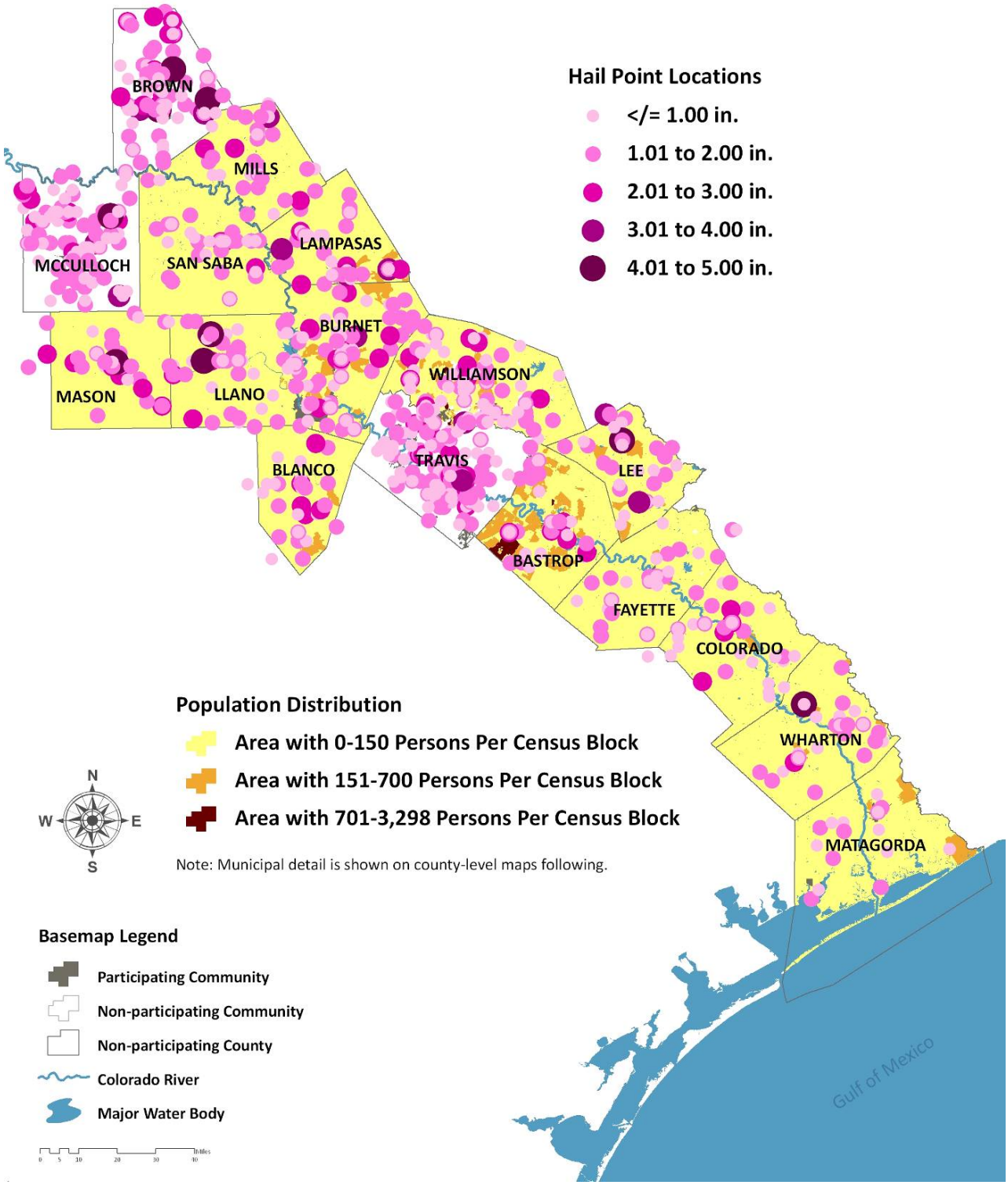


Figure 10-2. Hail Event Locations in Bastrop County

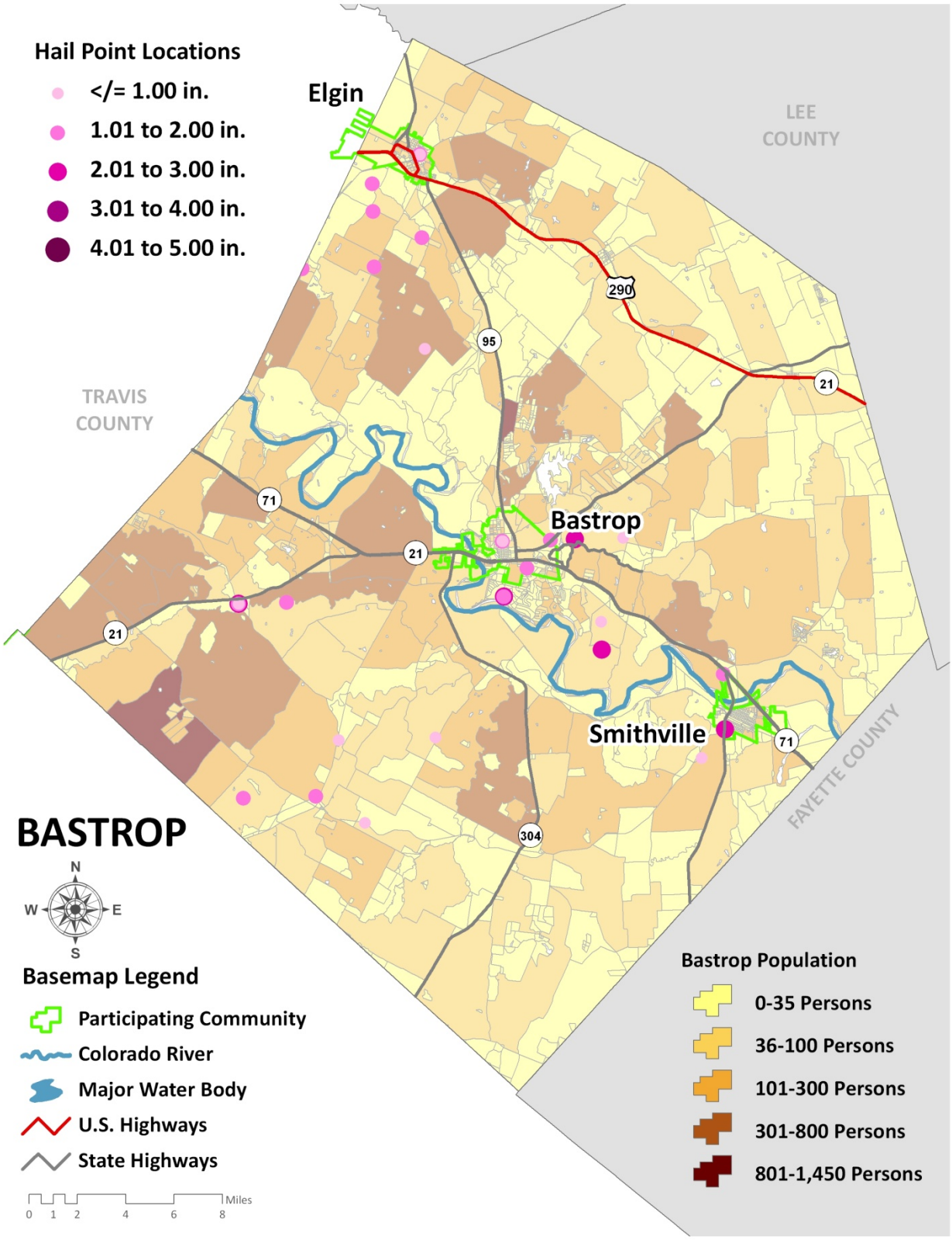


Figure 10-3. Hail Event Locations in Blanco County

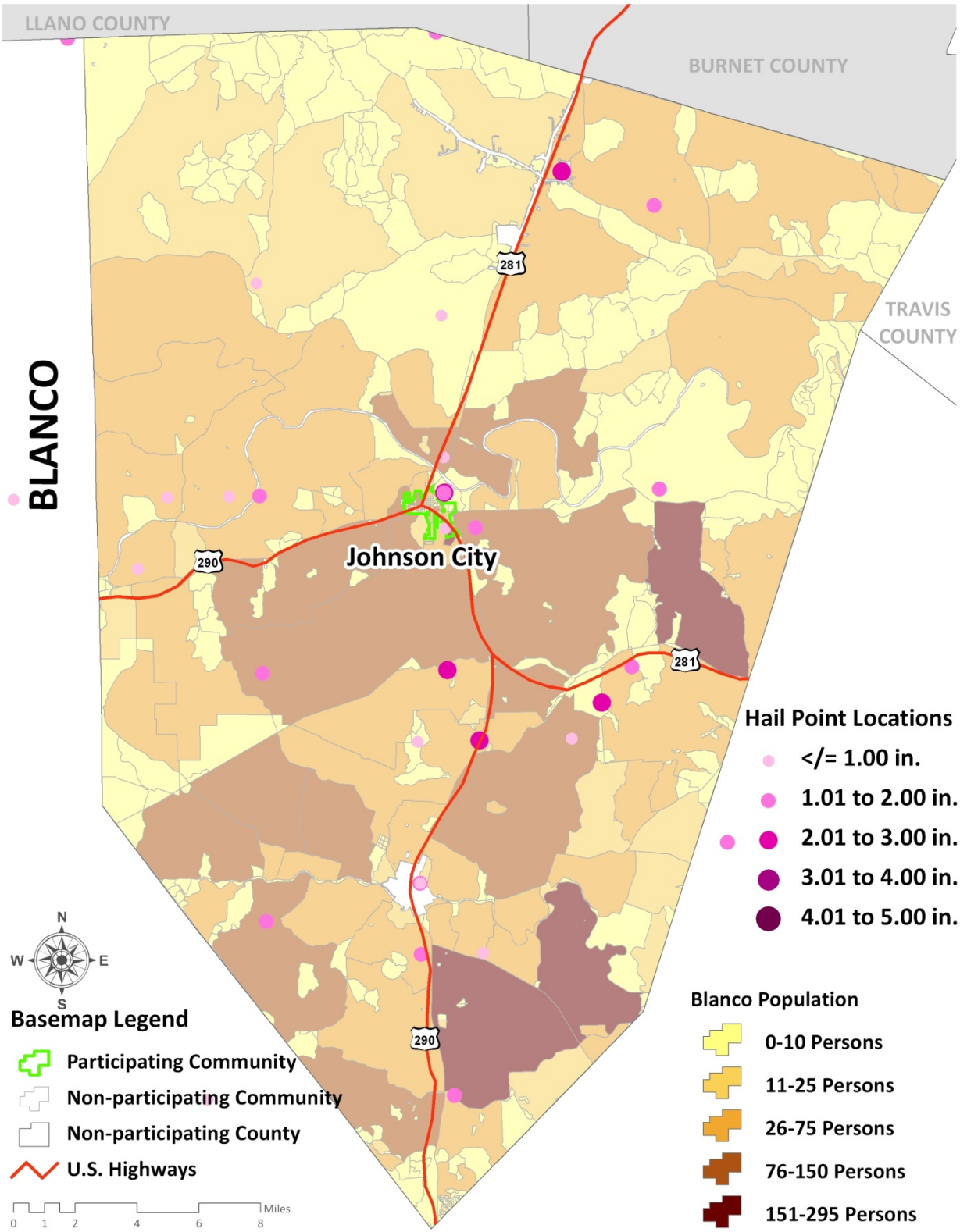


Figure 10-4. Hail Event Locations in Brown County/City of Brownwood

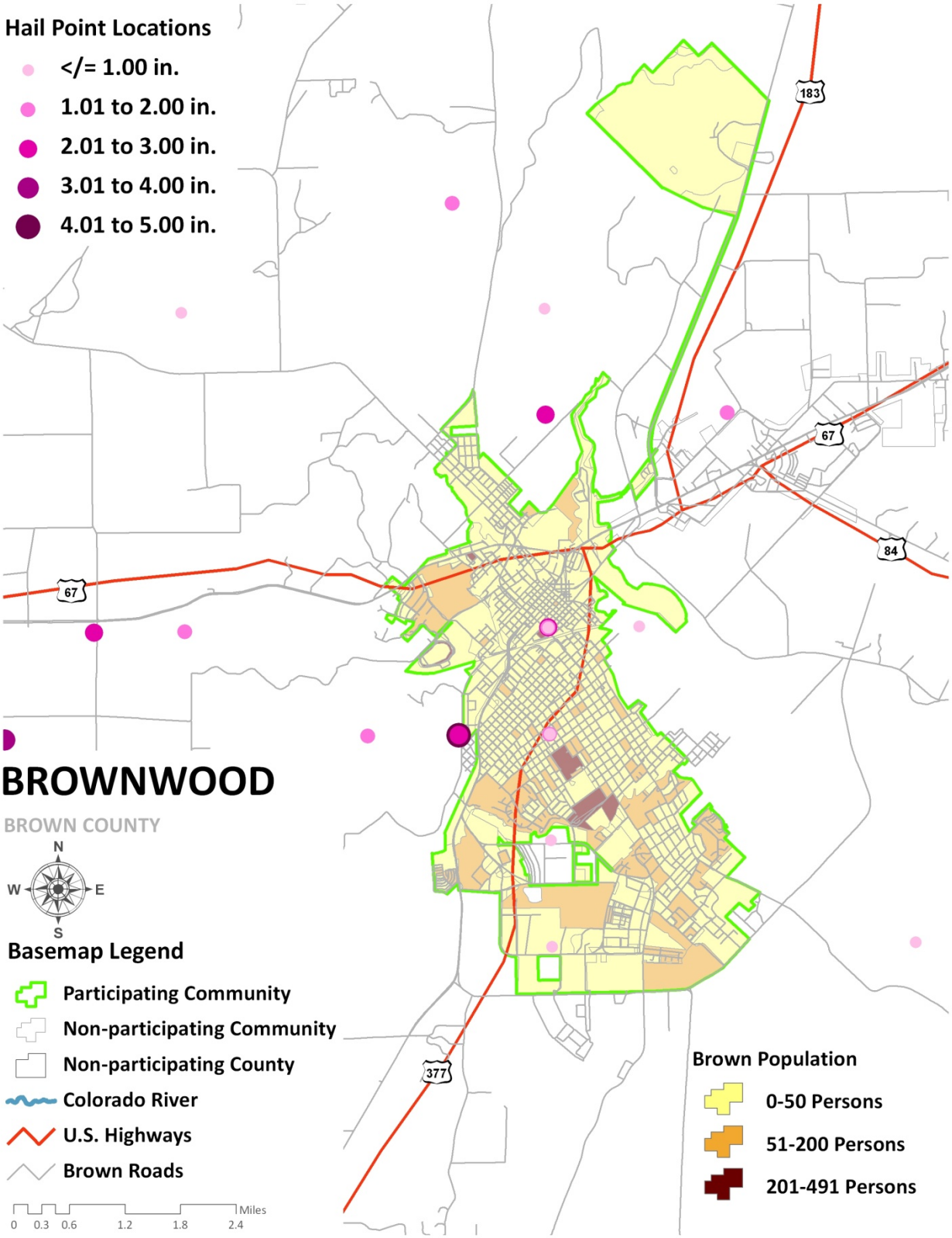


Figure 10-5. Hail Event Locations in Burnet County

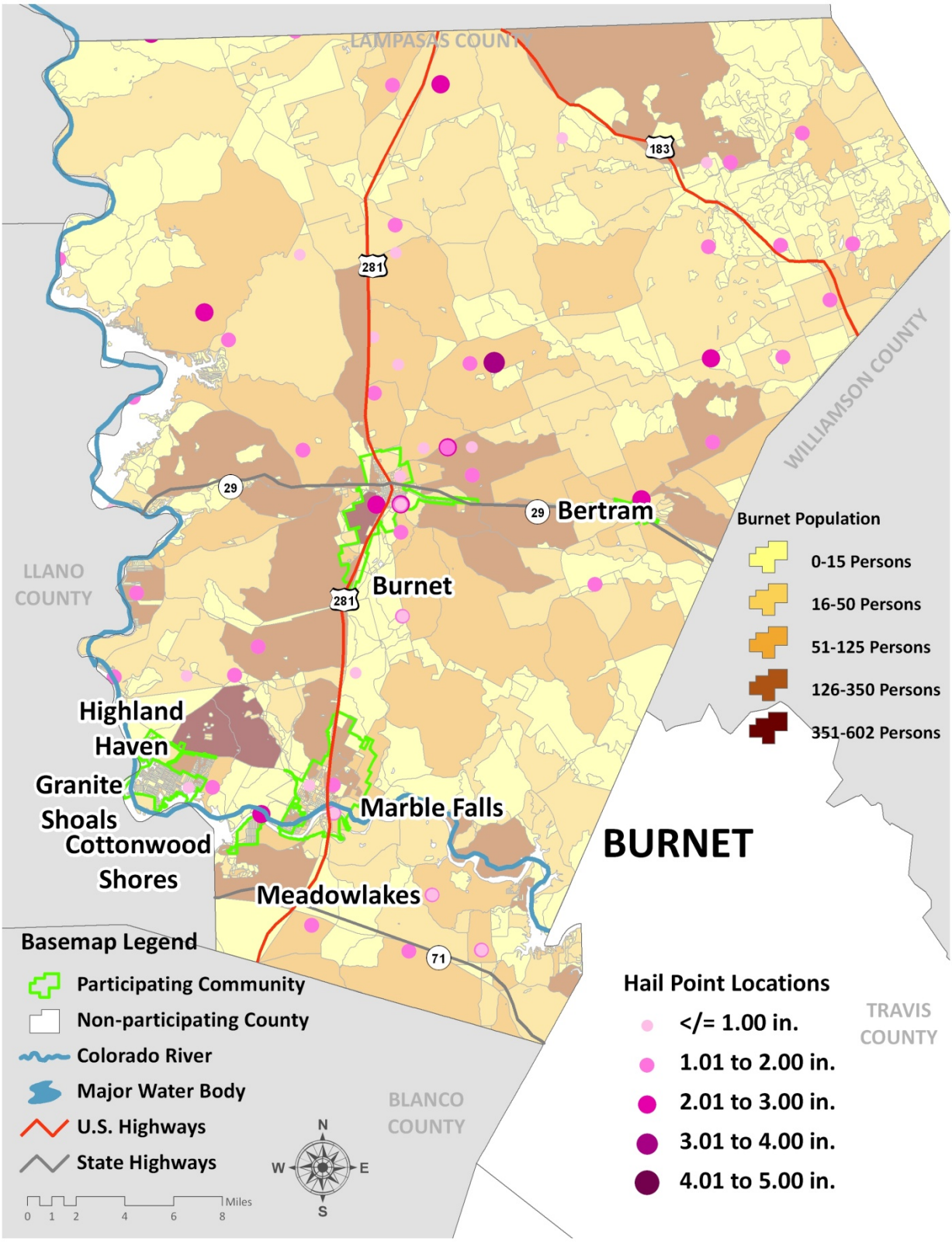


Figure 10-6. Hail Event Locations in Colorado County

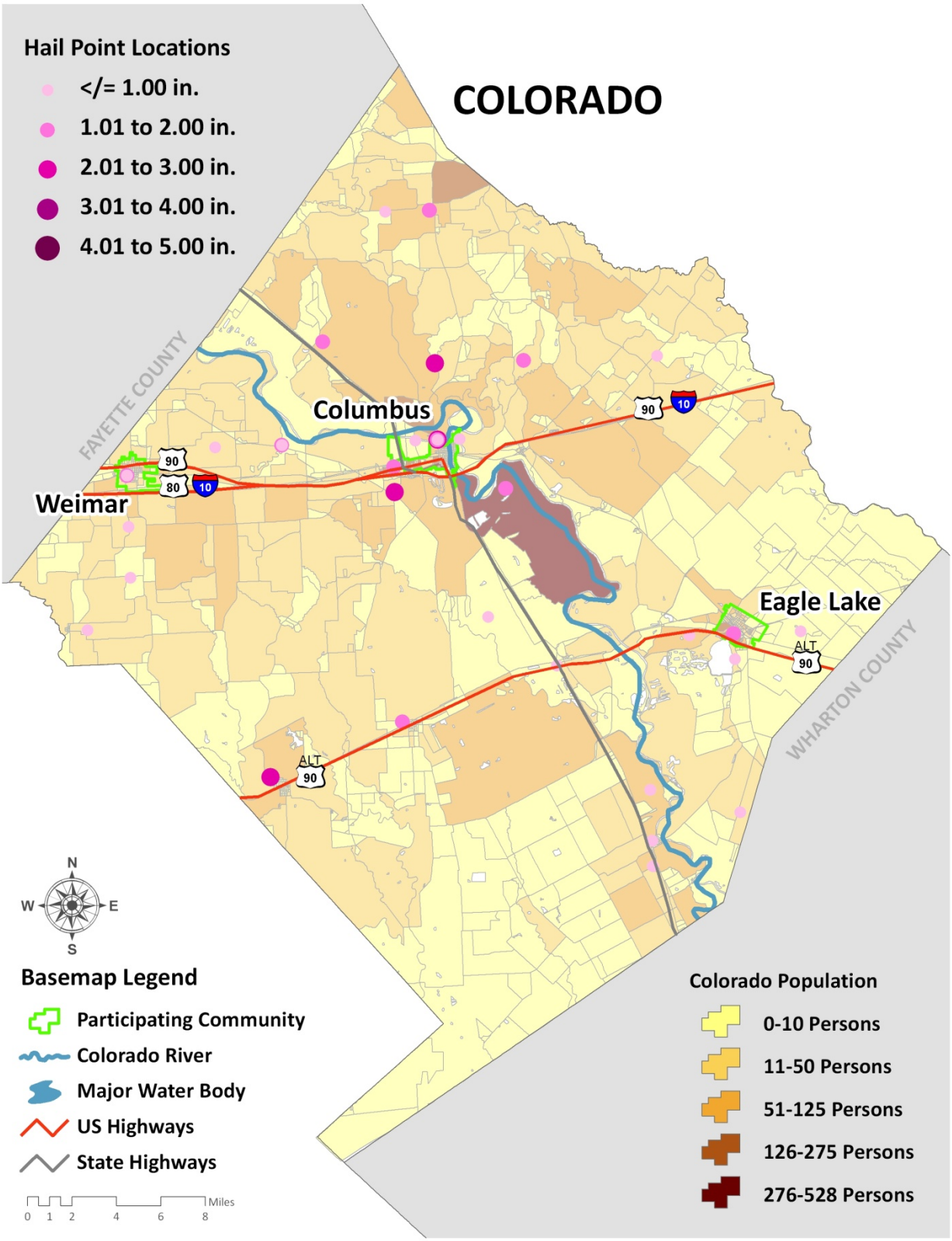


Figure 10-7. Hail Event Locations in Fayette County

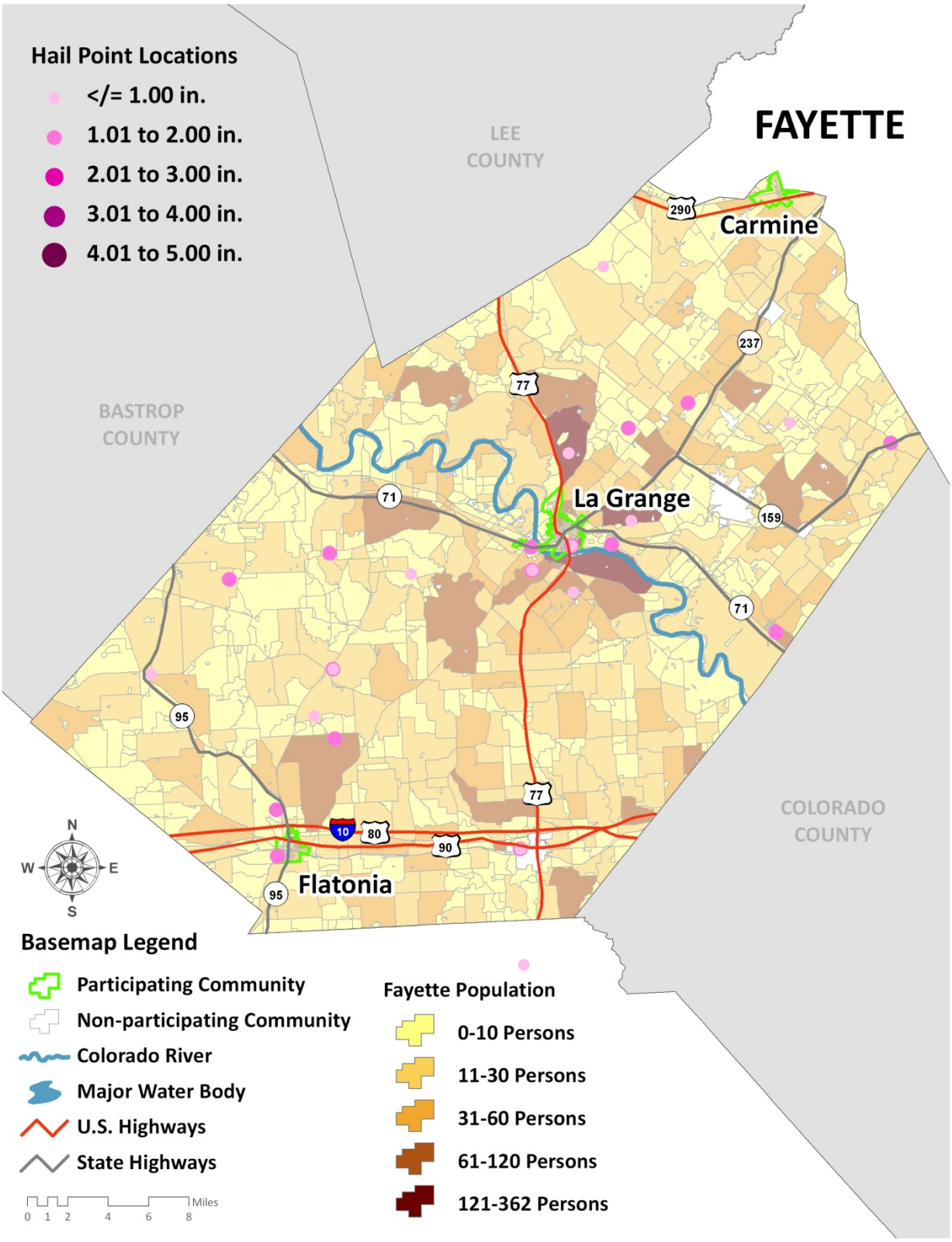


Figure 10-8. Hail Event Locations in Lampasas County

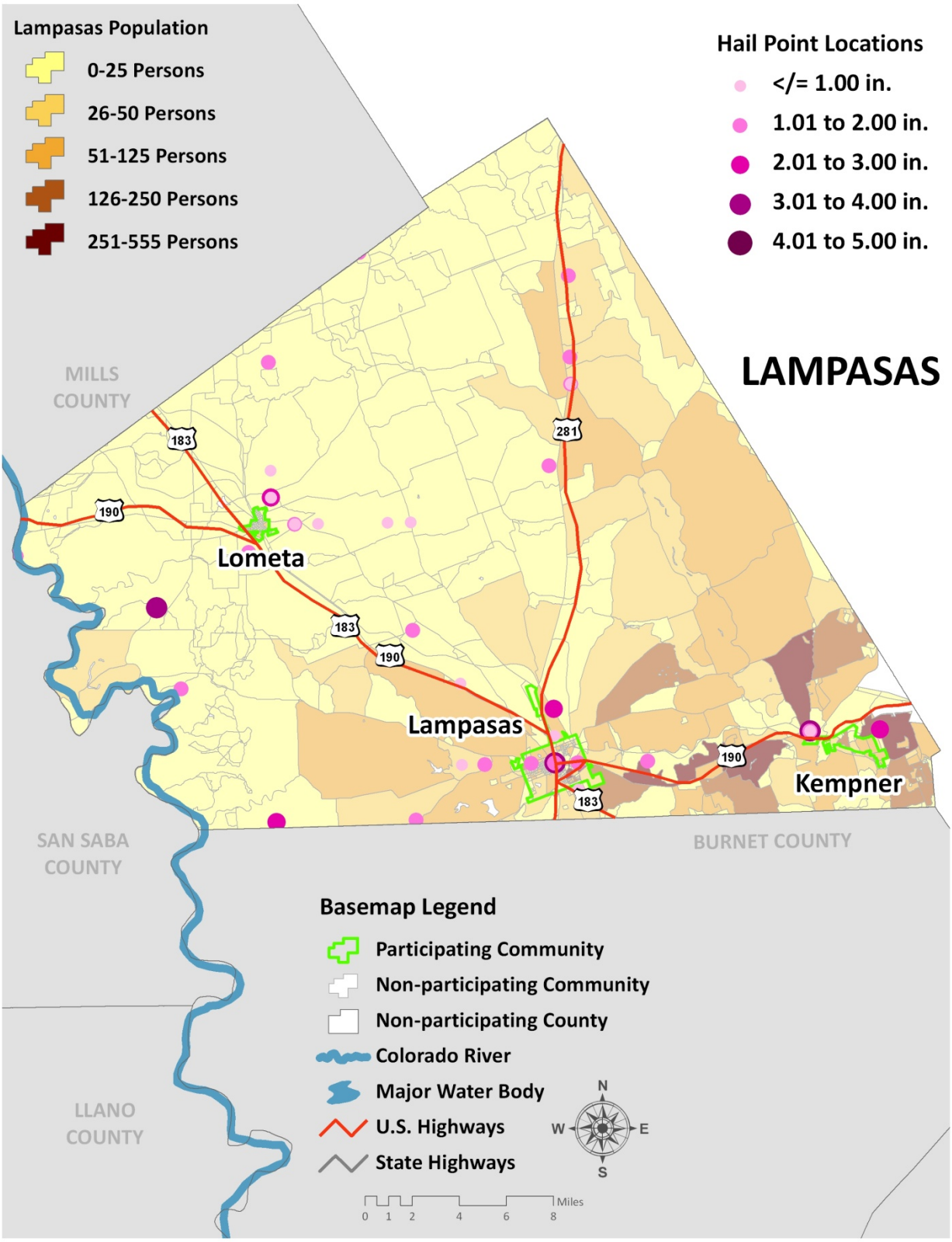


Figure 10-9. Hail Event Locations in Lee County

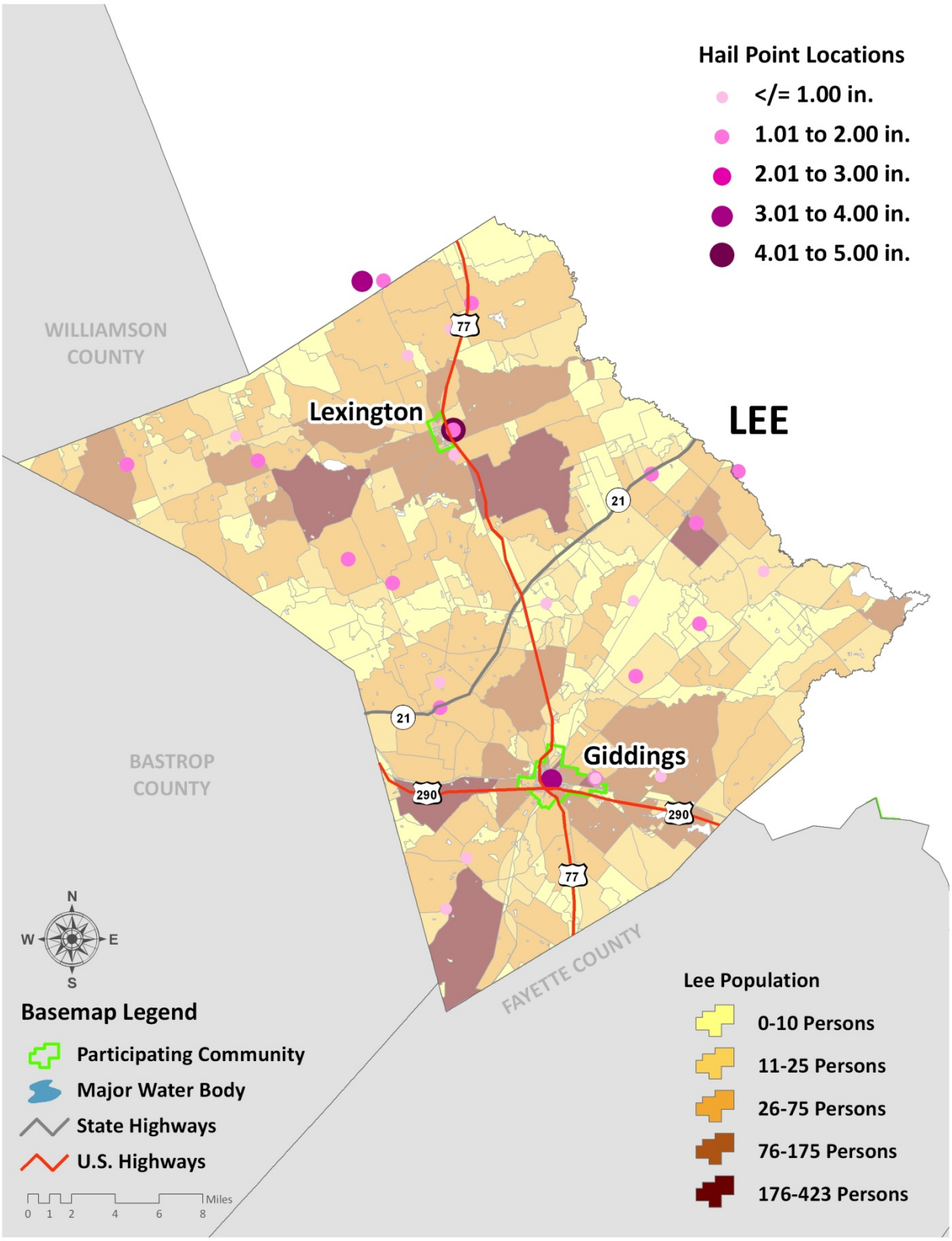


Figure 10-10. Hail Event Locations in Llano County

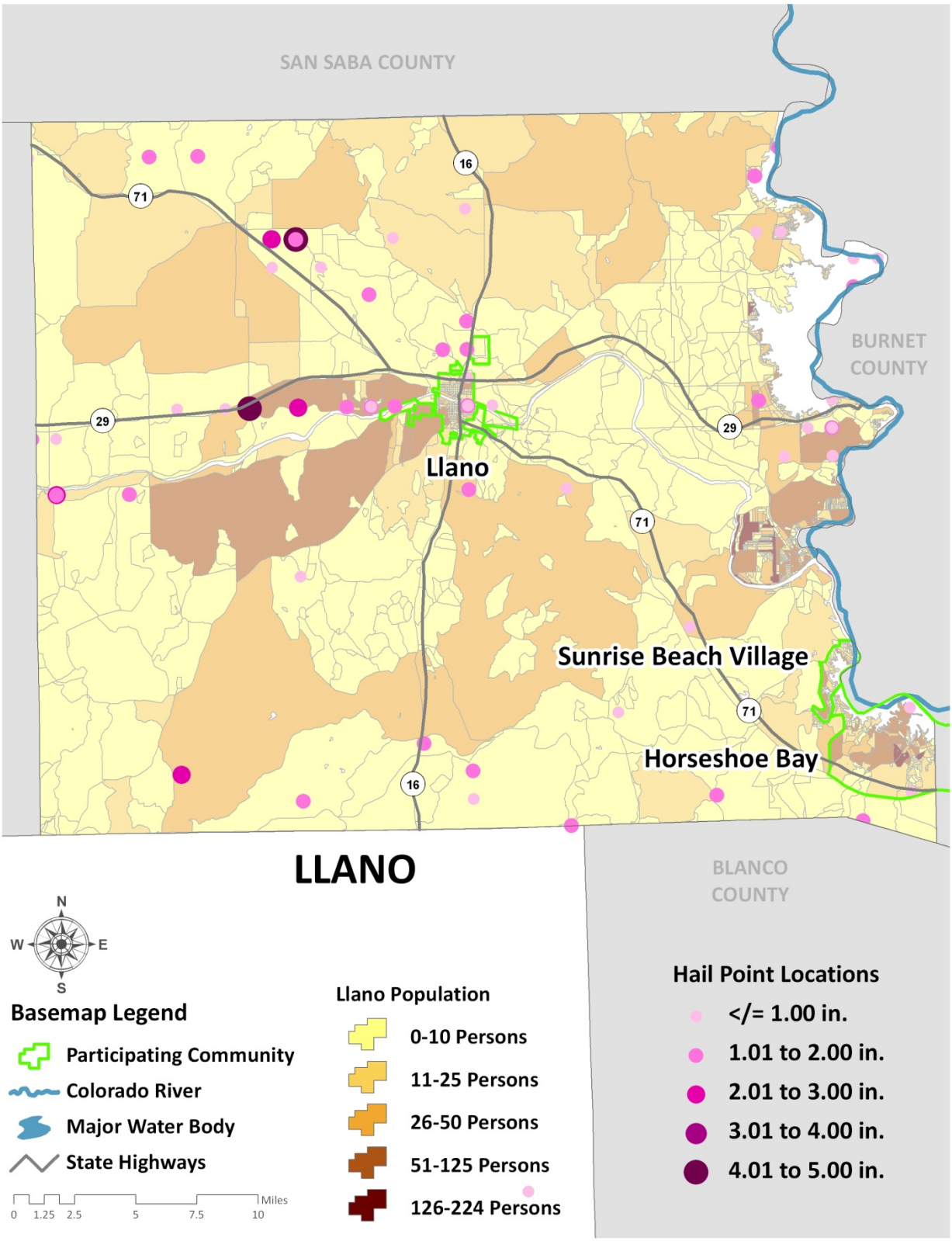


Figure 10-11. Hail Event Locations in Mason County

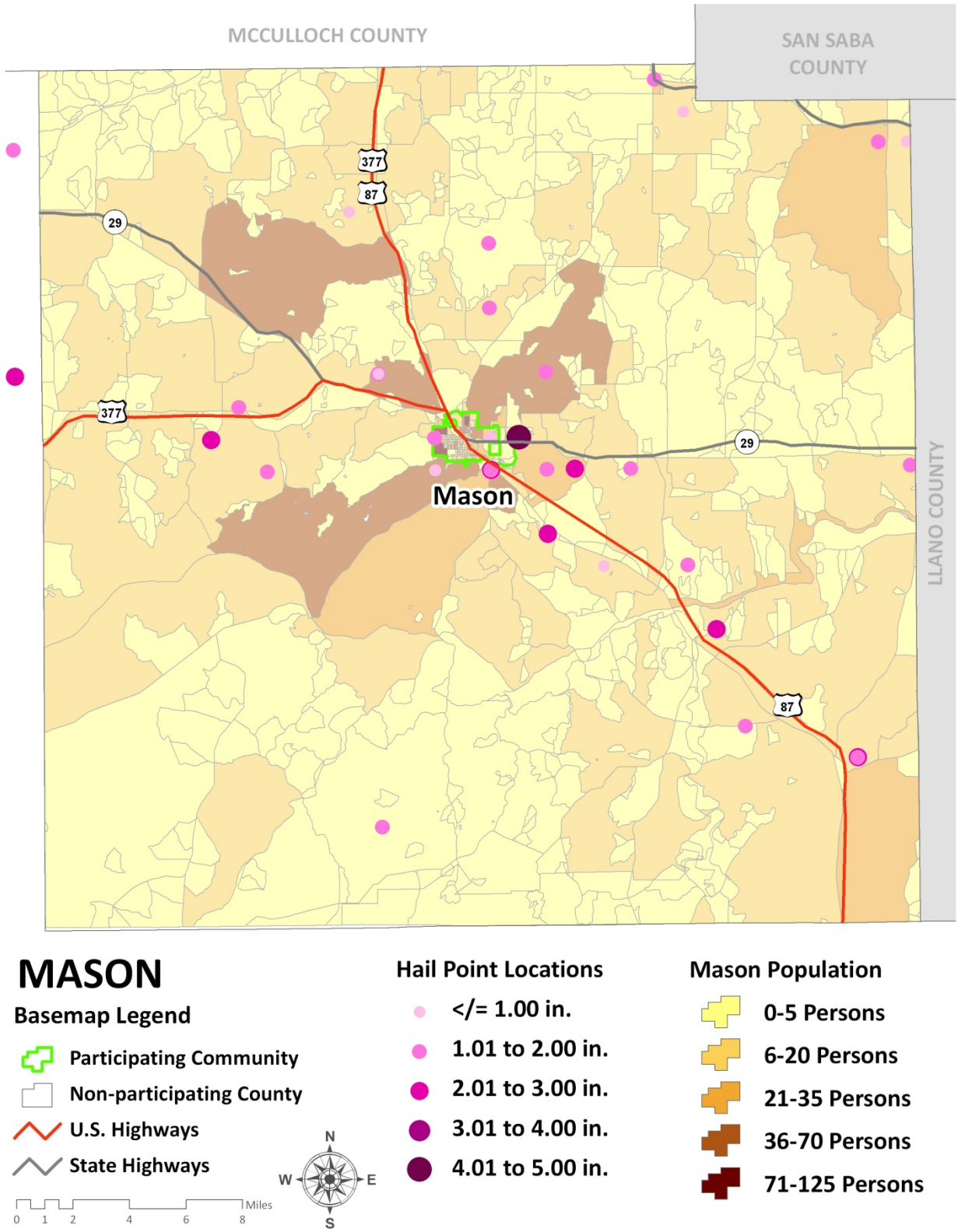


Figure 10-12. Hail Event Locations in Matagorda County

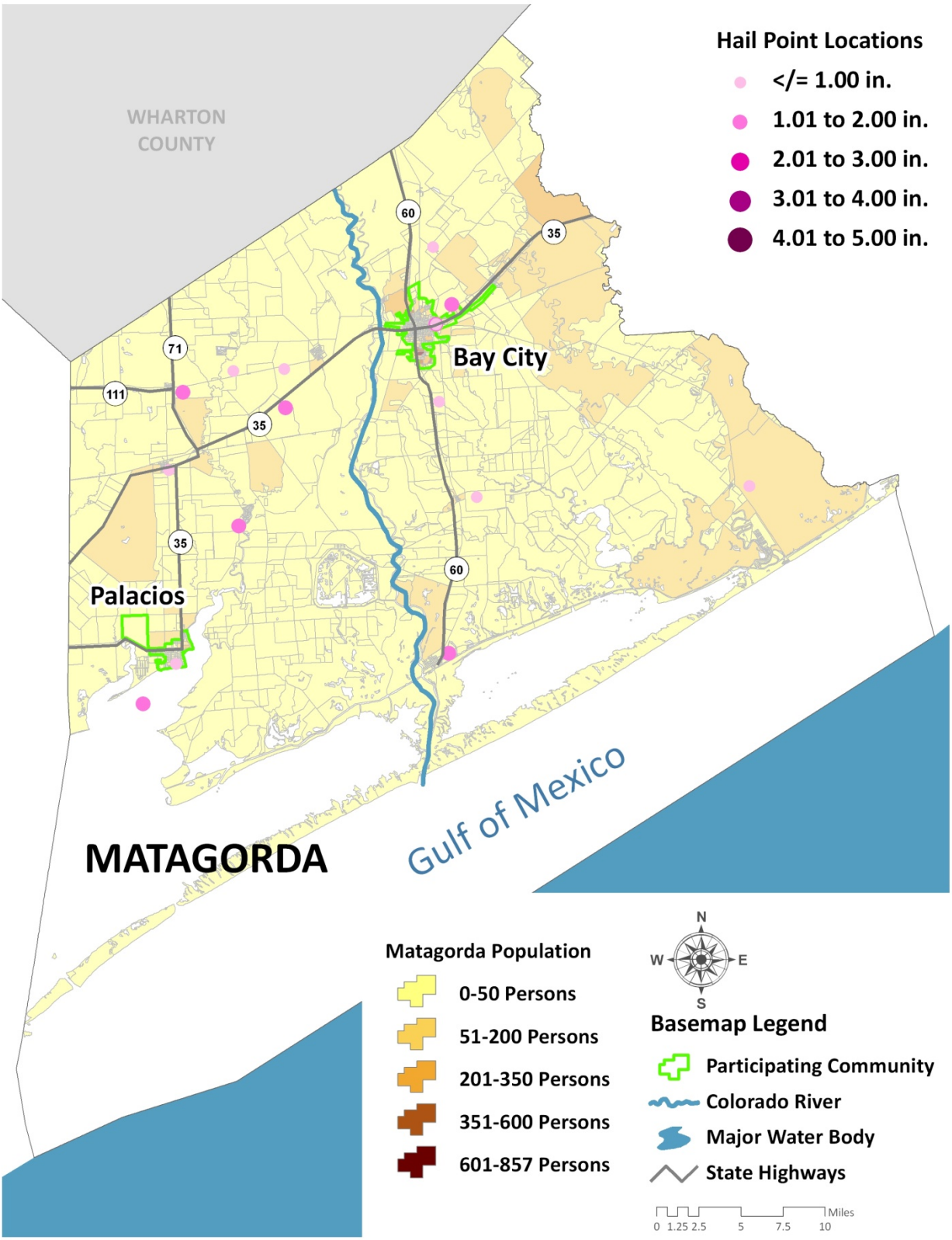


Figure 10-13. Hail Event Locations in McCulloch County/City of Brady

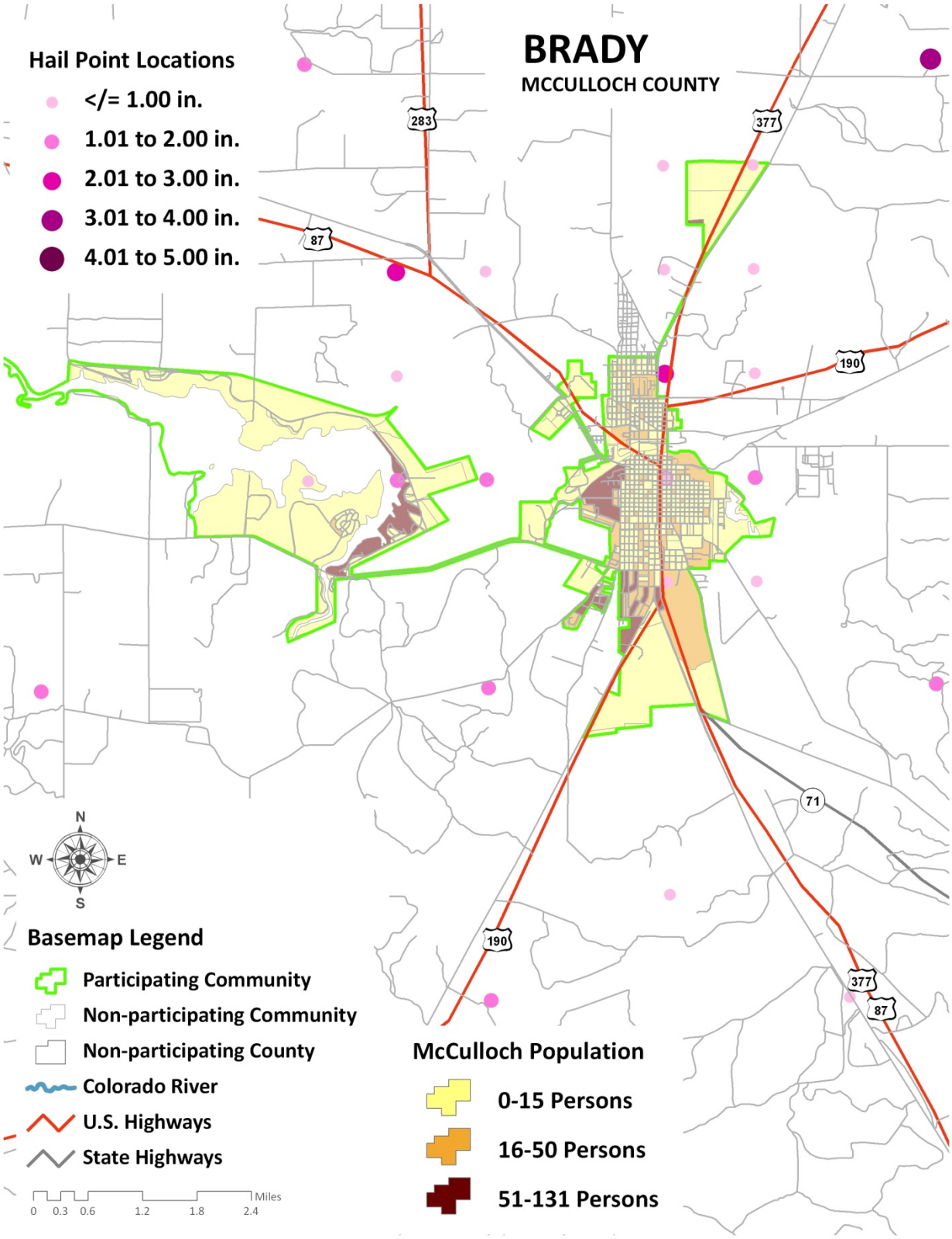


Figure 10-14. Hail Event Locations in Mills County

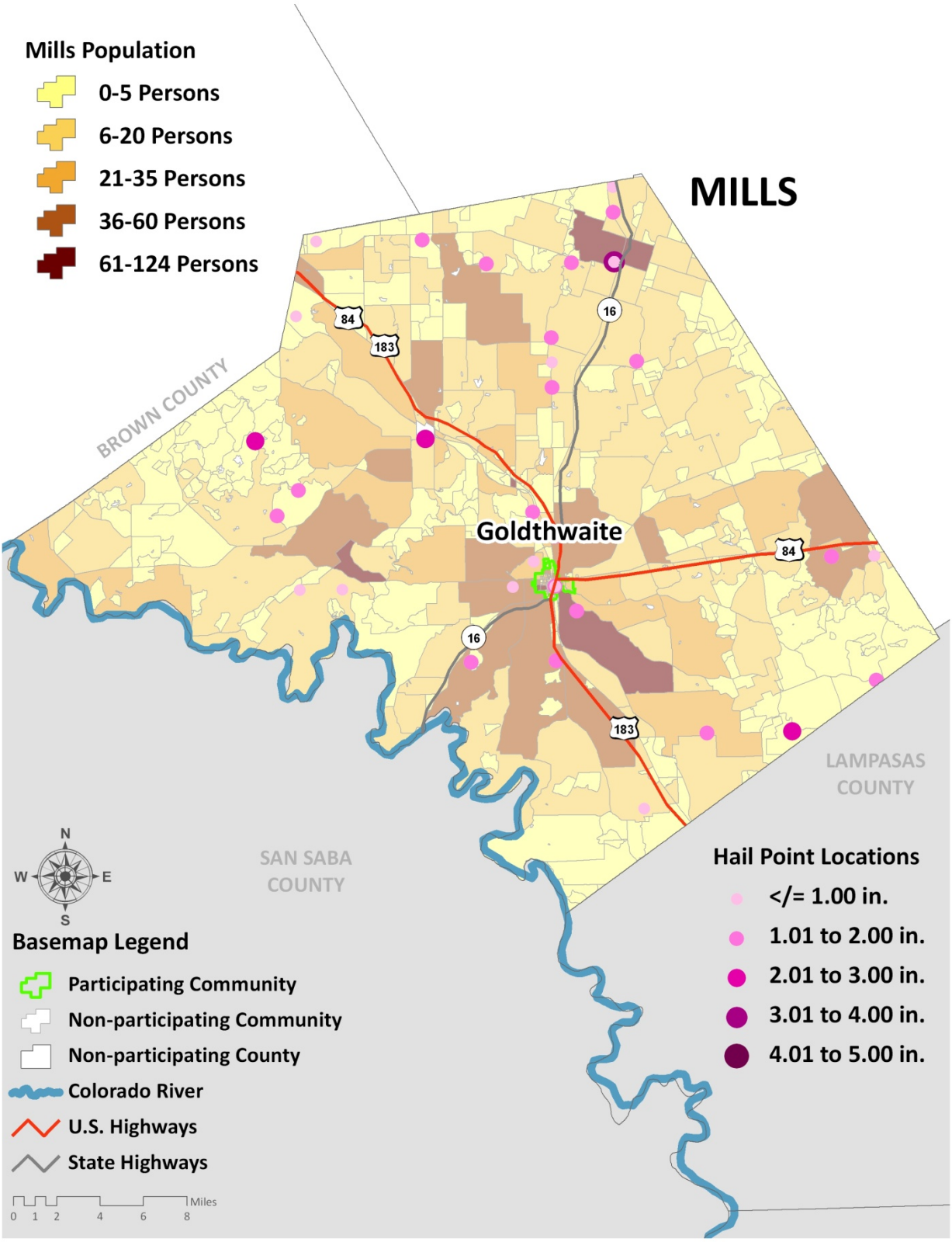


Figure 10-15. Hail Event Locations in San Saba County

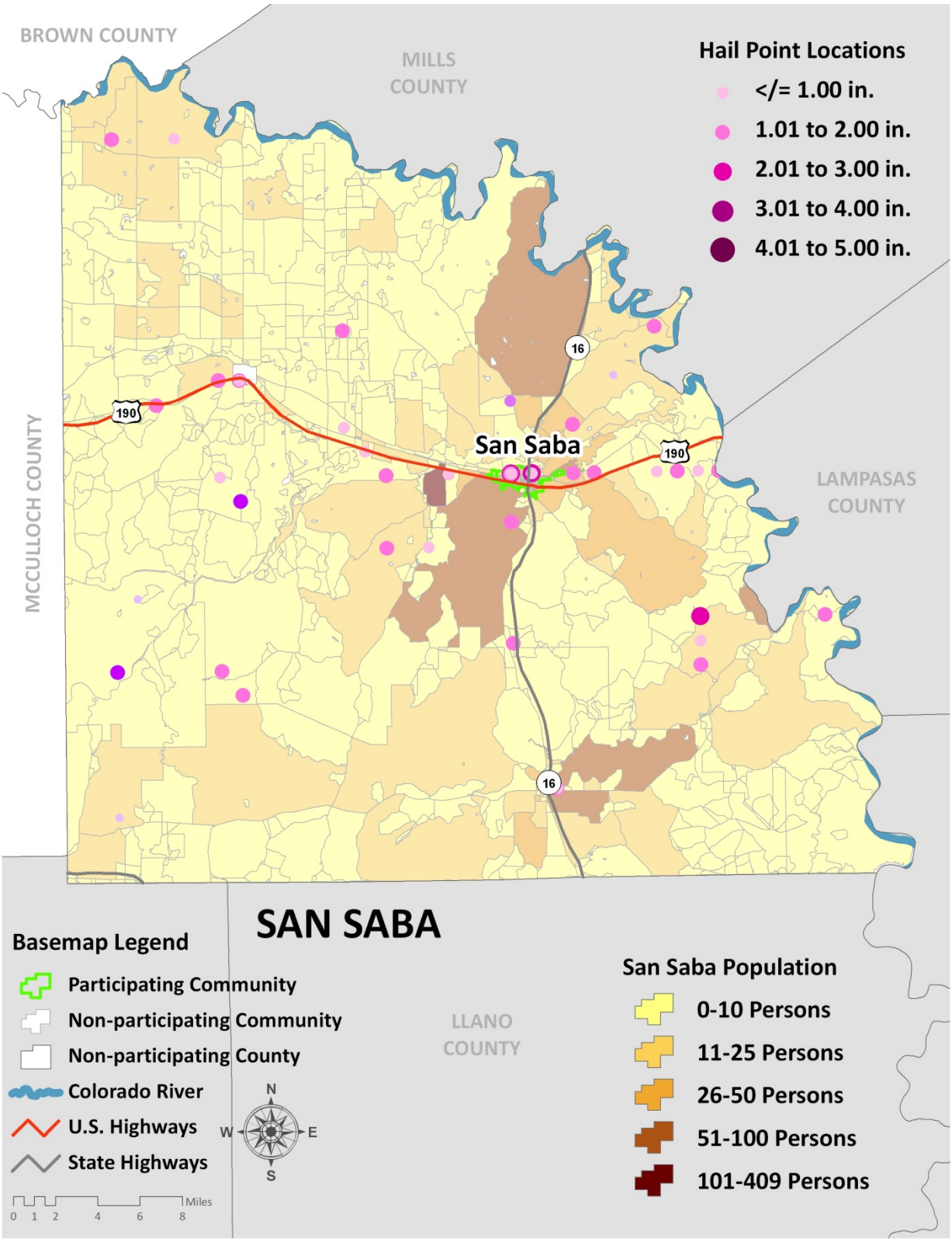


Figure 10-16. Hail Event Locations in Travis County

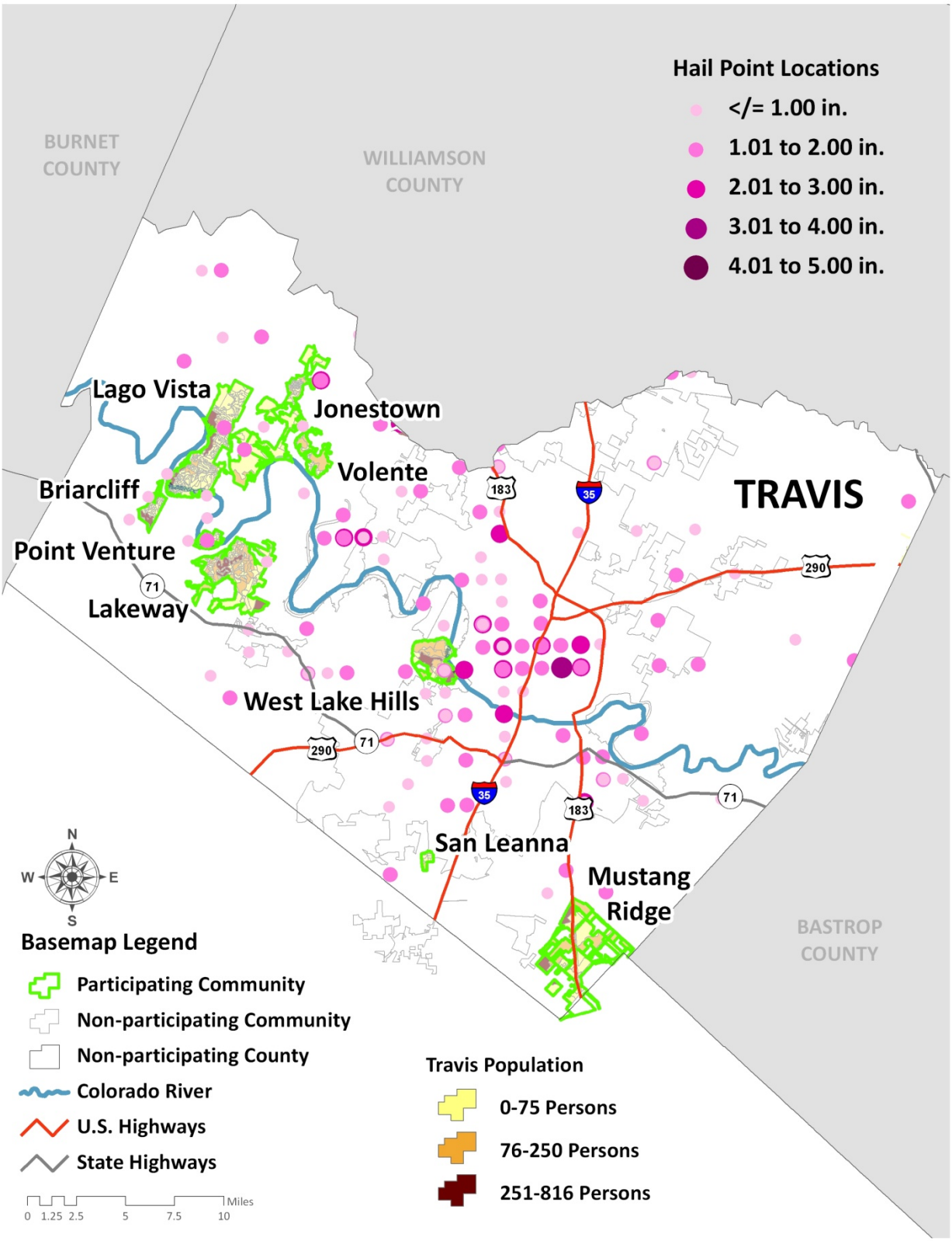


Figure 10-17. Hail Event Locations in Wharton County

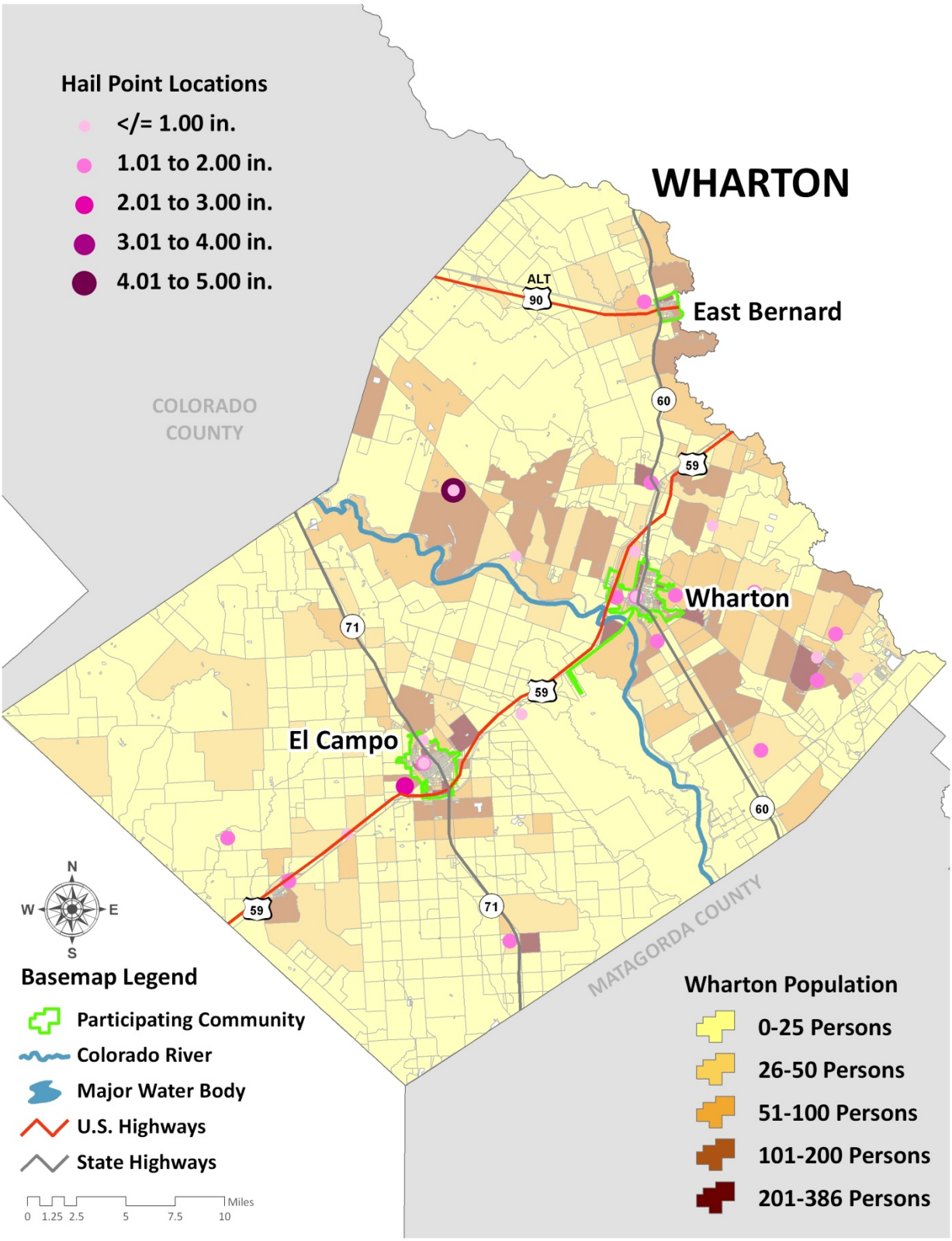
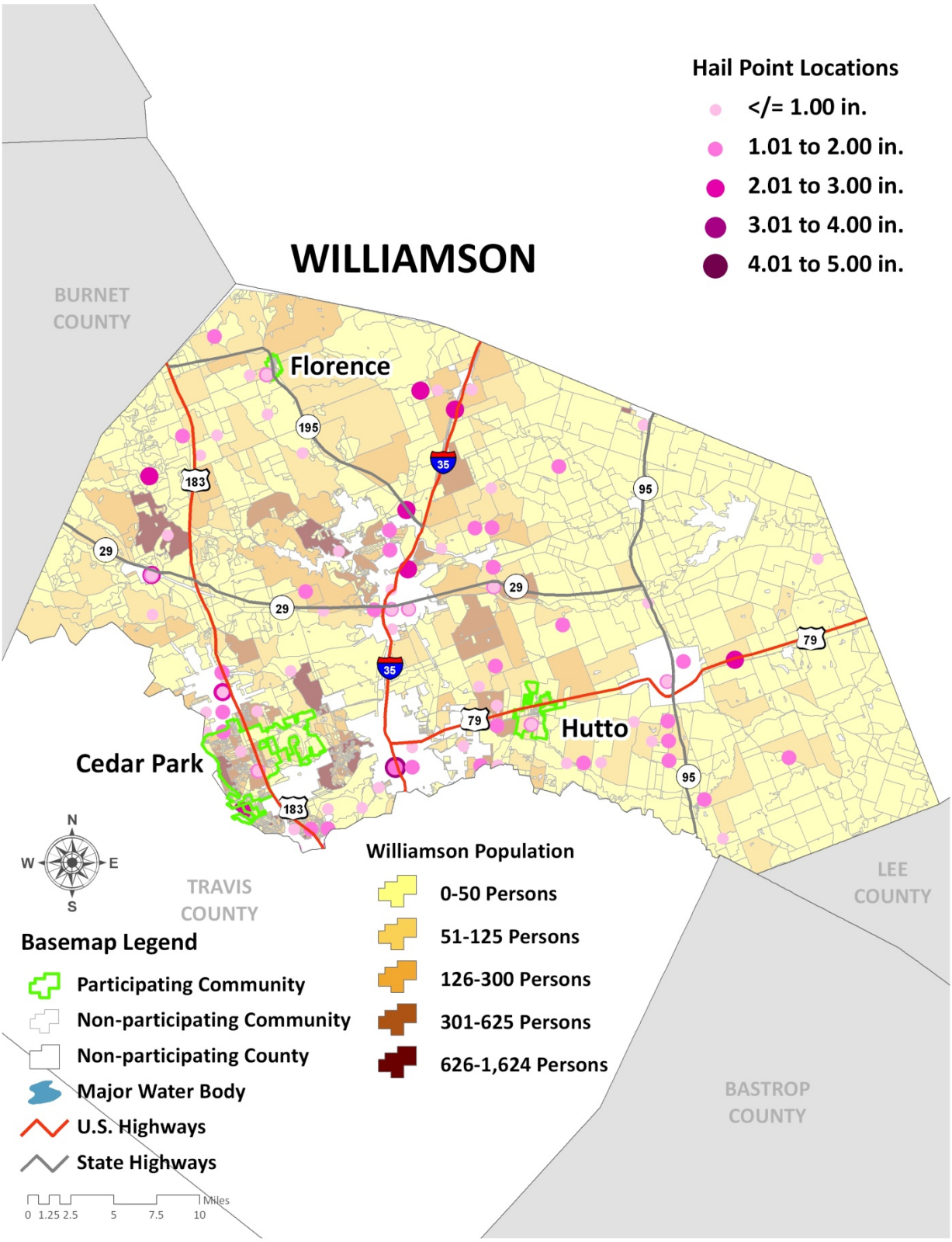


Figure 10-18. Hail Event Locations in Williamson County



Extent

Hailstorms can vary in terms of size of hail, the amount of winds and the structures in the path of the hailstorm. It is assumed that all of the jurisdictions are uniformly exposed to hail events; therefore, the entire area is equally exposed to hail which can be produced during such storms. A scale showing intensity categories was developed by the National Climatic Data Center (NCDC) and is included at Table 10-1.

Table 10-1. Hail Intensity and Magnitude

SIZE CODE	INTENSITY CATEGORY	SIZE (DIAMETER INCHES)	DESCRIPTIVE TERM	TYPICAL DAMAGE
H0	Hard Hail	up to 0.33	pea	no damage
H1	Potentially Damaging	0.33-0.60	marble	slight damage to plants and crops
H2	Potentially Damaging	0.60-0.80	dime	significant damage to plants and crops
H3	Severe	0.80-1.20	nickel	severe damage to plants and crops
H4	Severe	1.2-1.6	quarter	widespread glass and auto damage
H5	Destructive	1.6-2.0	half dollar	widespread destruction of glass, roofs, and risk of injuries
H6	Destructive	2.0-2.4	ping pong ball	aircraft bodywork dented and brick walls pitted
H7	Very Destructive	2.4-3.0	golf ball	severe roof damage and risk of serious injuries
H8	Very Destructive	3.0-3.5	hen egg	severe damage to all structures
H9	Super Hailstorms	3.5-4.0	tennis ball	extensive structural damage could cause fatal injuries
H10	Super Hailstorms	4.0 +	baseball	extensive structural damage could cause fatal injuries

The range of intensity for a hailstorm event for TCRFC jurisdictions can be anywhere from as low as an H3 or nickel-sized hail, to an H10 or super hailstorm with hail the size of a baseball. The jurisdictions in the planning area experience a uniform range of intensity for a hailstorm as

evidenced by the location and historical occurrences. An average storm event for each of the participating communities to expect to mitigate against is a severe hailstorm or H4, with hail the size of a quarter.

Historical Occurrences

Historical occurrences for hail were compiled by jurisdiction from the NCDC from 1950 to 2008. Table 10-1 shows historical occurrences for hail for each county and community.

Table 10-1. Historical Hail Impact by Jurisdiction (NCDC, 1950-2008)

JURISDICTION	NUMBER OF REPORTED EVENTS	MAXIMUM HAIL SIZE (INCHES)
Bastrop County	**37**	**2.75**
Bastrop	15	1.75
Elgin	7	1.75
Smithville	2	2.75
Blanco County	**59**	**2.75**
Johnson City	12	1.75
Brown County	**Not Participating**	
Brownwood	44	3.50
Burnet County	**70**	**3.50**
Bertram	4	2.50
Burnet	13	2.75
Cottonwood Shores	0	0.00
Granite Shoals	0	0.00
Highland Haven	0	0.00
Marble Falls	12	2.75
Meadowlakes	0	0.00
Colorado County	**37**	**2.75**
Columbus	16	2.75

JURISDICTION	NUMBER OF REPORTED EVENTS	MAXIMUM HAIL SIZE (INCHES)
Eagle Lake	5	1.75
Weimar	4	0.88
Fayette County	**30**	**2.00**
Carmine	0	0.00
Flatonia	9	2.00
La Grange	7	1.50
Lampasas County	**26**	**4.00**
Kempner	3	2.75
Lampasas	21	2.00
Lometa	15	4.00
Lee County	**23**	**2.00**
Lexington	6	4.50
Giddings	8	3.50
Llano County	**68**	**3.00**
Llano	36	4.25
Horseshoe Bay	0	0.00
Sunrise Beach Village	0	0.00
Mason County	**28**	**2.75**
Mason	27	4.25
Matagorda County	**17**	**2.00**
Bay City	11	1.75
Palacios	1	0.75
McCulloch County	**Not Participating**	
Brady	58	3.50

JURISDICTION	NUMBER OF REPORTED EVENTS	MAXIMUM HAIL SIZE (INCHES)
Mills County	**63**	**4.50**
Goldthwaite	19	2.00
San Saba County	**53**	**2.75**
San Saba	31	2.00
Travis County	**Not Participating**	
Briarcliff	0	0.00
Jonestown	3	1.25
Lago Vista	7	2.00
Lakeway	0	0.00
Mustang Ridge	0	0.00
Point Venture	0	0.00
San Leanna	0	0.00
Volente	0	0.00
West Lake Hills	1	0.75
Wharton County	**34**	**4.50**
East Bernard	4	1.75
El Campo	8	2.75
Wharton	17	1.75
Williamson County	**160**	**4.00**
Cedar Park	11	2.00
Florence	3	1.00
Hutto	6	1.75
TOTALS FOR STUDY AREA	**1,151**	**N/A**

Source: NCDC

Probability of Future Events

Hail events are experienced uniformly throughout the jurisdiction and they occur frequently. Most hailstorms occur during the spring (March, April and May) and the fall, during the month of September.

Due to the frequent past occurrences of hailstorms for the planning area s a whole and the extent of hailstorms for the area, the probability of a future occurrence is highly likely. This means that an event is probable in the next year for each of the participating TCRFC jurisdictions.

Vulnerability Assessment

Warning time for a hailstorm is generally minimal or there is no warning. Storms that produce high winds in addition to hail are most damaging and can result in numerous broken windows and damaged siding. Hailstorms can cause extensive property damage affecting both urban and rural landscapes. Fortunately, most hailstorms produce marble-size or smaller hailstones. These can cause damage to crops, but they normally do not damage buildings or automobiles.

Larger hailstones can destroy crops, livestock and wildlife and can cause extensive damage to buildings, including roofs, windows and outside walls. Vehicles can be total losses. When hail breaks windows, water damage from accompanying rains can also be significant. A major hailstorm can easily cause damage running into the millions of dollars. Nationwide hail is responsible for over $1 billion in property and crop damages per year.

Impact

Hailstorms are usually localized and their impact is considered limited since the injuries caused are generally treatable with first aid, they shut down critical facilities and services for 24 hours or less, and less than ten percent of affected properties are destroyed or suffer major damage.

To estimate hail losses, NOAA historical hail loss data was used to develop a hail stochastic model. In this model, losses were scaled to account for inflation:

- Average historic hail damage was used to generate losses for hail events where losses were not reported;
- Expected annualized losses were calculated through a non-linear regression of historical data; and
- Probabilistic losses were scaled to account for would-be losses where no exposure/instrument was present at the time of the event.

Table 10-2 shows potential annualized losses by jurisdiction. "Negligible" indicates that the annualized expected property losses are less than $5,000.

Table 10-2 Potential Annualized Losses by Jurisdiction (Hail)

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Bastrop County	**1,898,937,000**	**Negligible**	**0.00%**
Bastrop	576,435,000	Negligible	0.00%
Elgin	344,327,000	Negligible	0.00%
Smithville	271,908,000	Negligible	0.00%
Blanco County	**448,775,000**	**Negligible**	**0.00%**
Johnson City	78,214,000	Negligible	0.00%
Brown County	**Not Participating**		
Brownwood	1,160,816,000	Negligible	0.00%
Burnet County	**1,142,430,000**	**Negligible**	0.00%
Bertram	55,114,000	Negligible	0.00%
Burnet	255,342,000	Negligible	0.00%
Cottonwood Shores	41,613,000	Negligible	0.00%
Granite Shoals	124,784,000	Negligible	0.00%
Highland Haven	33,235,000	Negligible	0.00%
Marble Falls	376,568,000	15,222	0.00%
Meadowlakes	94,973,000	Negligible	0.00%
Colorado County	**652,241,000**	**10,966**	**0.00%**
Columbus	259,875,000	5,353	0.00%
Eagle Lake	168,646,000	Negligible	0.00%
Weimar	171,576,000	Negligible	0.00%

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
Fayette County	**1,143,993,000**	**Negligible**	**0.00%**
Carmine	16,978,000	Negligible	0.00%
Flatonia	73,581,000	Negligible	0.00%
La Grange	308,041,000	Negligible	0.00%
Lampasas County	**451,748,000**	**Negligible**	**0.00%**
Kempner	47,851,000	Negligible	0.00%
Lampasas	429,672,000	Negligible	0.00%
Lometa	41,863,000	12,741	0.03%
Lee County	**491,147,000**	**Negligible**	**0.00%**
Lexington	68,009,000	Negligible	0.01%
Giddings	309,504,000	15,333	0.00%
Llano County	**762,494,000**	**Negligible**	**0.00%**
Llano	217,712,000	Negligible	0.00%
Horseshoe Bay	401,845,000	Negligible	0.00%
Sunrise Beach Village	108,772,000	Negligible	0.00%
Mason County	**152,814,000**	**Negligible**	**0.00%**
Mason	114,666,000	Negligible	0.00%
Matagorda County	**937,051,000**	**Negligible**	**0.00%**
Bay City	1,011,160,000	Negligible	0.00%
Palacios	236,596,000	Negligible	0.00%
McCulloch County	**Not Participating**		
Brady	296,230,000	Negligible	0.00%
Mills County	**200,103,000**	**Negligible**	**0.00%**
Goldthwaite	120,497,000	Negligible	0.00%

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED EXPECTED PROPERTY LOSSES ($)	ANNUALIZED PERCENT LOSS RATIO
San Saba County	**195,326,000**	**13,906**	0.01%
San Saba	157,499,000	Negligible	0.00%
Travis County	**Not Participating**		
Briarcliff	78,826,000	Negligible	0.00%
Jonestown	115,523,000	Negligible	0.00%
Lago Vista	382,670,000	2,038,158	0.53%
Lakeway	1,058,045,000	Negligible	0.00%
Mustang Ridge	38,236,000	Negligible	0.00%
Point Venture	49,272,000	Negligible	0.00%
San Leanna	27,719,000	Negligible	0.00%
Volente	34,753,000	Negligible	0.00%
West Lake Hills	546,896,000	Negligible	0.00%
Wharton County	**1,056,683,000**	**121,355**	**0.01%**
East Bernard	92,899,000	Negligible	0.00%
El Campo	641,235,000	Negligible	0.00%
Wharton	499,567,000	Negligible	0.00%
Williamson County	**6,478,980,000**	**7,255**	**0.00%**
Cedar Park	1,872,480,000	Negligible	0.00%
Florence	59,444,000	Negligible	0.00%
Hutto	91,087,000	Negligible	0.00%
TOTALS FOR STUDY AREA	**29,575,276,000**	**2,240,289**	**N/A**

Sources: HAZUS-MH MR3 (total exposure) and NCDC (annualized losses)

Section 11 – Winter Storm

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Hazard Profile

A severe winter storm event is identified as a storm with snow, ice, or freezing rain—all of which can cause significant problems for area residents. Winter storms that threaten Central Texas usually begin as powerful cold fronts that push south from central Canada.

Most of the precipitation seen in the Lower Colorado River Basin from severe winter storms takes the form of ice or sleet. Freezing rain occurs when rain developing in a relatively warm (above freezing) layer of air falls through a layer of air that is below freezing (25-32° F). The rain is "super cooled" as it falls through the cold layer near the surface of the earth. When cooled but still liquid raindrops strike the ground or an object already below freezing, they freeze on contact. The resulting coating of ice is commonly known as glaze.

A heavy accumulation of ice can topple power and telephone lines, television towers, and trees. Highways become impossible to travel on and even stepping outdoors can be extremely risky. The severity of an ice storm and amount of damage caused by the storm depends on the amount of rain and thus the amount of icing, wind strength, and storm location. Urban areas tend to suffer more damage than rural areas because of the concentration of utilities and transportation systems, all of which may be affected to a great degree by icing.

Location

Despite the vast land area of the TCRFC regions, all areas are exposed to a winter event. Based on the historical evidence, however, the counties located in TCRFC Regions III and IV, which are located in the Texas Hill Country experience on average more winter storm events than those for Region II (central Texas) and Region I (southeastern portion of the TCRFC planning area that extends to the Gulf Coast).

Jurisdictions in TCRFC Regions III and IV (Blanco, Burnet, Lampasas, Llano, Mason, Mills, and San Saba counties) on average experience more winter storms as these counties are considered part of the Texas Hill Country. This is a more northern and western area of Texas, which experiences more winter storm events than central and southern Texas (Regions I and II) due to its arid climate.

Winter storms for Region II (Bastrop, Lee, Travis, and Williamson counties) are less frequent, although the area is still susceptible to an extreme event. The communities in TCRFC Region I are the closest to the Gulf Coast and include Colorado, Fayette, Matagorda and Wharton counties. Although this area receives the fewest occurrences of winter storms (See Table 11-3) the jurisdictions are not immune to a winter event.

Therefore while snowfall is more common across northern and western portion of the TCRFC planning area than the southern and eastern portion, large snowfall totals have occurred near and along the Gulf Coast in TCRFC Region I.

Extent

Table 11-1 below displays the magnitude of severe winter storms. The wind-chill factor is further described in Figure 11-1. This is an index developed by the National Weather Service, although the chart is not applicable when temperatures are over 50° or winds are calm.

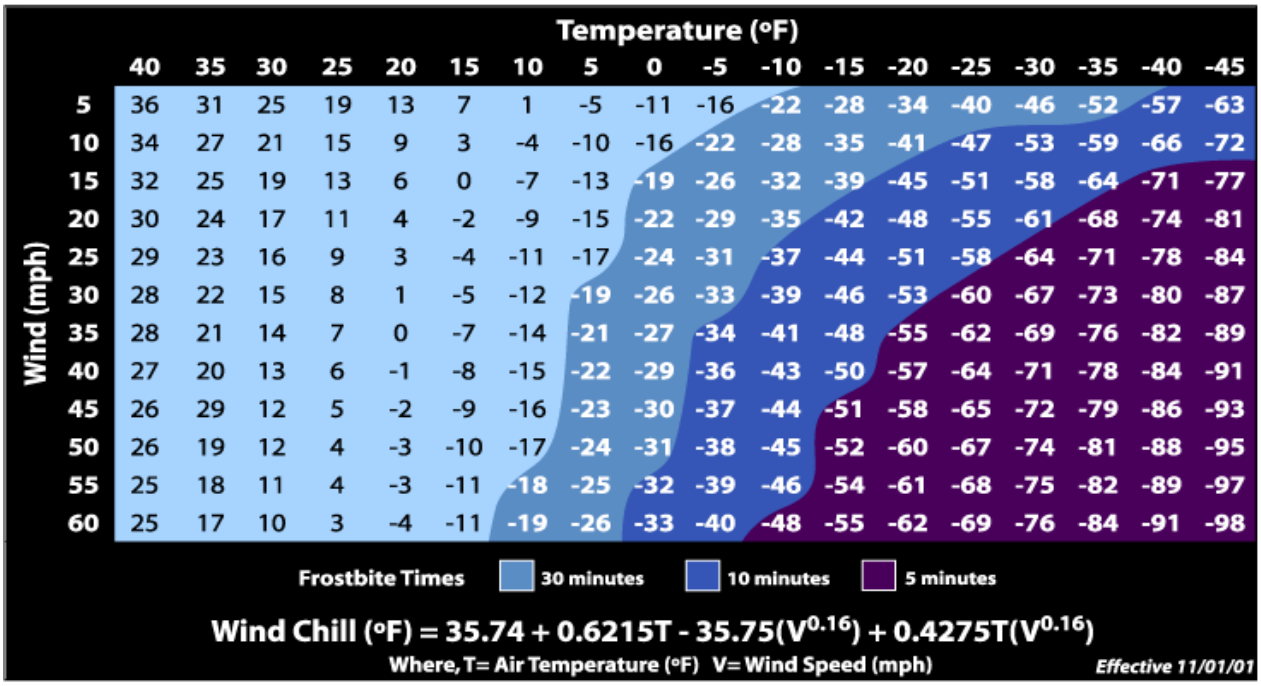
Table 11-1. Extent Scale - Winter Weather Alerts

Alert	Description	Frostbite Times
Freezing rain or freezing drizzle	Rain or drizzle is likely to freeze upon impact, resulting in a coating of ice glaze on roads and all other exposed objects.	30 minutes
Sleet	Small particles of ice, usually mixed with rain. If enough sleet accumulates on the ground, it makes travel hazardous.	30 minutes
Blizzard warning	Sustained wind speeds of at least 35 mph are accompanied by considerable falling or blowing snow. This alert is the most perilous winter storm with visibility dangerously restricted.	10-30 minutes
Frost/freeze warning	Below freezing temperatures are expected and may cause significant damage to plants, crops and fruit trees.	10 minutes
Wind chill	A strong wind combined with a temperature slightly	5 minutes

Alert	Description	Frostbite Times
	below freezing can have the same chilling effect as a temperature nearly 50 degrees lower in a calm atmosphere.	

Wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body, similar to the heat index for extreme heat (Figure 11-1). Since wind can dramatically accelerate heat loss from the body, a blustery 30° day would feel just as cold as a calm day with 0° temperatures.

Figure 11-1. Wind Chill Chart



Wind (mph)	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	29	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Although the communities throughout each of the TCRFC Regions have not experienced a blizzard, all jurisdictions have been subject to winter storm watches, warnings, freezing rain, sleet, snow and wind chill.

Table 11-2 displays the extent or intensity of a winter storm event according to the extent scale and winter advisory in Table 11-1.

Table 11-2. Extent by TCRFC Region

TCRFC REGION	COUNTIES WITHIN REGION	EXTENT
Region I	Colorado County, Fayette County, Matagorda County and Wharton County	Freezing rain or freezing drizzle
Region II	Bastrop County, Lee County, Travis County and Williamson County	Frost/freeze warning
Region III	Blanco County, Burnet County, Llano County and Mason County	Frost/freeze warning with possible wind chill
Region IV	Brown County (City of Brownwood), Lampasas County, Mills County, McCulloch County (City of Brady), San Saba County	Frost/freeze warning with possible wind chill

The intensity of a winter storm event to be mitigated increases from Region I at the Gulf Coast, to Regions III and IV in the northwestern section of the planning area. The jurisdictions within Region IV experience more winter events, and winter events of a stronger intensity. As shown in Table 11-3, Brown County, Lampasas County, McCulloch County and Mills County (all in TCRFC Region IV) have experienced the most winter storm events with the greatest number of injuries and fatalities from winter storm events.

Historical Occurrences

Historical evidence shows that most of the area is susceptible to winter storm activity. However, past reported property damages indicate that, while winter events (typically consisting of snow and ice) do occur, their economic impacts are usually not severe across the entire study area.

Because it cannot be predicted where a winter storm event may cause damage or disruption, all buildings and facilities are considered to be exposed to this hazard and could potentially be impacted. It is important to note that only winter storm events that have been reported have been factored into this risk assessment. It is likely that a high number of occurrences have gone unreported over the past 50+ years.

Table 11-3. Historical Winter Storm Impact by Jurisdiction (NCDC, 1950-2008)

JURISDICTION	NUMBER OF STORMS	TYPES OF EVENTS	DEATHS	INJURIES	PROPERTY DAMAGE (2008 DOLLARS)
Bastrop County	4	WINTER STORM	0	0	2,082,049
Blanco County	8	WINTER STORM	0	0	10,223,443
Brown County	10	WINTER STORM, ICE STORM, HEAVY SNOW, MIXED WINTER WEATHER	0	5	7,679,942
Burnet County	7	WINTER STORM, HEAVY SNOW	0	0	2,193,092
Colorado County	3	ICE STORM	3	0	1,267,800
Fayette County	5	WINTER STORM	0	0	3,438,948
Lampasas County	17	WINTER STORM, ICE STORM, HEAVY SNOW, MIXED WINTER WEATHER	10	0	90,923,232
Lee County	6	WINTER STORM	0	0	2,082,049
Llano County	7	WINTER STORM, HEAVY SNOW	0	0	2,193,092
Mason County	6	WINTER STORM, ICE STORM, HEAVY SNOW	0	0	5,150
Matagorda County	2	ICE STORM, HEAVY SNOW	3	0	0
McCulloch County	12	WINTER STORM, ICE STORM, HEAVY SNOW, WINTER WEATHER	0	5	73,850,866
Mills County	13	WINTER STORM, ICE STORM, HEAVY SNOW, MIXED WINTER WEATHER	10	0	90,907,782
San Saba County	6	WINTER STORM, ICE STORM, WINTER WEATHER	0	5	73,846,746
Travis County	9	WINTER STORM	0	0	10,223,443
Wharton County	3	ICE STORM, HEAVY SNOW	3	0	1,030
Williamson County	7	WINTER STORM	0	0	2,082,049
TOTALS	**125**	**N/A**	**29**	**15**	**373,000,713**

Source: NCDC

Probability of Future Events

The probability of a future winter storm event varies by TCRFC Region as communities in Region IV in the northwest on average experience more winter storms and storms of greater intensity than planning regions closer to the Gulf Coast.

A winter storm event is highly likely for Region IV, meaning an event is probable within the next year. Regions II and III experience winter storm events less often, therefore the probability of a future occurrence for this area is likely, with the possibility of an event occurring in the next three years. Because of its close proximity to the Gulf Coast, including Matagorda County, which is on the Gulf Coast, the probability of a future event for TCRFC Region I is occasional, meaning an event is possible in the next five years.

Vulnerability Assessment

Although winter storm is a slow onset hazard with generally six to twelve hours of warning time, utility disruptions from winter storms can severely impact the delivery of services. Water pipes can freeze and crack in sub-freezing temperatures. Ice can build up on power lines and cause them to break under the weight or ice on trees can cause tree limbs to fall on the lines. These events can disrupt electric service for long periods.

Economic impact may be felt by increased consumption of heating fuel which can lead to energy shortages and higher prices. House fires and resulting deaths tend to occur more frequently from increased and improper use of alternate heating sources. Fires during winter storms also present a greater danger because water supplies may freeze and impede firefighting efforts.

All populations, buildings, critical facilities, and infrastructure in the TCRFC region are vulnerable to severe winter events. People and animals are subject to health risks from extended exposure to cold air. Elderly people in the TCRFC planning area are at greater risk of death from hypothermia during these events. According to the U.S. Center for Disease Control, every year hypothermia kills about 600 Americans, half of whom are 65 years of age or older.

Impact

The severity of winter storm impact is generally minor. Winter storms can cause injuries and completely shut down facilities for more than one week, and cause more than ten percent of affected properties to be destroyed or suffer major damage.

Table 11-4 shows potential annualized property losses for each jurisdiction based on past reports of property damages in each jurisdiction (NCDC, 1950-2008) and exposure values extracted from HAZUS-MH MR3. "Negligible" indicates that the annualized expected property losses are less than $5,000.

Table 11-4. Potential Annualized Losses by Jurisdiction (Winter Storm)

JURISDICTION	TOTAL EXPOSURE	ANNUALIZED LOSS ($)	PERCENT LOSS RATIO
Bastrop County	3,091,607,000	34,701	0.00%
Blanco County	628,637,000	170,391	0.03%
Brown County	2,276,120,000	128,607	0.01%
Burnet County	2,124,059,000	36,552	0.00%
Colorado County	1,252,338,000	23,478	0.00%
Fayette County	1,542,593,000	57,316	0.00%
Lampasas County	984,168,000	1,547,618	0.16%
Lee County	868,660,000	34,701	0.00%
Llano County	1,490,823,000	36,552	0.00%
Mason County	267,480,000	Negligible	0.00%
Matagorda County	2,184,807,000	Negligible	0.00%
McCulloch County	462,487,000	1,231,463	0.27%
Mills County	332,198,000	1,547,332	0.47%
San Saba County	373,409,000	1,231,387	0.33%
Travis County	62,028,606,000	170,391	0.00%
Wharton County	2,290,384	Negligible	0.00%
Williamson County	18,650,064,000	34,701	0.00%
TOTALS FOR STUDY AREA	**98,560,346,384**	**6,285,190**	**N/A**

Sources: HAZUS-MH MR3 (total exposure) and NCDC (annualized losses)

Section 12 – Drought

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Hazard Profile

Drought is a period of time without substantial rainfall that persists from one year to the next. Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of anticipated natural precipitation reduction over an extended period of time, usually a season or more in length. Droughts can be classified as meteorological, hydrologic, agricultural and socioeconomic. Table 12-1 presents definitions for these different types of drought.

Droughts are one of the most complex of all natural hazards as it is difficult to determine their precise beginning or end. In addition, droughts can lead to other hazards such as extreme heat and wildfires (discussed in Sections 13 and 14 respectively). Droughts can affect a large area and range in size from a couple of counties to several states. Their impact on wildlife and area farming is enormous. Droughts can kill crops, grazing land, edible plants and even in severe cases, trees. Dying vegetation serves as a prime ignition source for wildfires. A heat wave combined with a drought is a very dangerous situation. Although drought can occur in any season, when extreme heat combines with drought conditions, the result can be a community disaster.

Pedernales River during period of drought.

Table 12-1. Drought Classification Definitions

Meteorological Drought	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
Hydrologic Drought	The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
Agricultural Drought	Soil moisture deficiencies relative to water demands of plant life, usually crops.
Socioeconomic Drought	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

Over time, droughts can have very damaging effects on crops, municipal water supplies, recreation, and wildlife. If droughts extend over a number of years, the direct and indirect economic impact can be significant.

Location

Droughts occur regularly in Central Texas and are a normal condition. However, they can vary greatly in their intensity and duration. On average, a yearlong drought takes place somewhere in Texas once every 3 years and a major drought every 20 years. Major droughts can last for years. There is no distinct geographic boundary to drought. Drought can occur in every area of TCRFC region equally.

Extent

The Palmer Drought Indexes are used to measure the extent of drought. The Palmer Z Short-Term Conditions Index measures short-term drought on a weekly scale. The Palmer Long-Term Meteorological Drought Index attempts to measure the duration and intensity of the long-term drought-inducing circulation patterns. Long-term drought is cumulative, with the intensity of drought during the current month dependent upon the current weather patterns plus the cumulative patterns of previous months. The hydrological impacts of drought (e.g., reservoir levels, groundwater levels, etc.) take longer to develop. The Palmer Long-Term Hydrological Drought Index is used to quantify these hydrological effects (See Table 12-2).

Table 12-2. Palmer Drought Classification Indices

Drought Index	Drought Condition Classifications						
	Extreme	Severe	Moderate	Normal	Moderately moist	Very moist	Extremely moist
Z index	-2.75 and below	-2.00 to -2.74	-125 to -1.99	-1.24 to +.99	+1.00 to +2.49	+2.50 to +3.49	n/a
Meteorological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.00	+3.00 to +3.00	+4.00 and above
Hydrological	-4.00 and below	-3.00 to -3.99	-2.00 to -2.99	-1.99 to +1.99	+2.00 to +2.00	+3.00 to +3.00	+4.00 and above

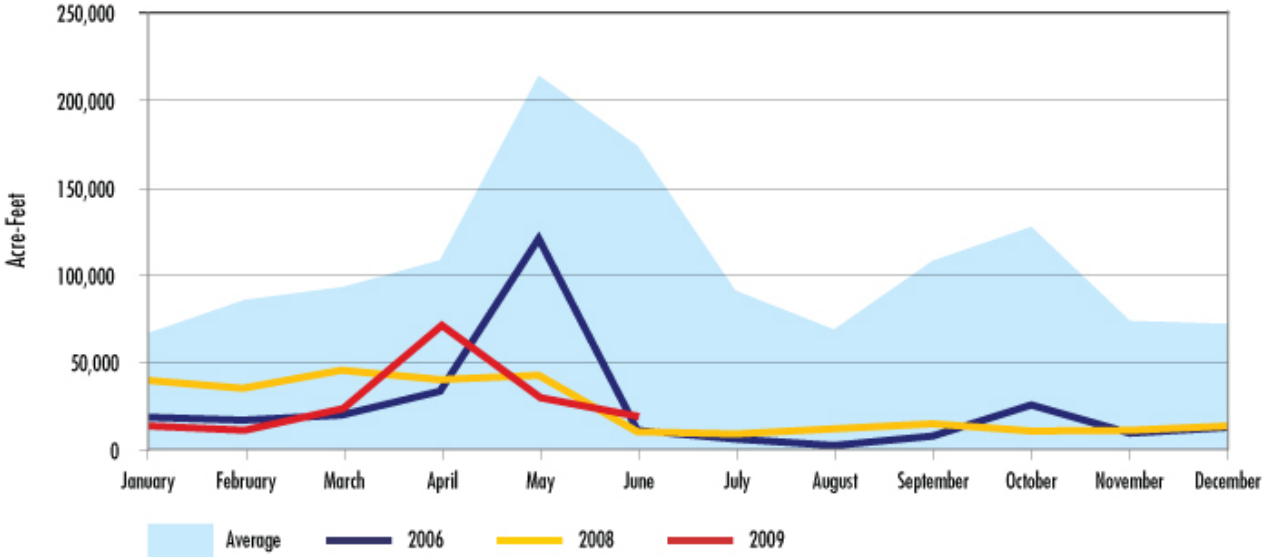
Table 12-3. United States Drought Monitor

D0	Abnormally Dry
D1	Moderate
D2	Severe
D3	Extreme
D4	Exceptional

Due to the expansive land area of the TCRFC, Table 12-2 should be read in conjunction with Table 12-3 to determine the level of drought to be mitigated. The region experienced exceptional drought in 2009, despite an almost record drought for 2008. The levels of lakes and aquifers throughout the TCRFC region were low and the potential for wildfire is high despite rainfall occurrences in the spring of 2009, as these rains produced little runoff into the lakes. The Highland Lakes average 1.2 acre-feet of water flows, but for 2009 less than 170,000 acre-feet of water has flowed into the lakes[1]. Figure 12-2 on the following page depicts monthly inflows of 2009 along with record drought years 2006 and 2008 against average inflows.

[1] Source: www.lcra.org

Figure 12-2. Monthly Inflows to the Highland Lakes



The Lower Colorado Basin was the driest in 2009 since the drought experienced in the 1950s, which was the most severe drought for the region in recent history. Rainfall for 2008 was 16 to 20 inches below normal, placing the majority of the counties in the TCRFC region as a D4 or exceptional drought according to the National Drought Monitor. Figure 12-1 shows a detailed map of Texas counties experiencing exceptional drought for 2008 with surrounding counties falling under category D3 or extreme drought. Figure 12-1 displays a period of extreme drought for the region in 2009 where all counties were experiencing either severe, extreme, or exceptional drought.

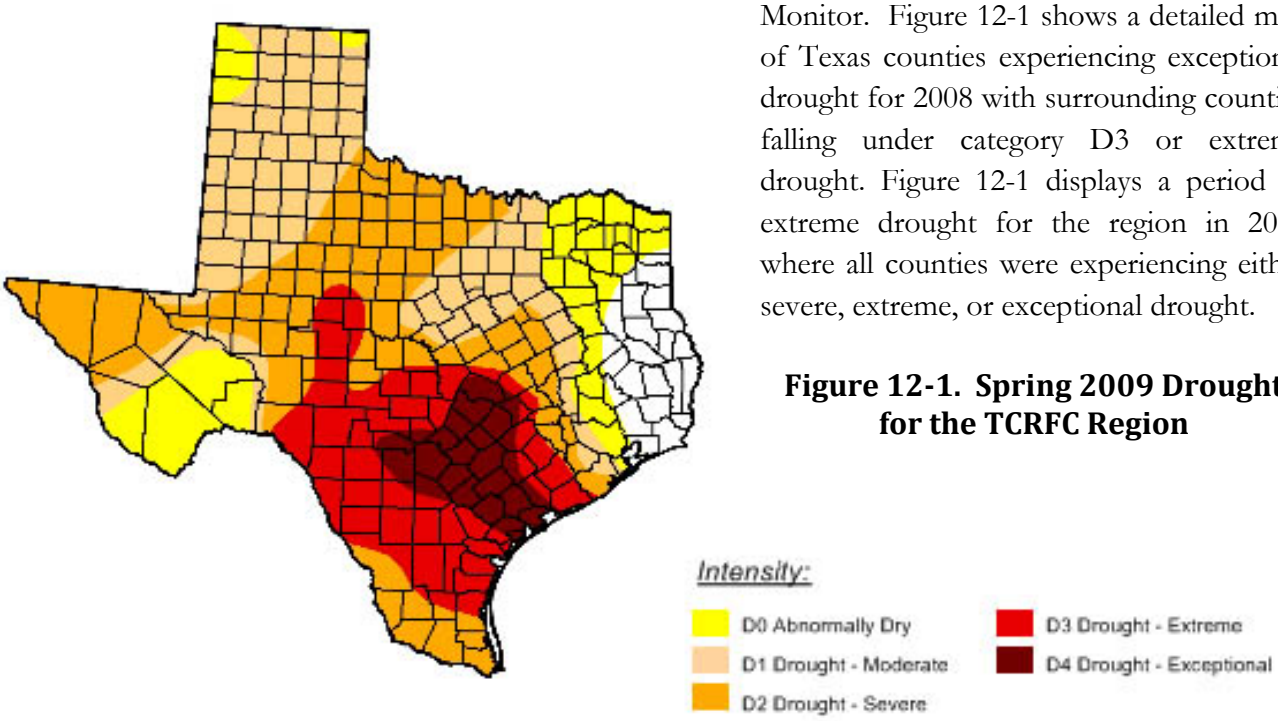


Figure 12-1. Spring 2009 Drought for the TCRFC Region

Typically the counties in TCRFC Region I, which are closest to the coast, experience on average no drought (D0) or moderate drought (D1) to the moisture level in the soil. This includes Colorado, Fayette, Matagorda and Wharton counties.

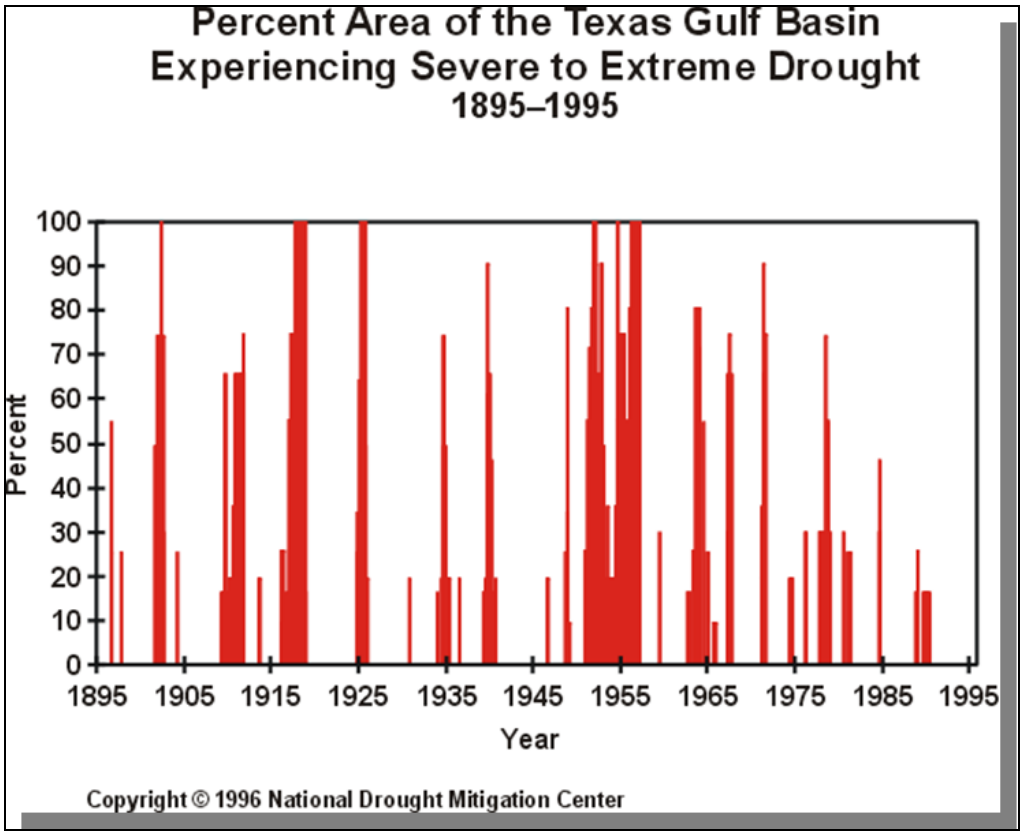
Lampasas, Brown, McCulloch, Mills and San Saba counties (Region IV) on average experience drought from a D1 to a D3 or moderate drought to extreme drought throughout the summer months.

Based on previous occurrences, the extent for drought for counties in TCRFC Regions II and III (Bastrop, Blanco, Burnet, Lee, Llano, Mason, Travis, and Williamson) is usually more drastic, typically with periods of extreme and exceptional drought (D3 and D4).

Historical Occurrences

Droughts are slow-onset hazards, but over time can have damaging effects on crops, municipal water supplies, recreation, and wildlife. If droughts extend over a number of years, the direct and indirect economic impact can be significant. Figure 12-3 shows historical drought in the Texas Gulf Basin and Table 12-4 shows previous occurrences of drought.

Figure 12-3. Drought in the Texas Gulf Basin



Historical drought events in the Lower Colorado River Basin are detailed in Table 12-4, by Region of the State. Table 12-5 provides updated information on drought in the Basin from 2005 to 2009.

Table12-4. Historical Drought Events, by Region of the State.

Drought Year[2]	Drought Extent (percentage of average precipitation)	Drought Year	Drought Extent (percentage of average precipitation)
Texas Edwards Plateau Region (Blanco, Burnet, Lampasas, Llano, Mason, McCulloch and San Saba Counties)			
1893	73	1953	50
1901	49	1954	43
1909	60	1956	68
1910	74	1962	65
1917	65	1963	72
1924	46	1970	67
1933	71	1988	72
1934	68	1989	67
1951	69	1999	53
North Central Region (Brown, Mills, Lee and Williamson Counties)			
1893	67	1943	72
1901	70	1948	73
1909	72	1954	68
1910	64	1956	61
1917	63	1963	63

[2] A drought year is defined as one in which average precipitation is less than 75 percent of the 1931-1960 average of 26 inches.

Drought Year[2]	Drought Extent (percentage of average precipitation)	Drought Year	Drought Extent (percentage of average precipitation)
1924	73	1999	73
1925	72		
South Central Region (Bastrop, Colorado, Fayette, Travis Counties)			
1893	56	1948	71
1897	73	1950	68
1901	62	1954	50
1909	70	1956	55
1910	69	1963	61
1916	73	1988	62
1917	42	1996	71
1925	72	1999	69
1939	69		
Upper Coast Region (Matagorda and Wharton Counties)			
1892	73	1927	74
1893	64	1948	67
1901	70	1954	57
1910	74	1956	62
1916	69	1963	73
1917	50	1988	67
1924	72	1999	69

Source: Texas Almanac.

Table 12-5. Counties Experiencing Drought in the TCRFC Region: 2005-2009

Season/Year	Drought Conditions for TCRFC Counties					
	No Drought	D0 – Abnormally Dry	D1 – Moderate	D2 - Severe	D3- Extreme	D4- Exceptional
Winter/2005	All counties					
Spring/2005	All counties					
Summer/2005		Colorado, Matagorda, Wharton	Bastrop, Blanco, Brown, Burnet, Fayette, Lampasas, Lee, Llano, Mason, McCulloch, Mills, San Saba, Travis, Williamson			
Fall/2005		Brown, Llano, Mason, Matagorda, McCulloch, Mills, San Saba, Wharton	Blanco, Bastrop, Burnet, Colorado, Fayette, Lampasas, Lee, Travis, Williamson			
Winter/2006			Colorado, Matagorda, Wharton	Brown, Fayette, Llano, Mason, McCulloch, Mills, San Saba	Bastrop, Blanco, Burnet, Lee, Travis, Williamson, Lampasas	
Spring/2006				Brown, Colorado, Fayette, Lampasas, Lee, Matagorda, McCulloch, Mills, San Saba, Wharton	Bastrop, Burnet, Llano, Mason, Travis, Williamson	Blanco
Summer/2006	Matagorda	Wharton	Bastrop, Colorado,	Blanco, Brown,	Mason	

Season/Year	Drought Conditions for TCRFC Counties					
	No Drought	D0 – Abnormally Dry	D1 – Moderate	D2 - Severe	D3- Extreme	D4- Exceptional
			Fayette, Lee, Travis, Williamson	Burnet, Lampasas, Llano, McCulloch, Mills, San Saba		
Fall/2006	Colorado, Matagorda, Wharton	Fayette, Lee	Bastrop	Brown, Burnet, Lampasas, Llano, Mason, McCulloch, Mills, San Saba, Williamson	Blanco, Travis	
Winter/2007		Colorado, Fayette, Matagorda, Wharton	Bastrop	Travis, Williamson	Blanco, Brown, Burnet, Lampasas, Lee, Llano, Mason, McCulloch, Mills, San Saba	
Spring/2007	Colorado, Fayette, Matagorda, Wharton	Bastrop, Lee, Travis, Williamson	Blanco, Burnet, Lampasas	Brown, Llano, Mason, McCulloch, Mills, San Saba		
Summer/2007	All Counties					
Fall/2007	All Counties					
Winter/2008	Colorado, Matagorda, Wharton	Bastrop, Brown, Burnet, Fayette, Lampasas, Lee, McCulloch, Mills, San Saba, Williamson	Blanco, Llano, Mason, Travis			
Spring/2008	Brown, Lee, McCulloch,	Bastrop, Blanco,				

Season/Year	Drought Conditions for TCRFC Counties					
	No Drought	D0 – Abnormally Dry	D1 – Moderate	D2 - Severe	D3- Extreme	D4- Exceptional
	Mills, Travis, Williamson	Burnet, Colorado, Fayette, Lampasas, Llano, Mason, Matagorda, San Saba, Wharton				
Summer/2008			Brown, Mills	Burnet, Lampasas, Llano, Mason, McCulloch, San Saba	Blanco, Matagorda, Travis, Wharton, Williamson	Bastrop, Colorado, Fayette, Lee
Fall/2008		Brown, Mills, Wharton	McCulloch, San Saba	Lampasas, Llano, Mason, Matagorda	Bastrop, Blanco, Burnet, Colorado, Fayette, Lee, Travis, Williamson	
Winter/2009				Brown, Colorado, Fayette, Lampasas, Matagorda, Mills, Wharton	Llano, Mason, McCulloch, San Saba	Blanco, Bastrop, Lee, Travis, Williamson

Source: U.S. Drought Monitor

Probability of Future Events

Based on the historical frequency, the probability of a future drought occurrence for jurisdictions throughout the TCRFC planning area is likely, with an event probable in the next three years, and a major drought every 20 years.

Vulnerability Assessment

Droughts impact large geographical areas, and because the TCRFC planning area can be impacted uniformly by drought, all the population, buildings, critical facilities, infrastructure and lifelines, and hazardous materials facilities are considered exposed to the hazard and could potentially be

impacted. Since all jurisdictions are considered to be equally affected by drought, each jurisdiction will not be assessed independently.

Droughts may cause a shortage of water for human and industrial consumption, hydroelectric power, recreation, and navigation. Water quality may also decline and the number and severity of wildfires may increase. Severe droughts may result in the loss of agricultural crops and forest products, undernourished wildlife and livestock, lower land values, and higher unemployment. Therefore not only are agricultural businesses vulnerable to drought, but also hydro-electric power and other water-dependent industries, such as forestry and tourism.

The occurrence of drought can also result in water rationing as well as burn bans. Hazards associated with drought are wildfire and expansive soils, but the most direct impact of drought is economic rather than loss of life or immediate destruction of property.

Impact

The potential severity of impact of droughts is substantial, especially taking into consideration the economic losses that may result. In order to analyze the risk of the TCRFC study area to drought and estimate potential losses, 19 years of statistical data from the National Climatic Data Center (NCDC) and 2002 USDA agriculture data was used. A drought event frequency-impact was then developed to determine a drought impact profile on non-irrigated agriculture products and estimate potential losses due to drought in the area (See Table 12-8).

Annualized expected property losses from drought are over $10 million per year per county with the exception of San Saba County, where losses are predicted at over $5 million. Table 12-8 shows estimated exposure, potential annualized losses, and annualized percent loss ratio by county.

Table 12-8. Annualized Expected Agricultural Product Market Value Exposed to Drought by County

JURISDICTION	TOTAL AGRICULTURAL PRODUCTS EXPOSURE	ANNUALIZED LOSS ($)	PERCENT LOSS RATIO
Bastrop County	27,822,000	11,104,260	39.91%
Blanco County	12,050,000	11,104,260	92.15%
Brown County	25,729,000	16,015,989	62.25%
Burnet County	10,257,000	11,104,260	108.26%
Colorado County	41,586,000	18,415,933	44.28%

JURISDICTION	TOTAL AGRICULTURAL PRODUCTS EXPOSURE	ANNUALIZED LOSS ($)	PERCENT LOSS RATIO
Fayette County	51,696,000	11,104,260	21.48%
Lampasas County	13,375,000	119,529,540	893.68%
Lee County	22,947,000	11,104,260	48.39%
Llano County	11,739,000	11,104,260	94.59%
Mason County	44,798,000	16,015,989	35.75%
Matagorda County	115,730,000	18,415,933	15.91%
McCulloch County	12,966,000	16,015,989	123.52%
Mills County	21,987,000	125,423,429	570.44%
San Saba County	22,938,000	5,981,970	26.08%
Travis County	17,116,000	11,104,260	64.88%
Wharton County	146,370,000	18,415,933	12.58%
Williamson County	46,396,000	11,104,260	23.93%
TOTALS FOR STUDY AREA	**645,502,000**	**443,064,785**	**N/A**

Sources: USDA (exposure) and NCDC (annualized losses)

Section 13 – Extreme Heat

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Hazard Profile

Severe, excessive summer heat is characterized by a combination of a very high temperatures and exceptionally humid conditions. When persisting over a period of time, it is called a heat wave. Many areas of the country, especially the Lower Colorado River Basin, are susceptible to heat waves.

The major human risks associated with severe summer heat include heatstroke, heat exhaustion, and heat cramps. Most at risk are people who work outdoors, the elderly, children, and people in poor physical health. The effects of severe summer heat are always more pronounced in urbanized areas than in rural areas. Within urbanized areas, the problem is exacerbated by what is known as the heat island effect, in which the concrete and metal infrastructure absorb radiant heat energy from the sun during the day and radiate that heat energy during the night. This cyclical process essentially traps the heat in the urbanized area and makes it as much as 10 degrees warmer than the surrounding area.

During summer months, the TCRFC Region is frequently affected by severe heat hazards. Persistent domes of high pressure establish themselves, which set up hot and dry conditions. This high pressure prevents other weather features such as cool fronts or rain events from moving into the area and providing necessary relief. Daily high temperatures range into the upper 90's and low 100's. When combined with moderate to high relative humidity levels, which are especially prevalent in counties such as Matagorda and Wharton, the heat index moves into dangerous levels, and a heat index of 105 degrees is considered the level where many people begin to experience extreme discomfort or physical distress.

Severe summer heat is an invisible killer. Although a heat wave does not happen with the spectacle of other hazards such as tornadoes and floods, the National Center for Environmental Health reports that, from 1979 to 1999, excessive heat exposure caused 8,015 deaths in the United States. In other words, during this period, more people in the U.S. died from severe summer heat than from hurricanes, lightning, tornadoes, floods and earthquakes combined.

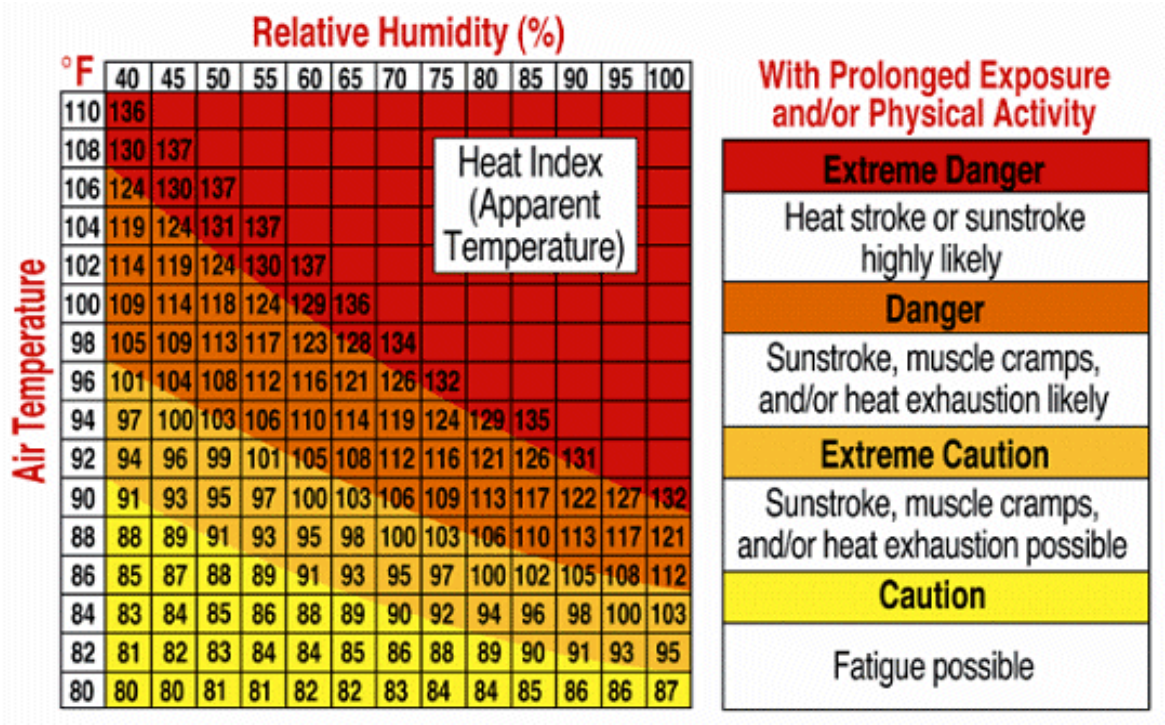
Location

There is no distinct geographic boundary to excessive summer heat. Excessive summer heat can occur in every area of the TCRFC Region.

Extent

The magnitude or intensity of an extreme heat event is measured according to temperature in relation to the percentage of humidity. According to the National Oceanic Atmospheric Administration (NOAA), this relationship is referred to as the "Heat Index," and is depicted in Figure 13-1. This index measures how hot it feels outside when humidity is combined with high temperatures.

Figure 13-1. Extent Scales for Extreme Summer Heat



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

The extent scale in Figure 13-1 displays varying degrees of caution depending on the relative humidity combined with the temperature. For example, when the temperature is at 90 degrees Fahrenheit or lower, caution should be exercised if the humidity level is at or above 40 percent.

The shaded zones on the chart indicate varying symptoms or disorders that could occur depending on the magnitude or intensity of the event. "Caution" is the first level of intensity where fatigue due to heat exposure is possible. "Extreme Caution" indicates that sunstroke, muscle cramps or heat exhaustion are possible, whereas a "Danger" level means that these symptoms are likely. "Extreme Danger" indicates that heat stroke is likely.

Because an extreme heat event of high temperature and high humidity can occur more often in the communities located near the coast in Region I, the intensity to be mitigated is "Extreme Danger". Although not associated with high humidity, the communities in Region IV experience higher temperatures and longer periods of extreme heat. Like Region I, the intensity to be mitigated for Region IV is "Extreme Danger". The more centrally-located cities and counties that make up Regions II and III may still experience a high air temperature with increased humidity during the summer months. Therefore the intensity to be mitigated for Region II and Region III would be a "Danger" level.

An extreme summer heat event could occur with an air temperature as low as 80°F if the percentage of humidity was equal to or greater than 40 percent. Even though this temperature seems relatively low, given the high humidity, fatigue is possible. Citizens, especially children and the elderly, should exercise caution by staying out of the heat for prolonged periods at this temperature and relative humidity. As the chart indicates fatigue is only possible, but can occur with prolonged exposure or physical activity. Citizens who work outdoors should exercise caution even at the lower temperature if the humidity is at a high degree. With prolonged exposure or physical activity fatigue could set in, causing dizziness, headaches or nausea.

Historical Occurrences

In other parts of the country and the world, severe summer heat hazards can have devastating consequences. For instance, in 1995 a two-week-long heat wave hit Chicago, and the heat index peaked at 119 degrees Fahrenheit. There were 465 deaths directly attributable to the heat wave, and more than half of the victims were 75 years of age or older.

During the summer of 2003, a heat wave scorched Europe and killed more than 19,000 people, according to official estimates by the Associated Press. Throughout

that July and August, the heat wave set new records across Europe. The heat wave caused billions of dollars in property damage due to crop failures, livestock failures, wildfires and melting Alpine glaciers. But, by far, the greatest losses were human lives.

According to the National Climatic Data Center, a strong heat wave effected Texas in the summer of 1999 and 2000. Colorado, Matagorda and Wharton in addition to Lampasas and Mills counties suffered in terms of injuries and deaths (See Table 13-1). Travis and Williamson counties are the only other two counties to have experienced a recorded extreme heat event. Except for one case, all of the victims of extreme heat in Travis and Williamson counties were either elderly or under three years of age. In total, 100 people in the TCRFC area have lost their lives due to extreme heat and heat waves during the summer months. This underscores the importance of increased public awareness regarding the danger of extreme heat.

Table 13-1. Historical Excessive Heat Events in the TCRFC[1]

County	Event Date	Deaths	Injuries	Property Damage	Crop Damage
Colorado/ Matagorda/ Wharton	7/21/95	2	200	0	0
	6/26/99	3	0	0	0
	8/1/99	6	0	0	0
	7/6/00	19	0	0	0
	8/29/00	3	0	0	0
	9/1/00	5	0	0	0
Lampasas/Mills	7/1/98	32	0	0	0
	8/1/99	3	0	0	0
	7/1/00	8	0	0	0
	8/1/00	5	0	0	0

[1] The totals for deaths and injuries in Table 13-1 include additional counties affected in the disaster area outside of the TCRFC. Therefore totals are greater than in the County alone.

County	Event Date	Deaths	Injuries	Property Damage	Crop Damage
	9/1/00	5	0	0	0
Travis	7/29/99	1	0	0	0
	8/14/99	1	0	0	0
	8/16/99	1	0	0	0
	7/4/00	1	0	0	0
	7/5/00	1	0	0	0
	7/18/00	1	0	0	0
	7/23/00	2	0	0	0
Williamson	7/25/00	1	0	0	0
Totals		**100**	**200**	**0**	**0**

Probability of Future Events

The likelihood or future probability of occurrence of excessive summer heat in the TCRFC is "highly likely", meaning that an extreme heat event is probable within the next year. Each year, jurisdictions participating in the TCRFC planning area experience excessive temperatures in the summer months, especially when the above-average temperatures are accompanied by drought as they were in 2009.

Vulnerability Assessment

There is no defined geographic boundary for excessive summer heat events. All population, buildings, critical facilities, infrastructure, lifelines, and hazardous material facilities are considered exposed to the excessive summer heat hazard and could be potentially impacted.

Heat waves are the most lethal weather phenomenon and presents significant life and safety threats to the population of the TCRFC region. Although there is some variance in terms of average days of heat for each jurisdiction, because this data is often not reported, it is difficult to state with accuracy detailed variables among participating communities in terms of vulnerability.

During an average year heat-related deaths outnumber the deaths from all other weather events. Young children, elderly people, and those who are sick or overweight are more likely to become victims to extreme heat. Another segment of the population at risk is those whose jobs consist of

strenuous labor outdoors. Livestock and crops can also become stressed, decreasing in quality or in production, during times of extreme heat.

Extreme high temperatures can cause droughts, water shortages, increase fire danger, and prompt excessive demands for energy. The possibility of rolling blackouts is increased with unseasonably high temperatures in what is a normally mild month with low power demands. Air pollution in summer months may result from consistent high temperatures and stagnant airflows. Transportation may be compromised and even aircraft may lose lift at high temperatures. Highways and roads are impacted as excessive heat softens asphalt on roads and buckles concrete. Stress is placed on automobile cooling systems, diesel trucks and rail cars. Refrigerated goods experience significant greater rate of spoilage due to extreme heat.

It is clear that the TCRFC has been and will continue to be affected by extreme summer heat. Based on a qualitative analysis of the impacts that a severe summer heat hazard would have on social, economic, and environmental components of the region, the risk of a severe summer heat hazard is sufficient enough to merit mitigation consideration.

Impact

The potential impact of excessive summer heat is "Minor" resulting in few, if any, injuries. There is only minor property damage and minimal disruption to the quality of life. Any shutdown of facilities is temporary.

Section 14 – Wildfire

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Hazard Profile

A wildland fire is any fire occurring on grassland, forest, or prairie, regardless of ignition source, damages, or benefits. According to the *National Fire Plan, 2000*, the wildland fire risk is now considered by authorities as "the most significant fire service problem of the Century."

The *National Fire Plan* was issued by the U.S. Departments of Agriculture and Interior. It defines the urban/wildland interface as "…. the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels." The interface problem has grown dramatically over the last twenty years, spawned by increases in population, urban expansion, land-management decisions, parks, greenbelts, and the ever-present desire to intermingle with nature. The marriage between humans and their property and wildland areas has significantly increased human exposure to wildfires.

Texas has seen a huge increase in the number of wildfires in the past 30 years. From January 2005 to mid-September 2006, the Texas Forest Service responded to 4,370 wildfires that burned 1.6 million acres. More and more people are placing their homes in woodland settings in or near forests, rural areas, or remote mountain sites. Many of these homes are nestled along ridgelines, cliff-edges, and other classic fire-interface hazard zones. There, homeowners enjoy the beauty of the environment but they also face the very real danger of wildfire.

Years of fire suppression have significantly disturbed natural fire occurrences—nature's renewal process. The result has been the gradual accumulation of understory and canopy fuels to levels of density that can feed high-energy, intense wildfires and further increase hazards from and exposure to interface problems.

Multiple devastating interface-area fires over the past several years have demonstrated the disastrous potential inherent to the interface. This danger is perhaps best epitomized by the Cerro Grande fire of 2000 in New Mexico or the Oakland, California, fire of 1991 in which 25 lives were lost and more than 2,900 homes destroyed.

In a letter to the President after the devastating 1999-2000 fire season, the secretaries of Agriculture and Interior wrote, "explosive growth in the wildland urban interface now puts entire communities and associated infrastructure, and the socioeconomic fabric that holds communities together, at risk from wildland fire."

Wildland fires can occur at any time of the year. Climatic conditions such as severe freezes and drought can significantly increase the intensity of wildland fires since these conditions kill vegetation, creating a prime fuel source for these types of fires. The intensity of fires and the rate at which they spread are directly related to wind speed, temperature, and relative humidity.

Location

GIS data depicting the Federal Register definition of the wildland-urban interface in Texas based on the integration of U.S. Census and USGS National Land Cover Data was used to identify the following areas of possible concern:

- High Density Interface
- Medium Density Interface
- Low Density Interface
- Intermix

Figures 14-1through 14-18 graphically illustrate the potential wildfire hazard areas listed above in each participating jurisdiction and provides an indication of where there is potential for damage to property and loss of life in the TCRFC study region. A narrative discussion follows the GIS maps.

Figure 14-1. Potential Wildlife Hazard Areas (NCDC, 1950-2008)

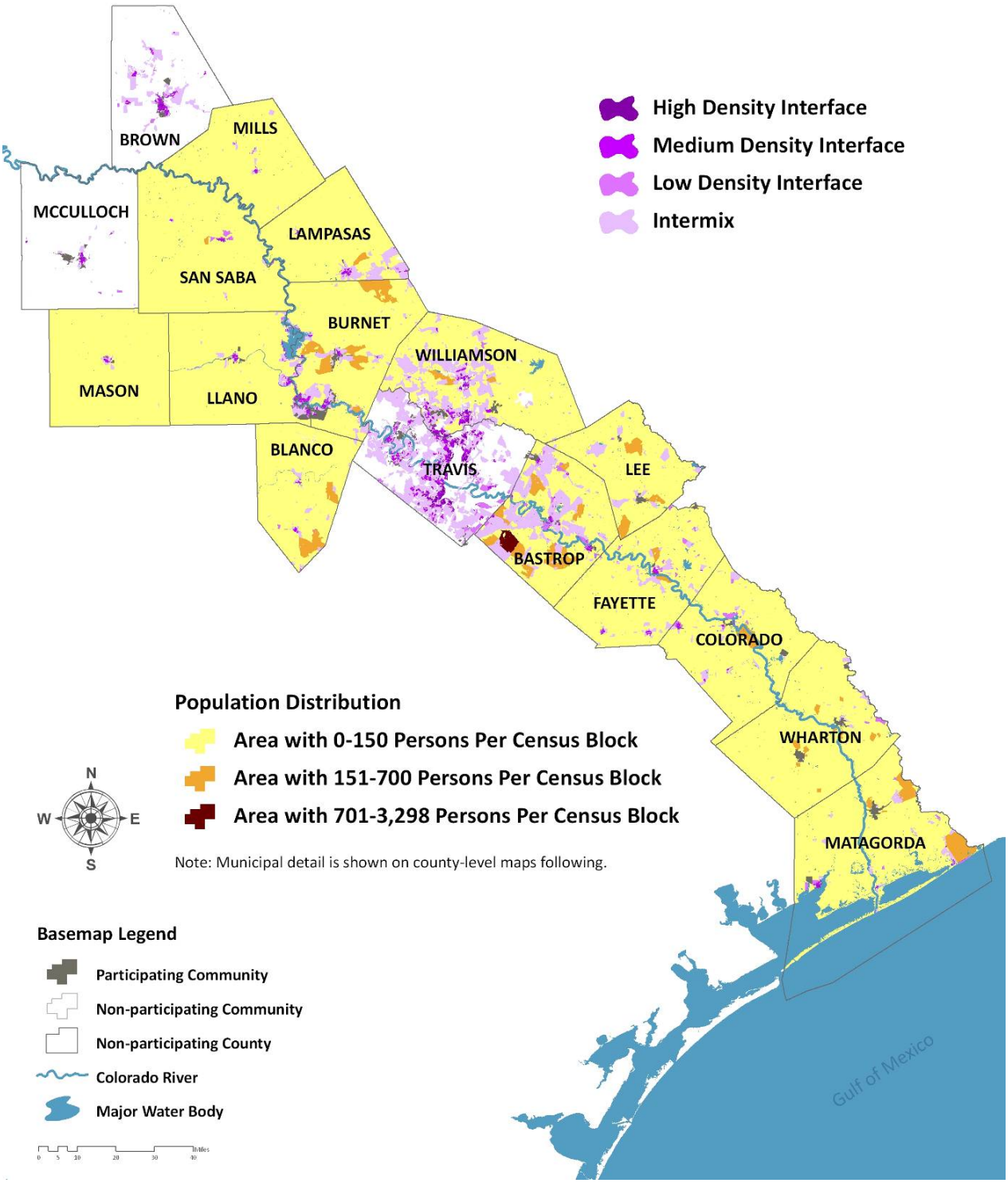


Figure 14-2. Potential Wildfire Hazard Areas in Bastrop County

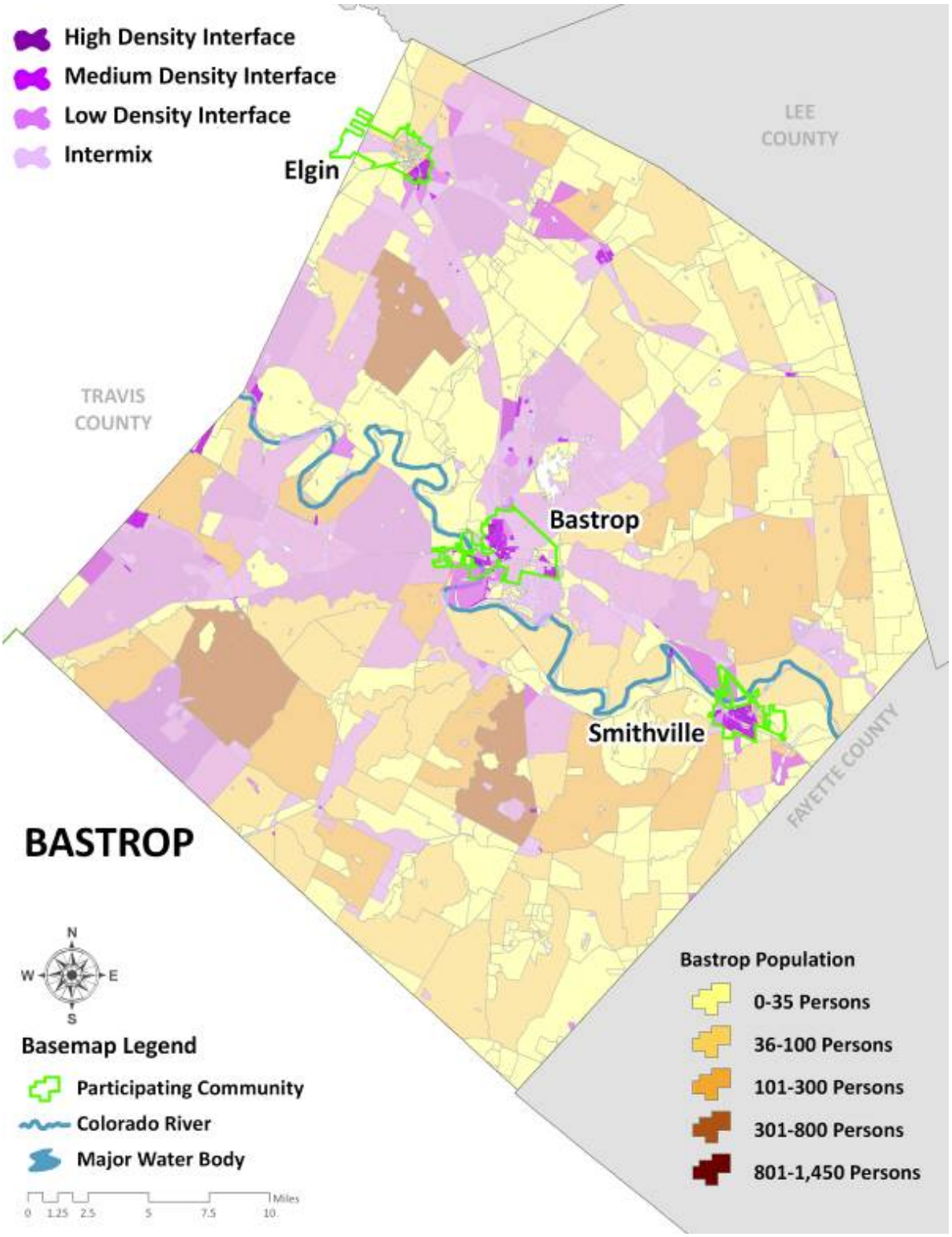


Figure 14-3. Potential Wildfire Hazard Areas in Blanco County

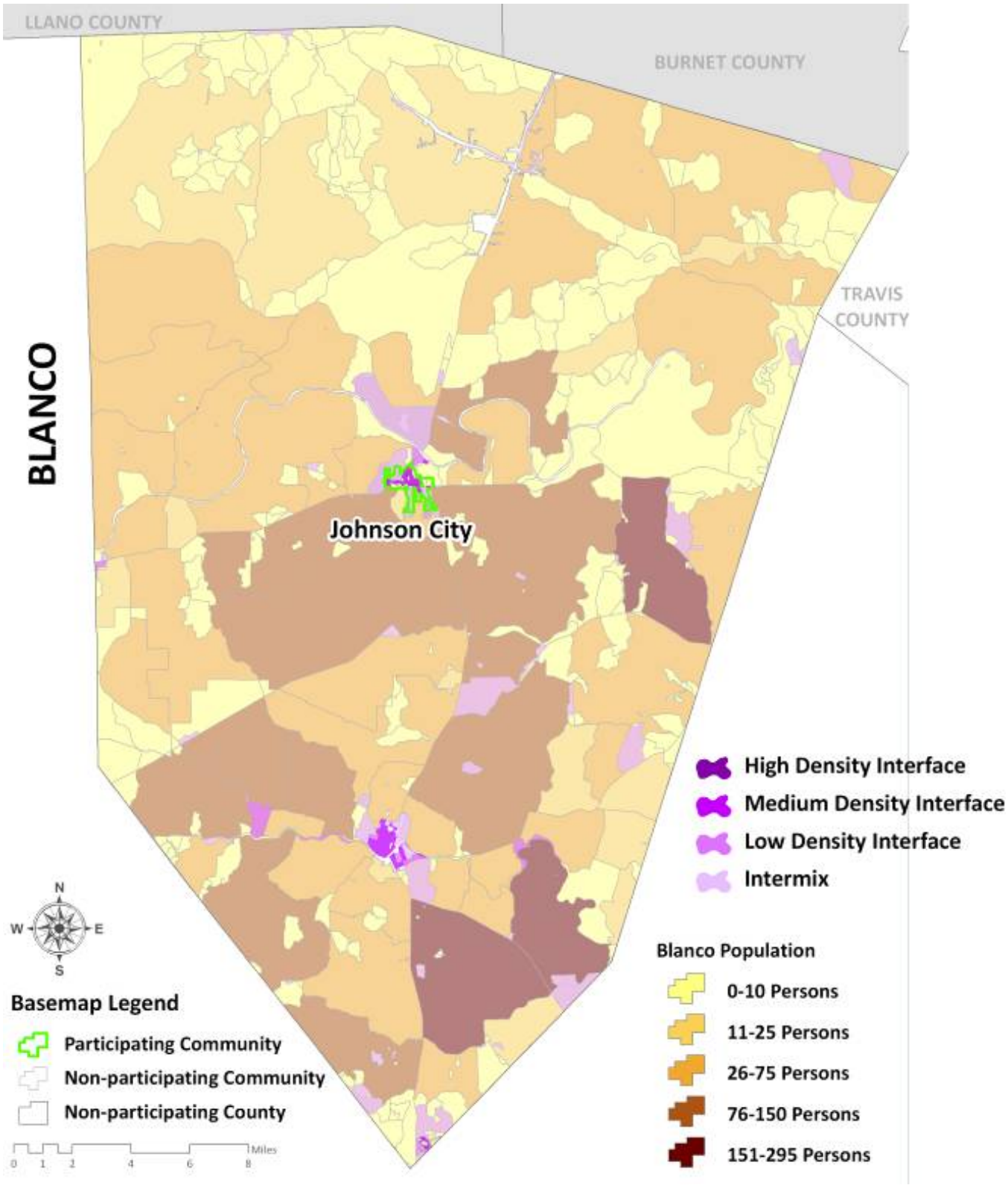


Figure 14-4. Potential Wildfire Hazard Areas in Brown County

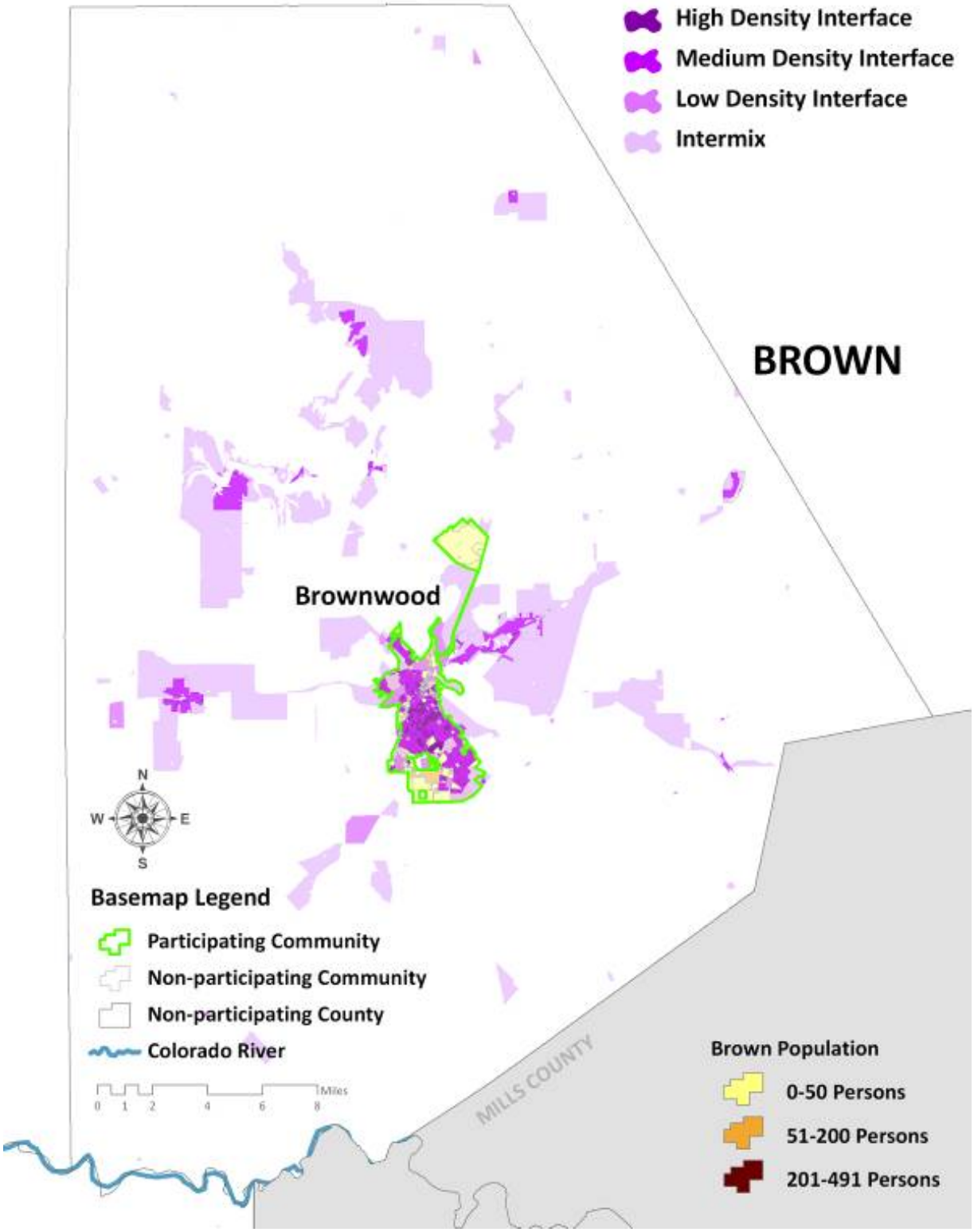


Figure 14-5. Potential Wildfire Hazard Areas in Burnet County

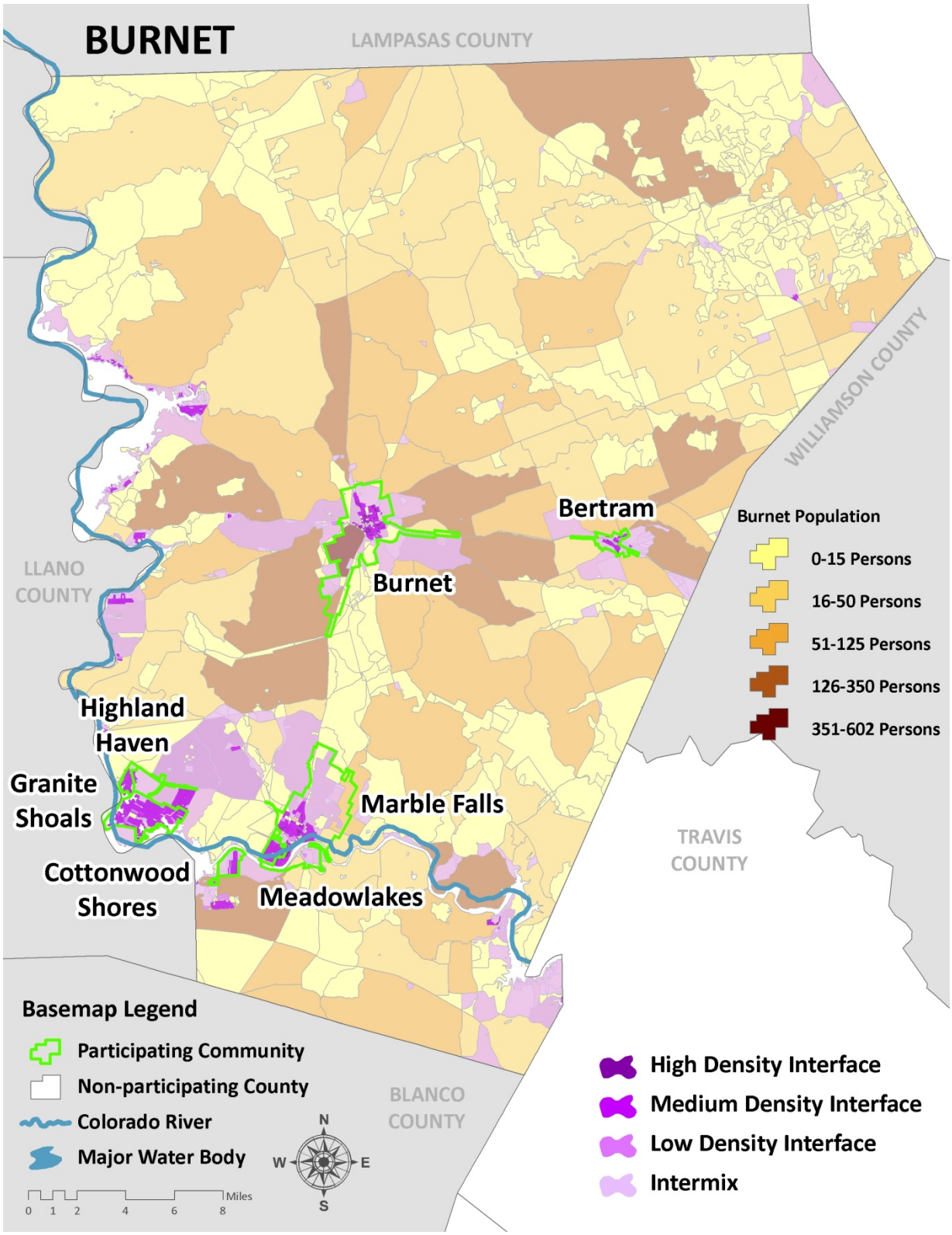


Figure 14-6. Potential Wildfire Hazard Areas in Colorado County

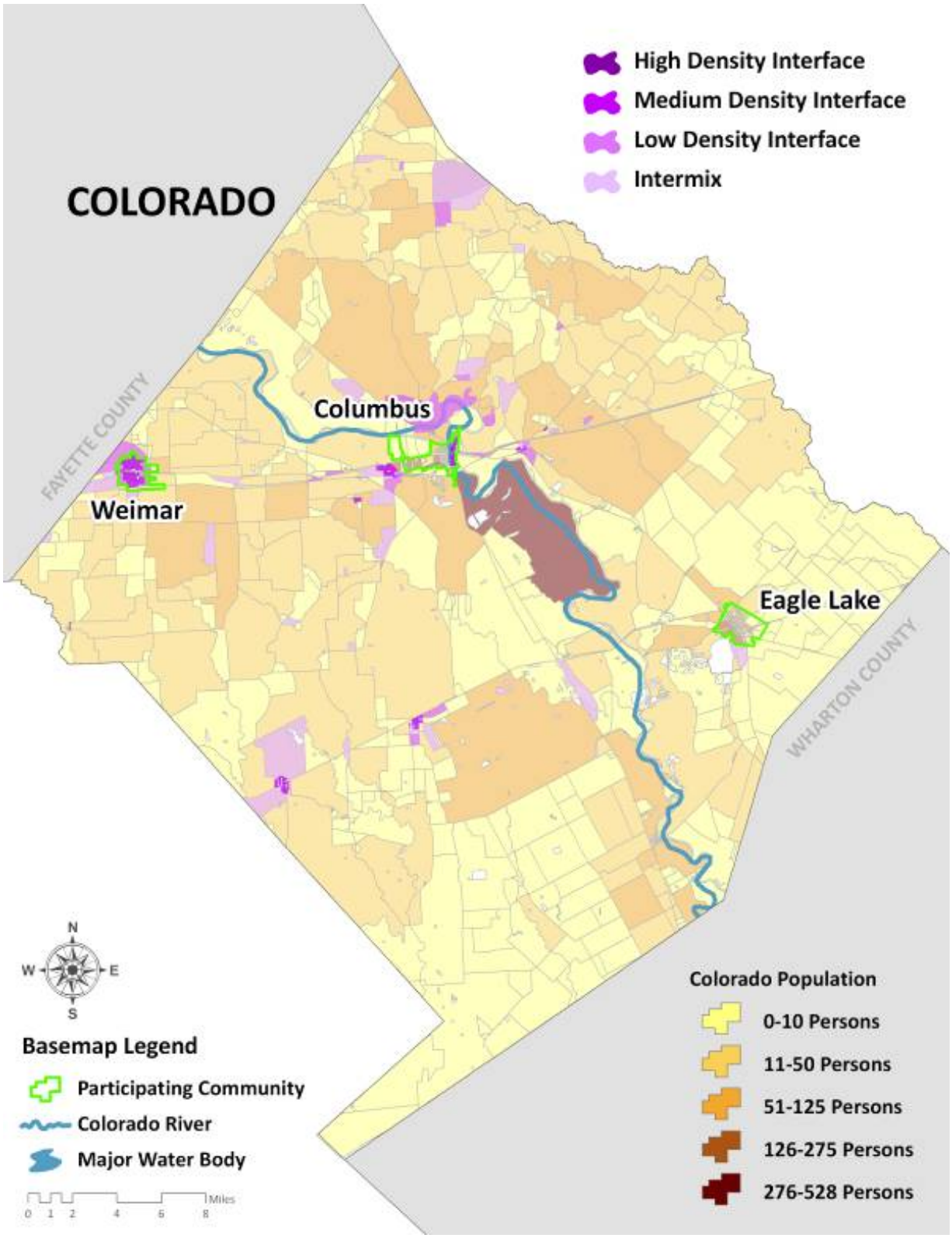


Figure 14-7 Potential Wildfire Hazard Areas in Fayette County

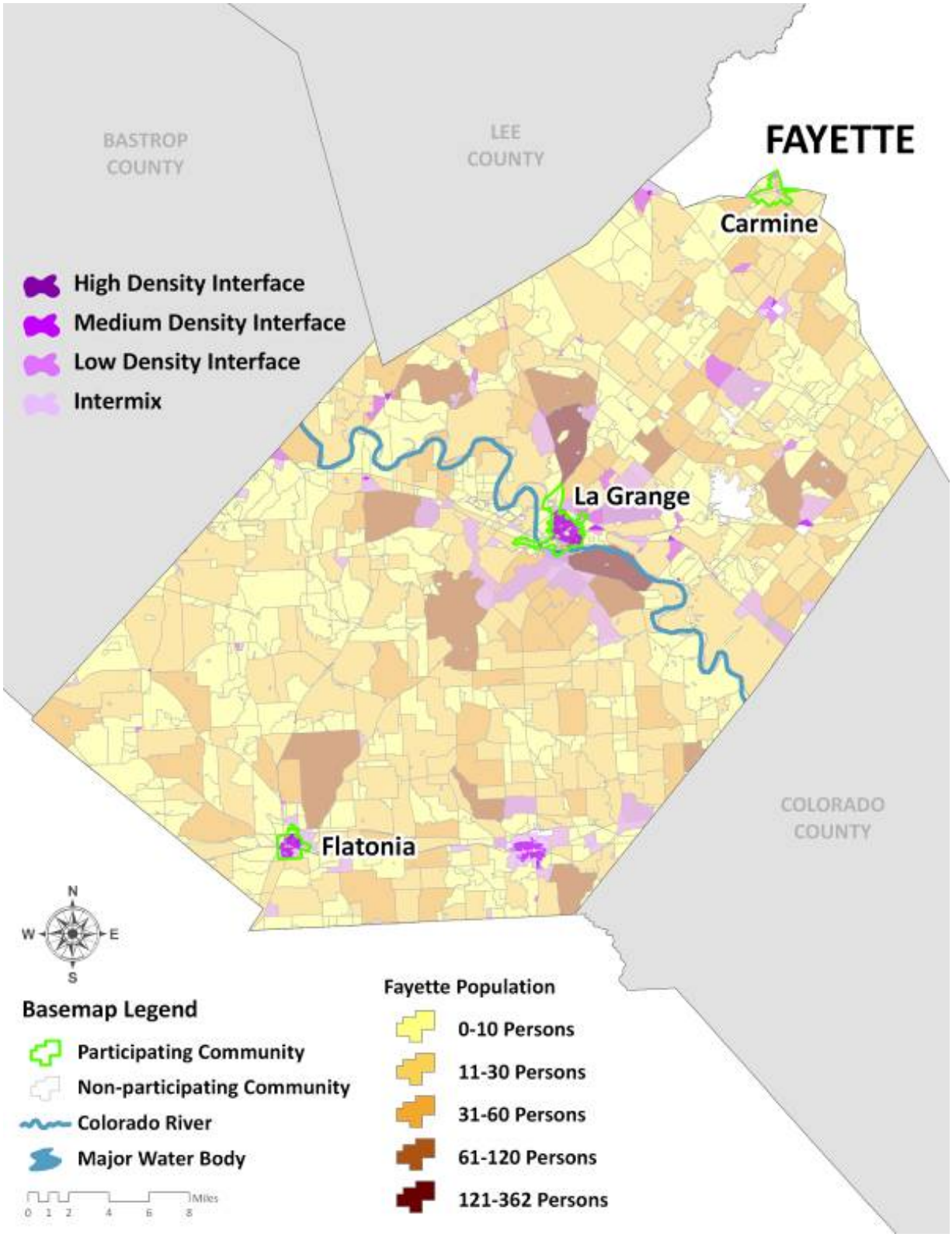


Figure 14-8. Potential Wildfire Hazard Areas in Lampasas County

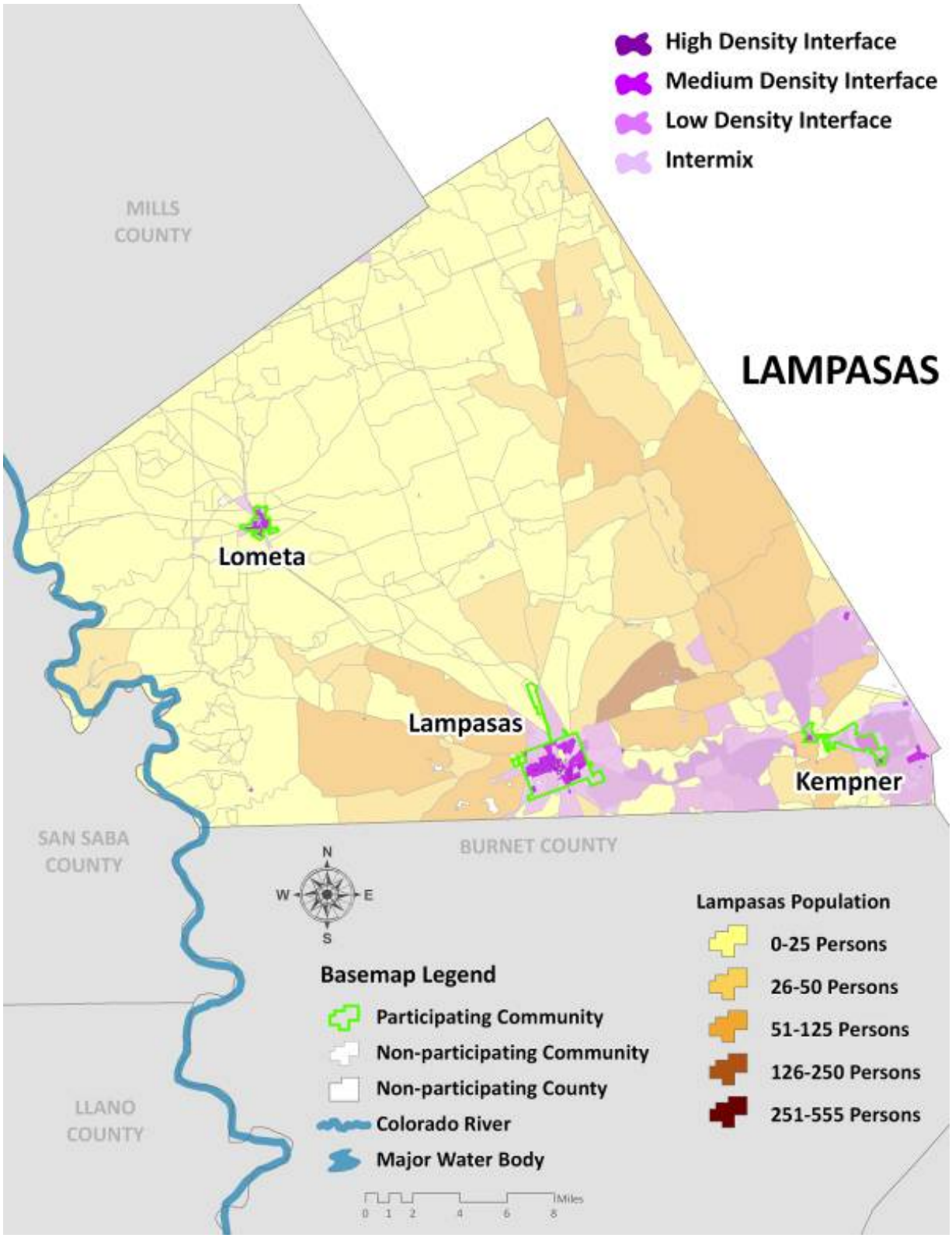


Figure 14-9. Potential Wildfire Hazard Areas in Lee County

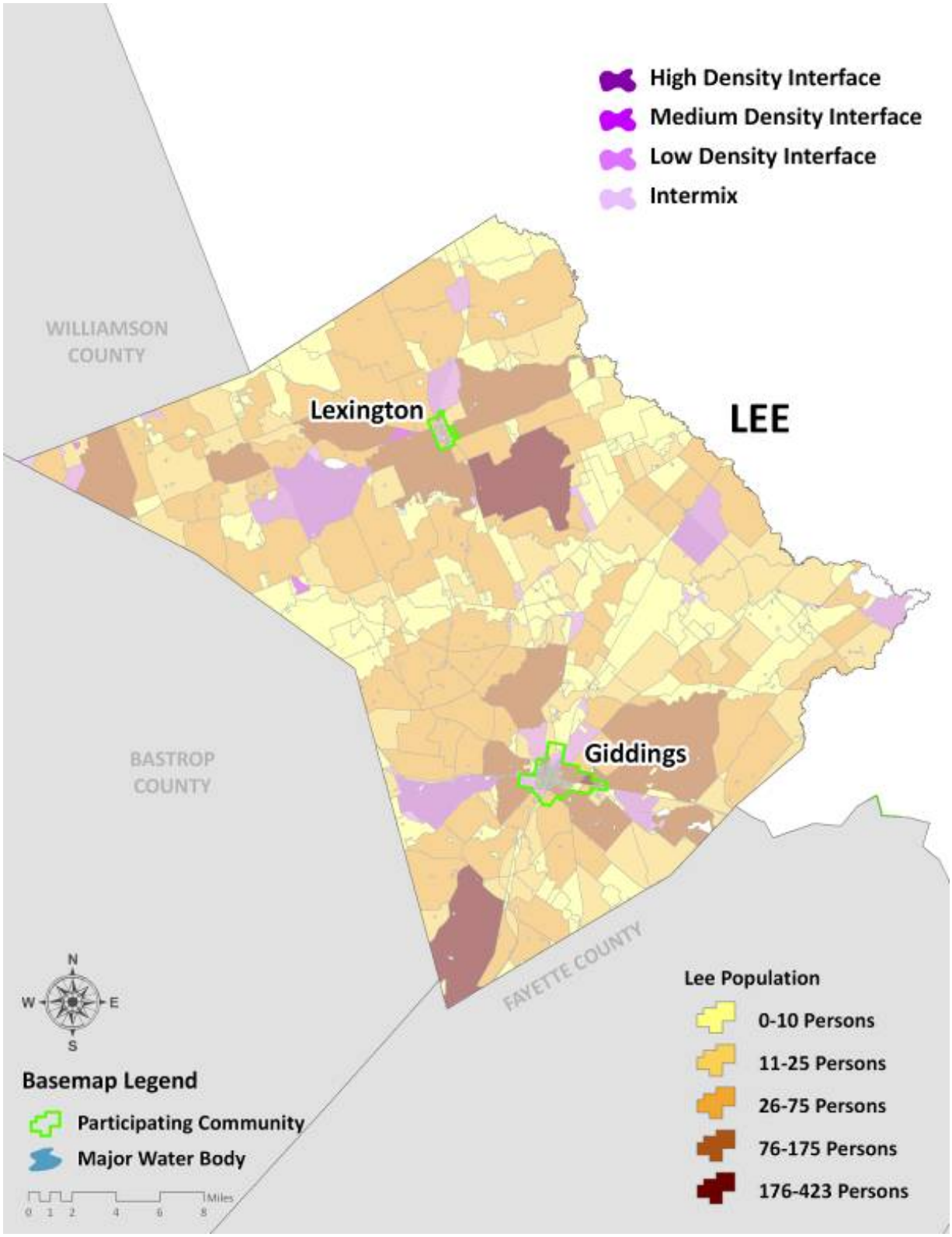


Figure 14-10. Potential Wildfire Hazard Areas in Llano County

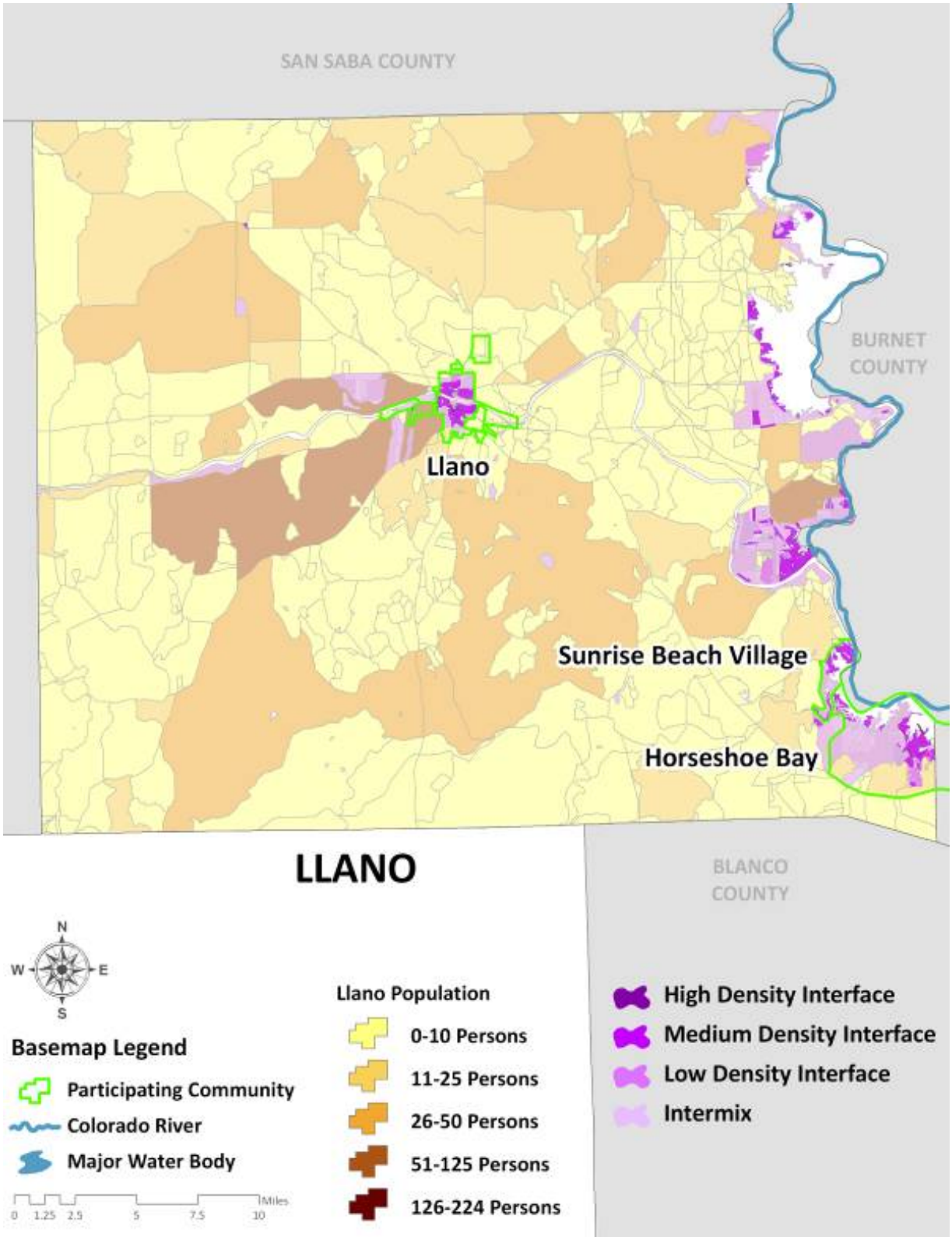


Figure 14-11. Potential Wildfire Hazard Areas in Mason County

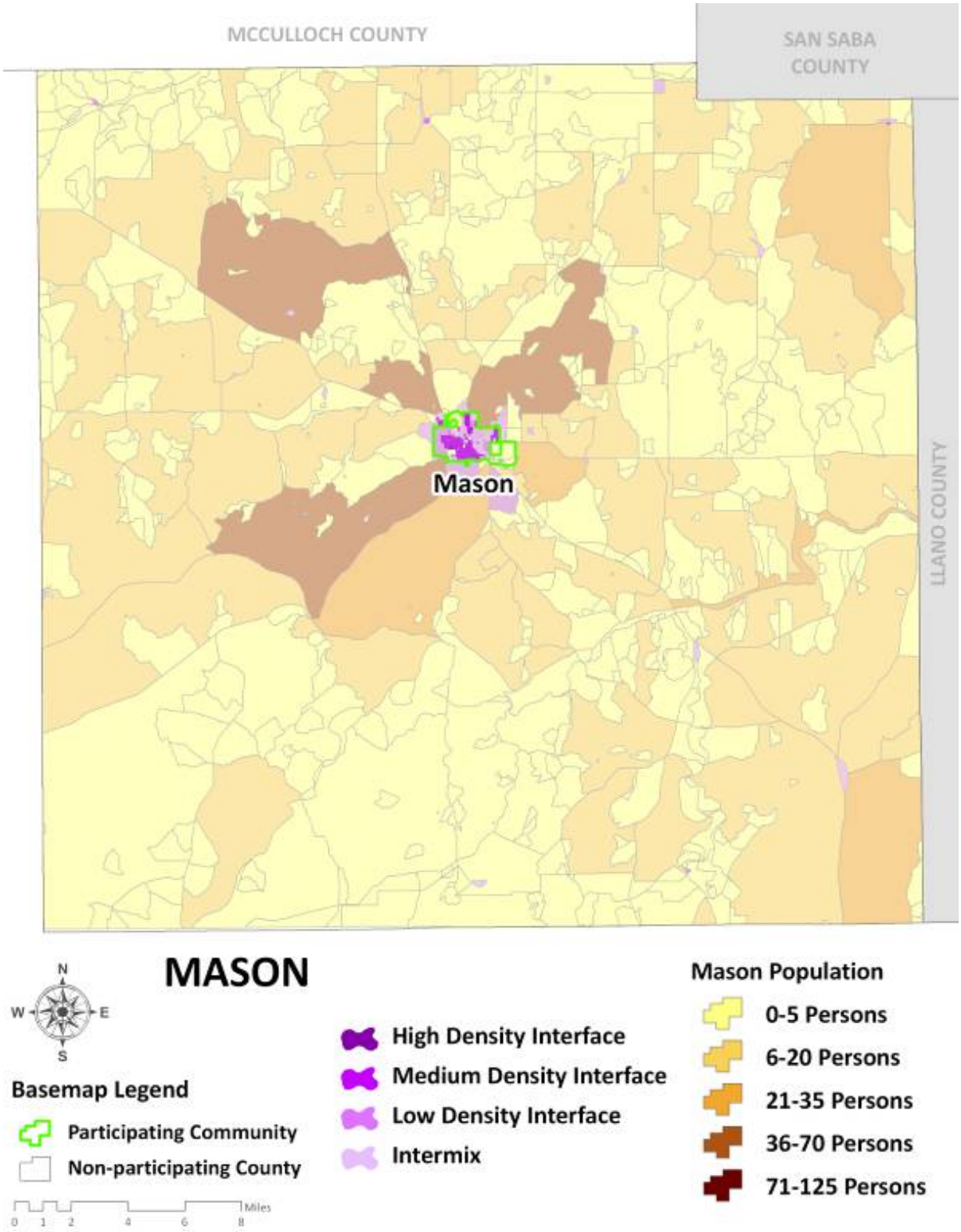


Figure 14-12. Potential Wildfire Hazard Areas in Matagorda County

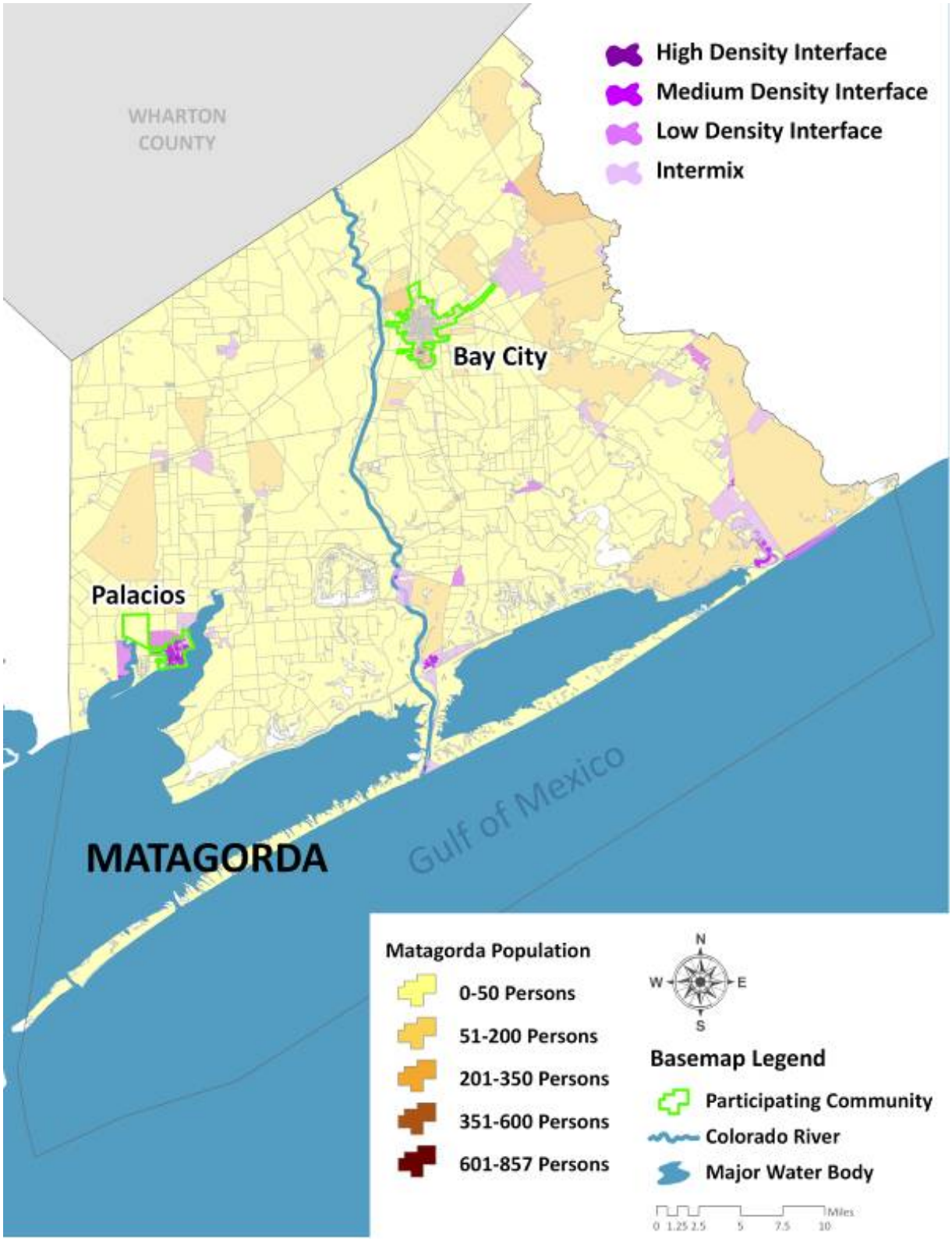


Figure 14-13. Potential Wildfire Hazard Areas in McCulloch County

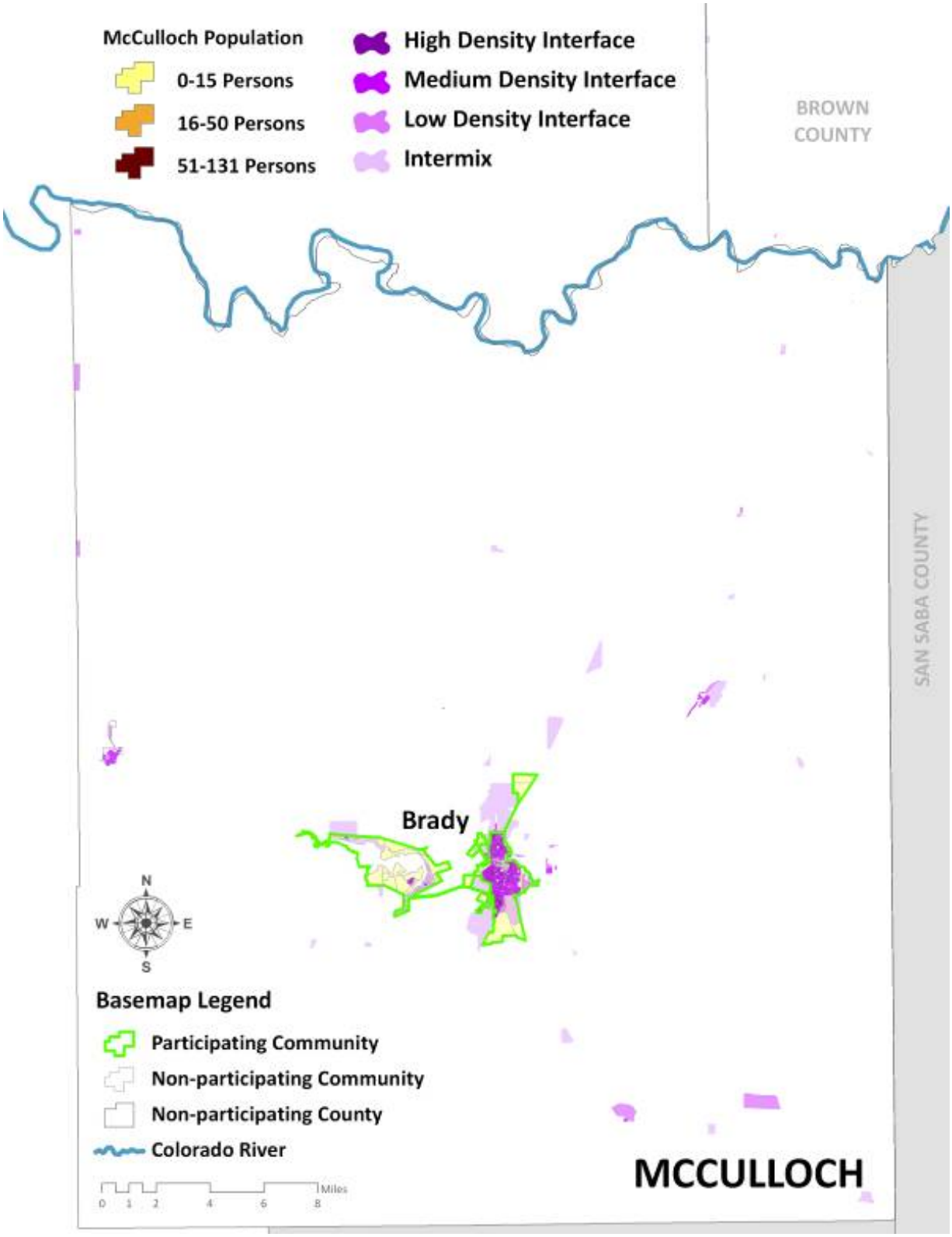


Figure 14-14. Potential Wildfire Hazard Areas in Mills County

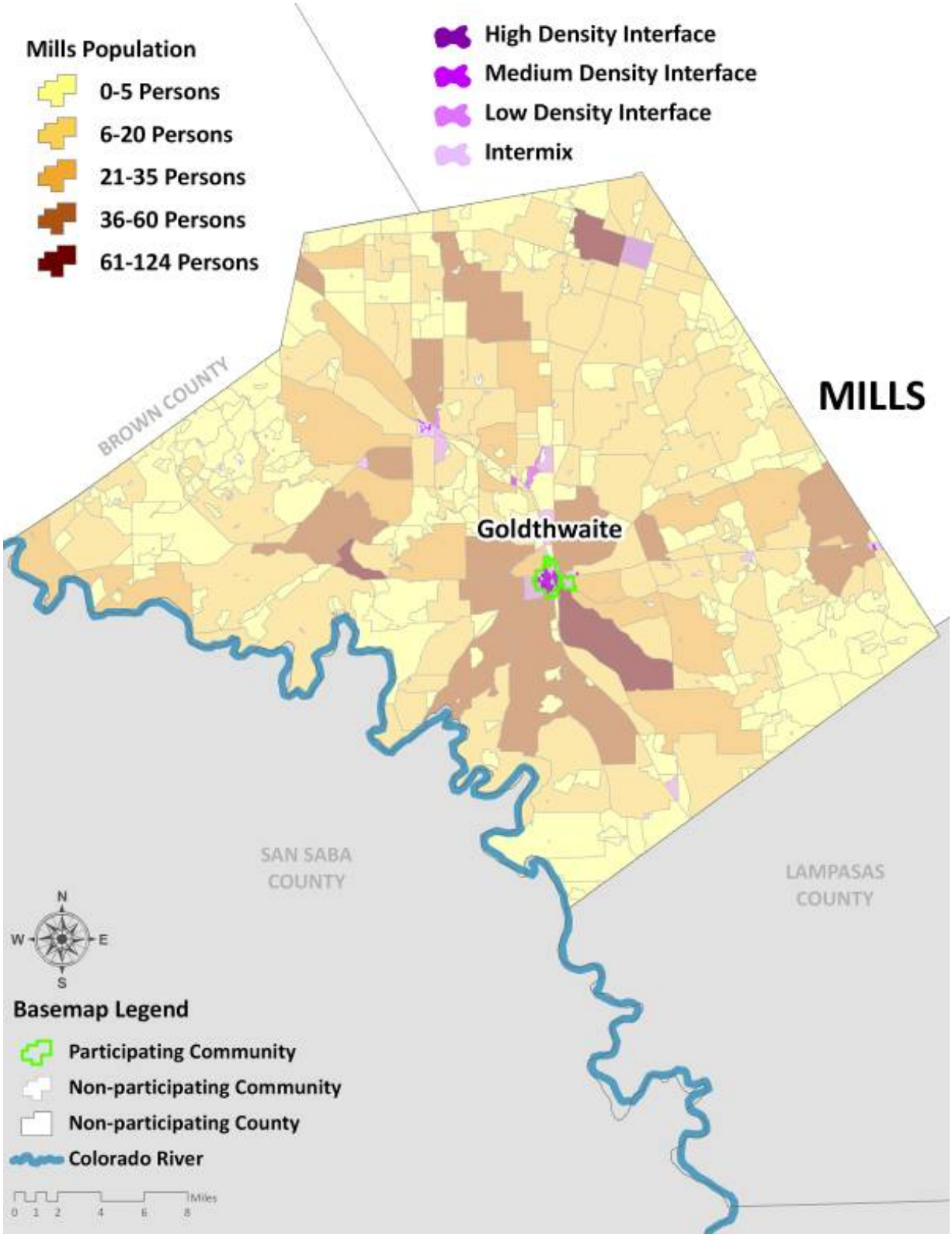


Figure 14-15. Potential Wildfire Hazard Areas in San Saba County

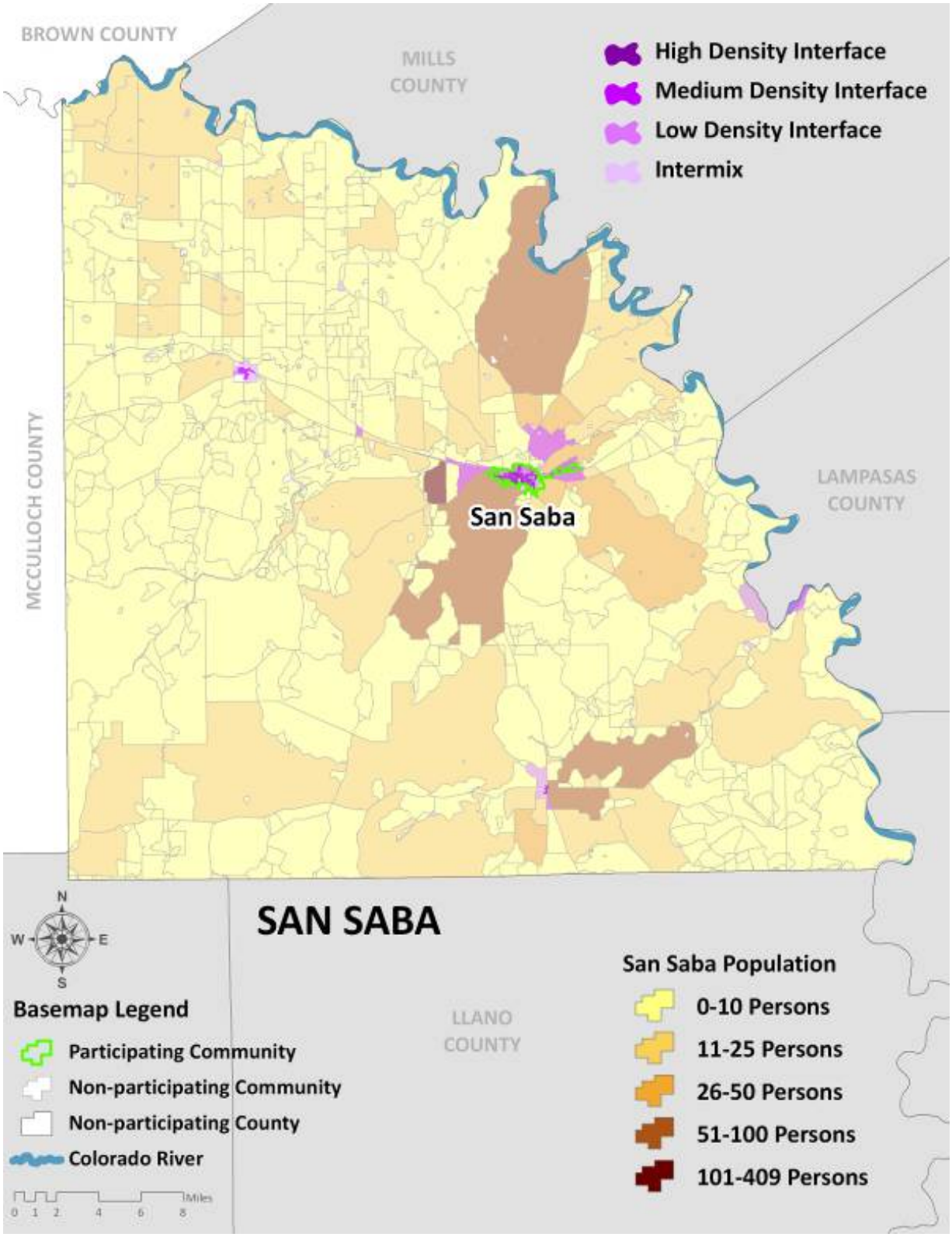


Figure 14-16. Potential Wildfire Hazard Areas in Travis County

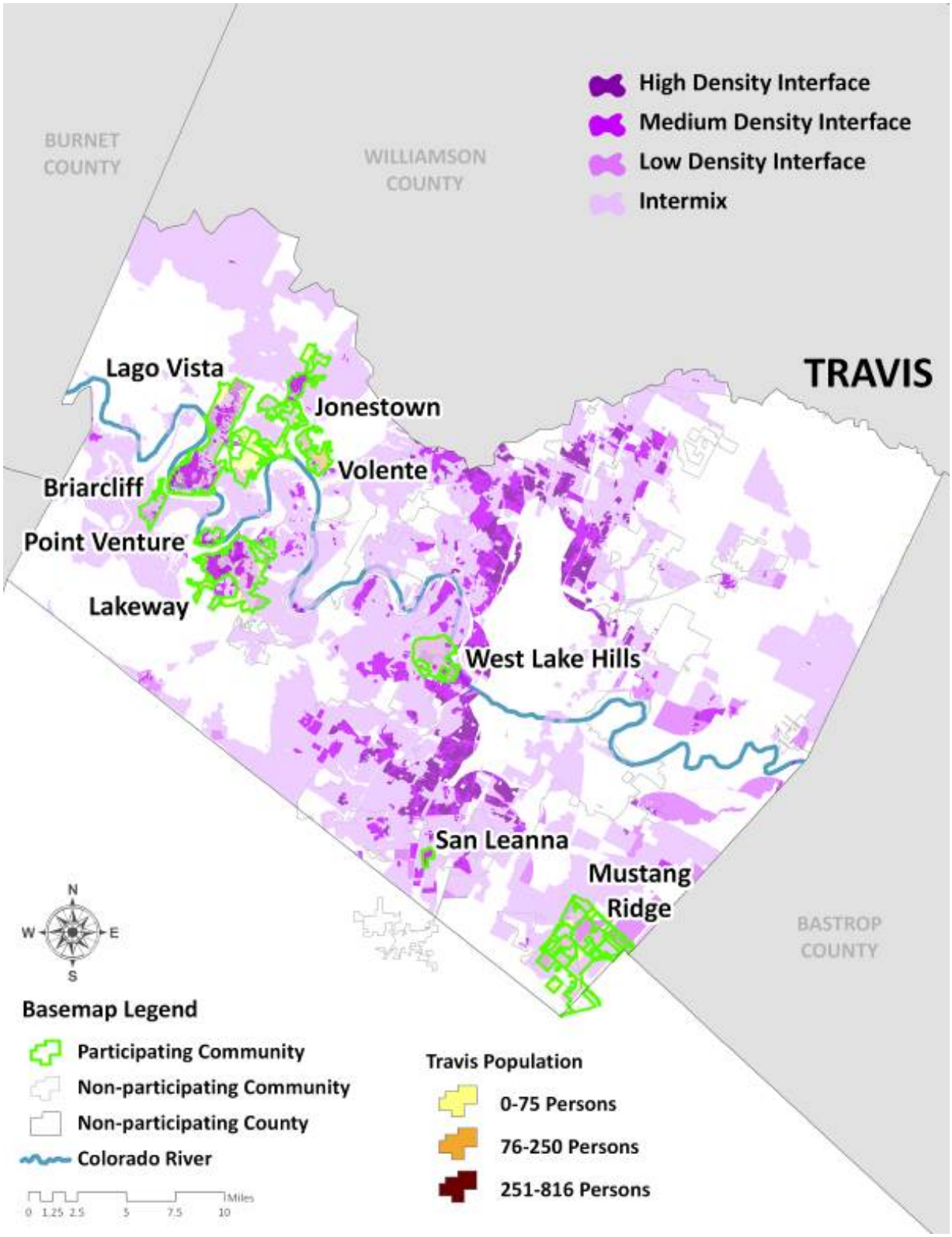


Figure 14-17. Potential Wildfire Hazard Areas in Wharton County

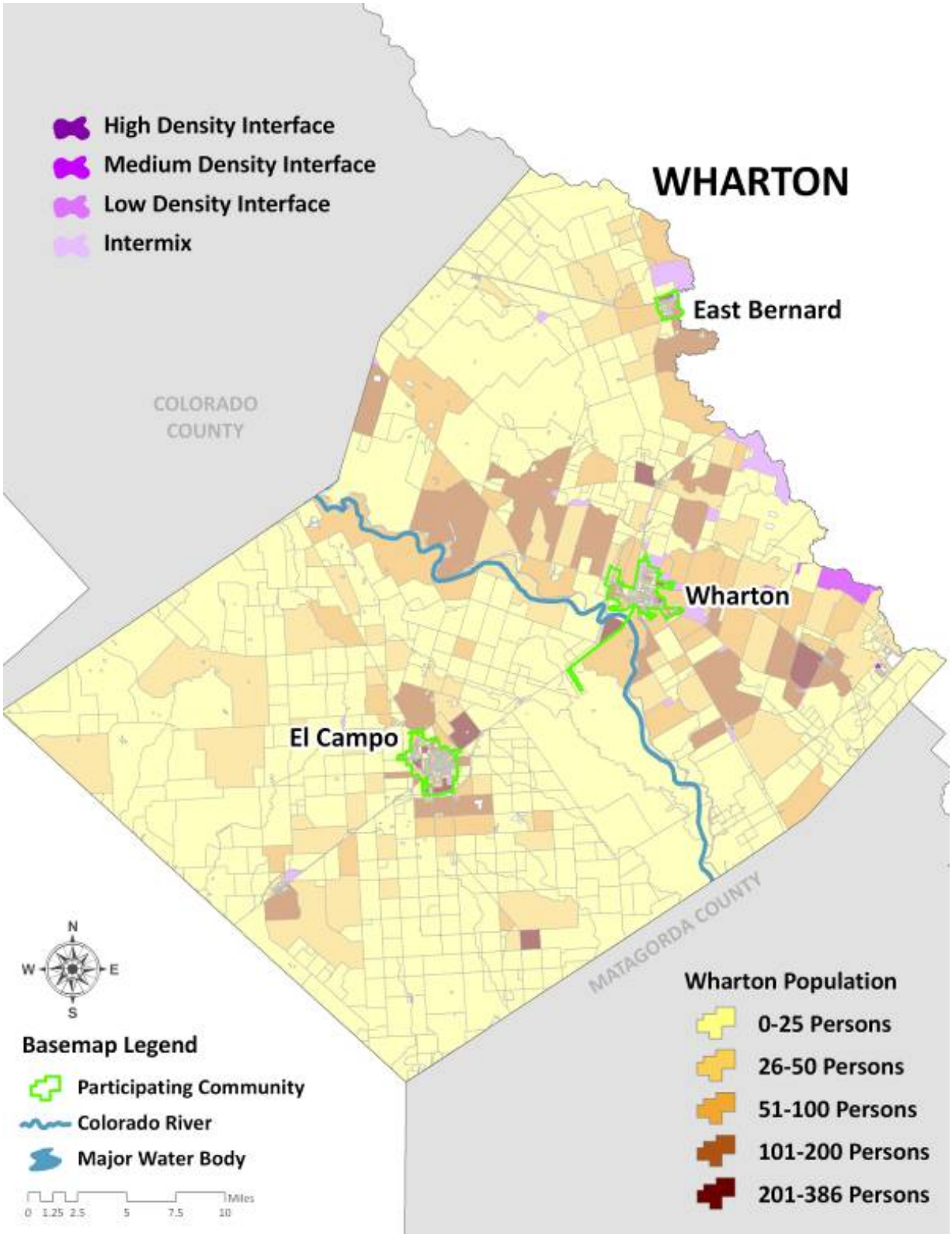
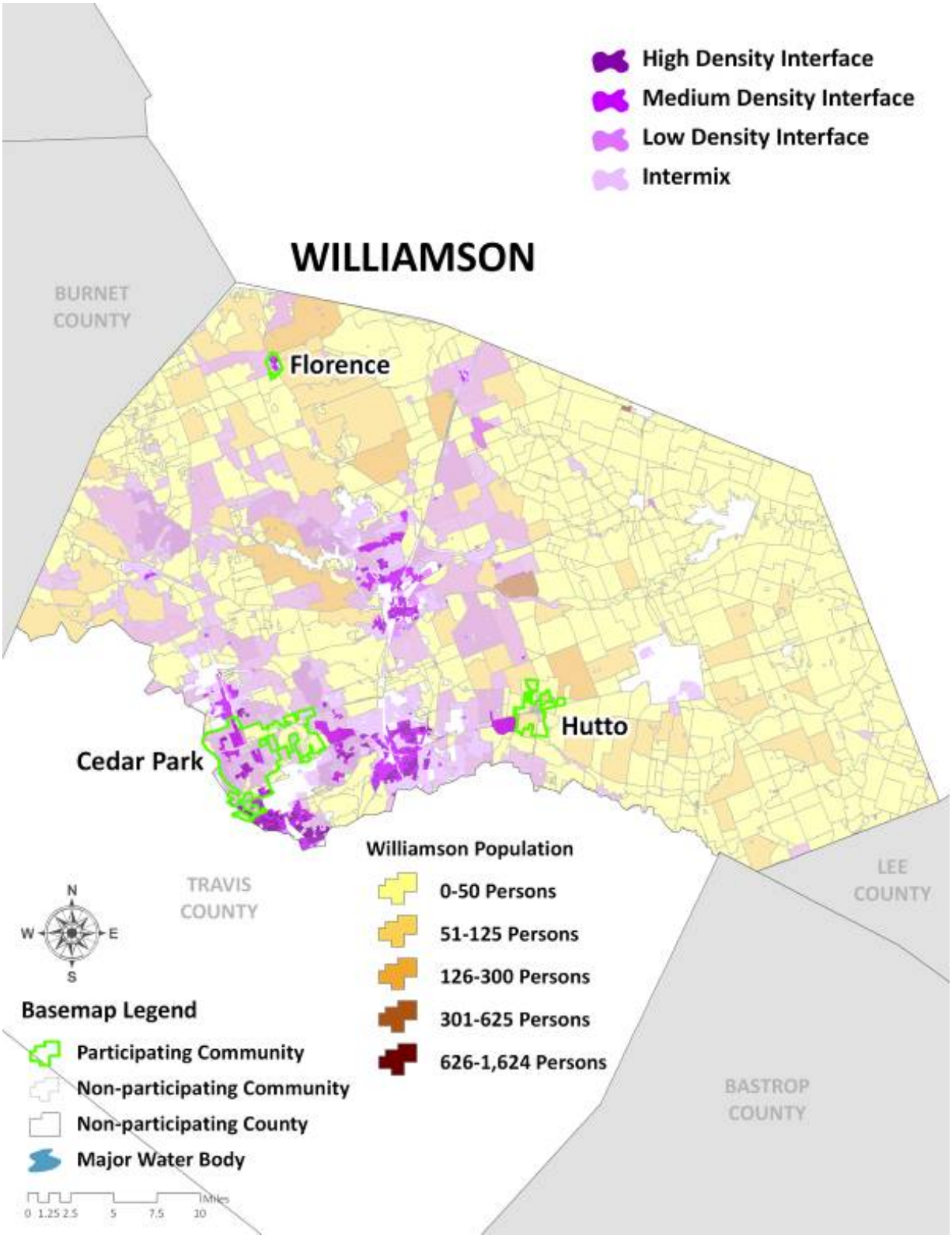


Figure 14-18. Potential Wildfire Hazard Areas in Williamson County



Bastrop County

There are many intermix areas scattered throughout most of the central and northeastern parts of Bastrop County, including a few medium and low interface sections; potentially affecting the unincorporated areas and Eglin, Bastrop and Smithville. High density interface is found in Bastrop where Highway 71 and the Colorado River meet, and in more rural areas of the city, north of Highway 21 and east of Highway 95. In Elgin high density interface is located near the intersection of Highways 95 and 290 and the southeastern corner of town. The higher risk areas for Smithville are in the center of town, south of the Colorado River, between Highways 95 and 71.

Blanco County

There are a few areas of intermix scattered around the southern and central parts of Blanco County, with some medium density interface areas in the southern unincorporated areas and Johnson City. Within Johnson City intermix areas are north of Highway 290 and west of Highway 281.

Brown County (City of Brownwood)

In the participating community of Brownwood in Brown County, most of the jurisdiction is interspersed with predominantly medium and low density interface, some intermix and some high density interface is located on Main Street, south of Commerce Street.

Burnet County

There are several areas within the southern and western parts Burnet County that have mostly intermix and low and medium density interface, and some high density interface; including unincorporated areas and each of the participating communities. In Bertram, high density interface is located in the center of town on both the north and south sides of Highway 29. Although Burnet is composed mostly of intermix, high interface is found in the town center and north of Highway 29. Cottonwood Shores, Granite Shoals and Highland Haven are all comprised mainly of intermix. Meadowlakes contains high density interface north and south of the Colorado River, with intermix throughout the rest of the community. Marble Falls contains some high density interface on the east and west sides of Highway 281 with intermix throughout except the far east side of town.

Colorado County

Intermix, low and medium density interface are scattered throughout the northern, central and west central parts of Colorado County, including unincorporated areas and each of the participating communities. Columbus has high density interface east of Highway 71, south of Highway 59 and north of Interstate 10 with intermix north of the Colorado River, surrounding FM 109. Similarly Weimar has medium and high density interface north of Interstate 10, on the north and south sides of Highway 90. In Eagle Lake, intermix is located south of Main Street and on the west side of Lakeside Drive.

Fayette County

Low density interface is prevalent in the northern portion of Carmine along the county line. In La Grange high density interface is located throughout the center of the city, north of the Colorado River and south of Highway 71. Intermix is located throughout Flatonia in the southern portion of the county.

Lampasas County

Intermix, medium and high density interface are located throughout Lampasas County. Lampasas, Kempner and Lometa have high density interface at the town center with intermix covering the rest of the area. In Lometa, intermix is predominantly located west of Highway 183 and north of Highway 190.

Lee County

Lee County contains low, medium and high density interface with small portions of intermix. In Lexington, a small area west of Highway 77 and south of FM 112 is comprised of intermix, while Giddings is comprised mainly of intermix with the exception of the eastern portion of town.

Llano County

Low, medium and high density interface are found mainly on the eastern boundary of the county, with the exception of the City of Llano in the center of the county, which contains intermix north of Highway 29 and east of Highway 16. Sunrise Beach Village and Horseshoe Bay contain mainly intermix with high density interface on the eastern portions near the Colorado River.

Mason County

With the exception of a few small areas of low density interface near the northern boundary of the county, areas of intermix, medium and high density interface are located in the center of the county in the City of Mason. The majority of the city is composed of intermix with the exception of the east side of town, south of Highway 29.

Matagorda County

Bay City contains mainly intermix with the exception of the area east of Nichols Avenue and north of FM 457. In Palacios, high density interface is located south of Henderson Street and north of Main Street. Fewer amounts of vegetation and low to no interface are found in the northwest portion of town, west of Johnson Road.

McCulloch County (City of Brady)

Medium to high density interface is found in the center of Brady, while intermix and low density interfaces if found in the rural areas to the west and northwest of the town center, specifically west of Highway 283 and north of Highway 87.

Mills County

Small pockets of intermix and low density interface are found in unincorporated areas of the county, but high density interface can be found in the center of Goldthwaite with intermix to the southwest and to the east, between Highway 16 and Highway 84, north of Fourth Street.

San Saba County

In the City of San Saba, high density interface is located in the town center, on the east and west side of Highway 16, with intermix and low density interface to the east, north of Highway 190.

Travis County

Intermix and low, medium and high density interface can be found throughout Travis County. West Lake Hills is predominantly made up of intermix with small portions of medium and high density interface bordering the Colorado River on the west side. In Jonestown, Briarcliff, Point Venture and Lago Vista, high density interface is found in the center of town with intermix located throughout. Lakeway contains areas of intermix, medium and high density interface exception for the southern portion of the city, just north of Highway 71. Both Mustang Ridge and San Leanna are composed of intermix with high density interface at their respective city centers.

Wharton County

Wharton County contains intermix with small portions of low density interface on the eastern border of the county. Although there is no interface, intermix is found in El Campo north of Highway 59 and west of Highway 71. East Bernard is comprised of intermix except for the very southeastern tip of the city, near the county line. Like East Bernard, the City of Wharton is comprised of intermix except one portion west of Highway 59.

Williamson County

Very little intermix is located in the eastern portion of the county; however intermix and low, medium and high density interface is found throughout the central, southern, western and northwestern portions of the county. Cedar Park contains high density interface west of Parmer Lane and east of Highway 183. In Hutto there is a smaller amount of vegetation with some intermix west of FM 1660 and Highway 79. Florence is comprised mainly of intermix, but medium and high density interface are found throughout the center of the city.

Extent

Fire risk is measured in terms of magnitude and intensity using the Keetch-Byram Drought Index (KBDI), a mathematical system for relating current and recent weather conditions to potential or expected fire behavior.

The KBDI determines forest fire potential and is based on a daily water balance, where a drought factor is balanced with precipitation and soil moisture (assumed to have a maximum storage capacity of 8-inchs) and is expressed in hundredths of an inch of soil moisture depletion.

The drought index ranges from 0 to 800, where a drought index of 0 represents no moisture depletion, and an index of 800 represents absolutely dry conditions.

These numbers correlate with potential fire behavior as follows:

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

Table 14-1 provides detail on the average, maximum and minimum KBDI for each county participating in the TCRFC Region, displaying the average level of intensity that would be mitigated by each participating county. Because the KBDI is a measure of the current readiness of fuels for wildfire, caution should be exercised in dryer, hotter conditions, and the KBDI should be referenced as the area experiences changes in precipitation and soil moisture.

Table 14-1. Extent for Wildfire by County[1]

PARTICIPATING COUNTY[2]	AVERAGE KBDI	MAXIMUM KBDI	MINIMUM KBDI
Bastrop County	509	554	398
Blanco County	488	545	401
Brown County	369	482	242
Burnet County	387	492	228
Colorado County	442	523	310

[1] Source: Texas Forest Service

[2] Although Brown, McCulloch and Travis County are not participating in this Plan Update, information is included as jurisdictions therein are participating, and information from the Texas Forest Service is available only at the county level.

PARTICIPATING COUNTY[2]	AVERAGE KBDI	MAXIMUM KBDI	MINIMUM KBDI
Fayette County	**415**	**495**	**276**
Lampasas County	**439**	**564**	**255**
Lee County	**523**	**613**	**425**
Llano County	**497**	**595**	**352**
Mason County	**540**	**624**	**434**
Matagorda County	**280**	**414**	**68**
McCulloch County	**417**	**547**	**282**
Mills County	**470**	**521**	**366**
San Saba County	**482**	**553**	**385**
Travis County	**410**	**489**	**277**
Wharton County	**323**	**498**	**123**
Williamson County	**428**	**518**	**351**

Across the TCRFC planning region the average KBDI is greater than 300 for each county except for Matagorda County. Due to its location on the coast, Matagorda County has a higher level of moisture in the soil and therefore a lower KBDI overall.

Historical Occurrences

Table 14-2 provides information about reported wildland, marsh and grass fires in the TCRFC study region from January 2005 to October 2008 (based on data obtained from the Texas Forest Service[3]). The table shows the number of fires reported by volunteer fire departments in the region and the number of fires where the Texas Forest Service responded at the request of the local jurisdiction. The table also provides the number of fires greater than 100 acres and the total acres burned in all reported fires for both the volunteer fire departments and the Texas Forest Service responses.

Table 14-2. Reported Wildfires in the TCRFC Region (Jan. 2001-Oct. 2008)

JURISDICTION	TOTAL WILDFIRES REPORTED >10 ACRES	NUMBER OF FIRES > 100 ACRES	TOTAL ACRES BURNED	FIRES WHERE TFS RESPONDED	FIRES WHERE TFS RESPONDED > 100 ACRES
Bastrop County	**44**		**1,508**	**568**	**22**
Bastrop	21	1	628		

[3] The reports included in this study were given to the Texas Forest Service by volunteer fire departments.

JURISDICTION	TOTAL WILDFIRES REPORTED >10 ACRES	NUMBER OF FIRES > 100 ACRES	TOTAL ACRES BURNED	FIRES WHERE TFS RESPONDED	FIRES WHERE TFS RESPONDED > 100 ACRES
Elgin	5	0	125		
Smithville	No data				
Blanco County	**25**	**10**	**3479**	**26**	**13**
Johnson City	2	0	35		
Brown County	**Not Participating**			**10**	**3**
Brownwood	7	2	425		
Burnet County	**48**	**19**	**16,326**	**24**	**12**
Bertram	45	10	9,755		
Burnet	3	0	131		
Cottonwood Shores	No data				
Granite Shoals	7	3	3,800		
Highland Haven	No data				
Marble Falls	No data				
Meadowlakes	No data				
Colorado County	**No data**			**11**	**3**
Columbus	No data				
Eagle Lake	No data				
Weimar	No data				
Fayette County	**6**	**1**	**138**	**265**	**4**
Carmine	1	0	31		
Flatonia	No data				
La Grange	No data				
Lampasas County	**4**	**2**	**3,145**	**9**	**7**
Kempner	No data				

JURISDICTION	TOTAL WILDFIRES REPORTED >10 ACRES	NUMBER OF FIRES > 100 ACRES	TOTAL ACRES BURNED	FIRES WHERE TFS RESPONDED	FIRES WHERE TFS RESPONDED > 100 ACRES
Lampasas	11	4	2,795		
Lometa	24	6	4,332		
Lee County	**6**	**3**	**605**	**62**	**6**
Giddings	15	2	805		
Lexington	20	2	934		
Llano County	**15**	**6**	**1,577**	**17**	**13**
Llano	6	2	1,380		
Horseshoe Bay	No data				
Sunrise Beach Village	No data				
Mason County	**11**	**9**	**11,430**	**13**	**11**
Mason	19	8	5,438		
Matagorda County	**10**	**5**	**1,950**	**None reported**	
Bay City	No data				
Palacios	No data				
McCulloch County	**Not Participating**			**10**	**5**
Brady	7	2	1,864		
Mills County	**17**	**11**	**4,335**	**3**	**3**
Goldthwaite	8	3	890		
San Saba County	**48**	**21**	**13,045**	**5**	**3**
San Saba	No data				
Travis County	**Not Participating**			**42**	**10**
Briarcliff	No data				
Jonestown	No data				
Lago Vista	No data				

JURISDICTION	TOTAL WILDFIRES REPORTED >10 ACRES	NUMBER OF FIRES > 100 ACRES	TOTAL ACRES BURNED	FIRES WHERE TFS RESPONDED	FIRES WHERE TFS RESPONDED > 100 ACRES
Lakeway	No data				
Mustang Ridge	No data				
Point Venture	No data				
San Leanna	No data				
Volente	2	1	1,472		
West Lake Hills	No data				
Wharton County	**No data**			**None reported**	
East Bernard	No data				
El Campo	14	2	745		
Wharton	No data				
Williamson County	**16**	**9**	**12,380**	**25**	**11**
Cedar Park	2	0	30		
Florence	16	6	3,352		
Hutto	No data				

Probability of Future Events

The threat of wildland fire changes almost daily, but given that the average KBDI for each of the participating counties is greater than 350, except for Wharton and Matagorda County due to the high moisture content in the soil, the probability of a future occurrence of a wildfire is highly likely, meaning that an event is probably within the next year. Because both Matagorda County and Wharton County are located on and near the coast, respectively, the probability for a wildfire event in either county is occasional, meaning that an event possible within the next four to five years.

Vulnerability Analysis

Periods of drought, dry conditions, high temperatures, and low humidity set the stage for wildfires. Areas along railroads and people with homes in wooded, rural areas have an increased risk of wildfire. The sparsely populated tall grassed rangelands and rural areas of TCRFC Regions III and IV, which include Blanco, Burnet, Lampasas, Llano, Mason, Mills, and San Saba counties are capable

of experiencing large sweeping fires. Ironically, fire suppression is capable of creating larger fire hazards, because live and dead vegetation is allowed to accumulate in areas where fire has been excluded.

Although at a slightly lower vulnerability than Regions III and IV, TCRFC Region II, which includes Bastrop, Lee, Travis and Williamson counties, faces the threat of wildfire on an annual basis. In 2009, Bastrop County experienced a 1,200-acre blaze apparently sparked by a 60-foot tree falling across a 30-foot power line. The flames, driven by north winds gusting up to 40 miles per hour, quickly spread south toward the Colorado River, forcing the evacuation of dozens of families while torching at least a score of homes, half as many businesses and more motor vehicles than one on-hand observer could count. Officials estimated that as many as 200 homes were threatened by the wildfire.

Although TCRFC Region I, which includes Colorado, Fayette, Matagorda and Wharton counties, has the lowest risk to wildfire overall and lowest average KBDI, unoccupied buildings and empty lots that have not been maintained are vulnerable to the threat of wildfire.

Throughout all TCRFC regions, the elderly and those individuals with compromised respiratory systems remain the most vulnerable to a wildfire event as diminished air quality may result from smoke plumes that can contain potentially carcinogenic matter. Fine particles of invisible soot and ash, that are too small for the respiratory system to filter, can cause immediate and possibly long-term effects.

Table 14-3 provides information on the number of persons potentially exposed to wildfire hazard based upon mapped wildfire hazard areas previously shown, along with the estimated number of buildings at risk and total exposure for at-risk buildings.

Table 14-3. Estimated Population and Buildings at Risk

JURISDICTION	TOTAL EST. POPULATION	NUMBER OF PEOPLE AT RISK	IDENTIFIED AS COMMUNITY AT RISK BY TEXAS FOREST SERVICE	NUMBER OF BUILDINGS AT RISK	ESTIMATED VALUE OF BUILDINGS AT RISK ($)
Bastrop County	**41,354**	**40,255**	**YES**	**16,304**	**1,808,295,000**
Bastrop	5,933	5,703	YES	3,300	556,741,000
Elgin	6,063	3,552	YES	1,434	164,058,000
Smithville	4,383	4,002	YES	2,479	250,725,000
Blanco County	**5,591**	**4,716**	**YES**	**2,886**	**375,958,000**

JURISDICTION	TOTAL EST. POPULATION	NUMBER OF PEOPLE AT RISK	IDENTIFIED AS COMMUNITY AT RISK BY TEXAS FOREST SERVICE	NUMBER OF BUILDINGS AT RISK	ESTIMATED VALUE OF BUILDINGS AT RISK ($)
Johnson City	1,247	1,247	YES	937	78,214,000
Brown County	**Not Participating**				
Brownwood	19,091	19,089	YES	10,239	1,122,021,000
Burnet County	**18,584**	**16,929**	**YES**	**9,344**	**1,012,005,000**
Bertram	1,000	1,000	YES	582	55,114,000
Burnet	4,755	4,755	YES	2,526	254,381,000
Cottonwood Shores	704	704	YES	372	41,613,000
Granite Shoals	2,303	2,303	YES	1,935	124,784,000
Highland Haven	453	453	YES	321	33,235,000
Marble Falls	5,070	5,070	YES	2,978	375,029,000
Meadowlakes	1,278	1,278	YES	693	94,973,000
Colorado County	**11,466**	**7,355**	**YES**	**3,743**	**409,150,000**
Columbus	3,506	1,511	YES	935	112,070,000
Eagle Lake	3,453	265	YES	114	8,178,000
Weimar	1,965	1,965	YES	1,225	169,564,000
Fayette County	**15,787**	**11,256**	**YES**	**7,200**	**794,175,000**
Carmine	184	136	NO	71	9,431,000
Flatonia	1,377	1,377	YES	847	73,581,000
La Grange	4,456	3,670	YES	2,206	277,647,000
Lampasas County	**8,940**	**7,771**	**YES**	**3,607**	**362,012,000**
Kempner	970	970	YES	447	47,851,000
Lampasas	6,818	6,818	YES	3870	423,306,000
Lometa	767	767	NO	638	41,863,000

JURISDICTION	TOTAL EST. POPULATION	NUMBER OF PEOPLE AT RISK	IDENTIFIED AS COMMUNITY AT RISK BY TEXAS FOREST SERVICE	NUMBER OF BUILDINGS AT RISK	ESTIMATED VALUE OF BUILDINGS AT RISK ($)
Lee County	**9,388**	**5,948**	**YES**	**3,017**	**309,235,000**
Giddings	1,166	1,510	YES	700	68,075,000
Lexington	5,103	577	YES	336	30,885,000
Llano County	**10,381**	**9,633**	**YES**	**7,445**	**678,292,000**
Llano	3,311	3,311	YES	2,265	217,072,000
Horseshoe Bay	2,648	2,646	YES	2,766	401,685,000
Sunrise Beach Village	704	704	YES	897	108,772,000
Mason County	**1,635**	**1,002**	**YES**	**799**	**78,434,000**
Mason	2,103	2,103	YES	1,399	114,666,000
Matagorda County	**14,429**	**8,473**	**YES**	**6,629**	**634,323,000**
Bay City	18,709	1,782	YES	755	80,622,000
Palacios	4,819	4,373	YES	2,179	221,526,000
McCulloch County	**Not Participating**				
Brady	5,308	5,308	YES	3,740	284,322,000
Mills County	**3,177**	**1,542**	**YES**	**900**	**93,011,000**
Goldthwaite	1,795	1,795	YES	1,170	119,585,000
San Saba County	**3,338**	**2,230**	**YES**	**1,292**	**124,188,000**
San Saba	2,498	2,498	YES	1,602	157,379,000
Travis County	**Not Participating**				
Briarcliff	862	862	YES	705	78,826,000
Jonestown	1,553	1,553	YES	914	115,523,000
Lago Vista	4,213	4,213	YES	2,554	381,300,000
Lakeway	8,130	8,130	YES	4,174	1,058,045,000

JURISDICTION	TOTAL EST. POPULATION	NUMBER OF PEOPLE AT RISK	IDENTIFIED AS COMMUNITY AT RISK BY TEXAS FOREST SERVICE	NUMBER OF BUILDINGS AT RISK	ESTIMATED VALUE OF BUILDINGS AT RISK ($)
Mustang Ridge	983	983	YES	369	38,236,000
Point Venture	420	420	YES	396	49,272,000
San Leanna	384	384	YES	183	27,719,000
Volente	363	363	NO	303	34,753,000
West Lake Hills	2,875	2,875	YES	1,355	546,896,000
Wharton County	**19,968**	**6,250**	**YES**	**2,863**	**330,625,000**
East Bernard	1,729	378	YES	203	20,210,000
El Campo	10,604	961	YES	370	35,267,000
Wharton	8,887	2,993	YES	1,300	162,271,000
Williamson County	**94,616**	**88,246**	**YES**	**32,748**	**6,080,376,000**
Cedar Park	25,617	25,617	YES	9,483	1,871,045,000
Florence	1,054	1,054	YES	538	59,444,000
Hutto	1,134	555	YES	242	47,705,000
TOTALS FOR STUDY AREA	**451,402**	**356,189**	**N/A**	**177,824**	**23,735,559,000**

Source: SILVIS, Texas Forest Service, HAZUS-MH MR3

Impact

The potential impact is "minor" and may result in few injuries with less than 10 percent of property in the affected area damaged or destroyed. There could be a temporary shutdown of facilities. Wildland fire risk varies considerably by month. Wildland fires are more likely to occur during periods of high wind and low humidity; warning time is minimal to none.

Section 15– Dam Failure

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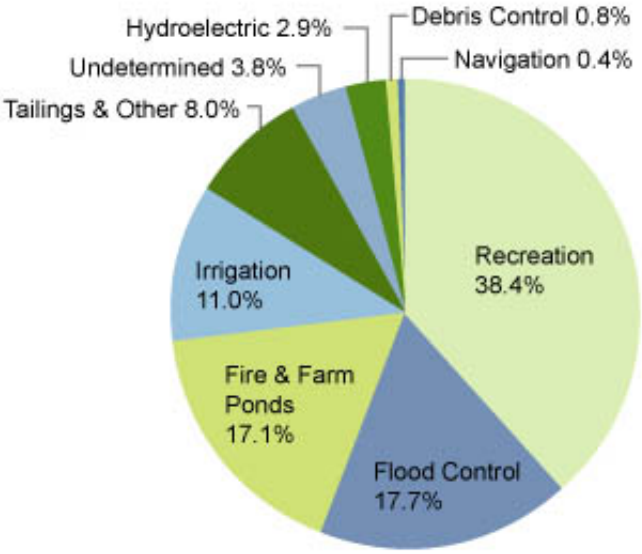
Hazard Profile

Water is an essential natural resource and one of the most efficient ways to manage and control water resources is through dam construction. A dam is defined in the Texas Water Code as, "any barrier, including one for flood detention, designed to impound liquid volumes and which has a height of dam greater than six feet[1]." Importantly this definition excludes highway or roadway embankments, low water crossings, levees, closed dykes or any other off-channel impoundments. The Texas Commission on Environmental Quality (TCEQ) has jurisdiction over rule changes to dams as 99% of dams are under state regulatory authority. In 2008 TCEQ proposed several rule changes including the definition of dams and dam classifications. According to the new definition a dam in Texas is a barrier with a "height greater than or equal to 25 feet and a maximum storage (top of dam) capacity of 15 acre feet (AF); a height greater than 6 feet and a maximum storage capacity great than or equal to 50 AF; or one that poses a threat

Figure 15-1. Dam Usage in the United States



Source: National Inventory of Dams

[1] 30 Texas Administrative Code, Ch. 299, 1986

to human life or property in the event of failure, regardless of height or maximum storage capacity.[2]" The majority of dams and lakes are used for water supply in Texas. In addition to preserving water supply, dams also provide benefits such as irrigation for agriculture, hydropower, flood control, maintenance of lake levels and recreation (See Figure 15-1). However, despite the benefits and importance of dams to our public works infrastructure, many safety issues exist for dams as with any complex infrastructure; the most serious threat is dam failure.

Dam failure is a collapse or breach in a dam. While most dams have storage volumes small enough that failures have little or no repercussions, dams with large storage amounts can cause significant downstream flooding. Dam failures can result from any one or combination of the following causes:

- Prolonged periods of rainfall and flooding, which cause most failures;
- Inadequate spillway capacity, resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage or piping;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, or maintain gates, valves, and other operational components;
- Improper design, such as use of improper construction materials;
- Failure of upstream dams in the same drainage basin;
- Landslides into reservoirs, which cause surges that result in overtopping;
- High winds, which can cause significant wave action and result in substantial erosion; and
- Earthquakes, which typically cause longitudinal cracks at the tops of the embankments, leading to structural failure.

Although failure is a rare occurrence, it is one that can have significant impact on an area. In the event of a dam failure, the potential water energy stored behind the dam is capable of causing rapid and unexpected flooding downstream, resulting in loss of life and great property damage. It could cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or severely damaged.

The LCRA owns and operates six dams[3] along the Colorado River in the TCRFC area. These dams are designed for flood management, water supply and hydroelectricity, and LCRA plays a vital role in delivering electricity and managing the water supply for central Texas. These dams (detail

[2] Warren Samuelson, Texas Dam Safety Program, Texas Commission on Environmental Quality (TCEQ)
[3] Tom Miller Dam is leased to the LCRA by the City of Austin

provided in Table 15-1) form six reservoirs that are collectively known as the Highland Lakes: Lake Buchanan, Inks Lake, Lake Lyndon B. Johnson, Lake Marble Falls, Lake Travis, and Lake Austin.

Each dam is built to handle floods, but only Mansfield Dam is designed to hold back floodwaters. The highland lake dams do not protect all people and property downstream from flooding. Rather, these dams manage floodwaters. Mansfield Dam was completed in 1941 in response to 15 major floods that caused devastating losses[4]. While the other dams are built to manage the flow of floodwaters as they travel through the lake chain, Mansfield Dam serves as the only flood control structure. However, a severe enough flood could exceed even flood storage capacity at Lake Travis causing downstream flooding.

Table 15-1. LCRA Operated Dams

Name	County	Built	Owner	River mi. from Gulf	Primary Purpose	Historic Elevation (above msl[5])
Buchanan	Burnet	1937	LCRA	414	Hydroelectric Power/Water Supply	1,021.4 feet
Inks	Burnet	1938	LCRA	409	Hydroelectric Power	902.8 feet
Alvin Wirtz	Burnet	1950	LCRA	387	Hydroelectric Power	836.2 feet
Max Starcke	Burnet	1951	LCRA	382	Hydroelectric Power/Water Supply	756.3 feet
Mansfield	Travis	1941	LCRA	318	Flood Management/ Water Storage/ Hydroelectric Power	710.4 feet
Tom Miller	Travis	1940	City of Austin[6]	298	Hydroelectric Power/Water Supply	495.2 feet

[4] See Section 5 for a discussion on flooding in the region.

[5] Mean Sea Level

[6] Currently leased to LCRA until 2020

Location

Figure 15-2 illustrates the general location of dams for each participating jurisdiction as recorded by the U.S. Army Corps of Engineers (USACE) in the National Inventory of Dams. This includes a total of 517 dams, of which 69 are classified as "high hazard[7]." Figures 15-3 to 15-19 show the location of dams specific to each county. Each of the dams displayed in the figures beginning on the following page are based on the information from the National Inventory of Dams. A table detailing location of each dam, storage capacity and the level of risk is found LCRA is aware of the inundation areas for all high hazard dams. Inundation maps are not included in this Plan due to the critical nature of the dams and security concerns associated with them. LCRA is committed to the safety of citizens and preservation of property in the Lower Colorado River basin, and works closely with the Texas Commission on Environmental Quality (TCEQ) and the Department of Homeland Security (DHS) to ensure all dams are properly maintained. Further, LCRA prepares employees through flood drill training for an event of a dam breach or scenario where the opening of floodgates would be required.

Regional and county level maps, overlaid with census population density to graphically illustrate areas at risk, is displayed at Figures 15-3 to 15-9. Three buffer areas were used based on the storage capacities. In lieu of dam failure inundation maps, total exposure was estimated by using 2000 census population and building inventory data from HAZUS-MH MR3, in combination with the location and maximum storage capacity of high and significant hazard dams. For dams with a maximum storage capacity of 100,000 acre-feet or more, all census blocks within five miles were considered to be at risk to potential dam failure hazards. For dams with a maximum storage capacity between 10,000 and 100,000 acre-feet, all census blocks within three miles were considered to be at risk to potential dam failure hazards. For dams with a maximum storage capacity of less than 10,000 acre-feet, all census blocks within one mile were considered to be at risk to potential dam failure hazards.

[7] For dam classifications please see Table 15-2 under "Extent".

Figure 15-2. Dams in the TCRFC Region

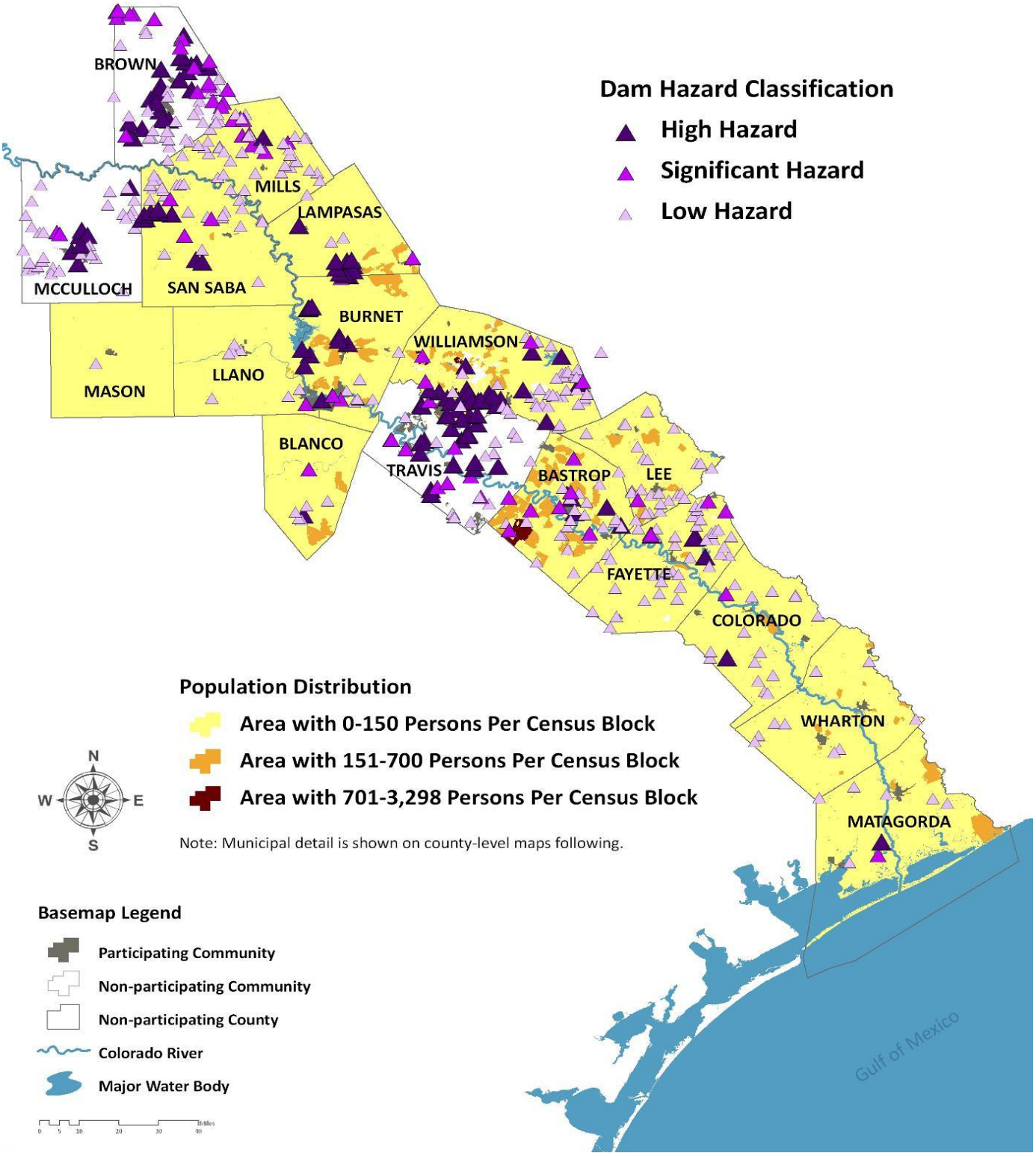


Figure 15-3. Dams in Bastrop County

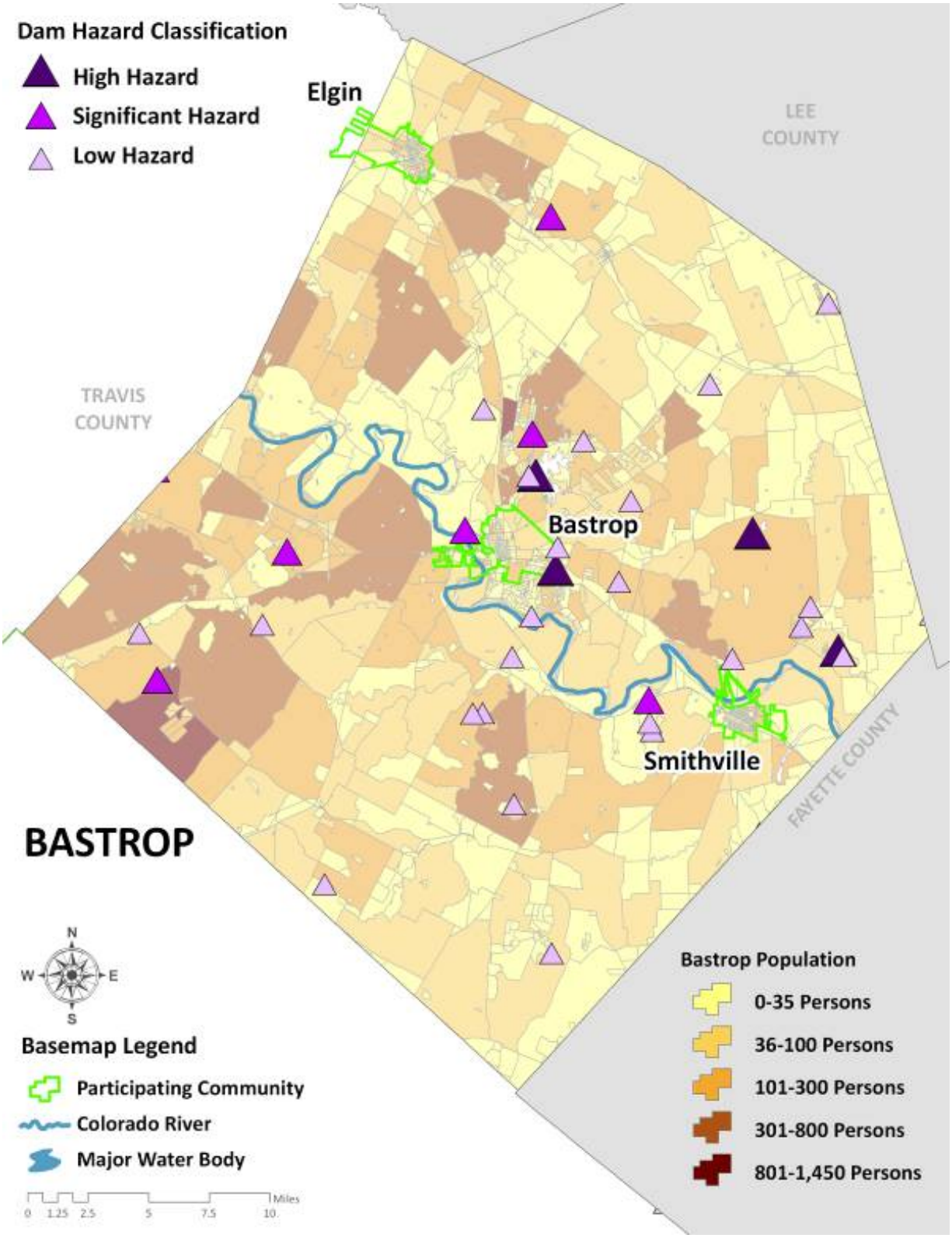


Figure 15-4. Dams in Blanco County

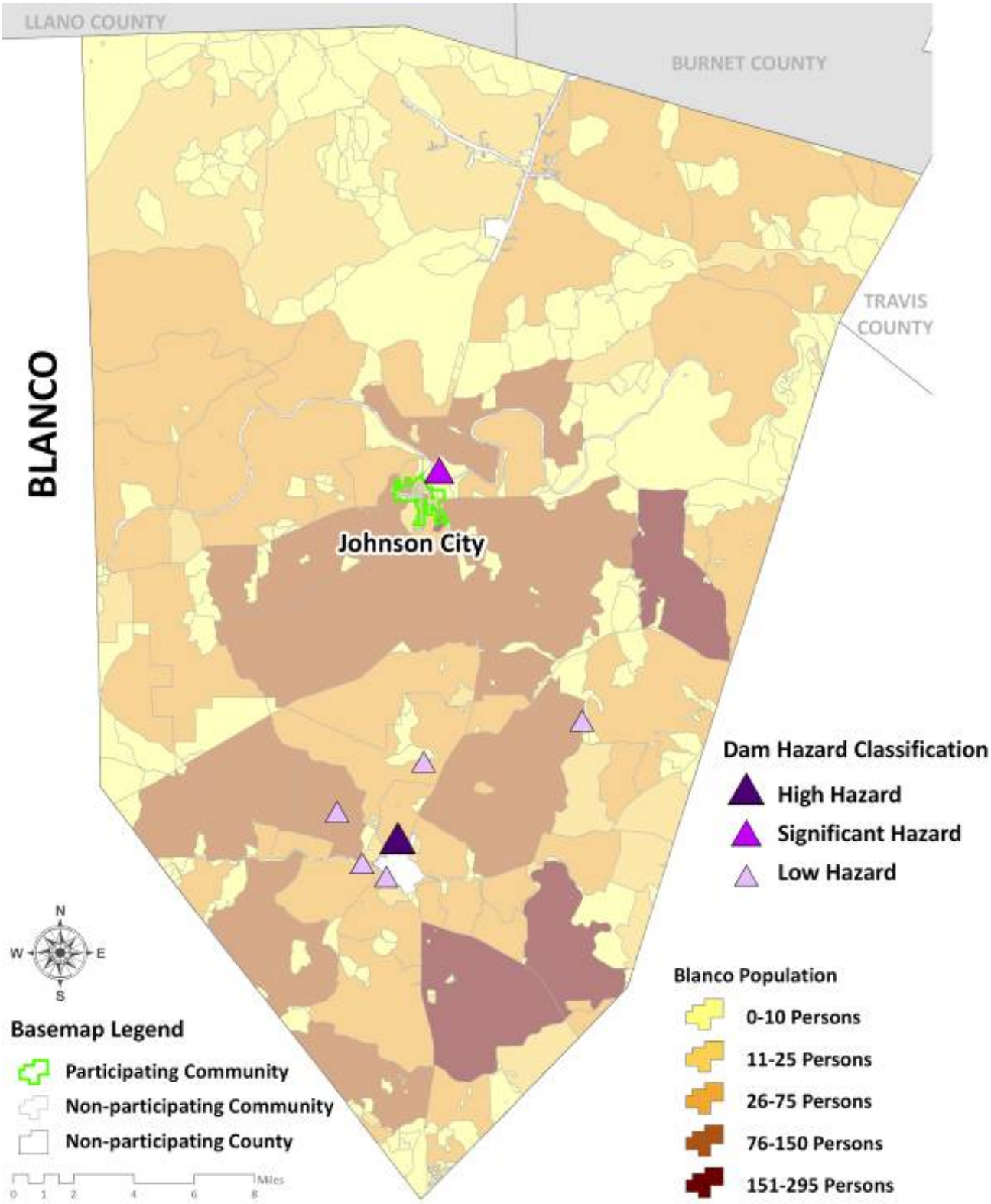


Figure 15-5. Dams in Brown County

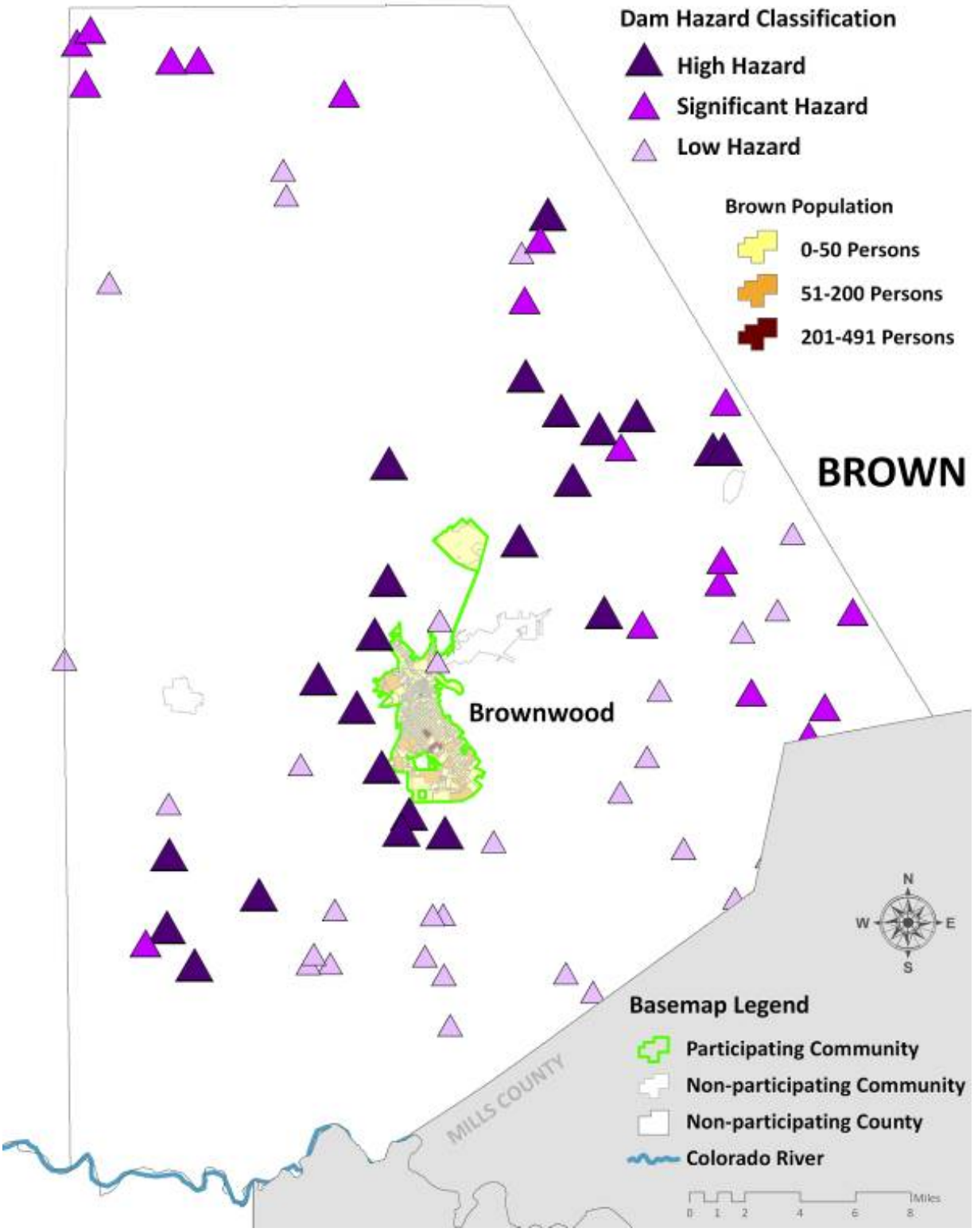


Figure 15-6. Dams in Burnet County

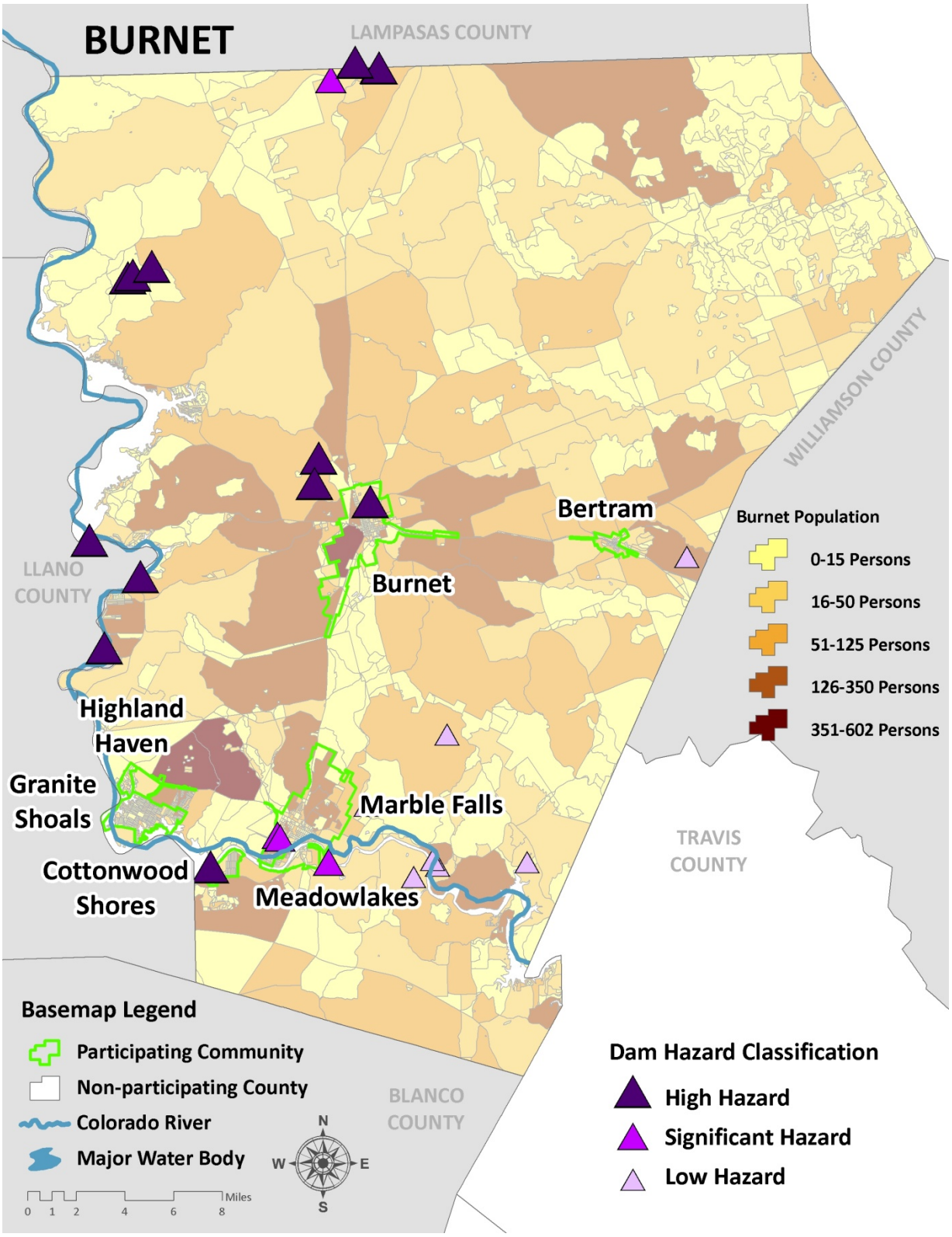


Figure 15-7. Dams in Colorado County

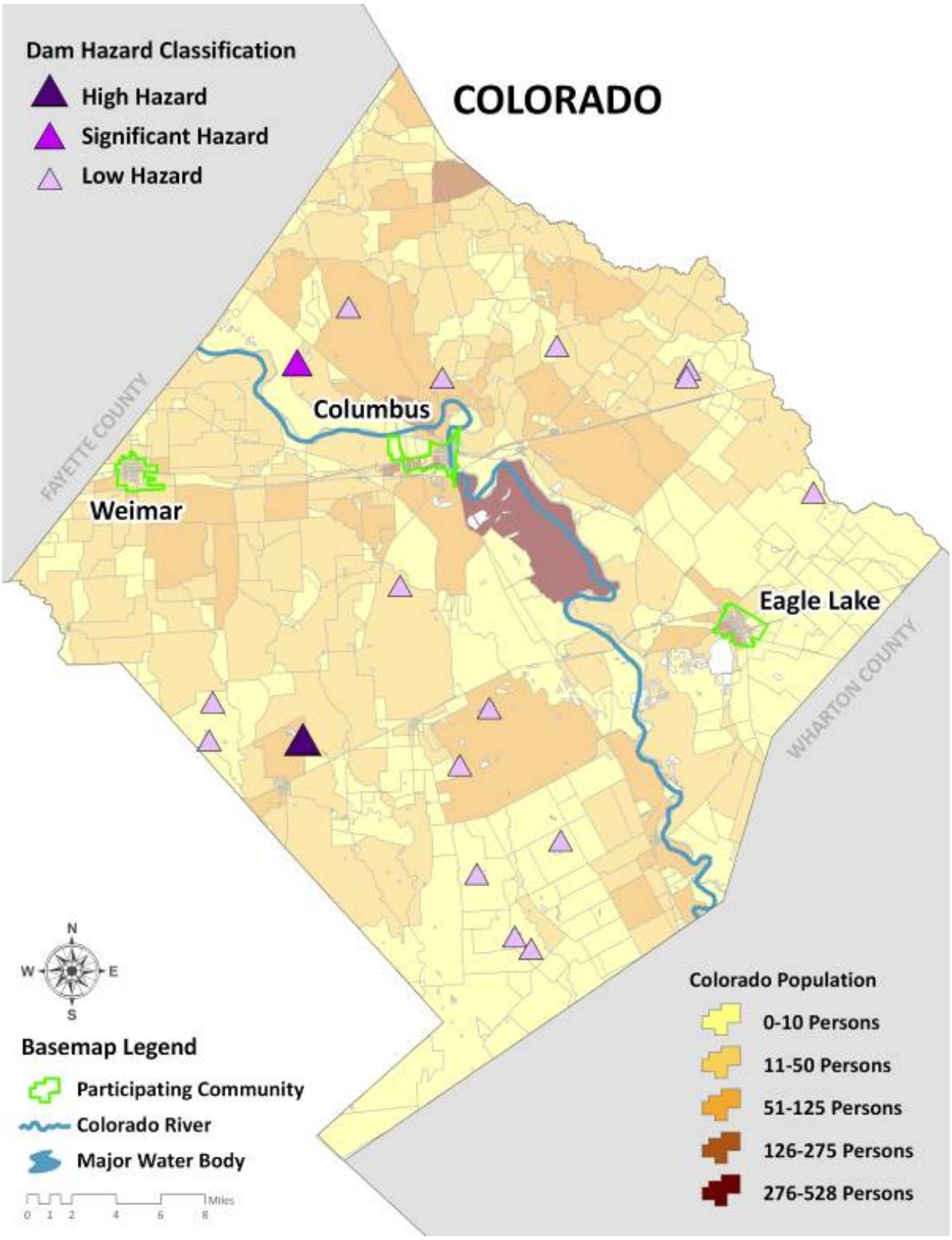


Figure 15-8. Dams in Fayette County

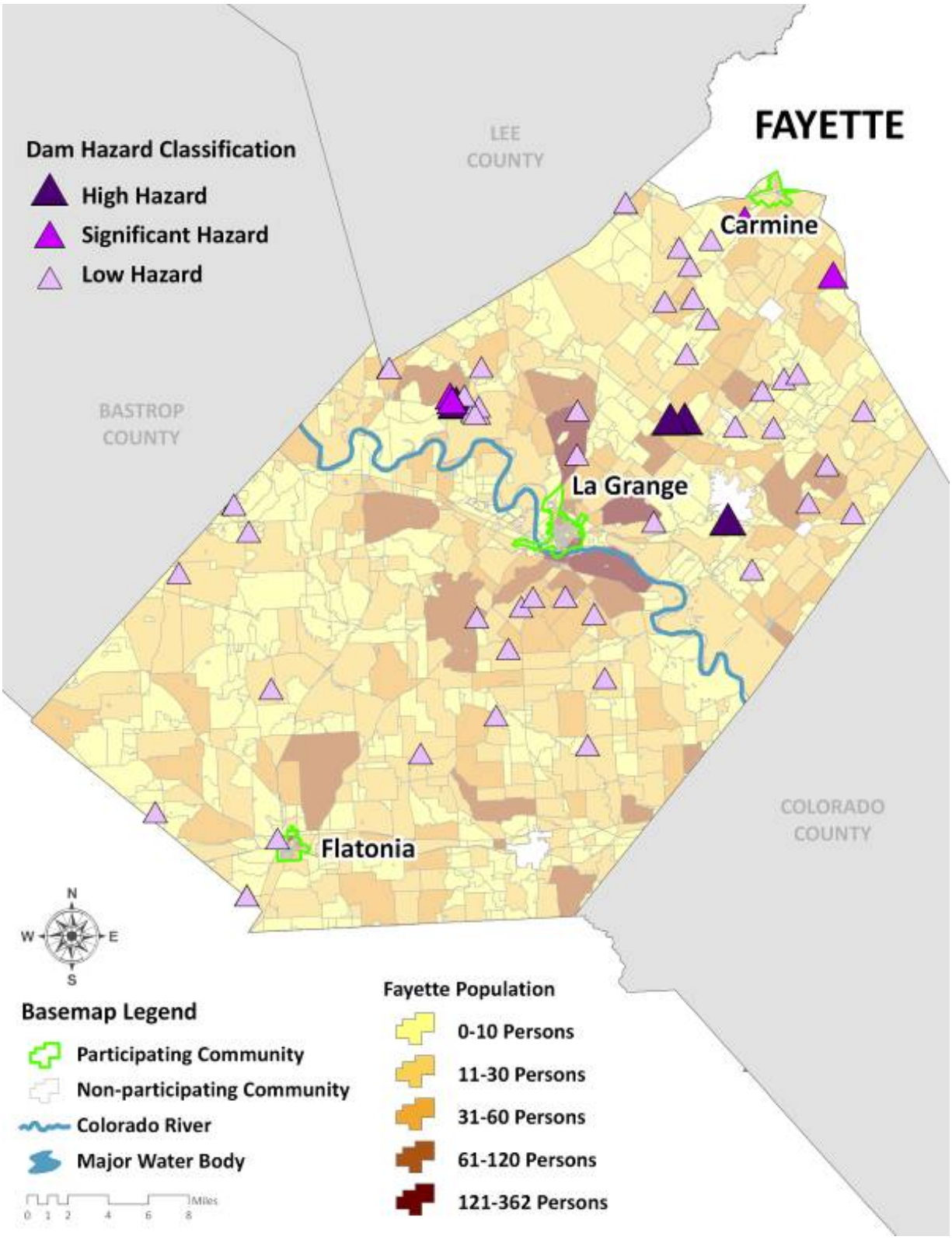


Figure 15-9. Dams in Lampasas County

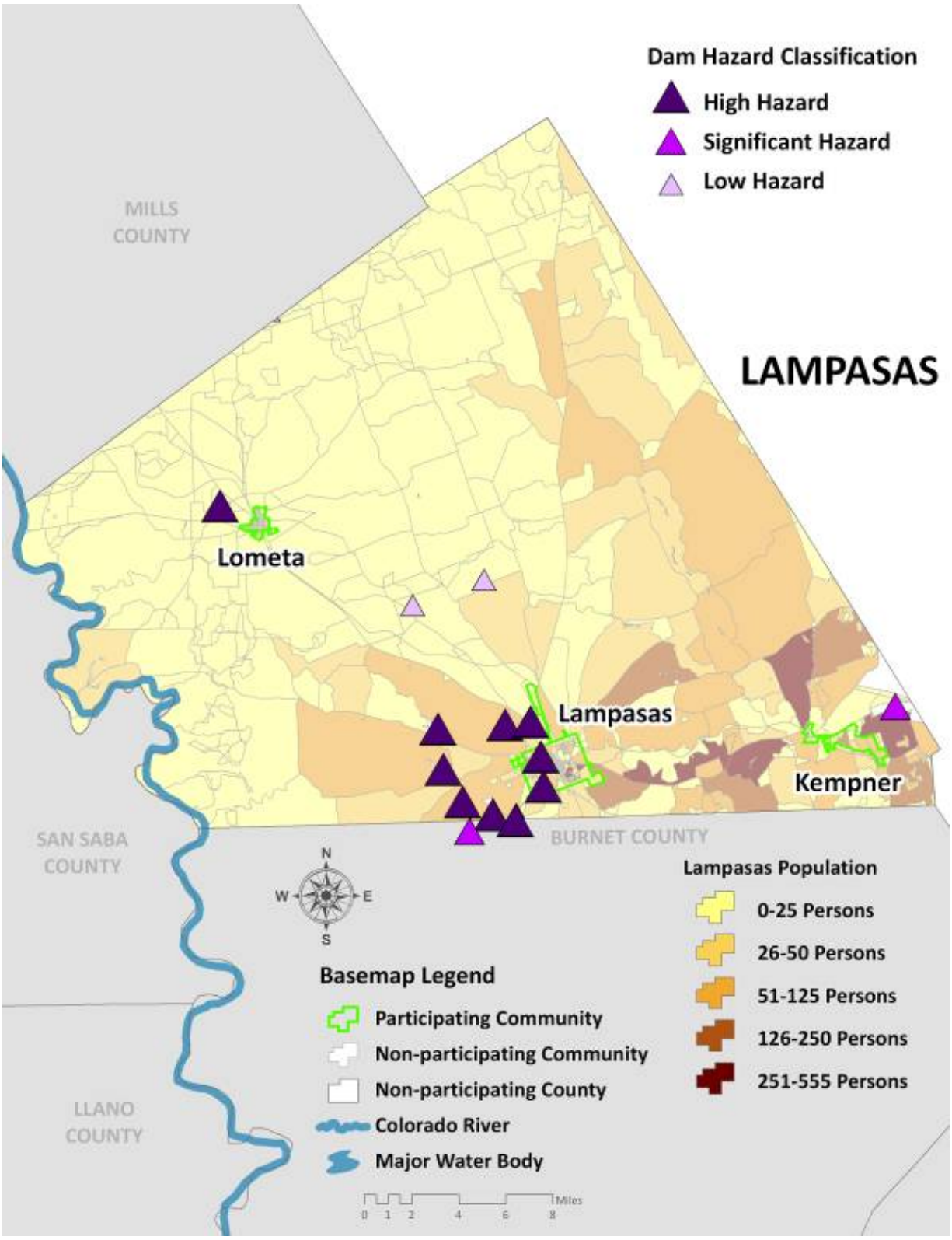


Figure 15-10. Dams in Lee County

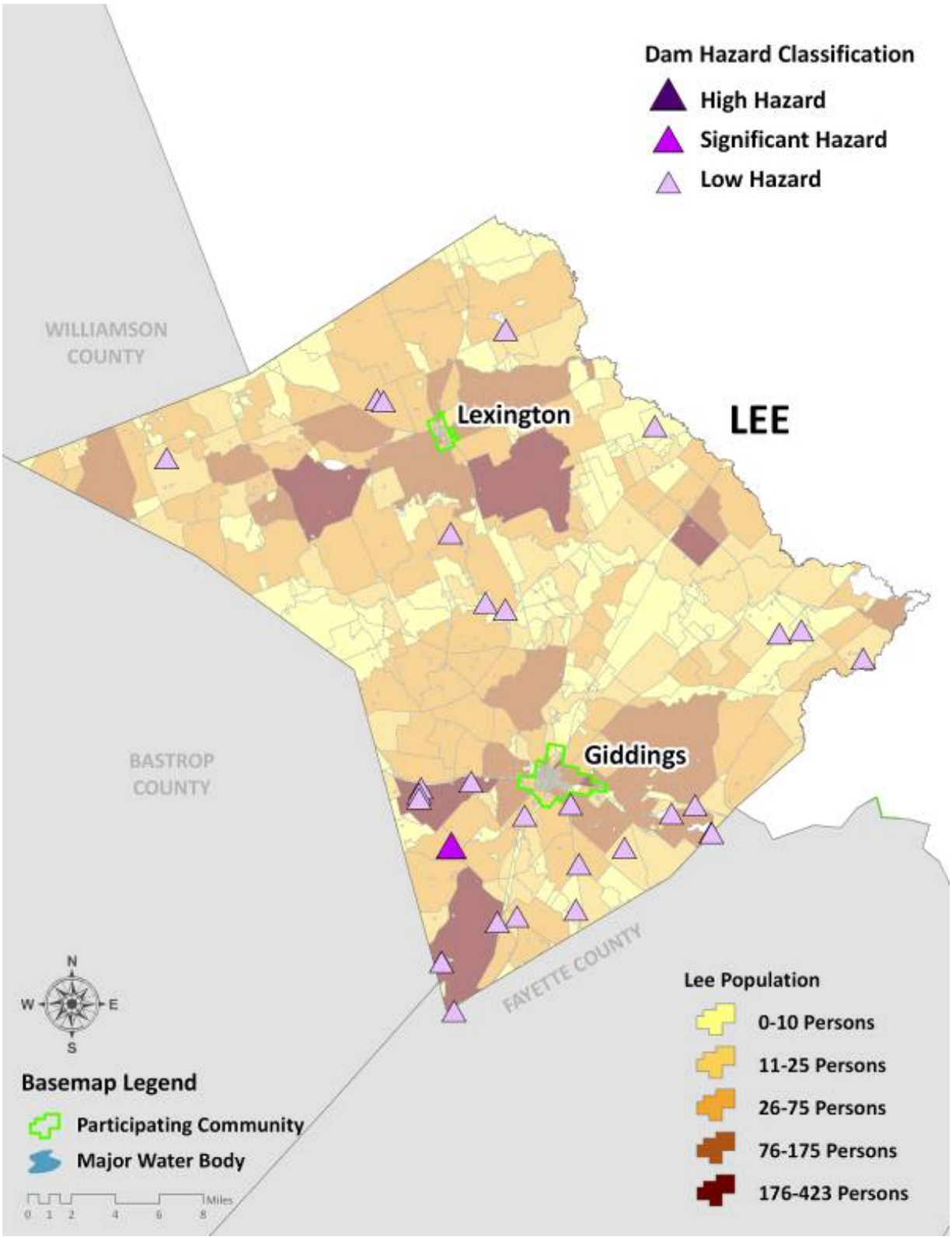


Figure 15-11. Dams in Llano County

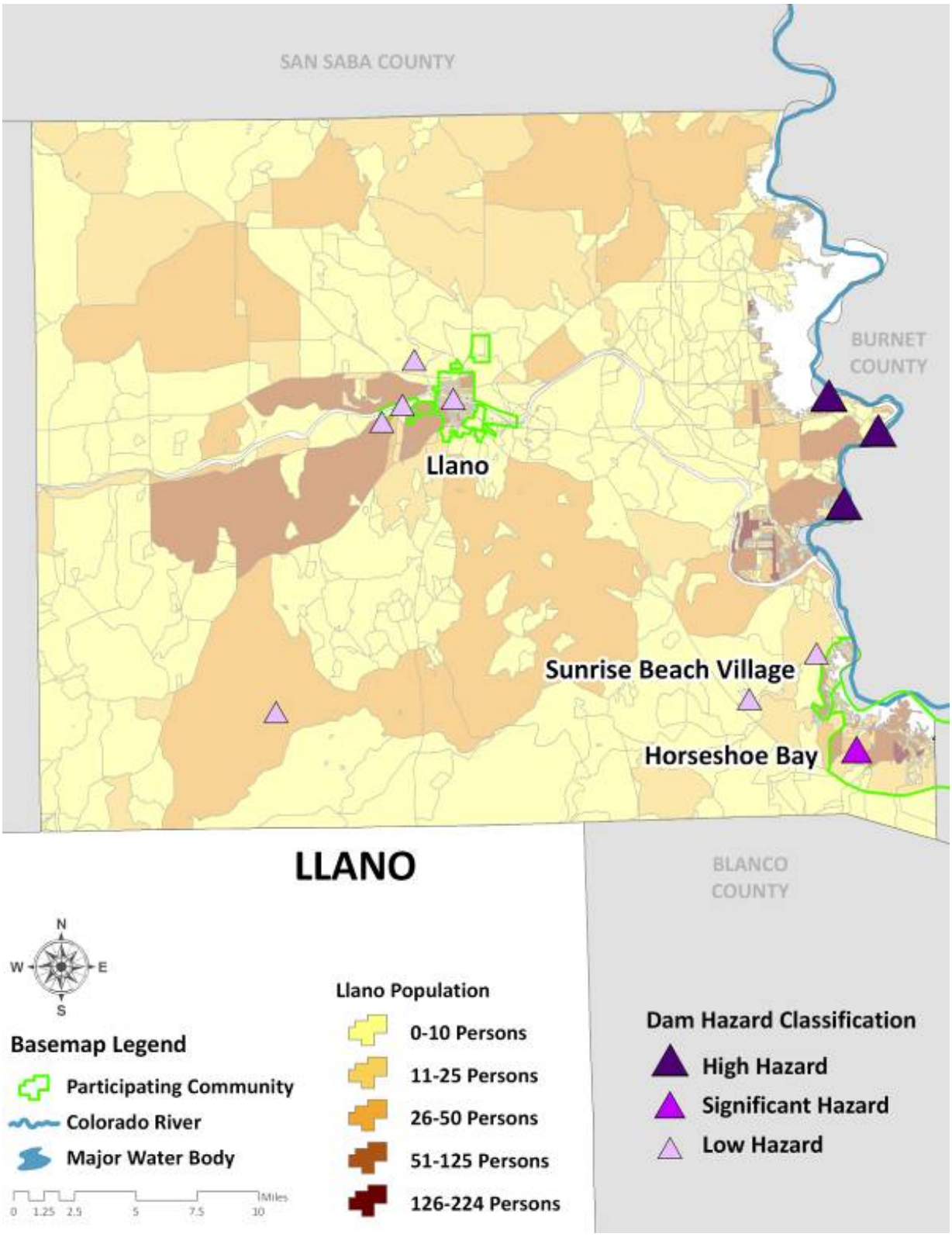


Figure 15-12. Dams in Mason County

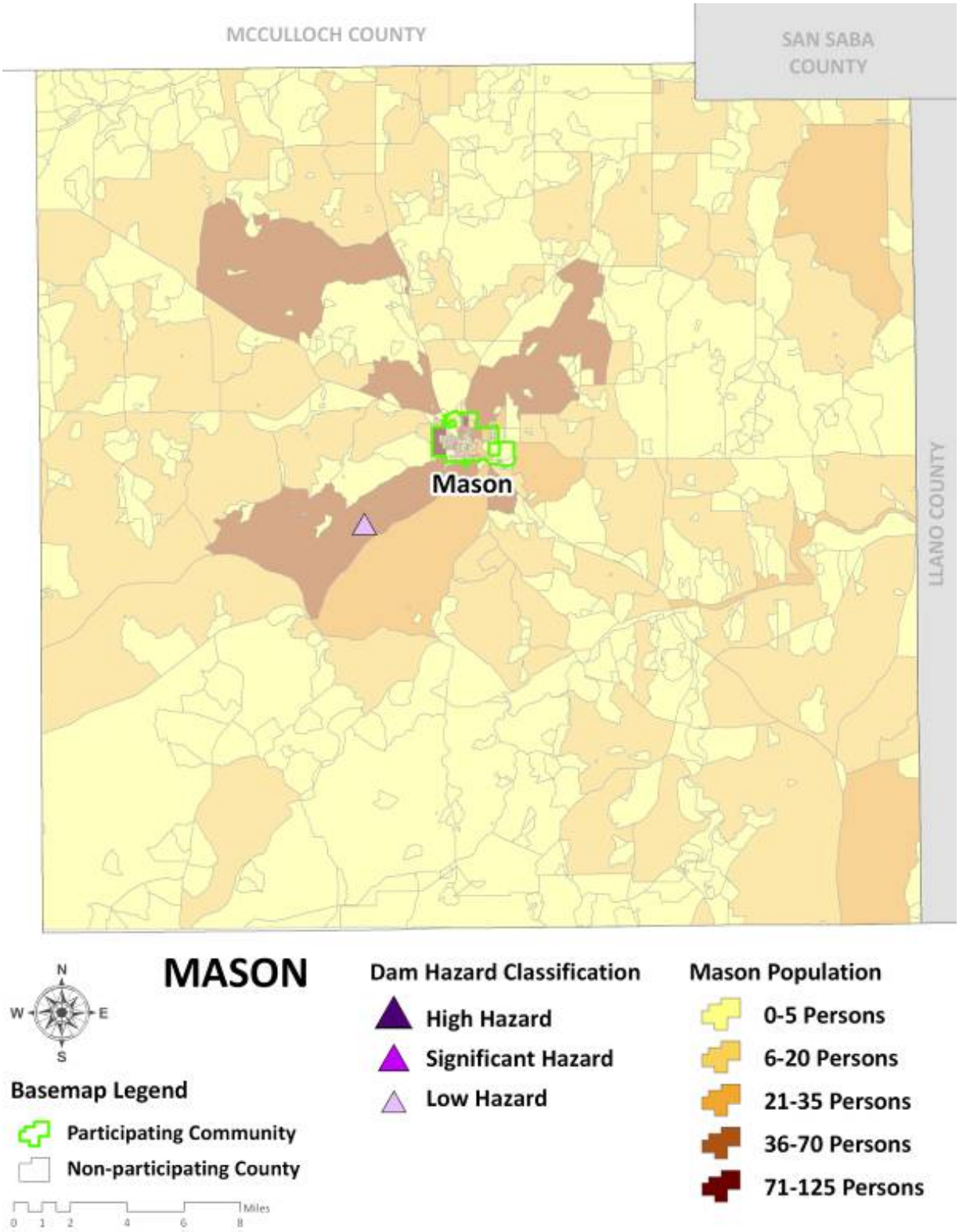


Figure 15-13. Dams in Matagorda County

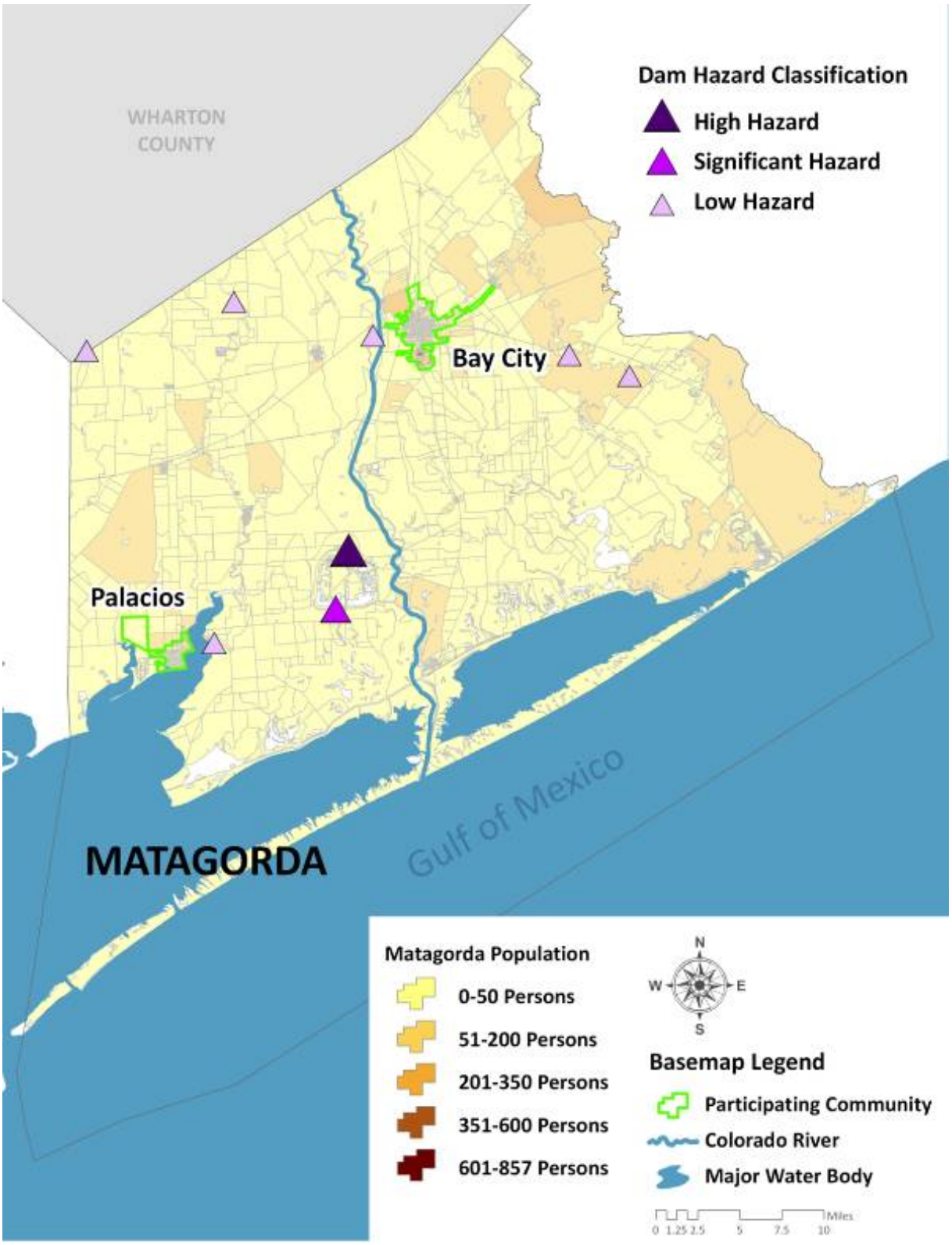


Figure 15-14. Dams in McCulloch County

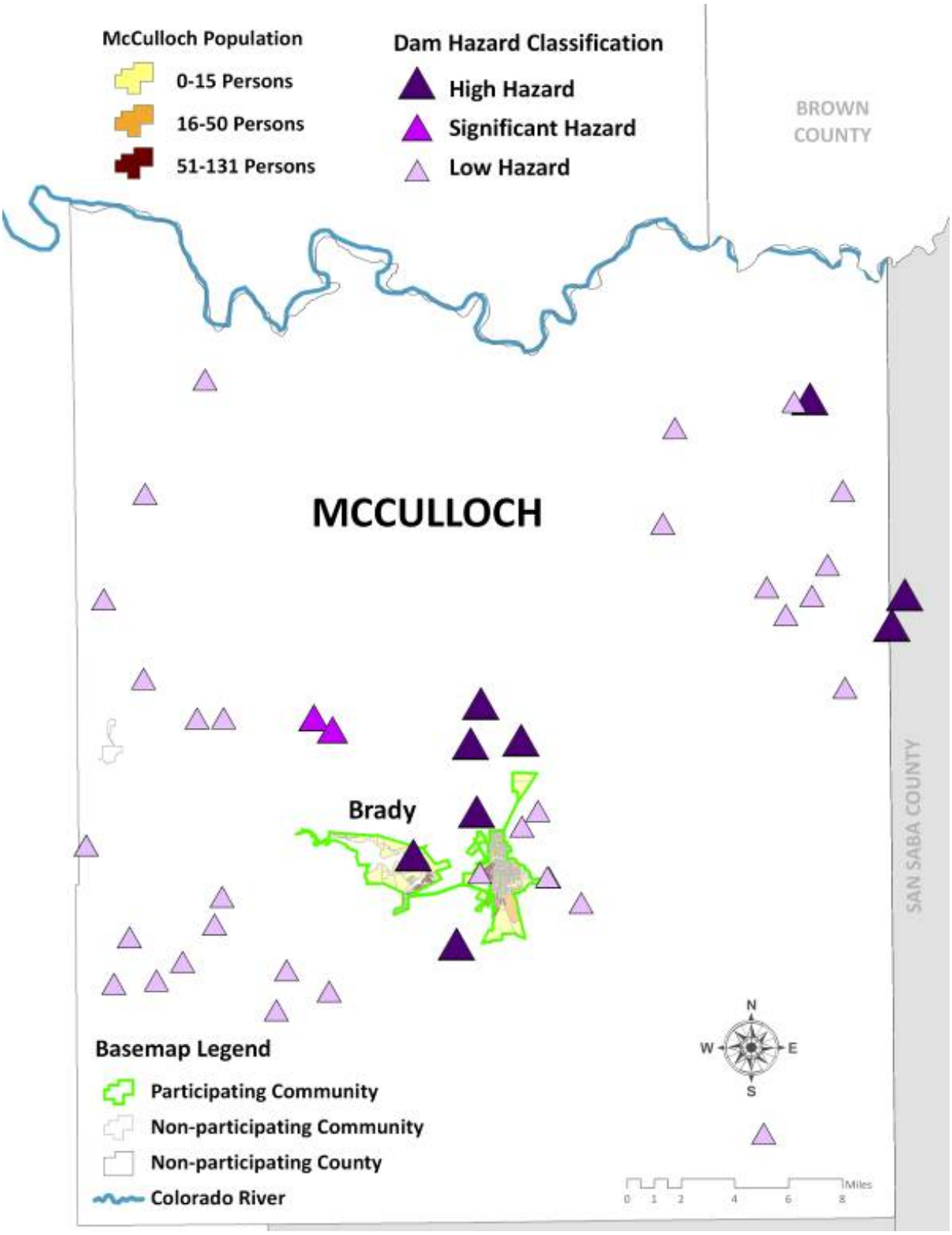


Figure 15-15. Dams in Mills County

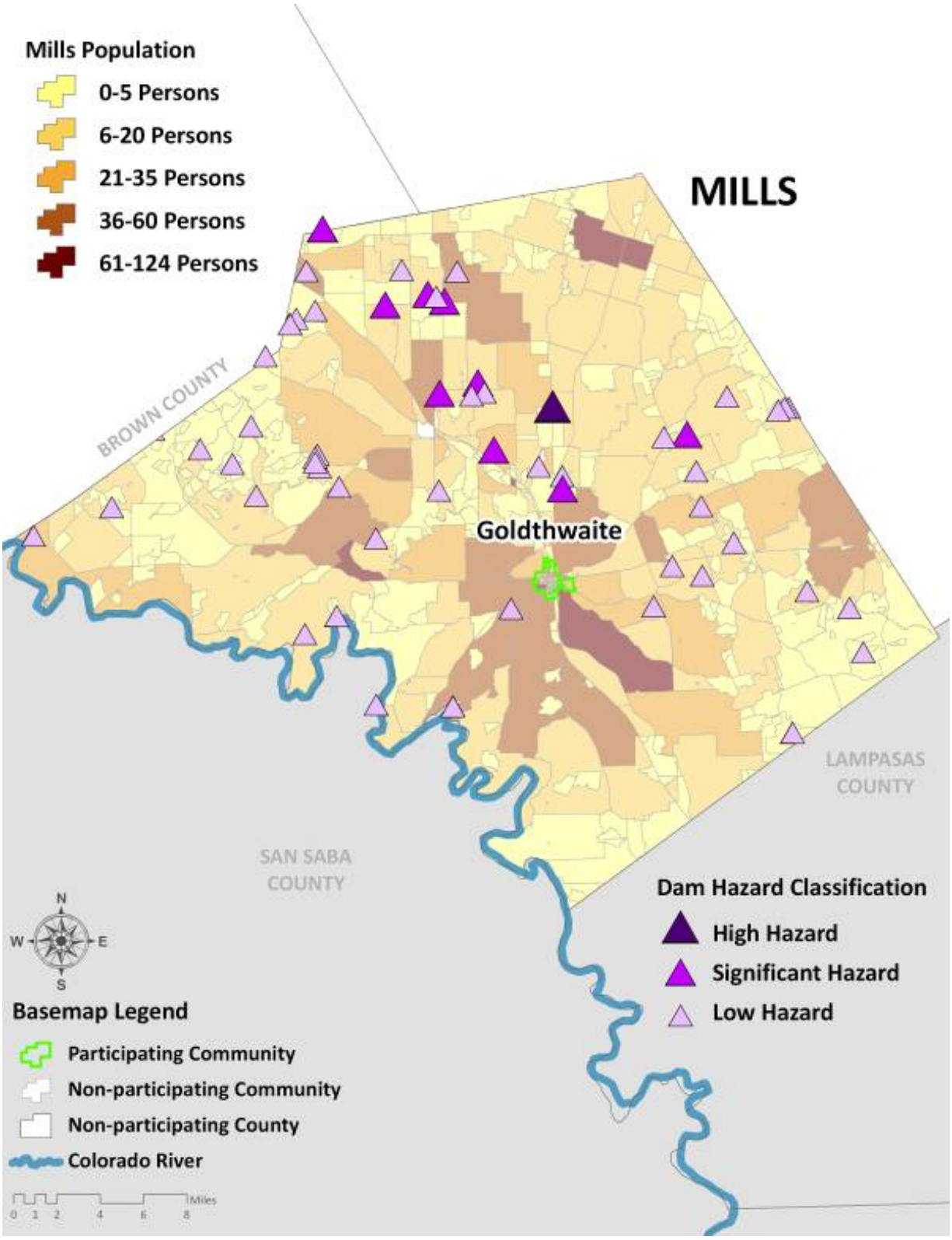


Figure 15-16. Dams in San Saba County

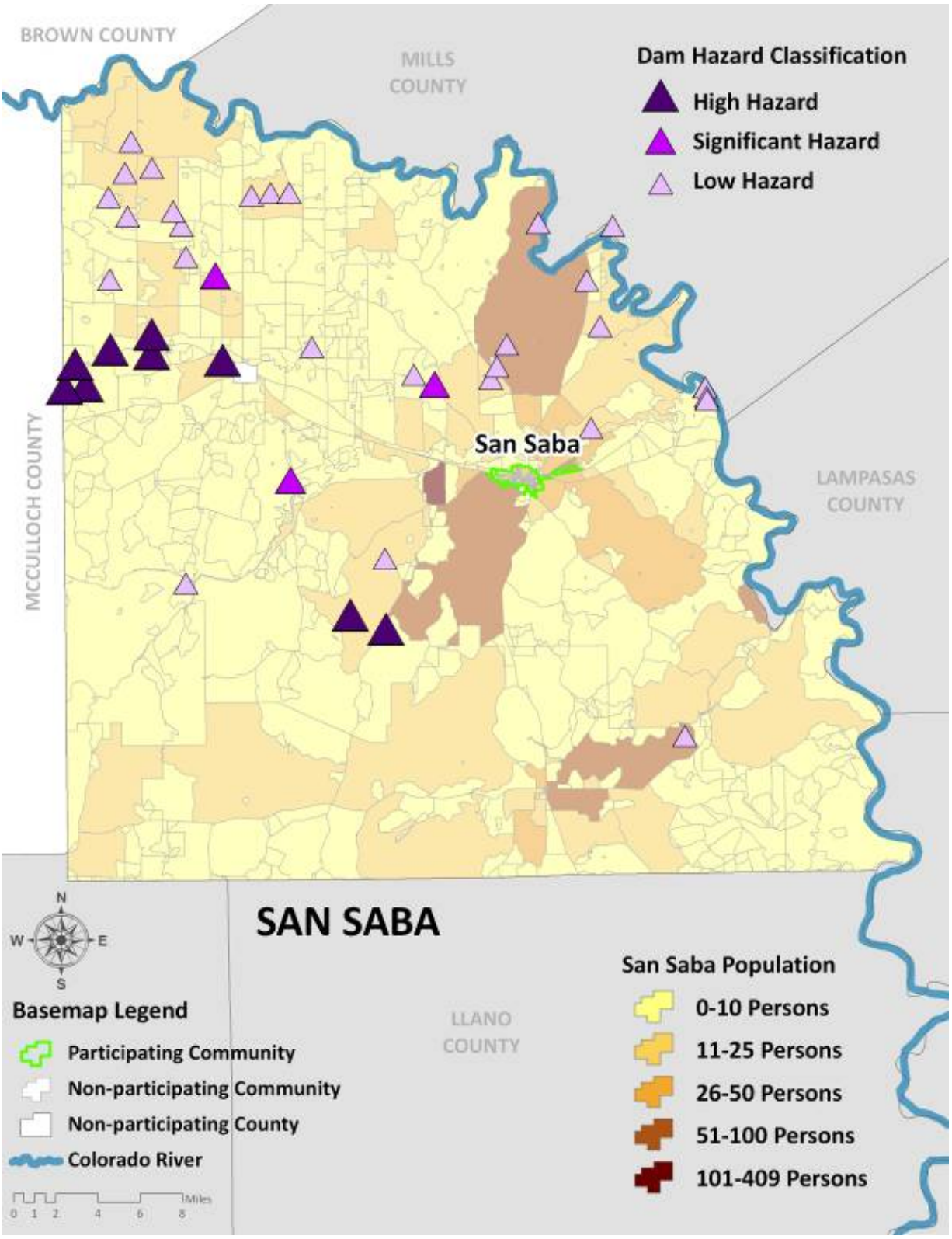


Figure 15-17. Dams in Travis County

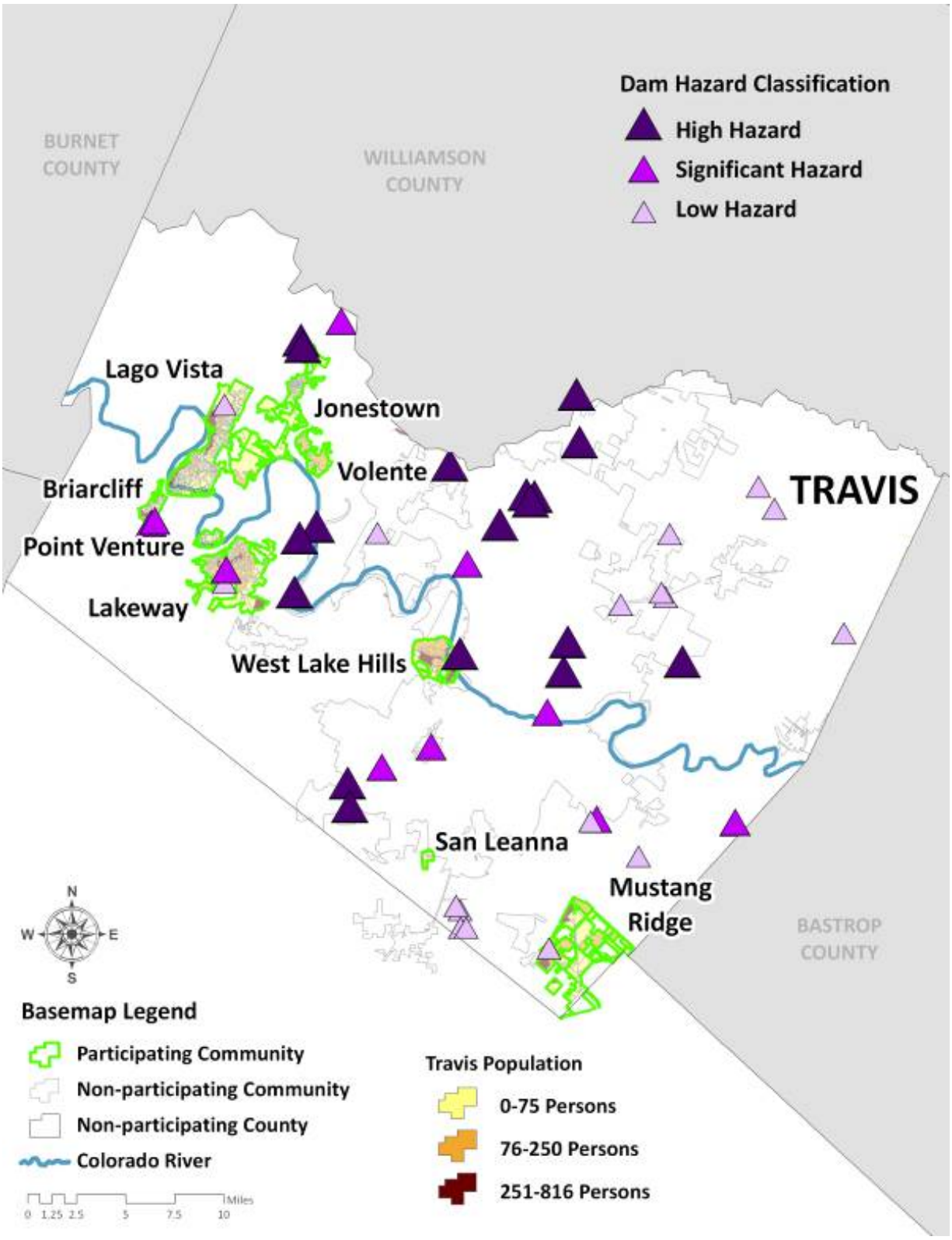


Figure 15-18. Dams in Wharton County

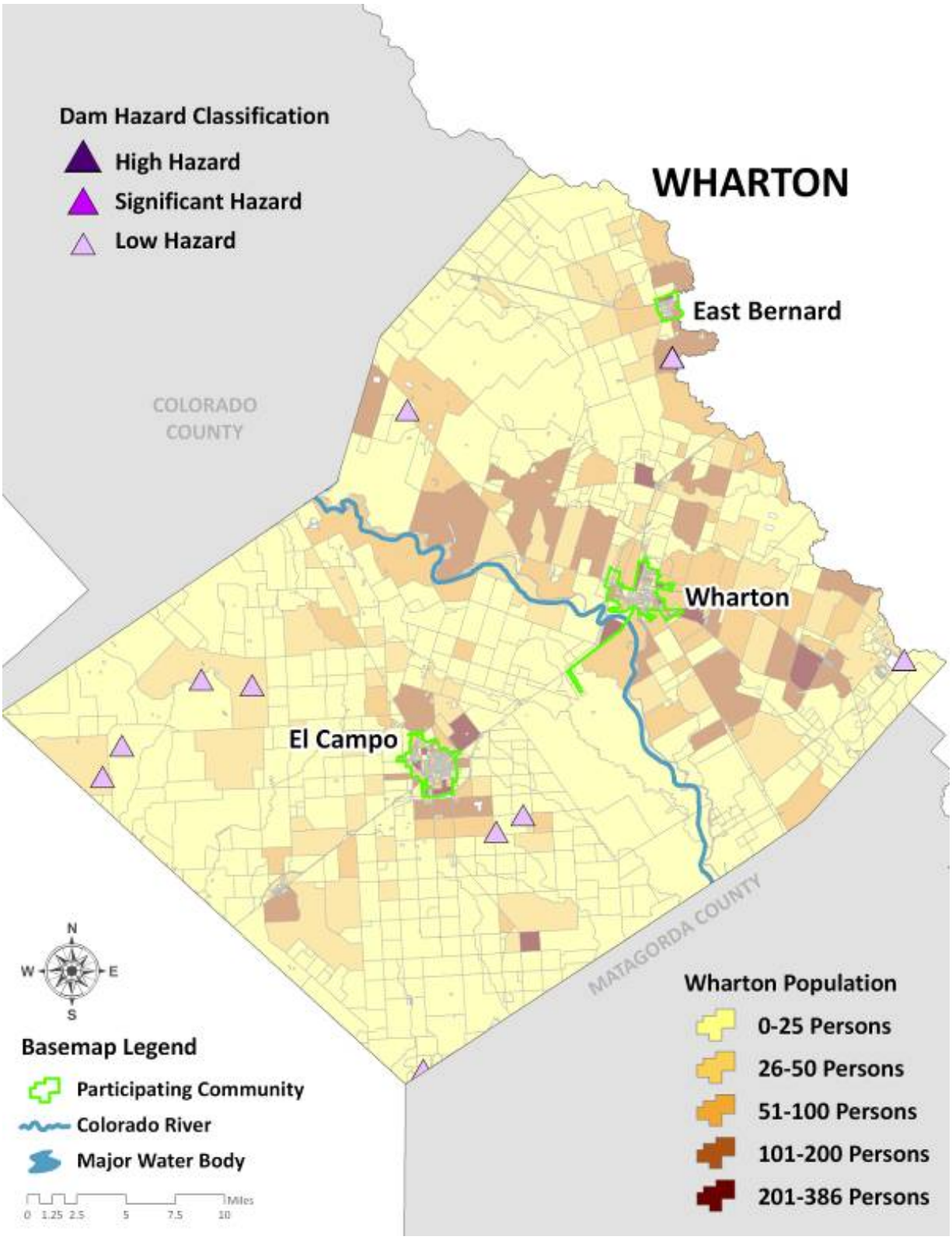


Figure 15-19. Dams in Williamson County

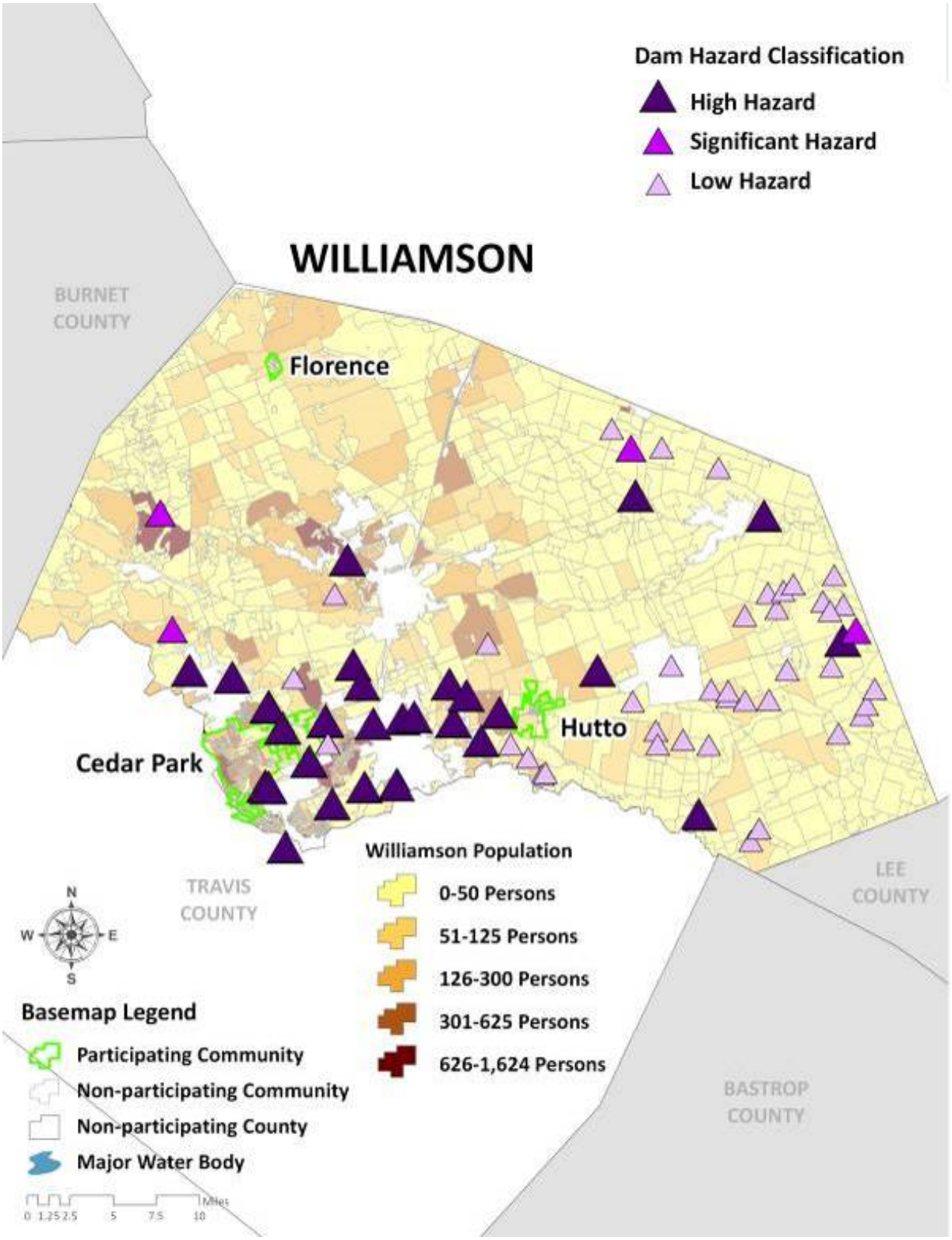


Table 15-2 details the location information for the dams located in each of the counties as displayed graphically in Figures 15-3 to 15-19. The information in Table 15-2 is categorized by hazard extent[8], whether the dams are considered "Low" (L), "Significant" (S) or "High" (H) and further detailed by county.

Table 15-2. Dam Location and Storage

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
BASTROP	200	L	-97.56830000	30.06670000
BASTROP	150	L	-97.08670000	30.25330000
BASTROP	1200	L	-97.31330000	29.95830000
BASTROP	250	L	-97.16000000	30.04170000
BASTROP	120	L	-97.23670000	30.09000000
BASTROP	290	L	-97.11170000	30.06000000
BASTROP	96	L	-97.29670000	30.15500000
BASTROP	110	L	-97.27830000	30.11170000
BASTROP	86	L	-97.33330000	30.01330000
BASTROP	1163	L	-97.29000000	29.86830000
BASTROP	118	L	-97.25830000	30.17500000
BASTROP	435	L	-97.22670000	30.13830000
BASTROP	1112	L	-97.17000000	30.20670000
BASTROP	112	L	-97.48330000	30.07000000
BASTROP	204	L	-97.44500000	29.91330000
BASTROP	160	L	-97.34000000	30.01330000
BASTROP	284	L	-97.21670000	30.00000000
BASTROP	418	L	-97.21830000	30.00500000
BASTROP	80	L	-97.10500000	30.07170000
BASTROP	423	L	-97.08330000	30.04170000
BASTROP	24	L	-97.31170000	30.04670000
BASTROP	20	L	-97.29750000	30.07060000
BASTROP	37	L	-97.32670000	30.19580000
BLANCO	69	L	-98.43000000	30.09330000
BLANCO	100	L	-98.44330000	30.10000000
BLANCO	250	L	-98.45670000	30.12500000
BLANCO	54	L	-98.40830000	30.14830000
BLANCO	584	L	-98.32000000	30.16670000

[8] For more information on hazard extent categories, see Tables 15-3 and 15-4.

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
BROWN	1578	L	-99.04170000	31.57500000
BROWN	670	L	-99.05500000	31.57500000
BROWN	900	L	-99.05830000	31.68000000
BROWN	1715	L	-98.83670000	31.71670000
BROWN	140	L	-98.84500000	31.68170000
BROWN	825	L	-98.97170000	31.75500000
BROWN	1474	L	-98.98330000	31.57830000
BROWN	460	L	-98.79170000	31.60670000
BROWN	1717	L	-99.05170000	31.58000000
BROWN	237	L	-99.03830000	31.60330000
BROWN	813	L	-99.20330000	31.73670000
BROWN	1120	L	-98.96830000	31.54170000
BROWN	1257	L	-98.97170000	31.56830000
BROWN	738	L	-98.97170000	31.60000000
BROWN	799	L	-98.97830000	31.60000000
BROWN	852	L	-98.94000000	31.63830000
BROWN	786	L	-98.78500000	31.74670000
BROWN	924	L	-98.75330000	31.79830000
BROWN	2226	L	-98.76330000	31.75830000
BROWN	269	L	-99.06500000	31.99330000
BROWN	128	L	-99.06330000	31.98000000
BROWN	300	L	-98.97330000	31.73330000
BROWN	592	L	-98.91830000	31.94830000
BROWN	715	L	-98.82330000	31.63330000
BROWN	3617	L	-98.86170000	31.66330000
BROWN	120	L	-99.17330000	31.93500000
BROWN	60	L	-99.14000000	31.66000000
BROWN	235	L	-98.88000000	31.55830000
BROWN	265	L	-98.89670000	31.56830000
BURNET	240	L	-98.19830000	30.54670000
BURNET	100	L	-98.23000000	30.59000000
BURNET	178	L	-98.00500000	30.73500000
BURNET	48	L	-98.18170000	30.55330000
BURNET	40	L	-98.18500000	30.55670000
BURNET	680	L	-98.17330000	30.63170000
BURNET	195	L	-98.11970000	30.55420000
COLORADO	112	L	-96.50500000	29.39000000
COLORADO	217	L	-96.53170000	29.43170000
COLORADO	240	L	-96.49330000	29.38170000

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
COLORADO	150	L	-96.46830000	29.45170000
COLORADO	480	L	-96.27000000	29.67330000
COLORADO	250	L	-96.72830000	29.52500000
COLORADO	137	L	-96.61330000	29.80500000
COLORADO	84	L	-96.45830000	29.77500000
COLORADO	200	L	-96.36000000	29.75670000
COLORADO	115	L	-96.36170000	29.75170000
COLORADO	240	L	-96.58170000	29.62170000
COLORADO	84	L	-96.54500000	29.75670000
COLORADO	73	L	-96.51830000	29.54000000
COLORADO	94	L	-96.54170000	29.50330000
COLORADO	99	L	-96.72500000	29.55000000
COLORADO	35	L	-97.14670000	30.71500000
COLORADO	99	L	-97.45000000	30.55000000
FAYETTE	184	L	-96.76670000	30.03500000
FAYETTE	4280	L	-96.76000000	30.07500000
FAYETTE	1865	L	-96.78330000	30.07330000
FAYETTE	3676	L	-96.76170000	30.09830000
FAYETTE	2700	L	-96.77000000	30.11170000
FAYETTE	147	L	-97.14330000	29.65500000
FAYETTE	110	L	-97.21670000	29.71670000
FAYETTE	216	L	-97.11670000	29.69500000
FAYETTE	888	L	-96.69670000	29.98000000
FAYETTE	3202	L	-96.63330000	29.91670000
FAYETTE	664	L	-96.67000000	29.92500000
FAYETTE	1304	L	-96.65330000	29.95170000
FAYETTE	578	L	-96.62170000	29.99000000
FAYETTE	52	L	-97.19170000	29.88830000
FAYETTE	1618	L	-96.70500000	30.00670000
FAYETTE	950	L	-96.68670000	30.01500000
FAYETTE	1356	L	-96.74830000	30.06000000
FAYETTE	1636	L	-96.74330000	30.11670000
FAYETTE	150	L	-96.67500000	30.01830000
FAYETTE	180	L	-96.94000000	29.99670000
FAYETTE	75	L	-96.94000000	30.00170000
FAYETTE	100	L	-96.94500000	29.99830000
FAYETTE	90	L	-96.94330000	29.99670000
FAYETTE	137	L	-96.86000000	29.96500000
FAYETTE	79	L	-96.85830000	29.99670000

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
FAYETTE	4125	L	-96.72830000	29.98170000
FAYETTE	526	L	-97.14500000	29.93670000
FAYETTE	55	L	-96.95170000	30.01000000
FAYETTE	135	L	-96.94670000	29.85000000
FAYETTE	170	L	-97.11830000	29.80330000
FAYETTE	188	L	-96.79830000	29.91500000
FAYETTE	161	L	-96.93670000	30.03000000
FAYETTE	300	L	-96.71830000	29.87830000
FAYETTE	90	L	-96.87330000	29.86330000
FAYETTE	213	L	-96.91000000	29.85670000
FAYETTE	296	L	-96.99670000	29.75330000
FAYETTE	31	L	-97.01330000	30.03170000
FAYETTE	232	L	-96.92170000	29.82670000
FAYETTE	213	L	-97.13330000	29.91670000
FAYETTE	61	L	-96.90000000	29.86330000
FAYETTE	157	L	-96.85000000	29.85000000
FAYETTE	250	L	-96.85860000	29.75560000
FAYETTE	206	L	-96.84280000	29.80360000
FAYETTE	130	L	-96.93330000	29.77890000
LAMPASAS	77	L	-98.23170000	31.18000000
LAMPASAS	121	L	-98.28330000	31.16500000
LEE	96	L	-97.03330000	30.18000000
LEE	123	L	-97.03500000	30.17670000
LEE	82	L	-97.03500000	30.17330000
LEE	461	L	-96.96330000	30.09330000
LEE	108	L	-96.95500000	30.16000000
LEE	200	L	-96.92000000	30.16670000
LEE	130	L	-96.99500000	30.18330000
LEE	5627	L	-96.84330000	30.15830000
LEE	58	L	-96.82500000	30.16330000
LEE	1888	L	-96.81330000	30.14500000
LEE	53	L	-96.75670000	30.27500000
LEE	2083	L	-96.95830000	30.48170000
LEE	290	L	-96.69330000	30.25670000
LEE	101	L	-96.74000000	30.27670000
LEE	101	L	-97.00500000	30.34830000
LEE	330	L	-96.98000000	30.30170000
LEE	235	L	-96.88000000	30.13670000
LEE	125	L	-96.91830000	30.09670000

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
LEE	167	L	-97.02170000	30.06500000
LEE	101	L	-97.05830000	30.43830000
LEE	240	L	-97.05330000	30.43670000
LEE	104	L	-97.22000000	30.40330000
LEE	396	L	-96.84670000	30.41500000
LEE	73	L	-96.91500000	30.12670000
LEE	138	L	-96.96500000	30.29670000
LEE	83	L	-96.97830000	30.09000000
LLANO	1008	L	-98.47670000	30.57170000
LLANO	60	L	-98.43000000	30.59830000
LLANO	435	L	-98.80170000	30.56830000
LLANO	197	L	-98.67670000	30.75330000
LLANO	500	L	-98.71170000	30.75000000
LLANO	128	L	-98.70330000	30.77670000
LLANO	126	L	-98.72610000	30.74000000
MASON	208	L	-99.29170000	30.70670000
MATAGORDA	84	L	-95.76170000	28.93330000
MATAGORDA	194	L	-95.82000000	28.95330000
MATAGORDA	156	L	-96.01170000	28.97670000
MATAGORDA	262	L	-96.14670000	29.01000000
MATAGORDA	50	L	-96.17830000	28.71830000
MCCULLOCH	856	L	-99.12000000	31.22830000
MCCULLOCH	2032	L	-99.47170000	31.07830000
MCCULLOCH	1673	L	-99.47830000	31.05670000
MCCULLOCH	1738	L	-99.44500000	31.06670000
MCCULLOCH	624	L	-99.28670000	31.11330000
MCCULLOCH	7732	L	-99.58000000	31.07170000
MCCULLOCH	1823	L	-99.55330000	31.07330000
MCCULLOCH	1287	L	-99.53670000	31.08330000
MCCULLOCH	741	L	-99.51670000	31.10330000
MCCULLOCH	612	L	-99.51170000	31.11830000
MCCULLOCH	671	L	-99.52670000	31.21500000
MCCULLOCH	3724	L	-99.51000000	31.21500000
MCCULLOCH	13511	L	-99.59670000	31.14670000
MCCULLOCH	50	L	-99.35000000	31.13000000
MCCULLOCH	235	L	-99.31330000	31.16330000
MCCULLOCH	192	L	-99.32330000	31.15500000
MCCULLOCH	2008	L	-99.57000000	31.09670000
MCCULLOCH	2045	L	-99.56000000	31.23670000

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
MCCULLOCH	231	L	-99.52000000	31.39830000
MCCULLOCH	1995	L	-99.12000000	31.33500000
MCCULLOCH	644	L	-99.13000000	31.29500000
MCCULLOCH	1939	L	-99.16830000	31.28330000
MCCULLOCH	524	L	-99.14000000	31.27830000
MCCULLOCH	4556	L	-99.15670000	31.26830000
MCCULLOCH	1598	L	-99.55830000	31.33670000
MCCULLOCH	1050	L	-99.22500000	31.37000000
MCCULLOCH	226	L	-99.23330000	31.31830000
MCCULLOCH	79	L	-99.15000000	31.38330000
MCCULLOCH	1980	L	-99.58470000	31.27970000
MCCULLOCH	60	L	-99.30670000	31.12720000
MCCULLOCH	34	L	-99.30780000	31.12750000
MCCULLOCH	165	L	-99.17390000	30.98750000
MILLS	115	L	-98.64830000	31.37000000
MILLS	4650	L	-98.45170000	31.45500000
MILLS	6018	L	-98.49000000	31.43500000
MILLS	295	L	-98.47500000	31.46170000
MILLS	280	L	-98.42670000	31.47670000
MILLS	110	L	-98.38170000	31.56670000
MILLS	737	L	-98.62000000	31.58000000
MILLS	900	L	-98.56000000	31.52330000
MILLS	82	L	-98.63000000	31.57830000
MILLS	160	L	-98.80000000	31.51330000
MILLS	3342	L	-98.91330000	31.50670000
MILLS	180	L	-98.81830000	31.53500000
MILLS	600	L	-98.80330000	31.56000000
MILLS	300	L	-98.84330000	31.54500000
MILLS	200	L	-98.77170000	31.62830000
MILLS	3450	L	-98.64000000	31.66170000
MILLS	1500	L	-98.75170000	31.63670000
MILLS	1595	L	-98.57830000	31.53000000
MILLS	170	L	-98.68330000	31.66330000
MILLS	75	L	-98.75000000	31.53170000
MILLS	75	L	-98.75170000	31.54000000
MILLS	70	L	-98.75330000	31.53830000
MILLS	60	L	-98.75330000	31.53500000
MILLS	3906	L	-98.45170000	31.50170000
MILLS	6226	L	-98.45500000	31.52500000

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
MILLS	97	L	-98.33670000	31.43170000
MILLS	101	L	-98.38500000	31.56670000
MILLS	235	L	-98.39000000	31.56500000
MILLS	112	L	-98.75830000	31.66330000
MILLS	85	L	-98.65670000	31.64500000
MILLS	240	L	-98.73500000	31.51830000
MILLS	400	L	-98.65670000	31.51500000
MILLS	76	L	-98.48000000	31.54830000
MILLS	60	L	-98.43000000	31.57500000
MILLS	105	L	-98.97500000	31.48830000
MILLS	243	L	-98.76330000	31.42000000
MILLS	280	L	-98.73830000	31.43170000
MILLS	180	L	-98.37000000	31.44330000
MILLS	75	L	-98.32670000	31.40170000
MILLS	115	L	-98.38330000	31.34830000
MILLS	261	L	-98.60170000	31.43500000
MILLS	119	L	-98.76670000	31.63170000
MILLS	63	L	-98.70670000	31.48330000
SAN SABA	158	L	-98.66830000	31.23000000
SAN SABA	1004	L	-98.89170000	31.28830000
SAN SABA	1242	L	-98.74830000	31.26500000
SAN SABA	384	L	-98.67000000	31.33170000
SAN SABA	1300	L	-98.73500000	31.28830000
SAN SABA	1793	L	-98.74330000	31.27330000
SAN SABA	1710	L	-99.03830000	31.38000000
SAN SABA	647	L	-99.05330000	31.39330000
SAN SABA	530	L	-99.01830000	31.41330000
SAN SABA	1037	L	-98.83500000	31.14170000
SAN SABA	1632	L	-98.81000000	31.26830000
SAN SABA	645	L	-98.93830000	31.39330000
SAN SABA	5899	L	-98.99170000	31.35170000
SAN SABA	602	L	-98.99500000	31.37330000
SAN SABA	665	L	-99.00170000	31.38330000
SAN SABA	562	L	-99.04000000	31.41000000
SAN SABA	560	L	-99.03500000	31.43170000
SAN SABA	1051	L	-99.05330000	31.33670000
SAN SABA	286	L	-98.70830000	31.37170000
SAN SABA	152	L	-98.66000000	31.30000000
SAN SABA	126	L	-98.99500000	31.12670000

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
SAN SABA	378	L	-98.59670000	31.01670000
SAN SABA	212	L	-98.92330000	31.39500000
SAN SABA	109	L	-98.90830000	31.39500000
SAN SABA	106	L	-98.57670000	31.25670000
SAN SABA	100	L	-98.57500000	31.25000000
SAN SABA	113	L	-98.57500000	31.24830000
TRAVIS	132	L	-97.63830000	30.14170000
TRAVIS	310	L	-97.79170000	30.10500000
TRAVIS	100	L	-97.60500000	30.38000000
TRAVIS	90	L	-97.52830000	30.41330000
TRAVIS	130	L	-97.51500000	30.39670000
TRAVIS	115	L	-97.45830000	30.30330000
TRAVIS	93	L	-97.79500000	30.10830000
TRAVIS	120	L	-97.79170000	30.09170000
TRAVIS	100	L	-97.78670000	30.09170000
TRAVIS	73	L	-97.67830000	30.16830000
TRAVIS	247	L	-97.71670000	30.07500000
TRAVIS	87	L	-97.98670000	30.35170000
TRAVIS	83	L	-97.61000000	30.33330000
TRAVIS	197	L	-97.61330000	30.33670000
TRAVIS	40	L	-97.64830000	30.32830000
TRAVIS	65	L	-97.98330000	30.48330000
TRAVIS	120	L	-97.85500000	30.38580000
WHARTON	150	L	-96.20170000	29.15830000
WHARTON	108	L	-96.53670000	29.22000000
WHARTON	2150	L	-95.87670000	29.26170000
WHARTON	50	L	-96.28670000	29.46000000
WHARTON	150	L	-96.29330000	28.97330000
WHARTON	340	L	-96.06170000	29.49170000
WHARTON	209	L	-96.22500000	29.14670000
WHARTON	194	L	-96.46830000	29.26670000
WHARTON	63	L	-96.55390000	29.19750000
WHARTON	134	L	-96.42560000	29.26110000
WILLIAMSON	531	L	-97.54000000	30.49000000
WILLIAMSON	144	L	-97.53670000	30.49170000
WILLIAMSON	564	L	-97.33830000	30.43000000
WILLIAMSON	861	L	-97.33000000	30.44000000
WILLIAMSON	548	L	-97.22670000	30.53330000
WILLIAMSON	1858	L	-97.30670000	30.62500000

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
WILLIAMSON	1476	L	-97.42830000	30.52500000
WILLIAMSON	574	L	-97.40170000	30.51670000
WILLIAMSON	2100	L	-97.31500000	30.63830000
WILLIAMSON	795	L	-97.30000000	30.64000000
WILLIAMSON	550	L	-97.26170000	30.63000000
WILLIAMSON	558	L	-97.57000000	30.51670000
WILLIAMSON	505	L	-97.55330000	30.50500000
WILLIAMSON	64	L	-97.74830000	30.52170000
WILLIAMSON	657	L	-97.78000000	30.57670000
WILLIAMSON	1883	L	-97.22170000	30.54170000
WILLIAMSON	1025	L	-97.21330000	30.55500000
WILLIAMSON	3248	L	-97.24170000	30.62670000
WILLIAMSON	545	L	-97.31670000	30.54830000
WILLIAMSON	710	L	-97.33830000	30.62000000
WILLIAMSON	1874	L	-97.25000000	30.51830000
WILLIAMSON	2790	L	-97.29830000	30.57330000
WILLIAMSON	547	L	-97.29000000	30.64500000
WILLIAMSON	1180	L	-97.25000000	30.65170000
WILLIAMSON	4093	L	-97.37670000	30.51170000
WILLIAMSON	4264	L	-97.41500000	30.76330000
WILLIAMSON	72	L	-97.25500000	30.57500000
WILLIAMSON	82	L	-97.35670000	30.55170000
WILLIAMSON	99	L	-97.36000000	30.74500000
WILLIAMSON	155	L	-97.59000000	30.60170000
WILLIAMSON	80	L	-97.37330000	30.55830000
WILLIAMSON	143	L	-97.25500000	30.62170000
WILLIAMSON	225	L	-97.73830000	30.64670000
WILLIAMSON	101	L	-97.42670000	30.51330000
WILLIAMSON	88	L	-97.34000000	30.54830000
WILLIAMSON	96	L	-97.35670000	30.55670000
WILLIAMSON	26	L	-97.46330000	30.78000000
WILLIAMSON	50	L	-97.41140000	30.57940000
BASTROP	350	S	-97.46500000	30.11330000
BASTROP	252	S	-97.21830000	30.01830000
BASTROP	119	S	-97.29330000	30.18000000
BASTROP	259	S	-97.27670000	30.31000000
BASTROP	131	S	-97.55670000	30.03830000
BASTROP	22	S	-97.34170000	30.12330000
BLANCO	1035	S	-98.39670000	30.28830000

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
BROWN	1200	S	-99.11670000	32.05170000
BROWN	1880	S	-99.19170000	32.06170000
BROWN	843	S	-99.18670000	32.04000000
BROWN	1000	S	-99.13330000	32.05170000
BROWN	2134	S	-99.18330000	32.06830000
BROWN	1634	S	-98.73500000	31.70670000
BROWN	945	S	-99.15500000	31.58670000
BROWN	1000	S	-98.78000000	31.71500000
BROWN	400	S	-98.79830000	31.77330000
BROWN	1853	S	-98.79670000	31.78500000
BROWN	1646	S	-98.79330000	31.86830000
BROWN	2418	S	-98.84670000	31.75170000
BROWN	1119	S	-98.90670000	31.95500000
BROWN	561	S	-98.91670000	31.92330000
BROWN	1200	S	-98.71670000	31.75670000
BROWN	560	S	-98.85830000	31.84500000
BROWN	646	S	-98.74500000	31.69170000
BROWN	2072	S	-99.02670000	32.03330000
BURNET	8760	S	-98.25670000	30.55670000
BURNET	7190	S	-98.24500000	31.02500000
BURNET	121	S	-98.29170000	30.57330000
BURNET	52	S	-98.29000000	30.57170000
COLORADO	267	S	-96.65330000	29.77000000
FAYETTE	4471	S	-96.71500000	30.13000000
FAYETTE	1849	S	-96.64330000	30.08830000
FAYETTE	69	S	-96.96330000	30.01000000
FAYETTE	65	S	-96.96170000	30.00670000
LAMPASAS	69	S	-97.93830000	31.09670000
LEE	240	S	-97.01170000	30.14170000
LLANO	31	S	-98.40360000	30.54060000
MATAGORDA	250000	S	-96.05830000	28.74330000
MCCULLOCH	1224	S	-99.45330000	31.21500000
MCCULLOCH	2667	S	-99.44170000	31.20830000
MILLS	170	S	-98.46170000	31.55000000
MILLS	848	S	-98.65500000	31.58000000
MILLS	4457	S	-98.62500000	31.58670000
MILLS	1530	S	-98.61330000	31.54170000
MILLS	675	S	-98.56000000	31.51500000
MILLS	1633	S	-98.66330000	31.64670000

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
MILLS	3000	S	-98.69670000	31.64000000
MILLS	166	S	-98.65000000	31.64170000
SAN SABA	2020	S	-98.96830000	31.33830000
SAN SABA	1215	S	-98.91000000	31.19670000
SAN SABA	314	S	-98.79330000	31.26170000
TRAVIS	6850	S	-97.71330000	30.25000000
TRAVIS	52	S	-97.55500000	30.16500000
TRAVIS	200	S	-97.67330000	30.17000000
TRAVIS	129	S	-97.88170000	30.54330000
TRAVIS	36	S	-97.98470000	30.36080000
TRAVIS	50	S	-97.77860000	30.36140000
TRAVIS	300	S	-97.85560000	30.21220000
TRAVIS	60	S	-999.99900000	-999.99900000
TRAVIS	99	S	-999.99900000	-999.99900000
TRAVIS	35	S	-999.99900000	-999.99900000
TRAVIS	15	S	-98.04830000	30.39670000
TRAVIS	14	S	-98.04500000	30.39830000
TRAVIS	13	S	-999.99900000	-999.99900000
TRAVIS	35	S	-97.81310000	30.22640000
WILLIAMSON	282	S	-97.23000000	30.60500000
WILLIAMSON	72	S	-97.90670000	30.71830000
WILLIAMSON	4698	S	-97.44500000	30.76330000
WILLIAMSON	1	S	-97.89720000	30.62000000
BASTROP	16962	H	-97.29170000	30.15500000
BASTROP	84	H	-97.28000000	30.09830000
BASTROP	764	H	-97.14330000	30.11670000
BASTROP	822	H	-97.08670000	30.04500000
BLANCO	280	H	-98.42330000	30.11170000
BROWN	5128	H	-99.12500000	31.57500000
BROWN	256	H	-98.99170000	31.65330000
BROWN	8083	H	-99.08500000	31.61170000
BROWN	5988	H	-99.14170000	31.59500000
BROWN	7891	H	-99.14000000	31.63330000
BROWN	7377	H	-99.00830000	31.67830000
BROWN	583	H	-98.80170000	31.84330000
BROWN	742	H	-98.79500000	31.84330000
BROWN	1407	H	-98.84830000	31.86170000
BROWN	474	H	-98.90170000	31.96830000
BROWN	448200	H	-99.00170000	31.83830000

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
BROWN	1761	H	-99.00330000	31.77670000
BROWN	455	H	-98.87170000	31.85500000
BROWN	1950	H	-98.87000000	31.75830000
BROWN	1546	H	-98.88830000	31.82830000
BROWN	723	H	-98.92170000	31.79670000
BROWN	404	H	-98.89500000	31.86500000
BROWN	1616	H	-98.91670000	31.88330000
BROWN	577	H	-98.97000000	31.64330000
BROWN	882	H	-98.99670000	31.64500000
BROWN	2516	H	-99.04670000	31.72500000
BROWN	2540	H	-99.01170000	31.74830000
BROWN	1025	H	-99.02330000	31.71000000
BURNET	227000	H	-98.33830000	30.55500000
BURNET	63500	H	-98.38500000	30.73000000
BURNET	982000	H	-98.41830000	30.75170000
BURNET	192	H	-98.38830000	30.90830000
BURNET	326	H	-98.38500000	30.91000000
BURNET	6405	H	-98.37170000	30.91500000
BURNET	1902	H	-98.21170000	31.03170000
BURNET	1375	H	-98.22330000	30.77170000
BURNET	1240	H	-98.25830000	30.79830000
BURNET	492	H	-98.26170000	30.78330000
COLORADO	1000	H	-96.65830000	29.52330000
FAYETTE	1086	H	-96.77000000	29.98830000
FAYETTE	3594	H	-96.78170000	29.98830000
FAYETTE	56	H	-96.95830000	30.00500000
FAYETTE	88628	H	-96.73670000	29.91500000
LAMPASAS	2237	H	-98.21830000	31.09000000
LAMPASAS	270	H	-98.19330000	31.07000000
LAMPASAS	1687	H	-98.19170000	31.05170000
LAMPASAS	9252	H	-98.22830000	31.03500000
LAMPASAS	4154	H	-98.25000000	31.04330000
LAMPASAS	3895	H	-98.26330000	31.06330000
LAMPASAS	8206	H	-98.26670000	31.08830000
LAMPASAS	2016	H	-98.42000000	31.22830000
LAMPASAS	325	H	-98.20000000	31.09170000
LLANO	22	H	-98.40920000	30.68720000
MATAGORDA	687	H	-96.04330000	28.79330000
MCCULLOCH	3732	H	-99.36500000	31.09170000

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
MCCULLOCH	212400	H	-99.39170000	31.14000000
MCCULLOCH	1607	H	-99.35500000	31.20000000
MCCULLOCH	1977	H	-99.34830000	31.22170000
MCCULLOCH	2119	H	-99.32330000	31.20170000
MCCULLOCH	144	H	-99.35170000	31.16330000
MCCULLOCH	2170	H	-99.14000000	31.38500000
MILLS	1633	H	-98.56670000	31.57000000
SAN SABA	4185	H	-98.86330000	31.10330000
SAN SABA	696	H	-98.96330000	31.28000000
SAN SABA	2392	H	-99.02000000	31.28500000
SAN SABA	4846	H	-99.07330000	31.26330000
SAN SABA	2106	H	-99.09000000	31.26170000
SAN SABA	2319	H	-99.08170000	31.27830000
SAN SABA	1099	H	-99.05330000	31.28830000
SAN SABA	1107	H	-99.02000000	31.29830000
SAN SABA	4269	H	-98.83500000	31.09330000
TRAVIS	73100	H	-97.78670000	30.29500000
TRAVIS	3223000	H	-97.90670000	30.39170000
TRAVIS	45200	H	-97.59670000	30.28500000
TRAVIS	82	H	-97.92170000	30.38330000
TRAVIS	183	H	-97.79170000	30.43500000
TRAVIS	30	H	-97.75000000	30.39000000
TRAVIS	70	H	-97.72670000	30.41170000
TRAVIS	140	H	-97.72000000	30.41000000
TRAVIS	97	H	-97.91670000	30.53000000
TRAVIS	50	H	-97.91500000	30.52500000
TRAVIS	0	H	-97.69830000	30.28000000
TRAVIS	144	H	-97.92670000	30.34330000
TRAVIS	448	H	-97.88500000	30.20080000
TRAVIS	225	H	-97.88330000	30.18330000
TRAVIS	70	H	-97.68000000	30.44970000
TRAVIS	150	H	-97.69420000	30.30190000
TRAVIS	27	H	-97.72310000	30.40690000
WILLIAMSON	3220	H	-97.81000000	30.48670000
WILLIAMSON	2858	H	-97.71330000	30.48330000
WILLIAMSON	843	H	-97.38830000	30.45330000
WILLIAMSON	992	H	-97.24330000	30.59670000
WILLIAMSON	1728	H	-97.48330000	30.57670000
WILLIAMSON	216	H	-97.44170000	30.72330000

COUNTY	Storage (Acre-Feet)	HAZARD (Low, Significant or High)	X Coordinates	Y Coordinates
WILLIAMSON	3408	H	-97.62830000	30.56830000
WILLIAMSON	619	H	-97.62500000	30.53670000
WILLIAMSON	1548	H	-97.58000000	30.54330000
WILLIAMSON	926	H	-97.59830000	30.52000000
WILLIAMSON	1661	H	-97.84000000	30.57830000
WILLIAMSON	4954	H	-97.80500000	30.55330000
WILLIAMSON	2679	H	-97.79170000	30.53500000
WILLIAMSON	5234	H	-97.76670000	30.50670000
WILLIAMSON	2061	H	-97.75000000	30.54000000
WILLIAMSON	3242	H	-97.88170000	30.58500000
WILLIAMSON	4484	H	-97.74500000	30.47000000
WILLIAMSON	1872	H	-97.72170000	30.58670000
WILLIAMSON	990	H	-97.71330000	30.57000000
WILLIAMSON	4037	H	-97.67500000	30.54000000
WILLIAMSON	2473	H	-97.70330000	30.53670000
WILLIAMSON	1760	H	-97.66330000	30.54170000
WILLIAMSON	1082	H	-97.61170000	30.55830000
WILLIAMSON	132	H	-97.68170000	30.48500000
WILLIAMSON	395	H	-97.80690000	30.48530000
WILLIAMSON	561100	H	-97.31670000	30.70330000
WILLIAMSON	220100	H	-97.72500000	30.67500000

Extent

Prior to 2009, *High-hazard-potential* dams were defined as those at which failure or mis-operation would probably cause loss of human life. *Significant-hazard-potential* dams are those at which failure or mis-operation probably would not result in loss of human life but could cause economic loss, environmental damage, disruption of lifeline facilities, or other significant damage. *Low-hazard-potential* dams are those at which failure or mis-operation probably would not result in loss of human life but would cause limited economic and/or environmental losses. Losses would be limited mainly to the owner's property.

Table 15-3. Previous Dam Classifications, National Inventory of Dams

Hazard Potential Classification	Loss of Human Life	Economic, Environmental, and Lifeline Losses
Low	None expected	Low and generally limited to owner
Significant	None expected	Yes

Hazard Potential Classification	Loss of Human Life	Economic, Environmental, and Lifeline Losses
High	Probable. One or more expected	Yes (but not necessary for this classification)

In 2008, the TCEQ proposed new rule changes including changing dam classification definitions. Effective January 1, 2009, dam classifications are labeled as shown in the extent scale in Table 15-4 below.

Table 15-4. Dam Classifications Effective January 1, 2009

Hazard Potential Classification	Loss of Human Life	Economic, Environmental, and Lifeline Losses
Low	None expected	Minimal economic loss
Significant	Probable (1 to 6)	Economic loss appreciable
High	Loss of life expected (7 or more).	Economic loss excessive

Source: Texas Commission on Environmental Quality

The new classifications place a greater impact on high and significant hazard dams. Now a significant classification indicates a probable loss of life, whereas before no loss of life was expected in the event of dam failure. A high hazard dam breach is now indicative of an expected loss of life of seven or more persons versus a probable chance in pre-2008 classifications.

Dam failure is at times difficult to mitigate due to the fact that any initial steps require determination of ownership. In Texas, there are a total of 7,590 dams. Of these 890 are high hazard dams, with another 802 as significant hazard dams. Almost 90% are over 25 years old. Responsibility for dams lies with the owners and managers of each dam.

The extent or average magnitude of a dam failure event that could be expected for each jurisdiction is shown in Table 15-5.

Table 15-5. Extent by Jurisdiction

JURISDICTION	EXTENT CLASSIFICATION	LEVEL OF INTENSITY TO MITIGATE
Bastrop County	SIGNIFICANT	Although 3 high hazard dams are present in the county, county-wide, the majority of dams present a significant threat, meaning that loss of life is probable and economic loss is appreciable in the event of a dam failure.

JURISDICTION	EXTENT CLASSIFICATION	LEVEL OF INTENSITY TO MITIGATE
Bastrop	SIGNIFICANT	Dam failure presents a significant threat for the City of Bastrop as high, significant and low hazard dams are located along the border of the town. Loss of life is probable and economic loss is appreciable in the event of a dam failure.
Elgin	N/A	There are no dams located within the City of Elgin or within a ten-mile radius of the boundary.
Smithville	LOW	The City of Smithville has a low hazard dam located on the northern border of the town. No loss of life is expected and there would be minimal economic loss in the event of a dam failure.
Blanco County	SIGNIFICANT	One high hazard dam is located in the southern portion of the county along with five low hazard dams and one significant dam. In the event of a dam failure, loss of life is probable and economic loss is appreciable.
Johnson City	SIGNIFICANT	Dam failure presents a significant threat as one significant hazard dam is located on the northeastern boundary of town. In the event of a dam failure, loss of life is probable and economic loss is appreciable.
Brown County	Not Participating	
Brownwood	HIGH	Only low hazard dams are located within the City of Brownwood; however, nine high hazard dams are located either on the border or in close proximity to Brownwood. In the event of dam failure, loss of life would be expected and economic loss would be excessive.
Burnet County	HIGH	In the event of dam failure, loss of life would be expected and economic loss would be excessive.
Bertram	N/A	No dams are located inside or in close proximity to Bertram.
Burnet	HIGH	One high hazard dam is located within the City of Burnet with two in close proximity on the northwestern side. Loss of life would be expected and economic loss would be excessive in the event of a dam failure.
Cottonwood	HIGH	One high hazard dam is located in close proximity to the City. Loss of life would be expected and economic loss would be excessive in

JURISDICTION	EXTENT CLASSIFICATION	LEVEL OF INTENSITY TO MITIGATE
Shores		the event of a dam failure.
Granite Shoals	N/A	No dams are located inside or in close proximity.
Highland Haven	N/A	No dams are located inside or in close proximity.
Marble Falls	SIGNIFICANT	Dam failure presents a significant threat as two significant hazard dams are located in Marble Falls. In the event of a dam failure, loss of life is probable and economic loss is appreciable.
Meadowlakes	SIGNIFICANT	Dam failure presents a significant threat as one significant hazard dam is located in Meadowlakes. In the event of a dam failure, loss of life is probable and economic loss is appreciable.
Colorado County	SIGNIFICANT	The county has one high hazard dam, one significant dam and multiple low hazard dams throughout unincorporated areas. In the event of a dam failure, loss of life is probable and economic loss is appreciable.
Columbus	LOW	The City of Columbus has a low hazard dam located in close proximity to the north side, although outside of the city limits. No loss of life is expected and there would be minimal economic loss in the event of a dam failure.
Eagle Lake	N/A	No dams are located inside or in close proximity.
Weimar	N/A	No dams are located inside or in close proximity.
Fayette County	HIGH	Four high hazard dams and multiple significant and low hazard dams are located throughout unincorporated areas of the county. In the event of dam failure, loss of life would be expected and economic loss would be excessive.
Carmine	LOW	The City of Carmine does not have any dams within the city limits, but a significant hazard dam is located in close proximity on the southwestern border of the city limits. No loss of life is expected and there would be minimal economic loss in the event of a dam failure.
Flatonia	LOW	Flatonia has one low hazard dam. No loss of life is expected and there would be minimal economic loss in the event of a dam failure.

JURISDICTION	EXTENT CLASSIFICATION	LEVEL OF INTENSITY TO MITIGATE
La Grange	N/A	No dams are located inside or in close proximity, and the closest dams are all low hazard ranking dams.
Lampasas County	HIGH	High hazard dams are located throughout unincorporated areas of the county. In the event of dam failure, loss of life would be expected and economic loss would be excessive.
Kempner	LOW	The City of Kempner does not have any dams within the city limits, but a significant hazard dam is located in close proximity to the northeast of the city. No loss of life is expected and there would be minimal economic loss in the event of a dam failure.
Lampasas	HIGH	High hazard dams are located within the city and in close proximity. In the event of dam failure, loss of life would be expected and economic loss would be excessive.
Lometa	SIGNIFICANT	Dam failure presents a significant threat as a high hazard dam is located in close proximity to the city. In the event of a dam failure, loss of life is probable and economic loss is appreciable.
Lee County	LOW	No loss of life is expected and there would be minimal economic loss in the event of a dam failure.
Lexington	N/A	No dams are located inside or in close proximity, and the closest dams are all low hazard ranking dams.
Giddings	N/A	No dams are located inside or in close proximity, and the closest dams are all low hazard ranking dams.
Llano County	SIGNIFICANT	Dam failure presents a significant threat as a high hazard dams are located on the border with Burnet County along the Colorado River. In the event of a dam failure, loss of life is probable and economic loss is appreciable.
Llano	LOW	No loss of life is expected and there would be minimal economic loss in the event of a dam failure.
Horseshoe Bay	SIGNIFICANT	Dam failure presents a significant threat as one significant hazard dam is located within Horseshoe Bay. In the event of a dam failure, loss of life is probable and economic loss is appreciable.
Sunrise Beach	LOW	No loss of life is expected and there would be minimal economic

JURISDICTION	EXTENT CLASSIFICATION	LEVEL OF INTENSITY TO MITIGATE
Village		loss in the event of a dam failure.
Mason County	N/A	Only one dam is in the entire county and it is a low hazard dam.
Mason	N/A	No dams are located inside or in close proximity
Matagorda County	SIGNIFICANT	The county has one high hazard dam, one significant dam and multiple low hazard dams throughout unincorporated areas. In the event of a dam failure, loss of life is probable and economic loss is appreciable.
Bay City	N/A	No dams are located inside or in close proximity, and the closest dams are all low hazard ranking dams.
Palacios	N/A	No dams are located inside or in close proximity, and the closest dams are all low hazard ranking dams.
McCulloch County	Not Participating	
Brady	HIGH	Only one high hazard dam is located within the jurisdiction, but there are multiple high hazard dams in close proximity to the city. In the event of dam failure, loss of life would be expected and economic loss would be excessive.
Mills County	SIGNIFICANT	The county has one high hazard dam, several significant dams and multiple low hazard dams throughout unincorporated areas. In the event of a dam failure, loss of life is probable and economic loss is appreciable.
Goldthwaite	N/A	No dams are located inside or in close proximity
San Saba County	HIGH	Multiple high hazard dams are located throughout the county. In the event of dam failure, loss of life would be expected and economic loss would be excessive.
San Saba	N/A	No dams are located inside or in close proximity, and the closest is a low hazard dam.
Travis County	Not Participating	
Briarcliff	LOW	A significant hazard dam is located in close proximity. No loss of life is expected and there would be minimal economic loss in the event of a dam failure.

JURISDICTION	EXTENT CLASSIFICATION	LEVEL OF INTENSITY TO MITIGATE
Jonestown	SIGNIFICANT	Dam failure presents a significant threat as two high hazard dams are located in close proximity to the town. In the event of a dam failure, loss of life is probable and economic loss is appreciable.
Lago Vista	LOW	Lago Vista has one low hazard dam. No loss of life is expected and there would be minimal economic loss in the event of a dam failure.
Lakeway	SIGNIFICANT	In the event of a dam failure, loss of life is probable and economic loss is appreciable as one significant dam is located in Lakeway.
Mustang Ridge	LOW	Mustang Ridge has one low hazard dam. No loss of life is expected and there would be minimal economic loss in the event of a dam failure.
Point Venture	LOW	A significant hazard dam is located in close proximity. No loss of life is expected and there would be minimal economic loss in the event of a dam failure.
San Leanna	N/A	No dams are located inside or in close proximity
Volente	N/A	No dams are located inside or in close proximity
West Lake Hills	SIGNIFICANT	High hazard dams are located within close proximity. In the event of a dam failure, loss of life is probable and economic loss is appreciable
Wharton County	LOW	Only low hazard dams are located in the county. No loss of life is expected and there would be minimal economic loss in the event of a dam failure.
East Bernard	N/A	No dams are located inside or in close proximity
El Campo	N/A	No dams are located inside or in close proximity
Wharton	N/A	No dams are located inside or in close proximity
Williamson County	HIGH	The county has over 20 high hazard dams. In the event of dam failure, loss of life would be expected and economic loss would be excessive.
Cedar Park	HIGH	The city has three high hazard dams and several in close proximity. In the event of dam failure, loss of life would be expected and

JURISDICTION	EXTENT CLASSIFICATION	LEVEL OF INTENSITY TO MITIGATE
		economic loss would be excessive.
Florence	N/A	No dams are located inside or in close proximity
Hutto	SIGNIFICANT	Although there are no dams within the City of Hutto, several high hazard dams are in close proximity. In the event of a dam failure, loss of life is probable and economic loss is appreciable.

Historical Occurrences

There are about 80,000 dams in the United States today. Catastrophic dam failures have occurred frequently throughout the past century. Between 1918 and 1958, 33 major dam failures in the United States caused 1,680 deaths—an average of 42 deaths a year. From 1959 to 1965, nine major dams failed worldwide.

According to the TCEQ, there have been a total of 98 dam failures from 1970 to 2008 in the State of Texas. Of these 13 were high hazard dams, 28 were significant, and 55 were low[9]. One of the dams that failed is no longer classified and another has been removed from inventory.

Two major dam failures have affected the Lower Colorado River Basin. The first occurred in 1900 when the Austin Dam gave way due to floods resulting from Hill Country storms. Basinwide, the 1900 flood claimed 47 lives and caused $14 million in damages. The destruction of its dam impoverished the City of Austin for several years. The Austin dam was rebuilt in 1909 and completed in 1912. It failed again in 1915. The structure was not repaired for more than two decades until it was rebuilt by the then newly-created Lower Colorado River Authority in 1938 and named Tom Miller Dam.

After a series of high profile failures throughout the United States during the 1960s and early 1970s, the U.S. Congress enacted legislation mandating inspections and strict safety requirements for all governmental and privately operated dams. Since that time the number of failures and deaths has dramatically decreased.

[9] These dams total 96 as one of the dams that failed is no longer classified, while the other has been removed from inventory.

Probability of Future Events

Only two major dam failures have occurred in the entire TCRFC planning region. Both occurred in the City of Austin, which is not a participating jurisdiction in this effort. The last failure for the City was in 1915. Since that time, no dam failures have occurred in the planning area.

Dam failure is an unlikely event, meaning that an event is possible within the next ten years.

The LCRA continues to make improvements to all of the dams in the Highland Lakes region. Mansfield Dam is able to withstand the probable maximum flood (PMF) without further reinforcement. This fact means that even in the event of failure of Buchanan, Inks, Wirtz, or Starcke dams, Mansfield Dam would hold their floodwaters and Lake Travis would not overtop Mansfield Dam.

The dams have performed virtually trouble free for decades. Natural wear over the years and more stringent design and construction standards, however, have created a need to update and improve the dams. Stricter state and federal dam safety regulations were adopted in the 1970s and 1980s as a direct response to numerous dam failures across the country. These standards require that dams be able to withstand the most severe flood imaginable, the Probable Maximum Flood (PMF). This flood is so severe and statistically remote that its probability of occurrence in any given year cannot be measured.

In 1994, the LCRA Board of Directors approved the $50 million Dam Modernization Program to strengthen the six Highland Lakes dams and ensure their safety for years to come. This program addressed a common problem with the stability of the "gravity" sections of the dams. Since gravity sections derive strength from their size and weight, post-tensioned anchors were added to improve stability. The dam modernization program helps ensure that LCRA's dams meet required design safety standards to resist the water load and pressure of the PMF. The Dam Modernization Program was substantially completed by 2004.

Vulnerability Analysis

Significant and high hazard dams are located in both rural and populated areas in the TCRFC planning area. Although low hazard dams are those at which failure or mis-operation probably would not result in loss of human life and would cause limited economic and/or environmental losses, damage to agriculture and housing is possible due to the amount of low hazard dams in each county (See Figure 15-2 and Table 15-2).

Flooding is the most prominent effect of dam failure. If the dam failure is severe, a large amount of water would enter the downstream waterways forcing them out of their banks. There may be significant environmental effects, resulting in flooding that could disperse debris and hazardous materials downstream that can damage local ecosystems. In addition debris carried downstream can

block traffic flow, cause power outages, and disrupt local utilities such as water and wastewater. Surge waves resulting from dam breaks have the potential to create major losses.

Impact

Annualized loss-estimates for dam failure are not available; neither is a breakdown of potential dollar losses of critical facilities, infrastructure and lifelines, or hazardous-materials facilities.

If a major dam should fail, however, the severity of impact could be substantial. It could cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or severely damaged.

Table 15-6 lists the number of high hazard dams for each participating jurisdiction in the region and the total estimated exposure of people and buildings to potential dam failure hazards. Due to security concerns, the Lower Colorado River Authority has chosen not to utilize or include dam failure inundation studies/maps in this assessment. In lieu of dam failure inundation maps, total exposure was estimated by using 2000 Census population and building inventory data from HAZUS-MH MR3, in combination with the location and maximum storage capacity of high hazard dams.

Table 15-6. Total Exposure to High Hazard Dams by Jurisdiction

JURISDICTION	TOTAL NUMBER OF HIGH HAZARD DAMS	TOTAL POPULATION IN JURISDICTION	NUMBER OF PEOPLE AT RISK	NUMBER OF BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Bastrop County	**3**	**41,354**	**8,123**	**2,955**	**349,384,000**
Bastrop	1	5,933	2,509	1,256	143,868,000
Elgin	0	6,063	0	0	0
Smithville	0	4,383	90	50	4,956,000
Blanco County	**1**	**5,591**	**276**	**179**	**21,155,000**
Johnson City	0	1,247	0	0	0
Brown County	**Not Participating**				
Brownwood	0	19,091	0	0	0
Burnet County	**8**	**18,584**	**7,376**	**3,766**	**395,583,000**
Bertram	0	1,000	0	0	0

JURISDICTION	TOTAL NUMBER OF HIGH HAZARD	TOTAL POPULATION IN	NUMBER OF PEOPLE AT	NUMBER OF BUILDINGS	VALUE OF BUILDINGS
Burnet	1	4,755	2,842	1,605	156,139,000
Cottonwood Shores	0	704	704	372	41,613,000
Granite Shoals	0	2,303	2,283	1,901	122,410,000
Highland Haven	0	453	66	51	5,690,000
Marble Falls	0	5,070	4,588	2,688	317,544,000
Meadowlakes	0	1,278	1,278	693	94,973,000
Colorado County	**1**	**11,466**	**148**	**134**	**14,347,000**
Columbus	0	3,506	0	0	0
Eagle Lake	0	3,453	0	0	0
Weimar	0	1,965	0	0	0
Fayette County	**4**	**15,787**	**825**	**539**	**51,522,000**
Carmine	0	184	0	0	0
Flatonia	0	1,377	0	0	0
La Grange	0	4,456	0	0	0
Lampasas County	**8**	**8,940**	**781**	**407**	**48,452,000**
Kempner	0	970	0	0	0
Lampasas	2	6,818	3,972	2,472	281,040,000
Lometa	0	767	0	0	0
Lee County	**0**	**9,388**	**0**	**0**	**0**
Lexington	0	1,166	0	0	0
Giddings	0	5,103	0	0	0
Llano County	**1**	**10,381**	**2,932**	**2,441**	**222,077,000**
Llano	0	3,311	0	0	0
Horseshoe Bay	0	2,648	2,554	2,624	379,762,000

JURISDICTION	TOTAL NUMBER OF HIGH HAZARD	TOTAL POPULATION IN	NUMBER OF PEOPLE AT	NUMBER OF BUILDINGS	VALUE OF BUILDINGS
Sunrise Beach Village	0	704	0	0	0
Mason County	0	1,635	0	0	0
Mason	0	2,103	0	0	0
Matagorda County	**1**	**14,429**	**0**	**4**	**670,000**
Bay City	0	18,709	0	0	0
Palacios	0	4,819	0	0	0
McCulloch County	**Not Participating**				
Brady	1	5,308	5,308	3,776	296,230,000
Mills County	**1**	**3,177**	**66**	**38**	**3,264,000**
Goldthwaite	0	1,795	0	0	0
San Saba County	**9**	**3,338**	**181**	**137**	**9,219,000**
San Saba	0	2,498	0	0	0
Travis County	**Not Participating**				
Briarcliff	0	862	0	0	0
Jonestown	0	1,553	0	0	0
Lago Vista	0	4,213	0	0	0
Lakeway	0	8,130	0	0	0
Mustang Ridge	0	983	0	0	0
Point Venture	0	420	0	0	0
San Leanna	0	384	0	0	0
Volente	0	363	0	0	0
West Lake Hills	0	2,875	0	0	0
Wharton County	**0**	**19,968**	**0**	**0**	**0**
East Bernard	0	1,729	0	0	0

JURISDICTION	TOTAL NUMBER OF HIGH HAZARD	TOTAL POPULATION IN	NUMBER OF PEOPLE AT	NUMBER OF BUILDINGS	VALUE OF BUILDINGS
El Campo	0	10,604	0	0	0
Wharton	0	8,887	0	0	0
Williamson County	**24**	**94,616**	**20,895**	**8,216**	**1,611,277,000**
Cedar Park	3	25,617	2,190	799	163,990,000
Florence	0	1,054	0	0	0
Hutto	0	1,134	0	0	0
TOTALS FOR STUDY AREA	**69**	**451,402**	**69,987**	**37,103**	**4,735,165,000**

Section 16 – Hazardous Material Release

Hazard Profile 1

Location 4

Vulnerability Analysis 9

Hazard Profile

Hazardous materials or toxic releases can have a substantial impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous materials incident, solid, liquid and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering-in-place can protect people from harmful effects. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

The Toxics Release Inventory (TRI) is a publicly available database from the federal Environmental Protection Agency (EPA) that contains information on toxic chemical releases and other waste management activities reported annually by certain industry groups as well as federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990. Each year, facilities that meet certain activity thresholds must report their releases and other waste management activities for listed toxic chemicals to EPA and to their state or tribal entity. A facility must report if it meets the following three criteria:

- The facility falls within one of the following industrial categories: manufacturing; metal mining; coal mining; electric generating facilities that combust coal and/or oil; chemical wholesale distributors; petroleum terminals and bulk storage facilities; RCRA Subtitle C treatment, storage, and disposal (TSD) facilities; and solvent recovery services;
- Has 10 or more full-time employee equivalents; and
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year. Persistent, bioaccumulative and toxic (PBT) chemicals are subject to different thresholds of 10 pounds, 100 pounds or 0.1 grams depending on the chemical.

Tier 2 data is a publicly available database from the Texas Department of State Health Services Tier 2 Chemical Reporting Program. Under the Community Right-to-Know program laws upheld at the state and federal level, all facilities which store significant quantities of hazardous chemicals must share this information with state and local emergency responders and planners. Facilities in Texas share this information by filing annual hazardous chemical inventories with the state, with Local Emergency Planning Committees (LEPCs), and with local fire departments. The Texas Tier 2 Reports contain facility identification information and detailed chemical data about hazardous chemicals stored at the facility.

A facility must report if it meets the following criteria:

- Any company using chemicals that could present a physical or health hazard must report them, according to Tier 2 requirements.
- If an industry has an OSHA deemed hazardous chemical that exceeds the appropriate threshold at a certain point in time, then the chemical must be reported. These chemicals may be on the list of 356 Extremely Hazardous Substances (EHS) or could be one of the 650,000 reportable hazardous substances (not on the EHS list). This reporting format is for a "snapshot in time". EHS chemicals have to be reported if the quantity is either greater than 500 pounds, or if the Threshold Planning Quantity (TPQ) amount is less than 500 pounds.

Table 16-1 summarizes the historical toxic releases (TRI sites only) that occurred during 1998 through 2006 as reported to the EPA. Figure 16-1shows the locations of TRI and Tier 2 listed toxic sites in the TCRFC study area, and Figure 16-2 through 16-19 show the location of TRI and Tier 2 listed toxic sites in the 17 counties within the study area.

Table 16-1. Historical Toxic Release Summary (TRI Only)
Reported Chemical Release and Waste Management Activities, in Pounds
(1998-2006)

JURISDICTION	1998	1999	2000	2001	2002	2003	2004	2005	2006
Bastrop County	30,400	124,252	90,740	182,000	307,618	234,352	233,679	348,918	281,112
Blanco County	0	0	0	0	0	0	0	0	0
Brown County	1,230,713	1,594,274	617,088	602,933	536,675	431,427	480,970	472,070	418,832
Burnet County	1,000	750	1,000	1,019	2,032	2,668	1,008	2,888	3,266
Colorado County	190,854	163,619	239,169	142,442	45,555	11,959	10,166	7,257	10,729
Fayette County	1,463,180	2,895,257	1,122,317	1,357,861	1,000,114	1,234,531	1,127,864	947,806	446,758

JURISDICTION	1998	1999	2000	2001	2002	2003	2004	2005	2006
Lampasas County	7,824	5,538	1,248	8,661	1,409	1,506	3,908	2,014	2,842
Lee County	0	194,471	178,285	139,080	228,782	217,423	170,043	215,533	186,533
Llano County	0	0	0	0	0	0	0	0	0
Mason County	0	0	0	0	0	0	0	0	0
Matagorda County	207,756	407,219	252,691	232,940	378,204	379,686	222,446	217,038	264,362
McCulloch County	2,773	30,993	64,485	60,144	28,545	97,694	146,919	93,674	40,345
Mills County	0	0	0	0	0	0	0	0	0
San Saba County	0	0	0	0	0	0	0	0	0
Travis County	423,858	518,677	863,235	530,724	207,434	140,677	142,556	127,967	131,720
Wharton County	175,626	120,858	125,559	106,097	126,060	91,139	80,307	50,768	49,368
Williamson County	43,442	79,626	77,595	53,602	75,792	84,004	76,539	60,998	82,301
TOTALS	**3,779,424**	**6,137,533**	**3,635,412**	**3,419,504**	**2,940,222**	**2,929,069**	**2,698,409**	**2,548,936**	**1,920,174**

Source: U.S. Environmental Protection Agency

Location

Figure 16-1. Location of Toxic Sites

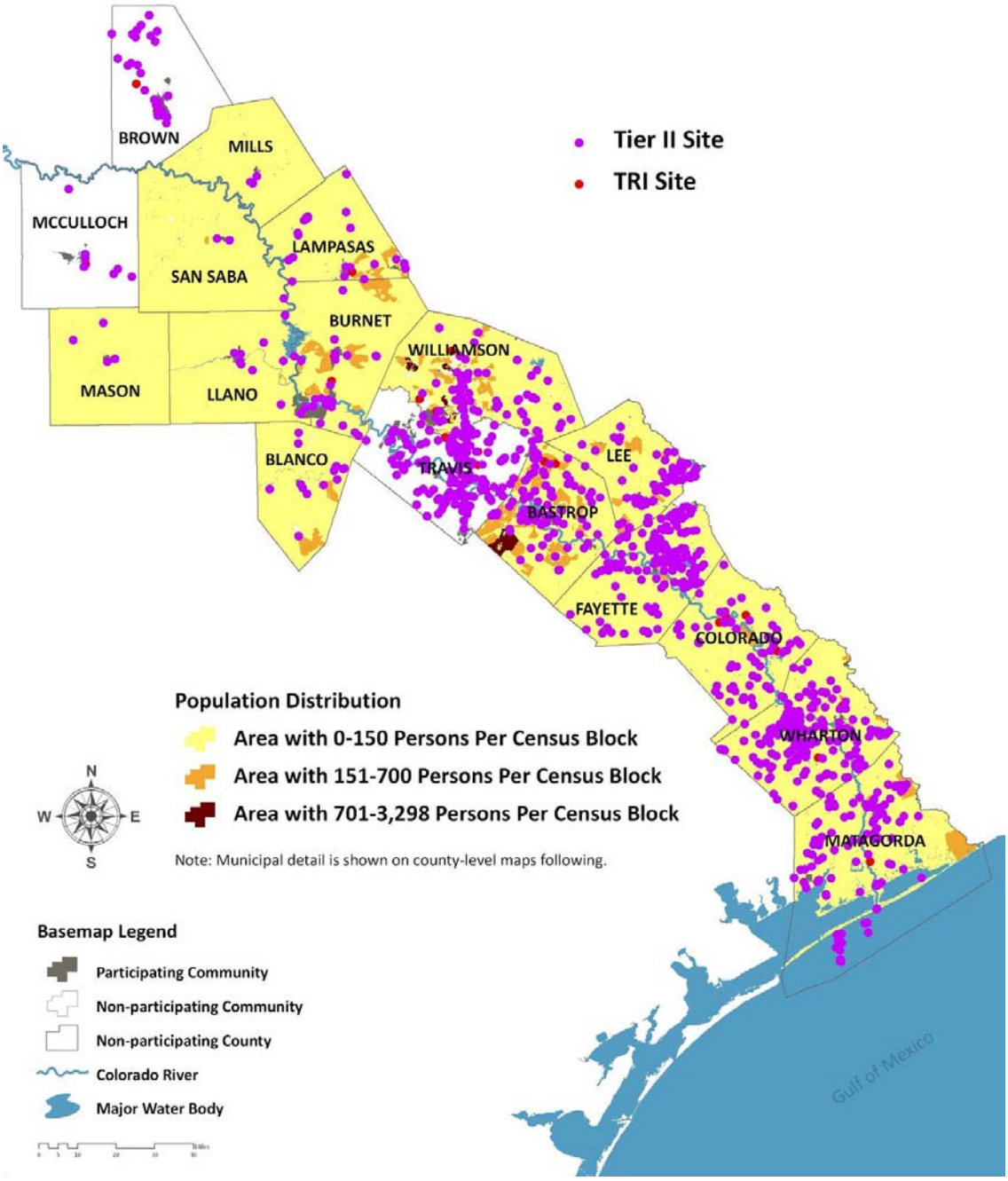


Figure 16-2. Locations of Toxic Sites in Bastrop County

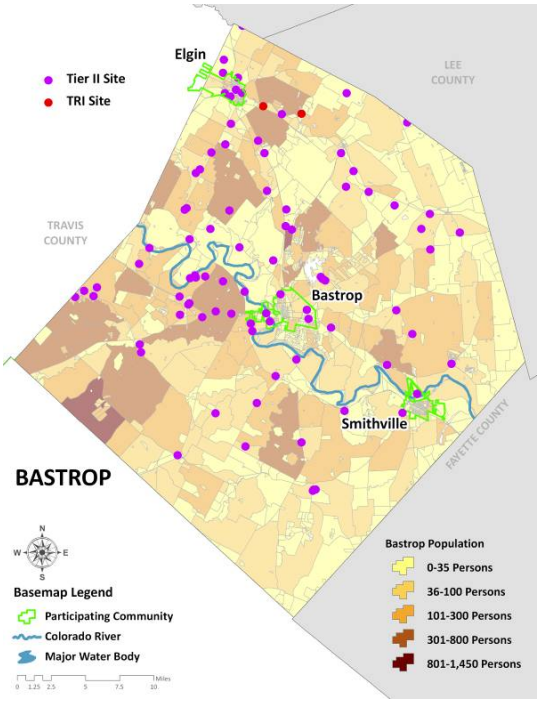


Figure 16-3. Locations of Toxic Sites in Blanco County

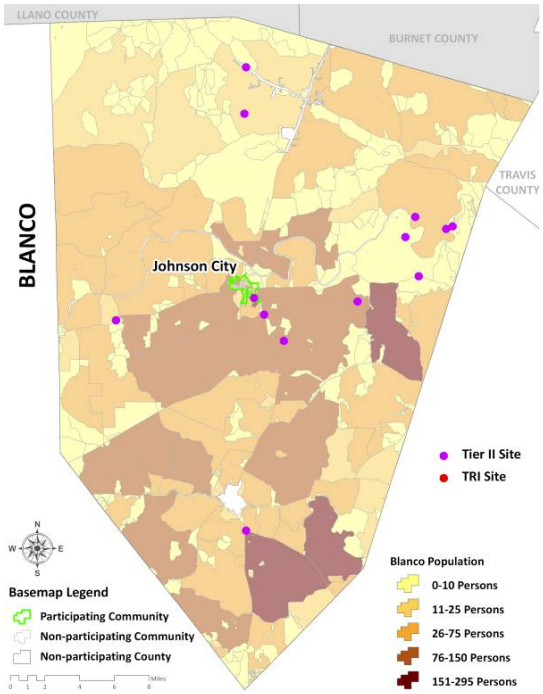


Figure 16-4. Locations of Toxic Sites in Brown County

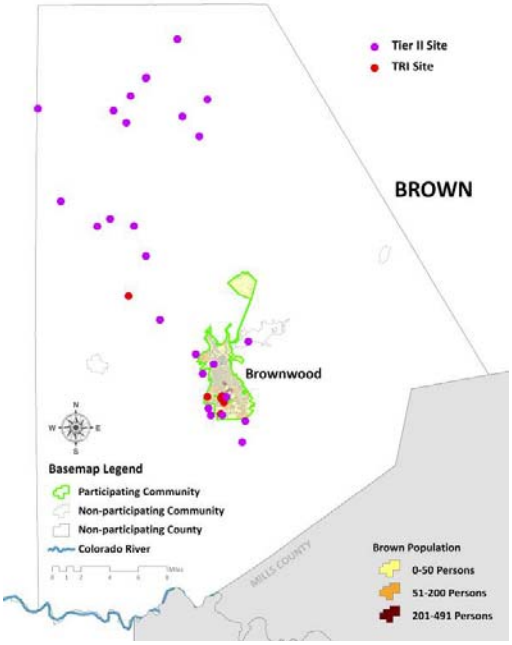


Figure 16-5. Locations of Toxic Sites in Burnet County

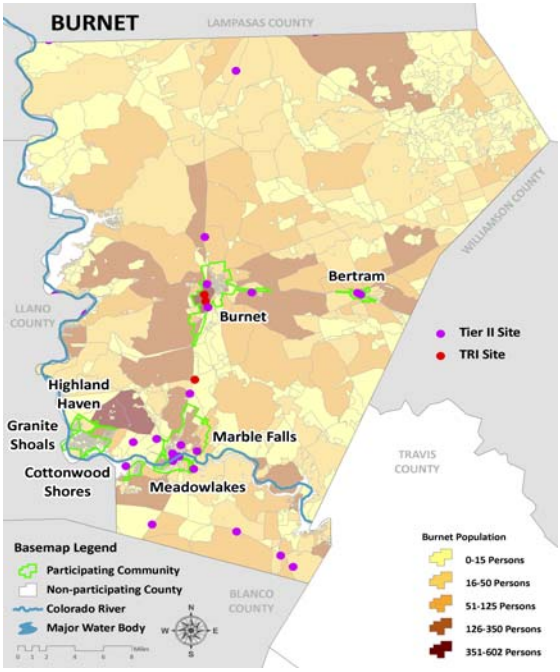


Figure 16-6. Locations of Toxic Sites in Colorado County

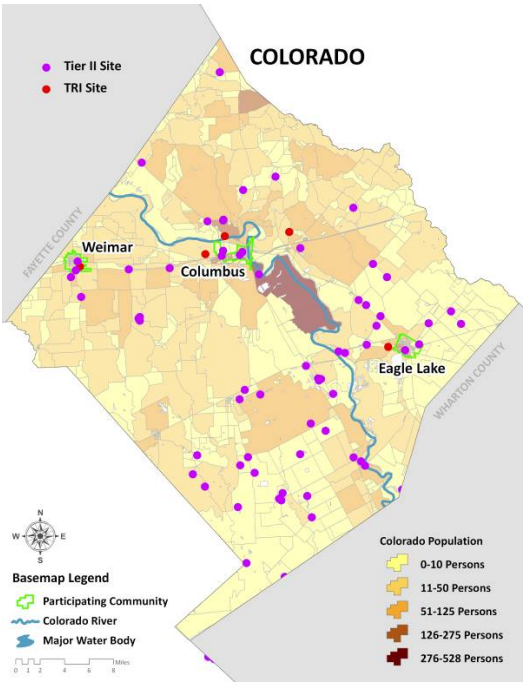


Figure 16-7. Locations of Toxic Sites in Fayette County

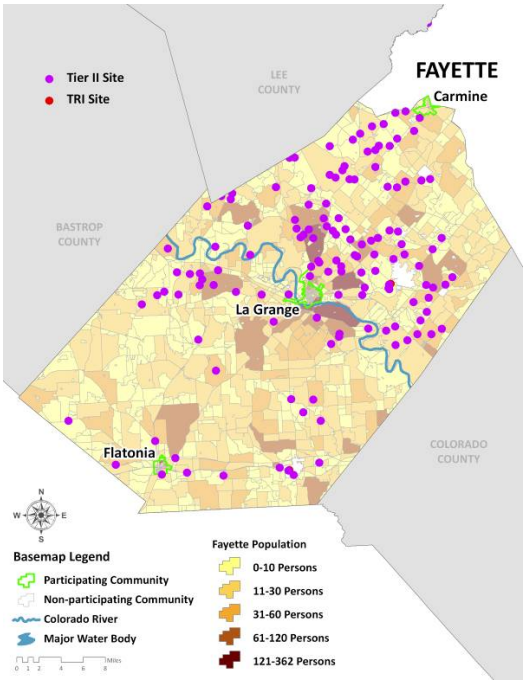


Figure 16-8. Locations of Toxic Sites in Lampasas County

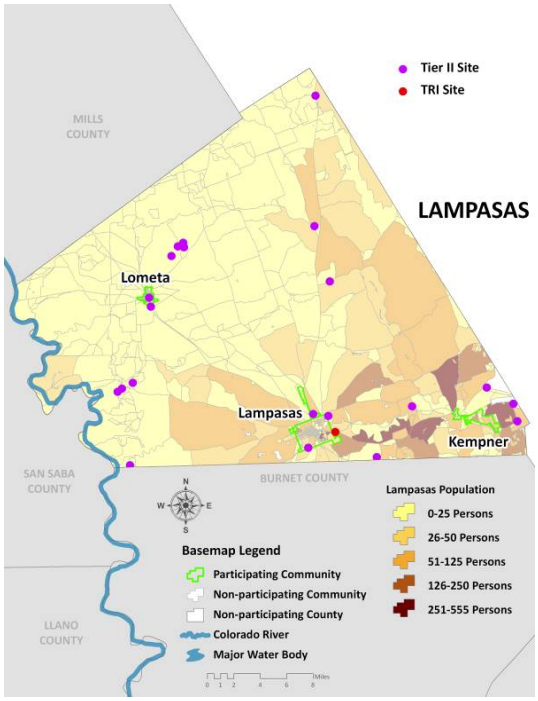


Figure 16-9. Locations of Toxic Sites in Lee County

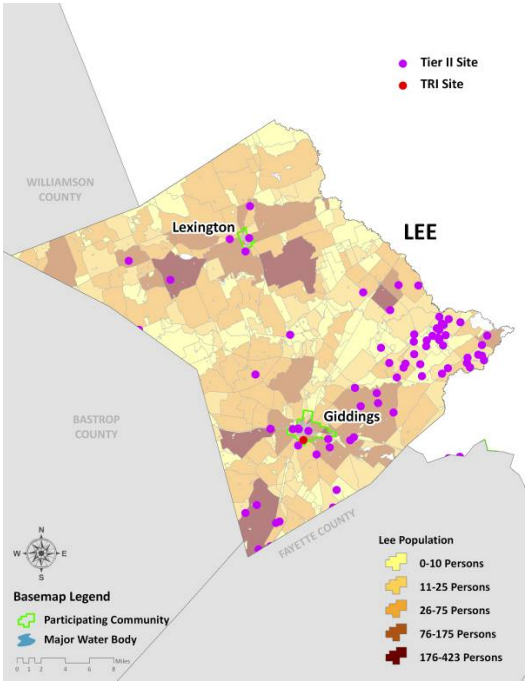


Figure 16-10. Locations of Toxic Sites in Llano County

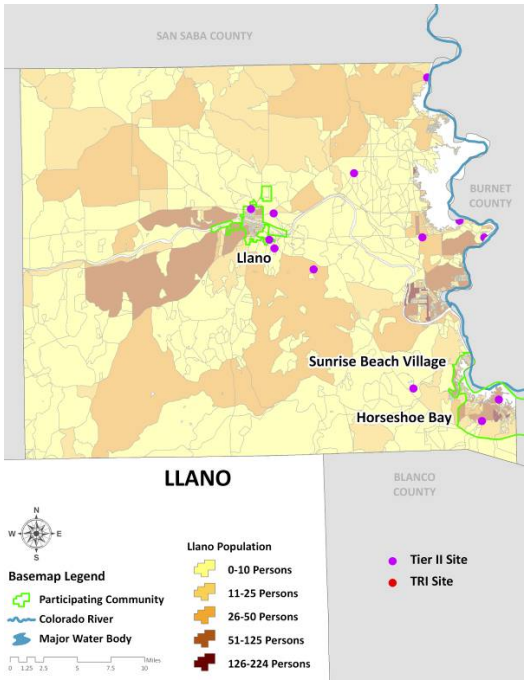


Figure 16-11. Locations of Toxic Sites in Mason County

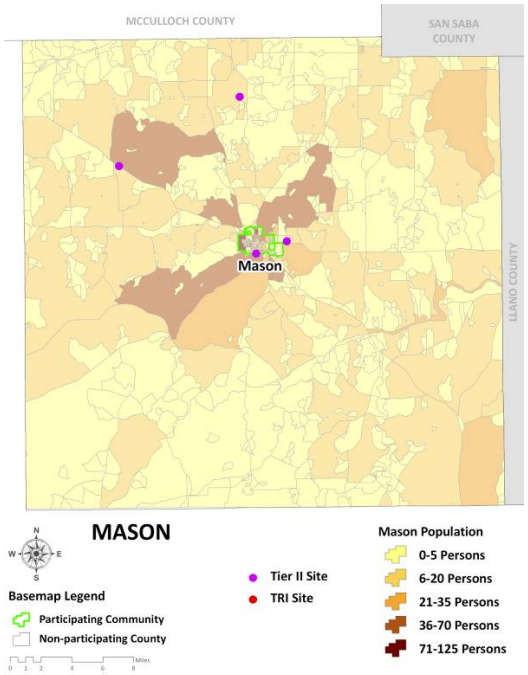


Figure 16-12. Locations of Toxic Sites in Matagorda County

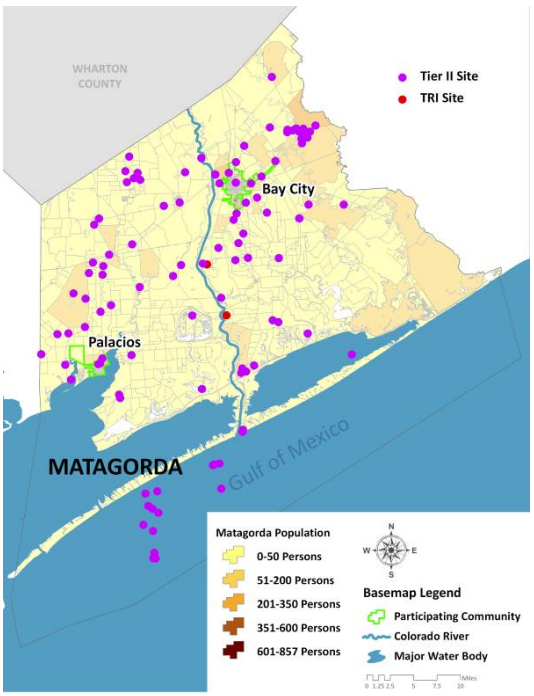


Figure 16-13. Locations of Toxic Sites in McCulloch County

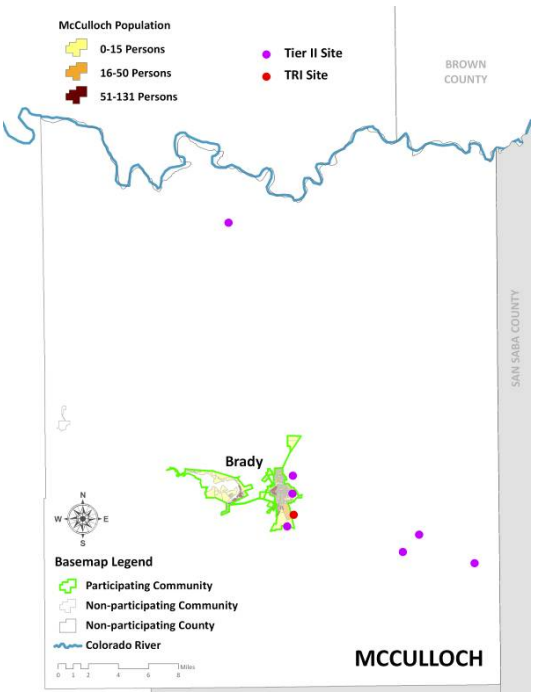


Figure 16-14. Locations of Toxic Sites in Mills County

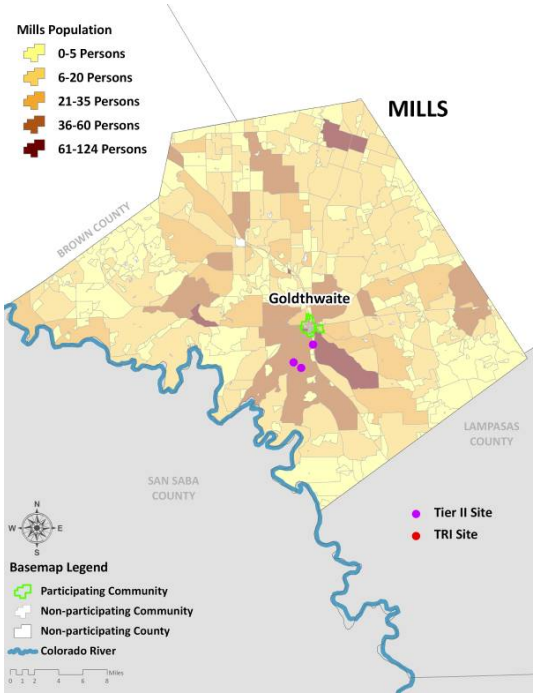


Figure 16-15. Locations of Toxic Sites in San Saba County

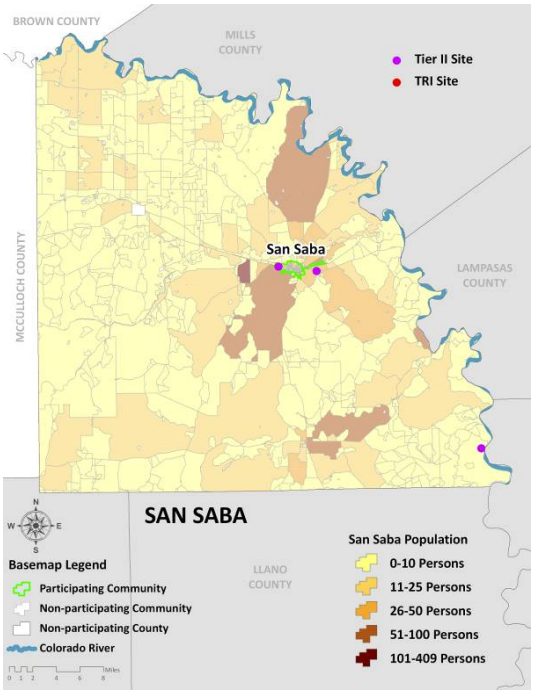


Figure 16-16. Locations of Toxic Sites in Travis County

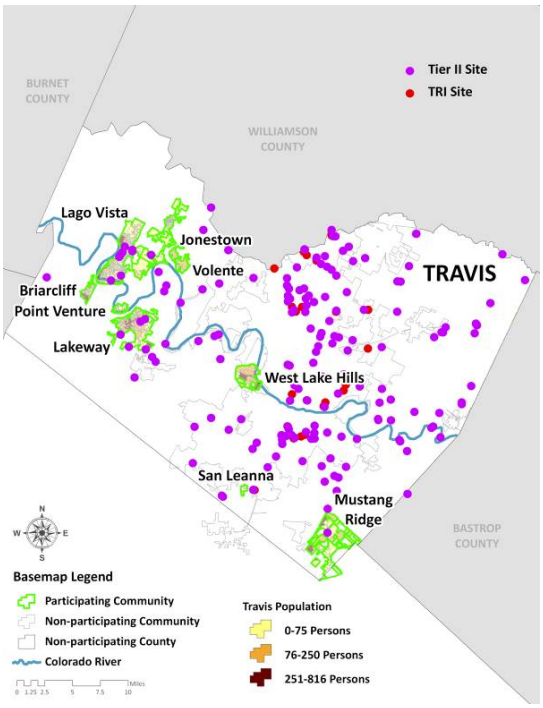


Figure 16-17. Locations of Toxic Sites in Wharton County

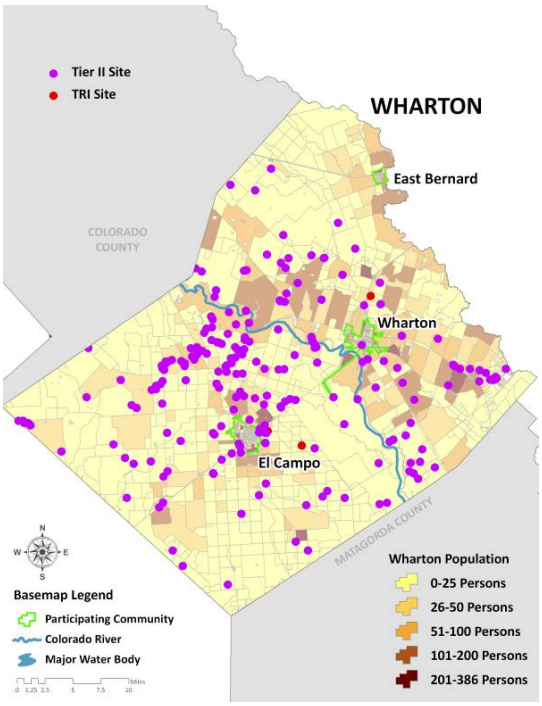
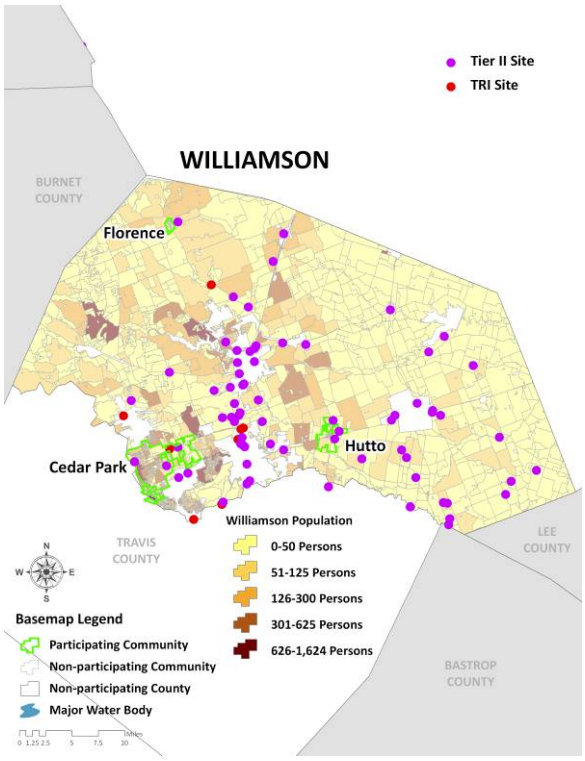


Figure 16-18. Locations of Toxic Sites in Williamson County



Vulnerability Analysis

Table 16-2 shows estimated toxic release exposure of people and buildings by county for fixed site. Table 16-3 shows the results for mobile site toxic release. For fixed site analysis, only toxic sites that have geo-referenced data available were analyzed. Circular buffers are drawn around each hazardous material site to delineate areas of impact. Two sizes of buffer—500 and 2,500 meters—are assumed in respect to the different levels of effect: immediate (primary) and secondary. Primary and secondary impact sites were selected based on guidance from FEMA 426, *Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings* and engineering judgment. For mobile analysis, major roads (Interstate highway, U.S. highway and State highway) and railroads are transportation corridors where hazardous materials are primarily transported that could adversely impact people and buildings. The buffers along the transportation corridors are drawn with the same size as fixed site analysis.

Table 16-2. Estimated Exposure of People and Buildings by County

(Fixed Site Toxic Release)

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Bastrop County	**16,996**	**41,354**	**14,492**	**5,374**	**645,230,000**	**30,035**	**12,349**	**1,418,483,000**
Bastrop	3,494	5,933	1,833	865	121,050,000	5,929	3,488	576,217,000
Elgin	2,649	6,063	3,025	1,347	167,047,000	6,063	2,649	344,327,000
Smithville	2,664	4,383	305	168	20,423,000	3,993	2,451	252,273,000
Blanco County	**3,620**	**5,591**	**928**	**578**	**120,647,000**	**1,909**	**1,238**	**187,718,000**
Johnson City	937	1,247	283	112	13,522,000	1,178	870	74,200,000
Brown County	**Not Participating**							
Brownwood	10,320	19,091	2,137	1,020	157,744,000	18,695	10,085	1,144,934,000
Burnet County	**10,339**	**18,584**	**1,818**	**851**	**110,250,000**	**8,108**	**4,046**	**498,266,000**
Bertram	582	1,000	726	427	39,568,000	1,000	582	55,114,000
Burnet	2,531	4,755	884	227	40,417,000	4,723	2,498	252,695,000
Cottonwood Shores	372	704	40	23	2,445,000	704	372	41,613,000
Granite Shoals	1,935	2,303	0	0	0	148	146	11,059,000
Highland Haven	321	453	0	0	0	0	0	0
Marble Falls	2,982	5,070	2,651	1,609	197,869,000	5,064	2,977	376,337,000
Meadowlakes	693	1,278	0	0	0	1,278	693	94,973,000
Colorado County	**6,089**	**11,466**	**4,325**	**1,952**	**238,331,000**	**8,097**	**4,045**	**449,569,000**
Columbus	2,087	3,506	1,116	562	70,819,000	3,506	2,087	259,875,000
Eagle Lake	1,876	3,453	780	376	39,891,000	3,453	1,876	168,646,000
Weimar	1,232	1,965	629	401	58,819,000	1,965	1,232	171,576,000
Fayette County	**10,515**	**15,787**	**5,576**	**3,495**	**374,936,000**	**12,911**	**8,423**	**925,619,000**

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Carmine	125	184	0	0	0,000	184	122	16,735,000
Flatonia	847	1,377	188	112	7,916,000	1,377	847	73,581,000
La Grange	2,545	4,456	15	12	2,534,000	2,393	1,312	160,649,000
Lampasas County	**4,467**	**8,940**	**1,869**	**863**	**86,121,000**	**5,599**	**2,630**	**265,457,000**
Kempner	447	970	0	0	0	0	0	0
Lampasas	3,884	6,818	577	259	30,156,000	6,785	3,870	427,838,000
Lometa	638	767	467	328	27,480,000	767	638	41,863,000
Lee County	**4,957**	**9,388**	**3,699**	**1,842**	**177,643,000**	**6,551**	**3,318**	**330,973,000**
Lexington	756	1,166	367	247	21,209,000	1,166	756	68,009,000
Giddings	3,159	5,103	1,647	1,257	107,511,000	5,103	3,159	309,504,000
Llano County	**8,310**	**10,381**	**493**	**381**	**33,454,000**	**1,885**	**1,533**	**141,323,000**
Llano	2,268	3,311	210	119	11,355,000	3,012	1,908	197,035,000
Horseshoe Bay	2,770	2,648	362	300	45,431,000	2,220	2,132	327,337,000
Sunrise Beach	897	704	0	0	0	7,117	5,573	665,695,000
Mason County	**1,555**	**1,635**	**169**	**99**	**9,817,000**	**525**	**352**	**40,019,000**
Mason	1,399	2,103	240	167	15,553,000	2,065	1,384	113,500,000
Matagorda County	**9,942**	**14,429**	**5,322**	**3,324**	**309,358,000**	**11,388**	**6,759**	**623,937,000**
Bay City	8,359	18,709	2,543	1,041	151,956,000	18,589	8,310	1,005,393,000
Palacios	2,449	4,819	1,715	881	86,151,000	4,819	2,449	236,596,000
McCulloch County	**Not Participating**							
Brady	3,776	5,308	206	181	20,486,000	5,023	3,519	276,238,000
Mills County	**1,956**	**3,177**	**195**	**127**	**19,378,000**	**326**	**220**	**39,997,000**
Goldthwaite	1,172	1,795	0	0	0	1,129	737	79,627,000
San Saba County	**2,438**	**3,338**	**181**	**103**	**8,402,000**	**634**	**388**	**30,616,000**

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
San Saba	1,603	2,498	135	83	7,065,000	1,898	1,091	101,800,000
Travis County	**Not Participating**							
Briarcliff	49,863	862	0	0	0	261	127	21,111,000
Jonestown	705	1,553	0	0	0	65	67	6,553,000
Lago Vista	2,557	4,213	1,299	736	115,036,000	4,136	2,495	372,655,000
Lakeway	4,174	8,130	2,338	1,002	259,448,000	8,130	4,174	1,058,045,000
Mustang Ridge	369	983	62	32	3,655,000	416	174	17,598,000
Point Venture	396	420	0	0	0	0	0	0
San Leanna	183	384	0	0	0	384	183	27,719,000
Volente	303	363	0	0	0	0	0	0
West Lake Hills	1,355	2,875	0	0	0	0	0	0
Wharton County	**9,282**	**19,968**	**8,070**	**3,755**	**442,795,000**	**16,759**	**7,754**	**893,612,000**
East Bernard	873	1,729	0	0	0	0	0	0
El Campo	5,676	10,604	931	415	42,960,000	10,604	5,676	641,235,000
Wharton	4,143	8,887	805	432	66,513,000	7,715	3,632	454,040,000
Williamson County	**35,618**	**94,616**	**6,022**	**2,514**	**456,948,000**	**43,290**	**16,511**	**3,025,766,000**
Cedar Park	9,484	25,617	2,505	950	168,097,000	18,538	6,985	1,363,534,000
Florence	538	1,054	23,911	9,738	2,763,076,000	1,054	538	59,444,000
Hutto	551	1,134	217	89	15,234,000	1,134	551	91,087,000
TOTALS	**279,023**	**451,402**	**108,308**	**50,776**	**7,931,746,000**	**321,800**	**163,981**	**20,909,615,000**

Source: EPA and Texas Department of State Health Services Tier 2 Chemical Reporting Program

Figure 16-19. Mobile HAZMAT Corridors in TCRFC

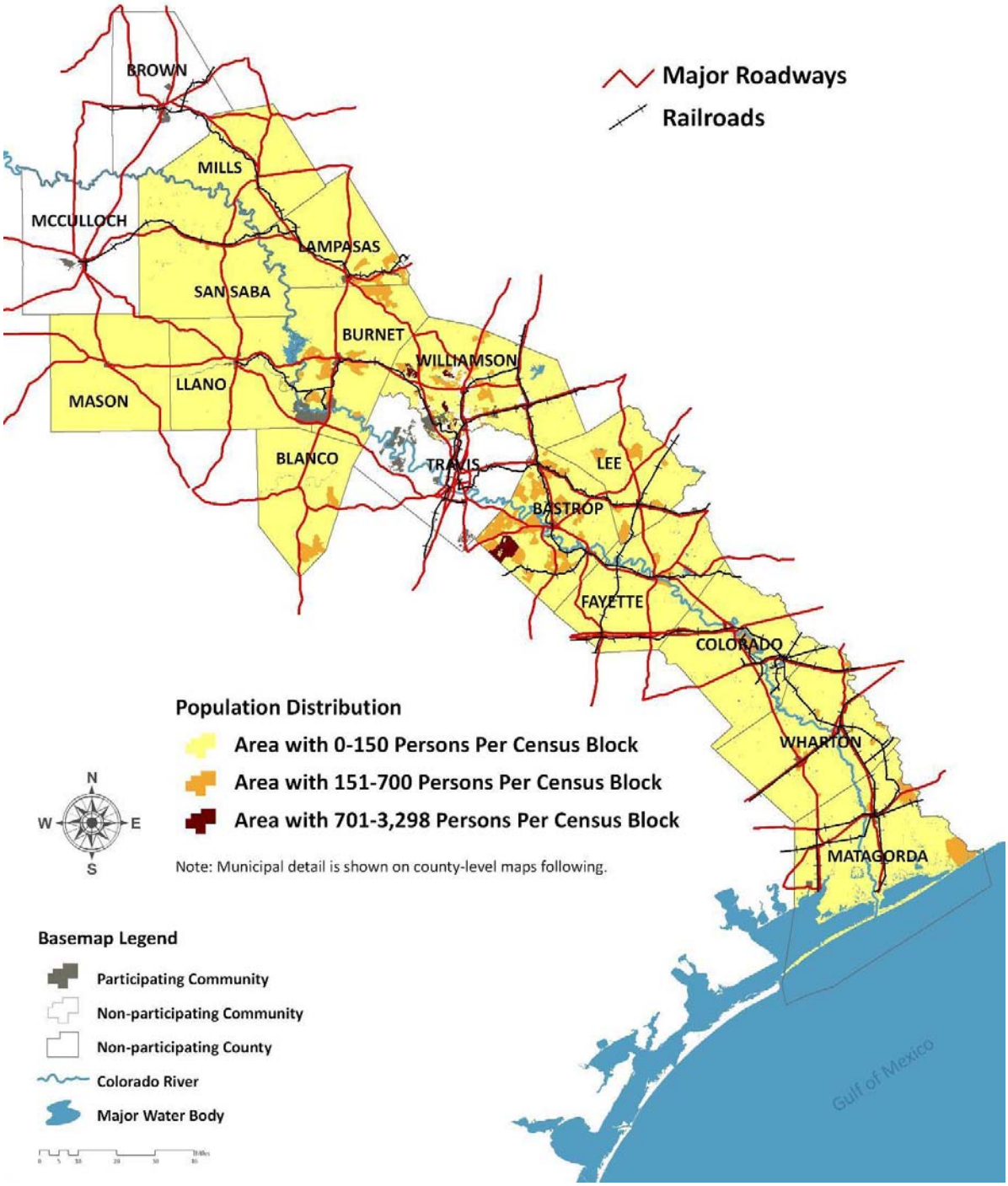


Figure 16-20 Mobile HAZMAT Corridors in Bastrop County

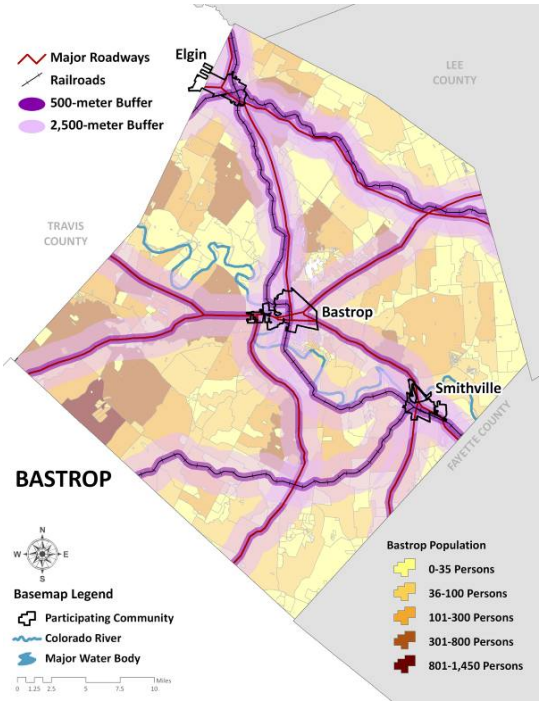


Figure 16-21. Mobile HAZMAT Corridors in Blanco County

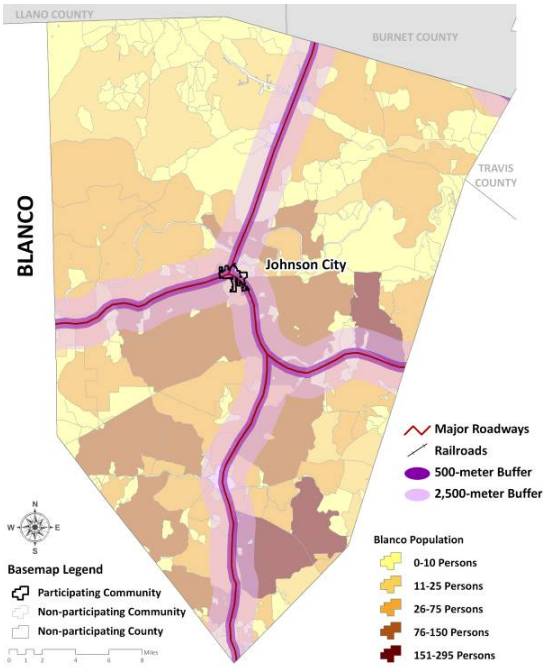


Figure 16-22. Mobile HAZMAT Corridors in Brown County

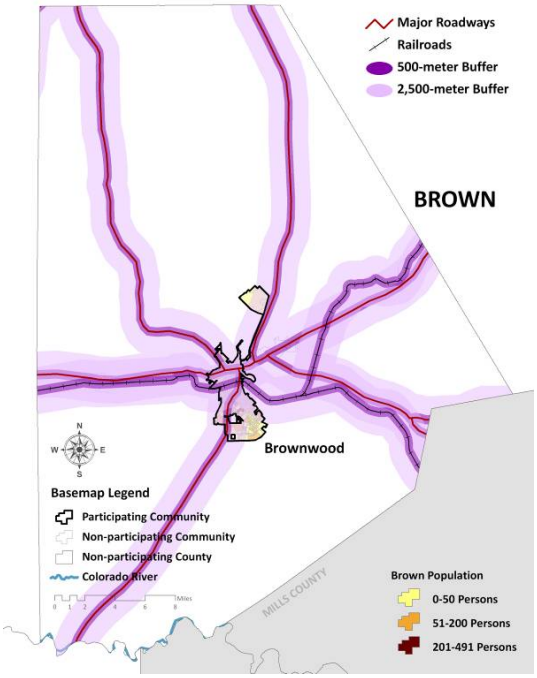


Figure 16-23. Mobile HAZMAT Corridors in Burnet County

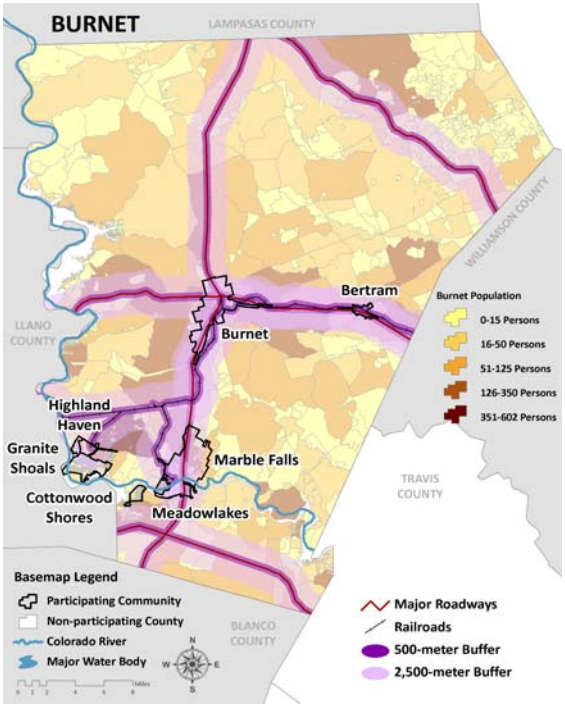


Figure 16-24. Mobile HAZMAT Corridors in Colorado County

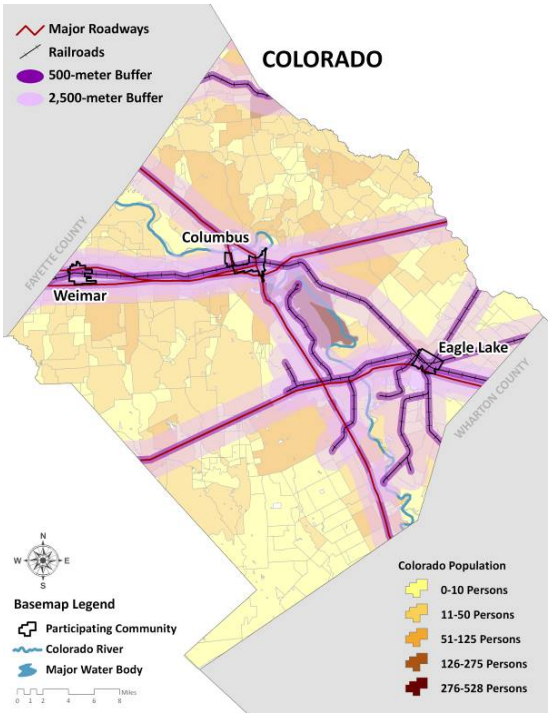


Figure 16-25. Mobile HAZMAT Corridors in Fayette County

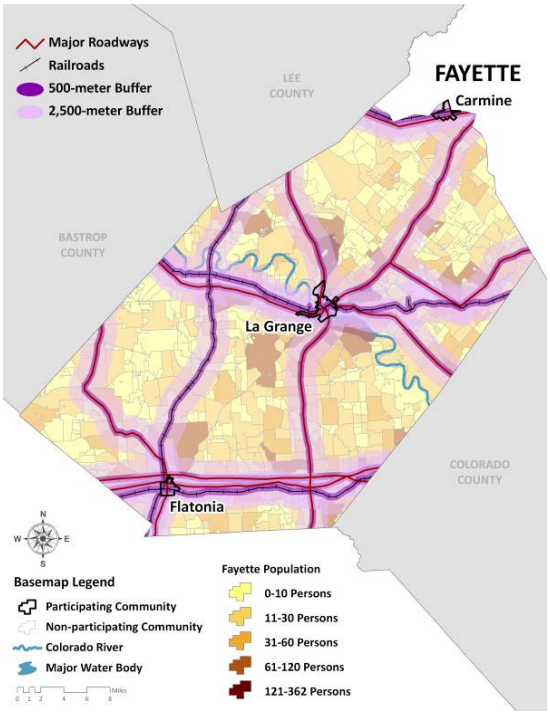


Figure 16-26. Mobile HAZMAT Corridors in Lampasas County

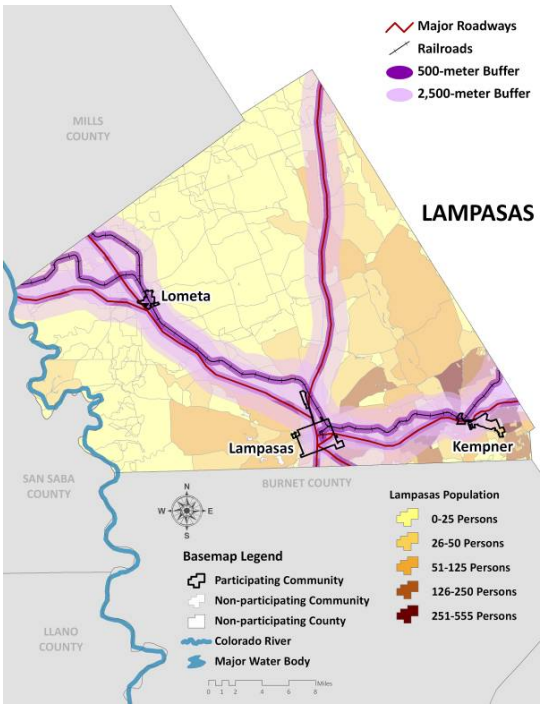


Figure 16-27. Mobile HAZMAT Corridors in Lee County

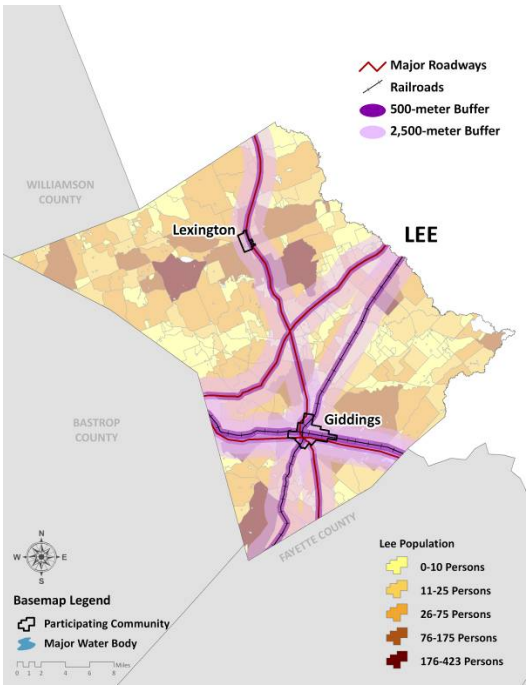


Figure 16-28. Mobile HAZMAT Corridors in Llano County

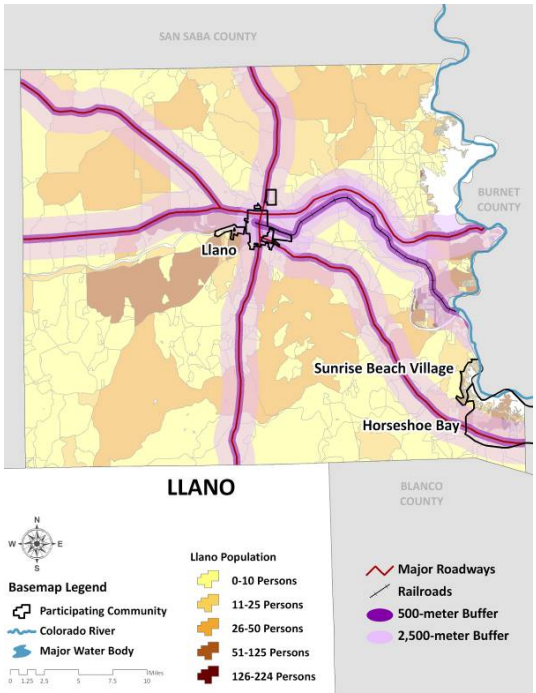


Figure 16-29. Mobile HAZMAT Corridors in Mason County

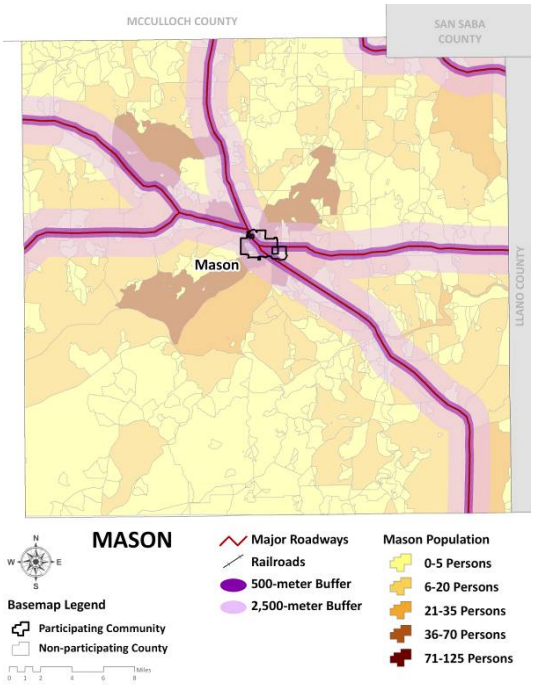


Figure 16-30. Mobile HAZMAT Corridors in Matagorda County

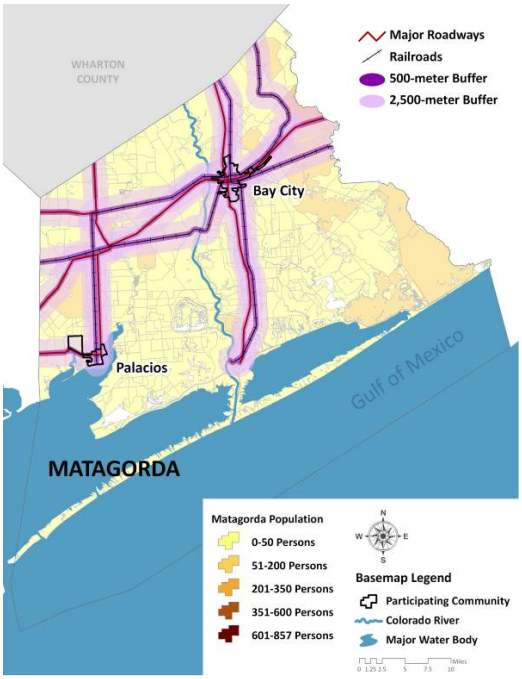


Figure 16-31. Mobile HAZMAT Corridors in McCulloch County

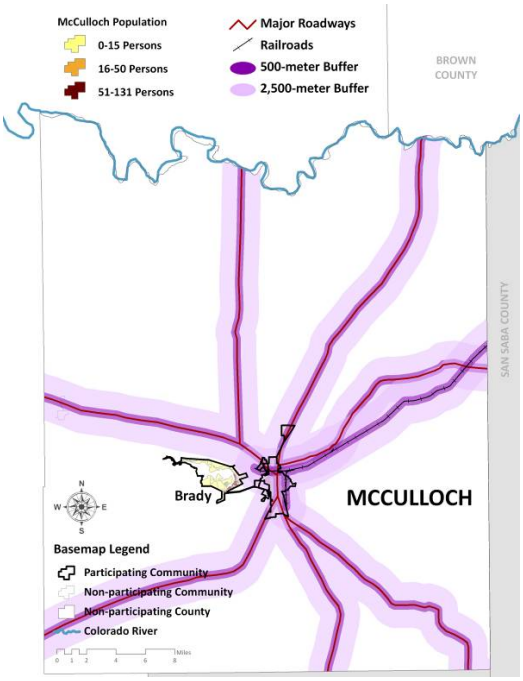


Figure 16-32. Mobile HAZMAT Corridors in Mills County

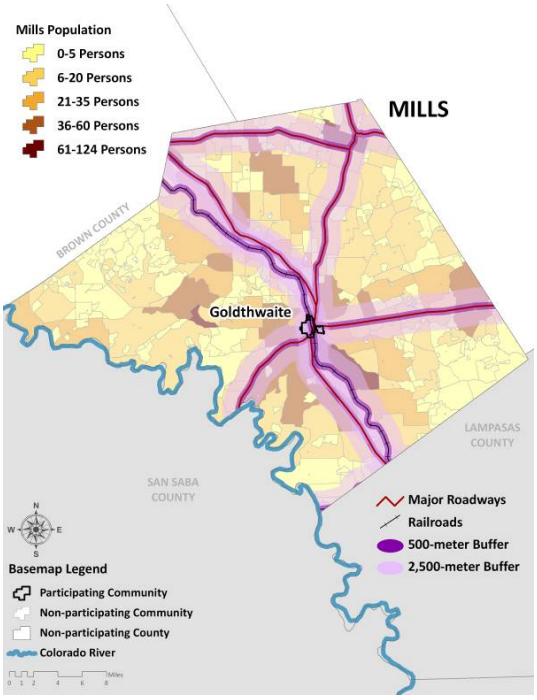


Figure 16-33. Mobile HAZMAT Corridors in San Saba County

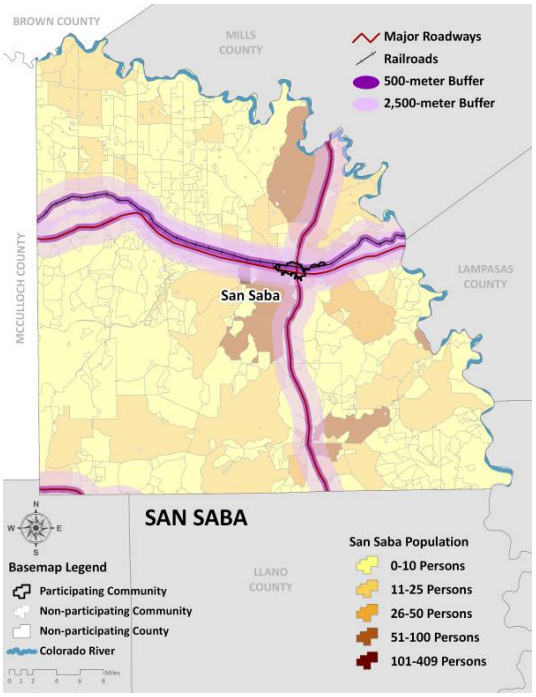


Figure 16-34. Mobile HAZMAT Corridors in Travis County

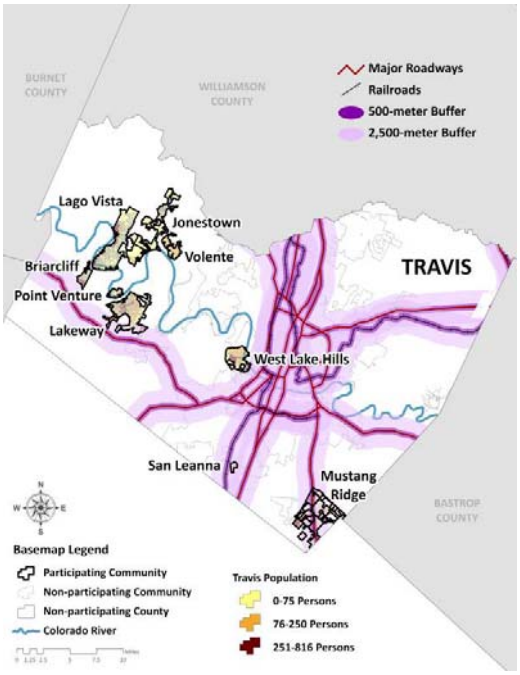


Figure 16-35. Mobile HAZMAT Corridors in Wharton County

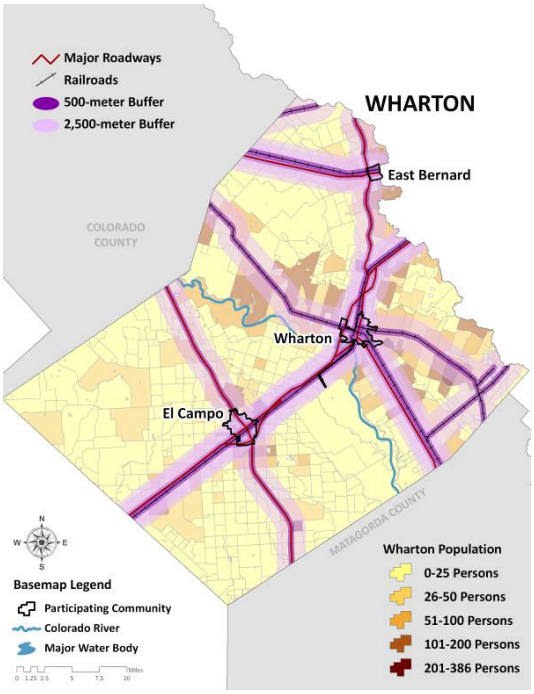


Figure 16-36. Mobile HAZMAT Corridors in Williamson County

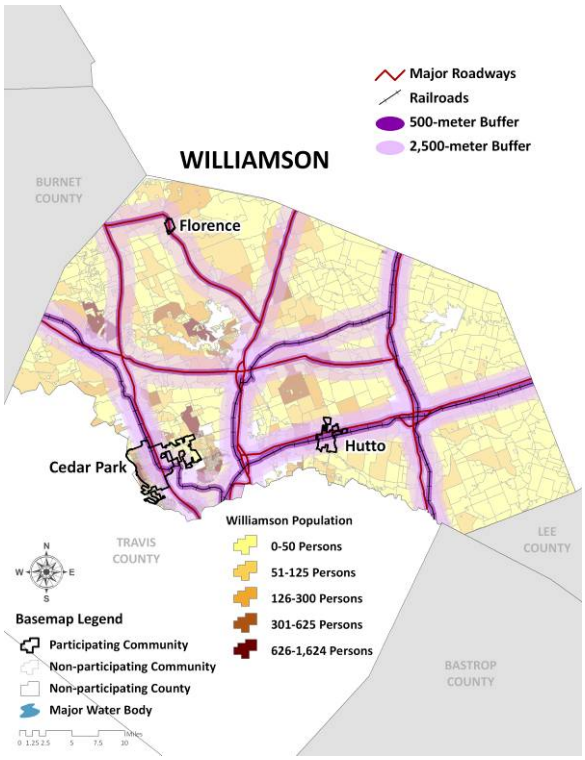


Table16-3. Estimated Exposure of People and Buildings by County

(Mobile Site Toxic Release)

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Bastrop County	**16,996**	**41,354**	**22,657**	**9,160**	**1,062,191,000**	**32,137**	**13,373**	**1,535,485,000**
Bastrop	3,494	5,933	5,392	3,131	540,224,000	5,933	3,494	576,435,000
Elgin	2,649	6,063	5,875	2,562	334,759,000	6,063	2,649	344,327,000
Smithville	2,664	4,383	4,120	2,532	257,573,000	4,383	2,664	271,908,000
Blanco County	**3,620**	**5,591**	**2,892**	**1,754**	**256,595,000**	**3,873**	**2,383**	**318,511,000**
Johnson City	937	1,247	1,151	873	73,630,000	1,247	937	78,214,000
Brown County	**Not Participating**							
Brownwood	10,320	19,091	9,800	5,156	653,401,000	17,473	9,582	1,072,796,000
Burnet County	**10,339**	**18,584**	**8,113**	**4,025**	**471,739,000**	**11,658**	**5,970**	**683,289,000**
Bertram	582	1,000	864	530	50,369,000	1,000	582	55,114,000
Burnet	2,531	4,755	4,642	2,483	252,494,000	4,755	2,531	255,342,000
Cottonwood Shores	372	704	0	0	0	0	0	0
Granite Shoals	1,935	2,303	0	0	0	1,561	1,116	73,703,000
Highland Haven	321	453	0	0	0	453	321	33,235,000
Marble Falls	2,982	5,070	3,522	2,162	294,214,000	5,070	2,982	376,568,000
Meadowlakes	693	1,278	0	1	97,000	1,278	693	94,973,000
Colorado County	**6,089**	**11,466**	**7,474**	**3,739**	**415,752,000**	**9,236**	**4,686**	**507,620,000**
Columbus	2,087	3,506	2,875	1,772	220,859,000	3,506	2,087	259,875,000
Eagle Lake	1,876	3,453	2,905	1,600	147,568,000	3,453	1,876	168,646,000
Weimar	1,232	1,965	1,759	1,141	161,426,000	1,965	1,232	171,576,000
Fayette County	**10,515**	**15,787**	**10,945**	**7,107**	**805,433,000**	**13,412**	**8,750**	**967,781,000**
Carmine	125	184	184	122	16,735,000	184	125	16,978,000

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Flatonia	847	1,377	1,377	847	73,581,000	1,377	847	73,581,000
La Grange	2,545	4,456	4,311	2,460	300,543,000	4,456	2,545	308,041,000
Lampasas County	**4,467**	**8,940**	**4,670**	**2,268**	**231,722,000**	**6,137**	**2,981**	**303,018,000**
Kempner	447	970	525	263	31,622,000	813	393	42,783,000
Lampasas	3,884	6,818	4,387	2,622	295,935,000	6,818	3,884	429,672,000
Lometa	638	767	767	638	41,863,000	767	638	41,863,000
Lee County	**4,957**	**9,388**	**5,085**	**2,641**	**263,871,000**	**6,448**	**3,328**	**345,949,000**
Lexington	756	1,166	665	438	34,043,000	1,166	756	68,009,000
Giddings	3,159	5,103	4,947	3,057	294,980,000	5,103	3,159	309,504,000
Llano County	**8,310**	**10,381**	**3,751**	**2,759**	**276,109,000**	**7,117**	**5,343**	**502,269,000**
Llano	2,268	3,311	2,142	1,359	145,346,000	3,311	2,268	217,712,000
Horseshoe Bay	2,770	2,648	282	239	28,384,000	1,516	1,412	192,578,000
Sunrise Beach	897	704	0	0	0	37	65	8,325,000
Mason County	**1,555**	**1,635**	**951**	**817**	**88,884,000**	**1,269**	**1,076**	**110,095,000**
Mason	1,399	2,103	1,334	899	79,710,000	2,103	1,399	114,666,000
Matagorda County	**9,942**	**14,429**	**8,769**	**4,761**	**467,650,000**	**10,820**	**5,984**	**582,726,000**
Bay City	8,359	18,709	15,442	7,336	869,926,000	18,709	8,359	1,011,160,000
Palacios	2,449	4,819	4,198	2,094	202,522,000	4,819	2,449	236,596,000
McCulloch County	**Not Participating**							
Brady	3,776	5,308	3,792	2,650	217,415,000	5,177	3,600	284,456,000
Mills County	**1,956**	**3,177**	**2,024**	**1,173**	**130,152,000**	**2,568**	**1,539**	**161,669,000**
Goldthwaite	1,172	1,795	**1,278**	**840**	**93,467,000**	**1,795**	**1,172**	**120,497,000**
San Saba County	**2,438**	**3,338**	**2,083**	**1,115**	**112,910,000**	**2,444**	**1,400**	**129,882,000**
San Saba	1,603	2,498	2,496	1,599	157,414,000	2,498	1,603	157,499,000

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Travis County	**Not Participating**							
Briarcliff	49,863	862	0	0	0	0	0	0
Jonestown	705	1,553	0	0	0	0	0	0
Lago Vista	2,557	4,213	0	0	0	0	0	0
Lakeway	4,174	8,130	0	0	0	105	90	26,704,000
Mustang Ridge	369	983	482	195	20,107,000	974	365	37,955,000
Point Venture	396	420	0	0	0	0	0	0
San Leanna	183	384	0	0	0	384	183	27,719,000
Volente	303	363	0	0	0	0	0	0
West Lake Hills	1,355	2,875	0	0	0	611	219	58,540,000
Wharton County	**9,282**	**19,968**	**13,426**	**6,111**	**726,730,000**	**17,144**	**7,893**	**904,678,000**
East Bernard	873	1,729	1,570	803	85,628,000	1,729	873	92,899,000
El Campo	5,676	10,604	8,559	4,702	517,147,000	10,604	5,676	641,235,000
Wharton	4,143	8,887	7,911	3,701	459,226,000	8,887	4,143	499,567,000
Williamson County	**35,618**	**94,616**	**29,476**	**11,391**	**1,981,564,000**	**64,503**	**23,744**	**4,238,746,000**
Cedar Park	9,484	25,617	6,220	2,419	457,240,000	19,454	7,188	1,390,621,000
Florence	538	1,054	1,051	526	59,170,000	1,054	538	59,444,000
Hutto	551	1,134	1,117	540	89,718,000	1,134	551	91,087,000
TOTALS	**279,023**	**451,402**	**240,258**	**123,113**	**14,849,638,000**	**352,491**	**175,696**	**21,684,121,000**

Source: Texas Railroad Commission and U.S. Department of Transportation

Section 17 – Pipeline Failure

Hazard Profile 1

Location 1

Historical Occurrences 6

Vulnerability Analysis 20

Hazard Profile

An estimated 2.2 million miles of pipelines in the United States carry hazardous materials such as oil and natural gas. Pipelines are out of sight and unnoticed, yet have caused fires and explosions that killed more than 200 people and injured more than 1,000 people nationwide in the last decade. Between 1984 and 2000, 50 Texans have died in pipeline incidents. It is important to note that some pipelines cannot be seen on maps where one pipeline runs directly over another or where pipelines appear too close together to be visible on the map (due to scale). If any of these energy pipelines were to rupture, such an event could endanger property and lives in the immediate area (within 500 meters).

Location

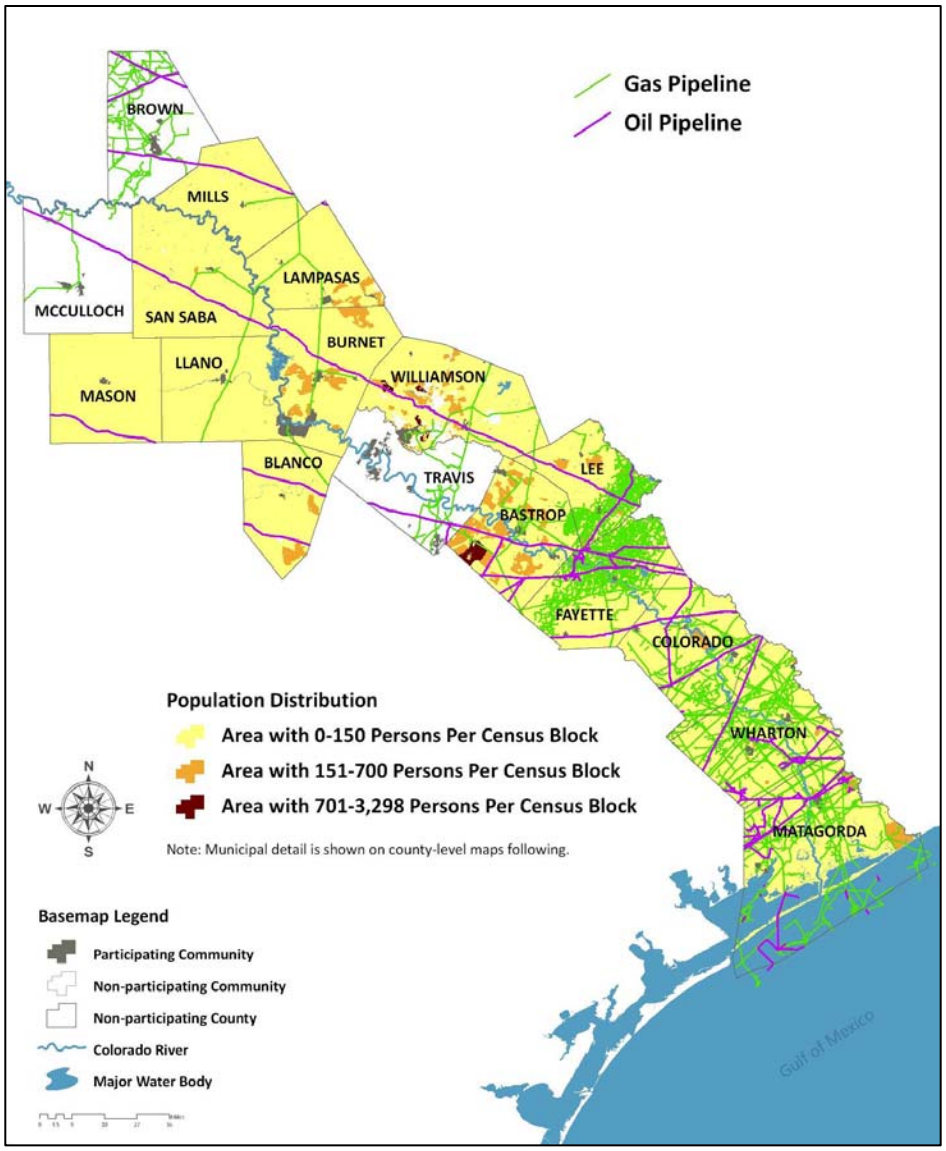


Figure 17-1. Location of Oil and Gas Pipelines

Figure 17-2. Gas and Oil Pipelines in Bastrop County

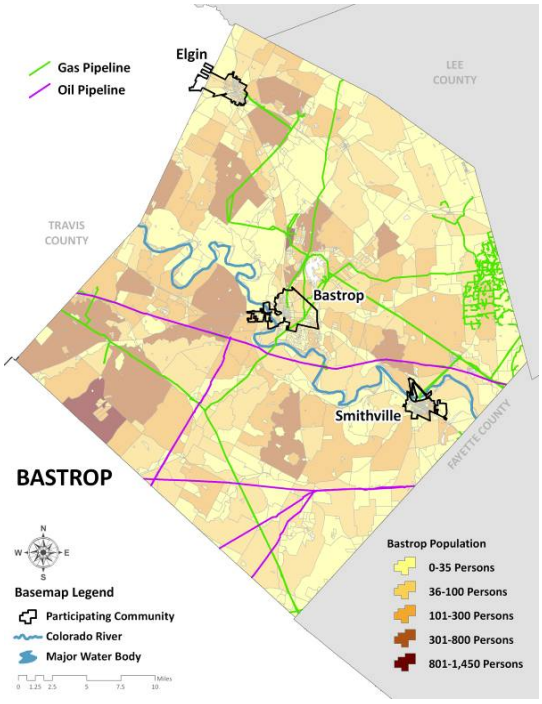


Figure 17-3. Gas and Oil Pipelines in Blanco County

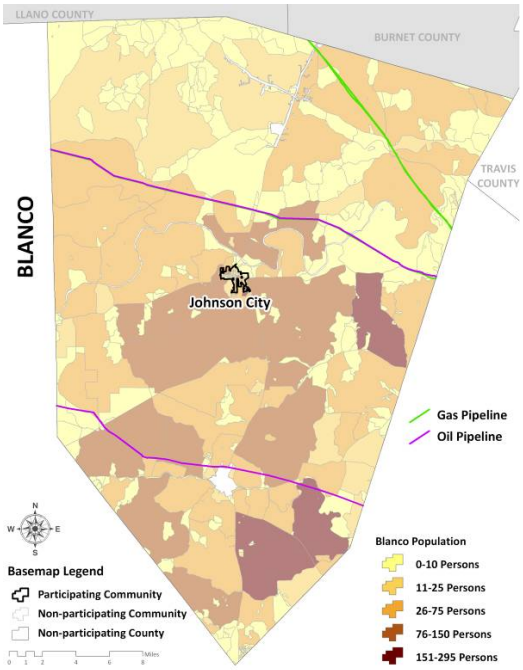


Figure 17-4. Gas and Oil Pipelines in Brown County

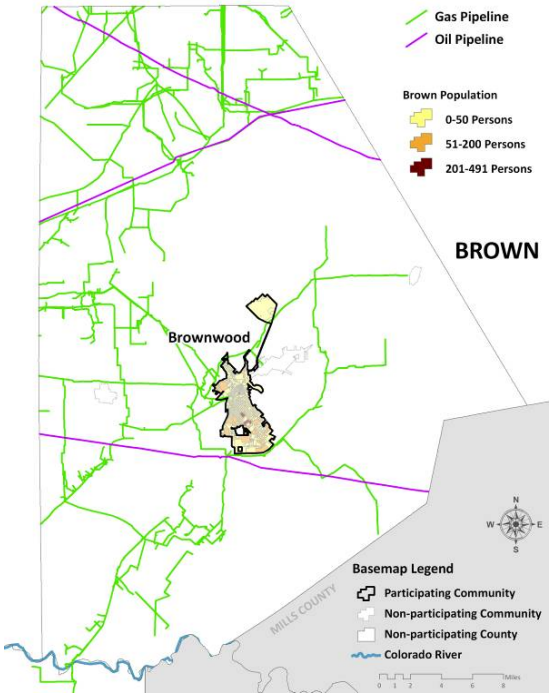


Figure 17-5. Gas and Oil Pipelines in Burnet County

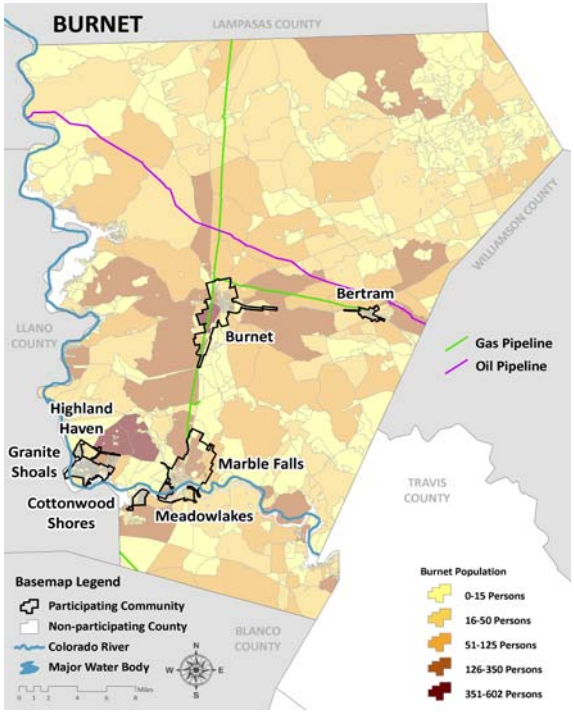


Figure 17-6. Gas and Oil Pipelines in Colorado County

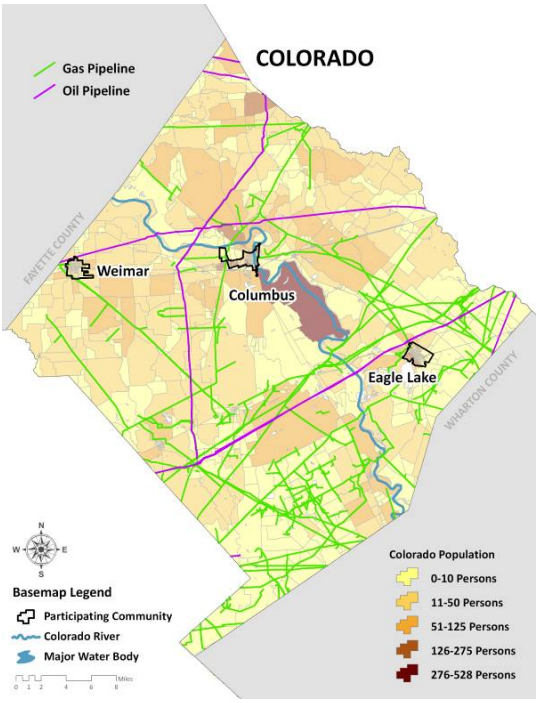


Figure 17-7. Gas and Oil Pipelines in Fayette County

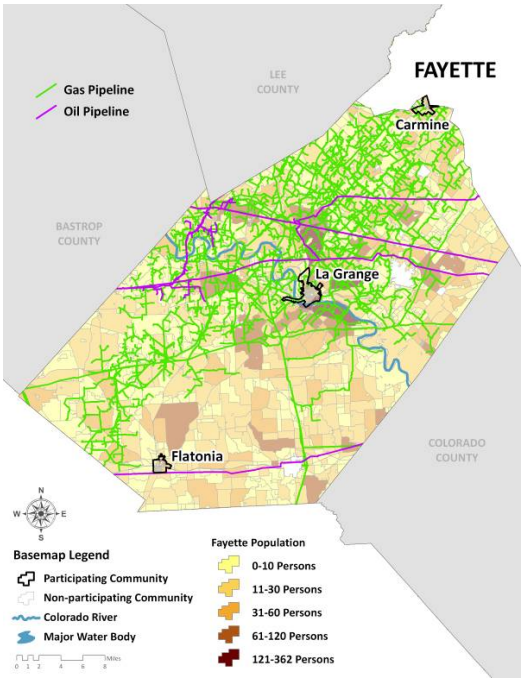


Figure 17-8. Gas and Oil Pipelines in Lampasas County

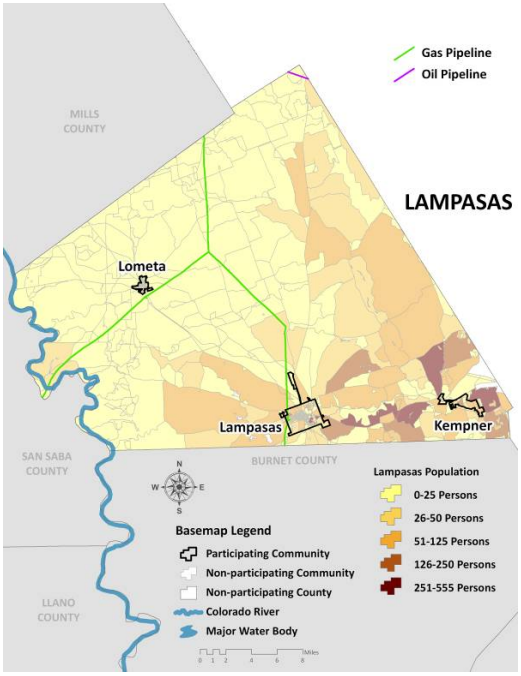


Figure 17-9. Gas and Oil Pipelines in Lee County

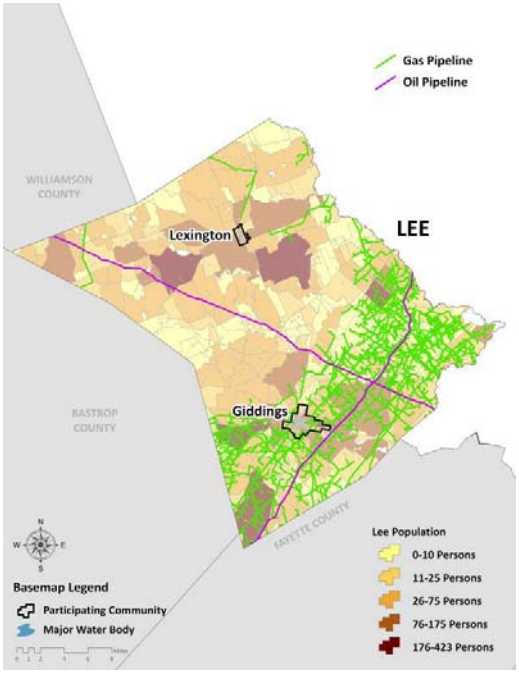


Figure 17-10. Gas and Oil Pipelines in Llano County

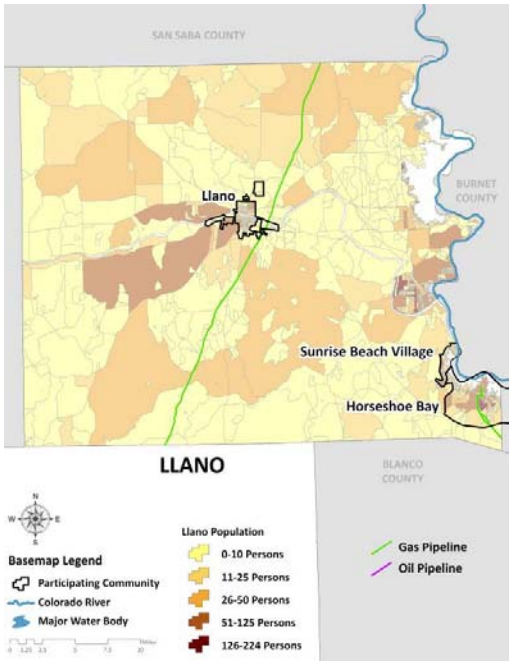


Figure 17-11. Gas and Oil Pipelines in Mason County

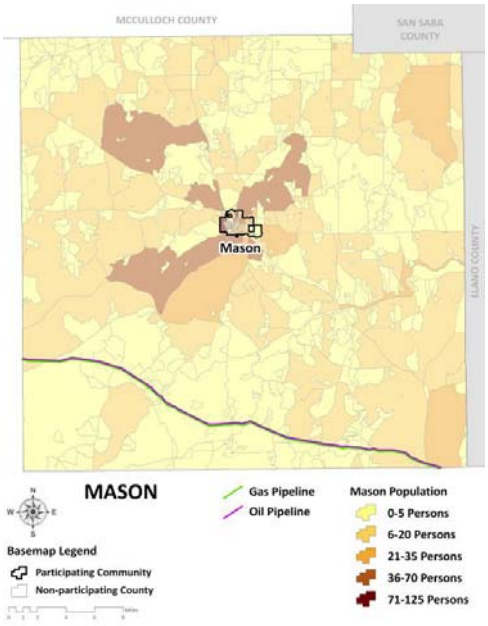


Figure 17-12. Gas and Oil Pipelines in Matagorda County

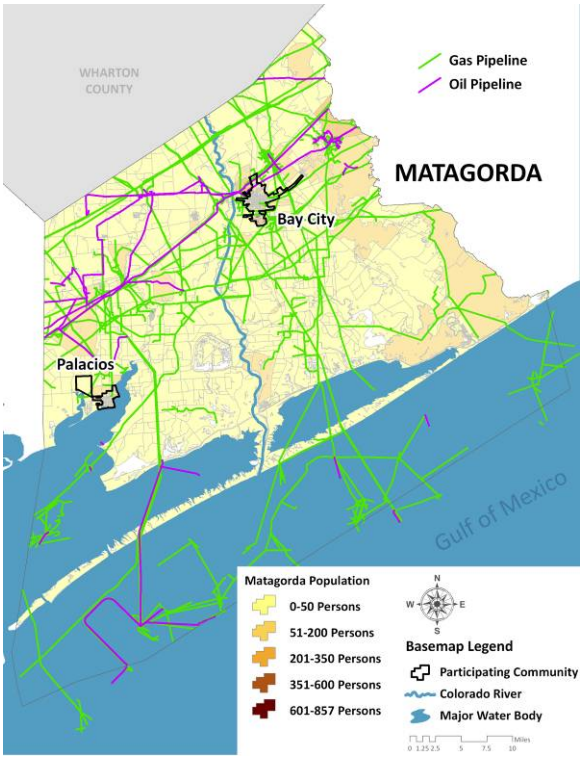


Figure 17-13. Gas and Oil Pipelines in McCulloch County

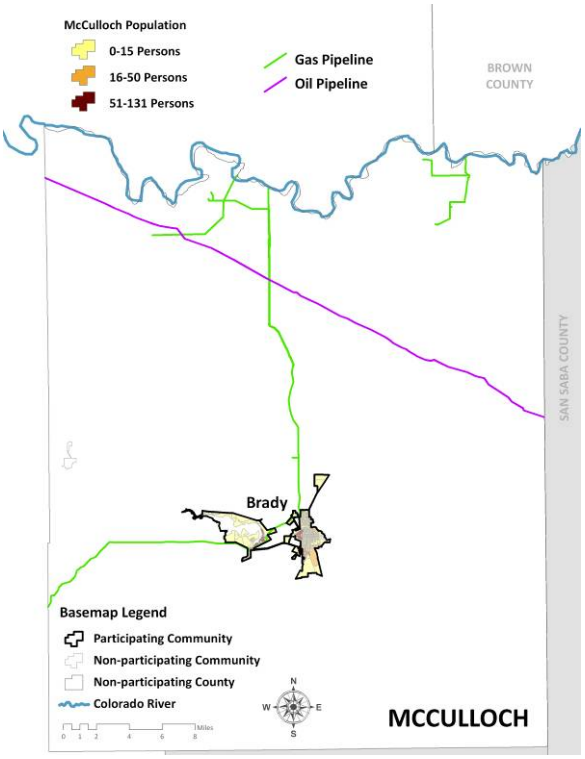


Figure 17-14. Gas and Oil Pipelines in Mills County

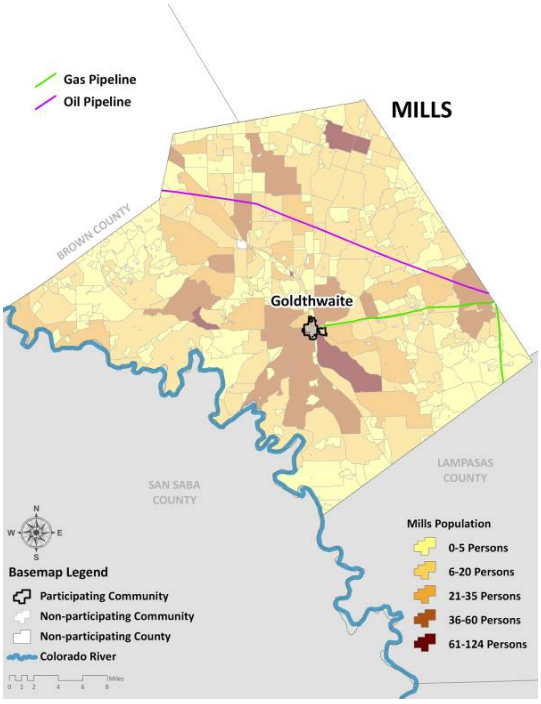


Figure 17-15. Gas and Oil Pipelines in San Saba County

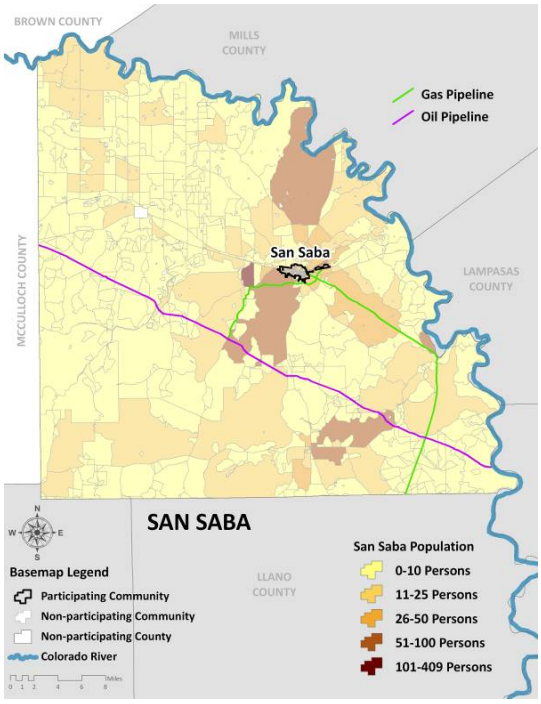


Figure 17-16. Gas and Oil Pipelines in Travis County

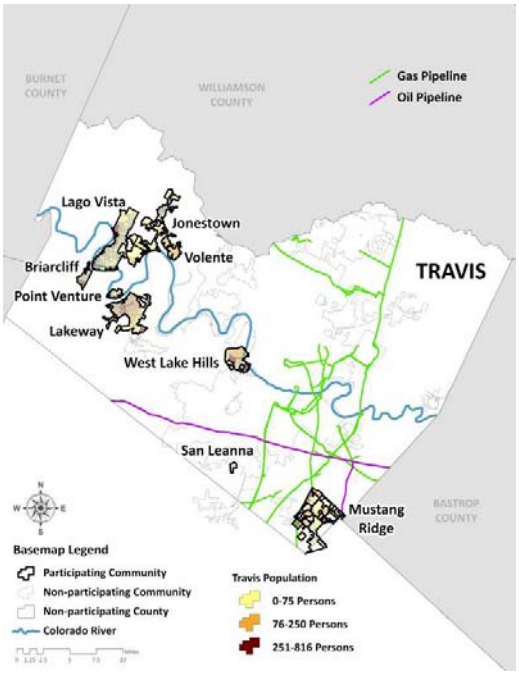


Figure 17-17. Gas and Oil Pipelines in Wharton County

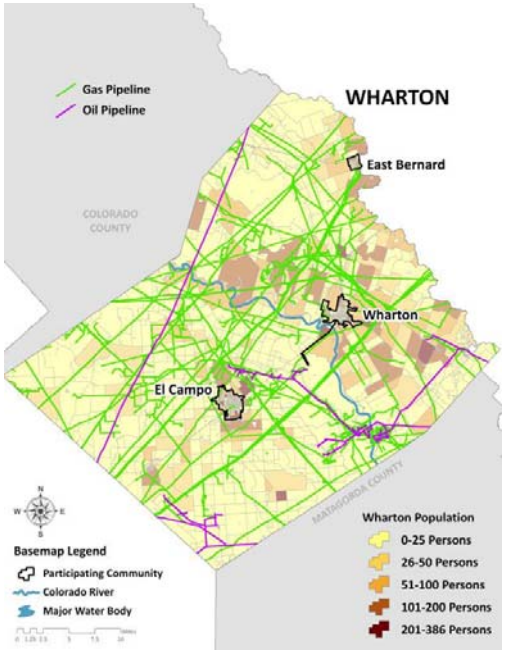
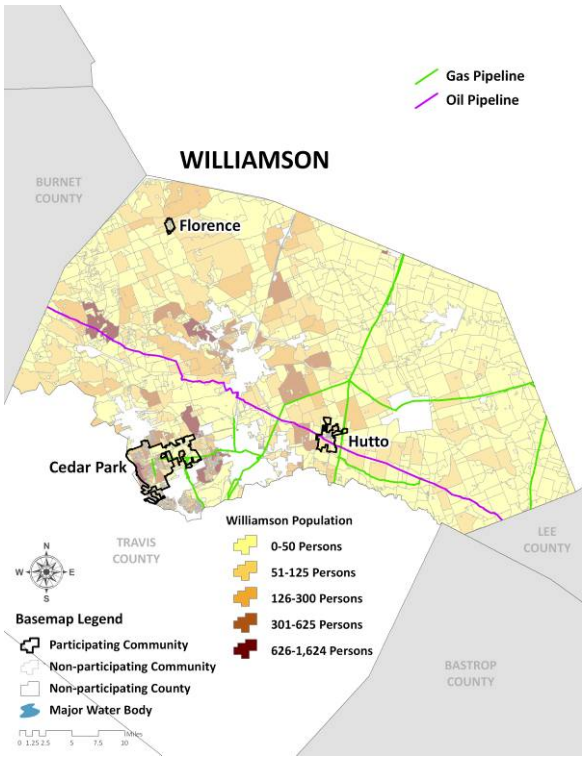


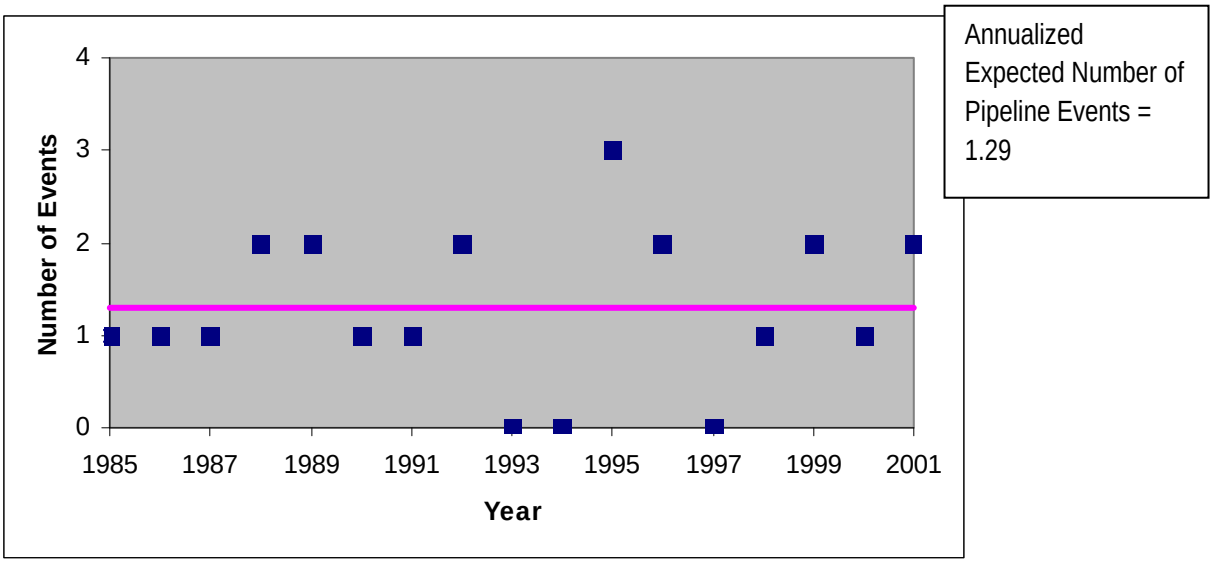
Figure 17-18. Gas and Oil Pipelines in Williamson County



Historical Occurrences

Figure 17-19 illustrates the annual occurrence of these accidents that transpired between 1985 and 2001. Table 17-1 summarizes the incident log of historical pipeline accidents (gas and oil combined) reported by the Railroad Commission of Texas. "Negligible" indicates that the reported losses are less than $5,000.

Figure 17-19. Historical Pipeline Accidents (Gas and Oil Combined) (1985-2001)



Source: Railroad Commission of Texas

Table 17-1. Historical Pipeline Accidents (Gas and Oil Combined) (1985-2001)

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
Bastrop	03-Jun-04	GAS	0	0	Negligible	CENTERPOINT ENERGY ENTEX
Bastrop	02-Oct-04	LIQUID	0	0	N/A	Teppco
Bastrop	09-Jan-07	GAS	0	0	>$50,000	CENTERPOINT ENERGY ENTEX
Bastrop	10-Feb-06	LPG	0	0	None	Ferrellgas, Inc.
Brown	03-Oct-06	LPG	0	0	Negligible	BOB'S LP-GAS, INC (LIC# 4445)
Brown	18-Nov-07	LIQUID	0	0	N/A	
Brown	02-Dec-08	GAS	1	0	>$5,000	
Brown	05-Mar-07	GAS	1	0	Unknown	Unknown
Brown	29-Jun-08	OG	0	0		

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
Brown	07-Aug-08	GAS	0	0	N/A	
Brown	14-Aug-08	OG	0	0	<$50,000	
Brown	09-Oct-06	GAS	3	0	<$50,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Brown	30-Nov-08	OG	0	0	N/A	
Brown	13-Feb-05	GAS	0	0	N/A	Brown Co Sherrif Office
Burnet	19-Dec-07	LPG	0	0	N/A	Independent Propane
Burnet	08-Apr-04	GAS	0	0	Negligible	TXU GAS COMPANY
Burnet	04-Oct-07	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Burnet	25-Apr-06	GAS	0	0	>5,000, But <50,000	Atmos Energy Corp., Mid-Tex Division
Colorado	18-Aug-08	GAS	0	0	$5,000 - $6,000	
Colorado	29-Nov-06	OG	0	0		GOLD KING OPERATING COMPANY
Colorado	24-Aug-05	LIQUID	0	0	$100,000	COPANO NGL SERVICES, LP
Fayette	03-Nov-06	LIQUID	0	0	$2,000	TEPPCO CRUDE PIPELINE, L.P.
Fayette	23-Apr-04	GAS	1	0	Negligible	ENERGY TRANSFER COMPANY
Fayette	08-Mar-07	GAS	0	0	>$5,000 But <$50,000	Enterprise Products, L.P.
Fayette	29-Aug-04	LIQUID	0	0	>$5,000	TEPPCO CRUDE OIL, LP
Fayette	12-Sep-06	OG	0	1		Key Energy
Fayette	27-Oct-06	LIQUID	0	0	$2,000	TEPPCO CRUDE PIPELINE, L.P.
Fayette	23-Dec-07	OG	0	0	N/A	Not Listed
Fayette	22-Feb-06	GAS	0	0	Negligible	CENTERPOINT ENERGY ENTEX
Fayette	25-May-06	LIQUID	0	0		TEPPCO CRUDE PIPELINE
Fayette	15-Jul-06	GAS	0	0	Negligible	ENTERPRISE PRODUCTS
Fayette	31-Jan-06	LIQUID	0	0	$184,320 (30-Day)	Koch Pipeline

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
Lampasas	18-May-06	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Lee	06-Jun-08	LIQUID	0	0	<$50,000	
Lee	23-Apr-05	GAS	0	0	Negligible	DUKE ENERGY FIELD SERVICES
Lee	09-Apr-06	GAS	0	0	Unknown	Duke Energy Field Services
Llano	04-Dec-07	LPG	0	0	None	Pecan Creek Propane
Llano	05-Mar-07	LPG	0	0	Negligible	Pecan Creek Propane
Mason	25-Nov-07	LPG	0	0	N/A	Community Service And Supply, Inc
Matagorda	29-Feb-08	GAS	0	0	>$5,000 But <$50,000	
Matagorda	07-Feb-06	LIQUID	0	0		CAPCO OFF SHORE
Matagorda	19-May-07	GAS	0	0	$72,000 (Jrp Per 30-Day)	Panther Pipeline
Matagorda	13-Oct-05	GAS	0	0	Negligible	DOW PIPELINE COMPANY
Matagorda	23-Aug-06	OG	0	0		UNKNOWN
Matagorda	14-Aug-07	GAS	0	0	$70,000	PANTHER PIPELINE, LTD
Matagorda	03-Jul-07	LIQUID	0	0	N/A	Unknown
Matagorda	19-Dec-06	GAS	0	0	$72,500	PANTHER PIPELINE, LTD
Matagorda	16-Feb-07	GAS	0	0	>$5,000 But <$30,000	Kinder Morgan Tejas Pipeline, Lp
Matagorda	18-Jul-07	GAS	0	0	>$50,000	PANTHER PIPELINE, LTD
Matagorda	17-Aug-05	GAS	0	0	Negligible	PANTHER PIPELINE
Matagorda	05-Dec-07	OG	0	0		EQUISTAR
Matagorda	16-Aug-08	NJ	0	0	N/A	
Matagorda	03-Jan-08	GAS	0	0	<$50,000	SEADRIFT PIPELINE CORPORATION
Matagorda	17-Feb-08	GAS	0	0	>$50,000 (Estimated	

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
					$300,000)	
Matagorda	05-Jan-09	GAS	0	0	>$50,000	
Matagorda	06-Oct-06	LIQUID	0	0	$45,000	TEPPCO
Matagorda	04-Feb-04	LIQUID	0	0	N/A	Equistar Chemicals
Matagorda	30-Apr-07	GAS	0	0	$72,000	Panther Pipeline
Matagorda	26-Aug-04	LIQUID			N/A	Teppco Crude Oil, Lp
Matagorda	27-Nov-07	GAS	0	0	Negligible	Main Energy Inc.
Matagorda	05-Sep-03	GAS	0	0	>$5,000	NOBLE ENERGY
Matagorda	22-Feb-08	GAS	0	0	<$50,000	
Matagorda	08-Jan-07	GAS	0	0	$72,500	PANTHER PIPELINE, LTD
Mcculloch	16-Dec-04	GAS	0	0	>$5,000	WEST TEXAS GAS
San Saba	09-Jan-06	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
San Saba	05-Aug-05	GAS	0	0	N/A	Atmos Energy Corp., Mid-Tex Division
San Saba	25-Jul-08	GAS	0	0	N/A	
Travis	04-Jun-04	GAS	0	0	Negligible	TXU GAS COMPANY
Travis	08-Dec-05	GAS	0	0	>$50,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Travis	04-Jun-04	GAS	0	0	$7,000	TEXAS GAS SERVICE
Travis	07-Dec-05	GAS	0	0	>$5,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Travis	07-Dec-05	GAS	0	0	Unknown	Texas Gas Service
Travis	11-Dec-08	GAS	0	0		
Travis	01-Jun-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	24-Jun-04	GAS	0	0	N/A	Kinder Morgan Tejas Pipeline, Lp
Travis	26-Apr-06	GAS	0	0	<$50,000 ($8,000	Texas Gas Service

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
					Per 30-Day)	
Travis	06-Dec-05	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	18-Nov-08	GAS	0	0	<$50,000	
Travis	17-Oct-08	GAS	0	0	>$50,000	
Travis	24-Apr-06	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	21-Apr-06	GAS	1	0	>$50,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Travis	13-Apr-06	GAS	2	0	Unknown (N/J)	Texas Gas Service
Travis	11-Dec-08	GAS	0	0	<$50,000	
Travis	04-May-04	GAS	0	0	>$5,000	TEXAS GAS SERVICE
Travis	03-Apr-06	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	07-May-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	01-Feb-06	GAS	0	0	>5,000	TEXAS GAS SERVICE
Travis	10-May-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	11-Dec-05	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	28-Jan-08	GAS	0	0	<$50,000	TEXAS GAS SERVICE COMPANY
Travis	26-May-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	02-Sep-05	GAS	0	0	>$5,000 But <$50,000	Texas Gas Service
Travis	06-Jun-06	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	07-Oct-08	GAS	0	0	>$5,000	
Travis	27-May-04	GAS	0	0	>$5,000	TEXAS GAS SERVICE
Travis	06-Jan-06	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	28-May-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	11-Dec-05	GAS	0	0	>$5,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Travis	21-Mar-06	GAS	0	0	Negligible	TEXAS GAS SERVICE

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
Travis	02-Sep-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	01-Jul-04	GAS	0	0	N/A	Kinder Morgan Tejas Pipeline, Lp
Travis	15-Jun-05	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	10-Jun-05	GAS	0	0	>$5,000 But <$50,000	Texas Gas Service
Travis	06-Aug-04	GAS	0	0	N/A	Texas Gas Service
Travis	05-May-05	GAS	0	0	>$5,000 But <$50,000	Texas Gas Service
Travis	02-Sep-04	GAS	0	0	N/A	Texas Gas Service
Travis	02-Apr-05	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	13-Oct-08	GAS	0	0		
Travis	16-Sep-04	GAS	0	0		ATMOS ENERGY CORP., MID-TEX DIVISION
Travis	07-Feb-05	GAS	0	0	N/A	Texas Gas Service
Travis	29-Jun-05	GAS	0	0	Negligible	ATMOS ENERGY
Travis	17-Jan-05	GAS	0	0	N/A	Texas Gas Service
Travis	17-Dec-04	GAS	0	0	>$5,000	TEXAS GAS SERVICE
Travis	04-Dec-08	GAS	0	0	Negligible	
Travis	05-Dec-08	LPG	1	0	Negligible	
Travis	25-Oct-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	21-Oct-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	31-Aug-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	22-Sep-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	08-Feb-05	GAS	0	0	N/A	Texas Gas Service
Travis	20-Aug-05	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	09-Nov-05	GAS	0	0	Negligible	TEXAS GAS SERVICE

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
Travis	23-Jun-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	25-Oct-05	GAS	0	0	$11,000	TEXAS GAS SERVICE
Travis	12-Oct-05	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	05-Oct-05	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	22-Apr-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	02-Jul-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	14-Apr-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	19-Jun-05	GAS	0	0	No Gas Damages	Atmos Energy
Travis	13-Oct-08	GAS	0	0	Negligible	
Travis	10-Nov-05	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	17-Aug-05	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	12-Aug-05	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	12-Jul-04	GAS	0	0	>$5,000	TEXAS GAS SERVICE
Travis	21-Jul-05	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	18-Jul-05	GAS	0	0	$8,000	TEXAS GAS SERVICE
Travis	18-Jul-05	GAS	0	0	$11,000	TEXAS GAS SERVICE
Travis	15-Jul-05	GAS	0	0	>$5,000 But <$50,000	Texas Gas Service
Travis	30-Jun-05	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	26-Aug-05	GAS	0	0	>$5,000	TEXAS GAS SERVICE
Travis	13-May-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	31-Oct-03	GAS	0	0	$6,000	TEXAS GAS SERVICE
Travis	09-Jul-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	05-Nov-03	GAS	0	0		TEXAS GAS SERVICE
Travis	05-Nov-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	02-Nov-07	GAS	0	0	$16,000	TEXAS GAS SERVICE

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
Travis	27-Jun-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	18-Jun-07	GAS	0	0	>$5,000	TEXAS GAS SERVICE
Travis	18-Nov-03	GAS	0	0	Negligible	TXU GAS DISTRIBUTION
Travis	12-Mar-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	14-May-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	23-Jul-07	GAS	0	0	Pending	Texas Gas Service
Travis	10-May-07	GAS	0	0	>$5,000 But <$50,000	Texas Gas Service
Travis	03-May-07	GAS	0	0	Negligible	TEXAS COMMUNITY PROPANE
Travis	04-May-07	GAS	0	0	Pending	Texas Gas Service
Travis	26-Apr-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	13-Apr-07	GAS	0	0	>$5,000	TEXAS GAS SERVICE
Travis	14-Apr-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	26-Mar-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	30-Apr-06	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	17-May-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	17-Oct-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	14-Jan-08	GAS	0	0	Negligible	TEXAS GAS SERVICE COMPANY
Travis	22-Feb-08	GAS	0	0	Negligible	
Travis	18-Dec-07	LPG	0	0	Unknown	Terry Garnett Propane
Travis	18-Dec-07	GAS	0	0	<$50,000	TEXAS GAS SERVICE
Travis	09-Dec-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	05-Dec-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	26-Nov-07	GAS	0	0	Negligible	TEXAS GAS SERVICE COMPANY
Travis	02-Oct-03	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	26-Oct-03	GAS	0	0	Negligible	TEXAS GAS SERVICE

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
Travis	24-Oct-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	16-Jul-07	GAS	0	0	>$5,000 But <$20,000	Texas Gas Service
Travis	08-Oct-03	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	14-Sep-07	LPG	4	0		EVERGREEN R.V.
Travis	09-Oct-03	GAS	0	0	Negligible	TXU GAS DISTRIBUTION
Travis	31-Aug-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	28-Aug-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	13-Oct-03	GAS	0	0	Negligible	HOUSTON PIPE LINE COMPANY
Travis	23-Oct-03	GAS	0	0	Negligible	TXU GAS DISTRIBUTION
Travis	27-Jul-07	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Travis	13-Mar-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	07-Oct-03	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis		NJ	0	0	<$50,000	
Travis	22-Aug-08	LPG	1	0	Negligible	
Travis	28-Mar-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	05-Mar-04	GAS	0	0	$91,000	TEXAS GAS SERVICE
Travis	25-Sep-06	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	08-Mar-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	11-Sep-06	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	06-Sep-06	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Travis	10-Mar-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	06-Mar-07	GAS	0	0	>$5,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Travis	12-Aug-06	GAS	0	0	Negligible	TEXAS GAS SERVICE

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
Travis	30-Oct-06	GAS	0	0	>$5,000	TEXAS GAS SERVICE
Travis	24-Nov-08	GAS	0	0		
Travis	03-Aug-06	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	21-Sep-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	16-Jul-06	GAS	0	0	>$5,000	TEXAS GAS SERVICE
Travis	24-Sep-08	GAS	0	0	Negligible	
Travis	05-Jul-06	LPG	1	0	>$5,000	Sharp Propane
Travis	30-Jun-06	GAS	0	0	>$5,000	TEXAS GAS SERVICE
Travis	03-Oct-08	GAS	0	0	<$50,000	
Travis	26-Mar-08	GAS	0	0	<$50,000	
Travis	21-Aug-06	GAS	0	0	Negligible	ENTERPRISE PRODUCTS OPERATING, LP
Travis	15-Dec-06	GAS	0	0	$10,000	TEXAS GAS SERVICE
Travis	12-Jun-08	GAS	0	0	<$50,000	
Travis	22-Feb-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	11-Dec-03	GAS	0	0	Negligible	TXU GAS DISTRIBUTION
Travis	16-Feb-07	GAS	0	0	Unknown	Atmos Energy Corp., Mid-Tex Division
Travis	05-Jan-04	GAS	0	0	>$5,000	TEXAS GAS SERVICE
Travis	29-Jan-07	GAS	2	0	Unknown	Atmos Energy Corp., Mid-Tex Division
Travis	18-Jan-07	GAS	0	0	$12,000	TEXAS GAS SERVICE
Travis	11-Jan-07	GAS	0	0	$184,000	TEXAS GAS SERVICE
Travis	04-Jan-07	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	24-Dec-06	GAS	0	0	Negligible	SHARP COMMUNITY ENERGY
Travis	26-Feb-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	14-Dec-06	GAS	0	0	Negligible	TEXAS GAS SERVICE

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
Travis	09-Jan-04	GAS	1	0	Negligible	TEXAS GAS SERVICE
Travis	01-Dec-06	LPG	0	0	Negligible	DIRECT PROPANE SERVICES
Travis	08-Aug-08	GAS	0	0	N/A	
Travis	12-Aug-08	GAS	0	0	N/A	
Travis	13-Feb-04	GAS	0	0	Negligible	TEXAS GAS SERVICE
Travis	10-Nov-06	LPG	0	0	>$5,000	PETRON LLC
Travis	08-Nov-06	GAS	0	0	Negligible	TEXAS GAS SERVICE
Wharton	07-Mar-05	LIQUID	0	0	$283,000	VALERO LOGISTICS OPERATIONS, LP
Wharton	20-Aug-04	GAS	0	0	Negligible	CENTERPOINT ENERGY ENTEX
Wharton	06-Dec-03	GAS	0	0	N/A	Duke Energy Field Services
Wharton	10-Jan-05	GAS	0	0	N/A	Copano Field Services
Williamson	16-Jul-04	GAS	0	0	Negligible	TXU GAS COMPANY
Williamson	14-Jun-07	GAS	0	0	<$50,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	14-Feb-06	GAS	0	0	N/A	Texas Gas Service
Williamson	10-Aug-06	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	01-Sep-06	GAS	0	1	$37,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	05-Sep-08	GAS	0	0		
Williamson	28-Aug-08	LPG	0	0	N/A	
Williamson	01-Nov-06	GAS	0	0	Unknown	Atmos Energy Corp., Mid-Tex Division
Williamson	24-Nov-06	GAS	0	0	Pending	Atmos Energy Corp., Mid-Tex Division
Williamson	14-Dec-06	GAS	0	0	<$50,000	ATMOS ENERGY CORP., MID-TEX DIVISION

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
Williamson	11-Feb-07	LPG	2	0	>$5,000	NONE-NO LISCENSEE INVOLVED
Williamson	22-Jul-06	GAS	0	0	>$5,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	23-Feb-07	LPG	0	0	>$5,000	Taylor Butane Co.
Williamson	28-Apr-06	GAS	0	0	<$50,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	28-Dec-07	LPG	2	0	N/A	Homeowner-Talyon Lange
Williamson	12-Jul-07	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	16-Jul-07	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	04-Aug-07	GAS	0	0		ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	06-Aug-07	LIQUID	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	20-Sep-07	GAS	0	0	N/A	Atmos Energy Corp., Mid-Tex Division
Williamson	26-Sep-07	LPG	1	0	Unknown	Enderby Gas Dba Bishop Energy
Williamson	25-Oct-07	Gas	0	0	None	Atmos Energy Corp., Mid-Tex Division
Williamson	08-Nov-07	LPG	0	0	<$50,000	Texas Community Propane
Williamson	26-Nov-07	GAS	0	0	<$50,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	16-Feb-07	GAS	0	0	Possibly Over $5,000	Atmos Energy Corp., Mid-Tex Division
Williamson	08-Dec-05	GAS	0	0	$112,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	28-Sep-04	GAS	0	0	Negligible	TXU GAS COMPANY
Williamson	03-Feb-05	GAS	0	0	Negligible	TXU GAS COMPANY
Williamson	09-Apr-05	GAS	0	0	>$5,000 But <$50,000	Texas Gas Service

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
Williamson	11-Apr-05	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	19-May-05	GAS	0	0	>$5,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	07-Jun-05	GAS	0	0	>$5,000 But <$50,000	Atmos Energy Corp., Mid-Tex Division
Williamson	28-Jul-05	GAS	0	0	>$5,000 But <$50,000	Atmos Energy Corp., Mid-Tex Division
Williamson	23-Sep-05	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	03-Oct-05	GAS	0	0	<$50,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	08-Aug-06	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	06-Dec-05	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	14-Sep-04	GAS	0	0	Negligible	TXU GAS COMPANY
Williamson	12-Dec-05	GAS	0	0	>$5,000 But <$50,000	Atmos Energy Corp., Mid-Tex Division
Williamson	10-Dec-05	GAS	0	0	>$5,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	11-Dec-05	GAS	0	0	>$5,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	13-Dec-05	GAS	0	0	>$5,000 But <$50,000	Atmos Energy Corp., Mid-Tex Division
Williamson	19-Jan-06	GAS	0	0	>$5,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	14-Feb-06	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	03-Mar-06	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	21-Mar-06	GAS	1	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION

COUNTY	INCIDENT DATE	TYPE	INJURIES	DEATHS	Loss	Operator
Williamson	05-Apr-06	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	05-Apr-06	GAS	0	0	>$50,000	ATMOS ENERGY CORP., MID-TEX DIVISION
Williamson	31-Oct-05	GAS	0	0	Negligible	ATMOS ENERGY CORP., MID-TEX DIVISION

Source: Railroad Commission of Texas

Vulnerability Analysis

Table 17-2 and Table 17-3 show the total people at risk, buildings at risk and value of exposure at risk from gas and oil pipelines, respectively. However, many pipelines run through less densely populated areas, creating less risk in many cases than those pipelines that run through heavily populated areas.

Table 17-2. Potential Impact Due to Gas Pipelines by Jurisdiction

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Bastrop County	**16,996**	**41,354**	**19,587**	**7,650**	**877,164,000**	**32,037**	**13,052**	**1,471,666,000**
Bastrop	3,494	5,933	2,076	1,086	150,389,000	5,725	3,300	554,737,000
Elgin	2,649	6,063	987	440	41,548,000	5,660	2,465	313,457,000
Smithville	2,664	4,383	659	384	43,540,000	4,382	2,659	271,840,000
Blanco County	**3,620**	**5,591**	**519**	**348**	**46,576,000**	**1,072**	**719**	**92,073,000**
Johnson City	937	1,247	0	0	0	0	0	0
Brown County	**Not Participating**							

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Brownwood	10,320	19,091	1,433	601	84,854,000	14,612	7,960	928,079,000
Burnet County	**10,339**	**18,584**	**2,180**	**1,001**	**136,101,000**	**4,793**	**2,246**	**290,968,000**
Bertram	582	1,000	343	200	19,246,000	1,000	582	55,114,000
Burnet	2,531	4,755	1,458	546	67,895,000	4,755	2,531	255,342,000
Cottonwood Shores	372	704	0	0	0	0	0	0
Granite Shoals	1,935	2,303	0	0	0	240	288	19,792,000
Highland Haven	321	453	0	0	0	0	0	0
Marble Falls	2,982	5,070	145	81	19,361,000	831	421	74,279,000
Meadowlakes	693	1,278	0	0	0	0	0	0
Colorado County	**6,089**	**11,466**	**7,664**	**3,967**	**424,244,000**	**10,788**	**5,672**	**612,613,000**
Columbus	2,087	3,506	1,214	832	100,896,000	3,506	2,087	259,875,000
Eagle Lake	1,876	3,453	858	521	47,399,000	3,453	1,876	168,646,000
Weimar	1,232	1,965	569	360	62,010,000	1,965	1,232	171,576,000
Fayette County	**10,515**	**15,787**	**10,172**	**6,465**	**721,457,000**	**13,849**	**9,204**	**1,004,425,000**
Carmine	125	184	184	125	16,978,000	184	125	16,978,000
Flatonia	847	1,377	0	0	0	172	109	13,543,000
La Grange	2,545	4,456	2,442	1,187	141,833,000	4,456	2,545	308,041,000
Lampasas County	**4,467**	**8,940**	**853**	**500**	**58,953,000**	**1,208**	**783**	**85,436,000**
Kempner	447	970	0	0	0	0	0	0
Lampasas	3,884	6,818	1,194	522	70,078,000	3,947	2,427	273,683,000
Lometa	638	767	24	11	750,000	767	638	41,863,000
Lee County	**4,957**	**9,388**	**5,734**	**3,062**	**310,666,000**	**6,835**	**3,658**	**364,938,000**
Lexington	756	1,166	0	0	0	786	534	49,330,000
Giddings	3,159	5,103	3,833	2,139	208,311,000	5,103	3,159	309,504,000

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Llano County	**8,310**	**10,381**	**190**	**194**	**17,839,000**	**339**	**354**	**33,351,000**
Llano	2,268	3,311	1	3	86,000	1,765	1,158	122,371,000
Horseshoe Bay	2,770	2,648	1,016	796	122,598,000	2,234	2,269	329,704,000
Sunrise Beach	897	704	0	0	0	0	0	0
Mason County	**1,555**	**1,635**	**80**	**132**	**14,230,000**	**108**	**176**	**18,722,000**
Mason	1,399	2,103	0	0	0	0	0	0
Matagorda County	**9,942**	**14,429**	**9,064**	**5,329**	**484,689,000**	**13,514**	**8,394**	**808,384,000**
Bay City	8,359	18,709	9,468	4,078	506,223,000	18,709	8,359	1,011,160,000
Palacios	2,449	4,819	1,799	903	94,258,000	4,819	2,449	236,596,000
McCulloch County	**Not Participating**							
Brady	3,776	5,308	648	414	20,894,000	3,267	2,345	167,280,000
Mills County	**1,956**	**3,177**	**513**	**256**	**26,358,000**	**868**	**512**	**56,321,000**
Goldthwaite	1,172	1,795	52	27	2,207,000	1,582	1,037	109,873,000
San Saba County	**2,438**	**3,338**	**894**	**350**	**58,279,000**	**1,425**	**708**	**83,383,000**
San Saba	1,603	2,498	234	121	10,931,000	2,498	1,603	157,499,000
Travis County	**Not Participating**							
Briarcliff	49,863	862	0	0	0	0	0	0
Jonestown	705	1,553	0	0	0	0	0	0
Lago Vista	2,557	4,213	0	0	0	0	0	0
Lakeway	4,174	8,130	0	0	0	0	0	0
Mustang Ridge	369	983	510	178	19,018,000	909	334	34,905,000
Point Venture	396	420	0	0	0	0	0	0
San Leanna	183	384	0	0	0	0	0	0
Volente	303	363	0	0	0	0	0	0

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
West Lake Hills	1,355	2,875	0	0	0	0	0	0
Wharton County	**9,282**	**19,968**	**16,192**	**7,400**	**864,588,000**	**19,913**	**9,249**	**1,053,870,000**
East Bernard	873	1,729	465	217	23,543,000	1,729	873	92,899,000
El Campo	5,676	10,604	3,637	2,040	229,820,000	10,604	5,676	641,235,000
Wharton	4,143	8,887	1,985	829	98,412,000	8,887	4,143	499,567,000
Williamson County	**35,618**	**94,616**	**10,418**	**3,810**	**731,189,000**	**39,307**	**14,667**	**2,839,388,000**
Cedar Park	9,484	25,617	5,979	2,256	476,653,000	20,148	7,417	1,430,355,000
Florence	538	1,054	0	0	0	0	0	0
Hutto	551	1,134	204	78	14,019,000	960	453	78,545,000
TOTALS	**279,023**	**451,402**	**127,477**	**61,439**	**7,466,083,000**	**285,711**	**142,448**	**17,813,206,000**

Source: Railroad Commission of Texas

Table 17-3. Potential Impact Due to Oil Pipelines by Jurisdiction

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Bastrop County	**16,996**	**41,354**	**7,898**	**3,172**	**345,970,000**	**15,152**	**6,399**	**714,287,000**
Bastrop	3,494	5,933	63	27	2,464,000	240	108	10,468,000
Elgin	2,649	6,063	0	0	0	0	0	0
Smithville	2,664	4,383	212	99	13,426,000	323	163	21,530,000
Blanco County	**3,620**	**5,591**	**1,458**	**852**	**106,326,000**	**2,719**	**1,632**	**192,249,000**
Johnson City	937	1,247	0	0	0	0	0	0
Brown County	**Not Participating**							
Brownwood	10,320	19,091	0	1	297,000	1,606	766	125,278,000
Burnet County	**10,339**	**18,584**	**1,170**	**531**	**74,218,000**	**2,253**	**1,043**	**129,341,000**
Bertram	582	1,000	0	0	0	945	549	52,404,000
Burnet	2,531	4,755	0	0	0	0	0	0
Cottonwood Shores	372	704	0	0	0	0	0	0
Granite Shoals	1,935	2,303	0	0	0	0	0	0
Highland Haven	321	453	0	0	0	0	0	0
Marble Falls	2,982	5,070	0	0	0	0	0	0
Meadowlakes	693	1,278	0	0	0	0	0	0
Colorado County	**6,089**	**11,466**	**3,017**	**1,708**	**192,617,000**	**5,217**	**2,904**	**314,387,000**
Columbus	2,087	3,506	0	0	0	0	0	0
Eagle Lake	1,876	3,453	51	24	2,415,000	2,548	1,502	132,743,000
Weimar	1,232	1,965	464	288	42,061,000	1,965	1,232	171,576,000
Fayette County	**10,515**	**15,787**	**4,697**	**2,925**	**340,102,000**	**9,204**	**5,960**	**650,630,000**
Carmine	125	184	0	0	0	0	0	0

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Flatonia	847	1,377	385	206	13,655,000	1,377	847	73,581,000
La Grange	2,545	4,456	0	0	0	0	0	0
Lampasas County	**4,467**	**8,940**	**52**	**30**	**3,242,000**	**52**	**36**	**3,879,000**
Kempner	447	970	0	0	0	0	0	0
Lampasas	3,884	6,818	0	0	0	0	0	0
Lometa	638	767	0	0	0	0	0	0
Lee County	**4,957**	**9,388**	**2,948**	**1,425**	**143,209,000**	**4,346**	**2,161**	**212,347,000**
Lexington	756	1,166	0	0	0	0	0	0
Giddings	3,159	5,103	6	9	551,000	962	257	29,865,000
Llano County	**8,310**	**10,381**	**0**	**0**	**0**	**0**	**0**	**0**
Llano	2,268	3,311	0	0	0	0	0	0
Horseshoe Bay	2,770	2,648	0	0	0	0	0	0
Sunrise Beach	897	704	0	0	0	0	0	0
Mason County	**1,555**	**1,635**	**80**	**132**	**14,230,000**	**108**	**176**	**18,722,000**
Mason	1,399	2,103	0	0	0	0	0	0
Matagorda County	**9,942**	**14,429**	**3,032**	**1,378**	**140,710,000**	**7,817**	**3,773**	**373,887,000**
Bay City	8,359	18,709	968	450	50,336,000	9,117	4,862	540,323,000
Palacios	2,449	4,819	0	0	0	0	0	0
McCulloch County	**Not Participating**							
Brady	3,776	5,308	0	0	0	0	0	0
Mills County	**1,956**	**3,177**	**332**	**203**	**19,047**	**634**	**375**	**36,225,000**
Goldthwaite	1,172	1,795	0	0	0	0	0	0
San Saba County	**2,438**	**3,338**	**224**	**181**	**11,242**	**317**	**291**	**16,198,000**
San Saba	1,603	2,498	0	0	0	0	0	0

JURISDICTION	TOTAL BUILD-INGS IN JURIS-DICTION	TOTAL POPULATION IN JURISDICTION	IMMEDIATE IMPACT (500 METERS)			SECONDARY IMPACT (2,500 METERS)		
			NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)	NUMBER PEOPLE AT RISK	NUMBER BUILDINGS AT RISK	VALUE OF BUILDINGS AT RISK ($)
Travis County	**Not Participating**							
Briarcliff	49,863	862	0	0	0	0	0	0
Jonestown	705	1,553	0	0	0	0	0	0
Lago Vista	2,557	4,213	0	0	0	0	0	0
Lakeway	4,174	8,130	0	0	0	0	0	0
Mustang Ridge	369	983	0	0	0	150	55	5,117,000
Point Venture	396	420	0	0	0	0	0	0
San Leanna	183	384	0	0	0	0	0	0
Volente	303	363	0	0	0	0	0	0
West Lake Hills	1,355	2,875	0	0	0	0	0	0
Wharton County	**9,282**	**19,968**	**2,511**	**1,208**	**$128,352**	**4,915**	**2,357**	**242,837,000**
East Bernard	873	1,729	0	0	0	0	0	0
El Campo	5,676	10,604	0	0	0	111	39	3,727,000
Wharton	4,143	8,887	0	0	0	0	0	0
Williamson County	**35,618**	**94,616**	**4,933**	**2,007**	**336,076**	**9,434**	**3,990**	**635,939,000**
Cedar Park	9,484	25,617	0	0	0	0	0	0
Florence	538	1,054	0	0	0	0	0	0
Hutto	551	1,134	136	88	23,769,000	1,134	551	91,087,000
TOTALS	**279,023**	**451,402**	**34,637**	**16,944**	**1,510,092,717**	**82,646**	**42,028**	**4,798,627,000**

Source: Railroad Commission of Texas

Section 18 – Terrorism

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Hazard Profile

Terrorism can strike not just large cities, but in communities of any size. While no amount of planning and mitigation can remove 100-percent of the risk from terrorism, hazard mitigation and preparedness can help reduce the risk.

Terrorism is the use of force or violence against persons or property in violation of criminal laws of the United States for purposes of intimidation, coercion, or ransom. Terrorists often use threats to create fear among the public, to convince citizens that government is powerless to prevent terrorism, and to get immediate publicity for their causes. Weapons of mass destruction (WMD), including incendiary, explosive, chemical, biological, radiological, and nuclear agents, have the capability to cause death or serious bodily injury to a significant number of people, thus posing the threat of a catastrophic incident. Terrorism includes the following hazards:

- Conventional bomb
- Biological agent
- Chemical agent
- Nuclear bomb
- Radiological agent
- Arson/incendiary attack
- Armed attack
- Agriterrorism
- Intentional hazardous materials release
- Assaults on the infrastructure and electronic information systems that could result in consequences affecting human life, health and safety

The Federal Bureau of Investigation (FBI) categorizes terrorism in the United States as one of two types—domestic terrorism or international terrorism. Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction. International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States, or whose activities transcend their national boundaries.

A terrorist attack can take several forms, depending on the technological means available to the terrorist, the nature of issue motivating the attack, and the points of weakness of the terrorist's target. Bombings are the most frequently used terrorist method in the United States. A terrorist using a chemical or biological weapon is of particular concern to officials. Special training and equipment is needed in order to safely manage a WMD incident.

Biological agents are infectious microbes or toxins used to produce illness or death in people, animals or plants. Biological agents can be dispersed as aerosols or airborne particles. Terrorists may use biological agents to contaminate food or water because they are extremely difficult to detect.

Chemical agents kill or incapacitate people, destroy livestock, or ravage crops. Some chemical agents are odorless and tasteless and are therefore difficult to detect. They can have an immediate effect (a few seconds to a few minutes) or a delayed effect (several hours to several days).

The Department of Defense estimates that as many as 26 nations may possess chemical agents and/or weapons and an additional 12 may be seeking to develop them. The Central Intelligence Agency reports that at least ten countries are believed to possess or to be conducting research on biological agents for weaponization.

Whether intentional or accidental, terrorist incidents – as with other natural and technological disasters – involve the application of one or more modes of harmful force to the built environment. These modes include contamination (as in the case of chemical, biological radiological or nuclear hazards), energy (explosives, arson, and even electromagnetic waves), or denial of service (sabotage, infrastructure breakdown, and transportation service disruption).

Location

There is no distinct geographic boundary to the threat of terrorism. An event is possible throughout the TCRFC.

Spatial Extent

There are heightened periods of risk for terrorism based on intelligence and other information. A potential terrorist event could devastate the community physically, economically and psychologically for many years to come. Warning time for terrorism is minimal to none.

Historical Occurrences

The history of terrorism on United States soil includes the attacks of September 11, 2001, on the World Trade Center in New York and the Pentagon in Washington, D.C. and the ensuing anthrax attacks; the 1995 bombing of the Murrah Federal Building in Oklahoma City; and earlier bombing of the World Trade Center in 1993.

No community in the Lower Colorado River Basin has experienced a terrorist act. While we may not be able to prevent an attack, it is well within our ability to lessen the likelihood and/or the potential effects of an incident. Cities in the basin continue to improve their readiness to respond to a terrorist incident through participation in state and federal programs that provide training and equipment for agencies that would respond to a local terrorist incident, and in exercises that help to improve agency coordination and test local response plans.

Probability of Future Events

The types, frequencies, and locations of many natural hazards are identifiable and, even in some cases, predictable. They are governed by the laws of physics and nature. Malevolence, however, cannot be forecast with any accuracy. There is, therefore, some potential for most, if not all, types of intentional terrorist acts to occur anywhere and at any time.

Vulnerability Assessment

There is no defined geographic boundary for a terrorist event. All population, buildings, critical facilities, infrastructure and lifelines and hazardous materials facilities are considered exposed to the hazards of terrorism and could potentially be impacted.

The Homeland Security Advisory System, issued by the U.S. Department of Homeland Security, is a color-coded terrorism warning system that sets out five threat levels. Terrorism Warning Threat Levels are described in Table 18-1.

Table 18-1. Terrorism Warning System Threat Levels[1]

Color	Threat Level	Governmental actions to be taken
Green	Low: Low risk of	Requires "protective measures" such as regularly assessing facilities for weaknesses and finding ways to reduce them, and making sure State and local government employees are trained to handle

[1] Department of Homeland Security

Color	Threat Level	Governmental actions to be taken
	attacks.	terrorism situations.
Blue	Guarded: General risk of attacks.	Requires government agencies to review and update emergency response procedures and communications systems, as well as provide the public with necessary information.
Yellow	Elevated: Significant risk of attacks.	Includes increasing surveillance of critical locations, coordinating emergency plans with nearby jurisdictions and implementing contingency and emergency response plans.
Orange	High: High risk of attacks.	Requires coordinating necessary security efforts with armed forces or law enforcement agencies, taking additional precautions at public events, preparing to work at an alternative site or with a dispersed workforce and restricting access to essential personnel.
Red	Severe: Severe risk of attacks.	Includes assigning emergency response personnel and setting up specially trained teams; monitoring, redirecting, or constraining transportation systems; closing public and government facilities; and increasing or redirecting personnel to address emergency needs.

The current threat level may be found at:
http://www.dhs.gov/xinfoshare/programs/Copy_of_press_release_0046.shtm.

The Red Cross also issues Advisory System Recommendations for individuals, families, neighborhoods, schools and businesses for each alert level. These may be found at: www.redcross.org.

Impact

Terrorist events can have a substantial severity of impact. They can cause multiple deaths, completely shut down facilities for thirty days or more, and cause more than fifty percent of affected properties to be destroyed or suffer major damage.

Section 19 –Capability Assessment

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This section of the Plan discusses the capability of the jurisdictions in the TCRFC to implement hazard mitigation activities. In addition this section will address previously implemented mitigation measures, excluding mitigation actions submitted in the 2004 Plan[1].

What is a Capability Assessment?

A capability assessment is an analysis tool distributed to each community in the form of a survey, the results of which are used to:

- Inventory a jurisdiction's relevant plans, programs and ordinances;
- Identify shortfalls or weaknesses that could hinder mitigation actions;
- Implement a comprehensive mitigation strategy;
- Identify opportunities for establishing or enhancing mitigation policies, programs or projects; and
- Establish goals based on an understanding of the organizational capacity and technical capability of a community.

In addition to providing an inventory of each jurisdiction's programs and plans in place, the capability assessment also helps communities to prioritize actions through the STAPLEE criteria by determining if mitigation actions are practical and likely to be implemented over time given the local planning and regulatory framework, level of administrative and technical support, amount of fiscal resources and current political climate. Further, a capability assessment highlights the positive mitigation measures already in place or being implemented at the local government level, which should continue to be supported and enhanced through future mitigation efforts.

The capability assessment serves as a critical planning step and an integral part of the foundation for designing an effective hazard mitigation strategy. When combined with the Risk Assessment, the Capability Assessment helps communities to specify mitigation actions and ensure that those are achievable given current capabilities and limitations of each community.

[1] These actions are found in Sections 21-25.

Conducting the Capability Assessment

During the regional kickoff meetings[2], a detailed Capability Assessment Survey was distributed to planning team members. The survey requested information regarding existing local plans, policies, programs or ordinances that contribute to and/or hinder the ability to implement hazard mitigation actions. Other indicators included information related to each jurisdiction's fiscal, administrative and technical capabilities, such as access to local budgetary and personnel resources for mitigation purposes. Survey respondents were also asked to comment on the current political climate with respect to hazard mitigation.

The results of the survey (presented below) provide an inventory of existing plans and ordinances, but also reflect each community's self-assessment of their specific capabilities. Table 19-1 depicts the result of the self-assessment for each community. This allows each jurisdiction to review and improve upon any identified gaps or weaknesses.

Capability Assessment Findings

The findings of the capability assessment are summarized in this Plan Update to provide insight into the relevant capacity of jurisdictions to implement hazard mitigation activities. All information is based upon the input provided by local government officials through the Capability Assessment Survey.

Planning and Regulatory Capability

Planning and regulatory capability is based on the implementation of plans, ordinances and programs that demonstrate a local jurisdiction's commitment to guiding and managing growth, development and redevelopment in a responsible manner, while maintaining the general welfare of the community. It includes emergency response and mitigation planning, comprehensive land use planning and transportation planning, in addition to the enforcement of zoning or subdivision ordinances and building codes that regulate how land is developed and structures are built, as well as protecting environmental, historic and cultural resources in the community. These planning initiatives generally present significant opportunities to integrate hazard mitigation principles and practices into the local decision making process.

This assessment is designed to provide a general overview of the key planning and regulatory tools or programs in place or under development, along with their potential effect on loss reduction. This information will help identify opportunities to address existing gaps, weaknesses or conflicts with other initiatives in addition to integrating the implementation of this Plan with existing planning mechanisms where appropriate.

[2] See Section 2 and Appendix E for dates and descriptions.

Hazard Mitigation Action Plan (HMAP)

A hazard mitigation plan represents a community's blueprint for how they intend to reduce the impact of natural and human-caused hazards on people and the built environment. Elements of a hazard mitigation plan include a risk assessment, capability assessment and mitigation strategy. Survey results indicate that all participating communities have developed or are developing hazard mitigation plans, as theses communities are either participating in the in an update to their 2004 plan through the TCRFC, or are receiving a mitigation plan for the first time through this Plan Update. One hundred (100) percent of jurisdictions reported that they had a hazard mitigation plan in place at the time of the survey or were currently developing a plan through the update process.[3]

Disaster Recovery Plan

A disaster recovery plan serves to guide the physical, social, environmental and economic recovery of a community, including the physical reconstruction process following a disaster. Survey results indicate that twelve counties have developed or are currently developing disaster recovery plans. Sixty-three (63) percent of the municipalities surveyed indicated that they had a disaster recovery plan in place or under development.

Emergency Management or Operations Plan

An emergency operations plan outlines the responsibilities of those responding to an emergency or disaster and the means by which resources are deployed. Survey results indicate that all 14 participating counties[4] have emergency operation plans. In addition all counties participating have an evacuation plan in place as either a stand-alone plan or part of their Emergency Operations Plan.

Almost all municipalities have an Emergency Plan as well or are developing one, either specifically for the municipality or in conjunction with their respective county. Only two communities do not have or are not developing emergency operations or management plans at the time of the survey, the Village of Volente in Travis County and the City of Florence in Williamson County. Due to the results of the assessment, the Village of Volente has added a mitigation action (See Section 23, page 137) to develop an Emergency Management Plan.

[3] Each participating county and municipality will have a hazard mitigation plan in place once this planning process is complete.

[4] Three counties (Brown, McCulloch, and Travis) are not participating in the Update Plan, yet jurisdictions within the each county are.

Continuity of Operation Plan (COOP)

A continuity of operations plan establishes a clear chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster. Of the fourteen (14) counties participating in the Plan, ten (10) either have or are developing a Continuity of Operation Plan. Twenty-three (23) municipalities or forty-nine (49) percent of the municipalities reporting have a COOP in place or were in the process of developing one.

Comprehensive Plan:

A comprehensive plan establishes the overall vision for a community and helps to guide municipal decision making. Survey results indicate that five (5) counties have comprehensive plans, and thirty-four (34) municipalities have comprehensive plans in place, are part of a county plan or are in the processing of developing a plan.

Capital Improvements Plan

A capital improvement plan guides the scheduling of spending on public improvements. A capital improvement plan can serve as an important mechanism to guide future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments. Survey results indicate that four (4) counties have or are developing a capital improvement plan; while twenty-eight (28) municipalities or sixty (60) percent have capital improvement plans.

Historic Preservation Plan

A historic preservation plan is intended to preserve historic structures or districts within a community. An often overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards to include the identification of the most effective way to reduce future damages.[5] This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of a hazard-prone area. Four (4) of the fourteen counties surveyed have or are developing a historic presentation plan, and thirteen (13) municipalities surveyed have a historic preservation plan.

[5] See Protecting the Past from Natural Disasters. 1989. Nelson, Carl. National Trust for Historic Preservation: Washington, D.C.

Zoning Ordinances

Zoning represents the means by which land use is controlled by local governments. As part of a community's police power, zoning is used to protect the public health, safety and welfare. A zoning ordinance is the mechanism through which zoning is typically implemented. Since zoning regulations enable municipal governments to limit the type and density of development, it can serve as a powerful tool when applied in identified hazard areas. No counties have a zoning ordinance.[6] Forty (40) municipalities or eighty-five (85) percent of the participating municipalities have zoning ordinances.

Subdivision Ordinances

A subdivision ordinance is intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Twelve (12) of the Fourteen (14) participating counties implement subdivision ordinances[7], and almost all of the municipalities have subdivision ordinances. At the time of the survey forty-three (43) communities or ninety-one (91) percent of the municipalities indicated that they enforce subdivision ordinances.

Building Codes, Permitting and Inspections

Building codes regulate construction standards. Decisions regarding the adoption of building codes, the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community. Only one county reported the enforcement of building codes.[8] Forty-three (43) communities or ninety-one (91) percent of the municipalities indicated that they enforce building codes.

Floodplain Management Capability

Flooding represents the greatest natural hazard facing the nation and the TCRFC planning area. At the same time, the tools available to reduce the impacts associated with flooding are among the most developed when compared to other hazard-specific mitigation techniques.

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[6] Counties do not have the statutory right to implement zoning (See Chapter 231 of the Texas Local Government Code).

[7] Unlike zoning regulation, counties do have the right to implement subdivision ordinance (See Chapter 232 of the Texas Local Government Code).

[8] Counties do not have the authority to adopt building codes, unless needed for fire safety for certain public and commercial buildings (See Chapter 233, Section 233.032 of the Texas Local Government Code).

Floodplain Management Plan

A floodplain management plan provides a framework for action regarding the corrective and preventative measures in place to reduce flood-related impacts. Almost all of the counties have a flood mitigation plan in place or under development (twelve out of fourteen). In addition thirty-eight (38) municipalities or eighty-one (81) percent have or are developing a floodplain management plan.

Flood Response Plan

A Flood Response plan addresses future flood events in terms of proactive remediation measures to minimize flood hardships and losses. Seven (7) counties and twenty-six (26) cities have or are developing flood response plans either as stand-alone plans or as part of the floodplain management plans.

Flood Mitigation Plan

The purpose of a Flood Mitigation plan is to evaluate existing flood conditions and recommend flood mitigation and land development alternatives in floodprone areas. Two counties, Matagorda and Wharton, and their respective cities, have flood mitigation plans. The actions from these plans have been included in Section 22. In addition both plans are incorporated with the Plan Update as Appendix H.

Stormwater Management Plan

A stormwater management plan is designed to address flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding. Survey results indicate that four (4) counties have a stormwater management plan, and twenty-five municipalities or fifty-three (53) percent have or are developing stormwater management plans.

Growth Management and Protection Plans

In addition to the plans and ordinances detailed above, several communities have implemented or are developing Open Space Management Plans and Natural Resource Protection Plans, which provide solutions for protecting land and resources for growing communities.

Open Space Management Plans

Open Space Management plans describe a process and recommend strategies and solutions for handling open space issues for outdoor recreational or open habitat areas of land. At the time of the survey, two counties and twenty-five municipalities had or were developing an open space management plan.

Natural Resource Protection Plans

Natural Resource Protection plans provide recommendations for how to best protect the sustainability of natural resources. Three (3) counties and six (6) municipalities have natural resource protection plans in place as a stand-alone plan or part of a comprehensive plan.

Jurisdictional Assessment

Table 19-1, below, depicts the results of each community's self-assessment. In the table, "L" denotes "Limited"; "M" is "Moderate"; and "H" is "High". Of the sixty-one (61) participating jurisdictions, twenty-five (25) communities or forty-one (41) percent ranked their community as having a limited overall capability. Another twenty-five (25) communities ranked their capability overall as moderate. Only eleven (11) jurisdictions or eighteen (18) percent assessed their capability as "high".

Table 19-1. Self-Assessment for Capability by Jurisdiction

County	Participating Jurisdiction	Planning / Regulatory	Technical Capability	Fiscal Capability	Political Capability	Overall Capability
Bastrop County	Bastrop County	M	H	L	H	M
	Bastrop	H	H	M	M	H
	Elgin	H	H	L	M	M
	Smithville	M	L	L	L	L
Blanco County	Blanco County	L	L	L	M	L
	Johnson City	H	M	L	L	M
Brown County	Brownwood	M	M	M	H	M
Burnet County	Burnet County	L	M	L	M	M
	Bertram	M	L	L	M	M
	Burnet	H	H	M	H	H
	Cottonwood Shores	L	L	L	M	L

County	Participating Jurisdiction	Planning / Regulatory	Technical Capability	Fiscal Capability	Political Capability	Overall Capability
	Granite Shoals	M	M	M	H	M
	Highland Haven	L	L	L	M	L
	Marble Falls	H	M	M	H	H
	Meadowlakes	L	L	L	L	L
Colorado County	Colorado County	L	L	L	L	L
	Columbus	M	L	L	M	M
	Eagle Lake	M	M	L	M	M
	Weimar	M	L	L	M	L
Fayette County	Fayette County	L	L	L	L	L
	Carmine	L	L	L	L	L
	Flatonia	L	L	L	M	L
	La Grange	L	M	L	M	M
Lampasas County	Lampasas County	M	M	M	M	M
	Kempner	L	L	M	L	L
	Lampasas	M	M	L	M	M
	Lometa	M	M	L	H	M
Lee County	Lee County	L	L	L	M	L
	Giddings	L	L	L	L	L
	Lexington	L	L	L	L	L
Llano County	Llano County	M	L	L	M	M
	Horseshoe Bay	M	H	H	H	H
	Llano	L	M	H	H	M
	Sunrise Beach Village	M	M	M	M	M
Mason County	Mason County	M	L	L	L	L
	Mason	M	L	L	L	L
Matagorda County	Matagorda County	H	M	M	H	H
	Bay City	M	H	H	H	H
	Palacios	M	L	M	M	M
McCulloch County	Brady	H	H	M	H	H
Mills County	Mills County	M	L	M	L	M
	Goldthwaite	H	M	L	L	M
San Saba	San Saba County	L	M	L	L	L

County	Participating Jurisdiction	Planning / Regulatory	Technical Capability	Fiscal Capability	Political Capability	Overall Capability
County	San Saba	M	M	L	L	M
Travis County	Briarcliff	L	L	L	L	L
	Jonestown	L	L	L	M	L
	Lago Vista	M	M	L	M	M
	Lakeway	H	H	H	H	H
	Mustang Ridge	L	L	L	L	L
	Point Venture	M	L	M	M	M
	San Leanna	M	L	L	L	L
	Volente	L	L	L	L	L
	West Lake Hills	H	H	H	M	H
Wharton County	Wharton County	L	M	L	L	L
	East Bernard	L	L	L	L	L
	El Campo	M	M	L	M	M
	Wharton	M	H	M	M	M
Williamson County	Williamson County	L	M	M	H	M
	Cedar Park	H	H	H	H	H
	Florence	L	L	L	M	L
	Hutto	H	H	H	H	H

Previously Implemented Mitigation Measures

The success of future mitigation efforts in a community can be gauged to some extent by its past efforts. Previously implemented mitigation measures indicate that there is, or has been, a desire to reduce the effects of natural hazards, and the success of these projects can be influential in building local government support for new mitigation efforts. The TCRFC has implemented a wide range of hazard mitigation measures, particularly as it relates to the flood and hurricane hazards.

Federal Emergency Management Programs

The Texas Colorado River Floodplain Coalition examined the effectiveness of a range of previously implemented hazard mitigation measures as it formulated mitigation action plans for this Plan. The effectiveness of each previously implemented mitigation program was evaluated based on the following criteria: effect on overall risk to life and property, ease of implementation, and political

and community support. Actions included in the 2004 Plan are analyzed in the mitigation action sections of this Update: Sections 21-25.

Through the Hazard Mitigation Grant Program (HMGP), FEMA has financially assisted the State and TCRFC jurisdictions to permanently reduce or eliminate future damages and losses due to natural hazards through safer building practices and improving existing structures and supporting infrastructure. The HMGP currently provides post-disaster funds equal to 15 percent of obligations for individual and public assistance, which can be used anywhere in the State. Grants are for planning and projects, including acquisition of real property, relocation and demolition of structures, seismic retrofitting, strengthening of existing structures, initial implementation of vegetative management programs, elevation of residential structures, elevation or dry flood-proofing of non-residential structures, and other activities that bring a structure into compliance with the floodplain management requirements of the National Flood Insurance Program.

The Hurricane Preparedness Program-Mitigation (HPP-M) w gives grants to improve hurricane preparedness. The Unmet Needs Program of the Department of Housing and Urban Development provides funding to rebuild viable communities affected by natural disasters.

The Small Business Administration loans, or SBA, provide low interest disaster loans to homeowners, renters, businesses and non-profits to repair or replace real estate damaged or destroyed in a disaster.

The Individual Assistance Program (IA), provides a wide range of aid, including emergency home repair, temporary disaster housing and replacement grants for serious disaster-related needs and expenses not covered by insurance or other assistance programs.

Table 19-2 shows, by jurisdiction, the projects funded under FEMA grant programs.

Table 19-2. Federal Mitigation Projects for TCRFC Jurisdictions

County	Program	Jurisdiction	Type of Project
Matagorda County	SBA and Individual Assistance	Matagorda County	Repair/replace for property damaged after Hurricane Ike
Wharton	HMGP-unmet needs	City of Wharton	Floodproofing
	Unmet Needs	City of Wharton	Elevation
Fayette	HMGP-DR-1257	Fayette County	Acquisition

County	Program	Jurisdiction	Type of Project
Travis	HMGP-DR-1179	Travis County	Warning
	HMGP and Unmet Needs	Travis County	Acquisition (3)
Blanco	HMGP-DR-1179	GBRA	Warning
	HMGP-DR-1179	GBRA	Public Awareness
Burnet	HMGP -DR-930	City of Marble Falls	Culverts
	HMGP-DR-1179	City of Marble Falls	Acquisition
	HMGP – DR-1709	Burnet County and the City of Highland Haven	Repair/Replace Culverts

The development of this Plan Update is funded under FEMA's Hazard Mitigation Grant Program (HMGP). The HMGP was authorized by the Disaster Mitigation Act of 2000 to supply funds for States and communities to institute cost-effective hazard mitigation activities that complement a comprehensive hazard mitigation program and reduce injuries, loss of life, and damage to and destruction of property. Assistance includes planning and project grants. Eligible activities include planning, assessing risks, and implementing cost-effective loss-reduction measures.

Public Assistance (PA) Projects

FEMA's Public Assistance (PA) grant program is available to states, local governments and eligible non-profits following a presidentially-declared disaster. PA grants focus on emergency measures such as debris removal, costs associated with operational response, and the repair and reconstruction of damaged infrastructure and are separated by category. PA categories include the following[9]:

- **Category A**: Debris Removal - Clearance of trees and woody debris; building wreckage, sand, mud, silt and gravel; vehicles; and other material deposited on public and, in very limited cases, private property;

[9] Source: www.FEMA.gov

- **Category B**: Emergency Protective Measures - Measures taken before, during and immediately after a disaster to save lives, protect public health and safety, and protect improved public and private property;
- **Category C**: Roads and Bridges - Repair of roads, bridges, shoulders, ditches, lighting and signs;
- **Category D**: Water Control Facilities - Repair of irrigation systems, drainage channels and pumping facilities; repair of levees, dams and flood control channels is eligible but limited;
- **Category E**: Buildings and Equipment - Repair or replacement of public buildings, including contents and systems; heavy equipment; and vehicles;
- **Category F:** Utilities - Repair of water treatment and delivery systems; power generation facilities and distribution lines; and sewage collection and treatment facilities; and
- **Category G**: Parks, Recreational Facilities, Other - Repair and restoration of parks, playgrounds, pools, cemeteries and beaches; work otherwise not covered in categories A-F

Table 19-3 lists PA projects as supplied by the Governor's Division of Emergency Management (GDEM).

Table 19-3. PA Projects in the TCFC Regions

County	Presidential Disaster	Category	Number of Projects	Total Amount
Bastrop	DR-1624-TX	B	2	$39,821.31
	DR-1606-TX	B	2	$13,507.08
	DR-1257-TX	A	1	$31,703.00
		B	5	$21,470.52
		C	62	$692,942.08
		F	2	$5,065.00
		G	4	$62,095.78
Blanco	DR-1624-TX	B	2	$7,989.45
	DR-1425-TX	A	2	$2,540.93
		B	2	$2,854.48
		C	13	$90,522.90

County	Presidential Disaster	Category	Number of Projects	Total Amount
		D	1	$3,240.80
		F	1	$20,000.00
		G	1	$5,970.00
Brown	DR-1709-TX	B	1	$5,314.30
		C	52	$1,391,126.14
	DR-1425-TX	A	2	$8,581.53
		B	1	$58,713.47
		C	22	$353,447.22
		F	2	$13,045.52
		G	4	$56,896.04
Burnet	DR -1709-TX	A	6	$284,187.74
		B	10	$362,869.88
		C	101	$1,879,383.91
		E	6	$21,285.65
		F	8	$780,442,55
		G	9	$695,395.30
	DR-1624-TX	B	2	$8,597.70
	DR-1425-TX	A	1	$1,156.19
		C	13	$160,014.14
Colorado	DR-1606-TX	B	4	$21,711.28
	DR-1257-TX	C	13	$322,004.19

County	Presidential Disaster	Category	Number of Projects	Total Amount
		F	1	$9,970.80
Fayette	DR-1624-TX	B	2	$1,864.67
	DR-1606-TX	B	2	$8,580.36
	DR-1257-TX	A	1	$1,464.00
		B	1	$1,776.00
		C	3	$42,947.00
		F	1	$10,185.00
Lampasas	DR-1709-TX	A	1	$1,066.68
		B	1	$6,331.81
		C	47	$360,324.98
	DR-1624-TX	B	2	$10,430.57
Lee	DR-1624-TX	B	2	$1,777.27
Llano	DR-1709-TX	A	1	$5,460.00
		B	3	$18,416.85
		C	30	$139,236.64
		E	1	$1,000.00
		F	14	$135,099.98
		G	1	$5,722.00
	DR-1624-TX	B	2	$7,195.42
Mason	DR-1791-TX	C	12	$149,983.03

County	Presidential Disaster	Category	Number of Projects	Total Amount
Matagorda[10]	DR-1791-TX	A	3	$271,726.38
		B	17	$149,052.66
		C	3	$393,264.01
		E	1	$1,385.00
		G	2	$544,272.31
	DR-1606-TX	B	6	$148,068.59
	DR-1479-TX	A	13	$333,468.79
		B	6	$42,256.99
		C	9	$135,556.16
		E	26	$255,608.80
		G	2	$6,356.95
	DR-1257-TX	A	2	$8,069.00
		D	1	$14,180.00
		G	1	$18,302.00
McCulloch	DR-1709-TX	C	74	$1,183,008.27
		B	2	$15,621.15
Mills	DR-1709-TX	C	113	$2,267,052.11
	DR-1624-TX	B	2	$4,099.07
San Saba	DR-1709-TX	C	31	$1,104,999.77
	DR-1425-TX	C	91	$941,011.33

[10] Public Assistance was declared for Matagorda County for DR-1245-TX, but records are not available.

County	Presidential Disaster	Category	Number of Projects	Total Amount
Travis	DR-1624-TX	B	2	$7,936.58
	DR-1606-TX	B	7	$710,224.35
	DR-1257-TX	A	5	$70,136.27
		B	24	$144,861.59
Wharton	DR-1791-TX	A	3	$159,229.29
		B	5	$49,899.76
		C	1	$1,446.14
	DR-1606-TX	B	2	$98,164.32
	DR-1257-5X	A	4	$52,731.24
		B	25	$230,352.06
		C	39	$276,802.99
		D	1	$21,640.00
		E	3	$75,191.31
		F	4	$156,897.11
		G	4	$30,852.36
Williamson	DR-1709-TX	A	3	$25,146.60
		B	7	$45,405.62
		C	6	$202,057.10
		F	2	$5,421.53
		G	8	$312,716.66
	DR-1624-TX	B	2	$9,631.91

County	Presidential Disaster	Category	Number of Projects	Total Amount
	DR-1606-TX	B	2	$115,948.51
			TOTAL	**$18,912,465.14**

U.S. Army Corps of Engineer (USACE) Studies

Information on the U.S. Army Corps of Engineers studies, plans and projects carried out in the last fifteen years was reviewed in the development of this Plan. USACE studies are included below and current and previous USACE projects in the Lower Colorado River Basin are included in Table 19-4.

Previous USACE Studies

U.S. Army Corps of Engineers. Columbus, Texas - Area Subject to Flooding. Map showing high water marks thru Columbus for the 1913, 1935, 1938 floods in Columbus, 1944.

U.S. Army Corps of Engineers. Floodplain Information, Colorado River and Country Club Creek. Austin, Texas, 1975.

U.S. Army Corps of Engineers. Floodplain Information, Colorado River, La Grange, Texas. 1975.

U.S. Army Corps of Engineers. Hydrographs & Mass Curves, Flood of Sept.-Oct. 1936. 1944.

U.S. Army Corps of Engineers, Interim Report and Environmental Assessment Shoal Creek. Austin, Texas. November 1991,

U.S. Army Corps of Engineers. Isohyetal Map Storm of September 8-11, 1921, from the Corps of Engineers' Report of Survey of the Colorado River and Tributaries.

U.S. Army Corps of Engineers. La Grange, Texas - Area Subject to Flooding, 1944. Map showing high water marks thru La Grange for the 1869,1913,1935,1938 floods in La Grange.

U.S. Army Corps of Engineers. Memorandum Report- Flood of 1957. 1959.

U.S. Army Corps of Engineers, Planning Guidance Notebook. April 2000.

U.S. Army Corps of Engineers. Planning – Risk-Based Analysis for Evaluation of Hydrology/Hydraulics, Geotechnical Stability, and Economics in Flood Damage Reduction Studies. March 1996.

U. S. Army Corps of Engineers. Reservoir Operation Mansfield Dam, Flood of June 1935. 1944.

U.S. Army Corps of Engineers. Reservoir Operation Mansfield Dam, Flood of Sept-Oct 1936. 1944.

U.S. Army Corps of Engineers. Reservoir Operation Mansfield Dam, Flood of July and August 1938. 1944.

U.S. Army Corps of Engineers. Reconnaissance Report - Central Colorado River Basin. Colorado, Texas, September 1989.

U.S. Army Corps of Engineers. Report on Flooding April-May 1990. 1990.

U.S. Army Corps of Engineers. Special Flood Hazard Information Report: Barton Creek. Austin, Texas, 1969.

U.S. Army Corps of Engineers. Special Flood Hazard Information Report, Pedernales River, Lyndon B. Johnson National Historic Site and State Park, Gillespie County, Texas. December 1979.

U.S. Army Corps of Engineers. Status Report Colorado River Basin, Texas. September 1987.

Fort Worth District

U.S Army Corps of Engineers, Fort Worth District. Colorado River and Tributaries, Texas. Boggy Creek, Austin, Texas, Design Memorandum No.1. October 1984.

U.S. Army Corps of Engineers, Fort Worth District. Reconnaissance Flood Protection Report, Central Colorado River Watershed, Colorado River Basin, Texas. September 1989.

Hydrologic Engineering Center

U.S. Army Corps of Engineers, Hydrologic Engineering Center. Water Control Software, Forecast and Operations. Davis, California. 1989.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-5 Simulation of Flood Control and Conservation Systems, Users Manual, Version 8.0, October, 1998.

U.S. Army Corps of Engineers, Economic Guidance Memorandum - Generic Depth Damage Relationships. January 2003.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-Geo HEC-RAS, An Extension for Support of HEC-RAS Using ArcView, User's Manual. Version 3.0, April, 2000.

U.S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-FDA. Flood Damage

U.S. Army Corps of Engineers, Hydrologic Engineering Center. 1989. Water Control Software. Forecast and Operations, Davis, California.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. 1990. PREAD Functions. Macros. Menus and Screens. User Information, Davis, California.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. 1991. Real-Time Water Control, Volumes I and II of Training Course Notes, Davis, California.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. 1992. DSSMATH Utility Program for Mathematical Manipulation of HECDSS Data. User Manual, Davis, California.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. August 1997. UNET One-Dimensional Unsteady Flow Through a Full Net Work of Open Channels. User's Manual, Davis, California.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. DSSMATH Utility Program for Mathematical Manipulation of HECDSS Data, Users' Manual. Davis, California. 1992.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. HEC-HMS Hydrologic.Modeling System. Davis, California. October 2001.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. HEC-RAS River Analysis System, Davis, California. January 2001.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. HEC-GeoHEC-RAS, An Extension for Support of HEC-RAS Using ArcView, Users' Manual, Version 3.0. April 2000.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. HEC-FDA Flood Damage Reduction Analysis, Users' Manual, Version 1.0. January 1998.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. HEC-FDA Flood Damage Analysis, Version 1.2, Davis, California. 2000.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. HEC-DSS Users' Guide and Utility Program Manuals. Davis, California. 1995.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. January, 2001. HEC-RAS River Analysis System, Davis, California.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. October, 2001. HEC-HMS Hydrologic Modeling System, Davis, California.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. PREAD Functions, Macros, Menus and Screens, User Information. Davis, California. 1990.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. Real-Time Water Control, Volumes I and II of *Training Course Notes*. Davis, California. 1991.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. UNET One-Dimensional Unsteady Flow Through a Full Network of Open Channels, Users' Manual. Davis, California. August 1997.

U.S. Army Corps of Engineers, Hydrologic Engineering Center. HEC-1 Flood Hydrograph Package. Users' Manual. Davis, California. 1990.

Southwestern Division

U.S. Army Corps of Engineers, Southwestern Division. Southwestern Division Modeling System for the Simulation of the Regulation of a Multi-purpose Reservoir System (SUPER). January 2000.

Table 19-4. USACE Projects in the Lower Colorado River Basin

Project Name	Location	Funding Category	Purpose	Total Cost	Status as of January 2009
Mouth of Colorado River, TX	Matagorda County, Colorado Rover below Gulf Intercoastal Waterway	Construction General	Navigation improvements with related recreational facilities and diversion of Colorado River into Matagorda Bay	$49.9 million	Mouth of the Colorado River project is on-going. Total cost is $25 million.
Colorado River Locks	Matagorda County, at intersection of Colorado river and Gulf Intercoastal Waterway	Operations and Maintenance, General	Operations and maintenance on the locks, constructed for the purpose of aiding tugs and barges cross the Colorado River during periods of high water flow and to prevent siltation of the Gulf Intercoastal Waterway.	Funding provided as part of the Gulf Intercoastal Waterway Project	All Operations and Maintenance Projects are on-going. The Colorado River Locks project is a $10 million dollar project. $5 million is from money USACE received for repairs due to Ike. Tthe $10 million will take 2 years to spend.

Project Name	Location	Funding Category	Purpose	Total Cost	Status as of January 2009
GIWW Modification Colorado River Locks	Brazoria and Matagorda Counties	General Investigations	Study to determine needs and advisability of modifying the configuration of the crossings at the Colorado River Locks on the GIWW to reduce accident traffic and delays.	$9.05 million	All General Investigation projects cover several fiscal years. The GIWW Modification project is "on-hold" as they are coordinating with the sponsor (TxDOT) b/c the sponsor wants to expand the project.
Matagorda Ship Channel	Matagorda County	Operations And Maintenance, General	Provides a 25-mile deep channel extending from the Gulf of Mexico through a jettied entrance, across Matagorda Peninsula to the Point Comfort Turning basin. Project also provides shallow draft channels.	$8.6 million	Matagorda Ship Channel is on-going. The sponsor wants to widen and deepen the channel. It is an FY09 cost.
Gulf Intercoastal Water Way	Entire Texas Coast	Operations and Maintenance, General	To provide safe and efficient commercial navigation.	$86.8 million	Gulf Intercoastal Water Way project is mostly maintenance dredging. It is FY09 and FY10 cost and includes regular and supplemental funding from Hurricane Ike.
Colorado River Levee	City of Wharton	Construction General	To provide drainage by constructing a levee and floodwall system along the Colorado River above Caney Creek & Baughman Slough.	$24,529,000	Federal funds are being used for the design of the Wharton projects.
Baughman Slough Levee	City of Wharton	Construction General	To provide drainage to the north side of Wharton by constructing a levee		

Project Name	Location	Funding Category	Purpose	Total Cost	Status as of January 2009
			and floodwall system along Baughman Slough.		
Baughman Slough Channel	City of Wharton	Construction General	Modification of Baughman Slough Channel in 3 of the 7 segments of the Baughman Slough Levee Project. The 3 segments to be modified are at the downstream end of the levee.		
Caney Creek – Hughes Street Drain	In downtown Wharton, under and along Hughes Street from Spanish Camp Rd to Milam	Construction General	Construct Hughes Street Drain with three 60-inch reinforced concrete pipes run in parallel under Hughes Street.		
Caney Creek – Polk Street Pipes	In downtown Wharton, under and along Polk Street from Caney Street to the Colorado River	Construction General	To install three 60-inch reinforced concrete pipes below the surface of Polk Street		
Caney Creek – Santa Fe Ditch	In the residential neighborhood in east Wharton along Caney Creek	Authorized by the Water Resources Act, 2007	To construct a ditch along the residential area reaches of Caney Creek.	$2,900,000	The City of Wharton began construction before Congress authorized USACE funds for this project. The costs incurred by the city for advance construction will be factored into the cost apportionment. As of October 4, 2006, the City was acquiring the necessary lands

Project Name	Location	Funding Category	Purpose	Total Cost	Status as of January 2009
					for construction of the Santa Fe Ditch, and construction has been initiated. Completion is anticipated within the next 18 months.
Timber Creek	Travis County	Authorized by the Water Resources Act, 2007	Flood Damage Reduction; acquisition and removal of 81 residential structures and 90 parcels of land in the 4% ACE floodplain.	total first cost of approximately $8,870,000.	Onion Creek buyout project is proceeding using only non-Federal funds
	Travis County	Authorized by the Water Resources Act, 2007	Ecosystem Restoration; combine recreation facilities on 40 acres of lands vacated for flood damage reduction purposes to form a multipurpose project.	total first cost of approximately $1,550,000	
Onion Creek Forest / Yarrabee Bend	Travis County	Authorized by the Water Resources Act, 2007	Flood Damage Reduction and Recreation; acquisition and removal of 410 residential structures located in the 4% ACE floodplain.	total first cost of approximately $63,652,000	Non-federally sponsored projects are underway.
	Travis County		Ecosystem Restoration; acquisition of 190 acres of land restored to woodlands, wetlands, and grasslands.	total first cost of approximately $4,267,000	

Project Name	Location	Funding Category	Purpose	Total Cost	Status as of January 2009
	Onion Creek Forest area,	City of Austin - HMGP	Buyout of 118 homes	up to $6,255,823	

State Mitigation Programs

The Texas Water Development Board (TWDB) is the state agency charged with collecting and disseminating water-related data, assisting with regional planning and preparing the State Water Plan for the development of the state's water resources. TWDB administers cost-effective financial programs for the construction of water supply, wastewater treatment, flood control, and agricultural water conservation projects. Further, the TWDB administers the FEMA Flood Mitigation Assistance Program (FMAP), which provides planning and project grants aimed at reducing the number of structures that have incurred repetitive losses and are insured through the National Flood Insurance Program. FMAP Planning grants may be used to develop or update Flood Mitigation Plans. Project grants may be used to mitigate insured structures by activities such as acquiring structures and real property, dry floodproofing, and elevating structures and structure elements. Only activities specified in a FEMA-approved Flood Mitigation Plan are eligible for project grants.
The TWDB is also responsible for the review and approval of Severe Repetitive Loss (SRL) grants, under FEMA, to provide funding to assist state and local communities in implementing mitigation measures to reduce or eliminate the risk of flood damage.

The Office of Rural and Community Affairs (ORCA) provides disaster relief grants for communities in Texas in order to supplement the non-federal cost-share of federal grants. Assistance from ORCA's Disaster Relief/Urgent Need Fund is available to communities and counties in officially declared disaster areas by either the Governor of Texas or the President of the United States. Providing this assistance is key to successful recovery efforts in rural communities who have tapped out their funding options from other resources. The Disaster Relief Fund is one of ORCA's Community Development Block Grant programs, which provide financial assistance to cities under 50,000 in population and counties under 200,000 in population. ORCA's CDBG funds, which come to the agency from the US Department of Housing and Urban Development, are earmarked for rural public works projects, housing, economic development, planning projects, and activities improving living conditions in eligible areas of Texas.

Table 19-5 provides data for ORCA and TWDB grants awarded for jurisdictions in the Lower Colorado River Basin.

Table 19-5. State Mitigation Grants in the Lower Colorado River Basin: TWDB, ORCA

Jurisdiction	Description	Commitment Amount	FY Commitment
Lower Colorado River Authority	Water related project grants to fund irrigation water use metering, conservation education and public awareness, innovative technology transfer and economic impacts of reduction or irrigation water use to the Lower Colorado River Authority, Texas A&M AgriLife Research-High Plains, Texas A&M AgriLife Research-Irrigated Acreage and Panhandle Groundwater Conservation District	$598,295 total	2009
Bastrop County – Bastrop, Elgin,Smithville	Funding Assistance through FMAP for county-wide LIDAR and digital elevation maps	$130,025	2009
City of Brady	TWDB Loan from the Clean Water State Revolving fund to finance wastewater system improvements	$2,000,000	2009
City of Burnet	TWDB Loan from the Clean Water State Revolving fund to finance construction of a wastewater system improvement project	$11,425,000	2008
City of Kempner	TWDB loan to the Kempner Water Supply Corporation (Lampasas, Bell, Coryell and Burnet Counties) in the amount of $7,000,000 from the Rural Water Assistance Fund to finance water system improvements, utilizing the pre-design funding option. Kempner Water Supply	$7,000,000	2008

Jurisdiction	Description	Commitment Amount	FY Commitment
	Corporation (Corporation) will complete the construction of a 7.08 million gallon per day Water Treatment Plant (WTP) and water transmission line.		
Burnet County, City of Highland Haven	ORCA disaster relief grant for DR 1709 (flooding).	$350,000	2007
City of Flatonia	TWDB Loan from the Drinking Water State Revolving Fund to finance water system improvements, utilizing the proceeds to finance the installation of water filtration equipment in order to decrease the amount of arsenic in the drinking water.	$660,000	2006
Mills County	TWDB- financial assistance to the Brookesmith Special Utility District (District) from the Rural Water Assistance Fund Program to finance water system improvements, utilizing the pre-design commitment option.	$2,500,000	2006
Caney Creek – Matagorda County	TWDB financial assistance to the Caney Creek Municipal Utility District to finance improvements to its existing water system, constructing improvements to its water system. The improvements consist of constructing a ground storage tank and related piping, demolishing the existing storage tank, and replacing 4,600 feet of six inch waterline.	$390,000	2006
Bastrop County and City of Bastrop	ORCA grants under the Disaster Relief program for repair to bridges and roads from flooding.	$700,000	2004
Brushy Creek WCID #1A of Williamson &	Flood Protection study for the watershed of Upper Brushy Creek	$63,000.00	2003

Jurisdiction	Description	Commitment Amount	FY Commitment
Milam Counties	located in Williamson County in the Brazos River Basin and includes all or parts of the following cities, towns and communities, Round Rock, Cedar Park, Austin, and Leander		
City of Wharton	Flood Protection study from the Colorado River in the Wharton area from River Mile 45, near the Matagorda County/Wharton County line, to River Mile 76, near Glen Flora, generally Wharton County.	$257,500.00	2002
Brushy Creek WCID No. 1	Flood Protection Study for Brushy Creek watershed in Williamson and Milam Counties.	$45,082.00	2000
Lower Colorado River Authority	Flood Protection Study for the Lower Colorado River Authority	$99,924.00	99
City of Brownwood	City of Brownwood	$168,750.00	95
Lower Colorado River Authority	10 County Statutory District	$12,280.00	94

Section 20 – Mitigation Strategy

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mitigation. 3

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become less vulnerable to hazards. 4

Goal 5 Promote growth in a sustainable manner. 4

Goal 6 Maximize the resources for investment in hazard mitigation. 4

At each regional mitigation workshop, participants were asked to re-evaluate the mitigation goals and objectives from the 2004 Plan. The communities unanimously agreed to keep the mitigation goals and objectives from the 2004 Plan, but to reorganize the first three goals. This reorganization is reflected below.

Introduction

The **overall goal** of this Plan Update is to reduce or eliminate the long-term risk to loss of life and property damage from the full range of disasters.

The mitigation **vision** of a safe, secure, and sustainable Lower Colorado River Basin is:

- Buildings located outside of hazardous areas and built to withstand the natural and man-made hazards that threaten them;
- An informed citizenry and active volunteer cadre protecting their families, homes, workplaces, communities, and livelihoods from the effects of disasters.
- Basin communities integrating hazard-mitigation concerns into decisions on growth and future development;

- Where increasing resistance to disaster is an integral part of the livability and sustainability of the community;
- Communities integrating cost-effective mitigation programs into routine planning and budgeting decisions;
- Smart communities investing in mitigation while leveraging state, Federal, and private resources; and
- A partnership of local, state and Federal governments, voluntary agencies, business and industry, and individual citizens focused on preventing or reducing the loss of life and property from the full range of hazards.

Colorado River below Mansfield Dam
Source: LCRA

Mitigation Goals and Objectives

Overall Goal

To reduce or eliminate the long-term risks to loss of life and property damage in the Lower Colorado River Basin from the full range of disasters.

Goal 1 Protect public health and safety.

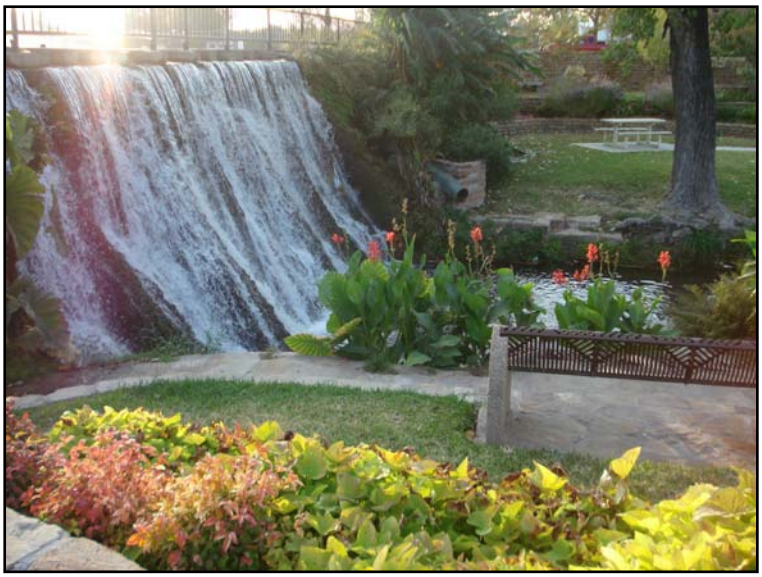
Objective 1.1 Advise the public about health and safety precautions to guard against injury and loss of life from hazards.

Objective 1.2 Maximize the utilization of the latest technology to provide adequate warning, communication, and mitigation of hazard events.

Objective 1.3 Reduce the danger to, and enhance protection of, dangerous areas during hazard events.

Objective 1.4 Protect critical facilities and services.

Goal 2 Protect existing and new properties.



Mill Pond Park – San Saba, Texas

Objective 2.1 Reduce repetitive losses to the National Flood Insurance Program.

Objective 2.2 Use the most cost-effective approaches to protect existing buildings and public infrastructure from hazards.

Objective 2.3 Enact and enforce regulatory measures to ensure that development will not put people in harm's way or increase threats to existing properties.

Goal 3 Increase public understanding, support and demand for hazard mitigation.

Objective 3.1 Heighten public awareness of the full range of natural and man-made hazards they face.

Objective 3.2 Educate the public on actions they can take to prevent or reduce the loss of life or property from all hazards.

Objective 3.3 Publicize and encourage the adoption of appropriate hazard mitigation measures.

Community Member (Signing In)
Region IV Public Meeting

Goal 4 Build and support local capacity and commitment to continuously become less vulnerable to hazards.

Objective 4.1 Build and support local partnerships to continuously become less vulnerable to hazards.

Objective 4.2 Build a cadre of committed volunteers to safeguard the community before, during, and after a disaster.

Objective 4.3 Build hazard mitigation concerns into planning and budgeting processes.

Goal 5 Promote growth in a sustainable manner.

Objective 5.1 Incorporate hazard mitigation into the long-range planning and development activities.

Objective 5.2 Promote beneficial uses of hazardous areas while expanding open space and recreational opportunities.

Objective 5.3 Utilize regulatory approaches to prevent creation of future hazards to life and property.

Goal 6 Maximize the resources for investment in hazard mitigation.

Objective 6.1 Maximize the use of outside sources of funding.

Objective 6.2 Maximize participation of property owners in protecting their properties.

Objective 6.3 Maximize insurance coverage to provide financial protection against hazard events.

Planning Team Members
Kickoff Workshop – Brady, Texas

Objective 6.4 Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.

Section 21–Regional Mitigation Actions

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Overview

This section includes the listing of the mitigation actions proposed by TCRFC and LCRA. Sections 22 through 25 of this Plan Update contain the mitigation actions of each participating jurisdiction, separated by region.

The actions described in this regional section as well as the four sections hereafter are designed to achieve the mitigation goals and objectives established in Section 20: *Mitigation Strategy*, and will be maintained on a regular basis according to the plan maintenance procedures established in Section 2.

As described in the previous section, the Mitigation Action Plan, or MAP, represents an unambiguous and functional plan for action. Each proposed mitigation action has been identified as an effective measure (policy or project) to reduce hazard risk for the TCRFC.

Each action is listed in the MAP in conjunction with background information such as the specific site and location of the project and the history of damages, if applicable. Other information provided in the MAP includes data on cost estimates and potential funding sources to implement the action should funding be required (not all proposed actions are contingent upon funding).

Most importantly, implementation mechanisms are provided for each action, including the designation of a lead agency or department responsible for carrying the action out as well as a timeframe for its completion. These implementation mechanisms ensure that the Plan remains a functional document that can be monitored for progress over time.

The proposed actions are not listed in exact priority order, though each has been assigned a priority level of "High," "Moderate" or "Low". The prioritization method was based on FEMA's STAPLE+E criteria and included social, technical, administrative, political, legal, economic and

environmental considerations. As a result of this exercise, an overall priority was assigned to each mitigation action by each member of the planning team.

An action that is ranked as "High" indicates that the action will be implemented as soon as funding is received. A "Moderate" action is one that may not be implemented right away depending on the cost and number of citizens served by the action. Actions ranked as "Low" indicate that they will not be implemented without first seeking grant funding and after "High" and "Moderate" actions have been completed. Note that these priorities are subject to change as the plan is updated, and as funding becomes available to the jurisdictions.

The overall priority of each action is reflected in the mitigation actions found in Sections 21 to 25. In prioritizing actions a community must consider many factors, including: targeting specific mitigation actions for implementation following a major disaster; ease of implementation by the community; cost of the project vs. perceived benefit; timeframe for implementing the action; and available personnel to oversee and implement the project.

As this is an update to the 2004 Plan, an analysis is provided for actions previously included. There are at least two mitigation actions for each of the thirteen hazards in the Plan Update. In developing individual mitigation actions, each jurisdiction identified, evaluated and analyzed the actions contained herein.

Previous Actions and Analysis

Texas Colorado River Floodplain Coalition

		TCRFC (Past Action)-1
	Proposed Action:	**Improve local floodplain management through adoption of higher regulatory standards. Promote the principles of "no adverse impact."** **Encourage adoption of a "no-rise" in BFE in the 100-year floodplain.** **Encourage freeboard requirements for permitting structures in the SFHA.** **Encourage the inclusion of cumulative damage provisions in local ordinances.** **Disseminate model ordinances and conduct program assessments.** **Encourage communities to participate in the Community Rating System, with an objective to have 5 CRS communities by October 2004 and an additional 5 communities by April 2005.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin Wide

	History of Damages:	The mission of the Texas Colorado River Floodplain Coalition is to encourage comprehensive, consistent management of the floodplain along the Colorado River. Central to that mission is regional coordination and planning to reduce flood damage. Rapid development both in and out of the mapped floodplains is occurring in many parts of the Colorado River Basin. Most communities do not coordinate floodplain management activities with other communities in the watershed and do not receive information regarding upstream or downstream development activities that may be impacting the floodplain. With this action, the Coalition will work to enhance regional floodplain management and coordinate floodplain management programs by establishing common regional goals, objectives, permit criteria and procedures for development within the Colorado River Basin. These activities will further the goal of "No Adverse Impact." No adverse impact floodplain management means the action of one property owner does not adversely impact the rights of other property owners, as measured by increased flood peaks, flood stage, flood velocity, and erosion and sedimentation. This mitigation action involves development of a Guidance Manual containing recommended criteria, policies and procedures; provision of training; provision of technical assistance; conducting assessments of local floodplain management programs; and issuance of model ordinances and permitting criteria.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	The budget for support of TCRFC administration and programs in FY 2004 is $304,000. Future costs are to be determined.
Potential Funding Sources:	Local Revenue and Grants
Lead Agency/Department Responsible:	The Texas Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.

Implementation Schedule:	This action will begin in September 2003 and continue, ongoing, through September 2012. Floodplain assessments will be conducted annually. The objectives are to have 5 CRS communities by October 2011 and an additional 5 communities by April 2011.

2009 Analysis:
Higher regulatory standards have been set and completed such as freeboard and higher level ordinances. The TCRFC has completed the promotion the principles of "no adverse impact." The encouraged adoption of a "no-rise" in BFE in the 100-year 1% ACE is complete. Encouraged freeboard requirements for permitting structures in the SFHA and the inclusion of cumulative damage provisions in local ordinances is complete. Disseminate model ordinances and conduct program assessments. The TCRFC has not completed the encouragement of communities to participate in the Community Rating System, with an objective to have 5 CRS communities by October 2004 and an additional 5 communities by April 2005. Therefore this part of the action will be deferred for the 2009 Update. The TCRFC will be the responsible agency as it is now self-funded.

TCRFC (Past Action)-2	
Proposed Action:	**Provide training for elected officials and professional technical staff (including emergency management coordinators) on floodplain management and emergency management issues.**
BACKGROUND INFORMATION	
Site and Location:	Basin Wide
History of Damages:	Many elected officials and city and county staff that must deal with floodplain management or emergency management issues do not receive adequate training or have access to comprehensive technical resources. With this action, the Texas Colorado River Floodplain Coalition will provide enhanced training programs for floodplain administrators, emergency management coordinators, and elected officials. The training program will be developed in partnership with Federal and state agencies and professional organizations. It will involve short courses, training seminars, workshops, conferences, on-call speakers, videos, websites and other educational resources directed at educating elected officials, the regulatory community, and the public about floodplain management and emergency management issues. The Coalition will work to support the “Certified Floodplain Manager” program administered by the Texas Floodplain Management Association and the Association of State Floodplain Managers, Inc.; the “certified Emergency Manager” program administered by the International Association of Emergency Managers; and the Texas Emergency Manager certification program administered by the Emergency Management Association of Texas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood

Priority (High, Moderate, Low):	High
Estimated Cost:	The budget for support of TCRFC administration and programs in FY 2004 is $304,000. Future costs are to be determined.
Potential Funding Sources:	General Revenue and Grants
Lead Agency/Department Responsible:	The Texas Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
Implementation Schedule:	This action will begin in September 2003 and continue, ongoing, through September 2012.

2009 Analysis:
This action was completed, but as it is an ongoing activity, it will be deferred for the 2009 Update. Training is a vital function of the TCRFC as many communities experience high turnover and rules continue to change.

		TCRFC (Past Action)-3
	Proposed Action:	**Facilitate inter-jurisdictional and basin-wide federal flood-mapping studies to improve understanding of flood risk.** **Develop and maintain a Map Master Plan.** **Set priorities for flood mapping needs in the Lower Colorado River Basin.** **Complete the production of Digital Flood Insurance Rate Maps for additional basin communities**
	BACKGROUND INFORMATION	
	Site and Location:	Basin Wide
	History of Damages:	The Flood Insurance Rate Maps of most communities in the Texas Colorado River Floodplain Coalition are older than fifteen years; they no longer accurately represent flooding and development patterns. Some communities have no Flood Insurance Rate Maps at all. Development in the Lower Colorado River Basin is occurring rapidly. From 1990 to 2000, the population increased by more than 40 percent in five basin counties. The overwhelming majority of Coalition members identified new and revised floodplain maps as their highest priority for improving floodplain management. This action involves developing and maintaining a Map Master Plan, setting basin-wide mapping priorities, and producing digital Flood Insurance Rate Maps for more basin communities. The Map Master Plan will document each community's mapping needs and assign them a relative priority in the context of the region as a whole. It will provide a schedule for producing and implementing the plan and will address how to keep maps up to date.

MITIGATION ACTION DETAILS

Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	The Texas Colorado River Fl Costs for map production vary from $4.7 million to $16.8 million depending upon complexity and detail of map.
Potential Funding Sources:	Mapping the Colorado River Basin will proceed as funding becomes available from FEMA's Map Modernization Program, the Lower Colorado River Authority, and local funding sources.
Lead Agency/Department Responsible:	Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
Implementation Schedule:	This action started in March 2001 with funding under FEMA's Best Practices Mapping Program. Mapping will proceed as additional funding becomes available through 2013
2009 Analysis:	
This action is complete in part, but will also be deferred in part. A master plan was developed with FEMA, and a number of priorities for the TCRFC were accomplished. The D-FIRMS were complete, but there are still communities within the TCRFC that do not have maps yet. Therefore this action should be deferred to the extent that it is needed to help communities that do not have maps.	

		TCRFC (Past Action)-4
	Proposed Action:	**(1) Facilitate inter-jurisdictional review of basin-wide Federal flood studies to identify projects to achieve flood damage reduction.** **(2) Assist in obtaining public input on the U.S. Corps of Engineers Lower Colorado River Basin Study and analyze the potential impact of each flood-reduction alternative on local jurisdictions.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin Wide
	History of Damages:	The U.S. Army Corps of Engineers is conducting a Lower Colorado River Basin Study in three phases. Phase 1, completed July 2002, and identified: existing conditions regarding flood damages to residential, commercial, industrial and public structures; environmental conditions and opportunities for enhancement of natural ecosystems; and recreational needs within the basin. The Phase 1 study area is the main stem of the Colorado River. Phase 2 will involve conduct of interim feasibility studies focusing on known flood problem areas. Under Phase 3, the Corps will develop and evaluate alternatives for implementing solutions to water resource-related problems. A number of alternatives for reducing the risk or magnitude of flood damages will be evaluated. The Corps of Engineers will then examine the consequence of each alternative, including the economic and environmental costs and benefits, and work with the LCRA and communities in the basin, through the Coalition, to decide on the most effective and practical course of action. The Texas Colorado River Floodplain Coalition will work with individual jurisdictions in conducting public outreach on the study results and analyze the impact of each flood reduction alternative on local jurisdictions.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$1.6 million is required in 2004 for the Corps to continue the multi-year study. Additional funding will be required in 2005 and subsequent years
Potential Funding Sources:	U.S. Army Corps of Engineers
Lead Agency/Department Responsible:	Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
Implementation Schedule:	Specific flood reduction alternatives will be completed by 2005.
2009 Analysis:	
This action is complete in part, but also deferred. Phase 1 has been completed and the Coalition is now looking at the operational procedures for Phase 2. This includes reviewing the operational procedures for Mansfield Dam as well as the impacts on flooding in the lower basin.	

		TCRFC (Past Action)-5
	Proposed Action:	**Conduct community education and outreach on flood insurance and floodplain management issues. Educate the community on the dangers of low-water crossings. Promote flood insurance by launching a "Cover the Basin" campaign**
	BACKGROUND INFORMATION	
	Site and Location:	Basin Wide
	History of Damages:	The most effective floodplain-management programs are based on public education and understanding of the causes of flooding and ways to mitigate damage to life and property. A comprehensive, concerted community education and outreach campaign is needed to give the citizens of the basin the knowledge and tools necessary to mitigate damage before disaster strikes, better prepare for disaster, and know what to do in an emergency situation. Outreach will include a "Cover the Basin" campaign to educate citizens in high-risk areas regarding the need for and benefits of flood insurance

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	The budget for support of TCRFC administration and programs in FY 2004 is $304,000. Future costs are to be determined.
Potential Funding Sources:	Coalition dues, LCRA funding, and FEMA grants
Lead Agency/Department Responsible:	Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
Implementation Schedule:	This on-going activity will start in 2004 and end in 2013.
2009 Analysis:	
This action is deferred as education is an ongoing activity. The Coalition will defer the action regarding educating the community on the dangers of low-water crossings. Even though the "Cover the Basin" campaign has been completed (the TCRFC completed press releases on the importance of buying flood insurance before the map changes as well as workshops with the NFIP), this action is also ongoing. The TCRFC continues to send out messages through FloodSmart. For 2009 Plan Update, the goal will be to have an annual NFIP insurance training workshop throughout the basin.	

		TCRFC (Past Action)-6
	Proposed Action:	**Assist TCRFC communities in achieving designation by the National Weather Service as "Storm Ready" communities.** **Establish 24-hour warning reception points.** **Improve monitoring of hydrometeorological data.** **Enhance the ability to inform communities and special authorities about weather warnings.** **Increase public education about severe weather threats and appropriate responses.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin Wide
	History of Damages:	By designating them as "Storm Ready," the National Weather Service recognizes local communities that have demonstrated a strong commitment to putting the infrastructure and systems in place that will save lives and protect property in the event of a severe weather event. To date, the City of Lakeway and the City of Brownwood are designated as "Storm Ready." Six criteria are used to determine if a city or county is "Storm Ready:" 24-hour Warning Reception Point and Emergency Operations Center; ability for these centers to receive National Weather Service warnings; ability to monitor hydrometeorological data; ability to inform the community and special authorities about weather warnings; public education about severe weather threats and appropriate responses; and formal hazards and risk assessment planning.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Hurricane & Tropical Storm, Tornado, Thunderstorm
Priority (High, Moderate, Low):	Medium
Estimated Cost:	The budget for support of TCRFC administration and programs in FY 2004 is $304,000. Future costs are to be determined.
Potential Funding Sources:	General revenue and Grants
Lead Agency/Department Responsible:	Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
Implementation Schedule:	Beginning 2003 through 2012
2009 Analysis:	
This action is deferred as some, but not all communities have achieved the designation of "Storm Ready". Thus far only the LCRA, Lago Vista, Brady and the City of Brownwood are StormReady communities.	

		TCRFC (Past Action)-7
	Proposed Action:	**Add new communities to the July 14, 2007 Hazard Mitigation Plan for the Lower Colorado River Basin and update the Plan based upon changes in risk, new risk information, and changes in land development.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin Wide
	History of Damages:	The Hazard Mitigation Plan for the Lower Colorado River Basin, "*Creating A Disaster Resistant Lower Colorado River Basin,"* was approved by the Federal Emergency Management Agency on July 14, 2004. At the time, 34 cities and 13 counties which are members of the Coalition participated in the Plan. Since that time, additional members have joined the Coalition, and additional jurisdictions have expressed an interest in joining the Coalition Plan. This action would add over 40 new communities. It would also update the entire plan based on changes in risk, new risk information, and changes in land development. It will involve setting up the planning process, conducting a jurisdiction-based risk assessment, and assisting the communities in developing mitigation actions. It is intended to result in FEMA-approved plans for over 40 additional jurisdictions and reduce the long-term risk to people and property throughout the region from a range of hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Hurricane & Tropical Storm, Tornado, Thunderstorm, Winter Storm, Hazardous Materials Release, Dam Failure, Pipeline Failure, Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$275,000
Potential Funding Sources:	Beginning 2003 through 2012. The 25% match will be met with in-kind services from the Texas Colorado River Floodplain Coalition member jurisdictions and Lower Colorado River

	Authority.
Lead Agency/Department Responsible:	Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
Implementation Schedule:	Eighteen months from Grant approval.
2009 Analysis:	
This action was completed. In 2007 the TCRFC received an HMGP grant for the completion of a Hazard Mitigation Plan Update to include additional communities in the planning area. Thirteen new communities joined the mitigation effort and are included in this Plan.	

		TCRFC (Past Action)-8
	Proposed Action:	**Acquire 200 "Turn Around, Don't Drown" warning signs for low water crossings to be placed strategically at low water crossings throughout the Lower Colorado River Basin in the heart of Flash Flood Alley.**
	BACKGROUND INFORMATION	
	Site and Location:	Lower Colorado River Basin
	History of Damages:	Between January and September 2007, there have been 40 flash flood fatalities in the State of Texas, 30 of which were vehicle related. Among its goals of the Texas Colorado River Floodplain Coalition is public education and awareness, including educating the community on the dangers of low water crossings. "Turn Around, Don't Drown" signs placed in strategic locations will warn drivers of the low water crossings and educate them about the danger of entering them when flooded. These signs would help educate the public about the dangers of flooded roadways and would elicit more appropriate actions/responses by drivers when approaching a flooded roadway.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$60,000
Potential Funding Sources:	State and local Grant funds
Lead Agency/Department Responsible:	Colorado River Floodplain Coalition, with technical support provided by the Lower Colorado River Authority.
Implementation Schedule:	1 month after grant award – purchase the 200 signs 2 months after grant award – publicize sign program to TCRFC members and solicit interest for placement 4 months after grant award – coordinate distribution 8 months after grant award – follow up to determine that signs have been placed and map where they are located 12 months after grant award – project completion, all signs in place and mapped for reference
2009 Analysis:	
While the TCRFC promotes “Turn Around, Don’t Drown”, this task will be deleted as it is more suited for individual jurisdictions to undertake	

Lower Colorado River Authority

		LCRA (Past Action)-1
	Proposed Action:	**Undertake a dam safety program to improve inspection and maintenance of all dams to ensure that they can withstand the maximum probable flood event; review and update dam-failure emergency action plans annually. Improve dam-failure modeling capability.**
	BACKGROUND INFORMATION	
	Site and Location:	Lower Colorado River Basin

	History of Damages:	The LCRA continues to make improvements to all of the dams in the Highland Lakes region. Mansfield Dam is able to withstand the probable maximum flood (PMF) without further reinforcement. This fact means that even in the event of failures of Buchanan, Inks, Wirtz, or Starcke dams, Mansfield Dam would hold their floodwaters and Lake Travis would not overtop Mansfield Dam. The Dam Modernization Program began in 1995 and is expected to continue through FY 2004 to strengthen the six Highland Lakes dams and ensure their safety for years to come. The dams have performed virtually trouble free for decades. However, natural wear over the years and more stringent design and construction standards have created a need to update and improve the dams. Stricter state and federal dam safety regulations were adopted in the 1970s and 1980s as a direct response to numerous dam failures across the country. These standards require that dams be able to withstand the most severe flood imaginable, the Probable Maximum Flood (PMF). This flood is so severe and statistically remote that its probability of occurrence in any given year cannot be measured. The Dam Modernization program will ensure that LCRA's dams meet required design safety standards to resist the water load and pressure of the PMF. In addition to capital improvements, this action improving LCRA's dam failure modeling capabilities, review and update of dam failure emergency action plans, and continuing inspection and maintenance of all dams to ensure that they can withstand the PMF.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$50 Million
Potential Funding Sources:	State and local Grant funds
Lead Agency/Department Responsible:	Lower Colorado River Authority.
Implementation Schedule:	Complete
2009 Analysis:	
This action has been completed.	

		LCRA (Past Action)-2
	Proposed Action:	**Maintain and expand hydrometeorological monitoring system.** **Identify sites where stream gauges need to be added or upgraded and coordinate installation requests with U.S.G.S.** **Expand the volunteer rainfall observer program.**
	BACKGROUND INFORMATION	
	Site and Location:	Lower Colorado River Basin
	History of Damages:	Information on the flow of the Colorado River and rainfall amounts throughout the basin are vital to safeguarding lives and property and ensuring adequate water resources. LCRA, with the assistance of the United States Geological Survey, operates a network of stream gauges that provide real-time and long-term historical flow of information. Such information is used for flood forecasting and mapping flood-prone areas; planning and managing water supplies; developing water quality standards and monitoring changes in flow; and designing structures. LCRA has a Rainfall Observer Program. This action seeks to expand the program by adding additional observers to obtain a more comprehensive picture of rainfall amounts.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$4.4 Million
Potential Funding Sources:	State and local Grant funds
Lead Agency/Department Responsible:	Lower Colorado River Authority.
Implementation Schedule:	Complete
2009 Analysis:	
This action has been completed. The Rainfall Observer Program has been rolled into the National Weather Service's CoCoRaHS program so more people have access to the volunteer rainfall data being observed.	

LCRA (Past Action)-3	
Proposed Action:	**Continue to support the Texas Colorado River Floodplain Coalition in administrative support of programs.**
BACKGROUND INFORMATION	
Site and Location:	Lower Colorado River Basin
History of Damages:	The Lower Colorado River Authority serves as the Administrative Agency for the Texas Colorado River Floodplain Coalition. The administrative services and functions it provides are specified in an Interlocal Agreement. Its activities include providing logistical support for meetings; acting as a central clearinghouse for technical information, models, studies, training and educational opportunities; identifying funding options and preparing and submitting grant applications on behalf of the Coalition; maintaining a web page and internet address for the Coalition; maintaining a computer database of floodplain application and permitting information; arranging for an independent assessment of each member's floodplain management program; and contracting with a qualified engineering consultant to perform, at the request of a coalition member, technical reviews of development permit applications.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	The budget for support of TCRFC administration and programs in FY 2004 is $304,000. Future costs are to be determined.
Potential Funding Sources:	State and local Grant funds
Lead Agency/Department Responsible:	Lower Colorado River Authority.
Implementation Schedule:	Complete

2009 Analysis:
This action has been completed. The LCRA is a technical partner and as such only provides technical support to the TCRFC. The Coalition has their own administration and maintains a database of floodplain application and permitting information. Assessment of each member's floodplain management program was completed for the entire basin. The LCRA will no longer directly incur any costs related to the Coalition as they are self-funded and independent. The funding guide has been developed and is updated by a consultant firm.

		LCRA (Past Action)-4
	Proposed Action:	**Support local jurisdictions in the LCRA service area in obtaining funds for local and regional mitigation and preparedness activities.**
	BACKGROUND INFORMATION	
	Site and Location:	Lower Colorado River Basin
	History of Damages:	A major challenge faced by communities seeking comprehensive hazard mitigation planning solutions is securing funds in an era of constrained resources at all levels of government. A wide range of financial and technical assistance is available from the State of Texas and the Federal Government to protect communities from floods and other natural and man-made disasters and preserve the quality of water in the Lower Colorado River and its tributaries. Appendix B of this Plan contains a Guide to Funding and Technical Assistance Programs That Support Hazard Mitigation. This Guide is a tool to use in leveraging State and Federal resources to protect residents of the basin from the ravages of natural and man-caused disasters and enhance water quality. To assist in leveraging resources, this Guide will be updated annually as changes are made in funding programs or as new funding programs become available.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	The Funding Guide will be updated annually, starting in 2004. The Lower Colorado River Authority will work with the Coalition members to continually leverage external resources, starting in 2004 and ending in 2009.
Potential Funding Sources:	Lower Colorado River Authority
Lead Agency/Department Responsible:	Lower Colorado River Authority.
Implementation Schedule:	N/A
2009 Analysis:	
This action will be deleted. There was not enough interest in this action by jurisdictions to warrant inclusion of the action in the 2009 Plan	

		LCRA (Past Action)-5
	Proposed Action:	**Strengthen the cooperative technical partnership with FEMA, the Department of Homeland Security.** **Improve local-Federal understanding and cooperation with regard to disaster damage-reduction activities.** **Reduce length of time for accomplishing tasks such as flood mapping.**
	BACKGROUND INFORMATION	
	Site and Location:	Lower Colorado River Basin
	History of Damages:	The Lower Colorado River Authority is a Cooperating Technical Partner of the Federal Emergency Management Agency in the conduct of floodplain-mapping activities. Under the auspices of the CTP program, LCRA and FEMA have partnered to complete an assessment of mapping needs and deficiencies in the basin; complete a pilot project for the City of Lago Vista to produce digital FIRMs; develop a Map Master Plan which sets priorities for the production of new maps; and produce new maps for the region. This action will continue and strengthen the cooperative technical partnership with FEMA.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$6,000, exclusive of grants
Potential Funding Sources:	Federal Emergency Management Agency Map Modernization Funds, Lower Colorado River Authority, local funding.
Lead Agency/Department Responsible:	Lower Colorado River Authority.
Implementation Schedule:	This is an on-going activity that will be conducted from 2003 to 2008.
2009 Analysis:	
This action has been completed. MapMod will be finished by the end of 2009 and some local funding was incorporated into several projects including, but not limited to: Wharton County, Colorado County and Bastrop County.	

New Actions

TCRFC

		TCRFC-1
	Proposed Action:	**Determine inundation areas and mitigate high hazard structures (500-year floodplain can be used as a general guide for areas of inundation) downstream of all dams.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin Wide
	History of Damages:	The potential for dam failure exists throughout the basin. Many dams are privately owned and have become a high hazard dam over the years due to downstream development.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure
Effect on new/existing buildings:	Determining inundation areas exactly will help the development of new buildings in risk-averse areas.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	TCEQ and Local communities
Implementation Schedule:	Begin 2009 – Future

COMMENTS

		TCRFC-2
	Proposed Action:	**Develop emergency action plan in the event of an area dam failure. Update new TCEQ rules and conduct drills.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	The potential for dam failure exists throughout the basin. Many dams are privately owned and have become a high hazard dam over the years due to downstream development.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	TCEQ, Local Departments of Emergency Management
Implementation Schedule:	2009-2011

COMMENTS

		TCRFC-3
	Proposed Action:	**Develop an enforcement plan for implementing mandatory water rationing; lawn watering restrictions; excess-use charges during times of water shortage.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Due to continued increase in population throughout the lower Colorado river basin, water will continue to be in high demand, especially during particularly dry periods.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on new/existing buildings:	Water shortage and drought can result in foundation problems for existing structures and this action helps to mitigate against that effect.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	TWDB/LCRA/Local communities
Implementation Schedule:	2009 and continuing into the future

COMMENTS

		TCRFC-4
	Proposed Action:	**Educate residents about Xeriscape planting.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Due to continued increase in population throughout the lower Colorado river basin, water will continue to be in high demand, especially during dry periods. Planting native plants have been proven to save water and are more resistant to extended drought periods.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000 for publishing brochures on Xeriscaping, but education campaign will need to be on-going
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-5
	Proposed Action:	**Provide water conservation education to residents and farmers (ex. drip irrigation, soil moisture monitoring, and tillage practices).**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Due to continued increase in population throughout the lower Colorado river basin, water will continue to be in high demand, especially during particularly dry periods.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on new/existing buildings:	Water conservation and soil monitoring will help determine threats to existing buildings in terms of foundation problems.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000 for publishing brochures, but education campaign will need to be on-going
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-6
	Proposed Action:	**Expand rainfall observer program utilizing volunteers through the National Weather Service's CoCoRAHS program**.
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Continued data gathering during rain events is critical to ensuring flood models are accurate for the next event. The best way to do this is to gather data of what is actually happening on the ground. Rain gauges only measure a tiny spot in the basin and are costly to maintain.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	None *
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	TCRFC
Implementation Schedule:	2009 and on

COMMENTS
* Note: Costs may be incurred if Coalition purchases CoCoRAHS approved rain gauges for communities.

		TCRFC-7
	Proposed Action:	**Identify sites where stream and rain gauges need to be added or upgraded and coordinate installation requests with the USGS and Lower Colorado River Authority**.
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Flooding cannot be prevented, but more adequate warning may be given to residents downstream if stream gauges are installed in more locations.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-8
	Proposed Action:	**Implement flood early warning system and response plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	A response plan allows communities to act quickly and professionally in a time of high stress. Flooding cannot be prevented, but more adequate warning may be given to residents downstream if an early warning system exists.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This action mitigates against potential injury and death rather than property damage.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 to 2011

COMMENTS
Continued response plan training will be required by all communities to ensure adequate continuing preparedness level.

		TCRFC-9
	Proposed Action:	**Track and record high water marks following a flood.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Flooding has been an ongoing problem in the basin. High water marks have helped in the past to improve flood models and help the public get a visual of how high the water got during certain floods.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5,000 for bench marks **
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	LCRA / Local Communities
Implementation Schedule:	2009 and on

COMMENTS
**Note: The Coalition already has purchased a number of brass benchmarks that can be used by communities for future flood events to mark high water levels.

		TCRFC-10
	Proposed Action:	**Encourage floodplain coordinators to become CFMs.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Improper development in the floodplain can be prevented through educating floodplain coordinators and ensuring they are certified floodplain managers (CFMs).

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	New buildings will be properly built according to NFIP standards
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	One time $100 exam fee per floodplain coordinator and continued TFMA annual membership
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS
Due to high turnover rate in the floodplain management field, it will be critical to ensure every new floodplain coordinator has the opportunity to become certified.

TCRFC-11		
	Proposed Action:	**Adopt ASFPM's (Association of State Floodplain Managers) "No Adverse Impact" (NAI) policy to mitigate local flooding.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Development has an impact up-and downstream. No Adverse Impact mitigates those impacts

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Adopting NAI will encourage the development of new buildings outside flood-prone areas and also mitigate against damage to existing buildings that are up or downstream of flood zones.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	No Cost
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009

COMMENTS

		TCRFC-12
	Proposed Action:	**Cross train building inspectors in floodplain management requirements**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Building inspectors are often not in contact with the floodplain administrators, even though inspectors are the ones who are out in the field and can catch violations and ensure that new structures are built in accordance with the NFIP regulations.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Enhanced compliance with the NFIP through continued inspections
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff time to train
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on to ensure new staff is continuously trained

COMMENTS

		TCRFC-13
	Proposed Action:	**Ensure public has access to local FIRMs and flood map ordering information.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	An educated public is a safer public. Potential buyers may think twice about purchasing an existing home in the floodplain and/or may decide to build on a different area of their new land to ensure the structure is outside the designated floodplain.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	New buildings will be built outside the designated floodplain or properly elevated if located in the floodplain
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	No cost except staff time to ensure maps remain current and available to the public
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-14
	Proposed Action:	**Place flood insurance materials/mortgage lending mandates in libraries.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	An educated public is a safer public. These materials allow the public to be aware of regulations and to make wiser decisions on where to build and what their insurance options are.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	n/a
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	No cost except staff time to ensure information remains current and available to the public
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-15
	Proposed Action:	**Use impact fees to help fund public hazard mitigation projects related to land development (i.e. increased runoff).**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Impervious cover changes the flow of water, increases runoff and can potentially cause homes to flood that have never flooded before.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Existing and new homes will be safer from flooding
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Impact Fees paid by land developers
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-16
	Proposed Action:	**Identify repetitive loss properties for future Hazard Mitigation Grant Program funding.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Repetitive loss properties exist throughout the basin and cause a drain on the flood insurance pool as well as on local resources and federal assistance dollars.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Existing repetitive loss properties may be bought out
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	HMGP Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS
Communities to apply for HMGP funds after a federally declared disaster occurs.

		TCRFC-17
	Proposed Action:	**Include "cumulative damage" provisions in local floodplain management ordinances.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Properties that have minor damage after smaller events exist throughout the basin and cause a drain on the flood insurance pool as well as on local resources.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff time to record repetitive losses in permit file
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

TCRFC-18		
	Proposed Action:	**Advertise and promote the ability of flood insurance and availability of the Preferred Risk Policy (PRP).**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Many home owners and especially renters do not know they qualify for flood insurance

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	More new and existing structures would be insured as a result of this action.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000 for publications ***
Potential Funding Sources:	State and Federal Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS
***Note: Residents come and go; it will be important to continue these campaigns on a regular basis to ensure even the newest residents to the area are aware of the availability of flood insurance.

TCRFC-19		
	Proposed Action:	**Conduct workshops for local lending agencies, insurance agents, surveyors, and title companies to promote availability and understanding of flood insurance.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Insurance agents often tell their clients they cannot get flood insurance even though everyone is eligible. Surveyors, title companies, and lenders often also have incorrect information about the NFIP.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This action would result in more accurate surveys and insurance policies for both new and existing buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	N/A
Potential Funding Sources:	NFIP training specialists
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-20
	Proposed Action:	**Educate communities on dangers of low water crossings through the Turn Around Don't Drown (TADD) campaign.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Low water crossings are the number one killer during floods.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS
It is vital to inform the public on the dangers of driving through flowing waters and it will be critical to inform all new residents to the basin on a continuing basis.

		TCRFC-21
	Proposed Action:	**Educate policy holders and area insurance agents regarding ICC availability.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Many policy holders and insurance agents do not know about the availability of the Increased Cost of Compliance benefit covered under the National Flood Insurance Program's flood insurance policy.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Existing buildings can be elevated with these funds after being substantially damaged or improved.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	No cost to communities
Potential Funding Sources:	NFIP Training staff
Lead Agency/Department Responsible:	FEMA/NFIP Training staff
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-22
	Proposed Action:	**Provide public awareness campaign on threats of extreme heat and tips on how to cope.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	An educated public is a safer public. Many people do not realize that extreme summer heat is now the number one killer in the Nation.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown cost for publications
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS
It is critical to keep educating new residents to the area on a continued basis on the dangers of extreme summer heat.

		TCRFC-23
	Proposed Action:	**Establish cooling centers and emergency shelters for residents without air conditioning.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Extreme summer heat is now the number one killer in the nation. It is vital to have cooling centers available throughout communities to ensure residents with no air conditioning can seek shelter from the heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-24
	Proposed Action:	**Advertise and promote the availability or crop insurance.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Hail can cause disastrous damage to crops.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hail
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants, Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-25
	Proposed Action:	**Require hail resistant roofing products.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Hail can cause roofing damage throughout the basin.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hail
Effect on new/existing buildings:	New and existing buildings can be built more hail resistant. A hail resistant roof will mitigate against damage and also reduce the cost of insurance by decreasing claims for hail damage.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS
While requiring hail resistant roofing products may cost the owner more in the beginning, future damages will be avoided.

		TCRFC-26
	Proposed Action:	**Develop a local hazmat team.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	It is critical to be informed and prepared during an emergency that involved hazardous material.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release
Effect on new/existing buildings:	n/a
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Grants and/or Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-27
	Proposed Action:	**Develop mutual aid agreements between local emergency responders and corporate hazmat response teams.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Hazardous material spills may cross jurisdictional boundaries and/or the spill may be so large that the affected jurisdiction needs help coping with it.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	No Cost for just signing the agreement
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-28
	Proposed Action:	**Arrange hazmat training for local emergency responders from major transportation companies (like railroads).**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Major transportation companies often carry hazardous material and local hazmat responders can learn to deal with potential releases of hazardous materials from those companies.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	N/A
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-29
	Proposed Action:	**Study how hazardous materials are transported through communities. Implement re-routing of hazardous materials to alternate routes outside of community.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Eliminating the potential threat hazardous materials may cause to the center of town is a prudent investment in a safer community.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-30
	Proposed Action:	**Create and practice neighborhood and community plans with drills and exercises.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	An informed and prepared public is a safer public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Local Emergency Management Teams
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-31
	Proposed Action:	**Educate the public about hazardous materials and household hazardous waste to ensure collection and proper disposal.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	An educated public is a safer public. Many people do not realize the dangers of the chemicals they use every day in their homes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-32
	Proposed Action:	**Educate public about hazmat safety risks, detecting an accident, responding to an accident, evacuation, and shelter-in-place training.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	An educated public is a safer public and potentially prevent a worse spill of hazardous materials if they know what to look for and who to contact quickly.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants, Local Funds
Lead Agency/Department Responsible:	Local Emergency Management Teams
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-33
	Proposed Action:	**Mandate use of steel connectors in new and existing construction. Install retrofits (reinforcement, flood proofing, storm shutters, bracing, etc.).**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Hurricane winds have caused much damage, especially in the lower basin area.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storm
Effect on new/existing buildings:	This action would result in retrofitting buildings, making them more resistant to natural hazards. For new buildings, this would result in building to a higher standard, mitigating against damage and reducing the cost of insurance.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS
While the mandated steel connectors may cost more to install, it will keep the structure safer during a wind event. Retrofitting a structure can prevent it from incurring potentially devastating damage during a hurricane.

		TCRFC-34
	Proposed Action:	**Study hazardous areas and relocate structures out of those hazard areas.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Many structures are currently located in high hazard zones, especially along the coast.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storm
Effect on new/existing buildings:	Relocate existing high hazard area buildings to lower hazard areas.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-35
	Proposed Action:	**Create a hurricane hazard information center.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	It is critical to be informed and prepared for the next hurricane.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storm
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Grants and/or Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-36
	Proposed Action:	**Secure traffic lights and install resilient street signs and traffic controls to avoid impeding evacuations.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Evacuations can be impeded by non-functioning traffic signs and signals.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storm
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants, Local Funds
Lead Agency/Department Responsible:	Local Departments of Transportation
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-37
	Proposed Action:	**Study and implement a system for early leak detection and accidents to protect those most at risk.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Underground pipelines can leak and cause environmental harm without being detected right away.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Pipeline Failure
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-38
	Proposed Action:	**Provide safety procedures to builders and developers for building and operating near hazardous pipelines. Ensure that the location of hazardous material sites and pipelines are readily available to builders.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Builders and developers can be safer in the field if they know where hazardous pipelines are located.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Pipeline Failure
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Safety staff time to track hazardous pipelines
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS
The US Department of Transportation regulates pipelines and may have information and requirements in place. Coordination will be essential so that efforts are not duplicated.

		TCRFC-39
	Proposed Action:	**Incorporate a Hazardous Pipeline Ordinance: adequate insurance pertaining to potential hazardous incidents, penalties for non-compliance, restricting certain uses within 200 feet, etc.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	A community that is aware of the potential dangers can be more prepared—an Ordinance should ensure this.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Pipeline Failure
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff time to prepare the ordinance
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-40
	Proposed Action:	**Implement a back-up plan for storing public records and digital copies off-site in a low-hazard area**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Critical information needs to be stored in a secondary location to ensure no records and vital data is lost.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

TCRFC-41	
Proposed Action:	**Develop alternative energy sources in the event of a utility or petroleum shortage.**
BACKGROUND INFORMATION	
Site and Location:	Basin wide
History of Damages:	Natural disasters in the past have proven it to be vital to have back-up energy sources. The same would apply in the event of a terrorist attack.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants, Local Funds
Lead Agency/Department Responsible:	Local Emergency Management Teams
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-42
	Proposed Action:	**Conduct vulnerability assessment of local water supply and water treatment systems.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Water supply and water treatment facilities are vital infrastructure that needs to be protected and hardened, if possible.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-43
	Proposed Action:	**Obtain certification of communities by the National Weather Service as "Storm Ready" communities.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	A community that is ready for the next storm is a prepared community and can be safer.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorms
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff time to gather information and submit application for certification
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on****

COMMENTS
****Note: The NWS Storm Ready program requires re-certification every three years and an annual visit to the NWS regional office, thus some staff time will be required to maintain the certification.

		TCRFC-44
	Proposed Action:	**Establish a post-event debris-management plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Thunderstorms can be quite violent in the lower Colorado river basin and debris such as fallen limbs may need to be removed from an affected area.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorms
Effect on new/existing buildings:	After a storm event, those buildings not affected by the hazard itself, can still be damaged due to debris that has built up, causing future flood damage. This action would provide for efficient cleanup, mitigating against damage to existing buildings and encourage the development of new buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff time to create the plan
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-45
	Proposed Action:	**Establish pre-disaster debris management contracts.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	It is critical to manage debris in any disaster so that citizens can rebuild and return to normal as quickly as possible.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornadoes
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants, Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-46
	Proposed Action:	**Require "safe rooms" to be added when constructing new schools, daycares, retirement homes, and critical care facilities.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Many structures that hold a potentially large amount of people currently do not have safe rooms.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornadoes
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown*****
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS
*****Note: although safe rooms are an added expense to construction, they are deemed to save lives and make communities safer for residents. It is especially critical to ensure vulnerable populations like children and the elderly are protected.

TCRFC-47	
Proposed Action:	**Require mobile home parks to provide safe storm shelters.**
BACKGROUND INFORMATION	
Site and Location:	Basin wide
History of Damages:	Mobile home parks are areas of highest risk in tornado prone areas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornadoes
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009-2013

COMMENTS

		TCRFC-48
	Proposed Action:	**Mandate and inspect to ensure standard tie-downs are properly fastened on mobile homes.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Mobile homes are at the greatest risk of being completely destroyed in the event of a tornado due to their lack of a solid foundation.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornadoes
Effect on new/existing buildings:	This would strengthen current mobile homes which are susceptible to damage during tornado events.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff time to inspect tie-downs
Potential Funding Sources:	Local Communities
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-49
	Proposed Action:	**Conduct public education program on fire risks and wild land fire mitigation, with the assistance of the Texas Forest Service.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Many residents are unaware of the dangers of wild land fires and continued construction in wild lands places more people at risk of wildfires.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-50
	Proposed Action:	**Develop a comprehensive wild land fire hazard and fuels management plan. Create a wildfire recovery plan, including soil erosion control, and vegetative recovery.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Many communities have no plan in place on how to deal with potentially catastrophic wildfires in their community.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	This would identify wildland interface areas and prevent the development of new buildings in high hazard areas, as well as provide mitigation techniques for reducing or eliminating damage for existing buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff time to develop plan
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Local Emergency Management Teams
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-51
	Proposed Action:	**Ensure area fire fighters are properly trained in wild land fire fighting.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	A wildfire can be very dangerous and it is critical for firefighters to be trained in the potential dangers of a wildfire.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-52
	Proposed Action:	**Bury utility lines to prevent ice build-up.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Many power outages during winter storms are caused by sagging tree limbs lying over power lines.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Winter Storms
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-53
	Proposed Action:	**Research alternate sources for farmers to acquire additional feed and adequate shelter for livestock.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Livestock can be lost during extended winter storms if there is no adequate food or shelter present.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Winter Storms
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants, Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

		TCRFC-54
	Proposed Action:	**Ensure adequate supply of snow and ice removal equipment and supplies.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Many communities have been caught unprepared to deal with extended winter storms.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Winter Storms
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants, Local Funds
Lead Agency/Department Responsible:	Local Communities
Implementation Schedule:	2009 and on

COMMENTS

LCRA

		LCRA-1
	Proposed Action:	**Develop an enforcement plan for implementing mandatory water rationing; lawn watering restrictions; excess-use charges during times of water shortage.**
	BACKGROUND INFORMATION	
	Site and Location:	LCRA service area
	History of Damages:	Due to continued increase in population throughout the lower Colorado river basin, water will continue to be in high demand, especially during particularly dry periods.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	LCRA
Implementation Schedule:	2009 and continuing into the future

COMMENTS

		LCRA-2
	Proposed Action:	**Update current emergency action plan per TCEQ rules for dam failure and conduct a drill.**
	BACKGROUND INFORMATION	
	Site and Location:	LCRA service area
	History of Damages:	The potential for dam failure exists throughout the basin. Many dams are privately owned and have become a high hazard dam over the years due to downstream development.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	TCEQ, LCRA Department of Emergency Management & Dam Safety
Implementation Schedule:	2009-2011

COMMENTS

		LCRA-3
	Proposed Action:	**Identify sites where stream and rain gauges need to be added or upgraded and coordinate installation requests with the USGS and Lower Colorado River Authority. Harden existing gauges against flood damages.**
	BACKGROUND INFORMATION	
	Site and Location:	LCRA service area
	History of Damages:	Flooding cannot be prevented, but more adequate warning may be given to residents downstream if stream gages are installed in more locations. It is critical that these gages function even during a large flood.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	LCRA
Implementation Schedule:	2009 and on

COMMENTS

		LCRA-4
	Proposed Action:	**Track and record high water marks following a flood.**
	BACKGROUND INFORMATION	
	Site and Location:	LCRA service area
	History of Damages:	Flooding has been an ongoing problem in the basin. High water marks have helped in the past to improve flood models and help the public get a visual of how high the water got during certain floods.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5,000 for bench marks *
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	LCRA
Implementation Schedule:	2009 and on

COMMENTS
*Note: The Coalition already has purchased a number of brass benchmarks that can be used by communities for future flood events to mark high water levels. LCRA may be able to use them as well.

		LCRA-5
	Proposed Action:	**Support education of citizens on dangers of low water crossings through the Turn Around Don't Drown (TADD) campaign.**
	BACKGROUND INFORMATION	
	Site and Location:	LCRA service area
	History of Damages:	Low water crossings are the number one killer in floods and educating the general public on the dangers of them may help reduce the number of fatalities.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000 for publications, etc.
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	LCRA
Implementation Schedule:	2009 and on

COMMENTS
It will be vital to inform the public on a continuing basis, not just once. Many new residents move into areas prone to flash flooding and low water crossing publications will need to be maintained and more money will be needed in the future.

		LCRA-6
	Proposed Action:	**During or following a flood event, LCRA may have to rebuild any number of its 262 Hydro meteorological gauging stations damaged or compromised in the flood event.**
	BACKGROUND INFORMATION	
	Site and Location:	The LCRA Hydromet gage network is located across the Colorado River basin and in some cases, adjacent river basins.
	History of Damages:	Gauging stations have been damaged historically due to flood waters inundating the equipment, wind damage, or lightning damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	LCRA
Implementation Schedule:	2009 and continuing into the future

COMMENTS

The Hydromet network plays a central part in LCRA success in managing the lake and river system during routine conditions, floods, and droughts. In recent years, data from the Hydromet system has come to be indispensable to external customers such as local floodplain administrators, local Emergency Managers, National Weather Service flood forecasters, the U.S. Geological Survey, media, and the general public. The Hydromet system is considered critical infrastructure and damage to the system could increase the risk of health and property loss by the public.

		LCRA-7
	Proposed Action:	**Implement a volumetric measurement system in the Garwood Irrigation Division. The measurement process would allow LCRA to charge for water based on the acre-feet of water used.**
	BACKGROUND INFORMATION	
	Site and Location:	Garwood Irrigation Division
	History of Damages:	Measuring water use at all farm turnouts in the Garwood Irrigation Division and billing based on those measurements would promote water conservation by sending a price signal to irrigation water contract holders. It would also increase overall system water management efficiency and improve response capability in times of floods by allowing for additional control and shut-off capacity of the irrigation canals.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$973,500
Potential Funding Sources:	Grants; TWDB; USBR
Lead Agency/Department Responsible:	LCRA River Operations
Implementation Schedule:	2009 to 2011

COMMENTS
With cost share funding, billing based on water use can be implemented by 2011. LCRA is also pursuing other grant opportunities and is willing to provide a 50% cost share for this project.

		LCRA-8
	Proposed Action:	**Develop incentive programs for residential and commercial customers to install water efficient equipment to reduce water demand.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	LCRA wholesale municipal water customers have no incentive programs in place to encourage customers to replace high water use appliances and fixtures with water efficient equipment. Water efficient equipment, such as high efficiency toilets, will maintain its water savings over time, which will help to ensure a reliable water supply when a drought occurs.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on new/existing buildings:	Retrofit program would have some effect on existing buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Approximately $275,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	LCRA Water Use and Conservation
Implementation Schedule:	2009 and on

COMMENTS
The estimated cost reflects a multi-faceted incentive program that would address indoor, outdoor, residential and commercial inefficiencies. If funding is available, incentive programs can be relatively easy to implement and expanded as resources allow.

		LCRA-9
	Proposed Action:	**Develop a web-based tool to calculate water use and savings from the implementation of conservation measures, efficiency standards, and water-wise practices for residential and commercial customers.**
	BACKGROUND INFORMATION	
	Site and Location:	Basin wide
	History of Damages:	Many customers are unaware of how much water they consume and as a result, are less likely to conserve. By equipping them with information on consumption and savings measures, customers will be able to make informed decisions to increase their water use efficiency. The resulting behavior modifications and efficiency improvements would help to ensure a reliable water supply when a drought occurs.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Approximately $10,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Water Use and Conservation
Implementation Schedule:	2009 and on

COMMENTS

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This section contains both an analysis of previous actions and new actions for the participating communities in TCRFC Region I. Each community evaluated and analyzed the regional mitigation actions in Section 21.

Colorado County

Previous Actions & Analysis

		Colorado County (Past Action)-1
	Proposed Action:	**Develop a water/power/supplies crisis response plan**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The county has never experienced water shortage or power outages, nor are there SOPs or SOGs to identify specific support actions outside the county's emergency management plan. This action will support the county infrastructure, emergency services and those citizens on whom a shortage/outage will have a direct impact.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Jan. 2011

2009 Analysis:
This action is currently not complete and will be deferred.

Colorado County (Past Action)-2	
Proposed Action:	**Educate landowners in remote locations on the importance of non-restrictive gates and private road maintenance.**
BACKGROUND INFORMATION	
Site and Location:	Countywide
History of Damages:	Although not a problem in the past, large grass fires in recent years have revealed that there is a lack of education and understanding of new land-owners concerning emergency access for fire response vehicles.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Low
Estimated Cost:	To be Determined
Potential Funding Sources:	Grants and volunteer efforts
Lead Agency/Department Responsible:	Fire Dept. and county extension service
Implementation Schedule:	2011-2012

2009 Analysis:
The majority has been completed through the Fire Department, but it is not countywide. As this action is an ongoing activity it will be deferred.

		Colorado County (Past Action)-3
	Proposed Action:	**Initiate flood event study of the southern part of the county, with emphasis on the Sandy Oaks subdivision**
	BACKGROUND INFORMATION	
	Site and Location:	Sandy Oaks subdivision
	History of Damages:	The last few flood events have revealed the flood and run-off problems that impact the south part of Colorado County. The Sandy Oaks subdivision is particularly impacted by creeks in the area that serve to isolate the residents in the area from emergency assistance.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$25,000
Potential Funding Sources:	Grants and TX Dot
Lead Agency/Department Responsible:	Floodplain Manager
Implementation Schedule:	2010

2009 Analysis:
This action is partially complete as only some of the creeks have been cleared. The current floodplain manager for the County has resigned, and a new floodplain manager has not been trained. Therefore this action is deferred.

		Colorado County (Past Action)-4
	Proposed Action:	**Re-activate the Colorado County LEPC**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The current LEPC is on record as in existence, but has not had any recorded activity for some time.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release
Priority (High, Moderate, Low):	Medium
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	LEPC
Implementation Schedule:	Jan. 2011

2009 Analysis:
Currently not complete. Therefore this action is deferred.

		Colorado County (Past Action)-5
	Proposed Action:	**Purchase NOAA "All Hazards" radios for early warning and post-event information and place in area schools/businesses/critical facilities utilizing public and private partnership funding**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Colorado County experiences all types of weather related events during the course of the year. Recently, the local radio station which provides EAS coverage for local notifications during weather events has sold and a majority of its programming by satellite from another city. Although they meet EAS requirements for remote activations and station personnel are available by phone, some severe weather events have occurred without local media activation.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Hurricane and Tropical Storm, Flood, Hail, Thunderstorm, Drought, Extreme Heat
Priority (High, Moderate, Low):	Medium
Estimated Cost:	To be determined
Potential Funding Sources:	Grants in conjunction with LCRA
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	By year end - 2010

2009 Analysis:
The county has begun purchasing NOAA radios, but does not currently have enough. This action is about 20% complete and will be deferred

Colorado County (Past Action)-6	
Proposed Action:	**Conduct a public education campaign on extreme heat/drought safety and health issues**
BACKGROUND INFORMATION	
Site and Location:	Countywide
History of Damages:	Even though everyone is familiar with or works in the heat, we often forget about those who cannot take care of themselves. Most situations are addressed on a case-by-case basis after it has been brought to someone's attention as a result of a hospitalization or other obvious conditions.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$2,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	County health and community action
Implementation Schedule:	Ongoing activity

2009 Analysis:
This is a public education/awareness activity. As such it is one that the county continues to implement. As it is an ongoing activity, this action will be deferred.

		Colorado County (Past Action)-7
	Proposed Action:	**Develop and train a rapid response team at the Operations Level.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The county has 9 volunteer fire departments that provide emergency response to HM incidents, but has no proper equipment and very few trained personnel. As the threat of WMD events and the increase of materials by road, rail and pipeline increase, so does the potential for such accident s and releases

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release
Priority (High, Moderate, Low):	High
Estimated Cost:	$70,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Fire and Emergency Management
Implementation Schedule:	2011

2009 Analysis:
This action is being deferred for lack of completion. The county cannot require the Volunteer Fire Department to develop this action as any compulsory requirement would have to come through the state.

Colorado County (Past Action)-8	
Proposed Action:	**Complete a study concerning an area-specific evacuation plan for threatened livestock.**
BACKGROUND INFORMATION	
Site and Location:	Countywide
History of Damages:	The potential for a fire, hazardous materials release or other wide area threats not only affect people, but livestock as well. Trying to evacuate even a small number of animals can present difficulties if not assessed and provided for prior to an event. The county has not experienced any calls for this type of assistance, yet the possibility does exist.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$1,000
Potential Funding Sources:	To be determined when lead agency determined
Lead Agency/Department Responsible:	County Commissioners, County Extension Service, Emergency Management, local veterinarians
Implementation Schedule:	2010

2009 Analysis:
This action is being addressed by Emergency Management Statewide through the Emergency Animal Health Commission. Therefore this action is deferred.

Colorado County (Past Action)-9	
Proposed Action:	**Assess current needs and establish short and long term goals for the county's Floodplain Management Division.**
BACKGROUND INFORMATION	
Site and Location:	Countywide
History of Damages:	The Colorado County Floodplain Management Office has endeavored to maintain training, compliance and participate in the Lower Colorado Floodplain Coalition and the National Flood Insurance Program. This task has proven challenging when you take into account the number of local, regional and national changes in polices and directives.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	To be determined
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Floodplain Management Office with assistance from the LCRA, LCFPC and NFIP
Implementation Schedule:	2010

2009 Analysis:
This action is being deferred as a new floodplain manager has recently been hired by the county and has currently not received training.

		Colorado County (Past Action)-10
	Proposed Action:	**Develop and train HAZMAT team to handle hazardous materials releases and purchase necessary equipment.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The county has 9 volunteer fire departments that provide emergency response to HM incidents, but has no proper equipment and very few trained personnel. As the threat of WMD events and the increase of materials by road, rail and pipeline increase, so does the potential for such accident s and releases.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release
Priority (High, Moderate, Low):	High
Estimated Cost:	$70,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Fire and Emergency Management
Implementation Schedule:	2009-2013

2009 Analysis:
This action is being deferred for lack of completion. The county cannot require the Volunteer Fire Department to develop this action as any compulsory requirement would have to come through the state.

		Colorado County (Past Action)-11
	Proposed Action:	**Obtain certification by National Weather Service as a storm ready community**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	Colorado County experiences all types of weather related events during the course of the year. Recently, the local radio station which provides EAS coverage for local notifications during weather events has sold and a majority of its programming by satellite from another city. Although they meet EAS requirements for remote activations and station personnel are available by phone, some severe weather events have occurred without local media activation.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, tornado, hurricane, hail, severe storms, drought
Priority (High, Moderate, Low):	Medium
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	2012

2009 Analysis:
This action is almost complete. The county has an emergency management plan; 24-hour notification point for alerts, but have not held the public meetings at this point. This action is deferred for lack of completion.

New Actions

		Colorado County-1
	Proposed Action:	**Upgrade installation requests for USGS to be compatible with FEMA standards of NGS.**
	BACKGROUND INFORMATION	
	Site and Location:	Southwest County – especially Skull Creek area
	History of Damages:	Skull Creek runs through a gravel pit between Highway 90A and 71S. The backup from this area results in flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Existing and potential new planned structures will benefit in the area.
Priority (High, Moderate, Low):	Moderate to High
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Colorado County Floodplain management
Implementation Schedule:	2011-2013

COMMENTS
LIDAR and completion of mapping required for some of this project.

		Colorado County-2
	Proposed Action:	**Require higher standards and conduct inspections for correspondence with standards on tie-downs for homes with propane tanks**.
	BACKGROUND INFORMATION	
	Site and Location:	Homes located in the floodplain with propane tanks.
	History of Damages:	Propane tanks become dislodged and damaged in times of high flooding or due to hurricane winds.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	If flotation occurs for the tanks it is damaging to homes; therefore this action would benefit existing buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Environmental/Floodplain Management
Implementation Schedule:	2010-2011

COMMENTS

City of Columbus

Previous Actions & Analysis

		Columbus (Past Action)-1
	Proposed Action:	**Conduct outreach to the public to educate citizens on the full range of hazards they face and how to protect themselves, their families and their businesses in disaster situations.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	An educated citizenry is one of the best methods of protection against disaster. Citizens need to know about the risks they face, how to prepare for disaster, and what to do should a disaster occur.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Drought, Extreme Heat, Hail, Winter Storm, Dam Failure, Thunderstorm, Hurricane & Tropical Storms
Priority (High, Moderate, Low):	Moderate to High
Estimated Cost:	Unknown
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	Ongoing

2009 Analysis
This action is ongoing and will be deferred

		Columbus (Past Action)-2
	Proposed Action:	**Undertake a review of the City's floodplain management ordinance.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Current ordinance meets minimum FEMA criteria. With this action, a review of the City's floodplain management ordinance will be undertaken. Consider increasing minimum standards for development in the regulatory floodway, and (1) no rise in the 100-year BFE; (2) offsetting the placement of fill material in the 100-year floodplain with compensating storage; (3) no construction of habitable structures in the 100-year floodway; and (4) no increase in erosive water velocity on- or off-site. This action examines the potential effects of new development on the hydrology of the watershed and thus raises community awareness about potential flooding from new development in the basin.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Annually

2009 Analysis
The floodplain ordinance is reviewed on an annual basis. Therefore, this action is ongoing and will be deferred

New Actions

		Columbus-1
	Proposed Action:	**Become a "Storm Ready" community certified by the National Weather Service (NWS).**
	BACKGROUND INFORMATION	
	Site and Location:	City of Columbus
	History of Damages:	The City of Columbus has been impacted by several natural hazards such as flood, hurricane, tropical storm and tornadoes. The NWS Storm Ready programs help communities to better respond when a disaster strikes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Tornado, Hail, Winter Storm
Effect on new/existing buildings:	Becoming Storm Ready enables communities to better warn their citizens, which allows for the strengthening of existing structures.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Floodplain Management
Implementation Schedule:	2011

COMMENTS

		Columbus - 2
	Proposed Action:	**Work in conjunction with Colorado County to develop a comprehensive land use plan.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Columbus
	History of Damages:	The City of Columbus has been impacted by several natural hazards such as flood, hurricane, tropical storm and tornadoes. A comprehensive land use plan would reference the current mitigation plan and also tie land use issues to hazard concerns such as flood and drought.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Drought
Effect on new/existing buildings:	Developing a land use plan benefits existing buildings as it prescribes a plan for development out of hazard-prone areas.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	2012-2013

COMMENTS

		Columbus - 3
	Proposed Action:	**Develop an area-specific evacuation plan for threatened livestock in the event of wildfire or hazardous material release.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The potential for a fire, hazardous materials release affects livestock as well as residents. Evacuation of animals can present difficulties if a plan is not in place prior to a disaster event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Hazardous Material Release
Effect on New/Existing Buildings:	Pre-planning for emergency livestock relocation will not only affect the salvaging existing buildings, but prevent an impact on the local economy.
Priority (High, Moderate, Low):	Low
Estimated Cost:	$1,000
Potential Funding Sources:	To be determined when lead agency determined
Lead Agency/Department Responsible:	City Manager
Implementation Schedule:	2010

COMMENTS

City of Eagle Lake

Previous Actions & Analysis

		Eagle Lake (Past Action)-1
	Proposed Action:	**Implement standards set forth by city ordinance to control new construction and/or substantial improvements to residential and nonresidential structures within flood-hazard areas that may alter the natural floodplain's stream channels and affect protective barriers involved in accommodating flood waters.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Eagle Lake's ordinance requires that the lowest floor of residential construction (1) within the designated floodplain be elevated to 1 foot areas, structures be elevated to at least 6 inches above existing grade. It also requires that all manufactured homes be installed using methods and practices that minimize flood damage. The flood-hazard areas of Eagle Lake are subject to periodic inundation that results in loss of life and property, health and safety hazards, disruption of commerce and government services, and extraordinary public expenditures for flood protection and relief – all of which adversely affect the public health, safety, and general welfare. These flood losses are created by the cumulative effects of obstructions in floodplains that cause an increase in flood heights and velocities, and by the occupancy of flood-hazard areas by inadequately elevated or flood-proofed structures and those not otherwise protected from flood damage.above the 100-year BFE and be certified by a registered professional engineer, architect, or land surveyor; (2) outside the flood-hazard

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	City of Eagle Lake
Implementation Schedule:	Annually

2009 Analysis
The floodplain ordinance is reviewed on an annual basis. Therefore, this action is ongoing and will be deferred

		Eagle Lake (Past Action)-2
	Proposed Action:	**Purchase equipment and carry out other activities to maintain drainage systems and to complete implementation of the program to set to grade and clean drainage ditches within the city. Coordinate efforts with the county and state agencies to improve drainage outside the city's jurisdiction and, thus, the overall drainage system.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Large amounts of rainfall over a short period of time or long periods of continuing rainfall saturate the drainage system within the city in a very short period of time. Areas north and west of the city are higher in elevation, and surface waters from these areas enter into and add to the city drainage load. The city drains reasonable well, but due to the flat terrain it drains very slowly. Limited resources have prevented an adequate maintenance program and the drainage system is flowing at less than 50 percent in many areas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000 per day (8 hours), based on the use of one gradall, two dump trucks, surveying and related equipment, operated by a four-man crew. Total is unknown
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	City of Eagle Lake
Implementation Schedule:	2012 or as resources becomes available

2009 Analysis
This action is currently not complete and will be deferred.

		Eagle Lake (Past Action)-3
	Proposed Action:	**Construct a satellite fire station on the south side of the railroad tracks to house equipment; and explore alternative options for continued operations of the fire and police departments and governing agencies.**
	BACKGROUND INFORMATION	
	Site and Location:	South side of railroad tracks
	History of Damages:	An average of 30 trains per day pass through the city, some of which exceed 100 cars and transport cargo that includes fuels, acids, and other hazardous materials. This poses a constant threat because a derailment could bloc (1) all crossings, eliminating access by fire and rescue equipment; or (2) the exit doors of the fire station across the street from the main line, preventing the deployment of fire and rescue equipment.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$80,000
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	City of Eagle Lake
Implementation Schedule:	2013 or as resources becomes available

2009 Analysis
This action is currently not complete and will be deferred.

		Eagle Lake (Past Action)-4
	Proposed Action:	**Coordinate with the local power company to implement a trimming program to clear tree limbs from the avenues used for power lines within the city to prevent burning or power outages when subjected to high winds; coordinate with state and county agencies for assistance with additional equipment needed in times of emergency.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city is subject to storm winds, tornados, and heavy rains that may be associated with hurricanes. These winds can cause tree limbs to come into contact with power lines, resulting in power failures. Such outages can interrupt the provision of fire and police services, as well as those of other government agencies, and can disrupt electrical service to residential areas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storm, Tornado
Priority (High, Moderate, Low):	Medium
Estimated Cost:	To be determined
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Public Works, Police Department
Implementation Schedule:	2011 or as resources becomes available

2009 Analysis
This action is currently not complete and will be deferred.

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New Actions

		EL-1
	Proposed Action:	**Purchase equipment for emergency services, either new or in good condition the following: 1) Gradall for ditch cleaning and 2) Maintainer for road grading.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Eagle Lake
	History of Damages:	The majority of the City does not have curb and guttering and relies on open ditches to divert stormwaters. The city has experienced inadequate maintenance of the ditches due to the inability to keep obsolete equipment operational, which has decreased the efficiency of the system by fifty percent (50%).

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Tornado, Thunderstorm
Effect on new/existing buildings:	Equipment is needed to support the maintenance of 70% of the city drainage system and maintenance of unimproved streets and ditches to enhance stormwater runoff and minimize flooding conditions caused by backup thereby benefitting existing structures and encouraging the development of new buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	$355,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works Dept.
Implementation Schedule:	2009

COMMENTS
The City of Eagle Lake does not have an adequate tax base to support the funding to purchase or replace major equipment required to maintain the city's drainage system. Parts to repair the existing equipment are no longer available from any source. When available, good condition and used equipment can be purchased from equipment supplier's rental fleets. Estimate Cost: 1. New: $250,000; Good Condition/Used: $125,000 2. New: $104,000; Good Condition/Used: $60,000

		EL-2
	Proposed Action:	**Construct a sixty by sixty foot satellite station to house fire and rescue equipment on the south side of the railroad tracks, which divide the city by 50% on the north side and 50% on the south side of the tracks.**
	BACKGROUND INFORMATION	
	Site and Location:	There are five railroad crossings serving the city in close proximity to the existing fire station, the bay doors of the existing fire station are less than one hundred feet from the north side of the railroad tracks.
	History of Damages:	Train emergencies involving a disabled train, derailed train or accident involving a train in the past have blocked all crossing in the area of the fire station and thereby delayed the fire department from responding in time to the south side of the tracks. A derailment could possibly block the doors of the station and prevent a response from the fire department.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire, Hazardous Materials Release
Effect on new/existing buildings:	This action would benefit the existing station and the development of new buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$72,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City management
Implementation Schedule:	As resources become available

COMMENTS

		EL-3
	Proposed Action:	**Retrofit the City Davitt Street Water Plant electrical system with a transfer switch to interface to a portable backup generator.**
	BACKGROUND INFORMATION	
	Site and Location:	The Davitt Street Water Plant is the city's newest and best producing of two water plants, and is critical in meeting the water supply demand for the city.
	History of Damages:	The Davitt Street Water Plant does not have backup power to support possible electrical power outages during storms, hurricanes or other extended periods of power loss.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storm, Flood, Thunderstorm, Winter Storm
Effect on new/existing buildings:	This action would benefit the existing station and the development of new buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	$23,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	As resources become available

COMMENTS
Backup generator equipment that meets load requirements of the water plant is available through the Colorado County Office of Emergency Management during times of emergency.

		EL-4
	Proposed Action:	**Conduct a public education campaign on extreme heat/drought safety and health hazards., distribute brochures at public offices, public meetings, library**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide – City of Eagle Lake
	History of Damages:	Extreme heat is a serious concern for public health and often overlooked. Many injuries or fatalities can be preventing by just informing citizens of the dangers of extreme heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Effect on New/Existing Buildings:	New construction may include energy-efficient construction, heat reflective materials including solar screens to reduce heat; existing buildings would benefit from solar screens, film to reduce UV rays, additional insulation
Priority (High, Moderate, Low):	High
Estimated Cost:	$500
Potential Funding Sources:	City Budget
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	2010

COMMENTS

City of Weimar

Previous Actions & Analysis

Not applicable: Weimar is a new community (See Table 1-2)

New Actions

		Weimar-1
	Proposed Action:	**Develop a soil conservation plan.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Weimar
	History of Damages:	The City experiences damages from drought and extreme heat. Although currently a water and power supply crisis response plan is in place, a longer-term plan for conservation is necessary

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	Benefits new and existing buildings by enhancing erosion control, planting xeriscape, shade structures in and near structures for protection.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$8,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Planning & Zoning
Implementation Schedule:	One year from grant award

COMMENTS

		Weimar-2
	Proposed Action:	**Develop a public awareness campaign to educate the public on extreme heat/drought safety and health issues.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Weimar
	History of Damages:	The City of Weimar has experienced periods of moderate to extensive drought since 2005.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	New construction may include energy-efficient construction including solar screens to reduce heat, existing buildings would benefit from solar screens, film to reduce UV rays, additional insulation
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Dependent upon advertising
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	To be implemented upon receipt of funding

COMMENTS

		Weimar-3
	Proposed Action:	**Create an evacuation plan that will include the evacuation of livestock in the event of a wildfire.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Weimar
	History of Damages:	The potential for a fire, hazardous materials release or other wide area threats not only affect people, but livestock as well. Trying to evacuate even a small number of animals can present difficulties if not assessed and provided for prior to an event. The city has not experienced any calls for this type of assistance, yet the possibility does exist

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire, Hazardous Materials Release
Effect on new/existing buildings:	Pre-planning for emergency livestock relocation will not only affect the salvaging existing buildings, but prevent an impact on the local economy.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$2,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Administration
Implementation Schedule:	To be implemented upon receipt of funding

COMMENTS

		Weimar-4
	Proposed Action:	**Install new automated electric meters throughout the City and continuing until all meters are replaced.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Weimar
	History of Damages:	The City of Weimar has experienced periods of moderate to extensive drought since 2005. The city is also prone to power outages with winter storms, tornadoes, severe thunderstorms or hurricanes/tropical storms

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Tornado, Thunderstorms, Winter Storms, Hurricane & Tropical Storms
Effect on new/existing buildings:	Controlled meter reading costs and improved meters conserves electric power and costs and reduces power surges, blackouts which can add stress to structures' electric utility systems
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Annual, until project completed
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	Ongoing project until all meters are installed

COMMENTS

		Weimar - 5
	Proposed Action:	**Provide proper design criteria and promote tornado safe rooms**
	BACKGROUND INFORMATION	
	Site and Location:	City
	History of Damages:	Storm cellars are not feasible. Life, health and safety would be better protected. Home windstorm shelters can provide protection against winds of up to 250 miles per hour and against projectiles traveling at 100 miles per hour. The construction of safe rooms reduce risk and potential loss of life in the event of severe weather disasters.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorms, Winter Storms, Hurricane & Tropical Storms
Effect on new/existing buildings:	Tornado safe rooms and other design criteria strengthen existing and new structures
Priority (High, Moderate, Low):	Low
Estimated Cost:	$10,000
Potential Funding Sources:	General Fund/ Grants
Lead Agency/Department Responsible:	Code Enforcement/Building Department
Implementation Schedule:	2010 and ongoing

COMMENTS
Federal loan programs are designed to help cover the cost of building home windstorm shelters, often called safe rooms. The City would administer the funds but homeowners apply for funds through approved FEMA Contractors in the area.

Weimar - 6	
Proposed Action:	**Join the National Weather Service Storm Ready Program**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Weimar experiences both natural and man-made hazards. Joining the Storm Ready program would help to ensure that citizens have timely information about conditions. It would also help to train workers about how to inform the public most efficiently about the action they need to take. A "Storm Ready" designation can lead to reduced insurance rates for communities participating in the National Flood Insurance Program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Tornado,
Effect on new/existing buildings:	A better warning system and recommendations for operating during and after hazardous weather, as well as lower insurance rates through the NFIP.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$2,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	2010

COMMENTS

Fayette County

Previous Actions & Analysis

		Fayette County (Past Action)-1
	Proposed Action:	**Install and/or improve Emergency Operating Center capabilities for monitoring, recording, and responding to disasters**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Fayette County had never had an Emergency Operations Center. Operations have been controlled from a vehicle having limited communications and personnel required to make command decisions.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Hail, Wildfire, Drought, Extreme Heat, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	High
Estimated Cost:	$80,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	County Judge
Implementation Schedule:	2012

2009 Analysis
This action is currently not complete and will be deferred. The County has an EOC but lacks equipment.

		Fayette County (Past Action)-2
	Proposed Action:	**The County's emergency services will need to continue to work with DPS and TXDot contra-flowed evacuation routes to ensure public notification when evacuation is imminent**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Fayette County is prone to coastal flooding, hurricanes, and other disasters, many of which require evacuations. The County provided emergency shelter for first responders and their families for Hurricanes Ike and Dolly in 2008, and has provided shelter numerous times in the past 10 years.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Hail, Wildfire, Drought, Extreme Heat, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	High
Estimated Cost:	$25,000-50,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	County EMC/County Judge
Implementation Schedule:	2013

2009 Analysis
This action is currently not complete and will be deferred. Evacuation zones were completed, but new plans were implemented by the State due to Hurricanes Katrina and Rita, causing the county to begin the planning process of evacuating thousands of people during a disaster.

		Fayette County (Past Action)-3
	Proposed Action:	**Educate the public about hazardous materials and household hazardous waste.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The general public generally is not aware of which household items and products can present dangers if disposed of improperly, and does not how to safety dispose of such items.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release
Priority (High, Moderate, Low):	High
Estimated Cost:	$15,000-20,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	County EMC/County Judge
Implementation Schedule:	Ongoing activity

2009 Analysis
This action was completed in 2006 but is ongoing and deferred. The county established an education program and recycling center in which to dispose of hazardous waste. Fayette County entered into an agreement with LCRA to recycle hazardous waste.

		Fayette County (Past Action)-4
	Proposed Action:	**Develop Mutual Aid Agreements with area communities**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	A limited number of mutual aid agreements of limited scope are in place to deal with emergency response. Agreements are needed among pertinent agencies and between neighboring counties to enable them to work together and work from the same information base, making emergency response policy and procedures consistent in adjoining areas

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane and Tropical Storm, Thunderstorm, Tornado, Drought, Wildfire
Priority (High, Moderate, Low):	High
Estimated Cost:	$35,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	County EMC/County Judge
Implementation Schedule:	Ongoing

2009 Analysis
This action is ongoing and deferred.

		Fayette County (Past Action)-5
	Proposed Action:	**Implement and area-wide telephone Emergency Notification System**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	Fayette County is prone to coastal flooding, hurricanes, and other disasters, many of which require evacuations. The County has had to provide shelter numerous times in the past 10 years.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane and Tropical Storm, Tornado, Thunderstorm, Wildfire
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$5,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	County EMC/County Judge
Implementation Schedule:	Completed

2009 Analysis
Completed through CAPCOG funds.

		Fayette County (Past Action)-6
	Proposed Action:	**Complete the buy-out to acquire all property in the Frish Auf Floodplain**
	BACKGROUND INFORMATION	
	Site and Location:	Frish Auf Floodplain
	History of Damages:	Because of repeated flooding, the County needs to purchase one remaining unit and several vacant lots for park use only as part of the capital improvement program

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$75,000
Potential Funding Sources:	Capital Improvement Program
Lead Agency/Department Responsible:	County EMC/County Judge
Implementation Schedule:	Upon receipt of funding

2009 Analysis
This action will be deferred. The county has not received grants or funding to buy out the remaining properties.

		Fayette County (Past Action)-7
	Proposed Action:	**Improve Emergency Management radio communication and reception**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	At present EMS, Fire, and Police/Sheriffs departments all have different sets of radios and each a different frequency. Communications for emergencies are poor.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Flood, Hurricane and Tropical Storm, Tornado, Extreme Heat, Drought
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000-150,000
Potential Funding Sources:	Department of Homeland Security
Lead Agency/Department Responsible:	County EMC/County Judge
Implementation Schedule:	Complete

2009 Analysis
This action is complete. Through Homeland Security Grants, a consistent radio and communications system was installed in 2005 (900 mghz).

Fayette County (Past Action)-8	
Proposed Action:	**Adopt a policy of "no-rise" in Base Flood Elevation (BFE) in the 100-year floodplain.**
BACKGROUND INFORMATION	
Site and Location:	County wide
History of Damages:	Repeat flooding occurs in and near the Colorado River, due to new subdivisions and new structures such as bridges and railroads that cross the river.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000-150,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	County Judge/Floodplain Administrator
Implementation Schedule:	Complete: 2005-2006

2009 Analysis
This action is complete. Fayette County Commissioner's Court adopted the 2006 FEMA Floodplain maps and Floodplain Ordinances.

		Fayette County (Past Action)-9
	Proposed Action:	**Educate individuals and businesses regarding actions to take in preparation for possible terrorist events (emergency preparedness kits)**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	No education programs have ever been provided for the general public, emergency responders, or businesses in Fayette County.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000-150,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	County Judge/EMC
Implementation Schedule:	Complete: 2005-2006

2009 Analysis
This action is complete. Education programs (ICS training, Skywarn, Hurricane Preparedness, Pandemic Outbreaks) have been provided at no cost to the general public, emergency responders, and businesses in Fayette County. This continued action will help prevent loss of lives and property.

Fayette County (Past Action)-10	
Proposed Action:	**Enclose the Fayette County Regional Airport with a 8-foot tall fence.**
BACKGROUND INFORMATION	
Site and Location:	County wide
History of Damages:	According to the Department of Homeland Security and the FBI, Al-Queda continues to develop plans for using commercial and private aircraft against targets in the United States.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$300,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	County Judge/Airport Advisory Committee/EMC
Implementation Schedule:	2011-2013

2009 Analysis
This action will be deferred. The county has not received grants or funding to install the 8-foot perimeter fence.

New Actions

		Fayette County -1
	Proposed Action:	**Strengthen the telephone Emergency Notification System (ENS) by including cell phones and non-landline based communications.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Fayette County has been prone to hurricane and tropical storms as well as flooding. The county is responsible for responding quickly when disaster strikes. The ENS was established after 2004, but needs to be updated.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Severe Storm, Winter Storms, Wildfire, Tornado
Effect on new/existing buildings:	This action would benefit existing buildings by warning citizens in advance, allowing them to protect their property.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	County EMC
Implementation Schedule:	2010-2011

COMMENTS

		Fayette County -2
	Proposed Action:	**Become a National Weather Service (NWS) Storm Ready Community.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Fayette County has been prone to hurricane and tropical storms as well as flooding. The county now has a response system that can notify residents in the event of a disaster.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorm, Winter Storms, Wildfire, Tornado, Drought, Extreme Heat
Effect on new/existing buildings:	Becoming "Storm Ready" helps communities to leverage grant funding for projects which benefit new and existing structures.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	County EMC
Implementation Schedule:	Begin in 2010 and continue

COMMENTS

City of Carmine

Previous Actions & Analysis

		Carmine(Past Action)-1
	Proposed Action:	**Conduct outreach to the public to educate citizens on the full range of hazards they face and how to protect themselves, their families and their businesses in disaster situations.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	An educated citizenry is one of the best methods of protection against disaster. Citizens need to know about the risks they face, how to prepare for disaster, and what to do should a disaster occur.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Wildfire, Hurricane and Tropical Storm, Tornado, Extreme Heat, Drought
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	Ongoing

2009 Analysis
This action will be deferred as the city intends to continue the ongoing activity of public awareness

		Carmine(Past Action)-2
	Proposed Action:	**Undertake a review of the City's floodplain management ordinance.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The City of Carmine has a floodplain management ordinance that meets FEMA minimum requirements and criteria. Consider moving beyond the minimum standards for development in the regulatory floodway including (1) no rise in the 100-year BFE; (2) offsetting the placement of fill material in the 100-year floodplain with compensating storage; (3) no construction of habitable structures in the 100-year floodway; and (4) no increase in erosive water velocity on- or off-site.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Continual/ongoing

2009 Analysis
This action will be deferred as the city intends to continue review the Floodplain Ordinance

New Actions

		Carmine -1
	Proposed Action:	**Develop a soil conservation plan for wind and water erosion of soils, reduced soil quality**
	BACKGROUND INFORMATION	
	Site and Location:	City of Carmine
	History of Damages:	The City experiences drought and extreme heat every summer which can lead to shortage of water and reduction of soil quality.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	This action would encourage new business development
Priority (High, Moderate, Low):	Low
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City Manager
Implementation Schedule:	One year after receipt of funds

COMMENTS

		Carmine -2
	Proposed Action:	**Make the location of hazardous material sites and pipelines are readily available to builders, homeowners, and lenders in the community.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Carmine has not experienced a pipeline rupture, but the amount of gas pipelines in the area underscores the need for greater public awareness.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release, Pipeline Failure
Effect on new/existing buildings:	This would encourage safer building for new construction
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	Ongoing activity

COMMENTS

		Carmine - 3
	Proposed Action:	**Conduct routine fire hydrant inspections**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Wildfires can cause rampant destruction, and therefore it's imperative that hydrants are operating properly.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	This action would protect existing buildings from the hazard of wildland fire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Fire Department
Implementation Schedule:	Continual /ongoing

COMMENTS

City of Flatonia

Previous Actions & Analysis

		Flatonia (Past Action)-1
	Proposed Action:	**Update floodplain development requirements.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Flatonia's floodplain requirements were adopted more than 25 years ago and are in need of updating. Flatonia's floodplain management ordinance meets mandatory requirements of the National Flood Insurance. Consider improving the existing ordinance and move beyond the minimum standards for development in the regulatory floodway.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$2,000 for training and legal cost
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	2011-2013

2009 Analysis
This action will be deferred as it has not been completed. The City has improved floodplain maps, but the ordinance has remained the same. The City would like to defer this action as it is useful. There have not been available funds or time to complete it during the five-year period of the 2004 HMAP.

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		Flatonia (Past Action)-2
	Proposed Action:	**Develop a system for using the city siren and for informing the public about the purposes of its use**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The city has a siren that can be heard in most parts of the town, but an early warning system has never been developed.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	City
Implementation Schedule:	2011-2013

2009 Analysis
This action will be deleted. The City has a means of communication for early warning (reverse 911). The City has determined that it is too difficult to update the Siren. Instead Flatonia has developed and implemented an early warning system using reverse 9-11.

Flatonia (Past Action)-3	
Proposed Action:	**Work with Texas Department of Transportation to improve drainage at Interstate 10 and FM 609.**
BACKGROUND INFORMATION	
Site and Location:	I10 and FM 609
History of Damages:	Flooding occurs at Interstate 10 feeder road, near FM 609 during heavy rain.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City of Flatonia
Implementation Schedule:	2011-2013

2009 Analysis
This action will be deferred. The City would like to defer this action as it is useful. There have not been available funds or time to complete it during the five-year period of the 2004 HMAP.

		Flatonia (Past Action)-4
	Proposed Action:	**Improve drainage on Second Street, Fifth Street, Ninth Street, and South Main Street.**
	BACKGROUND INFORMATION	
	Site and Location:	Second Street, Fifth Street, Ninth Street, and South Main Street
	History of Damages:	Flooding on roadways

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$100,000
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	City of Flatonia
Implementation Schedule:	Complete

2009 Analysis
This action has been completed. Completion of this project has significantly reduced the need for emergency service input during periods of heavy rainfall.

		Flatonia (Past Action)-5
	Proposed Action:	**Educate the public about requirements for development in the floodplain**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	This action will result in improved public knowledge; prevention of development in the floodplain and, thus, improved public safety and reduced losses.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$500
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	City of Flatonia
Implementation Schedule:	Complete

2009 Analysis
This action has been completed. The code compliance office provides information and requirements for prospective projects in or near the floodplain.

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		Flatonia (Past Action)-6
	Proposed Action:	**Review, amend, and enforce building codes**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Because the downtown area was developed with no setback requirements, it is especially vulnerable to urban fires that could destroy large areas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	City of Flatonia
Implementation Schedule:	Complete with continual review

2009 Analysis
This action has been completed. Code compliance is an ongoing activity.

		Flatonia (Past Action)-7
	Proposed Action:	**Work with Union Pacific Railroad to keep trains from stopping in areas that block all grade crossings.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Trains blocking road crossings prevent first responders from access

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Hurricane, Hazardous Materials Release, Thunderstorm, Wildfire
Priority (High, Moderate, Low):	High
Estimated Cost:	None
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	City of Flatonia
Implementation Schedule:	2010

2009 Analysis
This action will be deferred. Although substantial progress has been made, the City needs to monitor the situation and develop an “open and continuing channel of communication” with UPRR.

New Actions

		Flatonia-1
	Proposed Action:	**Develop routine fire hydrant maintenance schedule.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Flatonia, water system
	History of Damages:	The City has experienced periods of extreme drought especially within the last five years.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire
Effect on new/existing buildings:	Adopting routine maintenance helps to protect existing buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	City Budget, grant funding for emergency service
Lead Agency/Department Responsible:	City of Flatonia, Water Utility Department
Implementation Schedule:	2009-2010 Budget year

COMMENTS
Proper maintenance of the municipal fire protection system is a labor intensive activity. Since most water systems are dual purpose (potable water supply & fire protection supply), it is imperative the procedure be performed by qualified personnel.

		Flatonia-2
	Proposed Action:	**Implement maintenance program for drainage, including waterways, culverts, and bridges.**
	BACKGROUND INFORMATION	
	Site and Location:	Main watershed at W. Second St., W. Third St. W. Fourth St., W. Fifth St., W. Sixth St., W. South Main, W North Main, W. Seventh St., W. Ninth St. Penn St., Brunner Property (north of IH 10 Frontage Rd.)
	History of Damages:	Flatonia has experienced the damage from flooding when drainage systems back up.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane and Tropical Storms
Effect on new/existing buildings:	Better drainage will protect existing buildings against flooding and also encourage new development.
Priority (High, Moderate, Low):	High
Estimated Cost:	20,000
Potential Funding Sources:	City Budget, Fayette County
Lead Agency/Department Responsible:	City of Flatonia, Street Dept.
Implementation Schedule:	2009-2012

COMMENTS
Maintaining waterways should be a high priority issue, but is often overlooked due to time and labor concerns.

		Flatonia-3
	Proposed Action:	**Install standby power supply (generators) at Water Plant #2 & Waste Water Treatment Plant**
	BACKGROUND INFORMATION	
	Site and Location:	200 E Old Hallettsville Rd. 345 IH 10 Frontage Rd.
	History of Damages:	Flatonia has been exposed to several power outages due to strong storm systems. A generator is needed to keep the power supply steady in the face of a disaster.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storms, Flood, Winter Storm, Thunderstorm, Tornado
Effect on new/existing buildings:	This action strengthens the current Water Treatment facility
Priority (High, Moderate, Low):	High
Estimated Cost:	$120,000
Potential Funding Sources:	City Budget, Grants
Lead Agency/Department Responsible:	City of Flatonia, Water & Wastewater Depts
Implementation Schedule:	2009-2013

COMMENTS
Standby power that can be rapidly and efficiently placed into operation is essential to provide safe continuance of service to customers. In addition standby power (for the water system) is necessary to insure fire protection.

		Flatonia-4
	Proposed Action:	**Develop and install quick connect emergency generator system for critical emergency shelters and support facilities.**
	BACKGROUND INFORMATION	
	Site and Location:	Civic Center, American Legion Hall, Baptist Church Gym, Baptist Church Fellowship Hall, Flatonia Methodist Church Fellowship Hall, Sacred Heart Parish Hall, City Office
	History of Damages:	The city is currently in need of support during an emergency as even if the city is not directly hit, many evacuees will seek shelter in the area.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storms, Thunderstorm, Winter Storm, Tornado, Flood
Effect on new/existing buildings:	Generators will help restore electricity to buildings used as emergency shelters and support.
Priority (High, Moderate, Low):	High
Estimated Cost:	$60,000
Potential Funding Sources:	City Budget, Government Surplus, Grant
Lead Agency/Department Responsible:	City of Flatonia, Emergency Management
Implementation Schedule:	2009-2011

COMMENTS
Emergency power is necessary to provide temporary shelter and housing after a major disaster. This project would utilize two portable trailer mounted generators and pre-wired transfer switches to supply emergency shelters. Multiple shelter locations would be determined and each wired with a transfer switch. In the event the primary shelters were damage in the disaster, the generators could easily be moved to the secondary shelters.

		Flatonia-5
	Proposed Action:	**Flood proof Waste Water Treatment Plant**
	BACKGROUND INFORMATION	
	Site and Location:	345 N IH 10 Frontage Rd
	History of Damages:	The city is prone to flooding whether through a thunderstorm event or a hurricane or tropical storm.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane and Tropical Storm, Thunderstorm
Effect on new/existing buildings:	Protects all structures in the community from flooding from failed wastewater treatment facility in the event of weather disasters
Priority (High, Moderate, Low):	High
Estimated Cost:	$15,000
Potential Funding Sources:	City Budget, Grant
Lead Agency/Department Responsible:	City of Flatonia, Waste Water Dept.
Implementation Schedule:	2009-2011

COMMENTS
The wastewater treatment plant is located in a low area north of our community. This is not uncommon to locate these facilities on the “low end” of a community. This allows gravity flow to assist with waste water collection. The drawback is that many of these treatment plants were not designed to resist possible flooding of the facility. Such flooding produces safety and environmental concerns.

City of La Grange

Previous Actions & Analysis

		La Grange(Past Action)-1
	Proposed Action:	**Conduct outreach to the public to educate citizens on the full range of hazards they face and how to protect themselves, their families and their businesses in disaster situations.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	An educated citizenry is one of the best methods of protection against disaster. Citizens need to know about the risks they face, how to prepare for disaster, and what to do should a disaster occur.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Hurricane, Wildlfire, Drought, Extreme heat
Priority (High, Moderate, Low):	High
Estimated Cost:	Negligible
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	Ongoing

2009 Analysis
This action will be deferred as public outreach is an ongoing activity.

New Actions

		LG-1
	Proposed Action:	**Develop a public awareness campaign for drought and extreme heat as part of drought contingency plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city currently has a water conservation plan, but a public awareness campaign is necessary to inform citizens of the dangers of drought and extreme heat. Especially since La Grange has experienced periods of extreme drought in the last five years.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Effect on new/existing buildings:	Protects structures by promoting xeriscape and planting of shade structures to reduce extreme heat affects.
Priority (High, Moderate, Low):	High
Estimated Cost:	$25,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City manager
Implementation Schedule:	Ongoing activity

COMMENTS

		LG-2
	Proposed Action:	**Conduct monthly fire hydrant maintenance**
	BACKGROUND INFORMATION	
	Site and Location:	Fire hydrant every 500 feet or less within the City
	History of Damages:	Because the City has suffered damage due to wildfires; it's important to conduct routine maintenance for all fire hydrants within the City.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Extreme Heat, Drought
Effect on new/existing buildings:	This action strengthens existing buildings and encourages the development of new buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5,000 per month
Potential Funding Sources:	City
Lead Agency/Department Responsible:	Fire Department
Implementation Schedule:	Monthly activity

COMMENTS

		LG-3
	Proposed Action:	**Install automated flood warning systems**
	BACKGROUND INFORMATION	
	Site and Location:	Low water crossings throughout the city
	History of Damages:	Flooding causes damage and death when people drive over or through low-water crossings. Sometimes floodwaters rise before barricades are in place. Also citizens sometimes drive around the barricades.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Severe Storm, Hurricane and Tropical Storms
Effect on new/existing buildings:	Reduce effects of flooding on all structures in the community
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$50,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	One year after receipt of funding

COMMENTS

		LG-4
	Proposed Action:	**Provide safety procedures to builders and developers for building and operating near hazardous material sites and pipelines.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city contains many high-pressured gas lines as well as hazardous material sites. An even has not occurred, but there is the potential for a hazard occurrence.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Pipeline Failure, Hazardous Materials Release, Terrorism
Effect on new/existing buildings:	This would prevent the destruction of existing property as well as promote the development of new buildings.
Priority (High, Moderate, Low):	Low
Estimated Cost:	$10,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Fire Department and combined county Fire Fighters Association
Implementation Schedule:	Ongoing activity after receipt of funds

COMMENTS

Matagorda County

Previous Actions & Analysis

		Matagorda County (Past Action)-1
	Proposed Action:	**Install roofing material of stronger quality, enforce codes, encourage farmers to become more educated about protection of crops, and educate the general public about the damage caused by hail and how to prevent or alleviate it.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	Eleven reported hail storms occurred between 1973 and 1999

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hail
Priority (High, Moderate, Low):	High
Estimated Cost:	Building codes and enforcement - $125,000 Public education – minimal, can be absorbed within existing budgets
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Extension Agents, Hazard Mitigation Coordinator, Building Inspectors
Implementation Schedule:	Education - 2010 Building - 2011

2009 Analysis
This action will be deferred. Public education for 2010 and the building for 2012.

		Matagorda County (Past Action)-2
	Proposed Action:	**Establish and implement burning standards, build water reservoirs or wells, educate farmers about alternative crops, educate the general public and farmers about water conservation, enact an ordinance authorizing temporary water restrictions.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	14 droughts have affected the county since 1999

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Education – minimal, can be absorbed within existing budgets Reservoirs/wells - $8 million
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Extension Service
Implementation Schedule:	2012

2009 Analysis
This action will be deferred for the end of 2012.

		Matagorda County (Past Action)-3
	Proposed Action:	**Institute and enforce ordinances and codes, including tie-down requirements; educate the public to ensure tornado awareness and knowledge of insurance needs; continue to keep the public informed about the meaning of alerts and evacuation routes.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	There have been 32 events since 1954 that have caused 20 deaths from tornadoes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Priority (High, Moderate, Low):	High
Estimated Cost:	$175,000
Potential Funding Sources:	FEMA Grants/Small Business Admin.
Lead Agency/Department Responsible:	Emergency Mgmt. Coordinator, Red Cross, Environmental Health
Implementation Schedule:	2012

2009 Analysis
This action will be deferred until 2012, and the amount has increased to $180,000.00.

		Matagorda County (Past Action)-4
	Proposed Action:	**Educate the general public about storm issues, cold-weather issues, sand bridges.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	Matagorda County has not had a severe winter storm since 1979 and many citizens are unaware of the potential dangers.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Winter Storms
Priority (High, Moderate, Low):	Low
Estimated Cost:	$10,000
Potential Funding Sources:	FEMA Grants/Small Business Admin.
Lead Agency/Department Responsible:	Fire Departments, Red Cross, Extension Service
Implementation Schedule:	2013

2009 Analysis
This action will be deferred as public outreach is an ongoing activity. The estimated cost will also increase from $10,000 to $15,000.

		Matagorda County (Past Action)-5
	Proposed Action:	**Remove downed trees, establish and implement burning standards, maintain natural environmental features as wind buffers, provide ongoing education for firefighters, and enforce building codes.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	Although fires have not been a serious issue in the past, the possibility of damaging fires exists.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfires
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$600,000 over 5 years
Potential Funding Sources:	FEMA Grants/Small Business Admin.
Lead Agency/Department Responsible:	Environmental Health Dept., Fire Departments, Code Inspectors, Commissioners, Extension Service
Implementation Schedule:	Ongoing

2009 Analysis
This action will be deferred as it is an ongoing activity.

		Matagorda County (Past Action)-6
	Proposed Action:	**Track and record high-water marks, institute a maintenance program for cleaning debris from bridges and clearing out deposits on river banks, establish a buy-out program, investigate feasibility of reducing peak flows, encourage the purchase of flood insurance, and limit construction in flood-prone areas.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	Repeated floods in Tres Palacios and Colorado River, Caney Creek indicate a need to collect high-water data to support prediction of flood levels and locations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$14.5 million, including dam protection, buyouts, on tributaries, and maintenance
Potential Funding Sources:	FEMA Grants
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	2012

2009 Analysis
This action will be deferred as funding has not been available.

		Matagorda County (Past Action)-7
	Proposed Action:	**Institute a buy-out program after enactment of building codes and ordinances, and raise bridges above the BFE.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	This action will provide safer routes for emergency personnel, prevention of future flood damages, reduced flood insurance rates and claims, and reduced losses of life and property.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	Bridges - $10 million Overall total - $15 million
Potential Funding Sources:	Grants from FEMA and Texas DOT as well as Red Cross donations
Lead Agency/Department Responsible:	Emergency Management Coordinator, Seawall District, Port of Bay City, Floodplain Department
Implementation Schedule:	2012

2009 Analysis
This action will be deferred as the buy-out program is not complete.

		Matagorda County (Past Action)-8
	Proposed Action:	**Conduct Caney Creek Project to decrease flooding in the lower creek area**
	BACKGROUND INFORMATION	
	Site and Location:	Caney Creek
	History of Damages:	There is a need to decrease flooding in the lower creek area, and to buy out property to decrease claims on insurance and improve living conditions

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium High
Estimated Cost:	$3.3 Mil
Potential Funding Sources:	Capital Improvement Program
Lead Agency/Department Responsible:	Matagorda County
Implementation Schedule:	2010

2009 Analysis
This action will be deferred and the cost to implement is 3.8million. Currently a study is underway for Caney Creek.

Matagorda County (Past Action)-9	
Proposed Action:	**Divert water from Caney Creek to the Colorado River and otherwise control flows from tributaries**
BACKGROUND INFORMATION	
Site and Location:	Caney Creek area
History of Damages:	A diversion channel is needed on the Caney Linville Bayou to prevent future flood damages. There is also a need to control flooding on other tributaries.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$10+million for Caney Creek $8 million for other retention and prevention measures
Potential Funding Sources:	Capitol Improvement Program
Lead Agency/Department Responsible:	County
Implementation Schedule:	2012

2009 Analysis
This action will be deferred as a study is currently underway for Caney Creek

Matagorda County (Past Action)-10	
Proposed Action:	**Conduct Tres Palacios Project to buy out homes in the floodplain**
BACKGROUND INFORMATION	
Site and Location:	Tres Palacios River
History of Damages:	A buy-out program is needed specifically for the floodplain around the Tres Palacios River.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$1.8 Mil.
Potential Funding Sources:	Capital Improvement Project
Lead Agency/Department Responsible:	County
Implementation Schedule:	2012

2009 Analysis
This action will be deferred as a study for the Tres Palacios Project is currently being conducted.

		Matagorda County (Past Action)-11
	Proposed Action:	**Conduct studies to determine why areas flood that have not previously flooded (Pledger "C" Zone Flooding)**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	It is necessary to understand flooding patterns to be able to predict and avoid or reduce future flooding damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$50,000
Potential Funding Sources:	Capital Improvements Project
Lead Agency/Department Responsible:	County
Implementation Schedule:	2010

2009 Analysis
This action will be deferred due to lack of funds

New Actions

		Matagorda County-1
	Proposed Action:	**Develop a beach restoration program**
	BACKGROUND INFORMATION	
	Site and Location:	.Coastal communities along the Colorado River
	History of Damages:	Many of the beaches along the Colorado River were washed out leaving gaps and dunes because of Hurricane Ike.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storm, Flood
Effect on new/existing buildings:	Without the beach restoration, existing buildings can be totally lost
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$30 Million
Potential Funding Sources:	State and Federal Grants
Lead Agency/Department Responsible:	County EMC
Implementation Schedule:	Spring 2009

COMMENTS

		Matagorda County-2
	Proposed Action:	**Design, construct and maintain drainage improvement projects to minimize the risk of loss of life and future flood damages by utilizing funding from Federal, State, Capital Improvement Program (CIP), Development or Stormwater Utility Fee and other funding sources.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The National Weather Service reports that the national 30-year average for deaths related to flooding is 127 per year. Of that yearly average, nearly half are related to motorists attempting to cross roadways that are overtopped by floodwaters and recent (2007 and 2008) Texas flood deaths have exceeded the annual State average. The Matagorda County Consolidated Reclamation and Drainage District Study, currently underway, will identify problem areas including roadway crossings that are overtopped by floodwaters in the Tres Palacios River watershed

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Without the beach restoration, existing buildings can be totally lost
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$30 Million
Potential Funding Sources:	HMGP; Flood Protection Planning Grants; NRCS Stream Restoration Funding; Bonds; Capital Improvements Program
Lead Agency/Department Responsible:	County EMC
Implementation Schedule:	To be determined upon receipt of funding

COMMENTS
Incorporated from Flood Mitigation Plan, action F2 (see Appendix H)

		Matagorda County-3
	Proposed Action:	**Expand rainfall observer program through the National Weather Service within Matagorda County using CoCoRahs.**
	BACKGROUND INFORMATION	
	Site and Location:	Matagorda County
	History of Damages:	The County has experienced flooding throughout due to thunderstorms and hurricanes and tropical storms. Cocorahs helps the NWS to accurately track and report weather events

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane and Tropical Storms, Thunderstorm
Effect on new/existing buildings:	Adds greater potential to inform residents of impending weather and protect structures and contents by boarding up windows and moving contents to higher ground
Priority (High, Moderate, Low):	High
Estimated Cost:	minimal
Potential Funding Sources:	General fund
Lead Agency/Department Responsible:	EMS/NWS
Implementation Schedule:	Fall 2009

COMMENTS

		Matagorda County-4
	Proposed Action:	**Purchase and install emergency generator hookups for critical facilities including an automatic transfer switch**
	BACKGROUND INFORMATION	
	Site and Location:	County Courthouse and County Annex Building.
	History of Damages:	The County has lost computers, telephones and appliances due to power outages during storm events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Flood, Thunderstorm, Winter Storm, Hurricane and Tropical Storms, Terrorism
Effect on new/existing buildings:	This would benefit county buildings in the event of a power outage
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	EMC
Implementation Schedule:	Fall 2009

COMMENTS

		Matagorda County-5
	Proposed Action:	**Institute and enforce ordinances and codes, including tie-down requirements. Educate the public to ensure tornado awareness of insurance areas and continue to keep the public well-informed about the meaning of alerts and evacuation routes**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	There have been 32 events since 1954 that have caused 20 deaths just from tornado events alone.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Hurricane and Tropical Storms
Effect on new/existing buildings:	Provide retrofitting or new tie downs for mobile homes and structures during severe weather events.
Priority (High, Moderate, Low):	High
Estimated Cost:	$175,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	EMC/Red Cross/Environmental Health
Implementation Schedule:	Ongoing Activity through 2013

COMMENTS

		Matagorda County-6
	Proposed Action:	**Educate the general public about storm issues, cold-weather issues such as ice on bridges**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The county has not had a severe winter storm since 1979; therefore, many citizens are unaware of the potential damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Winter Storms
Effect on new/existing buildings:	Informed residents are better able to protect buildings and contents from winter storms.
Priority (High, Moderate, Low):	Low
Estimated Cost:	$15,000 per year
Potential Funding Sources:	General Revenue and Red Cross donations
Lead Agency/Department Responsible:	Fire Departments, Red Cross and County Precincts
Implementation Schedule:	Ongoing, annual activity

COMMENTS

		Matagorda County-7
	Proposed Action:	**Remove downed trees, establish and implement burning standards and maintain natural environmental features as wind and fire buffers. Provide ongoing education for firefighters to enforce codes**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Fires have long been a serious threat, and the possibility of a damaging fire exists during high periods of drought

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Drought
Effect on new/existing buildings:	Protect all structures from downed trees due to fire, wind and severe heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$600,000 over five years
Potential Funding Sources:	General revenue and grants
Lead Agency/Department Responsible:	Environmental Health, Fire Departments, Commissioners, Ext. Service
Implementation Schedule:	Ongoing

COMMENTS

		Matagorda County-8
	Proposed Action:	**Track and record high water marks to institute a maintenance program for clearing debris from bridges and deposits on river banks. Establish a buy-out and investigate the feasibility of reducing peak flows.**
	BACKGROUND INFORMATION	
	Site and Location:	Rivers and creeks in the County
	History of Damages:	Repeated floods on the Tres Palacios River, Colorado River and Caney Creek indicate a need to record high-water data to support prediction of flood levels and locations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane and Tropical Storms, Dam Failure
Effect on new/existing buildings:	Knowing flooding areas will cause citizens to strengthen structures or build outside of the floodplain
Priority (High, Moderate, Low):	High
Estimated Cost:	$14.5 Million
Potential Funding Sources:	General revenue and grants
Lead Agency/Department Responsible:	Environmental Health, Fire Departments, Commissioners, Ext. Service
Implementation Schedule:	Ongoing

COMMENTS
The cost included dam protection and buy-outs, tributaries and maintenance.

		Matagorda County-9
	Proposed Action:	**Educate the public on the benefits of purchasing flood insurance to minimize the financial impact of future floods.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The county has suffered from continual flooding in storm events. Based on NFIP flood insurance policy and claims data, there are only 3,789 flood insurance policies in force which is approximately 20% of the 18,611 structures in Matagorda County.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would aid in the development of new buildings. In addition, increasing flood policies would also minimize cost and risk to existing buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	unknown
Potential Funding Sources:	General revenue and grants
Lead Agency/Department Responsible:	Floodplain Administration; TWDB; TCRFC; HGACE
Implementation Schedule:	2010-2014; ongoing

COMMENTS
This is action F1 from Matagorda's Flood Mitigation Plan (see Appendix H).

		Matagorda County-10
	Proposed Action:	**Institute a buy-out program after enactment of building codes and ordinances and raise bridges above the BFE**
	BACKGROUND INFORMATION	
	Site and Location:	Coastal and river areas in the county
	History of Damages:	Most coastal flooding is from high tides, hurricanes and tropical storms. This action would provide safer routes for emergency personnel and prevent future damage as well as reduce flood claims. A total of 155 properties in Matagorda County have received 2 or more paid flood insurance claims that exceed $1,000 for each claim

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This action would institute better standards for new buildings and reduce potential damage from flood for existing buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	$27.5 M Acquisition + $4.65M Demolition
Potential Funding Sources:	Grants from FEMA, TXDOT, TWDB and Red Cross
Lead Agency/Department Responsible:	Floodplain Admin, EMC, Seawalk District and Port of Bay City
Implementation Schedule:	Ongoing

COMMENTS
This action corresponds with Action F3 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-11
	Proposed Action:	**Create a diversion channel on the Caney Bayou to prevent future flood damages.**
	BACKGROUND INFORMATION	
	Site and Location:	East side of Matagorda County
	History of Damages:	Flooding damages not only beaches but roads and property when there is improper drainage. This action helps to alleviate the damage from flooding and storms. There is also a need to control the flooding on other tributaries.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This action would help to prevent flooding of existing buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	$10 million for Caney Creek and $9 million for retention and prevention measures
Potential Funding Sources:	Grants and Capital Improvement
Lead Agency/Department Responsible:	Matagorda County
Implementation Schedule:	2013

COMMENTS

		Matagorda County-12
	Proposed Action:	**Conduct buyouts along the Tres Palacios River.**
	BACKGROUND INFORMATION	
	Site and Location:	West Side of Matagorda County – Tres Palacios River
	History of Damages:	Several houses have flooded causing repetitive losses.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would prevent new properties from developing in the floodway
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1.8 million
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Matagorda County
Implementation Schedule:	2009-2012

COMMENTS
The County is in the process of working on a Tres Palacios Study as mentioned in the previous actions/analysis section. Two new subdivisions have developed along the Tres Palacios, some of which are located in the floodway.

		Matagorda County-13
	Proposed Action:	**Update the Matagorda County Flood Insurance Study and FIRMs to include detailed floodplain information for all streams in Matagorda County.**
	BACKGROUND INFORMATION	
	Site and Location:	All streams in Matagorda County
	History of Damages:	The effective flood insurance studies for Matagorda County, Bay City and Palacios were published from 1985 to 1992 and are considered to be out-of-date and inadequate for floodplain management purposes. The Matagorda County Consolidated Reclamation and Drainage District initiated studies in 2009 to remap floodprone areas not scheduled for remapping by FEMA. The Matagorda County Consolidated Reclamation and Drainage District study includes two major tasks: (1) new hydrology and hydraulics studies of the Tres Palacios River in Matagorda County and (2) conversion of 39.28 river miles of the US Army Corps of Engineers Lower Colorado River Flood Damage Reduction Study to FEMA mapping criteria.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would prevent new properties from developing in the floodway
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5 million
Potential Funding Sources:	FEMA RiskMap/TWDB/LCRA
Lead Agency/Department Responsible:	Matagorda County/LCRA/TNRIS
Implementation Schedule:	2010-2014

COMMENTS
This action corresponds with Action F4 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-14
	Proposed Action:	**Adopt "Higher Standard" Riverine Flood Damage Prevention Ordinances and Standards**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	A "Higher Standard" Flood Damage Prevention Ordinance can assist a community's efforts to reduce future flood losses and provide additional Community Rating System (CRS) credits for communities desiring to participate in FEMA's CRS Program. In 2010 Matagorda County and the cities of Bay City and Palacios will be required to adopt the new Matagorda County (county-wide) Digital Flood Insurance Rate Maps (DFIRMs) by a new flood damage prevention ordinance. Should a community choose to adopt a "higher standard" flood damage prevention ordinance, that community will receive a higher CRS rating should they elect to enroll in the CRS Program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would result in a discount on insurance for new and existing properties; and mitigate damages for both new/existing buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$500 to $2,000 per residential structure; $1,000 to $10,000 nonresidential structure
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	Matagorda County/TCRFC/HGAC
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F5 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-15
	Proposed Action:	**Adopt "Higher Standard" Coastal Flood Damage Prevention Ordinances and Standards (Coastal High Hazard Areas – Zone VE and Coastal A Zones)**
	BACKGROUND INFORMATION	
	Site and Location:	All streams in Matagorda County
	History of Damages:	A higher standard would result in a higher CRS rating. Current ordinances for Matagorda County and Palacios do not meet the "higher standard" Flood Damage Prevention Ordinance implemented by other coastal communities with similar risk.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This action would provide CRS credits should the County participate, resulting in better protected structures with lower insurance premiums.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$500 to $2,000 per residential structure; $1,000 to $10,000 nonresidential structure
Potential Funding Sources:	State and FEMA grants and County funds
Lead Agency/Department Responsible:	Matagorda County/City of Palacios/ TCRFC/HGAC/FEMA/TWDB, TRMA
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F6 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-16
	Proposed Action:	**Provide Training for Community Floodplain Managers, Community Emergency Managers, CEM's and CFM's.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Conferences and workshops enhance public awareness, assist local communities and provide training and continuing education credits (CEC's) for local floodplain administrators, certified floodplain managers (CFM's), certified emergency managers (CEM's), professional engineers (PE's), registered public land surveyors (RPLS) and the general public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Public awareness and educating community personnel extends to residents that are better informed in protecting structures and belongings during disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff time
Potential Funding Sources:	NWS/TWDB/LCRA Hydromet Sysem
Lead Agency/Department Responsible:	Matagorda County
Implementation Schedule:	Annual basis

COMMENTS
This action corresponds with Action F7 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-17
	Proposed Action:	**Identify and actively pursue funding mechanisms for future drainage improvements.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Matagorda County and participating communities working together can plan, coordinate and fund the design, construction, and maintenance of (county-wide) drainage improvements and flood control projects that benefit entire watersheds and drainage basins.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would assist in prevention of flood damage to existing structures by improving drainage conditions nearby.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff Time
Potential Funding Sources:	General Fund; TWDB; USACE; FEMA grants
Lead Agency/Department Responsible:	Matagorda County
Implementation Schedule:	2010-2014

COMMENTS
This action corresponds with Action F8 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-18
	Proposed Action:	**Establish Countywide Bench Mark Network**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The Elevation Reference Marks and Base Flood Elevations (BFEs) on previously published FIRMs for Matagorda County and the cities of Bay City and Palacios identify Elevation Reference Marks and Base Flood Elevations referenced to NGVD 1929 which is no longer acceptable for National Flood Insurance Program (NFIP) purposes. Only 177 usable ERMs and BMs are identified in the National Geodetic Survey (NGS) database and available for floodplain management purposes (1,114 square miles or 1 BM per 6.3 square miles) presenting a major problem for local community administrators that must reference NAVD 1988 for new development permits.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Subdivision ordinance requires developers to establish a permanent survey monument in each new subdivision.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff time
Potential Funding Sources:	State/FEMA grants
Lead Agency/Department Responsible:	Matagorda County
Implementation Schedule:	Annually as needed.

COMMENTS
This action corresponds with Action F9 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-19
	Proposed Action:	**Provide support to the TCRFC for flood reduction projects**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Flood reduction projects should be identified in advance to prevent flood damage and loss of lives.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Reduced flooding protects all structures in the community during flooding events.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff Time
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	Matagorda County
Implementation Schedule:	2010-2014

COMMENTS
This action corresponds with Action F10 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-20
	Proposed Action:	**Participate in FEMA's Community Rating System (CRS) program**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Currently no Matagorda County communities participate in FEMA's CRS Program. FEMA recognizes community efforts that exceed the minimum requirements of the National Flood Insurance Program (NFIP) by designating communities that have adopted "higher standards" as CRS Communities. All flood insurance policies within communities that participate in FEMA's CRS program are rewarded with reduced flood insurance premiums.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Better protects existing properties through the development of CRS activities such as outreach for owners; reduces cost of insurance for new and existing buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff Time
Potential Funding Sources:	Grants and General Revenue
Lead Agency/Department Responsible:	Matagorda County
Implementation Schedule:	2010

COMMENTS
This action corresponds with Action F11 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-21
	Proposed Action:	**Create a Matagorda Disaster Response Team**
	BACKGROUND INFORMATION	
	Site and Location:	Matagorda County, including incorporated jurisdictions: Bay City and Palacios
	History of Damages:	Matagorda County and the cities of Bay City and Palacios identified possible hurricane and tornado paths, floodprone properties, repetitive loss properties, HAZMAT corridors, and areas where emergency assistance may be needed.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane and Tropical Storm, Hazardous Material Release, Terrorism, Pipeline Failure, Dam Failure, Tornado
Effect on new/existing buildings:	Having a disaster response team in place that can respond quickly to a natural or man-caused event would prevent damage to existing buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Dependent upon magnitude of the event and consultant firm
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	Matagorda County/LCRA/TCRFC
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F12 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-22
	Proposed Action:	**Install additional Stream and Precipitation Gauges in the Colorado Watershed**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Both the LCRA and the National Weather Service (NWS) monitors rain gauges in Matagorda County. LCRA has established a network of volunteers in Matagorda County that operate rain gauges and report data to LCRA that is incorporated into the LCRA HYDROMET System. LCRA is exploring the possibility of expanding the volunteer network in Matagorda County

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Flood warning gauges provide more warning time for mitigating flooding of all structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$20,000, plus $1,000 in annual maintenance
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	Matagorda County/LCRA
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F13 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-23
	Proposed Action:	**Install Reverse 911 Emergency notification system.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	A mitigation evaluation (study) is recommended to determine the feasibility of installing a Matagorda County (countywide) Reverse 911 System. The evaluation should identify flood-prone or "at risk" structures that should be notified and possibly evacuated when flooding is eminent. By identifying structures and phone numbers, a Reverse 911 database could be created. The Matagorda County 911 System will allow coordination between the Matagorda County, City of Bay City and City of Palacios Office of Emergency Management, the National Weather Service (NWS), LCRA and law enforcement agencies and could issue Emergency Warnings via the Reverse 911 System.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storm, Tornado, Thunderstorm, Winter Storm, Dam Failure, Wildfire, Hazardous Material Release, Pipeline Failure, Terrorism
Effect on new/existing buildings:	Reduced flooding and more warning time assists in mitigating flooding and other disasters and protect structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$75,000
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Matagorda County/HGAC/HCFCD
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F14 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-24
	Proposed Action:	**Become a National Weather Service (NWS) "Storm Ready" community.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	There are no communities within Matagorda County that have been designated as a "Storm Ready" community by the National Weather Service (NWS). The NWS Office in Houston is available to assist Matagorda County communities to become "Storm Ready". The mitigation plan goal is to classify every community within Matagorda County as "Storm Ready". HGAC and/or LCRA/TCRFC may be able to assist with the coordination effort with the NWS.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storm, Tornado, Thunderstorm, Winter Storm
Effect on new/existing buildings:	Storm ready communities equal more protection and earlier warning times during weather events allowing more time for protecting structures affected
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff Time
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Matagorda County/LCRA/NWS
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F15 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-25
	Proposed Action:	**Install emergency generators at critical facilities**
	BACKGROUND INFORMATION	
	Site and Location:	Critical Facilities throughout the County
	History of Damages:	The County experiences black outs or power outages during storm events, such as Hurricane Ike, and periodically during thunderstorm events. A study is recommended to evaluate options and estimate costs for Matagorda County and participating communities to select, design and construct backup power systems that can fulfill the need.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storm, Tornado, Thunderstorm, Winter Storm, Dam Failure, Wildfire, Hazardous Material Release, Pipeline Failure, Terrorism
Effect on new/existing buildings:	This would prevent existing properties from receiving extensive damage in a natural or man-caused hazard event.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$3,000 for a study; $30,000 for backup power facility; $20,000 for redundant power facility; $80,000 for secondary tower; $100,000 for 600 KW mobile power generator
Potential Funding Sources:	General Revenue; State/FEMA Grants
Lead Agency/Department Responsible:	Matagorda County/LCRA/TCRFC
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F16 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Matagorda County-26
	Proposed Action:	**Inspect, improve and certify flood protection levees and seawalls in Matagorda County**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	This mitigation action is to initiate the recommended actions from the Matagorda County Consolidated Reclamation and Drainage District study.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would prevent the inundation of existing properties
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	Matagorda County / USACE/ ORCA/ LCRA/ TCRFC/ TWDB
Lead Agency/Department Responsible:	Matagorda County/LCRA
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F17 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

City of Bay City

Previous Actions & Analysis

		Bay City (Past Action)-1
	Proposed Action:	**Install roofing material of stronger quality, enforce codes, encourage farmers to become more educated about protection of crops, and educate the general public about the damage caused by hail and how to prevent or alleviate it.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Eleven reported hail storms occurred between 1973 and 1999

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hail
Priority (High, Moderate, Low):	Low
Estimated Cost:	Building codes and enforcement - $125,000 Public education – minimal, can be absorbed within existing budgets
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Extension Agents, Hazard Mitigation Coordinator, Building Inspectors
Implementation Schedule:	Education – 2009 Building - 2011

2009 Analysis
This action will be deferred as it is an ongoing activity. The City has adopted newer codes. This portion of the action is partially complete. Every new business is now putting in stormwater retention ponds.

		Bay City (Past Action)-2
	Proposed Action:	**Establish and implement burning standards, build water reservoirs or wells, educate farmers about alternative crops, educate the general public and farmers about water conservation, enact an ordinance authorizing temporary water restrictions.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	14 droughts have affected the county since 1999

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Education – minimal, can be absorbed within existing budgets Reservoir/wells - $8 million
Potential Funding Sources:	Grants/Small Business Administration
Lead Agency/Department Responsible:	Extension Service
Implementation Schedule:	Ongoing

2009 Analysis
Deferred as ongoing activity

		Bay City (Past Action)-3
	Proposed Action:	**Institute and enforce ordinances and codes, including tie-down requirements; educate the public to ensure tornado awareness and knowledge of insurance needs; continue to keep the public informed about the meaning of alerts and evacuation routes.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	32 events since 1954 have caused 20 deaths

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Priority (High, Moderate, Low):	High
Estimated Cost:	$175,000
Potential Funding Sources:	FEMA Grants/Small Business Administration
Lead Agency/Department Responsible:	Emergency Management Coordinator, Red Cross, Environmental Health
Implementation Schedule:	Ongoing

2009 Analysis
This action deferred as an ongoing activity

		Bay City (Past Action)-4
	Proposed Action:	**Educate the general public about storm issues, cold-weather issues, and bridges.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Have not had a severe winter storm since 1979 and many citizens are unaware of the potential dangers

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Winter storms
Priority (High, Moderate, Low):	Low
Estimated Cost:	$10,000
Potential Funding Sources:	Fire Departments, Red Cross, Extension Service
Lead Agency/Department Responsible:	General revenue and Red Cross donations
Implementation Schedule:	2010

2009 Analysis
Action deferred

		Bay City (Past Action)-5
	Proposed Action:	**Remove downed trees, establish and implement burning standards, maintain natural environmental features as wind buffers, provide ongoing education for firefighters, and enforce building codes.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Although fires have not been a serious issue in the past, the possibility of damaging fires exists

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$600,000 over 5 years
Potential Funding Sources:	General revenue and grants
Lead Agency/Department Responsible:	Environmental Health Dept., Fire Departments, Code Inspectors, Commissioners, Extension Service
Implementation Schedule:	Ongoing

2009 Analysis
This action will be deferred as it is an ongoing activity

		Bay City (Past Action)-6
	Proposed Action:	**Institute a buy-out program after enactment of building codes and ordinances, and raise bridges above the BFE.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Most coastal flooding is from high tides from hurricanes and tropical storms

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	Bridges - $10 million (county-wide) Overall total - $15 million (county-wide)
Potential Funding Sources:	Grants from FEMA and Texas DOT and Red Cross donations received
Lead Agency/Department Responsible:	Emergency Management Coordinator, Seawall District, Port of Bay City, Floodplain Administrator
Implementation Schedule:	N/A – falls under Matagorda County

2009 Analysis
This action is not complete, but should be considered a County project and therefore deleted.

		Bay City (Past Action)-7
	Proposed Action:	**Conduct studies to determine why areas flood that have never flooded before (Pledger "C" Zone Flooding)**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	It is necessary to understand flooding patterns to be able to predict and avoid or reduce future flooding damage

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$50,000
Potential Funding Sources:	Capital Improvement Project
Lead Agency/Department Responsible:	Matagorda County
Implementation Schedule:	N/A – County responsible

2009 Analysis
This action will be deleted. It applies to the County and not the Bay City. There is no reason for inclusion under Bay City.

		Bay City (Past Action)-8
	Proposed Action:	**Undertake a review of the City's floodplain management ordinance.**
	Site and Location:	City wide
	History of Damages:	The City of Bay City's floodplain management ordinance meets mandatory minimum criteria of the National Flood Insurance Program for development in the regulatory floodplain. With this action, a review of the City's floodplain management ordinance will be undertaken. Consider moving beyond the minimum standards for development in the regulatory floodway such as including (1) no rise in the 100-year BFE; (2) offsetting the placement of fill material in the 100-year floodplain with compensating storage; (3) no construction of habitable structures in the 100-year floodway; and (4) no increase in erosive water velocity on- or off-site.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Negligible
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Annually

2009 Analysis
This action is deferred as an ongoing activity. The City reviews the floodplain ordinance annually.

New Actions

		BC-1
	Proposed Action:	**Implement standard that businesses and private property adhere to the BFE**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced massive flooding due to hurricanes and storms.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This action would help protect existing buildings by elevating requirements for additions/remodeling, and new structures built higher with add'l freeboard required
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and State grants
Lead Agency/Department Responsible:	Inspection Department
Implementation Schedule:	Ongoing activity

COMMENTS
New businesses that come into town that are inspected by the building inspector, who determines what is needed. If it is over certain dollar amount, then goes national. They come back with recommendations. This action corresponds with F3 in the Matagorda Flood Mitigation Plan (Appendix H).

		BC-2
	Proposed Action:	**Buy generators for lift stations to keep sewer water from backing up.**
	BACKGROUND INFORMATION	
	Site and Location:	Lift Stations: 11th and Ave. I Want main one at the powerplant – 4511 Starling Drive (runs all big pumps and clarifying – if goes down then contaminants in cottonwood creek.
	History of Damages:	The City has several outlying lift stations and when they go down private property are greatly affected.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane and Tropical Storm, Dam Failure, Winter Storm, Terrorism
Effect on new/existing buildings:	This would prevent the backup of sewer water thereby damaging existing buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$200,000
Potential Funding Sources:	grants
Lead Agency/Department Responsible:	Public works
Implementation Schedule:	Depends on grant funding received

COMMENTS
This action corresponds with Action F-16 in the Matagorda Flood Mitigation Plan, at Appendix H.

		BC-3
	Proposed Action:	**Build new warehouse with safe room for personnel during an emergency event.**
	BACKGROUND INFORMATION	
	Site and Location:	New location at 1217 Avenue J.
	History of Damages:	Currently the City only has a warehouse and it's not very strong as it is built out of tin.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Flood, Hurricane and Tropical Storm, Wildfire, Extreme Heat, Thunderstorm, Winter Storm, Hail, Hazardous Material, Pipeline Failure, Terrorism, Tornado
Effect on new/existing buildings:	Retrofit or rebuild structure to protect against severe weather as existing structural materials are inadequate and provide little protection to existing structure
Priority (High, Moderate, Low):	High
Estimated Cost:	$150,000
Potential Funding Sources:	Grants and City funds
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	Unknown, depends on factors; no set year

COMMENTS
The City has already begun drafting plans and looking at getting grants in 6 months to a year.

		BC-4
	Proposed Action:	**Educate the public on the benefits of purchasing flood insurance to minimize the financial impact of future floods.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city has suffered from continual flooding in storm events. Based on NFIP flood insurance policy and claims data, only 20% of the 18,611 structures in Matagorda County have policies in force.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would aid in the development of new buildings. In addition, increasing flood policies would also minimize cost and risk to existing buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	unknown
Potential Funding Sources:	General revenue and grants
Lead Agency/Department Responsible:	Floodplain Administration; TWDB; TCRFC; HGACE
Implementation Schedule:	2010-2014; ongoing

COMMENTS
This action corresponds with F1 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

		BC-5
	Proposed Action:	**Design, construct and maintain drainage improvement projects to minimize the risk of loss of life and future flood damages by utilizing funding from Federal, State, Capital Improvement Program (CIP), Development or Stormwater Utility Fee and other funding sources.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Roadway crossings are overtopped by floodwaters in the Tres Palacios River watershed, which presents a public danger and potential loss of human life.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Drainage improvements would encourage the development of new buildings where projects are complete, and also prevent damage to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants and City funds
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with F2 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

		BC-6
	Proposed Action:	**Adopt "Higher Standard" Riverine Flood Damage Prevention Ordinances and Standards**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	A "Higher Standard" Flood Damage Prevention Ordinance can assist a community's efforts to reduce future flood losses and provide additional Community Rating System (CRS) credits for communities desiring to participate in FEMA's CRS Program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would result in a discount on insurance for new and existing properties; and mitigate damages for both new/existing buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$500 to $2,000 per residential structure; $1,000 to $10,000 nonresidential structure
Potential Funding Sources:	Grants and City funds
Lead Agency/Department Responsible:	Bay City EMC
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with F5 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

		BC-7
	Proposed Action:	**Provide Training for Community Floodplain Managers, Community Emergency Managers, CEM's and CFM's.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Conferences and workshops enhance public awareness, assist local communities and provide training and continuing education credits (CEC's) for local floodplain administrators, certified floodplain managers (CFM's), certified emergency managers (CEM's), professional engineers (PE's), registered public land surveyors (RPLS) and the general public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Better trained personnel result in better informed citizens in protecting existing and new structures from weather disasters
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff time
Potential Funding Sources:	NWS/TWDB/LCRA Hydromet Sysem
Lead Agency/Department Responsible:	Bay City EMC
Implementation Schedule:	Annual basis

COMMENTS
This action corresponds with F7 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

		BC-8
	Proposed Action:	**Participate in FEMA's Community Rating System (CRS)**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	FEMA's CRS program identifies opportunities for flood protection such as outreach and training. Currently Bay City is susceptible to seasonal flooding, but is not a member of the CRS.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	CRS communities experience better protected existing structures, as well as a reduction in the cost of insurance premiums for buildings
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Grants and City funds
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	2011

COMMENTS
This action corresponds with F11 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

		BC-9
	Proposed Action:	**Become a National Weather Service (NWS) "Storm Ready" community.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	There are no communities within Matagorda County that have been designated as a "Storm Ready" community by the National Weather Service (NWS). The NWS Office in Houston is available to assist Matagorda County communities to become "Storm Ready". The mitigation plan goal is to classify every community within Matagorda County as "Storm Ready". HGAC and/or LCRA/TCRFC may be able to assist with the coordination effort with the NWS.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storm, Tornado, Thunderstorm, Winter Storm
Effect on new/existing buildings:	Storm Ready communities mean better informed residents and more protection to new and existing structures; more warning time to retrofit and build structures to mitigate disasters
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff Time
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Bay City
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with F15 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

		BC-10
	Proposed Action:	**Inspect, Improve and Certify flood protection levees and seawalls in Bay City**
	BACKGROUND INFORMATION	
	Site and Location:	42.05 miles of Colorado River levee through Bay City
	History of Damages:	This study will identify needed improvements and actions needed for certification of the various levees before they will be mapped by FEMA as providing flood protection.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would prevent the inundation of existing properties
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	Matagorda County / USACE/ ORCA/ LCRA/ TCRFC/ TWDB
Lead Agency/Department Responsible:	Matagorda County/LCRA
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with F17 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

		BC-11
	Proposed Action:	**Prepare and submit the Cottonwood Creek LOMR to FEMA for approval**
	BACKGROUND INFORMATION	
	Site and Location:	Cottonwood Creek
	History of Damages:	The City of Bay City received a TWDB Flood Protection Planning Grant to conduct a drainage improvement study for Cottonwood Creek. The project was designed and constructed and as of 2009 the Cottonwood Creek area in Bay City has not flooded. A LOMR was not submitted to FEMA and the Cottonwood Creek floodplain has not been officially revised.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Reduced flooding potential protects both new and existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	State and FEMA Grants and City funds
Lead Agency/Department Responsible:	Bay City Floodplain administration
Implementation Schedule:	2011

COMMENTS
This action corresponds with F18 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

City of Palacios

Previous Actions & Analysis

		Palacios (Past Action)-1
	Proposed Action:	**Install roofing material of stronger quality, enforce codes, encourage farmers to become more educated about protection of crops, and educate the general public about the damage caused by hail and how to prevent or alleviate it.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Eleven reported hail storms occurred between 1973 and 1999

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hail
Priority (High, Moderate, Low):	Low
Estimated Cost:	Building codes and enforcement - $125,000 Public education – minimal, can be absorbed within existing budgets
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Extension Agents, Hazard Mitigation Coordinator, Building Inspectors
Implementation Schedule:	Education - 6 months (2010) Building - 2 years (2011)

2009 Analysis
This action will be deferred as the city intends to continue the ongoing activity of public awareness.

		Palacios (Past Action)-2
	Proposed Action:	**Establish and implement burning standards, build water reservoirs or wells, educate farmers about alternative crops, educate the general public and farmers about water conservation, enact an ordinance authorizing temporary water restrictions.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	14 droughts have affected the county since 1999

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Education – minimal, can be absorbed within existing budgets Reservoirs/wells - $8 million
Potential Funding Sources:	Grants from USDA, Small Business Administration
Lead Agency/Department Responsible:	Extension Service
Implementation Schedule:	Ongoing

2009 Analysis
This action will be deferred as the city intends to continue the ongoing activity of public awareness.

		Palacios (Past Action)-3
	Proposed Action:	**Institute and enforce ordinances and codes, including tie-down requirements; educate the public to ensure tornado awareness and knowledge of insurance needs; continue to keep the public informed about the meaning of alerts and evacuation routes.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	32 events since 1954 have caused 20 deaths

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Priority (High, Moderate, Low):	High
Estimated Cost:	$175,000
Potential Funding Sources:	Grants from USDA, Small Business Administration
Lead Agency/Department Responsible:	Emergency Management Coordinator, Red Cross, Environmental Health
Implementation Schedule:	Ongoing

2009 Analysis
This action will be deferred as the city intends to continue the ongoing activity of public awareness

		Palacios (Past Action)-4
	Proposed Action:	**Educate the general public about storm issues, cold-weather issues, and bridges.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Have not had a severe winter storm since 1979 and many citizens are unaware of the potential dangers

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Winter Storms
Priority (High, Moderate, Low):	Low
Estimated Cost:	$10,000
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Fire Dept. Red Cross, Extension Agent
Implementation Schedule:	2010 and ongoing

2009 Analysis
This action will be deferred as the city intends to continue the ongoing activity of public awareness

		Palacios (Past Action)-5
	Proposed Action:	**Remove downed trees, establish and implement burning standards, maintain natural environmental features as wind buffers, provide ongoing education for firefighters, and enforce building codes.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Although fires have not been a serious issue in the past, the possibility of damaging fires exists

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$600,000
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Environmental Health Dept., Fire Departments, Code Inspectors, Commissioners, Extension Service
Implementation Schedule:	N/A

2009 Analysis
This action is deleted as it applies to the county.

		Palacios (Past Action)-6
	Proposed Action:	**Institute a buy-out program after enactment of building codes and ordinances, and raise bridges above the BFE.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Most coastal flooding is from high tides from hurricanes and tropical storms

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	Bridges - $10 million (county-wide) Overall total - $15 million (county-wide)
Potential Funding Sources:	FEMA, Red Cross (donations they receive), Texas DOT, grants
Lead Agency/Department Responsible:	Emergency Management Coordinator, Seawall District, Port of Palacios, Floodplain Administrator
Implementation Schedule:	2010-2013

2009 Analysis
This action will be deferred as the City has not conducted all buy-outs.

		Palacios (Past Action)-7
	Proposed Action:	**Conduct studies to determine why areas flood that have never flooded before (Pledger "C" Zone Flooding)**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	It is necessary to understand flooding patterns to be able to predict and avoid or reduce future flooding damage

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$50,000
Potential Funding Sources:	Capitol Improvement Project
Lead Agency/Department Responsible:	Matagorda County Floodplain Administrator
Implementation Schedule:	2010

2009 Analysis
This action will be deferred as the study has not been conducted at this time.

		Palacios (Past Action)-8
	Proposed Action:	**Undertake a review of the City's floodplain management ordinance**.
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The City of Palacios has a floodplain management ordinance that meets mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. With this action, a review of the City's floodplain management ordinance will be undertaken. Consider increasing minimum standards for development in the regulatory floodway. Examples of possible options to be considered include (1) no rise in the 100-year BFE; (2) offsetting the placement of fill material in the 100-year floodplain with compensating storage; (3) no construction of habitable structures in the 100-year floodway; and (4) no increase in erosive water velocity on- or off-site.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Negligible
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Continual

2009 Analysis
This action is deferred as the City will continually review the Floodplain Ordinance

New Actions

		Palacios-1
	Proposed Action:	**Create a Kawak trail and raise Bride road to improve wetland and low lying areas**
	BACKGROUND INFORMATION	
	Site and Location:	Koontz St.
	History of Damages:	The City has experienced substantial flooding and was recently impacted by Hurricane Ike.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorms
Effect on new/existing buildings:	This would assist in reduced flooding in low lying areas, quicker evacuation, and more protection to structures from potential flooding
Priority (High, Moderate, Low):	High
Estimated Cost:	$125,000.00
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Street Department
Implementation Schedule:	Summer 2010

COMMENTS

		Palacios-2
	Proposed Action:	**Begin a rainfall observer program within the City of Palacios as part of CoCoRahs through the NWS**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Extensive flooding in areas causes lasting damage in large storm events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorms
Effect on new/existing buildings:	Trained observers provide more warning time to mitigate existing and new structures and harden facilities from potential severe weather
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	WCOEM/NWS
Implementation Schedule:	Summer 2009

COMMENTS

		Palacios-3
	Proposed Action:	**Increase drainage for airport property.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Palacios
	History of Damages:	Flooding around the airport causes delays and hinders ingress and egress.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorm
Effect on new/existing buildings:	Existing buildings would be better protected from flooding; new buildings protected as well
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	Funds from Airport Devene
Lead Agency/Department Responsible:	Airport Manager
Implementation Schedule:	Summer 2009

COMMENTS

		Palacios-4
	Proposed Action:	**Move existing police station, currently in Flood Zone "B" on FIRMs into old bank building, which is located in Flood Zone "C" on FIRMs, and build a safe room inside to store records and use as EOC during disasters.**
	BACKGROUND INFORMATION	
	Site and Location:	Bank building located at 315 Henderson St in the City.
	History of Damages:	The Police Department had 3' of water in the building during the last flood, and is prone to flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Reduce flooding to police station, improving access and response time during time of flooding.
Priority (High, Moderate, Low):	High
Estimated Cost:	$45,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City Manager
Implementation Schedule:	Summer 2010

COMMENTS

		Palacios-5
	Proposed Action:	**Educate the public on the benefits of purchasing flood insurance to minimize the financial impact of future floods.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city has suffered from continual flooding in storm events. Based on NFIP flood insurance policy and claims data, only 20% of the 18,611 structures in Matagorda County have policies in force.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would aid in the development of new buildings. In addition, increasing flood policies would also minimize cost and risk to existing buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	unknown
Potential Funding Sources:	General revenue and grants
Lead Agency/Department Responsible:	Floodplain Administration; TWDB; TCRFC; HGACE
Implementation Schedule:	2010-2014; ongoing

COMMENTS
This action corresponds with F1 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

		Palacios-6
	Proposed Action:	**Design, construct and maintain drainage improvement projects to minimize the risk of loss of life and future flood damages by utilizing funding from Federal, State, Capital Improvement Program (CIP), Development or Stormwater Utility Fee and other funding sources.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Roadway crossings are overtopped by floodwaters in the Tres Palacios River watershed, which presents a public danger and potential loss of human life.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Drainage improvements would encourage the development of new buildings where projects are complete, and also prevent damage to existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants and City funds
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with F2 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

		Palacios-7
	Proposed Action:	**Adopt "Higher Standard" Riverine Flood Damage Prevention Ordinances and Standards**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	A "Higher Standard" Flood Damage Prevention Ordinance can assist a community's efforts to reduce future flood losses and provide additional Community Rating System (CRS) credits for communities desiring to participate in FEMA's CRS Program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would result in a discount on insurance for new and existing properties; and mitigate damages for both new/existing buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$500 to $2,000 per residential structure; $1,000 to $10,000 nonresidential structure
Potential Funding Sources:	Grants and City funds
Lead Agency/Department Responsible:	Floodplain Management
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with F5 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

		Palacios-8
	Proposed Action:	**Provide Training for Community Floodplain Managers, Community Emergency Managers, CEM's and CFM's.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Conferences and workshops enhance public awareness, assist local communities and provide training and continuing education credits (CEC's) for local floodplain administrators, certified floodplain managers (CFM's), certified emergency managers (CEM's), professional engineers (PE's), registered public land surveyors (RPLS) and the general public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Better trained city personnel mean better informed citizens in protection all structures from potential flooding and other severe weather events
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff time
Potential Funding Sources:	NWS/TWDB/LCRA Hydromet Sysem
Lead Agency/Department Responsible:	Palacios EMC
Implementation Schedule:	Annual basis

COMMENTS
This action corresponds with F7 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

		Palacios-9
	Proposed Action:	**Participate in FEMA's Community Rating System (CRS)**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	FEMA's CRS program identifies opportunities for flood protection such as outreach and training. Currently Palacios susceptible to seasonal flooding, but is not a member of the CRS.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	CRS communities experience better protected existing structures, as well as a reduction in the cost of insurance premiums for buildings
Priority (High, Moderate, Low):	High
Estimated Cost:	Staff Time
Potential Funding Sources:	Grants and City funds
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	2011

COMMENTS
This action corresponds with F11 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

		Palacios-10
	Proposed Action:	**Become a National Weather Service (NWS) "Storm Ready" community.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	There are no communities within Matagorda County that have been designated as a "Storm Ready" community by the National Weather Service (NWS). The NWS Office in Houston is available to assist Matagorda County communities to become "Storm Ready". The mitigation plan goal is to classify every community within Matagorda County as "Storm Ready". HGAC and/or LCRA/TCRFC may be able to assist with the coordination effort with the NWS.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storm, Tornado, Thunderstorm, Winter Storm
Effect on new/existing buildings:	Storm ready communities are better protected including hardening of structures and building new structures to withstand severe weather effects.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff Time
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Palacios EMC
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with F15 in the Matagorda Flood Mitigation Plan, incorporated herein and included in Appendix H.

Wharton County

Previous Actions & Analysis

		Wharton County (Past Action)-1
	Proposed Action:	**Review the County's floodplain management ordinance.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	The County has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met. Possible improvements will be considered to move beyond the minimum standards for development in the regulatory floodway. Examples of possible options to be considered include (1) no rise in the 100-year BFE; (2) offsetting the placement of fill material in the 100-year floodplain with compensating storage; (3) no construction of habitable structures in the 100-year floodway; and (4) no increase in erosive water velocity on- or off-site.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Negligible
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Ongoing

2009 Analysis
This action will be deferred as the County will continually review the ordinance.

New Actions

		Wharton County-1
	Proposed Action:	**Undertake bridge and culvert drainage improvements at Gobbler Stream on FM 1160.**
	BACKGROUND INFORMATION	
	Site and Location:	Gobbler Stream at FM 1160
	History of Damages:	During severe thunderstorms, flood or hurricane events the stream overflows. The area does not pass the required 25-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$142,463
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-2
	Proposed Action:	**Undertake bridge and culvert drainage improvements at Porters Creek**
	BACKGROUND INFORMATION	
	Site and Location:	Porters Creek on FM 1300
	History of Damages:	During severe thunderstorms, flood or hurricane events the stream overflows. The area does not pass the required 25-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$175,636
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS
See also action F7 in the Wharton County Flood Mitigation Plan – Appendix H

		Wharton County-3
	Proposed Action:	**Undertake bridge and culvert drainage improvements at Middle Bernard.**
	BACKGROUND INFORMATION	
	Site and Location:	Middle Bernard – FM 1093
	History of Damages:	During severe thunderstorms, flood or hurricane events the stream overflows. The area does not pass the required 25-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$156,266
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-4
	Proposed Action:	**Undertake bridge and culvert drainage improvements at FM 442**
	BACKGROUND INFORMATION	
	Site and Location:	Waterhole located on FM 442
	History of Damages:	During severe thunderstorms, flood or hurricane events the stream overflows. The area does not pass the required 25-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$224,604
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-5
	Proposed Action:	**Undertake bridge and culvert drainage improvements at Blue Tributary, 2**
	BACKGROUND INFORMATION	
	Site and Location:	FM 1162
	History of Damages:	During severe thunderstorms, flood or hurricane events the stream overflows. The area does not pass the required 25-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$412,117
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-6
	Proposed Action:	**Undertake bridge and culvert drainage improvements at East Mustang**.
	BACKGROUND INFORMATION	
	Site and Location:	FM 1300
	History of Damages:	During severe thunderstorms, flood or hurricane events the stream overflows. The area does not pass the required 25-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$577,424
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-7
	Proposed Action:	**Undertake drainage improvements in Lower Caney Creek**
	BACKGROUND INFORMATION	
	Site and Location:	Lower Caney Regional Detention
	History of Damages:	During severe thunderstorms, flood or hurricane events Lower Caney Creek overflows.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$150,000
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-8
	Proposed Action:	**Undertake drainage improvements along Gardner Slough**
	BACKGROUND INFORMATION	
	Site and Location:	Gardner Slough at FM 442
	History of Damages:	During severe thunderstorms, flood or hurricane events the Gardner Slough area overflows.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This will reduce flood damage to repetitive loss properties along Gardner Slough
Priority (High, Moderate, Low):	High
Estimated Cost:	$160,000
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-9
	Proposed Action:	**Clean up creek and improve drainage at East Fork Jones.**
	BACKGROUND INFORMATION	
	Site and Location:	East Fork Jones at US HWY 5
	History of Damages:	During severe thunderstorms, flood or hurricane events the East Fork Jones area overflows damaging area resident properties.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action will allows for proper drainage under US 5 and decrease damage for area residents
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,133,481
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-10
	Proposed Action:	**Increase drainage capacity at Jones Creek**
	BACKGROUND INFORMATION	
	Site and Location:	Jones Creek at FM 2546
	History of Damages:	During flood, thunderstorms and hurricane events floodwaters overtop Jones Creek damaging homes along FM 2546.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This will reduce flood damage to homes along 2546
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,431,787
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-11
	Proposed Action:	**Undertake drainage improvements at Lower Middle Bernard Clearing**
	BACKGROUND INFORMATION	
	Site and Location:	Lower Middle Bernard Clearing
	History of Damages:	During flood, thunderstorms and hurricane events floodwaters damage homes in the area.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This will reduce flood damage to repetitive loss properties along the Lower Middle Bernard Clearing
Priority (High, Moderate, Low):	High
Estimated Cost:	$160,600
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-12
	Proposed Action:	**Clear debris and improve drainage at Sante Fe Ditch and Jarvis Creek**
	BACKGROUND INFORMATION	
	Site and Location:	Upper Jarvis Creek and Santa Fe Ditch
	History of Damages:	During flood, thunderstorms and hurricane events floodwaters overtop Jarvis Creek and debris clogs the Santa Fe Ditch.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This will decrease flood levels and damages to properties in the upper Jarvis Creek Watershed area
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,836,814
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-13
	Proposed Action:	**Allow for adequate drainage under FM 442 through improvements at Lower Caney**
	BACKGROUND INFORMATION	
	Site and Location:	Lower Caney at Boling/FM 442
	History of Damages:	During flood, thunderstorms and hurricane events floodwaters backup on FM 442 due to lack of proper drainage

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This will reduce flood damage to local residents along FM 442
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,068,500
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-14
	Proposed Action:	**Conduct regional drainage improvements at East Mustang Creek**
	BACKGROUND INFORMATION	
	Site and Location:	East Mustang Creek at Louise
	History of Damages:	During flood, thunderstorms and hurricane events floodwaters backup damaging homes nearby

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This will decrease flood levels and damages to properties in Louise by $9,356,000 over the lifetime of the project
Priority (High, Moderate, Low):	High
Estimated Cost:	$7,823,200
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-15
	Proposed Action:	**Conduct drainage improvements at San Bernard near East Bernard**
	BACKGROUND INFORMATION	
	Site and Location:	San Bernard
	History of Damages:	Floodwaters backup due to poor drainage along the San Bernard.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This will decrease flood levels and damages near East Bernard by $617,000 over the lifetime of the project
Priority (High, Moderate, Low):	High
Estimated Cost:	$496,700
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-16
	Proposed Action:	**Conduct regional drainage improvements at Blue Creek**
	BACKGROUND INFORMATION	
	Site and Location:	Blue Creek in El Campo
	History of Damages:	During flood events, thunderstorms or hurricanes Blue Creek can overflow due to poor drainage, damaging homes and structures in the area.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This will decrease flood levels and damages near El Campo by $1,556,700 over the lifetime of the project
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,768,388
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-17
	Proposed Action:	**Conduct bridge and culvert improvements at Lower Caney**
	BACKGROUND INFORMATION	
	Site and Location:	Lower Caney Creek at CR 175 and CR 123
	History of Damages:	During severe thunderstorms, flood or hurricane events the stream overflows. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$156,872
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-18
	Proposed Action:	**Undertake bridge and culvert improvements at East Mustang**
	BACKGROUND INFORMATION	
	Site and Location:	East Mustang at FM 441
	History of Damages:	During severe thunderstorms, flood or hurricane events the stream overflows. The area does not pass the required 25-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$614,636
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-19
	Proposed Action:	**Undertake drainage improvements (culvert and bridge cleanup) - Chitland**
	BACKGROUND INFORMATION	
	Site and Location:	Chitland at FM 1160
	History of Damages:	During severe thunderstorms, flood or hurricane events the stream overflows. The area does not pass the required 25-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$784,781
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-20
	Proposed Action:	**Conduct drainage improvement and bridge and culvert cleanup at FM 640.**
	BACKGROUND INFORMATION	
	Site and Location:	FM 640 in Peach
	History of Damages:	During severe thunderstorms, flood or hurricane events the stream overflows. The area does not pass the required 25-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$797,102
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-21
	Proposed Action:	**Undertake cleanup for bridges and culverts at Lower Caney Creek**
	BACKGROUND INFORMATION	
	Site and Location:	Lower Caney at Garrett Road, CR 115, CR 156 and Knox Road
	History of Damages:	During severe thunderstorms, flood or hurricane events the stream overflows. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$451,844
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-22
	Proposed Action:	**Undertake bridge and culvert drainage improvements at Stavena Road**
	BACKGROUND INFORMATION	
	Site and Location:	Jarvis Creek at Stavena Road
	History of Damages:	During severe thunderstorms, flood or hurricane events the stream overflows. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$37,145
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-23
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 361**
	BACKGROUND INFORMATION	
	Site and Location:	Gobbler Creek at CR 361
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$34,982
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-24
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 254**
	BACKGROUND INFORMATION	
	Site and Location:	West Bernard at CR 254
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$42,190
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-25
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 376 and 372**
	BACKGROUND INFORMATION	
	Site and Location:	West Mustang Creek at CR 376 and 372
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows both county roads 376 and 372. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$126,463
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-26
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 459**
	BACKGROUND INFORMATION	
	Site and Location:	East Fork Jones at CR 459
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows at CR 459. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$97,436
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-27
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 391**
	BACKGROUND INFORMATION	
	Site and Location:	Lookout at CR 391
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows at CR 391. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$103,773
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-28
	Proposed Action:	**Clean culverts and repair bridges at Sandy Branch**
	BACKGROUND INFORMATION	
	Site and Location:	Sandy Branch at CR 213
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows at CR 213. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$108,551
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-29
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 235, CR 247 and CR 239**
	BACKGROUND INFORMATION	
	Site and Location:	Peach creek at CR 235, 247 and 239
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows causing damage to area residences. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,605,325
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-30
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 463 and CR 461.**
	BACKGROUND INFORMATION	
	Site and Location:	East Fork Jones at CR 463 and East Fork Jones Tributary at CR 461
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows at CR 463 and 461. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$792,971
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-31
	Proposed Action:	**Undertake bridge and culvert drainage improvements at West Bernard**
	BACKGROUND INFORMATION	
	Site and Location:	West Bernard at CR 252 and CR 214, and West Bernard Tributary at CR 131 and CR 177
	History of Damages:	During severe thunderstorms, flood or hurricane events the floodwaters damage homes at West Bernard. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,607,940
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-32
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 248**
	BACKGROUND INFORMATION	
	Site and Location:	Dewberry Branch at 248
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows at CR 248. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$182,882
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-33
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 307**
	BACKGROUND INFORMATION	
	Site and Location:	Stage Sand at CR 307
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows at CR 307. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$183,229
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-34
	Proposed Action:	**Undertake bridge and culvert drainage improvements at Old Caney Road**
	BACKGROUND INFORMATION	
	Site and Location:	Lower Caney at Old Caney Road
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows at Old Caney Road. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$242,972
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-35
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 250**
	BACKGROUND INFORMATION	
	Site and Location:	Dewberry Branch at CR 250
	History of Damages:	During severe thunderstorms, flood or hurricane events floodwaters damage homes and structures on CR 250. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$345,233
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-36
	Proposed Action:	**Undertake bridge and culvert drainage improvements at FM 647**
	BACKGROUND INFORMATION	
	Site and Location:	East Mustang at FM 647
	History of Damages:	During severe thunderstorms, flood or hurricane events floodwaters damage homes and structures on FM 647. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,089,171
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-37
	Proposed Action:	**Undertake bridge and culvert drainage improvements at FM 2919**
	BACKGROUND INFORMATION	
	Site and Location:	San Bernard at FM 2919
	History of Damages:	During severe thunderstorms, flood or hurricane events floodwaters damage homes and structures along FM 2919. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$2,555,813
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-38
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 116**
	BACKGROUND INFORMATION	
	Site and Location:	Jarvis at the end of CR 116
	History of Damages:	During severe thunderstorms, flood or hurricane events floodwaters damage homes and structures on CR 116. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$203,797
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-39
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 389**
	BACKGROUND INFORMATION	
	Site and Location:	Chitland at CR389
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows at CR 389. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$254,502
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-40
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 126**
	BACKGROUND INFORMATION	
	Site and Location:	Waterhole at CR 126
	History of Damages:	During severe thunderstorms, flood or hurricane events the creek overflows at CR 126. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$623,336
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-41
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 409**
	BACKGROUND INFORMATION	
	Site and Location:	MUD at CR 409
	History of Damages:	During severe thunderstorms, flood or hurricane events the structures are inundated by floodwaters at CR 409. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$436,577
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-42
	Proposed Action:	**Undertake bridge and culvert drainage improvements at CR 378**
	BACKGROUND INFORMATION	
	Site and Location:	West Mustang at CR 378
	History of Damages:	During severe thunderstorms, flood or hurricane events floodwaters inundate CR 378. The area does not pass the required 5-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$691,823
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Wharton County-43
	Proposed Action:	**Begin a rainfall observer program within the County for CoCorRahs through the NWS**
	BACKGROUND INFORMATION	
	Site and Location:	Wharton County
	History of Damages:	Extensive flooding in areas causes lasting damage in large storm events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	Better informed observers, personnel, and residents mean more protection for structures by increase warning time and accurate information
Priority (High, Moderate, Low):	High
Estimated Cost:	Negligible
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	WCOEM/NWS
Implementation Schedule:	Fall 2009

COMMENTS
Expand the CoCoRahs system through local PSA's and newspaper articles. Work with surrounding counties.

		Wharton County-44
	Proposed Action:	**Install stream and rain gauge on San Bernard River upstream from East Bernard**
	BACKGROUND INFORMATION	
	Site and Location:	FM 1893 at the San Bernard River
	History of Damages:	Numerous floods have occurred on this river. Population increases in this area will only increase the potential risks.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	Additional gauge provides more warning time to retrofit or harden structures from flooding in the area
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	USGS / LCRA / NWS / WCOEM / GDEM
Implementation Schedule:	2010-2011

COMMENTS
Currently there is no date for the San Bernard River north of the LCRA gauge in East Bernard. See also Action F13 in the Wharton County Flood Mitigation Plan – Appendix H.

		Wharton County-45
	Proposed Action:	**Implement emergency notification system and Reverse 911 for Wharton County residents**
	BACKGROUND INFORMATION	
	Site and Location:	Wharton County
	History of Damages:	The County is prone to natural and human-caused disaster events and also functions as a site/shelter for evacuees. This action would help to notify citizens in emergency situations

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms, Tornado, Dam Failure, Wildfire
Effect on new/existing buildings:	Increase notification of impending severe weather provides more time for hardening and protecting all structures from effects of natural disasters
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$75,000
Potential Funding Sources:	Wharton county
Lead Agency/Department Responsible:	WCOEM
Implementation Schedule:	Schedule depends on funding

COMMENTS
The City of Wharton has already implemented this plan and it is hoped that its success will help to implement this action for the county. See Action F14 in the Wharton County Flood Mitigation Plan (Appendix H).

		Wharton County-46
	Proposed Action:	**Reduce flood losses and increase NFIP coverage throughout Wharton County**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Based on NFIP flood insurance policy and claims data, there are only 2,144 flood insurance policies in force which is approximately 15% of the 14,000 structures in Wharton County and $330in coverage in Wharton County and the cities of East Bernard, El Campo and Wharton. There have been 458 paid flood insurance claims for a total of $8.6M (Average claim = $18,826) in Wharton County since 1978. FEMA has identified 44 Repetitive Loss Properties in Wharton County (16 in unincorporated Wharton County, 15 (city has reduced to 12 by recent elevation projects) in the City of Wharton, 13 in the City of El Campo and 1 in the City of East Barnard). A Repetitive Loss Property is a property that has received two or more paid flood insurance claims that exceed $1,000.00 within a ten year period.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would protect existing properties by reducing flood claims
Priority (High, Moderate, Low):	High
Estimated Cost:	Minimal – workshops at no cost
Potential Funding Sources:	FEMA RiskMap/TWDB/LCRA
Lead Agency/Department Responsible:	Wharton County/El Campo/ HGAC/TCRFC
Implementation Schedule:	2009-2012

COMMENTS
This action corresponds with Action F1 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Wharton County-47
	Proposed Action:	**Design, construct and maintain drainage improvement projects to minimize the risk of loss of life and future flood damages by utilizing funding from Federal, State, Capital Improvement Program (CIP), Development or Stormwater Utility Fee and other funding sources.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The National Weather Service reports that the national 30-year average for deaths related to flooding is 127 per year. Of that yearly average, nearly half are related to motorists attempting to cross roadways that are overtopped by floodwaters and Texas flood deaths in the first half of 2007 have exceeded the annual State average. The Wharton County Master Drainage Plan and San Bernard River Watershed Study, currently underway, will identify problem areas including roadway crossings that are overtopped by floodwaters.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would prevent new properties from developing in the floodway
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	Wharton County Floodplain Administration /LCRA/TNRIS
Implementation Schedule:	2010-2014

COMMENTS
This action corresponds with Action F2 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Wharton County-48
	Proposed Action:	**Acquisition and relocation, elevation and "demo-rebuild" of floodprone structures**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The City of Wharton has submitted an application to enroll in FEMA's CRS Program. The application addresses flood prone and repetitive loss properties within the city. This information will be incorporated into the Wharton County database to allow the County and communities to jointly address projects to reduce flood risks in entire watersheds rather than city by city. FEMA Region VI provided NFIP flood loss records, for planning purposes only, identifying a total of 44 properties in Wharton County have receive 2 or more paid flood insurance claims that exceed $1,000 for each claim.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would prevent new properties from developing in the floodway; and protect existing structures located in a flood zone.
Priority (High, Moderate, Low):	High
Estimated Cost:	$1.87M Acquisition + $0.45M Demolition (15 properties)
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	Wharton County
Implementation Schedule:	2010-2014

COMMENTS
This action corresponds with Action F3 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Wharton County-49
	Proposed Action:	**Update the Wharton County Flood Insurance Study and FIRM's to include detail floodplain information for all streams in Wharton County.**
	BACKGROUND INFORMATION	
	Site and Location:	All streams in Wharton County
	History of Damages:	The April 6, 2006 Wharton County Flood Insurance Study and FIRM's published by FEMA mapped floodplains, floodways and established base flood elevation (BFE's) on selected portions of 14 streams in Wharton County. The remaining 67 streams were mapped by approximate methods and designated as Approximate Zone A without identifying the 100-year, 500-year, and floodway boundaries and BFE's.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would prevent new properties from developing in the floodway
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5.2 million
Potential Funding Sources:	FEMA RiskMap/TWDB/LCRA
Lead Agency/Department Responsible:	Wharton County/LCRA/TNRIS
Implementation Schedule:	2010-2014

COMMENTS
This action corresponds with Action F4 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Wharton County - 50
	Proposed Action:	**Adopt "Higher Standard" Riverine Flood Damage Prevention Ordinances and Standards**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	"Higher Standard" Flood Damage Prevention Ordinance can assist a community's efforts to reduce future flood losses and provide additional Community Rating System (CRS) credits for communities desiring to participate in FEMA's CRS Program. In April 2006 Wharton County and the cities of East Bernard, El Campo and Wharton adopted the new Wharton County Digital Flood Insurance Rate Maps (DFIRMs) by either a new flood damage prevention ordinance or by automatic adoption where the current ordinance adopts future FIRM's published by FEMA.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would result in a discount on insurance for new and existing properties; and mitigate damages for both new/existing buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$500 to $2,000 per residential structure; $1,000 to $10,000 nonresidential structure
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	Wharton County/TCRFC/HGAC
Implementation Schedule:	2010-2014

COMMENTS
This action corresponds with Action F5 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Wharton County - 51
	Proposed Action:	**Provide Training for Community Floodplain Managers, Community Emergency Managers, CEM's and CFM's.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Conferences and workshops enhance public awareness, assist local communities and provide training and continuing education credits (CEC's) for local floodplain administrators, certified floodplain managers (CFM's), certified emergency managers (CEM's), professional engineers (PE's), registered public land surveyors (RPLS) and the general public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Better trained personnel result in better informed residents in protecting structures from flooding and other severe weather events.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff time
Potential Funding Sources:	NWS/TWDB/LCRA Hydromet Sysem
Lead Agency/Department Responsible:	Wharton County
Implementation Schedule:	Annual basis

COMMENTS
This action corresponds with Action F6 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

Wharton County - 52	
Proposed Action:	**Establish Countywide Bench Mark Network**
BACKGROUND INFORMATION	
Site and Location:	Countywide
History of Damages:	The Wharton County FIRM's, dated April 2006, identify Elevation Reference Marks (ERM) or Bench Marks (BM) and Base Flood Elevations (BFEs) that are referenced to NAVD 1988 Elevation Datum. The Elevation Reference Marks and Base Flood Elevations (BFEs) on previously published FIRMs for Wharton County and the cities of El Campo and Wharton show Elevation Reference Marks and Base Flood Elevations referenced to NGVD 1929 which is no longer acceptable for National Flood Insurance Program purposes. Only 188 ERMs and BMs are shown on the new FIRM's (1,094 square miles or 1 BM per 5.8 square miles) presenting a major problem for local community administrators that must reference NAVD 1988 for new development permits.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Subdivision ordinance requires developers to establish a permanent survey monument in each new subdivision.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$60,000
Potential Funding Sources:	State/FEMA grants
Lead Agency/Department Responsible:	Wharton County
Implementation Schedule:	Annually as needed.

COMMENTS
This action corresponds with Action F8 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

Wharton County - 53	
Proposed Action:	**Provide support to the TCRFC and San Bernard River in flood reduction projects**
BACKGROUND INFORMATION	
Site and Location:	Countywide
History of Damages:	Flood reduction projects should be identified in advance to prevent flood damage and loss of lives.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Flood mitigation projects result in better protection to existing and new structures from flooding
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff Time
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	Matagorda County
Implementation Schedule:	2010-2014

COMMENTS
This action corresponds with Action F9 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

Wharton County - 54	
Proposed Action:	**Participate in FEMA's Community Rating System (CRS) program**
BACKGROUND INFORMATION	
Site and Location:	Countywide
History of Damages:	Currently no Wharton County communities participate in FEMA's CRS Program. FEMA recognizes community efforts that exceed the minimum requirements of the National Flood Insurance Program (NFIP) by designating communities that have adopted "higher standards" as CRS Communities. All flood insurance policies within communities that participate in FEMA's CRS program are rewarded with reduced flood insurance premiums. There are only 45 Texas counties and communities that are enrolled in the CRS Program. The City of Wharton submitted a CRS Application to FEMA in 2007 to enroll in the CRS Program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Better protects existing properties through the development of CRS activities such as outreach for owners; reduces cost of insurance for new and existing buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff Time
Potential Funding Sources:	Grants and General Revenue
Lead Agency/Department Responsible:	Wharton County
Implementation Schedule:	2010

COMMENTS
This action corresponds with Action F10 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Wharton County-55
	Proposed Action:	**Create a Matagorda Disaster Response Team**
	BACKGROUND INFORMATION	
	Site and Location:	Wharton County, including incorporated jurisdictions: East Bernard; El Campo, City of Wharton
	History of Damages:	Wharton County and the cities of East Bernard; El Campo and Wharton, identified possible hurricane and tornado paths, floodprone properties, repetitive loss properties, HAZMAT corridors, and areas where emergency assistance may be needed.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane and Tropical Storm, Hazardous Material Release, Terrorism, Pipeline Failure, Dam Failure, Tornado
Effect on new/existing buildings:	Having a disaster response team in place that can respond quickly to a natural or man-caused event would prevent damage to existing buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Dependent upon magnitude of the event and consultant firm
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	Wharton County/LCRA/TCRFC
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F11 in the Matagorda Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Wharton County-56
	Proposed Action:	**Implement a Wharton County Flood Warning System**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Wharton County and the incorporated jurisdictions therein experience flooding at low water crossings which can lead to injuries and even fatalities.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	The system would prevent the loss of lives more than protect property
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,095,000
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	Wharton County/LCRA/TCRFC/TXDOT
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F12 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Wharton County-57
	Proposed Action:	**Become a National Weather Service (NWS) "Storm Ready" community.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	There are no communities within Wharton County that have been designated as a "Storm Ready" community by the National Weather Service (NWS). The NWS Office in Houston is available to assist Wharton County communities to become "Storm Ready". The mitigation plan goal is to classify every community within Wharton County as "Storm Ready". There is the possibility that HGAC and/or LCRA/TCRFC may be able to assist with the coordination effort with the NWS

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storm, Tornado, Thunderstorm, Winter Storm
Effect on new/existing buildings:	Storm Ready communities are better prepared in educating residents on protecting all structures from severe weather events
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff Time
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Wharton County/LCRA/NWS
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F15 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Wharton County-58
	Proposed Action:	**Install emergency generators at critical facilities**
	BACKGROUND INFORMATION	
	Site and Location:	Critical Facilities throughout the County
	History of Damages:	The County experiences black outs or power outages during storm events, such as Hurricane Ike, and periodically during thunderstorm events. A study is recommended to evaluate options and estimate costs for Wharton County and participating communities to select, design and construct backup power systems that can fulfill the need.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storm, Tornado, Thunderstorm, Winter Storm, Dam Failure, Wildfire, Hazardous Material Release, Pipeline Failure, Terrorism
Effect on new/existing buildings:	This would prevent existing properties from receiving extensive damage in a natural or man-caused hazard event.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$3,000 for a study; $30,000 for backup power facility; $20,000 for redundant power facility; $80,000 for secondary tower; $100,000 for 600 KW mobile power generator
Potential Funding Sources:	General Revenue; State/FEMA Grants
Lead Agency/Department Responsible:	Wharton County/LCRA/TCRFC
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F16 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

City of East Bernard

Previous Actions & Analysis –

Not applicable: East Bernard is a new community (See Table 1-2)

New Actions

		EB-1
	Proposed Action:	**Remove and replace culverts on Highway 60**
	BACKGROUND INFORMATION	
	Site and Location:	Highway 60 runs all the way through the City of East Bernard
	History of Damages:	Currently the culverts are not set for proper drainage on Highway 60. Therefore the road floods during thunderstorm, hurricane or flooding events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City of East Bernard and TXDOT
Implementation Schedule:	To begin in 2010

COMMENTS

		EB-2
	Proposed Action:	**Complete east and west sections of the drainage plan for East Bernard.**
	BACKGROUND INFORMATION	
	Site and Location:	City of East Bernard
	History of Damages:	The City's drainage plan consists of repairing culverts and cleaning ditches to help water flow into the San Bernard River. The City has completed work for the north section of town thus far. Currently improper drainage causes flooding in the east and west sections of town.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$75,000.00 per section of plan
Potential Funding Sources:	General fund and grants
Lead Agency/Department Responsible:	City Management;
Implementation Schedule:	Five year project

COMMENTS
See also F7 in the Wharton County Mitigation Plan (Appendix H)

		EB-3
	Proposed Action:	**Increase public awareness of the CoCoRahs program**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	There is not enough information regarding storm data as there is only one rain gauge up stream to measure the effect of a flooding, thunderstorm or hurricane event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms, Hail, Winter Storm
Effect on new/existing buildings:	More accurate storm data on streams increases warning time for protecting structures from severe flooding and weather events
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	No cost associated
Lead Agency/Department Responsible:	City emergency management
Implementation Schedule:	September 2009 and ongoing

COMMENTS

		EB-4
	Proposed Action:	**Develop shelter for emergency responders**
	BACKGROUND INFORMATION	
	Site and Location:	Far west section of town which is less likely to flood.
	History of Damages:	Operated out of fire department in center of town previously. Wharton County could also use the shelter as a base of emergency operations during a natural or man-made hazard event

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorms, Flood, Hurricane & Tropical Storms, Tornado, Extreme Heat, Severe Winter Storms, Hazardous Material Release, Pipeline Failure, Terrorism, Dam Failure, Wildfire
Effect on new/existing buildings:	New shelter for responders allows more quality operations, notification to residents of impending weather events, and more time to protect structures from flooding and other disasters
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$2,000,000
Potential Funding Sources:	HMGP and PDM grants
Lead Agency/Department Responsible:	City and county with contractors
Implementation Schedule:	Two years after receipt of funding

COMMENTS

		EB-5
	Proposed Action:	**Develop a drought contingency plan**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The City does not have a drought contingency plan in place, but relies on countywide burn bans.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	Promote and education part of contingency plan in planting shade and xeriscape structures, reducing erosion to better protect structures during severe heat and drought
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000
Potential Funding Sources:	General Revenue/Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	2012

COMMENTS

		EB-6
	Proposed Action:	**Work with Fire Departments countywide through Level 4 Radio Network.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Currently fire departments cannot connect with other counties and has to use dispatch because of difference of megahertz. This system will allow fire departments from different counties to communicate directly.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Increase notification of wildfire with better equipment, increasing warning time to residents to protect structures from impending wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$60,000.00
Potential Funding Sources:	Local funds
Lead Agency/Department Responsible:	Wharton County
Implementation Schedule:	2011

COMMENTS

		EB-7
	Proposed Action:	**Clean debris out of the San Bernard River and work with EPA/USACE and wetlands to expedite process**
	BACKGROUND INFORMATION	
	Site and Location:	San Bernard River
	History of Damages:	Trees grow in the river with weak root systems. When they fall, the debris causes blockage and flooding. The last major flood in 2004 left 45 homes flooded.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	Cleared waterways reduce blockage of debris, reducing out of bank flooding and flooding of structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City Management
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		EB-8
	Proposed Action:	**Acquisition and relocation, elevation and "demo-rebuild" of floodprone structures**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	FEMA Region VI provided NFIP flood loss records, for planning purposes only, identifying a total of 44 properties in Wharton County have receive 2 or more paid flood insurance claims that exceed $1,000 for each claim.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would prevent new properties from developing in the floodway; and protect existing structures located in a flood zone.
Priority (High, Moderate, Low):	High
Estimated Cost:	$125,000 Acquisition + $30,000 Demolition (1 property)
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	East Bernard/ Wharton County
Implementation Schedule:	2010-2014

COMMENTS
This action corresponds with Action F3 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		EB-9
	Proposed Action:	**Participate in FEMA's Community Rating System (CRS) program**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Currently no Wharton County communities participate in FEMA's CRS Program. FEMA recognizes community efforts that exceed the minimum requirements of the National Flood Insurance Program (NFIP) by designating communities that have adopted "higher standards" as CRS Communities. All flood insurance policies within communities that participate in FEMA's CRS program are rewarded with reduced flood insurance premiums. There are only 45 Texas counties and communities that are enrolled in the CRS Program. The City of Wharton submitted a CRS Application to FEMA in 2007 to enroll in the CRS Program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Better protects existing properties through the development of CRS activities such as outreach for owners; reduces cost of insurance for new and existing buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff Time
Potential Funding Sources:	Grants and General Revenue
Lead Agency/Department Responsible:	Wharton County/East Bernard
Implementation Schedule:	2010

COMMENTS
This action corresponds with Action F10 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		EB-10
	Proposed Action:	**Install emergency generators at critical facilities**
	BACKGROUND INFORMATION	
	Site and Location:	Critical Facilities throughout the City
	History of Damages:	The City experiences black outs or power outages during storm events, such as Hurricane Ike, and periodically during thunderstorm events. A study is recommended to evaluate options and estimate costs for East Bernard and participating communities to select, design and construct backup power systems that can fulfill the need.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storm, Tornado, Thunderstorm, Winter Storm, Dam Failure, Wildfire, Hazardous Material Release, Pipeline Failure, Terrorism
Effect on new/existing buildings:	This would prevent existing properties from receiving extensive damage in a natural or man-caused hazard event.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$3,000 for a study; $30,000 for backup power facility; $20,000 for redundant power facility; $80,000 for secondary tower; $100,000 for 600 KW mobile power generator
Potential Funding Sources:	General Revenue; State/FEMA Grants
Lead Agency/Department Responsible:	East Bernard/Wharton County/LCRA/TCRFC
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F16 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

City of El Campo

Previous Actions & Analysis

		City of El Campo (Past Action)-1
	Proposed Action:	**Complete (Norris Street to South Street) and begin (Vasa ditch improvements) construction of concrete ditches.**
	BACKGROUND INFORMATION	
	Site and Location:	Norris Street, South Street, Vasa Street
	History of Damages:	These areas are prone to localized flooding

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Norris Street: High Vasa ditch: Low
Estimated Cost:	Norris Street -- $125,000 Vasa ditch – To be determined
Potential Funding Sources:	Capital Improvement Project
Lead Agency/Department Responsible:	City of El Campo
Implementation Schedule:	Complete

2009 Analysis
The City has completed the action. Norris Street to the South Street was completed in 2007, and the Vasa Street Ditch Project was moved back.

City of El Campo (Past Action)-2	
Proposed Action:	**Modify storm drainage on Pecan Street.**
BACKGROUND INFORMATION	
Site and Location:	Pecan Street, City of El Campo
History of Damages:	Storm drainage is needed to prevent localized flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$323,000
Potential Funding Sources:	Capital Improvement Project
Lead Agency/Department Responsible:	City of El Campo
Implementation Schedule:	2011

2009 Analysis
This action will be deferred as project date postponed

City of El Campo (Past Action)-3	
Proposed Action:	**Modify Town & Country Street and improve storm drainage**
BACKGROUND INFORMATION	
Site and Location:	Town and Country Street area, City of El Campo
History of Damages:	Repetitive flooding of the town and Country Street area indicates a need for better flood control.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$478,000
Potential Funding Sources:	Capital Improvement Project
Lead Agency/Department Responsible:	City of El Campo
Implementation Schedule:	2011

2009 Analysis
Project deferred as project date postponed

City of El Campo (Past Action)-4	
Proposed Action:	**Upgrade storm drainage (TX Dot downtown upgrade)**
BACKGROUND INFORMATION	
Site and Location:	Downtown area of City
History of Damages:	Repetitive flooding of the area indicates a need for better flood control and drainage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$500,000
Potential Funding Sources:	Capital Improvement Project
Lead Agency/Department Responsible:	City of El Campo
Implementation Schedule:	Complete - 2006

2009 Analysis
This project was completed in 2006

City of El Campo (Past Action)-5	
Proposed Action:	**Implement Master Drainage Plan (7 projects).**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	Seven areas of the city are known to be subject to flood damages because of inadequate storm drainage. Improved storm drainage will reduce flood damage

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5,000,000
Potential Funding Sources:	Capital Improvement Project
Lead Agency/Department Responsible:	City of El Campo
Implementation Schedule:	2011

2009 Analysis
This action will be deferred as not all of the projects have been completed. The city has completed several, but the Drainage Plan is not 100% complete.

New Actions

		EC-1
	Proposed Action:	**Purchase backup generator for WWTP.**
	BACKGROUND INFORMATION	
	Site and Location:	WWTP Plant on Thompson St.
	History of Damages:	The City has experienced power loss that caused the treatment to shut down. This would allow the City to provide sewer service and wastewater treatment should primary power be lost.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorm, Tornado, Dam Failure
Effect on new/existing buildings:	Allows businesses to provide facilities for customers and employees
Priority (High, Moderate, Low):	High
Estimated Cost:	$193,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	2009-2010

COMMENTS
See also Action F 16 in the Wharton County Flood Mitigation Plan (Appendix H).

		EC-2
	Proposed Action:	**Implement area-wide Emergency Notification System through the use of telephones to notify residents, emergency personnel and strategic departments of pending emergencies.**
	BACKGROUND INFORMATION	
	Site and Location:	Emergency Services Building at 220 Merchant
	History of Damages:	The City has experienced multiple hazard events in the past. An informed citizenry is essential to implementing effective mitigation actions

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorm, Tornado, Dam Failure, Hazardous Material Release, Pipeline Failure, Wildfire, Hail
Effect on new/existing buildings:	Informed citizens and more warning time assist in retrofitting and reducing damages to new and existing structures during disaster events
Priority (High, Moderate, Low):	High
Estimated Cost:	$12,000 annually
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	EMS
Implementation Schedule:	2010 and ongoing

COMMENTS
See also Action F14 in the Wharton County Mitigation Plan

		EC-3
	Proposed Action:	**Purchase backup generator for WTP.**
	BACKGROUND INFORMATION	
	Site and Location:	WTP Plant on Monseratte St.
	History of Damages:	The City has experienced power loss that effects the water distribution

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorm, Tornado, Dam Failure, Wildfire
Effect on new/existing buildings:	Provides for potable water service and fire protection
Priority (High, Moderate, Low):	High
Estimated Cost:	$156,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	2009-2010

COMMENTS
See also Action F16 in the Wharton County Flood Mitigation Plan (Appendix H)

		EC-4
	Proposed Action:	**Acquisition and Relocation, Elevation and "Demo-Rebuild" of Floodprone Structures**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	FEMA Region VI provided NFIP flood loss records, for planning purposes only, identifying a total of 44 properties in Wharton County have receive 2 or more paid flood insurance claims that exceed $1,000 for each claim.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would prevent new properties from developing in the floodway; and protect existing structures located in a flood zone.
Priority (High, Moderate, Low):	High
Estimated Cost:	$1.625M Acquisition + $0.39M Demolition (13 properties)
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	El Campo/ Wharton County
Implementation Schedule:	2010-2014

COMMENTS
This action corresponds with Action F3 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		EC-5
	Proposed Action:	**Participate in FEMA's Community Rating System (CRS) program**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Currently no Wharton County communities participate in FEMA's CRS Program. FEMA recognizes community efforts that exceed the minimum requirements of the National Flood Insurance Program (NFIP) by designating communities that have adopted "higher standards" as CRS Communities. All flood insurance policies within communities that participate in FEMA's CRS program are rewarded with reduced flood insurance premiums. There are only 45 Texas counties and communities that are enrolled in the CRS Program. The City of Wharton submitted a CRS Application to FEMA in 2007 to enroll in the CRS Program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Better protects existing properties through the development of CRS activities such as outreach for owners; reduces cost of insurance for new and existing buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff Time
Potential Funding Sources:	Grants and General Revenue
Lead Agency/Department Responsible:	El Campo/Wharton County
Implementation Schedule:	2010

COMMENTS
This action corresponds with Action F10 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

City of Wharton

Previous Actions & Analysis

		City of Wharton (Past Action)-1
	Proposed Action:	**Clean and repair storm drains routinely**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The City of Wharton is prone to flooding from the Colorado River as it occurred in October 1998. It is also prone to flooding from local events as it experienced in September 2002.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	City of El Campo
Implementation Schedule:	Ongoing

2009 Analysis
This action will be deferred. This is an ongoing effort of the City of Wharton to routinely clean and repair stormwater drains. It is also apart of the City's drainage and maintenance plan.

City of Wharton (Past Action)-2	
Proposed Action:	**Encourage floodplain and CRS coordinators to earn CFM certification.**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	The City of Wharton has appointed the Building Official as Floodplain Administrator. This action will help ensure that a qualified individual is available to assist organizations such as FEMA and LCRA with flooding issues in the City and to help citizens with find answers to questions pertaining to flood issues. .

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$1500.00
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	City of Wharton
Implementation Schedule:	Complete

2009 Analysis
This action is complete. The Building Official is currently the City's Floodplain Administrator. He earned his CFM certification in 2004. The requirement has also been included in the City's floodplain ordinance

City of Wharton (Past Action)-3	
Proposed Action:	**Increase freeboard requirements for permitting structures in the floodplain**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	This action will result in safer structures and, thus, fewer flood damages.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	Minimal – can be managed within budget
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	City of Wharton
Implementation Schedule:	Complete

2009 Analysis
This action is complete. The freeboard requirements were increased to one foot above BFE in the City's floodplain ordinance and is administered under the Code Enforcement Department under the supervision of the Floodplain Administrator.

New Actions

		Wharton-1
	Proposed Action:	**Implement a comprehensive watershed ordinance for new development**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorms
Effect on new/existing buildings:	More stringent ordinance may provide add'l freeboard in SFHAs, improve drainage requirements thus protecting both new and existing structures from flooding
Priority (High, Moderate, Low):	High
Estimated Cost:	$15,000.00
Potential Funding Sources:	City and the TWDB
Lead Agency/Department Responsible:	City Public Works
Implementation Schedule:	2011

COMMENTS
The ordinance will be a tool used for future development.

		Wharton-2
	Proposed Action:	**Acquire, reuse and preserve open spaces adjacent to flood prone areas.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorms
Effect on new/existing buildings:	This will prevent damage to new and existing buildings from flooding.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	HMGP
Lead Agency/Department Responsible:	City Public Works
Implementation Schedule:	As needed

COMMENTS

		Wharton-3
	Proposed Action:	**Adopt a "no rise" in the BFE in the 100 year floodplain**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorms
Effect on new/existing buildings:	This would strengthen new and existing buildings against the threat of flooding
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	City of Wharton
Lead Agency/Department Responsible:	City Floodplain Administrator
Implementation Schedule:	2009

COMMENTS
This will update the floodplain ordinance.

		Wharton-4
	Proposed Action:	**Utilize erosion and sedimentation controls during construction**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	In the past the City has seen a degradation of water quality and erosion.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorms
Effect on new/existing buildings:	Reduced erosion protects structures from wash outs and reduced groundwater and collapse, protecting structures adjacent to construction areas
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	City
Lead Agency/Department Responsible:	Code Enforcement
Implementation Schedule:	2009

COMMENTS
The will tie into the development of a new drainage ordinance.

		Wharton-5
	Proposed Action:	**Implement a zero discharge policy for stormwater in subdivision platting**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Protects existing buildings in the subdivision from stormwater
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	City of Wharton
Lead Agency/Department Responsible:	Planning Department
Implementation Schedule:	2009 - 2010

COMMENTS
Update current ordinance.

		Wharton-6
	Proposed Action:	**Include onsite sediment retention as a development requirement.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorms
Effect on new/existing buildings:	This action will help prevent damage to existing buildings and also mitigate against the effect of flood for new structures.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	City of Wharton
Lead Agency/Department Responsible:	Planning / Code Enforcement
Implementation Schedule:	2009-2010

COMMENTS
Update ordinance.

		Wharton-7
	Proposed Action:	**Use impact fees to help fund public hazard mitigation projects related to land development (e.g. increase runoff)**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorms, Dam Failure
Effect on new/existing buildings:	Flood protection for existing structures and helps increase new development as runoff and impact areas will be mitigated
Priority (High, Moderate, Low):	High
Estimated Cost:	$15,000.00
Potential Funding Sources:	City/HMGP
Lead Agency/Department Responsible:	Floodplain Administrator/Code Enforcement
Implementation Schedule:	2009

COMMENTS

		Wharton-8
	Proposed Action:	**Raise electrical components of sewage lift stations above BFE**
	BACKGROUND INFORMATION	
	Site and Location:	City lift stations
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes. They City was inundated by floodwaters in 1998 which resulted in a loss of electrical power.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Improved public safety; better protect lift station and prevent power outages during flood event; mitigates against damage to new buildings
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	HMGP
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	2009-2010

COMMENTS

		Wharton-9
	Proposed Action:	**Increase capacity/add stormwater detention/retention basins**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Flood protection for existing buildings and also encouragement for the development of new structures
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	City/HMGP/USACE
Lead Agency/Department Responsible:	Planning Dept.
Implementation Schedule:	2009-2012

COMMENTS

		Wharton-10
	Proposed Action:	**Increase dimensions of drainage culverts in troublesome areas**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorms
Effect on new/existing buildings:	Drainage culverts would prevent inundation of existing buildings from floodwaters and also prevent development in high impact areas, thereby decreasing the potential damage to new structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	City of Wharton
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	Ongoing

COMMENTS

		Wharton-11
	Proposed Action:	**Minimize the impact of flooding by installing berms, levees when appropriate.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorm
Effect on new/existing buildings:	This action will protect existing properties from flooding and also help to reduce the cost of flood insurance. In addition the action will increase development and prevent damage from new buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	City/HMGP/USACE
Lead Agency/Department Responsible:	Planning Department
Implementation Schedule:	2009-2012

COMMENTS

		Wharton-12
	Proposed Action:	**Raise manhole opening using alternative methods**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorm
Effect on new/existing buildings:	Flood protection to improve public health instead of protection for structures
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	HMGP
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	2009-2010

COMMENTS

		Wharton-13
	Proposed Action:	**Develop a flood-Use stream restoration/channelization to ensure adequate drainage/diversion of stormwater.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorm
Effect on new/existing buildings:	Flood protection for existing buildings and also encouragement for the development of new structures
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	City/HMGP/USACE
Lead Agency/Department Responsible:	Planning Dept.
Implementation Schedule:	2009-2012

COMMENTS

		Wharton-14
	Proposed Action:	**Install structural retrofits (reinforcement, flood proofing, storm shutters, bracing, etc.) for critical facilities**
	BACKGROUND INFORMATION	
	Site and Location:	Police Station, EMS, EMC, City Hall
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorms, Tornado, Dam Failure, Winter Storm
Effect on new/existing buildings:	Strengthens current critical facilities, and also sets standards for mitigation against damage for new development.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	HMGP
Lead Agency/Department Responsible:	Emergency Management/Facilities Maintenance
Implementation Schedule:	2009-2010

COMMENTS

		Wharton-15
	Proposed Action:	**Identify and assess the most at-risk critical facilities and evaluate possible mitigation techniques**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorms, Tornado, Dam Failure, Winter Storm, Wildfire, Drought, Extreme Heat, Hazardous Materials, Pipeline Failure, Hail
Effect on new/existing buildings:	Strengthens current critical facilities, and also sets standards for mitigation against damage for new development.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	HMGP
Lead Agency/Department Responsible:	Emergency Management/Planning
Implementation Schedule:	2009

COMMENTS

		Wharton-16
	Proposed Action:	**Establish a reserve fund for emergency and public mitigation measures.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Wharton
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorms, Tornado, Dam Failure, Winter Storm
Effect on new/existing buildings:	Strengthens current critical facilities
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	City/HMGP
Lead Agency/Department Responsible:	Emergency Management/Finance
Implementation Schedule:	2009

COMMENTS

		Wharton-17
	Proposed Action:	**Install quick-connect emergency generator hook-ups for critical facilities**
	BACKGROUND INFORMATION	
	Site and Location:	Critical facilities, lift stations and water plants
	History of Damages:	The City has experienced natural hazards such as floods and hurricanes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storms, Thunderstorm, Tornado, Dam Failure, Winter Storm, Hazardous Materials, Terrorism, Pipeline Failure, Winter Storm
Effect on new/existing buildings:	Strengthens current critical facilities
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	HMGP
Lead Agency/Department Responsible:	Emergency Management/Public Works/Planning
Implementation Schedule:	2009-2010

COMMENTS

		Wharton 18
	Proposed Action:	**Acquisition and relocation, elevation and "demo-rebuild" of floodprone structures**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	FEMA Region VI provided NFIP flood loss records, for planning purposes only, identifying a total of 44 properties in Wharton County have receive 2 or more paid flood insurance claims that exceed $1,000 for each claim.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This would prevent new properties from developing in the floodway; and protect existing structures located in a flood zone.
Priority (High, Moderate, Low):	High
Estimated Cost:	$1.87M Acquisition + $0.45M Demolition (15 properties)
Potential Funding Sources:	State and FEMA grants
Lead Agency/Department Responsible:	El Campo/ Wharton County
Implementation Schedule:	2010-2014

COMMENTS
This action corresponds with Action F3 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Wharton -19
	Proposed Action:	**Participate in FEMA's Community Rating System (CRS) program**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Currently no Wharton County communities participate in FEMA's CRS Program. FEMA recognizes community efforts that exceed the minimum requirements of the National Flood Insurance Program (NFIP) by designating communities that have adopted "higher standards" as CRS Communities. All flood insurance policies within communities that participate in FEMA's CRS program are rewarded with reduced flood insurance premiums. There are only 45 Texas counties and communities that are enrolled in the CRS Program. The City of Wharton submitted a CRS Application to FEMA in 2007 to enroll in the CRS Program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Better protects existing properties through the development of CRS activities such as outreach for owners; reduces cost of insurance for new and existing buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Staff Time
Potential Funding Sources:	Grants and General Revenue
Lead Agency/Department Responsible:	City of Wharton/Wharton County
Implementation Schedule:	2010

COMMENTS
This action corresponds with Action F10 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

		Wharton-20
	Proposed Action:	**Install emergency generators at critical facilities**
	BACKGROUND INFORMATION	
	Site and Location:	Critical Facilities throughout the City
	History of Damages:	The City experiences black outs or power outages during storm events, such as Hurricane Ike, and periodically during thunderstorm events. A study is recommended to evaluate options and estimate costs for Wharton and participating communities to select, design and construct backup power systems that can fulfill the need.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storm, Tornado, Thunderstorm, Winter Storm, Dam Failure, Wildfire, Hazardous Material Release, Pipeline Failure, Terrorism
Effect on new/existing buildings:	This would prevent existing properties from receiving extensive damage in a natural or man-caused hazard event.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$3,000 for a study; $30,000 for backup power facility; $20,000 for redundant power facility; $80,000 for secondary tower; $100,000 for 600 KW mobile power generator
Potential Funding Sources:	General Revenue; State/FEMA Grants
Lead Agency/Department Responsible:	Wharton /LCRA/TCRFC
Implementation Schedule:	2010-2015

COMMENTS
This action corresponds with Action F16 in the Wharton Flood Mitigation Plan, incorporated herein and found at Appendix H.

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This section contains both an analysis of previous actions and new actions for the participating communities in TCRFC Region II. The communities in this section evaluated and analyzed the regional mitigation actions for the TCRFC in Section 21.

Bastrop County

Previous Actions & Analysis

		Bastrop County (Past Action)-1
	Proposed Action:	**Track and record high-water marks following a flood event.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Several homes outside a Special Flood Hazard Area flooded during the last year from stormwater runoff.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	Minimal – covered by existing budgets. County employees drive through potential flood sites during a flood event and flooded sites after an event. The only cost associated with conducting this action would be employee time to gather flood-level information and record findings in a database.
Potential Funding Sources:	
Lead Agency/Department Responsible:	Bastrop County Health, Sanitation and Environmental Enforcement
Implementation Schedule:	Jan. 2011

2009 Analysis:
This action has not been completed and will be deferred for the 2009 Plan

		Bastrop County (Past Action)-2
	Proposed Action:	**Implement a maintenance program for clearing debris from drains and culverts; possibly enact "driveway permitting" ordinance.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	During the past year, several homes outside a Special Flood Hazard Area were flooded from stormwater runoff. Since then, the County Commissioners are interested in developing procedures for monitoring the performance of, inspecting, and maintaining existing drains and culverts. The development of a "driveway permitting process" is being explored to cover the cost of implementing the project.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	Partially covered by existing budgets -- the cost to the County would be the salary of one office staff person. A road crew member from each Precinct could be assigned the tasks of inspection and maintenance. Existing precinct road and bridge equipment could be used in the beginning stage of developing the project. Driveway permit fees would cover additional costs.
Potential Funding Sources:	Bastrop County general revenues and, possibly, "driveway permit" fees
Lead Agency/Department Responsible:	Precincts' Road and Bridge Division
Implementation Schedule:	Jan. 2011

2009 Analysis:
This action is partially complete and will be deferred for the 2009 Plan. Bastrop County has enacted a driveway permitting ordinance. There still exists a need for a maintenance program for clearing debris. This portion of the action will be included in the 2009 update, with some changes.

		Bastrop County (Past Action)-3
	Proposed Action:	**Increase local rating by participating in the NFIP's Community Rating System.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Participation will increase the County's rating and lower flood insurance premiums for homeowners.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Covered by existing budgets -- there would be minimal cost to the County. The County floodplain manager would perform and record activities.
Potential Funding Sources:	
Lead Agency/Department Responsible:	Bastrop County Health, Sanitation and Environmental Enforcement
Implementation Schedule:	2006

2009 Analysis:
This action has been completed. Bastrop County is rated CRS-8.

		Bastrop County (Past Action)-4
	Proposed Action:	**Distribute flood insurance handouts with all permit applications.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Presently, flood insurance information is made available as handouts at educational presentations. However, additional opportunities for disseminating information are presented as permit applications are issued.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Covered by existing budgets -- there would be minimal cost to the County. The County floodplain manager would perform and record activities.
Potential Funding Sources:	Cost would be minimal
Lead Agency/Department Responsible:	Bastrop County Health, Sanitation and Environmental Enforcement
Implementation Schedule:	2004

2009 Analysis:
This action has been completed. In 2004, Bastrop County began and will continue to provide flood insurance handouts as permit applications are issued.

		Bastrop County (Past Action)-5
	Proposed Action:	**Enhance the early warning system through increased awareness gained by use of NOAA weather radio and other media**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	NOAA Weather Radio is a nationwide network of radio stations broadcasting continuous weather information direct from a nearly National Weather Service office. These stations broadcast National Weather Service warnings, as well as post-event information for all types of hazards, both natural and man-made. NOAA Weather Radios are a single source for the most comprehensive weather and emergency information available to the public. Local jurisdictions in Bastrop County have the opportunity to purchase portable NOAA weather radios.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Units cost $50 to $60 each for those with Specific Area Messaging (SAME) Technology
Potential Funding Sources:	County, School District, City, General Fund, Grants
Lead Agency/Department Responsible:	Commissioners, City Councils, School Districts, local newspapers
Implementation Schedule:	2007

2009 Analysis:
This action has been completed and Bastrop County is a “Storm Ready” community.

Bastrop County (Past Action)-6	
Proposed Action:	**Increase public education about weather events using local media.**
BACKGROUND INFORMATION	
Site and Location:	Countywide
History of Damages:	Bastrop County has three newspapers, all of which are cooperative with regard to placing Public Service Announcements (PSAs) for emergency/disaster preparedness.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Thunderstorm, Hurricane and Tropical Storm, Winter Storm, Wildfire, Hail
Priority (High, Moderate, Low):	High
Estimated Cost:	No cost
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Bastrop County, city offices
Implementation Schedule:	2011

2009 Analysis:
This action will be deferred for the 2009 Plan as an ongoing activity. The County continues to look at media outreach possibilities to inform the public on local weather events.

		Bastrop County (Past Action)-7
	Proposed Action:	**Develop (through training) an effective emergency response to wildfire, hazardous materials and aircraft incidents, and pipeline incidents; establish a regional plan and mutual aid agreements; adopt a county urban interface code and the Life Safety Code; and create and fill the position of Fire Marshal**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Bastrop County currently has about 200 law enforcement and 300 fire and emergency medical first responders who have had limited training in these disciplines (most notably hazardous materials and aircraft incidents). ICS training is particularly needed.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Hazardous Materials Release, Pipeline Failure
Priority (High, Moderate, Low):	High
Estimated Cost:	Salaries for instructors, materials, equipment ($20K annually); salary/benefits for Fire Marshal ($60K annually)
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	County and city governments; fire fighters' association; TEEX; State DEM; Texas Forest Service
Implementation Schedule:	2011

2009 Analysis:
The regional plan and mutual aid agreements have been established. Bastrop County is a participant in the CAPCOG Mutual Aid Agreement, which is renewed annually. The Life Safety Code portion of the action should be deleted as well as the creation of the Fire Marshal position. The county will defer the portion of the action regarding effective emergency response to wildfire, hazardous materials and aircraft incidents, pipeline incidents, and county urban interface code.

		Bastrop County (Past Action)-8
	Proposed Action:	**Lessen the impact on the community from riverine and localized flooding of tributaries, creeks, and streams by reviewing the feasibility of a buy-out program, installing more visible notices about areas most prone to flood, and constructing barricades/gates where indicated**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Bastrop County has identified a need for better signage and gates/barricades for areas most prone to flooding. The county does not have a buy-out program and will consider working this problem in the future with LCRA and FEMA.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	Signage, gates, equipment -- $100K Floodplain management efforts -- $2.5M
Potential Funding Sources:	LCRA, FEMA, County, local government
Lead Agency/Department Responsible:	LCRA, FEMA, County, local government
Implementation Schedule:	2010

2009 Analysis:
This action has not been completed and will be deferred for the 2009 Plan.

		Bastrop County (Past Action)-9
	Proposed Action:	**Develop a county-wide intra-jurisdictional emergency management plan**
	BACKGROUND INFORMATION	
	Site and Location:	County, multiple local jurisdictions
	History of Damages:	The plan would use all county resources as well as those of the cities of Elgin, Bastrop, and Smithville. Cooperation among county and city governments is essential.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Thunderstorm, Winter Storm, Tornado, Hurricane and Tropical Storm, Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Minimal, in existing budgets
Potential Funding Sources:	Smithville, Elgin, Bastrop, County
Lead Agency/Department Responsible:	County and cities of Elgin, Bastrop, and Smithville
Implementation Schedule:	2006

2009 Analysis:
This action has been completed. Bastrop County has an emergency management plan. The cities of Smithville and Elgin have joined in the plan. The City of Bastrop operates under its own plan and has signed a mutual aid agreement with Bastrop County

Bastrop County (Past Action)-10	
Proposed Action:	**Equip and maintain a county EOC** **Bastrop County mitigation goals to be implemented as and when resources are available:** **1. Develop a crisis management plan and curriculum for all schools, daycare services, nursing homes, hospitals, etc.;** **2. Establish a residential hazardous materials waste program;** **3. Work with the Red Cross to identify sheltering locations; and** 4. **Develop an LEPC.**
BACKGROUND INFORMATION	
Site and Location:	County
History of Damages:	At present, the EOC is at the Bastrop County Law Enforcement Center in Bastrop, but is not sufficiently equipped to accommodate staff who would use the facility during a disaster.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Tornado, Hurricane and Tropical Storm, Thunderstorm, Winter Storms, Wildfire
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Approximately $20K for equipment purchase and installation; maintenance costs are to be determined.
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Bastrop County
Implementation Schedule:	2010

2009 Analysis:
This action has not been completed and will be deferred for the 2009 Plan. Work upgrades are still needed for the EOC. This goal of developing a crisis management plan and curriculum for all schools, daycare services, nursing homes, hospitals will be deleted for the 2009 Plan. A residential hazardous materials waste program has been established, and Bastrop County partners with LCRA and CAPCOG to remove hazardous residential wastes. The County will defer the goal of working with the Red Cross to identify shelter hubs as this action has not been completed. The goal of developing an LEPC should be deleted.

		Bastrop County (Past Action)-11
	Proposed Action:	**Conduct a planning study to provide the basis for development of a capital plan to systematically address critical low water crossing locations within Bastrop County, and identify other flood prone roadway areas.**
	BACKGROUND INFORMATION	
	Site and Location:	County
	History of Damages:	Bastrop County has had several fatalities since 2000 due to vehicles driving into flood prone areas. The County has also experienced hundreds of successful rescues of citizens out of low water crossings and flood prone roadways which put public safety responders at increased risk. The Planning Study will provide the technical foundation for Bastrop County to take action to lessen the impact on the community from flooding. It will provide the basis for systematically addressing critical low water crossing locations and other flood prone roadway areas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$60,000
Potential Funding Sources:	State and Federal grants, local funding authorized and approved by the Bastrop County Commissioners Court, and as in-kind contributions.
Lead Agency/Department Responsible:	Bastrop County Floodplain Management
Implementation Schedule:	120 days after grant approval

2009 Analysis:
This action has not been completed and will be deferred for the 2009 Plan.

New Actions

		Bastrop County-1
	Proposed Action:	**Continue cooperative efforts with the U. S. Army Corp of Engineers, the Texas Water Development Board, and the Lower Colorado River Authority to develop a county-wide Flood Damage Reduction Feasibility Study over five phases. Information from the Study will be used to lessen the impact on the county from riverine and localized flooding of tributaries, creeks, and streams by developing base flood elevation data in unstudied areas, reviewing the feasibility of a buy-out program, installing more visible notices / barricades / gates in areas prone to flooding, improve drainage conditions, and recording high water marks following flood events.**
	BACKGROUND INFORMATION	
	Site and Location:	County-wide
	History of Damages:	According to USACE 2003 data: No. of structures in floodplain – 720 No. of homes in floodplain – 560 Estimated value of property in floodplain - $ 67,248,000 Population in floodplain – 1,550 Flood Claims (1979-2006) – 71 Dollar Amount of Claims – $ 1,523,163

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Flood damage
Priority (High, Moderate, Low):	High
Estimated Cost:	$ 6,039,000
Potential Funding Sources:	USACE, TWDB, and County General Fund
Lead Agency/Department Responsible:	Development Services
Implementation Schedule:	Five Phases over nine years

COMMENTS
Phase I has been completed, in process of Phase Ib. The estimated cost reflects budgeted amount for Phases II, III, and IV.

		Bastrop County-2
	Proposed Action:	**Implement a program to monitor and clear vegetation and debris from drains and culverts.**
	BACKGROUND INFORMATION	
	Site and Location:	County-wide
	History of Damages:	Homes located outside a Special Flood Hazard Area were flooded from storm water runoff.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Minimal
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Existing budget
Lead Agency/Department Responsible:	Developmental Services
Implementation Schedule:	Ongoing activity

COMMENTS
This action would be to develop procedures for monitoring, inspecting and maintaining existing drains and culverts to prevent damage from storm water runoff into homes and to prevent erosion and damage to County roads. Development of a maintenance plan would include identification likely areas for maintenance, and available workforce and equipment.

		Bastrop County-3
	Proposed Action:	**Increase public education about weather and other emergency events using local media.**
	BACKGROUND INFORMATION	
	Site and Location:	County-wide
	History of Damages:	The County is susceptible to a wide range of hazards and one of the most important activities identified by public surveys was the need to communicate severe weather events to the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storm, Tornado, Winter Storm, Flood, Hail, Thunderstorm
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Minimal
Potential Funding Sources:	Pre-printed materials, grants and general funding
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	Ongoing

COMMENTS
This is an ongoing action to utilize public meetings, bulletin boards, websites, local newspapers, radio and television to help education large portions of the county population on current weather conditions.

		Bastrop County-4
	Proposed Action:	**Develop an effective mitigation, response and recovery plan for wildfire in the urban wildland interfacial areas by building local capacity, enlisting support from the development community and citizens groups, identifying the more hazardous areas of the "fireplain" and implementing the goals and projects discussed in the Bastrop County Wildfire Protection Plan adopted by the Bastrop County Commissioner's Court in April, 2008.**
	BACKGROUND INFORMATION	
	Site and Location:	County-wide
	History of Damages:	The 2005-2006 fire seasons in Texas resulted in 19 deaths and $643 million in property damage. Well over one million acres burned during that siege. 85% of those fires broke out within two miles of a Texas community. Since January 1, 2008, over 7000 homes have been spared destruction from wildfire, a savings of some $675 million due to quick response and public and private prevention/mitigation efforts.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Damage by wildfire
Priority (High, Moderate, Low):	High
Estimated Cost:	> $150,000
Potential Funding Sources:	Grants, donations, general funds
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	ongoing

COMMENTS
This is an ongoing action.

		Bastrop County-5
	Proposed Action:	**Equip and maintain a county Emergency Operations Center (EOC).**
	BACKGROUND INFORMATION	
	Site and Location:	200 Jackson Street, Bastrop, Texas.(Bastrop County Law Enforcement Center)
	History of Damages:	N/A

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	Grants and Local match
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	Begin mid- 2009 and continue to completion.

COMMENTS
The County EOC is at the Bastrop County Law Enforcement Center and is not sufficiently equipped to accommodate staff who would use the facility during a disaster. The Bastrop County Emergency Management system includes the municipalities of Elgin and Smithville, a 2008 population estimate of approximately 70,000. The EOC staffing includes officials from those cities as well as 4 independent school systems, two hospitals, CERT, VIPS, several faith-based groups and various State agencies (TxDOT, DSHS, TFS, DPS and Red Cross)

		Bastrop County-6
	Proposed Action:	**Identify facilities and develop a county shelter plan to support both the regional Capital Area Shelter Hub Plan (CSAH-P) for coastal evacuations and local shelter needs for residents of Bastrop and surrounding counties.**
	BACKGROUND INFORMATION	
	Site and Location:	County-wide and within the cities of Bastrop, Elgin and Smithville.
	History of Damages:	The County has experienced damage from both natural and man-made hazards and needs to identify shelters to mitigate against loss of life and property of future hazard events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	unknown
Potential Funding Sources:	Grants, donations and local funding
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	On-going

COMMENTS
This item to include shelter inventory and typing, shelter management training, and pre-positioning required equipment. Shelter typing would include any event that might result in residents being displaced from their homes, which includes, but is not limited to: Flooding, Extreme Heat, Hurricane, Hazardous material release, Oil and gas pipeline failure, Tornados, Wildfire and Winter Storms

		Bastrop County-7
	Proposed Action:	**Inventory and map all area dams.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide dam sites
	History of Damages:	While the County has not experienced a dam failure, the potential impact could be great. Therefore it is necessary to inventory and map dams.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Dam Failure
Effect on new/existing buildings:	This action would mitigate against damage to existing structures within a dam inundation area and also prevent the development of new structures in high risk areas.
Priority (High, Moderate, Low):	Low
Estimated Cost:	Existing budget
Potential Funding Sources:	Grants/General Revenue
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Fall 2009

COMMENTS
There are conflicting resources regarding dams located in Bastrop County.

		Bastrop County-8
	Proposed Action:	**Upgrade low water crossing to include a cast in place multi (2) box culvert-bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Caldwell Road at Wet Weather Creek
	History of Damages:	Historically experiences flooding problems average of 4x yearly. On school bus route and only one entry/exit point for residences. Serious safety issue.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$36,790
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	As funding becomes available

COMMENTS

		Bastrop County-9
	Proposed Action:	**Upgrade low water crossing to include a cast in place multi (2) box culvert-bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Rianna Woods at Wet Weather Creek
	History of Damages:	Floods annually. On school bus route where alternative route to 17 homes is additional 10 minute drive during flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$36,790
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	As funding becomes available

COMMENTS

		Bastrop County-10
	Proposed Action:	**Upgrade low water crossing to include a cast in place multi (2) box culvert-bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Old Sayers Road at Big Sandy Creek
	History of Damages:	Floods avg. 6x/year. On school bus route serving 32 homes and businesses. Flooding poses serious safety concerns due to erosion and water running deep across the road. Residents must use alternate route during flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$61,400
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	As funding becomes available

COMMENTS

		Bastrop County-11
	Proposed Action:	**Upgrade low water crossing to include a cast in place multi (2) box culvert-bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Upper Elgin River Road at Cotton Creek A & B
	History of Damages:	Structurally insufficient culverts unable to handle floods that occur avg. 2/x year. Located on a school bus route. Traffic heavy in this growing part of the county

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$48,720
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	As funding becomes available

COMMENTS

		Bastrop County-12
	Proposed Action:	**Upgrade low water crossing to include a cast in place multi (1) box culvert-bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Kanapali Road at Wet Weather Creek
	History of Damages:	Structurally insufficient culverts unable to handle floods that occur avg. 4/x year. Located on a school bus route. Traffic heavy in this growing part of the county. Vehicles must use alternate route during flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$28,100
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	As funding becomes available

COMMENTS

		Bastrop County-13
	Proposed Action:	**Install 2 Concrete Multi-Box culverts (4 - 8x4 with wings) designed to 5-year flood standard**
	BACKGROUND INFORMATION	
	Site and Location:	Low-water crossing at Hofferek Road at Piney Creek Trib., Bastrop County
	History of Damages:	Gravel low water crossing flooding avg. 8x/year. Located on school bus route and must use alternate route during flooding. In 1998 vehicle lost in floodwaters at this location

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$48,720
Potential Funding Sources:	Grants/CIP Funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2011

COMMENTS

		Bastrop County-14
	Proposed Action:	**Ugrade low water crossing to include cast in place multi (4) box culvert-bridge.**
	BACKGROUND INFORMATION	
	Site and Location:	Antioch Road at Pin Oak Tributary “B”, Bastrop County
	History of Damages:	Historically experiences flooding problems 8x/year. On school bus route serving as one of two ingress/egress routes during flooding events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$61,400
Potential Funding Sources:	Grants/CIP Funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2013

COMMENTS

		Bastrop County-15
	Proposed Action:	**Upgrade existing culvert to include a cast in place multi(2) box culvert-bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Longhorn Trail at Creek Crossing
	History of Damages:	Structurally deficient culverts unable to handle floods that occur avg. 8/x year. Located on a school bus route s, No additional access during -2 and -5 year flooding events. Serious safety issue.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$36,790
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	As funding becomes available

COMMENTS

		Bastrop County-16
	Proposed Action:	**Upgrade gravel low water crossing to include cast in place multi (3) box culvert-bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Vyvjala Road at Barton Ck Draw, Bastrop County
	History of Damages:	Historically experiences flooding problems 8x/year. Access severely limited during flood event and alternate access also floods. On school bus route posing safety concerns.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$48,720
Potential Funding Sources:	Grants / CIP funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2011

COMMENTS

		Bastrop County-17
	Proposed Action:	**Upgrade structurally deficient wooden bridge to include a sixty foot span pier and beam bridge.**
	BACKGROUND INFORMATION	
	Site and Location:	Patterson Road at Bartons Creek
	History of Damages:	Bridge subject to flooding avg. 8x/year and unable to handle -8 to -10 foot rise in floodwaters that regularly occurs. Located on school bus route with severely limited access during flood event. Alternate route also floods.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$110,150
Potential Funding Sources:	Grants / CIP funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2014

COMMENTS

		Bastrop County-18
	Proposed Action:	**Upgrade low water crossing to include cast in place, multi (3) box culvert-bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Friendship Road at Turner Creek A & B, Bastrop County
	History of Damages:	Rural Rd. has two gravel low-water crossings which flood avg. 8/x year. On school bus route posing safety concerns.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$95,540
Potential Funding Sources:	Grants / CIP funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2015

COMMENTS

		Bastrop County-19
	Proposed Action:	**Upgrade to a forty-five span pier and beam bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Hall Road at Young's Branch
	History of Damages:	Structurally deficient low water crossing unable to handle floods that occur avgerage 8/x year. Only point of access during flooding for residents and vehicles.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$80,300
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	As funding becomes available

COMMENTS

		Bastrop County-20
	Proposed Action:	**Upgrade low water crossing to include cast in place, multi (4) box culvert-bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Low-water crossing at Gottier Trace at Gravelly Creek, Bastrop County
	History of Damages:	Historically experiences flooding problems 8x/year. On school bus route and only ingress/egress point during flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$61,400
Potential Funding Sources:	Grants/CIP funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2012

COMMENTS

		Bastrop County-21
	Proposed Action:	**Upgrade low water crossing to include cast in place, box culvert-bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Low-water crossing at Gottier Trace at Gravelly Creek, Bastrop County
	History of Damages:	Historically experiences flooding problems 6x/year. On school bus route and only ingress/egress point during flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$28,100
Potential Funding Sources:	Grants/CIP funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2012

COMMENTS

		Bastrop County-22
	Proposed Action:	**Upgrade low water crossing to include cast in place, box culvert-bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Pine Valley Loop at Wet Weather Creek
	History of Damages:	Insufficient culvert to handle flood waters. Flooding occurs avg. every 1-5 years. On school bus route with limited ingress/egress. Alternate route also floods.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$28,100
Potential Funding Sources:	Grants/CIP funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	As funding becomes available

COMMENTS

		Bastrop County-23
	Proposed Action:	**Upgrade low water crossing to include cast in place, multi (2) box culvert -bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Pine Canyon Drive at Wet Weather Creek
	History of Damages:	Insufficient culvert to handle flood waters. Flooding occurs avg. every 1-5 years. On school bus route with limited ingress/egress. Alternate route also floods

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$36,790
Potential Funding Sources:	Grants/CIP funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	As funding becomes available

COMMENTS

		Bastrop County-24
	Proposed Action:	**Upgrade low water crossing to include cast in place, box culvert -bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Meduna Rd. at Barton Oaks Draw 1
	History of Damages:	Insufficient culvert to handle flood waters. Safety issue.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$13,650
Potential Funding Sources:	Grants/CIP funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2011

COMMENTS

		Bastrop County-25
	Proposed Action:	**Upgrade low water crossing to include cast in place, box culvert -bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Meduna Rd. at Barton Oaks Draw 1
	History of Damages:	Insufficient culvert to handle flood waters. Safety issue.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$15,750
Potential Funding Sources:	Grants/CIP funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2011

COMMENTS

		Bastrop County-26
	Proposed Action:	**Upgrade 5' CMP to include cast in place, multi box (2) culvert -bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Paffen Road at Grassy Creek Draw
	History of Damages:	Insufficient culvert to handle flood waters. Safety issue.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$22,000
Potential Funding Sources:	Grants/CIP funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2015

COMMENTS

		Bastrop County-27
	Proposed Action:	**Upgrade low water crossing to include cast in place multi-box(2) culvert –bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Low-water crossing at O'Grady Road at Wet Weather Creek, Bastrop County
	History of Damages:	Historically floods 8x/year. On school bus route with no additional ingress/egress making it a serious safety issue.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$36,790
Potential Funding Sources:	Grants/CIP funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2012

COMMENTS

		Bastrop County-28
	Proposed Action:	**Upgrade low water crossing to include cast in place multi (2) box culvert-bridge**
	BACKGROUND INFORMATION	
	Site and Location:	Antioch Road at Pin Oak Creek "A"
	History of Damages:	Historically experiences flooding problems 8x/year. On school bus route serving as one of two ingress/egress routes during flooding events. Critical conditions during flooding. Vehicle lost in floodwaters at this site in 2004

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$36,790
Potential Funding Sources:	Grants/CIP funds
Lead Agency/Department Responsible:	Public Works/Engineering
Implementation Schedule:	2015

COMMENTS

City of Bastrop

Previous Actions & Analysis

City of Bastrop (Past Action)-1	
Proposed Action:	**Develop strategies and initiate activities to mitigate the effects of wildfire in areas where new development occurs in the City and its extraterritorial jurisdiction.**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	The City has authority to regulate, through subdivision standards, the manner and type development in a rapidly growing region, much of which is within what is known as the urban-wildland interface. The City should form cooperative partnerships with the Texas Forest Service and other agencies that have crafted guidelines and methods of fire wise management in the interface and adopt those methods into current development standards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	High
Estimated Cost:	Undetermined
Potential Funding Sources:	Grants, local funds, and cooperative partnerships
Lead Agency/Department Responsible:	Planning and Development
Implementation Schedule:	2011

2009 Analysis:
This action has not been completed and will be deferred for the 2009 Plan. Some work has been done on the Planning and Development Department. That department is now working on a zoning ordinance to require such planning in the development stages of any new subdivision.

City of Bastrop (Past Action)-2	
Proposed Action:	**Purchase communication and related equipment to provide a higher degree of interoperability between City forces and other regional jurisdictions within Bastrop County**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	Currently, City forces such as law enforcement, fire, medical and utility groups do not have the ability to communicate effectively with their counterparts in the cities of Elgin or Smithville, nor with the County of Bastrop and other agencies. This inability causes routine deficiencies in daily, routine events, and would be a significant shortfall in large scale, multijurisdictional episodes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane and Tropical Storm, Tornado, Hail, Thunderstorm, Drought, Extreme Heat, Wildfire, Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$150,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Bastrop Police Dept
Implementation Schedule:	2011

2009 Analysis:
This action has not been completed and will be deferred for the 2009 Plan. Approximately een used among several departments but the technology has already changed he City is now considering yet another upgrade with an estimated cost about $110,000.

City of Bastrop (Past Action)-3	
Proposed Action:	**Increase staffing capabilities to provide routine fire and safety inspections of certain occupancies. It is desirable to perform such inspections on all mass care or assembly occupancies at least annually and of all commercial and public facilities at least biannually**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	The Bastrop central business district has a proliferation of older historic buildings used for business, government and even downtown residential uses. Much of the area has been remodeled and face lifted. At present, local building codes are sufficient to assure adequate construction, but little mechanism is in place to conduct future compliancy inspections. Likewise, the City's West side is experiencing rapid growth of commercial uses as well as medical care facilities. Those properties should be given routine inspections as well.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	High
Estimated Cost:	$50,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Planning and Development
Implementation Schedule:	2011

2009 Analysis:
This action has not been completed and will be deferred for the 2009 Plan. Approximately een used among several departments but the technology has already changed he City is now considering yet another upgrade with an estimated cost about $110,000.

New Actions

		Bastrop-1
	Proposed Action:	**Conduct Piney Creek Drainage Improvements. Clean up new growth in natural drainage feature and resurface and & build new and existing drainage as a part of the natural creek.**
	BACKGROUND INFORMATION	
	Site and Location:	Piney Creek, North end of city.
	History of Damages:	Slow drainage and rain runoff has increased scope of floodplain since 1991.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Flood damage would be reduced and eliminated for existing structures and also any new buildings that are developed.
Priority (High, Moderate, Low):	High
Estimated Cost:	$4,000,000
Potential Funding Sources:	Municipal bonds and tax revenue
Lead Agency/Department Responsible:	Public Works in conjunction with the County
Implementation Schedule:	Started in 2007 finishing dependent on finance.

COMMENTS

		Bastrop-2
	Proposed Action	**Conduct Gills Branch Drainage improvements and cleanup of natural feature & manmade extensions.**
	BACKGROUND INFORMATION	
	Site and Location	Gills Branch. Existing creek that extends from Northeast side of city through to the south end into Colorado river. This is the main drainage for the east side of Bastrop.
	History of Damages:	Has caused flooding and slow drainage of 35% to 40% of the city. Flood pain has increased since the 1991 flood plain maps.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Has added 12 building into flood plain and hindered development.
Priority (High, Moderate, Low):	High
Estimated Cost:	$12,000,000
Potential Funding Sources:	Municipal bonds/tax revenue/Grants
Lead Agency/Department Responsible:	Public Works Dept.
Implementation Schedule:	Has started cleanup since 2004.

COMMENTS
Most needed but the most difficult due to cost constraints as well as land ownership issues.

		Bastrop-3
	Proposed Action:	**Conduct flood plain education for the public. Provide a computer with Flood plain information as well as Floodplain maps for the public access.**
	BACKGROUND INFORMATION	
	Site and Location:	Desk in the Library.
	History of Damages:	Flood and damage throughout the city and new residents unaware of problem areas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	For both new and existing buildings, flood prone areas can be better prepared.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$2500
Potential Funding Sources:	Tax revenue/ Public donations/Grant
Lead Agency/Department Responsible:	Library Dept.
Implementation Schedule:	2009-2010

COMMENTS

		Bastrop-4
	Proposed Action	**Replace existing old wooden poles with stronger, new, Electric metal poles and run all service from street to customer underground. Protect from down electric lines and loss of power.**
	BACKGROUND INFORMATION	
	Site and Location:	Electrical service area throughout the city.
	History of Damages:	2007 City experienced a strong wind storm that knocked out power for several days for many customers and all customers for several hours due to broken poles and broken tree limbs breaking power to the customers.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorms, Dam Failure, Hazardous Material Release, Pipeline Failure
Effect on new/existing buildings:	Loss of power to all homes and businesses
Priority (High, Moderate, Low):	High
Estimated Cost:	$3.2 Million
Potential Funding Sources:	Utility increase/grants/bonds
Lead Agency/Department Responsible:	Bastrop Power and Light.
Implementation Schedule:	Ongoing since 1999

COMMENTS

		Bastrop-5
	Proposed Action	**Create or retrofit existing structures to provide shelters for the public.**
	BACKGROUND INFORMATION	
	Site and Location:	Throughout the city, such as: City Hall, Convention Ctr., churches, schools, etc.
	History of Damages:	Numerous storms, fires, emergencies, storms, State evacuations.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Existing buildings would be modified for use for emergency evacuations.
Priority (High, Moderate, Low):	High
Estimated Cost:	$25,000 - $50,000
Potential Funding Sources:	Grants/tax revenues/donations
Lead Agency/Department Responsible:	All city Depts.
Implementation Schedule:	Ongoing since 2002

COMMENTS
The City would like to add an emergency generator for one designated building so that there would be one site for emergency care with power for persons with special needs and for emergency communications.

		Bastrop-6
	Proposed Action:	**Purchase portable pumps for emergency water and for waste.**
	BACKGROUND INFORMATION	
	Site and Location:	Wastewater Plant Yard in the City of Bastrop
	History of Damages:	During emergencies with damage we have lost water service and sewer removal. Portable emergency pumps are needed for health reason to provide water and waste service for the public during emergency situations.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	Could make many building habitable faster after a event.
Priority (High, Moderate, Low):	High
Estimated Cost:	$60,000
Potential Funding Sources:	Tax revenue/bonds/grants
Lead Agency/Department Responsible:	Water and Wastewater
Implementation Schedule:	Not scheduled but in future plans.

COMMENTS

		Bastrop-7
	Proposed Action:	**Purchase all-terrain vehicles.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City had emergency fires in 2009 and 2007, etc. where these vehicles were loaned for use and were found very helpful for emergency situations. The City has several areas where Gators or similar vehicles are indispensible during emergency events for transportation for hard to get to sites.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Severe Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Faster response for first and last responders.
Priority (High, Moderate, Low):	High
Estimated Cost:	$15,000
Potential Funding Sources:	Tax revenue/grants/bonds
Lead Agency/Department Responsible:	All depts..
Implementation Schedule:	One has been purchased two more required.

COMMENTS

		Bastrop-8
	Proposed Action:	**Obtain handouts to place in several areas for the public access. Buy shelving or slots for hand outs for public awareness campaigns**
	BACKGROUND INFORMATION	
	Site and Location:	Library, Planning and Development office, City Hall.
	History of Damages:	The results of public surveys indicated that a main concern of those who responded was the dissemination of hazard information to the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Help the public to help them be prepared in their buildings
Priority (High, Moderate, Low):	Low
Estimated Cost:	$250
Potential Funding Sources:	Tax revenue
Lead Agency/Department Responsible:	Police/P&D/Water and Wastewater
Implementation Schedule:	On going.

COMMENTS

City of Elgin

Previous Actions & Analysis

		City of Elgin (Past Action)-1
	Proposed Action:	**Undertake a review of the city's Floodplain Management Ordinance**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The City of Elgin has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met. With this action, a review of the City's floodplain management ordinance will be undertaken. Possible improvements will be considered to move beyond the minimum standards for development in the regulatory floodway

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Negligible
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Floodplain Manager
Implementation Schedule:	Complete in 2005, but ongoing activity

2009 Analysis:
This action has been completed, but also will be deferred as an ongoing activity.

City of Elgin (Past Action)-2	
Proposed Action:	**Conduct outreach to the public to educate citizens on the full range of hazards they face and how to protect themselves, their families and their businesses in disaster situations**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	An educated citizenry is one of the best methods of protection against disaster. Citizens need to know about the risks they face, how to prepare for disaster, and what to do should a disaster occur

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Thunderstorms, Winter Storms, Tornado, Hurricane and Tropical Storm, Wildfire, Drought
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Negligible
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Floodplain Manager
Implementation Schedule:	2011

2009 Analysis:
This action has not been completed and will be deferred for the 2009 Plan as this is an ongoing, public outreach activity.

New Actions

		Elgin-1
	Proposed Action:	**Conduct outreach to the public to educate citizens on a full range of hazards they face and how to protect themselves, their families and their businesses in disaster situations.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Elgin
	History of Damages:	The City has experienced a wide range of disasters and public surveys indicated that the highest concern was for more information regarding severe weather.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	On-going

COMMENTS
An educated citizenry is one of the best methods of protection against disaster. Citizens need to know about the risks they face, how to prepare for disaster and what to do should a disaster occur.

		Elgin-2
	Proposed Action:	**Identify facilities and develop a county shelter plan to support both the regional Capital Area Shelter Hub Plan (CSAH-P) for coastal evacuations and local shelter needs for residents of Bastrop and surrounding counties.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Elgin
	History of Damages:	The City is susceptible to both natural and man-made hazards. Therefore it's necessary to identify sheltering opportunities for citizens.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	unknown
Potential Funding Sources:	Grants, donations and local funding
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	On-going

COMMENTS
This item to include shelter inventory and typing, shelter management training, and pre-positioning required equipment.

City of Smithville

Previous Actions & Analysis

		City of Smithville (Past Action)-1
	Proposed Action:	**Track and record high water marks following a flood**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Smithville has several homes located outside the designated Special Flood Hazard Area that have suffered damage from stormwater runoff due to flooding in past years.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Minimal
Potential Funding Sources:	General Revenue, Grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	2011

2009 Analysis:
This action has not been completed and will be deferred in the 2009 Plan as this is an ongoing action

		City of Smithville (Past Action)-2
	Proposed Action:	**Increase rating and participate in the NFIP Community Rating System (CRS)**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The City of Smithville has participated in the National Flood Insurance Program since 1979 and continues to upgrade it floodplain management program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Minimal
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	2011

2009 Analysis:
This action will be deleted

		City of Smithville (Past Action)-3
	Proposed Action:	**Implement maintenance program for clearing debris from drains and culverts**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The City of Smithville has several homes outside Special Flood Hazards Areas that suffered damage from stormwater runoff. The City Council is trying to develop a plan of procedure for tracking and conducting inspections and maintenance of existing drains and culverts.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	Salary of one office staff person. An existing Public Works employee would be assigned the inspections and maintenance work. Existing Public Works equipment would be used in the beginning stage of the project.
Potential Funding Sources:	Grants, general revenue
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	2011

2009 Analysis:
This action has not been completed and will be deferred for the 2009 Plan as this is an ongoing, public outreach activity.

New Actions

		Smithville-1
	Proposed Action:	**Track and record high water marks following a flood**
	BACKGROUND INFORMATION	
	Site and Location:	City of Smithville
	History of Damages:	The City of Smithville is particularly susceptible to flooding and experienced rising floodwaters in the summer of 2007 due to an extended period of rains.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Minimal
Potential Funding Sources:	Existing Budget
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	Ongoing

COMMENTS
This is a continued action from the 2004 Mitigation Plan. Activities would include city representatives gathering flood level information during and after a flood event, and developing a process for maintaining the records. This information would be provided to the public and city staff for risk mitigation strategies for these areas.

		Smithville-2
	Proposed Action:	**Implement maintenance program for clearing debris from drains and culverts**
	BACKGROUND INFORMATION	
	Site and Location:	City of Smithville
	History of Damages:	Structures and residences are damaged from floodwaters when debris in culverts prevents proper drainage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Minimal
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$15,000 annually
Potential Funding Sources:	Existing budget
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	Ongoing/annually

COMMENTS
This action would be to develop procedures for monitoring, inspecting and maintaining existing drains and culverts to prevent damage from storm water runoff into homes and to prevent erosion and damage to roads. Development of a maintenance plan would include identification likely areas for maintenance, and available workforce and equipment

		Smithville-3
	Proposed Action:	**Identify facilities and develop a county shelter plan to support both the regional Capital Area Shelter Hub Plan (CSAH-P) for coastal evacuations and local shelter needs for residents of Bastrop and surrounding counties.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Smithville
	History of Damages:	The City is susceptible to both natural and man-made hazards. Therefore it's necessary to identify sheltering opportunities for citizens.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane & Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	unknown
Potential Funding Sources:	Grants, donations and local funding
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	On-going

COMMENTS
This item to include shelter inventory and typing, shelter management training, and pre-positioning required equipment.

Lee County

Previous Actions & Analysis

Not applicable as Lee County is a new community (See Table 1-2)

New Actions

		Lee County-1
	Proposed Action:	**Develop a water/power/supplies crisis response plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	On average a year long drought/excessive takes place every 3 years. A major drought takes place every 20 years. The drought in 1996 caused 80K in property damage and 160K in crop damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Effect on new/existing buildings:	Helps mitigate damage caused by Drought / excessive heat.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-2
	Proposed Action:	**Educate the public on extreme heat/drought safety and health issues.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	On average a year long drought/excessive takes place every 3 years. A major drought takes place every 20 years. The drought in 1996 caused 80K in property damage and 160K in crop damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought , Extreme Heat
Effect on new/existing buildings:	Helps mitigate damage caused by Drought / excessive heat.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-3
	Proposed Action:	**Identify sites where stream and rain gages need to be added or upgraded and coordinate installation requests with USGS and River Authority.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	In the past ten years Lee County has experienced 20 flood events with a total of 10 injuries, $140K in crop damage and $281K in property damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm
Effect on new/existing buildings:	Helps mitigate damage caused by Flooding.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-4
	Proposed Action:	**Implement or expand rainfall observer program, utilizing volunteers and encourage participation in National Weather Service CoCoRahs program.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	In the past ten years Lee County has experienced 20 flood events with a total of 10 injuries, $140K in crop damage and $281K in property damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hail, Winter Storm
Effect on new/existing buildings:	Helps mitigate damage caused by Flooding.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-5
	Proposed Action:	**Track and record high water marks following a flood.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	In the past ten years Lee County has experienced 20 flood events with a total of 10 injuries, $140K in crop damage and $281K in property damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Helps mitigate damage caused by Flooding.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-6
	Proposed Action:	**Arrange hazmat training for local emergency responders from major transportation companies (like railroads).**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	In the past 25 years, Lee County has experienced very few hazardous material spills Of these spills, generally all have been gasoline spills from one or two car wrecks. Potential dollar loss estimates for hazardous material incidents are not available.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release, Pipeline Failure
Effect on new/existing buildings:	Helps mitigate damage caused by Hazmat/Pipeline spill.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-7
	Proposed Action:	**Develop and maintain a basic emergency management plan that complies with State planning standards. Use LEPCs and annual community report from TRC/DEM.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	In the past 25 years, Lee County has experienced very few hazardous material spills Of these spills, generally all have been gasoline spills from one or two car wrecks. Potential dollar loss estimates for hazardous material incidents are not available.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release, Pipeline Failure
Effect on new/existing buildings:	Helps mitigate damage caused by Hazmat/Pipeline spill.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-8
	Proposed Action:	**Educate the public about hazardous materials and household hazardous waste.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	In the past 25 years, Lee County has experienced very few hazardous material spills Of these spills, generally all have been gasoline spills from one or two car wrecks. Potential dollar loss estimates for hazardous material incidents are not available.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release, Pipeline Failure
Effect on new/existing buildings:	Helps mitigate damage caused by Hazmat/Pipeline spill.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-9
	Proposed Action:	**Educate the public about hazmat: safety risks, detecting an accident, responding to an accident, evacuation, and shelter-in-place training.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	In the past 25 years, Lee County has experienced very few hazardous material spills Of these spills, generally all have been gasoline spills from one or two car wrecks. Potential dollar loss estimates for hazardous material incidents are not available.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release, Pipeline Failure, Terrorism
Effect on new/existing buildings:	Helps mitigate damage caused by Hazmat/Pipeline spill.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-10
	Proposed Action:	**Improve local warning system.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	Lee County has been affected in the past by Hazmat/Pipeline spills, and has received damage from Tornadoes/Wind, Flooding, Wildland Fires, Hail Storms, and Drought/Heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Pipeline Failure, Hazardous Materials Release Tornado, Flood, Wildfire, Hail, Thunderstorm, Drought, Extreme Heat
Effect on new/existing buildings:	Helps mitigate damage caused by natural and manmade disasters.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$1,000 - $5,000
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Commissioners Court
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-11
	Proposed Action:	**Enhance communications within Lee County among our first responders.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	Lee County has been affected in the past by Hazmat/Pipeline spills, and has received damage from Tornadoes/Wind, Flooding, Wildland Fires, Hail Storms, and Drought/Heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Pipeline Failure, Hazardous Materials Release Tornado, Flood, Wildfire, Hail, Thunderstorm, Drought, Extreme Heat
Effect on new/existing buildings:	Helps mitigate damage caused by natural and manmade disasters.
Priority (High, Moderate, Low):	High
Estimated Cost:	More than $100,000
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-12
	Proposed Action:	**Develop a disaster recovery plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	Lee County has been affected in the past by natural and man-made hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Pipeline Failure, Hazardous Materials Release Tornado, Flood, Wildfire, Hail, Thunderstorm, Drought, Extreme Heat
Effect on new/existing buildings:	Helps mitigate damage caused by natural and manmade disasters.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-13
	Proposed Action:	**Develop evacuation plans, policies and procedures for the full range of emergencies and disasters in the community.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	Lee County has been affected in the past by Hazmat/Pipeline spills, and has received damage from Tornadoes/Wind, Flooding, Wildland Fires, Hail Storms, and Drought/Heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Pipeline Failure, Hazardous Materials Release Tornado, Flood, Wildfire, Hail, Thunderstorm, Drought, Extreme Heat
Effect on new/existing buildings:	Helps mitigate damage caused by natural and manmade disasters.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-14
	Proposed Action:	**Implement and promote a multi-hazard awareness program consisting of but not limited to a speaker's bureau for disaster related topics that focus on Mitigation, preparedness and response and a mitigation library or hazard information center for use by local residents and schools.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	Lee County has been affected in the past by Hazmat/Pipeline spills, and has received damage from Tornadoes/Wind, Flooding, Wildland Fires, Hail Storms, and Drought/Heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Pipeline Failure, Hazardous Materials Release Tornado, Flood, Wildfire, Hail, Thunderstorm, Drought, Extreme Heat
Effect on new/existing buildings:	Helps mitigate damage caused by natural and manmade disasters.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-15
	Proposed Action:	**Promote safety campaigns to educate the public on what to do in the event of a tornado.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	Lee county has an average of 5-6 tornadoes every ten years. In the past 54 years Lee County has reported $30k in crop damage and $3.6M in property damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Effect on new/existing buildings:	Helps mitigate damage caused by Tornados.
Priority (High, Moderate, Low):	Low
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-16
	Proposed Action:	**Conduct public education program on fire risks and wildland fire mitigation, with the assistance of the Texas Forest Service.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	Approximately 22 wildland fire events have been reported in the past 11 years. No information is available on the property and crop loss by wildfires. Approximately 12.18 acres are damaged in every wildland fire.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Helps mitigate damage caused by Wildland Fires.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

		Lee County-17
	Proposed Action:	**Create a wildfire recovery plan, including soil erosion control, vegetative recovery.**
	BACKGROUND INFORMATION	
	Site and Location:	Lee County, TX
	History of Damages:	Approximately 22 wildland fire events have been reported in the past 11 years. No information is available on the property and crop loss by wildfires. Approximately 12.18 acres are damaged in every wildland fire.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Helps mitigate damage caused by Wildland Fires.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Lee County Office of Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

City of Giddings

Previous Actions & Analysis

Not applicable as Giddings is a new community (See Table 1-2)

New Actions

		Giddings-1
	Proposed Action:	**Develop and maintain a basic emergency management plan that complies with State planning standards**
	BACKGROUND INFORMATION	
	Site and Location:	City of Giddings
	History of Damages:	The City of Giddings is currently without an adequate emergency management plan needed to address both natural and man-made hazards

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	The Plan would increase the standards for building codes thereby effectively mitigating against natural and man-made hazards
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000-$5,000
Potential Funding Sources:	Existing Budget
Lead Agency/Department Responsible:	Law Enforcement, Fire Department, Public Utilities
Implementation Schedule:	Within the Fiscal budget year and updated as needed

COMMENTS

		Giddings-2
	Proposed Action:	**Arrange for Severe Weather Awareness training for local emergency responders, including roadway and railway release incidents.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Giddings
	History of Damages:	The City of Giddings needs to implement training to address both natural and man-made hazards

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane & Tropical Storm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000-$5,000
Potential Funding Sources:	Existing Budget
Lead Agency/Department Responsible:	Law Enforcement, Fire Department, Public Utilities
Implementation Schedule:	Within the Fiscal budget year and updated as needed

COMMENTS

		Giddings-3
	Proposed Action:	**Implement an early warning system and resource plan for Hazardous Material Release.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Giddings
	History of Damages:	The City of Giddings is at risk for a hazardous materials release due to the location of fixed and mobile sites throughout the City.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000-$5,000
Potential Funding Sources:	Existing Budget/Grants
Lead Agency/Department Responsible:	Law Enforcement, Fire Department, Public Utilities
Implementation Schedule:	Within the Fiscal budget year and updated as needed

COMMENTS

		Giddings-4
	Proposed Action:	**Develop and enforce a plan for implementing mandatory water rationing**
	BACKGROUND INFORMATION	
	Site and Location:	City of Giddings
	History of Damages:	The City of Giddings experiences mild to severe drought as well as extreme heat during the summer months.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5,000-$10,000
Potential Funding Sources:	Existing Budget / Grants
Lead Agency/Department Responsible:	Public Utilities
Implementation Schedule:	Within the Fiscal budget year and updated as needed

COMMENTS

		Giddings-5
	Proposed Action:	**Impose excess-use charges during times of water restriction/rationing**
	BACKGROUND INFORMATION	
	Site and Location:	City of Giddings
	History of Damages:	The City of Giddings experiences mild to severe drought as well as extreme heat during the summer months.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5,000-$10,000
Potential Funding Sources:	Existing Budget / Grants
Lead Agency/Department Responsible:	Public Utilities
Implementation Schedule:	Within the Fiscal budget year and updated as needed

COMMENTS

		Giddings-6
	Proposed Action:	**Adopt an emergency water allocation strategy to be implemented during the summer months.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Giddings
	History of Damages:	The City of Giddings experiences mild to severe drought as well as extreme heat during the summer months.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5,000-$10,000
Potential Funding Sources:	Existing Budget / Grants
Lead Agency/Department Responsible:	Public Utilities
Implementation Schedule:	Within the Fiscal budget year and updated as needed each summer.

COMMENTS

City of Lexington

Previous Actions & Analysis

Not applicable as Lexington is a new community (See Table 1-2)

New Actions

		Lexington-1
	Proposed Action:	**Develop a Fire Mitigation Plan with the goal of:** • **Emphasizing prevention of city property interface fires using a proactive, cooperative approach;** • **Ensuring land development ordinances and building codes support mitigation efforts;** • **Promoting effective fuel reduction programs in the City and surrounding areas; and** • **Promoting the development of water resources for firefighting within the City.** • **Establishing at least one full time position**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has a lot of areas of brush that can easily get out of control with a wildfire event. In 2009 a field on FM 1624 caught fire threatening several homes and lives.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	This would enhance standards for new buildings while also protecting existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000-$10,000
Potential Funding Sources:	General Revenue and Grants
Lead Agency/Department Responsible:	Fire and Police Department
Implementation Schedule:	One year after receipt of funding

COMMENTS
The Fire Department does not have any paid positions, only volunteer. As part of the Fire Mitigation Plan, it would be necessary to have at least one full-time, paid position to monitor calls and respond.

		Lexington-2
	Proposed Action:	**Facilitate a City and County-wide mutual aid agreement for response to hazards and examine the current agreements with the county to assess the need to expand or update, including coordinating with local, state and federal agencies**.
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City of Lexington is a small community that is susceptible to both natural and man-made hazards. Assistance from the County will most likely be necessary if a large-scale hazard event were to occur.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane & Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	This would enhance standards for new buildings while also protecting existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	Negligible
Potential Funding Sources:	City Budget
Lead Agency/Department Responsible:	Fire and Police Department
Implementation Schedule:	Draft by 2011 with periodic, yearly review

COMMENTS

		Lexington-3
	Proposed Action:	**Produce and distribute functional maps of the City and surrounding area for response to fire threats, and work with the EMC to produce maps for emergency management**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has a lot of areas of brush that can easily get out of control with a wildfire event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	This would enhance standards for new buildings while also protecting existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000
Potential Funding Sources:	City Budget & Grant funding where necessary
Lead Agency/Department Responsible:	Fire and Police Department
Implementation Schedule:	Annually or as needed when maps are updated

COMMENTS

		Lexington-4
	Proposed Action:	**Improve the technical capability and provide training classes for the Lexington Police, Fire Department and Public Works to ensure that personnel will work closely together in the event of a natural or man-made disaster. Offer more FEMA in-service training on table top discussions and encourage rural districts to become familiar with the City of Lexington.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City of Lexington is a small community that is susceptible to both natural and man-made hazards. Therefore it is imperative that the community departments work together to effectively mitigate risks

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	This would enhance standards for new buildings while also protecting existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	Negligible
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Fire and Police Department and Public Works
Implementation Schedule:	Ongoing activity

COMMENTS
The purpose behind this action is to work together to protect the most vulnerable populations, buildings and critical facilities through the implementation of cost-effective and technically feasible techniques.

		Lexington-5
	Proposed Action:	**Institute a working group to include local officials and the County to develop and adopt a first response group to fires and evaluate water supply issues in terms of both fixed and mobile supplies.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City of Lexington is a small community that is susceptible to both natural and man-made hazards. Assistance from the County will most likely be necessary if a large-scale hazard event were to occur.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire, Extreme Heat
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	City Budget
Lead Agency/Department Responsible:	Fire, Police, EMS, and Public Works
Implementation Schedule:	Ongoing

COMMENTS

		Lexington-6
	Proposed Action:	**Enforce the current State building codes and enhance the local code to increase wind resistance for structures.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Most buildings and structures within town are built to the latest code standards. No severe structural damage has been reported thus far as the majority of buildings can withstand the impact of minor storms and hazard events. However, not all structures are built to withstand a high hazard event. In addition downed trees and power lines resulting from thunderstorms or tornados affect both buildings and citizens.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Hurricane and Tropical Storm, Thunderstorm, Tornado, Terrorism
Effect on new/existing buildings:	This would enhance standards for new buildings while also protecting existing structures
Priority (High, Moderate, Low):	Low
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Fire and Police Department and Public Works
Implementation Schedule:	To be implemented yearly after receipt of funding

COMMENTS
In the event that there is a high-scale hazard tornado, thunderstorm, hurricane or terrorism event, the Ministerial Alliance has agreed to assist the citizens of Lexington.

		Lexington-7
	Proposed Action:	**Increase public awareness of natural and man-made hazards through brochures, print, media and school events. Encourage individual responsibility and provide examples of actions citizens can undertake to make their homes and lives more disaster resistant.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City of Lexington is susceptible to both natural and man-made hazards. While the City has not experienced a massive hazard event, it's imperative that citizens are well informed of the risks that exist as well as opportunities to mitigate against those risks.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane, Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	This would strengthen residences.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000-$5,000 annually depending on advertising and printing costs.
Potential Funding Sources:	General revenue and Grants
Lead Agency/Department Responsible:	Fire and Police Department and Public Works
Implementation Schedule:	Ongoing activity

Travis County

There are no actions listed for Travis County, only the communities therein as the County is not participating in the Update.

Village of Briarcliff

Previous Actions & Analysis

Not applicable: Briarcliff is a new community (See Table 1-2)

New Actions

		Briarcliff-1
	Proposed Action:	**Purchase a standby generator for the wastewater treatment plant.**
	BACKGROUND INFORMATION	
	Site and Location:	Wastewater Treatment Plant, located at 1601 Judy Lyn Dr , Briarcliff, TX
	History of Damages:	The lift station overflows in a hazard event such as flooding or severe thunderstorms. A standby generator is needed to prevent overflow

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$25,000
Potential Funding Sources:	City funds / Grants
Lead Agency/Department Responsible:	City Management
Implementation Schedule:	2010-2011

COMMENTS

		Briarcliff-2
	Proposed Action:	**Purchase NOAA weather radios**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	NOAA Weather Radio is a nationwide network of radio stations broadcasting continuous weather information direct from a nearly National Weather Service office. NOAA Weather Radios are a single source for the most comprehensive weather and emergency information available to the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Winter Storms, Hail, Tornado, Hurricane and Tropical Storm
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100.00 per unit
Potential Funding Sources:	City Budget & Grants
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	Purchase by the end of 2010

COMMENTS

		Briarcliff-3
	Proposed Action:	**Install flood gauges for low water crossings**
	BACKGROUND INFORMATION	
	Site and Location:	Low water crossings throughout the city, including Briarcliff Drive
	History of Damages:	In flooding or thunderstorm events, low water crossings are inundated with floodwaters, damaging property and potentially endangering lives.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Knowing the inundation levels would better protect existing property and also prevent the development of new structures in high hazard areas.
Priority (High, Moderate, Low):	Low
Estimated Cost:	$500.00 per gauge
Potential Funding Sources:	City Budget & Grants
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	2010-2011

COMMENTS

City of Jonestown

Previous Actions & Analysis

Not applicable: Jonestown is a new community (See Table 1-2)

New Actions

		JT-1
	Proposed Action:	**Acquisition of property located in the Floodway on Sandy Creek, Pecan Park area**
	BACKGROUND INFORMATION	
	Site and Location:	11803, 11813,11815,11817 and 11819 Pecan Drive adjacent to Sandy Creek.
	History of Damages:	Properties owned by individuals are 35-75% within the floodway . One property has a SFR. Creek has been in flood status more than 5 times in the last 10 years with swift and rapid water with little to no warning to those who live in the area.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane and Tropical Storm
Effect on new/existing buildings:	Removal of existing structure, creating public parkland.
Priority (High, Moderate, Low):	High
Estimated Cost:	$75,000
Potential Funding Sources:	State grants, LCRA grants, parkland development fees
Lead Agency/Department Responsible:	Inspection Services
Implementation Schedule:	2009-2010

COMMENTS
Properties listed are also with the 100 year floodplain of Lake Travis.

		JT-2
	Proposed Action:	**Engineer study of storm water run-off for the incorporated limits of the City**.
	BACKGROUND INFORMATION	
	Site and Location:	City of Jonestown
	History of Damages:	Pre- mitigation planning

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane and Tropical Storm
Effect on new/existing buildings:	Prevent future loss and damage to existing properties as the City develops.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	75,000-150,000
Potential Funding Sources:	Developer impact fees, other grants
Lead Agency/Department Responsible:	City Engineer
Implementation Schedule:	As funds are available

COMMENTS
The City is growing from a mostly rural to a more urban setting with a steady increase of more structures being built. Current regulations address new subdivisions, with the greatest risk for the older areas of the City, where there is only the natural drainage that occurs in this hilly terrain. As more properties are developed, the potential of rapid run-off of water becomes a potential hazard to life and property.

		JT-3
	Proposed Action:	**Install operational warning signs / gates at low water crossings.**
	BACKGROUND INFORMATION	
	Site and Location:	Reed Park Road (2), Cross St, Pecan Drive, Lakeside Dr.
	History of Damages:	Areas have water crossing public roadways during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane and Tropical Storm
Effect on new/existing buildings:	The gates would better protect existing property and also prevent the development of new structures in high hazard areas.
Priority (High, Moderate, Low):	High
Estimated Cost:	75,000
Potential Funding Sources:	Impact fees, State grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	As funds are available

COMMENTS
Multiple areas of the city have low water crossings that are only marked with a water measure and an unlit sign. Installation of flashing light or gates will help prevent the loss of life and property in dangerous flood events.

		JT-4
	Proposed Action:	**Acquisition of property located in the floodplain of Lake Travis, Cross Street area.**
	BACKGROUND INFORMATION	
	Site and Location:	Properties on the lower (lake) side of Cross Street.
	History of Damages:	Area is located 20- 35 feet below the BFE of Lake Travis and has flooded more than 3 times in the last 10 years.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane and Tropical Storm
Effect on new/existing buildings:	Removal of existing structures, prevention of future development.
Priority (High, Moderate, Low):	High
Estimated Cost:	1 M
Potential Funding Sources:	State grants, parkland development grants, in kind donations
Lead Agency/Department Responsible:	Inspection service
Implementation Schedule:	As funding is available

COMMENTS
This area has a history of flooding due to the low elevations and being in the floodplain of Lake Travis. Current regulations prohibit the property owners from building or developing the properties.

		JT-5
	Proposed Action:	**Educate the public on extreme heat/drought safety and health issues.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Jonestown
	History of Damages:	It has been shown, the major loss of life can be caused by individuals exposed to extreme heat and the associated problems caused to the human body. This is of particular concern to the elderly and young infants exposed to heat, such as in an automobile, or home with no cooling method.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000 for a public awareness program for the city
Potential Funding Sources:	State or federal grants
Lead Agency/Department Responsible:	Mayor and City Council Members
Implementation Schedule:	Ongoing

COMMENTS

		JT-6
	Proposed Action:	**Implement a floodplain early warning system and local response plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Property affected by the LCRA floodplain within the City of Jonestown
	History of Damages:	When Lake Travis rises, the amount of increase is fairly small to effect property along the lake front. Some of the structures have already been damaged by earlier floods and the increasing water levels, put citizens at risk of loss.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane and Tropical Storm
Effect on new/existing buildings:	Significant to existing and structure effected by the increase to the LCRA floodplain criteria
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000 - $15,000
Potential Funding Sources:	State and federal grants
Lead Agency/Department Responsible:	City of Jonestown PD and Public Works Dept
Implementation Schedule:	As soon as funded

COMMENTS

		JT-7
	Proposed Action:	**Implement and promote a multi-hazard public awareness program**
	BACKGROUND INFORMATION	
	Site and Location:	City of Jonestown
	History of Damages:	Many citizens are not aware of the many potential hazards to which they can be exposed. They know the obvious items, such as flood or fire, but have little awareness for others, such as hazardous material spill, the effect of heat, or extreme cold.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Hazardous Materials Release, Dam Failure, Pipeline Failure, Thunderstorm, Winter Storm, Hurricane and Tropical Storm, Terrorism, Tornado
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Minimal. Possible costs of advertising
Potential Funding Sources:	City budget or public service announcement
Lead Agency/Department Responsible:	City staff
Implementation Schedule:	On-going

COMMENTS

		JT-8
	Proposed Action:	**Enhance code enforcement and inspection services.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Jonestown
	History of Damages:	The city has an effective code enforcement program, but is limited by the amount of time one person can devote being on the city streets. With funding for an additional person, we could enhance the ability to focus on very specific problem areas and code issues.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Wildfire, Drought, Extreme Heat, Hazardous Materials Release, Dam Failure, Pipeline Failure, Winter Storm, Thunderstorm, Hurricane and Tropical Storm, Terrorism, Tornado
Effect on new/existing buildings:	Existing structures could be effected by code issues and focused enforcement policy
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Part-time additional person ~ $15K - $20K
Potential Funding Sources:	State or federal grant
Lead Agency/Department Responsible:	Building Department
Implementation Schedule:	As funds become available

COMMENTS

		JT-9
	Proposed Action:	**Advertise and promote the availability of flood insurance, even for property not normally effected by past flood levels**
	BACKGROUND INFORMATION	
	Site and Location:	City of Jonestown
	History of Damages:	Many homeowners assume they cannot obtain, nor do they need, flood insurance, unless their property is located in the floodplain. They can be effected by water damage, even if, they are not located in the floodplain area

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Minimal cost to obtain flood insurance, if your property is not located in the existing floodplain. Also this would better protect existing properties.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Cost to homeowner, minimal to advertise by the city
Potential Funding Sources:	City budget or grant funds
Lead Agency/Department Responsible:	Financial Planning for the city
Implementation Schedule:	To Be Determined by interest

COMMENTS

		JT-10
	Proposed Action:	**Implement a voluntary buyout program for repetitive flood properties along Lakeside Dr.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Jonestown property located in the existing floodplain on Lakeside Dr.
	History of Damages:	When Lake Travis rises due to weather, there are known properties that will always be flooded. Many are approaching the maximum limit to allow rebuilding and those properties should be the first to be involved in a buyout program

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane and Tropical Storm
Effect on new/existing buildings:	Effect would be on existing structures to mitigate damage due to flood and also prevent development of new structures in the floodplain
Priority (High, Moderate, Low):	High
Estimated Cost:	$100K - $500K
Potential Funding Sources:	Grant funds, impact fees
Lead Agency/Department Responsible:	Building Department
Implementation Schedule:	As funds become available to do program

COMMENTS
18 homes in this location along Lakeside Dr. 2 houses have repetitive loss at this time. However, with the BFE of Lake Travis increased by additional 6 feet, the chances of more suffering loss, has been dramatically increase.

		JT-11
	Proposed Action:	**Identify repetitive loss properties for future Hazard Mitigation Grant Program funding.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Jonestown properties located within the specified floodplain boundaries
	History of Damages:	There many properties that will always be effected by flood waters from Lake Travis. They have been repeated flooded and represent potential loss of life and property destruction.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Existing properties would be effected
Priority (High, Moderate, Low):	High
Estimated Cost:	$100K - $500K
Potential Funding Sources:	Grant funding
Lead Agency/Department Responsible:	Building Department
Implementation Schedule:	As funding is available

COMMENTS

		JT-12
	Proposed Action:	**Prohibit granting of variances for development in floodplains**.
	BACKGROUND INFORMATION	
	Site and Location:	Property located in the specified floodplain within the city limits of Jonestown
	History of Damages:	As a matter of practice, the City does not allow development in the existing floodplain. The easiest method is to stop any variance request at the P & Z Board level.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	New building would be effected by preventing development in high hazard areas.
Priority (High, Moderate, Low):	High
Estimated Cost:	$0. Action by City Council & P & Z Board
Potential Funding Sources:	None needed
Lead Agency/Department Responsible:	Jonestown City Council and City Manager
Implementation Schedule:	As soon as possible. Part of Mitigation program

COMMENTS

		JT-13
	Proposed Action:	**Develop a land use study for acquiring, reusing and preserving open spaces within floodplain/floodway areas.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Jonestown properties located in or next to existing floodplain locations.
	History of Damages:	The City should development an on-going strategy to acquire floodplain properties and adjacent property to minimize the potential for loss of life or continued property damage by floods. It would be possible to plan a use by the City that would not be effected by flood damage and potentially generate revenue to the City.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Could affect both new and existing buildings by protecting existing properties from flood, but also preventing new structures from damage.
Priority (High, Moderate, Low):	High
Estimated Cost:	$100K - $200K
Potential Funding Sources:	Grant funding
Lead Agency/Department Responsible:	Building Department
Implementation Schedule:	As funds are made available

COMMENTS

City of Lago Vista

Previous Actions & Analysis

		City of Lago Vista (Past Action)-1
	Proposed Action:	**Install backup generators**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Most city water and sewer facilities have adequate backup generators to operate during a power outage. The airport, however, does not have an emergency power source to operate lights, beacons, and the landing system. A few other facilities also need a backup generator.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storm, Flood, Thunderstorm, Tornado
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$250,000
Potential Funding Sources:	General funds, bonds, utility funds
Lead Agency/Department Responsible:	Public Works and Airport
Implementation Schedule:	2013

2009 Analysis:
This action is partially complete and therefore deferred. The City Hall wastewater lift stations, water treatment facilities, and future lift stations and water and wastewater treatment will need generators.

		City of Lago Vista (Past Action)-2
	Proposed Action:	**Conduct a drainage study and disseminate study results.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The city is only 15 percent built out. As new homes and businesses locate in Lago Vista, it is apparent that drainage will be an increasing problem. Area topography does not lend itself to an easy solution and the layout of lots and streets exacerbates the problem

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$200,000-$500,000
Potential Funding Sources:	Bonds
Lead Agency/Department Responsible:	Building Services, Public Works
Implementation Schedule:	2014

2009 Analysis:
This action has yet to be completed and will be deferred for the 2009 Plan. Phase 1 of 1/3 of city study to be competed in one month. Future study and construction and lot purchase proposed within next 5 years.

		City of Lago Vista (Past Action)-3
	Proposed Action:	**Develop a mass debris removal plan**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The city has not had an event that created a great amount of debris. Brush cleanups are done twice a year and a controlled burn gets rid of that material. There is no plan, however, to collect and dispose of building materials, couches, rugs, and other large debris that would be created by a flood, fire, or tornado. A plan would enable the city to preplan with solid waste contractors alternative actions and locations for solid waste disposal in the event of a disaster, and would allow timely information to the public about what to do about debris.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$500
Potential Funding Sources:	General fund, utility fund
Lead Agency/Department Responsible:	Building Services, Public Works
Implementation Schedule:	2006

2009 Analysis:
This action has been completed. Developers have removed most of the debris on vacant land from previous floods.

		City of Lago Vista (Past Action)-4
	Proposed Action:	**Install outdoor sirens**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The city has a low-frequency radio station used for warning announcements as needed and weather and public service announcements at other times. A siren system would enable the city to gain the attention of the public to tune into the radio station whenever the siren sounded.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Hurricane and Tropical Storm, Flood, Terrorism, Wildfire, Hazardous Materials Release
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$150,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	2014

2009 Analysis:
This action has not been completed and will be deferred in the 2009 Plan

City of Lago Vista (Past Action)-5	
Proposed Action:	**Improve methods for preserving essential records**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	The city has several storage facilities for records around the city. In each case, the storage facility is vulnerable to fire, water, terrorist attack, or other event that destroys buildings. By copying the records to a digital format and storing them off-site in at least two locations, retention of essential records would be ensured

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Hurricane and Tropical Storm, Wildfire, Terrorism, Hazardous Materials Release
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$50,000
Potential Funding Sources:	General fund, utility fund
Lead Agency/Department Responsible:	City Secretary
Implementation Schedule:	2014

2009 Analysis:
This action has not been completed and will be deferred in the 2009 Plan

City of Lago Vista (Past Action)-6	
Proposed Action:	**Encourage building of safe rooms**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	Lago Vista has enacted the International Building Code for Residential Structures. The wind-zone requirements are generally adequate for the area, except for modular homes. The city wants to encourage further safety by recommending that new structures have safe rooms, or safe-room specifications built into the structure; and that the same specifications are used when major remodeling is done. The City has no storm shelters.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorms, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$1,000-2,000 per home
Potential Funding Sources:	Individual homeowner
Lead Agency/Department Responsible:	Building Services
Implementation Schedule:	N/A

2009 Analysis:
This action has been deleted as it is not cost effective

.

City of Lago Vista (Past Action)-7	
Proposed Action:	**Encourage safe zones in public buildings**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	The International Building Code for Commercial Structures has been enacted. The wind-zone requirements are generally adequate but the city wants to encourage commercial building owners to build safe zones in their structures to provide shelter for those who use the facilities. There are no storm shelters in the city. The construction of shelters in commercial buildings would be publicized to ensure that workers and customers know where the safe zones are and would allow for some shelter for other citizens who need it.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorms, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$2,000 - $10,000 per structure
Potential Funding Sources:	Commercial building owners
Lead Agency/Department Responsible:	Building Services
Implementation Schedule:	N/A

2009 Analysis:
This action has been deleted as it is not cost effective

		City of Lago Vista (Past Action)-8
	Proposed Action:	**Implement the National Weather Service's Storm Ready program.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	By designating them as "Storm Ready," the National Weather Service recognizes local communities that have demonstrated a strong commitment to putting the infrastructure and systems in place that will save lives and protect property in the event of a severe weather event. "Storm Ready" communities are better prepared and will help serve their citizens when help is needed the most.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	High
Estimated Cost:	$500
Potential Funding Sources:	General Funding
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	2014

2009 Analysis:
This action is partially complete and will be deferred. The EOC is established. New EOC scheduled for construction with new police station in 2010.

New Actions

		LV-1
	Proposed Action:	**Conduct training for and purchase 900 MHz Radio System including equipment and antennas for all emergency responders.**
	BACKGROUND INFORMATION	
	Site and Location:	Emergency operations center and emergency response vehicles. Proposed to use LCRA radio bands and towers. Coordination with LCRA continuing.
	History of Damages:	Lago Vista has experienced both natural and man-made disasters. The new system would help for more timely and effective weather warnings and detailed recommendations to facilitate hazardous weather operations for local authorities.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$700,000
Potential Funding Sources:	CAPCOG Grant application made.
Lead Agency/Department Responsible:	CAPCOG/ Police Department
Implementation Schedule:	2010

COMMENTS
Grant application made.

		LV-2
	Proposed Action:	**Advise flood prone property owners of flood hazard and new flood plain elevations through news articles, letters to property owners and personally communicating with over 50 owners.**
	BACKGROUND INFORMATION	
	Site and Location:	Along Lake Travis.
	History of Damages:	Homeowners along Lake Travis experience property damage in flood and thunderstorm events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flooding, Thunderstorm, Hurricane and Tropical Storm
Effect on new/existing buildings:	Elevation out of floodplain and property protection for existing structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$3000
Potential Funding Sources:	General fund
Lead Agency/Department Responsible:	Development Services
Implementation Schedule:	Completed October 2008

COMMENTS

		LV-3
	Proposed Action:	**Amend regulations to allow trees in the ROW and landscape requirements for more trees on commercial property. Develop a landscape ordinance that encourages xeriscape**.
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City experiences mild to severe drought during the summer months.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Flood
Effect on new/existing buildings:	New building sites would be more efficient and also experience a reduction in temperature during times of drought and extreme heat. The new landscaping would also mitigate against flood damage for existing buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Depends on site
Potential Funding Sources:	Property owners
Lead Agency/Department Responsible:	Development Services
Implementation Schedule:	Completed February 2008. Subdivision regulation: July 2009.

COMMENTS

		LV-4
	Proposed Action:	**Replace fire hydrants.**
	BACKGROUND INFORMATION	
	Site and Location:	Throughout community.
	History of Damages:	Some older hydrants harder to open during fire.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Faster more efficient water delivery during fire to mitigate against damage for existing buildings.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100,000
Potential Funding Sources:	Bonds and general fund.
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	On-going from 2007 to 2010.

COMMENTS

		LV-5
	Proposed Action:	**Allow for Building Official to become a CFM.**
	BACKGROUND INFORMATION	
	Site and Location:	N/A
	History of Damages:	Recent floods require the expertise of a Certified Floodplain Manager to assist citizens

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$300
Potential Funding Sources:	General fund
Lead Agency/Department Responsible:	Development Services
Implementation Schedule:	Completed March 2008

COMMENTS

		LV-6
	Proposed Action:	**Update subdivision regulations for higher level of ingress and egress.**
	BACKGROUND INFORMATION	
	Site and Location:	Throughout city and extraterritorial jurisdiction (ETJ).
	History of Damages:	Floodwaters at low water crossings prevent ingress and egress throughout the city during flood and thunderstorm events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane and Tropical Storm
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	City
Lead Agency/Department Responsible:	Development Services
Implementation Schedule:	September 2009

COMMENTS

City of Lakeway

Previous Actions & Analysis

		City of Lakeway (Past Action)-1
	Proposed Action:	**Develop a mass debris removal plan.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The City has never had a devastating storm causing damage to private property resulting in very large quantities of materials (couches, carpets, appliances, rotting foodstuffs, building materials such as sheetrock, etc.), which would end up curbside. As a result, the City has no plans for managing debris removal in the event of a disaster.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$500
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Lakeway PD&CE and Public Works
Implementation Schedule:	2013

2009 Analysis:
This action is not complete and is deferred to the 2009 Plan

City of Lakeway (Past Action)-2	
Proposed Action:	**Employ consulting engineers to assess the adequacy of the City's drainage ways, culverts, bridges, water-quality zones, and detention ponds; and make needed, feasible improvements.**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	Building inspectors, the Street Department, and code enforcement personnel perform these functions when time allows but heavy rains continue to reveal drainage problems in many areas of the city. The adequacy of drainage ways needs to be assessed by professional engineers and improvements need to be made.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium high
Estimated Cost:	Consulting fees estimated at $30,000. Improvement costs estimated at $250,000.
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	PD&CE and Public Works
Implementation Schedule:	2013

2009 Analysis:
This action is not complete and is deferred to the 2009 Plan

City of Lakeway (Past Action)-3	
Proposed Action:	**Digitize hard copies of public records and store them in hazard-free off site locations.**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	No site exists in which to store critical City information. In the event of a fire, flood, or tornado, the City would likely lose valuable and irreplaceable records.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Winter Storm, Tornado, Hurricane, Wildfire, Winter Storm
Priority (High, Moderate, Low):	high
Estimated Cost:	$25,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City of Lakeway
Implementation Schedule:	2006

2009 Analysis:
This action has been completed

City of Lakeway (Past Action)-4	
Proposed Action:	**Keep the city in compliance with the requirements of the National Weather Service program, Storm Ready.**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	Lakeway has been designated by the National Weather Service as a Storm Ready Community. By designating them as "Storm Ready," the National Weather Service recognizes local communities that have demonstrated a strong commitment to putting the infrastructure and systems in place that will save lives and protect property in the event of a severe weather event. "Storm Ready" communities are better prepared and will help serve their citizens when help is needed the most. The Storm Ready Program certification encourages an ongoing program to enhance public education related to weather hazards. It also requires installation of Weather Alert radios in government buildings, schools, etc.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$100
Potential Funding Sources:	Grants and local revenue
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	Ongoing

2009 Analysis:
This action is complete, but will be deferred for the 2009 Plan as an ongoing activity. Lakeway continues to work toward maintaining Storm Ready status

		City of Lakeway (Past Action)-5
	Proposed Action:	**Investigate the feasibility of installing outdoor warning sirens. Determine types of sirens, their placement, and purchase and installation costs; determine maintenance costs; and interview system owners to determine satisfaction levels and problems encountered. Install the most cost-effective system.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The city relies on commercial radio, television, television cable services, and, in limited cases, NOAA Weather Alert Radios to disseminate warnings to the public. The outdoor warning sirens will enable warnings to more of the population. The city has a significant number of elderly and homebound citizens that would benefit from a community-wide warning system. Local control will allow for timely warning of local incidents.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	High
Estimated Cost:	$200,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	N/A

2009 Analysis:
This action was suspended in 2006 and should be deleted. The City of Lakeway opted to utilize the Revere 911 system due to costs and other issues.

		City of Lakeway (Past Action)-6
	Proposed Action:	**Complete the Lakeway Emergency Plan.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	. FEMA and the Texas Division of Emergency Management (DFEM) began in 2000 to revise the format for emergency plans used by all jurisdictions in the state. Many of the changes made existing plans obsolete. The Lakeway Office of Emergency Management has been working with each individual having responsibility in its plan to update it to current standards. This is time-consuming due to the number of disciplines involved and detail required, but will provide the city with an emergency plan acceptable to the DEM and FEMA. The new plan format is easier to use and provides greater clarification of assigned responsibilities.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm, Hurricane and Tropical Storm, Flood, Hail
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	Ongoing

2009 Analysis:
The City continues to work on the Emergency Plan in order to keep it current. This action is deferred as an ongoing activity.

		City of Lakeway (Past Action)-7
	Proposed Action:	**Submit an application to participate in the National Flood Insurance Program's Community Rating System (CRS)**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The city has excellent water control and flood-related ordinances. It does not allow construction in the floodplain. The CRS gives points for activities such as public education and enacting ordinances and regulations that result in "no rise" floodplain controls. It also includes civic activities such as dedicating lands in the floodplain to parks or other public recreational uses. Because of potential changes in the Lake Travis BFE, some residences may be in the 100-year floodplain. This will result in the purchase of flood insurance by affected homeowners.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$100
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	2005

2009 Analysis:
This action was completed in 2005

City of Lakeway (Past Action)-8	
Proposed Action:	**Identify and publicize the location of safe zones in public buildings, schools, day-care centers, senior citizens' facilities**
BACKGROUND INFORMATION	
Site and Location:	City wide
History of Damages:	When severe storms or tornadoes threaten, citizens in public buildings need access to protective shelter. Many times, shelter areas are selected by non-experts and are based on general guidelines provided by the National Weather Service or FEMA. They may or may not be the areas within the structure that would provide maximum protection. At the time of planning a building, the architect and engineers should determine the "safest" areas of the structure. Perhaps minor changes in construction materials or construction methods would greatly enhance the structure's resistance to high winds and flying debris. The square footage of "safer areas" would be based on anticipated occupancy. The availability of designated, identified shelters would provide a much higher degree of safety for employees and visitors.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm
Priority (High, Moderate, Low):	High
Estimated Cost:	$500
Potential Funding Sources:	Building Fees
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	Ongoing

2009 Analysis:
This action will be deferred in 2009 plan as it is an ongoing activity to continue growth in the community.

		City of Lakeway (Past Action)-9
	Proposed Action:	**Disseminate information about, and encourage the installation of, safe rooms in new and existing homes and businesses.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The city has no designated storm shelters. This would provide at least limited shelter for citizens.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$3,000 - $6,000 per unit
Potential Funding Sources:	Building Owner
Lead Agency/Department Responsible:	Office of Emergency Management, PD & CE
Implementation Schedule:	Ongoing

2009 Analysis:
This action will be deferred as it is an ongoing activity. The City of Lakeway continues to work with new builders and home owners to encourage precautions are taken.

New Actions

		Lakeway-1
	Proposed Action:	**Conduct brush management to assist with wildfire control**
	BACKGROUND INFORMATION	
	Site and Location:	City of Lakeway
	History of Damages:	Brush fires are common in Texas especially during the hot and dry summer months.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Drought, Extreme Heat
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1000
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	City of Lakeway / Public Works
Implementation Schedule:	Summer 2009

COMMENTS
With the central Texas area being under extreme draught conditions it is necessary to monitor and clear out any underbrush and/or high grass near trails, streets, houses or businesses.

		Lakeway-2
	Proposed Action:	**Install and monitor rain gauges at various city locations with gauges from COCORAHS**
	BACKGROUND INFORMATION	
	Site and Location:	Police Department Fire Departments Schools City buildings
	History of Damages:	The City of Lakeway experiences severe storms, hail and flood events. Many times events are not reported accurately to measure impact and probability of future occurrences. Gauges through Cocorahs will help to accurately report and predict hazard events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Winter Storm, Thunderstorm
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$200.00
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Police/EMA
Implementation Schedule:	Spring 2009

COMMENTS

		Lakeway-3
	Proposed Action:	**Maintain Strom Ready designation/recertify before July 2009/get with LTISD to attempt to get them involved in the Storm Ready program and to seek certification.**
	BACKGROUND INFORMATION	
	Site and Location:	Host city offices / schools
	History of Damages:	Lakeway experiences both natural and man-made hazards. Maintaining the Storm Ready status would help to ensure that citizens have timely information about conditions. It would also help to train workers about how to inform the public most efficiently about the action they need to take. A "Storm Ready" designation can lead to reduced insurance rates for communities participating in the National Flood Insurance Program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$100.00
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Police / EMA
Implementation Schedule:	Spring / Summer 2009

COMMENTS

		Lakeway-4
	Proposed Action:	**Conduct joint Skywarn training with emergency services (police, fire, EMS) / city staff / LTISD / bus drivers.**
	BACKGROUND INFORMATION	
	Site and Location:	Host training within community
	History of Damages:	In order to protect citizens, the city continues to update its emergency plans including training with Skywarn for emergency services to protect against both natural and man-made hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Hail, Winter Storm, Thunderstorm, Hazardous Material Release, Pipeline Failure, Terrorism, Dam Failure
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$200.00
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Police / EMA
Implementation Schedule:	Summer 2009

COMMENTS
Target dates for the training are February, March, and April. All day events – open to the public (possibly do one just for the public) Completion of this action assists with our Storm Ready status.

		Lakeway-5
	Proposed Action:	**Develop an effective Emergency Call Back for Police Personnel.**
	BACKGROUND INFORMATION	
	Site and Location:	Police Department
	History of Damages:	The city needs a more effective way to call back police officers in the event of an emergency during hazard events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	None
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1500 / year
Potential Funding Sources:	General funding / grant
Lead Agency/Department Responsible:	Police / EMA
Implementation Schedule:	Summer 2009

COMMENTS

City of Mustang Ridge

Previous Actions & Analysis

		City of Mustang Ridge (Past Action)-1
	Proposed Action:	**Review Mustang Ridge's floodplain management ordinance and obtain a rating under the TCRFC's Floodplain Management Assessment Program.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The Coalition's Floodplain Management Assessment Program undertakes a periodic review to assess the effectiveness of floodplain management in the region. Each Coalition member-community receives a rating of excellent, superior, or outstanding, depending on the community's implementation of floodplain management criteria that exceed NFIP minimum standards

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Negligible
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	2011

2009 Analysis:
This action is partially complete and will be deferred

New Actions

		MR-1
	Proposed Action:	**Develop a public awareness program regarding flooding and also distribute Turn Around Don't Drown (TADD) materials.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Flooding affects the city on an annual basis and residents often go across low-water crossings endangering their lives and others. Flooding particular high hazard for the area

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000-$5,000 annually
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	Annually

COMMENTS
The City will seek grants, but also rely on materials where available for low or no cost from TADD.

		MR-2
	Proposed Action:	**Partner with Travis County to develop an interlocal agreement to institute a tree-trimming program.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city experiences damage from low-hanging limbs and branches in every storm. Currently no tree-trimming program is in place.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Wildfire, Tornado
Effect on new/existing buildings:	This action will prevent damages from natural hazards to existing buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	2011-2012

COMMENTS

		MR-3
	Proposed Action:	**Develop drought conservation plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city experiences drought every summer, especially in rural areas. Mustang Ridge contains black dirt, and when it dries, it cracks and is extremely harsh on crops and property throughout town.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	One year after funding

COMMENTS

Village of Point Venture

Previous Actions & Analysis

		Village of Point Venture (Past Action)-1
	Proposed Action:	**Establish a hazard mitigation information center for use by local residents.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Being a newly incorporated village, there is no location at which information is displayed to help residents prepare for and survive a major disaster

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$50
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	City
Implementation Schedule:	2011

2009 Analysis:
This action is partially complete and will be deferred. The information should include the dangers of flood and the availability of flood insurance.

		Village of Point Venture (Past Action)-2
	Proposed Action:	**Develop a mass debris removal plan; inform the public about hazards related to disposal of household hazardous wastes.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	Natural and man-made disasters generate a variety of debris that includes trees and other vegetative organic matter, construction materials, appliances, personal property, mud, and sediment. The City may have difficulty in locating staff, equipment, and funds to devote to debris removal following a major natural or man-made disaster.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release
Priority (High, Moderate, Low):	Low
Estimated Cost:	$100
Potential Funding Sources:	Point Venture and Point Venture Homeowners Association
Lead Agency/Department Responsible:	City
Implementation Schedule:	2011

2009 Analysis:
This action is not complete and will be deferred to 2009 Plan

New Actions

		PV-1
	Proposed Action:	**Institute a chipping program and underbrush trimming program. Purchase of chipping equipment or contract for service. Obtain training for two people to operate and make available for residents to use for landscaping or contractors to use for outside sales**
	BACKGROUND INFORMATION	
	Site and Location:	WCID water tower area
	History of Damages:	Point Venture has many areas of interface and residents face the threat of fire.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	This action will benefit both existing and new buildings by preventing the threat or spread of wildfire.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$13,000
Potential Funding Sources:	Grant
Lead Agency/Department Responsible:	Village EMC
Implementation Schedule:	2010

COMMENTS
A space for chip piles will be designated as part of the program.

		PV-2
	Proposed Action:	**Institute a Fire Awareness and Prevention Program**
	BACKGROUND INFORMATION	
	Site and Location:	PVPOA Club Room
	History of Damages:	Townhouse Units burned in1994 and 2004 due to wildfire.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$3,000 per year
Potential Funding Sources:	Grant
Lead Agency/Department Responsible:	Village EMC
Implementation Schedule:	2010

COMMENTS

- invite Texas Forest Service to PVPOA and/or Village meetings twice per year
- invite electrician to speak about dangers of aluminum wiring
- invite Village Mayor and PVPOA President to speak about deed restrictions and ordinances regarding fireworks, litter, brush trash, lot clearing, etc
- invite Fire Department to speak about open flame fires

		PV-3
	Proposed Action:	**Conduct public awareness programs regarding natural and man-made hazards**
	BACKGROUND INFORMATION	
	Site and Location:	PVPOA Club Room and Library
	History of Damages:	Point Venture is a small community that is susceptible to wildfire and floods among other hazards. It's important to keep the community informed about hazards and ways they can effectively mitigate against hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$3,000 per year
Potential Funding Sources:	Grant
Lead Agency/Department Responsible:	Village EMC
Implementation Schedule:	Ongoing starting in 2009

COMMENTS

- prepare half hour presentations to acquaint citizens with emergency procedures as well as resources available in times of emergency
- designate three people to deliver the presentations at various functions already being attended
- present prior to or immediately following scheduled meetings of the PVPOA and village council

		PV - 4
	Proposed Action:	**Construct a shelter for citizen protection during emergencies**
	BACKGROUND INFORMATION	
	Site and Location:	PVPOA Club Room, Library, and Exercise Room
	History of Damages:	Point Venture is a small community that is susceptible to natural and man-made hazards. Currently the community does not have a shelter specifically designated for man-made and natural hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Provide power backup for HVAC, furnish TV, internet access, all hazard radio
Priority (High, Moderate, Low):	Low
Estimated Cost:	$19,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	PVPOA or Village EMC
Implementation Schedule:	2009

COMMENTS

- store comfortable furniture in old kitchen area
- base power requirements on two HVAC systems and library unit
- locate generator near PVPOA fuel storage and run power cables underground

Village of San Leanna

Previous Actions & Analysis

		Village of San Leanna (Past Action)-1
	Proposed Action:	**Conduct outreach to the public to educate citizens on the full range of hazards they face and how to protect themselves, their families and their businesses in disaster situations.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	An educated citizenry is one of the best methods of protection against disaster. Citizens need to know about the risks they face, how to prepare for disaster, and what to do should a disaster occur.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Wildfire, Thunderstorm, Hail, Hurricane and Tropical Storm, Tornado
Priority (High, Moderate, Low):	High
Estimated Cost:	Negligible
Potential Funding Sources:	Mayor's office
Lead Agency/Department Responsible:	City
Implementation Schedule:	2005

2009 Analysis:
This action has been completed. Ongoing efforts have been made to keep the public informed of potential hazards through regular mailings and participation in public meetings. The Environmental Commissioner has worked with the Floodplain Administrator and the Mayor to ensure that San Leanna meets the requirements for participation in the TCRFC, NFIP, NIMS, etc. These efforts will be continued.

		Village of San Leanna (Past Action)-2
	Proposed Action:	**Review San Leanna's floodplain management ordinance and obtain a rating under the TCRFC's Floodplain Management Assessment Program.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The Coalition's Floodplain Management Assessment Program undertakes a periodic review to assess the effectiveness of floodplain management in the region. Each Coalition member-community receives a rating of excellent, superior, or outstanding, depending on the community's implementation of floodplain management criteria that exceed NFIP minimum standards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Negligible
Potential Funding Sources:	Floodplain Administrator
Lead Agency/Department Responsible:	City
Implementation Schedule:	2010

2009 Analysis:
This action is partially complete and will be deferred to the 2009 Plan. San Leanna's Floodplain Management Ordinance has been under review during the flood map revision period. A revised Floodplain Damage Prevention Ordinance was adopted by the Board of Aldermen of San Leanna on August 21, 2008 and has been approved by FEMA. All citizens residing in the updated floodplain have been notified of their status and have been invited to participate in planning to mitigate flooding problems. We have not been notified of a rating standard by TCRFC to date.

New Actions

		SL-1
	Proposed Action:	**Provide alternative water source for severe water-use restrictions.**
	BACKGROUND INFORMATION	
	Site and Location:	Interconnection with City of Austin, located in San Leanna
	History of Damages:	The city has large landscaped lots with many trees; therefore an alternative source of water is needed

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire, Extreme Heat
Effect on new/existing buildings:	Preserve trees and landscaping
Priority (High, Moderate, Low):	High
Estimated Cost:	$50,000 plus ongoing costs
Potential Funding Sources:	TWDB loan/ City Revenue
Lead Agency/Department Responsible:	Council/Administrator
Implementation Schedule:	Summer 2009

COMMENTS

		SL-2
	Proposed Action:	**Develop a water rate structure charging a premium price for excessive water usage.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city has large landscaped lots with many trees. A water rate structure charging for excessive usage is needed in order to preserve trees and landscaping

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire, Extreme Heat
Effect on new/existing buildings:	Preserve trees and landscaping through discouraging overuse of limited natural resources
Priority (High, Moderate, Low):	High
Estimated Cost:	None
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Council/Administrator
Implementation Schedule:	Summer 2009

COMMENTS

		SL-3
	Proposed Action:	**Educate residents regarding xeriscape planting**
	BACKGROUND INFORMATION	
	Site and Location:	Workshops at the Community Center
	History of Damages:	Xeriscape planting will help preserve the trees and landscaping as the City experiences drought and wildfire every summer.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire, Extreme Heat, Flood
Effect on new/existing buildings:	Preserve trees and landscaping. This would also prevent flood damage to existing structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	City Revenue
Lead Agency/Department Responsible:	Tree Committee/Arborist
Implementation Schedule:	Summer 2009

COMMENTS

		SL-4
	Proposed Action:	**Complete engineering studies and determine project designs for storm water flood prevention.**
	BACKGROUND INFORMATION	
	Site and Location:	Circle Drive, River Oaks Drive, Old Manchaca Road and Redbud Trail
	History of Damages:	Eleven homes in San Leanna flooded during the last thunderstorm and flood event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood
Effect on new/existing buildings:	This action will prevent damage to existing homes during flood events, and also help establish areas to develop new structures at the least risk for damage from flooding.
Priority (High, Moderate, Low):	High
Estimated Cost:	$50,000
Potential Funding Sources:	Grant funds/ City revenue
Lead Agency/Department Responsible:	Council/Administrator
Implementation Schedule:	Summer 2009

COMMENTS

		SL-5
	Proposed Action:	**Complete stormwater management projects to reduce or eliminate long-term flood hazard risks.**
	BACKGROUND INFORMATION	
	Site and Location:	Circle Drive, River Oaks Drive, Old Manchaca Road and Redbud Trail
	History of Damages:	Eleven homes in San Leanna flooded during the last thunderstorm and flood event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood
Effect on new/existing buildings:	This action will prevent damage to existing homes during flood events
Priority (High, Moderate, Low):	High
Estimated Cost:	$400,000
Potential Funding Sources:	Grant funds/ City revenue
Lead Agency/Department Responsible:	Council/Administrator
Implementation Schedule:	Summer 2010

COMMENTS

		SL-6
	Proposed Action:	**Conduct wildfire fuel removal program**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city experiences wildfires and brush fires throughout the summer. In the last year, one fire occurred on a large wooded property.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Many homes are constructed of wood rather than stone and this action will help prevent the rapid spread of fire
Priority (High, Moderate, Low):	High
Estimated Cost:	$2,000
Potential Funding Sources:	City revenue
Lead Agency/Department Responsible:	Environmental Commissioner Arborist/Administrator
Implementation Schedule:	2009 and ongoing

COMMENTS

Village of Volente

Previous Actions & Analysis

Not applicable: Volente is a new community (See Table 1-2)

New Actions

		Volente-1
	Proposed Action:	**Implement rainfall observer program, utilizing volunteers and encourage participation in National Weather Service CoCoRahs program.**
	BACKGROUND INFORMATION	
	Site and Location:	Volente
	History of Damages:	The community has experienced damage from severe storms in flooding including wash out at roads and low water crossings. An accurate way of measuring rainfall will help to predict future events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hail, Winter Storm
Effect on new/existing buildings:	Helps mitigate damage caused by flooding to existing structures and measure the amount of flooding in high risk areas.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	General Fund/Grants
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	Ongoing beginning in 2010

COMMENTS

		Volente-2
	Proposed Action:	**Review and update floodplain management plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Volente
	History of Damages:	Floodwaters at low water crossings prevent ingress and egress throughout the city during flood and thunderstorm events. A review of the floodplain management plan will be undertaken with possible improvements considered to move beyond the minimum standards for development. Periodic reviews of the City's floodplain management ordinance will help ensure that it is up to date.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	The plan would better protect existing property and also prevent the development of new structures in high hazard areas.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000-$5,000
Potential Funding Sources:	General Fund with grants as needed
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	Annually

COMMENTS

		Volente-3
	Proposed Action:	**Develop an Emergency Operations and Evacuation Plan**
	BACKGROUND INFORMATION	
	Site and Location:	Volente
	History of Damages:	The community is susceptible to man-made and natural hazards, but currently does not have an emergency operations plan or evacuation plan in place.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000-$15,000
Potential Funding Sources:	General Revenue and Grants
Lead Agency/Department Responsible:	Fire Department
Implementation Schedule:	2010-2011

COMMENTS
Volente will work with Travis County as needed to develop a singular or combined plan.

City of West Lake Hills

Previous Actions & Analysis

		City of Westlake Hills (Past Action)-1
	Proposed Action:	**Conduct a public outreach program to educate citizens about the full range of hazards they face and how to protect themselves, their families, and their businesses in disaster situations.**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	An educated citizenry is one of the best methods of protection against disaster. Citizens need to know about the risks they face, how to prepare for disaster, and what to do should a disaster occur.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hail, Tornado, Hurricane and Tropical Storm, Wildland Fire, Winter Storms
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	Ongoing

2009 Analysis:
This action is an ongoing activity and will be deferred for the 2009 Plan.

		City of Westlake Hills (Past Action)-2
	Proposed Action:	**Conduct a review of the city's Floodplain Management Ordinance**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	West Lake Hills has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met. With this action, a review of the City's floodplain management ordinance will be undertaken. Possible improvements will be considered to move beyond the minimum standards for development in the regulatory floodway.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	2008

2009 Analysis:
This action is complete. The ordinance was updated on June 25, 2008 to meet the FEMA Model Flood Damage Prevention Ordinance.

New Actions

		WLH-1
	Proposed Action:	**Implement the Firewise Community Program to improve existing ordinances and implement the new building code to reduce loss.**
	BACKGROUND INFORMATION	
	Site and Location:	West Lake Hills and surrounding jurisdictions
	History of Damages:	The community is prone to wildfire and drought every summer, and experienced a major fire in 1961 that burned over 4000 acres.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire, Extreme Heat
Effect on new/existing buildings:	This action will prevent damage to existing buildings and will aid new development
Priority (High, Moderate, Low):	High
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	West Lake Hills and Travis County ESD#9
Implementation Schedule:	Ongoing

COMMENTS

		WLH-2
	Proposed Action:	**Educate citizens on brush clean up and evacuation communication. Implement the Regional Radio System and Reverse 911**
	BACKGROUND INFORMATION	
	Site and Location:	West Lake Hills and surrounding jurisdictions
	History of Damages:	The community is prone to wildfire and drought every summer. Public education and awareness is extremely important in order to get warnings to the community in time. The community has started a basic fire dept. for the community.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire, Extreme Heat
Effect on new/existing buildings:	This will reduce exposure to new and existing buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	West Lake Hills and Travis County ESD#9
Implementation Schedule:	Ongoing

COMMENTS

		WLH-3
	Proposed Action:	**Install a warning and safety procedure for VL Rich water treatment plant.**
	BACKGROUND INFORMATION	
	Site and Location:	VL Rich water treatment plant at redbud trail
	History of Damages:	The water treatment plant has not suffered any damage to date, but is susceptible to man-made hazards. In addition, citizens in the surrounding area are at risk.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	City of Austin/West Lake Fire Dept.
Implementation Schedule:	To be determined

COMMENTS
The amount of chlorine at the water treatment plant is substantial. This plant treats drinking water for the City of Austin. The City of Austin 1st Response is currently working on a plan with West Lake Emergency Service District #9 and the West Lake Hills Dispatch Dept. on a warning system. The community seeks to ensure that the unloading of hazardous materials from trucks is conducted in a controlled environment.

Williamson County

Previous Actions & Analysis

		Williamson County (Past Action)-1
	Proposed Action:	**Implement a county-wide geographically-based telephone emergency notification system. Develop protocols for use of the system**
	BACKGROUND INFORMATION	
	Site and Location:	City wide
	History of Damages:	The high-speed Emergency Notification System is a state-of-the-art telephone notification system that can communicate important, time-sensitive information from local governments and public safety agencies simultaneously to large groups of residents. The system will allow geographical selection of targeted notification areas, including homes, businesses, hospitals, etc. The emergency notification system will enable local governments and public-safety agencies to contact residences and businesses in specific areas in the event of an emergency or potential emergency.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	The first year's cost to purchase and begin operating the system is $39,600. The estimated annual cost to maintain the system in subsequent years will be approximately $21,600 per annum. This includes 150,000 calls per year, with additional calls costing 15 cents each.
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	2005

2009 Analysis:
This action has been completed

		Williamson County (Past Action)-2
	Proposed Action:	**Expand and enhance the County's Emergency Paging System.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	The County has an Emergency Paging System currently serving the County Sheriff's Office, County Emergency Medical Services, and County Hazardous Materials Team. Efforts will be undertaken to expand and improve the system to incorporate warning and communications to a broader base, including all public safety agencies within the County.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined.
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	2005

2009 Analysis:
This action has been completed

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		Williamson County (Past Action)-3
	Proposed Action:	**Develop evacuation plans, policies and procedures for the full range of contingencies and geographic areas of the County. Bring together experts in emergency planning, transportation and traffic engineers for the full range of contingencies. Develop canned messages for use with the public and the media. Examine the need for additional legislative authority to conduct mandatory evacuations.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	The County has an evacuation annex to its Emergency Operations Plan. This action would take evacuation planning to the next level, tailoring plans for specific events and specific neighborhoods. This action will help protect public health and safety by having plans in place to assist those people threatened by various emergency conditions evacuate to safety in a timely manner. The plans to be developed will include a determination of the conditions under which evacuation may be necessary; a clear chain of command; specific evacuation routes, plans and procedures for different types of emergencies and geographic areas; provisions for assisting those with disabilities and those who do not speak English; and outreach to the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Thunderstorms, Winter Storms, Wildfire, Tornado, Hurricane and Tropical Storms
Priority (High, Moderate, Low):	Low
Estimated Cost:	To be determined
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	2013

2009 Analysis:
This action is partially complete and will be deferred to 2009 Plan

		Williamson County (Past Action)-4
	Proposed Action:	**Develop a coordinated, interagency emergency debris removal plan that includes: a proposed command structure; pre designate staging areas and dumping sites; pre-qualified contractors for large-scale disasters; and pre-identified specialized equipment needs and standby lease agreements. The plan would cover debris removal for public and private property.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	Natural and man-made disasters generate a variety of debris that includes trees and other vegetative organic matter, construction materials, appliances, personal property, mud, and sediment. The County may have difficulty in locating staff, equipment, and funds to devote to debris removal following a major natural or man-made disaster.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Tornado
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Existing Budgets
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	The County in conjunction with local jurisdictions
Implementation Schedule:	2011-2014

2009 Analysis:
This action is partially complete and will be deferred to 2009 Plan

		Williamson County (Past Action)-5
	Proposed Action:	**Establish the capability for a single, interagency mobile incident command post and mobile communications center.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	The mobile communications center would facilitate communications among responders from different agencies, using different types and frequencies of radios. It also would provide for a mobile, on-scene incident command post.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Tornado, Hurricane and Tropical Storm, Wildfire, Winter Storms
Priority (High, Moderate, Low):	Medium
Estimated Cost:	To be determined
Potential Funding Sources:	General revenue, grants
Lead Agency/Department Responsible:	Williamson County Office of Emergency Management and Sheriff's Office, along with the Fire Departments and Law Enforcement Agencies of cities within the County.
Implementation Schedule:	2011-2014

2009 Analysis:
This action is partially complete and will be deferred to 2009 Plan

		Williamson County (Past Action)-6
	Proposed Action:	**Recruit and train volunteers to provide support in safeguarding Williamson County before, during, and after any disaster. The Williamson County Sheriff's Office has established a volunteer program that recruits and trains teams of committed volunteers to perform critical tasks that will enhance the County's disaster preparedness and homeland security strategy.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	Increasing the County's pool of disaster preparedness and homeland defense volunteers enhances the County's ability to manage major emergencies more effectively. These volunteers will be called upon to supplement existing County staff in the delivery of emergency related services.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Tornado, Hurricane and Tropical Storm, Wildfire, Winter Storms
Priority (High, Moderate, Low):	Medium
Estimated Cost:	To be determined
Potential Funding Sources:	General revenue, grants
Lead Agency/Department Responsible:	Sheriff's office
Implementation Schedule:	2012

2009 Analysis:
This action is partially complete and will be deferred to 2009 Plan

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		Williamson County (Past Action)-7
	Proposed Action:	**Develop a coordinated, regional interagency all-hazard mitigation plan and structure to complement the existing County Resource Coordinator (CRC) concept.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	Multiple local, County, State, and Federal agencies and interests have a role in mitigating the All-Hazard risk in Williamson County. Among those included are 19 County departments and agencies, the Federal Emergency Management Agency, Texas Forest Service, State Fire Marshal's Office, Lower Colorado River Authority, land owners and neighborhood associations, chambers of commerce, and other communities in the region. Major components of this action include development of an expanded, coordinated action plan; pooling of resources among multiple stakeholders towards a common objective; and information sharing.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Tornado, Hurricane and Tropical Storm, Wildfire, Winter Storms
Priority (High, Moderate, Low):	High
Estimated Cost:	$30,000
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Williamson County Office of Emergency Management, Williamson County Fire Chiefs Association
Implementation Schedule:	2012

2009 Analysis:
This action is partially complete and will be deferred to 2009 Plan

		Williamson County (Past Action)-8
	Proposed Action:	**Continue to improve the training and education of emergency services personnel with regard to fire prevention and safety, and general safety awareness.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	The County Fire Chiefs Association, County Emergency Medical Services, and the Fire Departments of the cities within the County continue to protect lives and property through extensive fire-prevention and safety-education efforts, and quick and effective response to emergencies. It is their goal to deliver comprehensive safety services of the highest quality and to be a community resource for life-safety knowledge and information. This action will continue to improve their ongoing fire prevention and fire safety awareness educational efforts. It will continue to help save lives and property by educating the public on how to prevent fires

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	High
Estimated Cost:	Minimal, within existing budgets
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Williamson County Fire Chiefs Association
Implementation Schedule:	2006

2009 Analysis:
This action has been completed

		Williamson County (Past Action)-9
	Proposed Action:	**Re-route hazardous materials not destined for the cities to routes outside of cities; build Highway 130 and re-route hazardous materials to the east of the more populated areas within Williamson County. Work with the railroad industry to harden rail lines along the major urban routes within Williamson County.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	Re-routing hazardous materials outside the more populated areas of Williamson county will significantly reduce the risk of a hazardous materials transportation accident.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release
Priority (High, Moderate, Low):	Medium
Estimated Cost:	To be determined
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Texas Department of Transportation, Williamson County, City of Round Rock, City of Georgetown, City of Jarrell
Implementation Schedule:	2012

2009 Analysis:
. This action has been partially completed and deferred to 2009 plan

		Williamson County (Past Action)-10
	Proposed Action:	**Participate in education within all Williamson County first-responder agencies concerning actions that can be taken in preparation for possible terrorist events, including provide real time information on alert levels, educate responders on levels, educate county, city, and hospital personnel on mitigation techniques, provide education on protective measures involving chemical and biological agents, explosives, and radiological agents.**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	. Williamson County first-responder agency personnel and hospitals need to be better prepared for the potential consequences of a terrorist attack and to develop the ability to protect themselves as well as respond to the public's health and safety needs in such events. The actions of these personnel can truly make a difference for the health and safety of the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Terrorism, Hazardous Materials Release
Priority (High, Moderate, Low):	High
Estimated Cost:	Costs are to be shared among involved agencies and organizations' current budgets
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	2012

2009 Analysis:
. This action has been partially completed and deferred to 2009 plan

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		Williamson County (Past Action)-11
	Proposed Action:	**Encourage all Williamson County communities to complete vulnerability assessments for water supply and water treatment systems and encourage those communities to make any necessary improvements to harden security and ensure that appropriate emergency plans are in place**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	Security has always been a priority for water utilities. Utilities have broad experience in dealing with emergency interruptions to water supplies. The events of September 11 have given new focus to the vulnerability of water resources from the perspective of the potential consequences of intentional acts of terrorism. Communities within Williamson County have been evaluating this risk and related action will be taken as those communities deem necessary and obtain funding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	Costs are to be shared among involved agencies and organizations' current budgets
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	2012

2009 Analysis:
. This action has been partially completed and deferred to 2009 plan

		Williamson County (Past Action)-12
	Proposed Action:	**Install or replace culverts wherever needed in the county**
	BACKGROUND INFORMATION	
	Site and Location:	County wide
	History of Damages:	Culverts are needed at several sites in the county to help enhance flood and rainwater drainage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	County Road 208 (2 box culvert) -- $47,296 County Road 121 (1 box culvert) -- $49,121 County Road 300 (1 box culvert) -- $72,500
Potential Funding Sources:	Capital Improvement Project
Lead Agency/Department Responsible:	Williamson County
Implementation Schedule:	2011-2014

2009 Analysis:
This action has been partially completed and deferred to 2009 plan

		Williamson County (Past Action)-13
	Proposed Action:	**Replace bridge on County Road 123**
	BACKGROUND INFORMATION	
	Site and Location:	County Road 123
	History of Damages:	This bridge needs to be replaced but estimates received for replacement vary widely. Further study needs to be done before construction.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$200,00-700,000
Potential Funding Sources:	Capital Improvement Project
Lead Agency/Department Responsible:	Williamson County
Implementation Schedule:	2011-2014

2009 Analysis:
This action has been partially completed and deferred to 2009 plan

		Williamson County (Past Action)-14
	Proposed Action:	**Eliminate large-scale washout problem on the banks of Brushy Creek through an erosion control project**
	BACKGROUND INFORMATION	
	Site and Location:	Brushy Creek
	History of Damages:	An erosion control project is needed on County Road 129 at Brushy Creek to eliminate further washout.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	$100,000
Potential Funding Sources:	Capital Improvement Project
Lead Agency/Department Responsible:	Williamson County
Implementation Schedule:	2011-2014

2009 Analysis:
This action has been partially completed and deferred to 2009 plan

		Williamson County (Past Action)-15
	Proposed Action:	**Undertake a review of the County's floodplain management ordinance.**
	BACKGROUND INFORMATION	
	Site and Location:	County Wide
	History of Damages:	Williamson County has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met. With this action, a review of the County's floodplain management ordinance will be undertaken. Possible improvements will be considered to move beyond the minimum standards for development in the regulatory floodway.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Minimal
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	2011-2014

2009 Analysis:
This action has been partially completed and deferred to 2009 plan

New Actions

		Wilco-1
	Proposed Action:	**Develop and implement a Community Wildfire Protection Plan for Williamson County.**
	BACKGROUND INFORMATION	
	Site and Location:	Williamson County is one of the fastest growing counties in the state/nation and with its unique topography presents an increasing wildland/urban interface hazard. Subdivisions are being developed in rural areas with dense vegetation that are prone to drought.
	History of Damages:	Williamson County experienced a reported 75 wildfires involving approx. 9000 acres with the largest lasting 7 days at an estimated cost of $750k.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Establish fire protection guidelines for new development.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	General revenues, grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Begin Spring 2009 (~1 year for completion)

COMMENTS
This project will be conducted through cooperation with the Williamson County Office of Emergency Management, Williamson County Fire Chiefs Association, and Texas Forest Service.

		Wilco-2
	Proposed Action:	**Implement a county-wide public education program for residents about xeriscape planting.**
	BACKGROUND INFORMATION	
	Site and Location:	County homeowners associations will be the target audience for this education program. Focus will be to lessen the effects of drought and reduction of water usage.
	History of Damages:	Williamson County is prone to periodic drought conditions in which impact local water supplies. Currently the county has been approximately 180 days without significant rainfall. Rural water well levels are beginning to reach levels that are critically low.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	Reduction of need for external watering.
Priority (High, Moderate, Low):	High
Estimated Cost:	Low / Unknown
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Spring 2009

COMMENTS
Information gathered from the Texas Forest Service

		Wilco-3
	Proposed Action:	**Conduct public education program on fire risk and wildland fire mitigation.**
	BACKGROUND INFORMATION	
	Site and Location:	County homeowners associations will be the target audience for this education program. Focus will be to stress the importance of a safe zone around homes which will lessen the likelihood of damage from wildland fires or make it easier to protect/defend during a fire.
	History of Damages:	In 2008 Williamson County experienced a high number of wildland fires consuming approximately 9000 acres. Fortunately no homes were lost however the probability increases every year due to the growth into fire prone areas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire
Effect on new/existing buildings:	Lower the risk of damage/destruction due to wildland fires.
Priority (High, Moderate, Low):	High
Estimated Cost:	Low / Unknown
Potential Funding Sources:	General Revenues / Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Spring 2009

COMMENTS
Information gathered from the Texas Forest Service

		Wilco-4
	Proposed Action:	**Install "Burn Ban" or "Fire Danger" signs along major county roadways.**
	BACKGROUND INFORMATION	
	Site and Location:	Signage along US/State Highways and Farm/Ranch to Market Roads within Williamson County.
	History of Damages:	Williamson County is routinely under a "Burn Ban". In 2008 a burn ban was issued for greater than 8 months of the year.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Protect homes and buildings from fire through public awareness of the current fire dangers and /or subsequent burn bans.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	General Funding / Grants
Lead Agency/Department Responsible:	Emergency Management / URS
Implementation Schedule:	TBD

COMMENTS

		Wilco-5
	Proposed Action:	**Develop comprehensive GIS mapping tool with multiple hazard layers to include historical events by location and type.**
	BACKGROUND INFORMATION	
	Site and Location:	The GIS mapping tool will be fundamental in emergency operations and planning. This tool when combined with Computer Aided Dispatch will enhance initial response and extended operations. Providing the IC with invaluable information.
	History of Damages:	Multiple incidents including Wildland fires, flash flooding, and law enforcement tactical operations where such mapping tools would have been beneficial in decision making and planning.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Severe Storm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	General Revenue / Grants
Lead Agency/Department Responsible:	OEM, Communications, GIS
Implementation Schedule:	TBD

COMMENTS

		Wilco-6
	Proposed Action:	**Establish interactive website for educating the public on hazard mitigation / preparedness measures.**
	BACKGROUND INFORMATION	
	Site and Location:	An interactive website will provide citizens with education on how to prepare for and lessen the effects of natural or man-made disasters and serve as a place to post current events to keep everyone informed.
	History of Damages:	Currently the Williamson County Office of Emergency Management has no such website.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Severe Storm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Increased information sharing and education.
Priority (High, Moderate, Low):	High
Estimated Cost:	Low / Unknown
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Winter/Spring 2009

COMMENTS

City of Cedar Park

Previous Actions & Analysis –

Not applicable: Cedar Park is a new community (See Table 1-2)

New Actions

		CP-1
	Proposed Action:	**Educate citizenry of: 1. Risks from disasters, 2. How to prepare for disasters, and 3. What to do during a disaster. Encourage citizenry to have: 1. An all hazard radio, 2. Home disaster plan, 3. Food and water for initial 72 hours of a disaster.**
	BACKGROUND INFORMATION	
	Site and Location:	Various public events within Cedar Park
	History of Damages:	F-3 tornado on 5-27-97 Ice Storm on 1-17-07

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Winter Storm, Thundrestorm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$4,000 for printing/publishing
Potential Funding Sources:	City General Fund Emergency Management Budget
Lead Agency/Department Responsible:	Cedar Park Emergency Management
Implementation Schedule:	Throughout 2009-2013

COMMENTS
Consider purchasing or discounting cost of all hazard radios.

		CP-2
	Proposed Action:	**Acquire an all hazard mobile command unit for response to emergency calls and public events within Cedar Park.**
	BACKGROUND INFORMATION	
	Site and Location:	Various locations throughout Cedar Park
	History of Damages:	F-3 Tornado on 5-27-97 Ice Storm on 1-17-07 Multiple long duration calls including stand-offs and structure fires.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	None
Priority (High, Moderate, Low):	High
Estimated Cost:	TBD
Potential Funding Sources:	General Fund, Grants
Lead Agency/Department Responsible:	Police and Fire Departments, Emergency Management
Implementation Schedule:	As budget allows

COMMENTS
This unit would be accessible by multiple departments within the City of Cedar Park.

		CP-3
	Proposed Action:	**Acquire road closure/redirection equipment**
	BACKGROUND INFORMATION	
	Site and Location:	Multiple roadway and event sites within Cedar Park
	History of Damages:	F-3 Tornado on 5-27-97 Ice Storm on 1-17-07 Multiple fatality roadway events Multiple City Events requiring road closures

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	None
Priority (High, Moderate, Low):	High
Estimated Cost:	TBD
Potential Funding Sources:	General Fund, Grants
Lead Agency/Department Responsible:	Cedar Park Police Department
Implementation Schedule:	As budgeting allows

COMMENTS
Equipment to include a trailer, A-frame barricades, and traffic cones.

		CP-4
	Proposed Action:	**Acquire a replacement water rescue boat.**
	BACKGROUND INFORMATION	
	Site and Location:	Multiple flood locations within Cedar Park and Williamson County
	History of Damages:	Multiple flood events and water rescues.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flooding, Thunderstorm
Effect on new/existing buildings:	None
Priority (High, Moderate, Low):	High
Estimated Cost:	25,000
Potential Funding Sources:	Grants, Cedar Park General Fund
Lead Agency/Department Responsible:	Cedar Park Fire Department
Implementation Schedule:	As budget allows

COMMENTS
Cedar Park lost the use of Jets skis by our swift water/dive team due to the cancelation of a public safety grant. Acquiring the boat would allow us to maintain our team without the year to year unknown.

		CP-5
	Proposed Action:	**Relocate and maintain a City Emergency Operations Center in Fire Station #5**
	BACKGROUND INFORMATION	
	Site and Location:	Is currently being determined and purchased
	History of Damages:	F-3 Tornado 5-27-97 Ice Storm 1-17-07 Multiple emergency management drills

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Would be built as part of administration at Fire Station #5
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	Grants, City of Cedar Park Bonds
Lead Agency/Department Responsible:	Cedar Park OEM, Fire Department
Implementation Schedule:	As budget allows for construction of Fire Station #5

COMMENTS
Currently the site for fire station #5 is being purchased with City General Obligation Bonds. Construction costs will have to be approved in a future bond election.

City of Florence

Previous Actions & Analysis –

Not applicable: Florence is a new community (See Table 1-2)

New Actions

		Florence-1
	Proposed Action:	**Strengthen zoning ordinance to encourage higher densities only outside of known hazard areas.**
	BACKGROUND INFORMATION	
	Site and Location:	Multiple locations throughout the City of Florence.
	History of Damages:	The community experiences wildfire during the summer months. The City of Florence has a floodplain and zoning ordinance in place, which need to be strengthened to encourage building where residents are less susceptible to the threat of wildfire.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire
Effect on new/existing buildings:	Strengthening the zoning ordinance would decrease the chance of property damage to new and existing structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Existing Budget and Grants
Lead Agency/Department Responsible:	Planning and Zoning Commission
Implementation Schedule:	2009

COMMENTS

		Florence-2
	Proposed Action:	**Prohibit fill in floodplain areas and conduct assessment of floodplain management ordinance and implementation.**
	BACKGROUND INFORMATION	
	Site and Location:	Beck Street, Sullivan Avenue, the proposed subdivision of Lone Oaks
	History of Damages:	Houses in these areas have flooded multiple times during severe storm and flooding events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storms
Effect on new/existing buildings:	This would prevent damage to current homes that have experienced multiple floods and also prevent damage to new buildings by eliminating the development of structures in high hazard areas.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	CIP Funding
Lead Agency/Department Responsible:	City Management
Implementation Schedule:	Within two years from funding

COMMENTS

		Florence-3
	Proposed Action:	**Develop a Capital Improvements Plan**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Florence currently does not have a Capital Improvement Plan, the implementation of which would strongly support the mitigation plan.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000-$25,000
Potential Funding Sources:	SIB, TWDB Grants
Lead Agency/Department Responsible:	Advisory Committee
Implementation Schedule:	Within twelve months from receipt of funds

COMMENTS

City of Hutto

Previous Actions & Analysis –

Not applicable: Hutto is a new community (See Table 1-2)

New Actions

		Hutto-1
	Proposed Action:	**Adopt Smart Growth initiatives and incentive programs to implement them.**
	BACKGROUND INFORMATION	
	Site and Location:	New development in Hutto, especially expansion, extra-territorial jurisdiction, Gateway Overlay, and Shiloh developments.
	History of Damages:	With the City expanding areas are at risk to interface with wildland areas, making them more susceptible to wildfire, especially during the summer periods of drought and extreme heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Wildfire, Extreme Heat, Drought
Effect on new/existing buildings:	Will completely alter character of build environment for new construction.
Priority (High, Moderate, Low):	High
Estimated Cost:	TBD
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Community Development
Implementation Schedule:	February 2009

COMMENTS

		Hutto-2
	Proposed Action:	**Establish and Implement an Agricultural Zoning District to preserve areas of land in high-hazard areas.**
	BACKGROUND INFORMATION	
	Site and Location:	Throughout the city limits.
	History of Damages:	Possible hazard areas have been paved and developed in accordance with our subdivision and zoning ordinances.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Wildfire
Effect on new/existing buildings:	Existing – none; New – removes threat level.
Priority (High, Moderate, Low):	Low
Estimated Cost:	Staff time only
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Community Development Department
Implementation Schedule:	Summer 2009

COMMENTS

		Hutto-3
	Proposed Action:	**Create an evacuation plan, with multiple routes for varying scenarios**
	BACKGROUND INFORMATION	
	Site and Location:	Throughout City limits.
	History of Damages:	The City has not experienced a high hazard event requiring mass evacuation, but currently does not have one in place.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release, Hurricane & Tropical Storm, Wildfire, Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	TBD
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	CD/PW/WCESD#3/CMO/HPD
Implementation Schedule:	TBD

COMMENTS

		Hutto-4
	Proposed Action:	**Arrange for HazMat training for local emergency responders from Union Pacific Railroad.**
	BACKGROUND INFORMATION	
	Site and Location:	Public Works Shop and Union Pacific Rail Line, Hutto.
	History of Damages:	The City has not experienced a derailment, but have prior to when the Missouri Pacific and the Missouri-Kansas-Texas railroads were bought by UP.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release
Effect on new/existing buildings:	Existing – none; New – removes threat level.
Priority (High, Moderate, Low):	Low
Estimated Cost:	TBD
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	PW/WCESD#3/HPD
Implementation Schedule:	Summer/Fall 2009

COMMENTS

		Hutto-5
	Proposed Action:	**Join the Community Rating System of the National Flood Insurance Program, to incentivize new development to maintain existing 1% chance floodplain areas and to reward citizens who obtain flood insurance through the NFIP with lower premiums.**
	BACKGROUND INFORMATION	
	Site and Location:	Anyone under the City's floodplain management jurisdiction.
	History of Damages:	The city has not experienced damages since joining the NFIP.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	More affordable and higher levels of flood insurance.
Priority (High, Moderate, Low):	Medium
Estimated Cost:	Staff time, postage, etc. …
Potential Funding Sources:	Staff salary, TWDB, FEMA
Lead Agency/Department Responsible:	Community Development
Implementation Schedule:	Application to be accepted by September 2009

COMMENTS

		Hutto-6
	Proposed Action:	**Provide access to the public of local Flood Insurance Rate Maps (FIRM) and map ordering information through the City of Hutto website.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide, accessed through website: http://www.huttotx.gov/
	History of Damages:	The city has not experienced damages since joining the NFIP.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Can influence NFIP CRS standing and potentially save buildings within the floodplain (esp. legal non-conforming structures)
Priority (High, Moderate, Low):	High
Estimated Cost:	Free
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	CD/GIS Division
Implementation Schedule:	Immediately

COMMENTS

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This section contains both an analysis of previous actions and new actions for the participating communities in TCRFC Region III. The communities in this section evaluated and analyzed the regional mitigation actions for the TCRFC in Section 21.

Blanco County

Previous Actions & Analysis

		Blanco (Past Action)-1
	Proposed Action:	**Undertake a review of the County's floodplain management ordinance.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Blanco County has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met. With this action, a review of Blanco County's floodplain ordinance will be undertaken. Possible improvements will be considered to move beyond the minimum standards for development in the regulatory floodway.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	2005

2009 Analysis:
This action has been completed.

New Actions

		Blanco County-1
	Proposed Action:	**Improve and strengthen the Emergency Management Radio coverage and reception**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The County is susceptible to a wide range of hazards and one of the most important activities identified by public surveys was the need to communicate severe weather events to the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Improved communication results in increased communication time for protecting structures from severe weather
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	CAPCOG/Governor's Office
Lead Agency/Department Responsible:	County Judge & EMC
Implementation Schedule:	TBD

COMMENTS
Due to the terrain there are many dead spots in the County that do not receive reception.

		Blanco County-2
	Proposed Action:	**Update and maintain a basic Emergency Management Plan that complies with State standards**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Although a large scale hazard event has not been recorded for the County, it is susceptible to both natural and man-made hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Severe Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Response plans provide increase communication and education of residents for implementing structural measures to secure new and existing structures from potential threats
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000
Potential Funding Sources:	TCEQ and TWDB Grants
Lead Agency/Department Responsible:	Emergency Management Coordinator
Implementation Schedule:	TBD

COMMENTS
Several pipelines run through the county with river crossings.

		Blanco County-3
	Proposed Action:	**Work with Extension Agent to develop a Soil Conservation Plan**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The County experiences severe drought and high temperature during the summer months along with depleted ground cover.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Wildfire, Extreme Heat
Effect on new/existing buildings:	This will prevent foundation damage for new and existing buildings
Priority (High, Moderate, Low):	High
Estimated Cost:	$100
Potential Funding Sources:	NRCS/Soil Conservation District
Lead Agency/Department Responsible:	County Judge
Implementation Schedule:	TBD

COMMENTS

		Blanco County-4
	Proposed Action:	**Post burn ban signs and conduct fire risks and plans with other local and State agencies**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Fires have consumed rangeland, outbuildings and hay bales throughout the county. Approximately 1,000 acres were burned in 2008.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Educating residents by posting signs and conducting fire workshops help residents to better protect structures during wildfire events
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,500
Potential Funding Sources:	Texas Forest Service/County funds
Lead Agency/Department Responsible:	County Judge
Implementation Schedule:	TBD

COMMENTS

		Blanco County-5
	Proposed Action:	**Implement and maintain a program for clearing debris from drains and culverts and enact driveway permits.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Past heavy rains cause severe erosion of roads.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms
Effect on new/existing buildings:	Clearing debris will prevent floodwaters from overtopping and damaging existing structures.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Minimal
Potential Funding Sources:	Road and Bridge Fund
Lead Agency/Department Responsible:	Each County Commissioner
Implementation Schedule:	Summer 2009

COMMENTS

		Blanco County-6
	Proposed Action:	**Develop floodplain maps that include the BFE and floodway**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Past heavy rains cause severe erosion of roads.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm
Effect on new/existing buildings:	This will provide better information for homeowners and developers for new structure development.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$50,000
Potential Funding Sources:	FEMA-TCRFC and TWDB grants
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	To begin in 2009

COMMENTS
The old paper maps for the City of Blanco do not provide BFEs, only a small portion of Blanco County has been studied.

City of Johnson City

Previous Actions & Analysis

City of Johnson City (Past Action)-1	
Proposed Action:	**Undertake a review of the City's floodplain management ordinance.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Johnson City has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met. With this action, a review of Johnson City's floodplain ordinance will be undertaken. Possible improvements will be considered to move beyond the minimum standards for development in the regulatory floodway.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	2005

2009 Analysis:
This action has been completed.

New Actions

		JC-1
	Proposed Action:	**Reduce the number of unoccupied and uninhabitable structures in the floodplain.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Debris causes damage during flooding events including culvert stoppage and roadway flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm
Effect on new/existing buildings:	Reduce hazard and damage of new and existing structures by removing structures out of high hazard areas and preventing development of new buildings in floodprone areas.
Priority (High, Moderate, Low):	High
Estimated Cost:	$15,000
Potential Funding Sources:	General Revenues / Grants
Lead Agency/Department Responsible:	Code Enforcement
Implementation Schedule:	January 2010

COMMENTS

		JC-2
	Proposed Action:	**Develop an enforcement plan for mandatory water rationing; impose excess use charges during times of shortage or drought.**
	BACKGROUND INFORMATION	
	Site and Location:	All water users throughout the city
	History of Damages:	Excessive drawdown of wells and possible mining during drought.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Effect on new/existing buildings:	Reduce groundwater withdrawals from wells and reduce potential erosion that can compromise structural integrity of all structures
Priority (High, Moderate, Low):	High
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenues / Grants
Lead Agency/Department Responsible:	Water Department
Implementation Schedule:	May 2009

COMMENTS

		JC-3
	Proposed Action:	**Provide proper design criteria for tornado safe rooms**
	BACKGROUND INFORMATION	
	Site and Location:	City and ETJ
	History of Damages:	Due to rocky soil conditions, storm cellars are not feasible. Life, health and safety would be better protected.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorms, Winter Storms, Hurricane & Tropical Storms
Effect on new/existing buildings:	Tornado safe rooms and other design criteria strengthen existing and new structures
Priority (High, Moderate, Low):	Low
Estimated Cost:	$200,000
Potential Funding Sources:	General Fund/ Grants
Lead Agency/Department Responsible:	Code Enforcement/Building Department
Implementation Schedule:	2009

COMMENTS

		JC-4
	Proposed Action:	**Enhance code enforcement and inspection services**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The community has not experienced an extreme hazard event, but is susceptible to both natural and man-made hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorms, Winter Storms, Hurricane & Tropical Storms, Hail, Flood, Drought, Wildfire
Effect on new/existing buildings:	Foster better building practices in the development of new structures and reduce risk for loss of life and property
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	TBD
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Code Enforcement
Implementation Schedule:	2009

COMMENTS

		JC-5
	Proposed Action:	**Conduct study to assess the city's drainage and culverts and establish the minimum culvert size per location**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Heavy rain reveals problems with undersized culverts and drainage systems. This could cause localized shallow water flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm
Effect on new/existing buildings:	This action would prevent damage to existing buildings and help drainage to new buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$385,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City Street Department; Engineering Contractor
Implementation Schedule:	2010

COMMENTS

		JC-6
	Proposed Action:	**Bring city into compliance with requirements of the National Weather Service Storm Ready Program**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Johnson City experiences both natural and man-made hazards. Maintaining the Storm Ready status would help to ensure that citizens have timely information about conditions. It would also help to train workers about how to inform the public most efficiently about the action they need to take. A "Storm Ready" designation can lead to reduced insurance rates for communities participating in the National Flood Insurance Program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	A better warning system and recommendations for operating during and after hazardous weather, as well as lower insurance rates through the NFIP.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$2,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	June 2010

COMMENTS

		JC-7
	Proposed Action:	**Develop floodplain maps that include the BFE and floodway**
	BACKGROUND INFORMATION	
	Site and Location:	Incorporated area and ETJ of Johnson City
	History of Damages:	The city experiences damaged roadways and backup of culverts during flooding events. An accurate floodplain map is necessary to determine low hazard areas for building and development

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm
Effect on new/existing buildings:	This action would have a substantial beneficial effect for new home builders including more accurate BFE and info. for existing buildings
Priority (High, Moderate, Low):	High
Estimated Cost:	$25,000
Potential Funding Sources:	FEMA/TCRFC/TWDB Grants
Lead Agency/Department Responsible:	Floodplain Administration
Implementation Schedule:	2009-1020

COMMENTS

		JC-8
	Proposed Action:	**Prune and trim trees along streets, utilities and drainage.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Broken limbs and downed trees cause transportation problems in event of evacuation and difficulty in repairs of service after storm events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Weak limbs and trees can potentially damage all structures when downed during severe weather events; pruning and trimming greatly protects structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$500
Potential Funding Sources:	City Revenue
Lead Agency/Department Responsible:	Street Department
Implementation Schedule:	Summer 2009

COMMENTS

Burnet County

Previous Actions & Analysis

		Burnet County (Past Action)-1
	Proposed Action:	**Track and record high water marks following a flood event.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Benefits include improved record-keeping, better historical flood data, and a more sound basis for predicting future flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Beginning in 2004; ongoing

2009 Analysis:
This action is deferred as an ongoing activity.

		Burnet County (Past Action)-2
	Proposed Action:	**Work with the school system to ensure that each school campus has a NOAA Weather Radio and uses it.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	NOAA Weather Radio is a nationwide network of radio stations broadcasting continuous weather information direct from a nearly National Weather Service office. These stations broadcast National Weather Service warnings, as well as post-event information for all types of hazards, both natural and man-made. NOAA Weather Radios are a single source for the most comprehensive weather and emergency information available to the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	High
Estimated Cost:	$55 per radio
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	2005

2009 Analysis:
This action is complete. Weather radios have been installed at city schools.

Burnet County (Past Action)-3	
Proposed Action:	**Train and equip first responders on inter-operative radio communications.**
BACKGROUND INFORMATION	
Site and Location:	Countywide
History of Damages:	This action may save lives by ensuring that first responders (i.e., EMS, Fire) have the necessary training and equipment for detection of and response to weapons of mass destruction incidents.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	High
Estimated Cost:	$20,000
Potential Funding Sources:	General Revenue, Grants
Lead Agency/Department Responsible:	Burnet County, Capital Area Planning Commission
Implementation Schedule:	April 2004; 2010

2009 Analysis:
This action is partially complete. The inter-operative radio has been established, but the County continues to upgrade communication equipment.

		Burnet County (Past Action)-4
	Proposed Action:	**Conduct community awareness programs to inform the public about the hazards they face and actions they can take to prevent or reduce the loss of life and property. This action will be carried out through public speeches for builders, realtors and civic groups such as the Rotary and Kiwanis and making available flood maps in the public library.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	An educated citizenry is one of the best ways to protect against disaster. This action will increase community awareness and foster the adoption of appropriate hazard mitigation measures.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	City Floodplain Administrator
Implementation Schedule:	Beginning in 2004 and ongoing

2009 Analysis:
This action will be deferred as an ongoing activity.

		Burnet County (Past Action)-5
	Proposed Action:	**Revise subdivision regulations to encourage natural drainage easements and greenbelts and establishment of hiking, biking, and equestrian trails.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	This action will help maintain natural drainage, eliminate development in hazardous area, and encourage use of high-hazard areas as open space.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	City Floodplain Administrator
Implementation Schedule:	Beginning in January 2004, revisions to occur on an ongoing basis

2009 Analysis:
This action will be deferred as the County continues to revise subdivision regulations.

Burnet County (Past Action)-6	
Proposed Action:	**Upgrade the low water crossing along County Road 404 with minimal flood frequency to a structure with a 10-15 year flood frequency.**
BACKGROUND INFORMATION	
Site and Location:	CR 404 low water crossing
History of Damages:	With approximately 150 vehicle crossings daily, numerous flooding events on the low water crossing on County Road 404 have put residents and emergency personnel at risk. This action calls for the upgrade of a damaged crossing with concrete approaches, increased drainage, improved anchoring and concrete capping. A 125' crossing structure is needed with 2-4'x6' concrete box drains with a 50' concrete approach on the west side and 125' concrete approach on the east side. With rapid growth in the southern end of Burnet County, this is a logical location for mitigation. Increased traffic and development will require this crossing be upgraded. The action is the most cost effective improvement for a long term solution. This mitigation action will eliminate repeated damage to the approaches during minor flood events and provide for the ingress and egress of residents and emergency vehicles.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$188,750
Potential Funding Sources:	State and Federal Grants
Lead Agency/Department Responsible:	Burnet County Engineering Department
Implementation Schedule:	18 months after grant approval

2009 Analysis:
This action has not been completed and will be deferred.

		Burnet County (Past Action)-7
	Proposed Action:	**Strengthen the approaches to the low water crossing at the intersection of County Road 343 and Camp Creek.**
	BACKGROUND INFORMATION	
	Site and Location:	CR 343 at Camp Creek
	History of Damages:	Repeated flooding has eroded the approaches at each end of the of the low water crossing on County Road 343. This area includes the only access to Camp Creek Park and an un-platted subdivision with approximately 32 residents. Camp Creek Park has one of the few boat ramps for the north side of Lake Travis. The eastern approach requires a concrete approach of 130'x 20' x 6" while the western approach requires a concrete approach of 100'x 20'x 6". Currently the base and chip/seal is eroded during minor flood events. The low water crossing was destroyed during the June 27, 2007 flood event and will be replaced with FEMA assistance. Repeated damage to the approaches and the significant impact of the June 27, 2007 flood event have reinforced the need to upgrade Burnet County's infrastructure to reduce future risk. This action is the most cost-effective solution to eliminate recurring flood damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$43,000
Potential Funding Sources:	ORCA, Local
Lead Agency/Department Responsible:	Burnet County
Implementation Schedule:	2011
2009 Analysis:	
This action is partially complete and will be deferred. An ORCA grant was received in 2007, but the construction has not been completed.	

		Burnet County (Past Action)-8
	Proposed Action:	**Replace approaches to low water crossing and repair crossing structure on County Road 328 at Cow Creek.**
	BACKGROUND INFORMATION	
	Site and Location:	CR 328 at Cow Creek
	History of Damages:	Cow Creek crosses County Road 328 several times. The June 27, 2007 flood event damaged one crossing and destroyed a second crossing. At this particular location, the structure was damaged and the approaches were destroyed. The June 27, 2007 flood was a 500-year event; however, previously 1 – 2 inch rains frequently damaged the approach. This low water crossing has been affected during wet periods by any rain event exceeding 1" per hour. This action will mitigate the risk to approximately 40 structures and 104 individuals. It involves installation of concrete approaches 50' either side of the structure. Each side would receive 50' x 20' x 6 inch thick concrete approaches to prevent loss in repeated flood events. The event that damaged the structure and destroyed the approaches was estimated at a 500-year event. However previously 1"-2" rains frequently damage the approaches. Repetitive damage at this site requires constant input of county labor and money to maintain. The installation of concrete approaches will harden the target and minimize the repairs required after minor flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$18,520
Potential Funding Sources:	ORCA, State and Federal Grants
Lead Agency/Department Responsible:	Burnet County Engineering Department
Implementation Schedule:	2011

2009 Analysis:
This action is partially complete and will be deferred. An ORCA grant was received in 2007, but the construction has not been completed.

		Burnet County (Past Action)-9
	Proposed Action:	**Provide an improved flow structure as the low water crossing at County Road 340 and the intersection of Hamilton Creek is being rebuilt, eliminating a wet crossing.**
	BACKGROUND INFORMATION	
	Site and Location:	CR 340 at Hamilton Creek
	History of Damages:	County Road 340 and the intersection of Hamilton Creek. Approximately 200 persons use this crossing daily. County Road 340 is an alternate route from Burnet to Marble Falls should Highway 281 be closed for any reason. This area is primed for growth and has several properties being considered for development at this time, leading to more traffic in the future. Pending a hydrological study, it is anticipated that this action will utilize concrete box drains with a concrete capped structure along with concrete approaches. It is anticipated that this project will require 100' of concrete approaches, 100' of crossing structure and either Corrugated Metal Pipe or concrete box drains. The extensive damage to this crossing in DR-1709, the age of the structure, and the wet nature of the crossing make this crossing a target for mitigation.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$157,520
Potential Funding Sources:	ORCA, Local
Lead Agency/Department Responsible:	Burnet County Engineering Department
Implementation Schedule:	2011

2009 Analysis:
This action is partially complete and will be deferred. An ORCA grant was received in 2007, but the construction has not been completed.

		Burnet County (Past Action)-10
	Proposed Action:	**Upgrade low water crossing in the City of Highland Haven off of FM 1431 via Burnet County Road 125 and Station Creek.**
	BACKGROUND INFORMATION	
	Site and Location:	CR 125 and FM 1431
	History of Damages:	The City of Highland Haven is accessed off FM1431 via Burnet County Road 125. Station Creek crosses CR 125 just before entering into the city and during rain events can isolate the city. There is no current design standard for the existing flow thru crossing and minimal rain events during wet periods causes either unsafe conditions or closes the crossing. This mitigation action will upgrade the crossing to be passable during at least a 15-year event. This will involve a hydrological study as this area is in zone A. Complete removal is anticipated of the existing structure which consists of 11 Corrugated Metal Pipes (6@36" oval and 5@24" oval) and replacing them with approximately 4- 4'x6' concrete box culverts beneath concrete capping and 50' concrete approaches. This should allow for ingress/egress of citizens and emergency vehicles during normal rain events. This area has grown from a vacation/second home neighborhood into a full-fledged city with more than 800 permanent residents. As the Highland Lakes area grows, so will the City of Highland Haven leaving more people at risk without this project. There are no alternative routes into the city. The completion of this project will allow not only the safe passage of residents but also emergency vehicles, as this area is served by outside sources for law enforcement, fire and Emergency Management Services. This project is currently being planned as a cooperative effort between Burnet County and the City of Highland Haven.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$227,070
Potential Funding Sources:	State and Federal Grants
Lead Agency/Department Responsible:	Burnet County Engineering Department
Implementation Schedule:	18 months after grant approval

2009 Analysis:
This action is partially complete and will be deferred. An HMGP grant was approved by the state and currently pending FEMA approval.

New Actions

		Burnet County-1
	Proposed Action:	**Undertake drainage improvements at low water crossings to increase flow through to two-lane flow through structures with the capacity for at least a 25-year event.**
	BACKGROUND INFORMATION	
	Site and Location:	Cr 118 at Ute Trail Cr 116 at Peter's Creek CR135 at Williams Creek CR 134 at unnamed creek crossing CR 120 at Station Creek, Dry Creek, Backbone Creek and just east of CR120A (4 sites) CR123 at Stream DC-2 (per FIRM panel #48053C0301C) CR 144 at Stream DC-2 (FIRM panel 301C) Paseo de Vaca at Stream DC-2 (FIRM panel 301C) Toby Drive at Stream DC-2 (FIRM panel 301C)
	History of Damages:	During severe thunderstorms, flood or hurricane events the low water crossings are inundated. The area does not pass the required 25-year flow required for emergency access during flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorms, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Floodplain Administration
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Burnet County-2
	Proposed Action:	**Upgrade single lane crossings to two-lane crossing with sizing for a 25-year event.**
	BACKGROUND INFORMATION	
	Site and Location:	CR 207 at Mesquite Creek CR 210 at .2 miles east of CR 210/215 intersection CR 215 at .2 miles south of CR215/210 intersection CR 203 at North Fork of the San Gabriel (Sage) CR208 at Rocky Creek
	History of Damages:	The low water crossings listed above currently flood with a 3-5 year event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorms, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Floodplain Administration
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Burnet County-3
	Proposed Action:	**Replace the single lane flow through with a two lane flow through at the low water crossings**
	BACKGROUND INFORMATION	
	Site and Location:	CR 202 at North Fork of the San Gabriel
	History of Damages:	During severe thunderstorms, flood or hurricane events the low water crossings are inundated.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorms, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Floodplain Administration
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Burnet County-4
	Proposed Action:	**Conduct drainage improvements by replacing the single lane flow through with a two lane flow through at the low water crossings**
	BACKGROUND INFORMATION	
	Site and Location:	CR 323 at South Fork of the San Gabriel
	History of Damages:	The existing crossing is a single lane on a heavily traveled road. There have been several accidents resulting in injuries and fatalities at this location. The structure floods in a 10 year event delaying fire and EMS to approximately 300 citizens in the Thousand Oaks Subdivision.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorms, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	This action would benefit new development and help mitigate against flooding of current structures
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Floodplain Administration
Implementation Schedule:	18 months after receipt of funds

COMMENTS

		Burnet County-5
	Proposed Action:	**Conduct drainage improvements by reinforcing the abutment and concreting the approaches on CR 341**
	BACKGROUND INFORMATION	
	Site and Location:	CR 341 at Hamilton Creek
	History of Damages:	The existing bridge is structurally sound, but the approaches and abutment were destroyed during massive flooding due to severe storms in 2007.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorms, Flood, Hurricane & Tropical Storms
Effect on new/existing buildings:	Reinforcing the abutment and concreting the approaches would secure the crossing from further damage and allow for a constant by-pass for FM1431
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants (FMA/HMGP/PDM/TWDB)
Lead Agency/Department Responsible:	Floodplain Administration
Implementation Schedule:	18 months after receipt of funds

COMMENTS

City of Bertram

Previous Actions & Analysis

		City of Bertram (Past Action)-1
	Proposed Action:	**Complete implementation of the Master Plan for the City adopted on May 27, 2003.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Coordinated actions to both reduce hazards and prevent future disaster damages to public and private property in the city, and to prevent injuries and loss of life to people and animals.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	General Revenues, Grants
Lead Agency/Department Responsible:	City of Bertram
Implementation Schedule:	The Master Plan will be updated every 5 years

2009 Analysis:
This action is complete.

City of Bertram (Past Action)-2	
Proposed Action:	**Install a switch to the emergency warning siren in the city office; purchase a weather alert radio.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	The City has an emergency warning siren on the tank tower in the middle of town. It is activated from the utility department building but the city has recently moved into a new city hall and the utility building is not continually occupied.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	High
Estimated Cost:	Roughly $1,000
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	City of Bertram
Implementation Schedule:	2011

2009 Analysis:
This action is partially complete, but will not be deferred for feasibility. Bertram has weather alert radios, but not a switch to the office because it is not feasible to run the conduit down the street.

New Actions

		Bertram-1
	Proposed Action:	**Increase local rating by participating in the Community Rating System (CRS)**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Participation will increase the County's rating and lower flood insurance premiums for homeowners.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm
Effect on new/existing buildings:	Reduction of flood insurance costs for existing structures; also better informs citizens before developing new structures.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Minimal
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	2010-2011

COMMENTS

		Bertram-2
	Proposed Action:	**Upgrade drought contingency plan and conduct a public awareness campaign regarding the dangers of drought and heat.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Bertram experiences mild to severe drought each summer along with extreme heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	Educating residents regarding xeriscaping increases plantings of shade trees and reduced water use, thus protecting structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000-$5,000
Potential Funding Sources:	General Revenue and Grants
Lead Agency/Department Responsible:	Fire Department
Implementation Schedule:	Annually

COMMENTS

		Bertram-3
	Proposed Action:	**Promote use of energy efficient appliances through an incentive program**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Energy conservation is key in a hazard event where there is the possibility of power outage, or where energy usage is high, such as in a period of extreme heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Severe Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Energy conservation prolongs life of appliances and structures, reduces power outages and pull on structures' electrical systems
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000
Potential Funding Sources:	General Revenue/Grants
Lead Agency/Department Responsible:	City Management
Implementation Schedule:	Annually

COMMENTS

		Bertram-4
	Proposed Action:	**Strengthen warning system through the purchase of two storm warning sirens.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Currently citizens have NOAA weather radios, but the city needs additional warning sirens

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Longer warning time allows residents to retrofit, protect existing structures in the event of approaching storms
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	2011

COMMENTS

		Bertram-5
	Proposed Action:	**Develop a pamphlet/brochure educating the public on emergency evacuation procedures in the event of a natural hazard such as a tornado or man-made hazard.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Public surveys indicate awareness of hazard events as a primary concern for citizens

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Awareness and education of residents afford more action to protect new and existing structures from approaching storms
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	General Revenue/Grants
Lead Agency/Department Responsible:	City Management
Implementation Schedule:	Beginning in 2010 and updated annually

COMMENTS

		Bertram-6
	Proposed Action:	**Purchase generator for City Hall**
	BACKGROUND INFORMATION	
	Site and Location:	City Hall
	History of Damages:	City Hall is set up to be the emergency center in the event of a disaster. The City Hall is set up to be the emergency center because it is a center command center and the strongest building.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Will provide for backup power in the event of a disaster.
Priority (High, Moderate, Low):	High
Estimated Cost:	$35,000.00
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	2010-2011

COMMENTS
Bertram needs a generator large enough to provide for power in the event of a disaster. A special switch is also needed in order to start the generator. The switch alone costs $2,000.00. City Council will have to look at costs before purchasing the generator.

		Bertram-7
	Proposed Action:	**Revise comprehensive Land Use Plan**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City is prone to damages for drought/heat; flooding; tornadoes; and thunderstorms, and needs a revised comprehensive plan to help address the growing needs of a developing community.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Drought, Extreme Heat, Thunderstorm
Effect on new/existing buildings:	A land use plan would facilitate growth in the city by looking at perspective areas for building/development.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Depends on partnering opportunities
Potential Funding Sources:	Grants/LCRA
Lead Agency/Department Responsible:	City with assistance from LCRA
Implementation Schedule:	2010-2011

COMMENTS
As noted in the City's capability assessment survey, a plan is currently in place. This plan was developed by LCRA. Land Use plans should be reviewed and revised about every 3 years to assess new growth and opportunities.

City of Burnet

Previous Actions & Analysis

Not applicable as the City of Burnet is a new community (See Table 1-2)

New Actions

		Burnet-1
	Proposed Action:	**Promote water and energy conservation to the general public and governmental agencies**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Members of the public and governmental officials can make an important contribution to water and energy conservation efforts. Water conservation awareness is important year-round. However, educational efforts will be intensified upon receipt of an advisory regarding an impending drought.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Effect on new/existing buildings:	Promotes xeriscaping planting, shade tree structures to protect structures and reduced water usage.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Minimal
Potential Funding Sources:	General City Revenue
Lead Agency/Department Responsible:	Water and electric departments in cooperation with emergency management coordinator.
Implementation Schedule:	2009 and ongoing

COMMENTS
Water and energy are critical resources that need to be used efficiently. This action will make the public and governmental officials aware of steps they can take to promote water and energy conservation.

		Burnet-2
	Proposed Action:	**Educate residents about water conservation and landscape planting practices to preserve water supplies.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City is prone to damages for drought/heat especially during the summer months. t is critical that Burnet residents are educated about water conservation and landscaping practices that conserve water supplies. Topics to be addressed in this educational program include water conservation measures, selection of drought tolerant plants for reducing water demands outdoors, weed and brush control to reduce the impact of drought and increase water yields, drought assistance that may be available through State and Federal agencies (including the LCRA), and information to mitigate the effects of drought on wildlife.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Effect on new/existing buildings:	Better education and informed residents promote improved planting practices to shade structures, reduce water consumption for structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Minimal
Potential Funding Sources:	General City Revenue
Lead Agency/Department Responsible:	Water and Building Departments
Implementation Schedule:	2009 and ongoing

COMMENTS
This educational program is intended to make citizens more aware of steps that can be taken to more efficiently use water.

		Burnet-3
	Proposed Action:	**Undertake a comprehensive review of the City's floodplain management ordinance.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City of Burnet has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met. With this action, a review of the City of Burnet's floodplain management ordinance will be undertaken. Possible improvements will be considered to move beyond the minimum standards for development in the regulatory floodplain.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm
Effect on new/existing buildings:	More stringent building practices including increased freeboard reduces flooding and drainage problems for all structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General City Revenue
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	To be complete by 2010

COMMENTS
T his review, coupled with a comprehensive periodic review after, will ensure that this ordinance is maintained in a current manner. This action will examine the potential effects of new development on the hydrology of the watersheds within our jurisdiction, and raise community awareness about potential hazards resulting from new development.

		Burnet-4
	Proposed Action:	**Establish a post-disaster debris management plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Disasters generate a variety of debris, including vegetative matter, building/construction material, appliances, personal property, mud and sediment. The quantity and type of debris is a function of the location and type of event. This action will foster a unified and coordinated approach to response to any debris-generated disaster. It will develop a plan for the most efficient and effective methods to resolve disaster debris removal and disposal issues; expedite debris response and recovery efforts that will mitigate secondary impacts to health, safety and welfare.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hail, Winter Storm, Tornado, Hurricane & Tropical Storm
Effect on new/existing buildings:	Reduced debris reduces obstruction of waterways, out of bank flooding contributing to flooding of structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General City Revenue
Lead Agency/Department Responsible:	Code Enforcement, Public Works, Emergency Management
Implementation Schedule:	2009

COMMENTS

		Burnet-5
	Proposed Action:	**Revise and update community FIRMs.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The current FIRM has an effective date of 16 November 1992. The increased growth within the jurisdiction during the intervening years has resulted in numerous alterations to the identified special flood hazard areas. Additionally, in one specific case, the FEMA identified floodplain is located in error on the FIRM.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm
Effect on new/existing buildings:	This would help define areas that are at risk to better protect existing structures in the floodplain and also prevent development in high hazard areas.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Federal and state grants
Lead Agency/Department Responsible:	FEMA, consulting engineers
Implementation Schedule:	2010

COMMENTS
A reliable FIRM will serve as the basis for making decisions about mitigation actions within the floodplain. Additional benefits include the ability to make more accurate assessments as to the actual floodplain boundaries when requested for specific properties, development planning and keeping the public informed about the potential hazards associated with floods to private property.

City of Cottonwood Shores

Previous Actions & Analysis

City of Cottonwood Shores (Past Action)-1	
Proposed Action:	**Undertake a review of the City's floodplain management ordinance.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Cottonwood Shores has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Beginning in 2005; ongoing

2009 Analysis:
This action is deferred as an ongoing activity.

New Actions

		CWS-1
	Proposed Action:	**Establish annual review of the city's floodplain ordinance**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city experiences wash out from flooding events

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm
Effect on new/existing buildings:	An updated and current ordinance promotes increased freeboard and reduced drainage problems for all structures
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Minimal
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Annually

COMMENTS

		CWS-2
	Proposed Action:	**Identify emergency escape routes and crisis plan and educate the public on low-lying areas.**
	BACKGROUND INFORMATION	
	Site and Location:	Location immediately downstream from Wurtz Dam
	History of Damages:	Area immediately downstream from Wurtz Dam

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Dam Failure, Terrorism, Flood
Effect on new/existing buildings:	Emergency plans and better warning improve and protect structures and residents and provide additional warning time
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000-$5,000
Potential Funding Sources:	General Fund, Grants
Lead Agency/Department Responsible:	City Management
Implementation Schedule:	2010-2012

COMMENTS

		CWS-3
	Proposed Action:	**Conduct routine maintenance of fire hydrants and purchase more fire hydrants**
	BACKGROUND INFORMATION	
	Site and Location:	Dry hydrants that connect to the river throughout the city.
	History of Damages:	The City has experienced drought, extreme heat and wildfire during the summers

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	This would better protect existing structures. Routine maintenance helps to ensure all hydrants are fully functional in order to prevent damage to existing structures in a wildfire event.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Volunteer Fire Department
Implementation Schedule:	Ongoing

COMMENTS

		CWS-4
	Proposed Action:	**Conduct public awareness of hailstorm and tornado for mobile home community.**
	BACKGROUND INFORMATION	
	Site and Location:	North eastern section of the city
	History of Damages:	Originally city developed as mobile home community; significant area of mobile homes; recent storms caused substantial damage to mobile home communities

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hailstorm, Tornado, Winter Storm, Hurricane & Tropical Storm
Effect on new/existing buildings:	This will strengthen building development for the mobile home community. Also this action will help maintain mobile homes as people are better-informed and can better protect their existing property.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000-$5,000
Potential Funding Sources:	Revenue/Grants
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	Annually

COMMENTS
City has adopted the NACE electric code and ICC

		CWS-5
	Proposed Action:	**Pursue new building ordinance that will focus on green planning and construction including xeriscaping for trails that connect parks.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city experiences moderate to severe drought each season and is currently in a period of exceptional drought.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	Xeriscaping helps reduce water usage and drought which can lead to foundation problems for existing buildings.
Priority (High, Moderate, Low):	Low
Estimated Cost:	Unknown
Potential Funding Sources:	General Funds/Revenue
Lead Agency/Department Responsible:	City Council/Mayor
Implementation Schedule:	2010

COMMENTS

City of Granite Shoals

Previous Actions & Analysis

		City of Granite Shoals (Past Action)-1
	Proposed Action:	**Undertake a review of the City's floodplain management ordinance.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Granite Shoals has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Beginning in 2005 and ongoing

2009 Analysis:
This action is deferred as an ongoing activity.

New Actions

		GS-1
	Proposed Action:	**Clean main Elm Creek and tributaries**
	BACKGROUND INFORMATION	
	Site and Location:	Elm Creek is located on the northeastern area of the city.
	History of Damages:	This area contains lots of fill, trees, and appliances, and with any rain event the creek overflows the banks and causes flooding along the floodway area into surrounding areas

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm
Effect on new/existing buildings:	This action will help prevent damage to new and existing buildings by reducing the effect of flooding
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Funding/General Revenue
Lead Agency/Department Responsible:	USACE/public works
Implementation Schedule:	To be complete by 2013

COMMENTS

		GS-2
	Proposed Action:	**Continual review and maintenance of the city drought ordinance**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city experiences drought and extreme heat each summer.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	Promote xeriscaping and planting of shade structures to protect structures during severe heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	No cost associated
Potential Funding Sources:	City
Lead Agency/Department Responsible:	Building department
Implementation Schedule:	Ongoing – yearly review

COMMENTS

		GS-3
	Proposed Action:	**Conduct study on new sewer treatment plant**
	BACKGROUND INFORMATION	
	Site and Location:	2101 Phillips Ranch Road
	History of Damages:	Everything on individual septic system; need new city wide

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hail, Winter Storm, Hurricane & Tropical Storm, Hazardous Material Release, Terrorism
Effect on new/existing buildings:	Public sewer opposed to individual septic systems offer better protection of residents and structures with regard to potential flooding from overload of individual septic systems during storm events
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	unknown
Potential Funding Sources:	grants
Lead Agency/Department Responsible:	City manager
Implementation Schedule:	unknown

COMMENTS

		GS-4
	Proposed Action:	**Purchase new warning siren system**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	City currently uses 30 year old siren that can't be heard past a roofline- inadequate

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Improved and additional warning time gives residents more time to protect, retrofit existing and new structures during storm events
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public works
Implementation Schedule:	Within one year from receipt of funds

COMMENTS

City of Highland Haven

Previous Actions & Analysis

		City of Highland Haven (Past Action)-1
	Proposed Action:	**Undertake a review of the City's floodplain management ordinance.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Highland Haven has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Beginning in 2005; ongoing

2009 Analysis:
This action is complete, and will be deferred for the 2009 Plan as an ongoing activity.

City of Highland Haven (Past Action)-2	
Proposed Action:	**Design and install drainage ditches and or culverts in six areas of the city to increase capacity to remove storm water runoff to reduce the number of homes flooded during heavy rainstorms. These areas are:** **1. Bluebird Circle / Bluebird Lane** **2. Flamingo Circle / Lark Road** **3. 1400 Highland Drive** **4. Redbird St / 700 Highland Drive** **5. Robin Road / Dove Road** **6. Pheasant Road at Oriole Road**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	As Highland Haven was built starting in about 1962, the flooding of homes has become a gradually increasing problem because of inadequate means of removing rain storm runoff. The situation is greatly affected by the increase of impervious cover, as the city has become more than 90% built out. Shallow bar-ditches and small-bore culverts are no longer adequate to handle the runoff from large storms in several areas of the city.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$90,000
Potential Funding Sources:	State and Federal Grants, City budget 25% match
Lead Agency/Department Responsible:	City of Highland Haven Engineering Department
Implementation Schedule:	22 months project duration

2009 Analysis:
This action is deferred pending funding.

New Actions

		HH-1
	Proposed Action:	**Purchase supplies such as blankets/cots/pillows for community center in the event of a disaster or assisting evacuees from neighboring communities**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has not had to assist with a large amount of evacuees to date.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Hurricane & Tropical Storm, Hail, Winter Storm
Effect on new/existing buildings:	None
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$4,000
Potential Funding Sources:	Federal Grants
Lead Agency/Department Responsible:	City
Implementation Schedule:	2009-2013

COMMENTS

		HH-2
	Proposed Action:	**Provide box fans for citizens for summer heat**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city experiences periods of extreme summer heat and drought during the summer months

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	Homes cooled with fans or window units will keep structures cooler and less prone to deterioration
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$250
Potential Funding Sources:	General Revenue/Grants
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	Summer 2009 and ongoing

COMMENTS

		HH-3
	Proposed Action:	**Purchase sandbags and place around dams for dam break**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	A dam failure has not occurred but if one did, two thirds of the community would be flooded

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Dam Failure, Terrorism
Effect on new/existing buildings:	This would prevent damage to existing properties in inundation areas and also any new structures that are developed.
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	Grants/General Revenue
Lead Agency/Department Responsible:	City management
Implementation Schedule:	2009-2011

COMMENTS

		HH-4
	Proposed Action:	**Provide education for subdivisions regarding flood /fire procedures and the Turn Around Don't Drown Program**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Right now low water crossings prevent ingress and egress in a flood event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Wildfire
Effect on new/existing buildings:	TADD helps residents to understand the dangers of flood and actions they can take to prevent damage to their homes and property
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	City Management
Implementation Schedule:	2009 and ongoing

COMMENTS
Issue Turn Around Don't Drown (TADD) materials where available.

		HH-5
	Proposed Action:	**Implement a call assistance system to reach citizens of Highland Haven during flood or fire events.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Currently low water crossings prevent ingress and egress in a flood event. Burnet County has a call system that police use during a flood or fire event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Wildfire
Effect on new/existing buildings:	Longer warning time with early notification allows residents to protect new and existing structures with sandbags and other mitigation efforts during severe weather events
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000
Potential Funding Sources:	Federal and State Grants
Lead Agency/Department Responsible:	City Management
Implementation Schedule:	2009 and ongoing

COMMENTS

		HH-6
	Proposed Action:	**Educate citizens about purchasing flood insurance through the National Flood Insurance Program**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Highland Haven residences are susceptible to damage during a severe storm or flooding event. Because of the geography of the city, many areas become blocked off when floodwaters inundate low water crossings. Citizens are also at risk when attempting to go through low water crossings.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane & Tropical Storm, Thunderstorm
Effect on new/existing buildings:	This action would prevent damage to existing buildings and also development in high hazard areas
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000
Potential Funding Sources:	City Revenue/Grants
Lead Agency/Department Responsible:	City
Implementation Schedule:	Ongoing

COMMENTS
Advertise free training provided by the TFMA and LCRA where available.

		HH-7
	Proposed Action:	**Develop agreement to lease a water truck for up to one month, if needed, for loss of water in a disaster event.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	There has not been a substantial disaster event which required the leasing of a water truck. However, in a natural or man-made disaster it will be imperative to get potable water to citizens.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	None
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City and Burnet County
Implementation Schedule:	2010

COMMENTS

		HH-8
	Proposed Action:	**Close gates for low water crossings at the entrance to Highland Haven.**
	BACKGROUND INFORMATION	
	Site and Location:	Entrance to Highland Haven
	History of Damages:	The City experienced damage from torrential flooding in the summer of 2007. Areas of the town were shut off completely due to floodwaters washing out culverts and inundating low water crossings on county roads. Swing gates are needed on both sides of the entrance to Highland Haven to prevent citizens from driving through dangerous areas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Gates would prevent damage to existing property.
Priority (High, Moderate, Low):	High
Estimated Cost:	$2,500
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City
Implementation Schedule:	2009

COMMENTS
Swing gates needed on both sides because see people drive through.

		HH-9
	Proposed Action:	**Purchase generator for City Hall and emergency radios for emergency personnel**
	BACKGROUND INFORMATION	
	Site and Location:	City Hall
	History of Damages:	During previous disaster events the city has experienced power outages. With a generator, City Hall would act as an emergency operations center for first responders. Emergency radios would allow personnel to communicate when the power is down.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Better communication allows earlier warning to residents and businesses for protecting property during disaster events
Priority (High, Moderate, Low):	High
Estimated Cost:	$35,000
Potential Funding Sources:	State and Federal Grants
Lead Agency/Department Responsible:	City Management
Implementation Schedule:	2010

COMMENTS

City of Marble Falls

Previous Actions & Analysis

		City of Marble Falls (Past Action)-1
	Proposed Action:	**Undertake a review of the City's floodplain management ordinance.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Marble Falls has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	Beginning in 2005 and ongoing

2009 Analysis:
This action is deferred as an ongoing activity.

City of Marble Falls (Past Action)-2	
Proposed Action:	**Install computer-based flood warning system with remote flashers and remote automatic gates at nine locations.**
BACKGROUND INFORMATION	
Site and Location:	The approximate locations for this project are: 1. Lakeview Drive between Edyth Street and Brazos Street 2. Avenue N between Second Street and Backbone Street 3. Broadway and Main Street 4. Broadway and Avenue J 5. Broadway between Avenue L and Avenue O 6. Broadway between Avenue Q and Avenue R 7. Broadway between Avenue U and Industrial Street 8. Mission Hills Drive between Bluebonnet Street and Avenue K 9. Oakridge Drive between Hi Way 281 and Nature Heights Drive
History of Damages:	There are nine low water crossings in the City of Marble Falls that flood regularly every year. Currently the city has two manual gates at two of the locations. City personnel must close the two gates manually and then erect barricades at the other crossings. During a flood event, a team of City personnel must inspect each low water crossing site to determine if the barricades need to be erected and the gates closed. While the teams are at one crossing other crossings may be flooded with nothing stopping the driving public from driving across the low water crossings. This situation leaves the driving public in a life-threatening situation. Once the event is over, the team of city personnel must open the two gates and take down the barricades at the remaining seven low water crossings. A delay in this process delays the resumption of the natural flow of traffic, which can delay emergency vehicle response. The system is a Mark XG computer-based flood warning system with remote flashers and remote automatic gates designed to be monitored with both Web and PC based software. This system is configured for the dual lane city and county roads. The gates span up to 20’ to cover one inbound lane of traffic. Extra gates can be ordered to close the outbound lanes of traffic from the low water crossing to achieve a complete shut down around the flood hazard.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$650,250
Potential Funding Sources:	Local and State Grants, General Revenues
Lead Agency/Department Responsible:	City of Marble Falls
Implementation Schedule:	12 months after grant approval

2009 Analysis:
This action has not been completed and will be deferred for the 2009 Plan.

City of Marble Falls (Past Action)-3	
Proposed Action:	**Install an alert AM Emergency Advisory Radio System.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	It was made evident after the flooding event (DR-1709-TX) that a mass communication system for the residents and visitors to the City of Marble Falls needed to be implemented. There were bridges destroyed and roads closed. With the sewer and water plants damaged and not operational for many days, the city had to provide temporary solutions including bottled water and temporary portable toilets. There was no effective way of communicating to the public at large to provide the locations of the water and toilet facilities and the location of the destroyed roads and bridges.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$30,000
Potential Funding Sources:	Local and State Grants, General Revenues
Lead Agency/Department Responsible:	City of Marble Falls
Implementation Schedule:	12 months after grant approval

2009 Analysis:
This action has not been completed. The City has applied for a grant, but it has not been approved. Therefore this action will be deferred for the Plan Update .

City of Marble Falls (Past Action)-4	
Proposed Action:	**Acquire residential (10 mobile homes and 2 single family) and commercial (5 parcels) property with substantially damaged structures located in the flood plain and relocation them out of floodplain.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	After the 2007 flood event, DR-1709-TX, it became evident that acquisition is the only hazard mitigation method that addresses the problem of repetitive losses and will prevent similar future damages. After consideration of a range of options it is the most practical, cost effective and environmentally sound action for the City of Marble Falls. The commercial property acquisition is necessary to keep the business, its local employees and investment in the City of Marble Falls. This property is the largest employer in the city. The economic impact is estimated at $8 million dollars

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$990,000
Potential Funding Sources:	Local and State Grants, General Revenues
Lead Agency/Department Responsible:	City of Marble Falls
Implementation Schedule:	12 to 18 months after grant approval

2009 Analysis:
This action is 50% complete. Therefore this action will be deferred for the Plan Update.

New Actions

		MF-1
	Proposed Action:	**Complete Fire Wise Community project during 2009 year.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Marble Falls is seeking to have Fire Wise Certification for those areas within the city limits of Marble Falls.
	History of Damages:	Wildfire is a major concern with the city recently annexing 1400 acres of agricultural land scheduled for development in the next few years. The new annexation will stretch the ability of the local fire department to respond to wildland fires in this area as the annexation is in rough terrain with accessibility problems.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Drought
Effect on new/existing buildings:	Prevention of fire impact
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$2,500.00
Potential Funding Sources:	State, federal
Lead Agency/Department Responsible:	Marble Falls Fire Rescue
Implementation Schedule:	Completion by end of 2009

COMMENTS

		MF-2
	Proposed Action:	**Build highway bypass and bridge bypassing communities in Burnet County in order to provide alternate transportation route for hazardous materials in the cities and counties.**
	BACKGROUND INFORMATION	
	Site and Location:	Streets and highways within city limits of Marble Falls
	History of Damages:	Estimate 1-3 instances per year.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release, Terrorism
Effect on new/existing buildings:	Protect people in buildings and on roadways in close proximity to those materials being transported through the communities.
Priority (High, Moderate, Low):	High
Estimated Cost:	$45,000,000.00
Potential Funding Sources:	State, Federal
Lead Agency/Department Responsible:	City of Marble falls, Burnet County
Implementation Schedule:	2010-2015

COMMENTS
Develop alternate roadways that bypass cities of Burnet and Marble falls. Must build second bridge over Lake Marble Falls and roadway to form a connecting loop which will affect hazardous materials bypass in ours and others communities in Burnet County.

		MF-3
	Proposed Action:	**Build bridge to span creek on Mission Hills Street.**
	BACKGROUND INFORMATION	
	Site and Location:	Mission Hills Street within City Limits of Marble Falls
	History of Damages:	This street is often closed (6-12 times per year) for flash flooding due to storms on our watershed. This street is major east west connection on the north side of community. Disruption of critical traffic flow has been caused for this major connection between a federal building (post office), school, and disaster shelter (Methodist Church) due to flooding isolating school children and preventing use of the designated shelter.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flooding, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Allow use of disaster shelters in storms, schools, and Federal building by community.
Priority (High, Moderate, Low):	High
Estimated Cost:	$2,000,000.00
Potential Funding Sources:	State, Federal
Lead Agency/Department Responsible:	City of Marble Falls
Implementation Schedule:	2010-2015

COMMENTS
A bridge over this easily flooded area would provide increased safety for citizens in our community that depend on this major east west connection in our community.

		MF-4
	Proposed Action:	**Purchase floodway that is privately owned within the city limits of Marble Falls**
	BACKGROUND INFORMATION	
	Site and Location:	Private properties along FEMA designated floodways within the city limits of Marble Falls.
	History of Damages:	These private properties designated as floodways are continually flooded during major storms in the city and north of the city on the watershed. Private owners are unable to clean debris that accumulate due to flooding causing even more severe flooding during subsequent flood events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Potential decrease of number of flooded structures as the city purchases floodway properties and subsequent preventative maintenance of those properties by the city.
Priority (High, Moderate, Low):	High
Estimated Cost:	$750,000.00
Potential Funding Sources:	State and Federal
Lead Agency/Department Responsible:	City of Marble Falls
Implementation Schedule:	2009-2015

COMMENTS
The purchase of these properties would allow the city to begin proper maintenance of the floodways using specialized equipment and a scheduled maintenance program thereby lowering the amount of flooding in these neighborhoods.

		MF-5
	Proposed Action:	**Install computer-based flood warning system with remote flashers and remote automatic gates at nine low water crossings**
	BACKGROUND INFORMATION	
	Site and Location:	Lakeview Drive, Ave. N, Broadway and Main Street, Broadway and Ave. J, Broadway and L, Broadway and Q, Broadway and U, Mission Hills drive, Oakridge Dr.
	History of Damages:	These low water crossings flood during thunderstorms and flashflood events necessitating the closing of manual gates by public safety officials who often busy at other emergency situations which often slows the timely closing of these gates thereby causing an unsafe situation for citizens. In one flood 21 cars were swept into the swollen creeks by a flashflood event within the city limits.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flooding, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Life safety of those traveling the streets of our community
Priority (High, Moderate, Low):	High
Estimated Cost:	$750,000.00
Potential Funding Sources:	State and Federal
Lead Agency/Department Responsible:	City of Marble falls
Implementation Schedule:	2009-2015

COMMENTS

		MF-6
	Proposed Action:	**Develop master drainage plan using currently available data plus new field survey data and information from prior studies to evaluate significant changes and proposals for evaluation of needs based on that research.**
	BACKGROUND INFORMATION	
	Site and Location:	Flood areas including floodways, flood plains, and drainage creeks within the city limits of Marble Falls
	History of Damages:	Marble Falls has a history of flooding each year due to the large area of the inhabited city in the flood plain. The changes due to construction and recent floods dictate that we explore critical changes in the drainage system in our community

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Ability to accurately depict flood actions in our community for existing and new development.
Priority (High, Moderate, Low):	High
Estimated Cost:	$300,000.00
Potential Funding Sources:	State and Federal
Lead Agency/Department Responsible:	City of Marble falls
Implementation Schedule:	2009-2012

COMMENTS
This project is a high priority in our community due to the number of flood incidents per year and due to the cost benefit ratio of the study.

City of Meadowlakes

Previous Actions & Analysis

		City of Meadowlakes (Past Action)-1
	Proposed Action:	**Develop a coordinated debris management and removal plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	This action will foster a unified and coordinated approach to response to any debris-generating disaster. It will develop a plan for the most efficient and effective methods to resolve disaster debris removal and disposal issues; expedite debris response and recover efforts that will mitigate secondary impacts to health, safety and welfare. Coordinated efforts with Marble Falls would be more efficient and cost productive.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Meadowlakes City and MUD
Implementation Schedule:	January 2004

2009 Analysis:
This action is complete. Meadowlakes sent a representative to a Debris Management Seminar. The city also has contacts to call for help, but considering most of the acreage is privately owned, the city is limited by regulations.

City of Meadowlakes (Past Action)-2	
Proposed Action:	**Develop emergency evacuation plans, policies and procedures and ensure the availability of emergency services in the event of disaster.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Because of location, Meadowlakes must egress through Marble Falls where streets are below the 100-year floodplain or must exit through open ranchland. Plans, policies and procedures need to be developed to allow residents to evacuate and to enable emergency personnel to come into the area and provide emergency fire or medical services.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Marble Falls Volunteer Fire Department, Marble Falls Emergency Medical Services, City of Meadowlakes Council
Implementation Schedule:	January 2004

2009 Analysis:
This action is complete. Evacuation concerns have been met. Meetings and phone calls with county officials, EMS and Fire Department, and the Red Cross were conducted to complete this action. The city's contracts with EMS, Burnet County, and Fire Department are also current.

City of Meadowlakes (Past Action)-3	
Proposed Action:	**Undertake a review of the City's floodplain management ordinance.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	The City of Meadowlakes is currently rated a level one (Excellent) in the Coalition's Local Floodplain Assessment. The City meets the minimum requirements of the National Flood Insurance Program and of State law. With this action, a review of the City's floodplain management ordinance will be undertaken. Possible improvements will be considered to move beyond the minimum standards for development in the regulatory floodway. The City will also seek to participate in the NFIP Community Rating System.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	Moderate
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Floodplain Administrator, Mayor of Meadowlakes
Implementation Schedule:	2012

2009 Analysis:
Meadowlakes has partially completed this action; therefore, it will be deferred for the 2009 plan to be completed in 2012. The City was not able to obtain a National Flood Insurance Rating up to Level 2 because records did not date far enough back. A new target date of 2012 has been established, and the city will remain in correspondence regarding same.

City of Meadowlakes (Past Action)-4	
Proposed Action:	**Develop a plan with POA to work with residents to prune trees and clear tree limbs in the right-of-way.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Streets are maintained by POA (private streets). It is currently the responsibility of City residents to trim their trees. They are encouraged through educational newsletters. The City has many large, old pecan trees on private property.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Winter Storm, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	City of Meadowlakes, Meadowlakes POA
Implementation Schedule:	Beginning in 2004 and ongoing

2009 Analysis:
This item has been completed, but will be deferred as it is an ongoing educational experience. Ordinance Number 2008-12 (Tree Overhang) was passed 8 December, 2008.

New Actions

		ML-1
	Proposed Action:	**Conduct a study and evaluation of access and road conditions for emergency response vehicles**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Street flooding and windblown debris/limbs clogs drainage systems and prevents ingress and egress during natural hazard events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm, Winter Storm, Hail
Effect on new/existing buildings:	Access in emergency situations allows for support teams to aid in protecting properties during disaster events
Priority (High, Moderate, Low):	High
Estimated Cost:	Minimal
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	Ongoing

COMMENTS

		ML-2
	Proposed Action:	**Assess city's water supply and water treatment system following in the event of a terrorism alert**
	BACKGROUND INFORMATION	
	Site and Location:	City water facilities
	History of Damages:	The community has never experienced a terrorist event, but a study is needed to assess the susceptibility of the water treatment and water supply to mitigate any natural or man-made disaster.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release, Terrorism
Effect on new/existing buildings:	Buildings may be retrofitted or constructed to mitigate terrorism or other disaster event with more sustainable building materials
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Minimal
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Public Works Department
Implementation Schedule:	2010 with updates as needed

COMMENTS
The study would be for the water supply and water system of only the Meadowlakes jurisdiction.

		ML-3
	Proposed Action:	**Purchase NOAA "All Hazards" radios for critical facilities throughout the jurisdiction**
	BACKGROUND INFORMATION	
	Site and Location:	City Hall and Public Works buildings
	History of Damages:	The community has not experienced a large-scale disaster, but NOAA radios help to better inform and protect citizens and property in the event of a natural or man-made hazard event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Better informed citizens are more educated in protecting structures during hazard events
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100 per unit
Potential Funding Sources:	General Revenue/Grants as needed
Lead Agency/Department Responsible:	Emergency management
Implementation Schedule:	2009

COMMENTS
Action to be completed in 2009 with acquisition of all required NOAA radios.

Llano County

Previous Actions & Analysis

		Llano County (Past Action)-1
	Proposed Action:	**Employ consulting engineers to assess the County's drainage ways, culverts and bridges and make needed improvements.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Llano County has many roads that become impassable during high water events. Some areas leave no evacuation route for residents and they may become stranded.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$250,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Roads and Bridges
Implementation Schedule:	2012

2009 Analysis:
This item has not been completed and will be deferred. The County commissioner in Precinct 2 is working with large drainage areas that are privately owned. Engineers have not been hired by the County, but effort has started. The County is also awaiting FEMA approval for grants.

		Llano County (Past Action)-2
	Proposed Action:	**Digitize hardcopies of public records and store them in hazard-free offsite locations.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	No site exists at which to store critical information belonging to the County. In the event of a fire, flood or tornado, the County would likely lose valuable and non-replaceable records.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Dam Failure, Drought, Extreme Heat, Hail, Hazardous Materials Release, Hurricane and Tropical Storm, Pipeline Failure, Terrorism, Thunderstorm, Wildfire, Winter Storm
Priority (High, Moderate, Low):	High
Estimated Cost:	$25,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	County Clerk
Implementation Schedule:	2010

2009 Analysis:
This item is partially complete and will be deferred for the 2009 Plan. The County Clerk began the process of digitizing the records in 2006, but the project is not complete.

		Llano County (Past Action)-3
	Proposed Action:	**Bring the County into compliance with the requirements of the National Weather Service program Storm Ready.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	By designating them as "Storm Ready," the National Weather Service recognizes local communities that have demonstrated a strong commitment to putting the infrastructure and systems in place that will save lives and protect property in the event of a severe weather event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Dam Failure, Drought, Extreme Heat, Hail, Hazardous Material Release, Hurricane and Tropical Storm, Pipeline Failure, Terrorism, Thunderstorm, Wildfire, Winter Storm
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$15,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	Began November 2004; deferred for 2011

2009 Analysis:
The County is still working towards becoming Storm Ready. This action is deferred as it is ongoing.

		Llano County (Past Action)-4
	Proposed Action:	**Explore the possible installation of outdoor warning sirens. Investigate available equipment, determine type of sirens recommended, their placement and the installed costs. Investigate operating and maintenance costs. Interview existing system owners to determine level of satisfaction and problems encountered.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The County currently relies upon Volunteer Fire Departments, Sheriff's Deputies, commercial radio, television, cable television and in limited cases, NOAA Weather Alert Radios to disseminate warnings to the public. Llano County has a significant number of elderly homebound citizens that would benefit from warning systems located at several spots throughout the County. Only one community has a system at present and there are several in harm's way.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Dam Failure, Drought, Extreme Heat, Hail, Hazardous Materials Release, Hurricane and Tropical Storm, Pipeline Failure, Terrorism, Thunderstorm, Wildfire, Winter Storm
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$400,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	2012

2009 Analysis:
The County Commissioner in Kingsland determined need. This action is partially complete and will be deferred.

		Llano County (Past Action)-5
	Proposed Action:	**Complete the Llano County Emergency Plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	In 2000, FEMA and the Texas Division of Emergency Management (DEM) revised the format for emergency plans used by all jurisdictions in the State. Many of the changes made existing plans obsolete. The Llano County Office of EM has been working to update its plan to current standards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Dam Failure, Drought, Extreme Heat, Hail, HAZMAT, Hurricane and Tropical Storm, Pipeline Failure, Terrorism, Thunderstorm, Wildfire, Winter Storm
Priority (High, Moderate, Low):	High
Estimated Cost:	$100
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	2005

2009 Analysis:
This item has been completed. The County met all deadlines in updating the plan, with only four areas remaining for upgrade.

		Llano County (Past Action)-6
	Proposed Action:	**Clean areas of debris and upgrade culverts/bridges damaged from flooding on June 16, 2007 at County Road 320 (River Oaks Drive) one-quarter mile in from FM 340 and at other sites.**
	BACKGROUND INFORMATION	
	Site and Location:	County Road 320 (River Oaks Drive) one-quarter mile in from FM 340
	History of Damages:	Llano County is a flood-prone area and several bridges and large culvert areas need specific engineering studies and a more permanent culvert system to prevent a disaster in the future. In the recent flood, CR 320 (River Oaks Drive) one-quarter mile in from FM 3404 had a section 70' to 100' wide and 20' deep washed out. All five culverts have been washed out downstream. The county must contract to rebuild and clean area of debris. Several other sites in the county, including the Kingsland MUD and the Kingsland Water Supply Corporations, also require extensive repairs.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$1.1 million of which $150,000 would be CR 320
Potential Funding Sources:	State and Federal Grants
Lead Agency/Department Responsible:	Llano County Engineering Department
Implementation Schedule:	3 to 6 months after grant approval

2009 Analysis:
This item is partially complete and will be deferred. The County applied for a FEMA grant under DR 1709, but it has not been improved. An engineering firm was hired, but work is not complete.

New Actions

		Llano County-1
	Proposed Action:	**Implementation of backup plan for storing public records and digital copies off site in a non-hazard area.**
	BACKGROUND INFORMATION	
	Site and Location:	Walk-in fire proof vault.
	History of Damages:	The County has not experienced destruction of records.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Wildfire
Effect on new/existing buildings:	Fireproof provides protection of public buildings during disaster events
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000.00
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	Building and Maintenance
Implementation Schedule:	ASAP

COMMENTS

		Llano County-2
	Proposed Action:	**Inspect drains/culverts for flood debris. Establish inspection program of same with road & bridge department**
	BACKGROUND INFORMATION	
	Site and Location:	All roads adjacent to Llano & Colorado Rivers to Pct. 3
	History of Damages:	Residents flooded various times as in 2007. About 20 homes for aprx. $100,000 to $200,000 in damages

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storms
Effect on new/existing buildings:	This would prevent damage from floodwaters to existing structures and also enhance mitigation techniques for new structures through proper inspection.
Priority (High, Moderate, Low):	High
Estimated Cost:	$75,000 - $200,000
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	Llano Road & Bridge and Commissioner
Implementation Schedule:	Semi-annually or as needed

COMMENTS

		Llano County -3
	Proposed Action:	**Increase dimensions of drainage culverts in troublesome areas**
	BACKGROUND INFORMATION	
	Site and Location:	River Oakes 3 locations – Skyview, Skyline, Pearl Streets
	History of Damages:	Road wash out.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Floods, Thunderstorms, Hurricane & Tropical Storm
Effect on new/existing buildings:	This action would allow greater accessibility to buildings and also prevent damage from floodwaters to new buildings in the event of a flood or storm event.
Priority (High, Moderate, Low):	High
Estimated Cost:	$80,000 to $100,000
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	Llano Road & Bridge and Commissioner
Implementation Schedule:	2009 & 2010

COMMENTS

		Llano County-4
	Proposed Action:	**Educate community on the dangers of low water crossings.**
	BACKGROUND INFORMATION	
	Site and Location:	County Libraries, High School auditorium, community centers
	History of Damages:	Loss of lives during flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Protection at low water crossings and flood projects reduce flooding of structures adjacent to or near creeks and waterways
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000.00
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	DEES
Implementation Schedule:	2009

COMMENTS

		Llano County-5
	Proposed Action:	**Conduct public education program on fire risks and wild land fire mitigation, with the assistance of the Texas Forest Service.**
	BACKGROUND INFORMATION	
	Site and Location:	Non-incorporated areas of Llano County will be invited to Kingsland and Llano Libraries.
	History of Damages:	Historically thousands of dollars are lost due to burned vegetation

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Reduction of structure damage
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000.00
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	Fire Departments
Implementation Schedule:	2009

COMMENTS

		Llano County - 6
	Proposed Action:	**Place flood insurance materials/mortgage lending mandates in libraries**.
	BACKGROUND INFORMATION	
	Site and Location:	Llano, Kingsland, & Buchanan Dam Libraries
	History of Damages:	100's of acres in Llano County are in the 100 year flood plain & have a history of structure flooding and damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Reduce property damage costs & control insurance costs
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000.00
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	Dept. of Environmental & Emergency Services
Implementation Schedule:	As soon as funded

COMMENTS

		Llano County - 7
	Proposed Action:	**Increase dimension of drainage culverts or dig up/lower road and install a slab.**
	BACKGROUND INFORMATION	
	Site and Location:	Lazy Oaks & Williams Lakeshore Drive
	History of Damages:	Flooded 2 homes in past heavy rains with about $30,000 in damage to homes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Increased capacity of drainage culverts reduces blockage of debris and other materials, out of bank flooding, and flooding of nearby structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$40,000.00
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	Road & Bridge, Commissioner
Implementation Schedule:	2009

COMMENTS
Large amount of runoff from hill into cove on Colorado River.

		Llano County - 8
	Proposed Action:	**Annually distribute flood protection/NFIP pamphlets to owners of flood prone property.**
	BACKGROUND INFORMATION	
	Site and Location:	County libraries, Llano County Department of Environmental & Emergency Services, Chambers of Commerce, Banks, other county agency offices
	History of Damages:	Llano County experiences seasonal flooding which leads to property damage and loss of life at low water crossings.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	New structures will be compliant; existing structures are restricted
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5,000.00
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	DEES
Implementation Schedule:	2009

COMMENTS

		Llano County - 9
	Proposed Action:	**Stabilize bank erosion by placing rip rap on and slab crossing**
	BACKGROUND INFORMATION	
	Site and Location:	CR 308 D Sandy Harbor CR 310 C Wyatt Cash CR 310 C Sandy Harbor
	History of Damages:	Water erosion at approach to slab crossings

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Stabilizing soils in and around structures reduces potential for structural damage
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$500,000.00
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	Commissioner Pcnt. 1
Implementation Schedule:	As appropriate following funding

COMMENTS

		Llano County - 10
	Proposed Action:	**Relocate Kingsland VFD building located in the 100 year floodplain making it inaccessible during high water events, not just 100 year events.**
	BACKGROUND INFORMATION	
	Site and Location:	128 Willowood, Kingsland, TX. 78639
	History of Damages:	Most recently the large rains of 2007.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	This action would prevent flooding of VFD building and encourage building outside of the floodplain.
Priority (High, Moderate, Low):	High
Estimated Cost:	$210,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Kingsland VFD
Implementation Schedule:	ASAP

COMMENTS

		Llano County - 11
	Proposed Action:	**Purchase NOAA "All Hazards" radios for early warning & post event information & place in area schools, businesses, critical facilities utilizing public & private partnership funding**
	BACKGROUND INFORMATION	
	Site and Location:	All area schools, public offices not equipped with radios, & businesses with 10+ employees.
	History of Damages:	Immeasurable

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Nominal, but will reduce human injury & loss of life.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$2,500.00
Potential Funding Sources:	FEMA; LCRA; Llano Memorial Hospital
Lead Agency/Department Responsible:	Each Precinct Commissioner
Implementation Schedule:	When funded, target 90days following delivery of radios

COMMENTS

		Llano County - 12
	Proposed Action:	**Require safe rooms to be added when constructing new schools, daycares, rest homes, and critical care facilities.**
	BACKGROUND INFORMATION	
	Site and Location:	All new facilities listed above.
	History of Damages:	The county has never experienced a terrorist event, but is effected seasonally by drought, extreme heat, flooding and winter storms.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Severe Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Safe room development would strengthen existing buildings for those with special needs (day cares and rest homes), while resulting in sounder, safer designs for new buildings
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	City & County offices
Implementation Schedule:	As funding becomes available

COMMENTS

		Llano County -13
	Proposed Action:	Raise crossing 5' by placing 4 – 5 ft. box culverts
	BACKGROUND INFORMATION	
	Site and Location:	Walnut Creek Crossing, Sandy Harbor Subdivision
	History of Damages:	Flooding cuts off and maroons all residents in west side of Walnut Creek.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Eliminate flooding so residents will have access to houses
Priority (High, Moderate, Low):	High
Estimated Cost:	$750,000
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	Commissioner Prct . 1
Implementation Schedule:	As appropriate

COMMENTS

		Llano County -14
	Proposed Action:	**Repair retaining wall to prevent damage to lift station**
	BACKGROUND INFORMATION	
	Site and Location:	Bluebonnet Lift Station – 1511 Laramie Trail, Kingsland, TX in Llano County
	History of Damages:	Due to new construction in the area, the dirt around the lift station is corroding with every rain.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	No direct effect
Priority (High, Moderate, Low):	High
Estimated Cost:	$26,000.00
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Kingsland MUD
Implementation Schedule:	30 Days from start

COMMENTS

		Llano County -15
	Proposed Action:	**Raise elevation of lift station man way and lift station control panel**
	BACKGROUND INFORMATION	
	Site and Location:	Woodyville Lift Station 130 Willowood, Kingsland, TX in Llano County
	History of Damages:	During flood events the man way is submerged. The lift station control panel is susceptible to water damage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Raising the elevation of the lift station will help to control flood event and prevent extensive damage to existing buildings. It will also help to mitigate against flood damage to new buildings
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$6,000
Potential Funding Sources:	FEMA grants or TWDB grants
Lead Agency/Department Responsible:	Kingsland MUD
Implementation Schedule:	30 days from start

COMMENTS

		Llano County -16
	Proposed Action:	**Build retaining wall to prevent corrosion from flood waters**
	BACKGROUND INFORMATION	
	Site and Location:	Kingsland Estates Lift Station, 3659 River Oaks, Kingsland, TX in Llano County
	History of Damages:	Flood waters cover man way

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	The retaining wall will help to prevent corrosion, which leads to flooding of existing structures in Kingsland.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$15,000
Potential Funding Sources:	FEMA/TWDB grants
Lead Agency/Department Responsible:	Kingsland MUD
Implementation Schedule:	30 days from start

COMMENTS

		Llano County -17
	Proposed Action:	**Raise below-ground level pumps at the Kingsland MUD sewer plant**
	BACKGROUND INFORMATION	
	Site and Location:	100 Ingram St. Kingsland, TX in Llano County
	History of Damages:	When the County experiences flooding the pumps fail due to submersion and emergency pumps must be brought in. This happens every time the streets surrounding the plant flood.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	The sewer plant can back up without proper pumping. Raising the pumps would prevent sewage and bacteria from entering property and the water supply. This would protect both new and existing buildings from flood damage.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$50,000
Potential Funding Sources:	FEMA/TWDB grants
Lead Agency/Department Responsible:	Kingsland MUD
Implementation Schedule:	90 days from start

COMMENTS

		Llano County - 18
	Proposed Action:	**Install inflow guards in manholes**
	BACKGROUND INFORMATION	
	Site and Location:	Nob Hill Subdivision
	History of Damages:	Inflow from rainwater

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Low
Estimated Cost:	$2500.00
Potential Funding Sources:	Federal and State grants where available
Lead Agency/Department Responsible:	Kingsland MUD
Implementation Schedule:	30 Days from Start

COMMENTS

		Llano County - 19
	Proposed Action:	**Contract for engineering study to determine how to mediate severe flooding created by draining from adjacent lands to Comanche Rancherias Subdivision. Results to be used to pay for improvements to drainage area.**
	BACKGROUND INFORMATION	
	Site and Location:	Comanche Rancherias Subdivision
	History of Damages:	Homes and property have been flooded several times in recent years by drainage from surrounding properties causing safety concerns, damage to homes and adverse affects to property values

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	This action would improve safety for residents, but also protect existing structures that currently flood by reducing damage and claims from homeowners and lessening demand on local jurisdiction services.
Priority (High, Moderate, Low):	Very High
Estimated Cost:	$60,000.00
Potential Funding Sources:	Grants with local contribution from in-kind services
Lead Agency/Department Responsible:	Llano County and Comanche Rancherias Subdivision
Implementation Schedule:	Summer 2011

COMMENTS

City of Horseshoe Bay

Previous Actions & Analysis

Not applicable: Horseshoe Bay is a new community (See Table 1-2)

New Actions

		HSB-1
	Proposed Action:	**Install warning systems at all low water crossings in the City.**
	BACKGROUND INFORMATION	
	Site and Location:	There are a number of low water crossings which have been developed in the community as amenity features of the Horseshoe Bay development. These will be identified and located on a GIS map for placement of gates which will be closed when flood waters rise to a dangerous level.
	History of Damages:	Some low water crossings in Horseshoe Bay repeatedly flood during high intensity rain events. One individual has been killed when his vehicle was washed off the road and he drowned. In the past 24 months rescues have been initiated to save motorists on two separate occasions in the crossings.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	None
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	Horseshoe Bay POA, Horseshoe Bay Resort, FEMA
Lead Agency/Department Responsible:	City Community Services Dept.
Implementation Schedule:	Ongoing

COMMENTS
A total of 17 low water crossings have been identified that need gates. The HSB Resort has agreed to contribute for 3 of the gates. The City's Community Services Department has so far designed and erected 3 low water crossing gates. The Horseshoe Bay Resort and Horseshoe Bay POA asked to be able to assist with design and costs for erection of the remaining gates. However, funding for completion of the remaining 12 gates is still undetermined. An additional

10 low water crossing areas require signage for warning of water hazards. In addition, a bridge-type crossing is needed near Pinkerton Loop and Mountain Dew, and one of the 12 locations also needs to be elevated. This activity is ongoing, with no timeline determined.

		HSB-2
	Proposed Action:	**Provide additional means of access into single-entry neighborhoods (or those with potentially flooded main entries) and gated communities in order to prevent residents from becoming trapped in a hazardous area**
	BACKGROUND INFORMATION	
	Site and Location:	There are several major subdivisions, including Horseshoe Bay West, which have limited/gated entries, and for which there are no secondary evacuation routes should flooding or some other hazard close them.
	History of Damages:	During the June, 2007 “rain bomb” event that hit the Marble Falls area, Horseshoe Bay experienced a 9 inch rainfall, which required closing of the low water crossing gates on Bay West Blvd. in Horseshoe Bay West, and others in Horseshoe Bay South. Closing these gates severely restricted emergency access to these subdivisions.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Reduce possible flooding of structures from blocked debris and overbank flooding
Priority (High, Moderate, Low):	High
Estimated Cost:	$250,000
Potential Funding Sources:	City, FEMA
Lead Agency/Department Responsible:	City Community
Implementation Schedule:	

COMMENTS
There are streets in the City that have been blocked by high water and prevent access to homes. Another such area is the entrance to the Pecan Creek subdivision which was blocked during floods last year as the water was well over the road. Flash floods in the City can quickly overcome the culverts in Horseshoe Bay South and other areas. In addition, one of the existing low water crossings needs to be upgraded to an all-weather secondary access

into Horseshoe Bay South. There has been one drowning fatality in one of the low-water crossings previously and on two occasions within the last 24 months two separate families have had to be rescued by first responders from vehicles stranded within the crossings.

		HSB-3
	Proposed Action:	**Undertake a comprehensive study of flood risk and reduction alternatives along all major creeks, with the assistance of the US Army Corps of Engineers**
	BACKGROUND INFORMATION	
	Site and Location:	There are a number of dry weather and wet weather creeks in the City that have the potential to cause flooding hazards. These creeks need to be identified, as well as the extent of their potential hazards.
	History of Damages:	Because there has been very minimal development near the creeks in the City, historical damage has been minimal. However, current and future development of hundreds of lots could be impacted by flooding along the creeks.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Potential flood hazard for new buildings near creeks
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	USACE, FEMA
Lead Agency/Department Responsible:	City Development Services
Implementation Schedule:	2009-2013

COMMENTS
A preliminary engineering study needs to be prepared to identify the creeks that have flooding potential and to estimate the extent of their flood hazard areas. This would be followed by detailed surveying and engineering to determine base flood elevations. The final product would be used to update the FEMA FIRM Map, which has not been updated since 1991.

		HSB-4
	Proposed Action:	**Identify repetitive loss properties for future Hazard Mitigation Grant Program funding**
	BACKGROUND INFORMATION	
	Site and Location:	There are a number of properties that have experienced repetitive losses from flooding that need to be identified and documented.
	History of Damages:	Although it is common knowledge that these properties have experienced repetitive losses, there is no documentation on specific locations or extent of losses.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	Existing – provide opportunity for future hazard mitigation actions
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	FEMA, City
Lead Agency/Department Responsible:	City Development Services Dept.
Implementation Schedule:	2009-2013

COMMENTS
This pro-active action would allow the City to identify and begin to alleviate repetitive flood losses that are known to exist in the community.

		HSB-5
	Proposed Action:	**Conduct public education program on fire risks and wildland fire mitigation, with the assistance of the Texas Forest Service**
	BACKGROUND INFORMATION	
	Site and Location:	City of Horseshoe Bay and surrounding rural areas
	History of Damages:	Wild fires occur randomly and have caused monetary and other damages

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Existing – provide additional information for protecting structures and people
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	City, Texas Forest Service
Lead Agency/Department Responsible:	Fire Department
Implementation Schedule:	Ongoing

COMMENTS

		HSB-6
	Proposed Action:	**Investigate feasibility of designating hazardous materials routes to minimize impact on major residential areas**
	BACKGROUND INFORMATION	
	Site and Location:	Various roadways in City of Horseshoe Bay, particularly FM 2147
	History of Damages:	Motorists have reported near accidents when meeting wide- loads on the narrow portion of FM2147, having to run off the roadway onto the unpaved portion to avoid collisions with wide loads, and danger created by long lines of traffic unable to pass while slow wide-loads traverse the roadway.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release, Terrorism
Effect on new/existing buildings:	Minimize effects of potential hazardous materials release and chemical exposure of all structures in the vicinity
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	City, FEMA
Lead Agency/Department Responsible:	Police Department
Implementation Schedule:	Unknown

COMMENTS
Previous requests have been made to TXDOT by law enforcement officials to either greatly reduce or eliminate all wide-load permitting on FM 2147 after complaints of near collisions on several occasions. Thus far we are unaware of any restrictions being placed on wide-load permitting as they continue to be observed traversing the narrow and heavily congested roadway. Traffic counts are already high and increasing daily as the area continues to develop making an already dangerous situation even more so. Speed limits on the entire stretch of FM2147 have been reduced from 10-15 mph by TXDOT in response to the heavy traffic, previous fatalities, and dangerous issues in existence on the roadway.

City of Llano

Previous Actions & Analysis

City of Llano (Past Action)-1	
Proposed Action:	**Develop a land acquisition program in flood-prone areas.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Some properties in the City of Llano repeatedly flood.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	State and Federal Grants
Lead Agency/Department Responsible:	City Floodplain Administrator
Implementation Schedule:	Property will be acquired as funding is available

2009 Analysis:
This action is deferred as an ongoing activity.

City of Llano (Past Action)-2	
Proposed Action:	**Revise, upgrade and update FIRMs**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	The FIRM is very outdated (May 4, 1982) and needs revision because it is no longer accurate.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	FEMA Grants
Lead Agency/Department Responsible:	FEMA
Implementation Schedule:	2012

2009 Analysis:
This item has not been completed and will be deferred.

City of Llano (Past Action)-3	
Proposed Action:	**Implement a maintenance program to clear and clean creeks/drains and Llano River bed.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Back-up in the Llano River caused the river to rise in the city in 1997 to near the 100-year flood level.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$200,000
Potential Funding Sources:	General Revenues, Grants
Lead Agency/Department Responsible:	City of Llano, County of Llano, US Corps of Engineers
Implementation Schedule:	2012

2009 Analysis:
This item has not been completed and will be deferred.

City of Llano (Past Action)-4	
Proposed Action:	**Develop stormwater drainage and reduce stormwater runoff into homes.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	During a heavy rain the city has no stormwater drainage system in many parts of town. Stormwater damage is significant.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	General Revenues, Grants
Lead Agency/Department Responsible:	City of Llano
Implementation Schedule:	2008

2009 Analysis:
This item has been completed.

		City of Llano (Past Action)-5
	Proposed Action:	**Prohibit fill in floodplain.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Llano County has had difficulty in preventing property owners from putting fill in the flood plain.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Code Enforcement
Implementation Schedule:	Beginning in 2004; ongoing

2009 Analysis:
This item is deferred as an ongoing activity.

New Actions

		Llano -1
	Proposed Action:	**Provide water conservation education and incentives for low-flow plumbing/toilets, efficient washers and rain harvesting**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City experiences mild to severe drought each summer. Citizens would benefit in terms of water supply and costs by following conservation techniques

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	None, but water conservation will reduce energy consumption and undue stress on structures during times of drought and excess heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000-$5,000 annually
Potential Funding Sources:	General Revenue/Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Annually

COMMENTS

		Llano -2
	Proposed Action:	**Install burn ban signs to warn of wildfire danger/drought**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City experiences mild to severe drought each summer. It's imperative that citizens are made aware of burn bans when in effect.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Wildfire
Effect on new/existing buildings:	Mitigates against the possibility of property damage due to wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000
Potential Funding Sources:	General Revenue/Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Ongoing

COMMENTS

		Llano -3
	Proposed Action:	**Implement a flood early warning system and response plan**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Flooding cuts off roadways when low-water crossings are inundated by floodwaters. Citizens often attempt to drive through inundated roadways, endangering themselves and others in a flood event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Having a warning and response plan in place will better protect existing structures from the threat of flood damage.
Priority (High, Moderate, Low):	High
Estimated Cost:	$30,000
Potential Funding Sources:	FEMA Grants
Lead Agency/Department Responsible:	Floodplain Manager
Implementation Schedule:	2010 or upon receipt of funds

COMMENTS

		Llano -4
	Proposed Action:	**Distribute flood protection and NFIP pamphlets, including Turn Around Don't Drown materials, to owners of flood prone properties**
	BACKGROUND INFORMATION	
	Site and Location:	Repetitive loss properties
	History of Damages:	Although the city does not have any severe repetitive loss properties, there are a few areas that experience repetitive losses in a flood event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Prevent building in high hazard areas and also mitigates against damage to existing structures. Leads to a reduction in cost of insurance for properties.
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000
Potential Funding Sources:	General Revenue, TWDB Grants
Lead Agency/Department Responsible:	City of Llano
Implementation Schedule:	Annually

COMMENTS

		Llano - 5
	Proposed Action:	**Implement and enhance an area-wide telephone Emergency Notification System ("Reverse 911")**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Llano has not experienced a major disaster. However, the reverse 911 system would not only help to better inform citizens, but also help Llano become a Storm Ready community under the National Weather Service.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release, Pipeline Failure, Tornado, Flood, Wildland Fire, Hail Storm, Drought, Extreme Heat, Terrorism
Effect on new/existing buildings:	Helps mitigate damage caused by natural and manmade disasters.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Operating Budget, Contingency Fund, Grant Funding
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Fiscal Budget Year

COMMENTS

City of Sunrise Beach Village

Previous Actions & Analysis

City of Sunrise Beach Village (Past Action)-1	
Proposed Action:	**Construct a bridge over a low-lying road area to provide an evacuation route and access to emergency services.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	During flooding, a low area on Sunrise Drive becomes impassable. This road is one of two main access roads for the city. One-half of the city's population and geographical area is affected. Residents living beyond this low spot cannot be evacuated. The Volunteer Fire Department, City Hall, and Police Department would become isolated and unable to provide critical facilities and services to the community.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$275,000
Potential Funding Sources:	Grants, Capital Improvement Program
Lead Agency/Department Responsible:	City of Sunrise Beach
Implementation Schedule:	Depends of Funding Availability

2009 Analysis:
This item has not been completed and will be deferred.

New Actions

		SBV-1
	Proposed Action:	**Increase stormwater runoff capability under roadway on Beach Drive**
	BACKGROUND INFORMATION	
	Site and Location:	Beach Drive, 1 block off Sunrise Drive
	History of Damages:	Roadway goes underwater with a moderate to severe storm.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Eliminate flooding so residents will have access to houses
Priority (High, Moderate, Low):	High
Estimated Cost:	$19,000
Potential Funding Sources:	General Fund/Grants
Lead Agency/Department Responsible:	Maintenance
Implementation Schedule:	2009

COMMENTS
Dug out existing 24 inch drain and replaced with two 36” oval drainage pipes, cemented in place with concrete rip rap to prevent further erosion of ROW

		SBV-2
	Proposed Action:	**Correct Stormwater Runoff area on Sandy Mountain Drive.**
	BACKGROUND INFORMATION	
	Site and Location:	300 Block of Sandy Mountain Drive
	History of Damages:	During heavy rains of 2007 part of roadway washed out and water backed up on private property adjacent to ravine. Water eroded property downstream of drainage area as a result of water overflowing roadway. Water main exposed and subject to breakage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	This would prevent damage to property downstream and also inhibit new building development that could be damaged.
Priority (High, Moderate, Low):	High
Estimated Cost:	$55,000
Potential Funding Sources:	General fund / FEMA/ LCRA
Lead Agency/Department Responsible:	Maintenance Dept.
Implementation Schedule:	2010

COMMENTS
Coordinate with LCRA for insertion of sleeve and replacement of water main in concrete structure. Installed 3-36” oval drain lines encased in cement and stabilized ROW and drainage site with concrete rip rap.

		SBV-3
	Proposed Action:	**Clean out and deepen the stormwater drainage ditches in key flood prone areas. Reestablish drainage patterns as designed in 1978 road and drainage site plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Throughout the city
	History of Damages:	Flooding of properties not including residences

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Winter Storm, Hurricane & Tropical Storm
Effect on new/existing buildings:	This would prevent damage to property downstream and also inhibit new building development that could be damaged.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	25-75,000
Potential Funding Sources:	Grants, Capital Improvement funds
Lead Agency/Department Responsible:	SRB, Maintenance
Implementation Schedule:	Ongoing

COMMENTS

		SBV-4
	Proposed Action:	**Implement development requirements to control or reduce runoff from new development on Mountain Top**
	BACKGROUND INFORMATION	
	Site and Location:	Mountain Top off of Sandy Mountain Drive
	History of Damages:	Heavy rains result in runoff crossing road

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Less runoff decreases flooding and drainage problems to nearby structures
Priority (High, Moderate, Low):	High
Estimated Cost:	$25,000
Potential Funding Sources:	Developer
Lead Agency/Department Responsible:	Z & P Board
Implementation Schedule:	TBD

COMMENTS
New development on top of mountain increasing flow and current of runoff. Hydrology study requested prior to further action on approval of development plan. Limit degree or extent of development without additional allowances

Mason County

Previous Actions & Analysis

		Mason County (Past Action)-1
	Proposed Action:	**Undertake a review of Mason County's floodplain management ordinance.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Mason County has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met. However, Mason County has no floodplain map. With this action, a review of Mason County's floodplain ordinance will be undertaken. Possible improvements will be considered to move beyond the minimum standards for development in the regulatory floodway.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Mason County
Implementation Schedule:	2005

2009 Analysis:
This item has been completed.

		Mason County (Past Action)-2
	Proposed Action:	**Educate the public about pipeline safety risk, detecting a pipeline accident, and responding to a pipeline accident. Provide the public with proper design criteria for "tornado safe rooms" and ensure that the public has access to Flood Insurance Rate Maps identifying flood hazard areas.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	An educated public is one of the best protections against disaster. There are three pipelines that cross part of Mason County carrying hazardous liquids. The risk of tornadoes is high, and the public needs to know if they are in a flood hazard area.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Pipeline Failure
Priority (High, Moderate, Low):	High
Estimated Cost:	$200
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	October 2004

2009 Analysis:
This item has been completed. The initial awareness effort was conducted in October 2004.

		Mason County (Past Action)-3
	Proposed Action:	**Purchase generators and install quick-connect emergency generator hook-ups for critical facilities.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The Dispatch Office has only battery backup, good for only a few hours, while EMS and Law Enforcement have no generators.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Hail
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	General Revenues, Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	2005

2009 Analysis:
This action has been completed. County purchased a 25 Kilowatt generator with an automatic transfer witch for dispatch in November 2005.

		Mason County (Past Action)-4
	Proposed Action:	**Educate the community on the dangers of various hazards, including: (1) wildfires; (2) flash flooding at low water crossings; and (3) extreme heat and drought safety and health issues.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Mason County is at risk from wildfires, flash flooding and extreme heat and drought. An educated public will be better able to mitigate damage from these hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Wildfire, Extreme Heat, Drought
Priority (High, Moderate, Low):	High
Estimated Cost:	$300
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Began in October 2004; deferred – ongoing activity

2009 Analysis:
This item has been completed, initial awareness conducted in October 2004; however, it will be deferred as an ongoing activity.

New Actions

		Mason County-1
	Proposed Action:	**Obtain Storm Ready Certification from the National Weather Service**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	NWS encourages Storm Ready as a way to protect property and save lives when severe weather occurs as Storm Ready communities are better prepared.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Will prevent and/or reduce property damage and save lies
Priority (High, Moderate, Low):	High
Estimated Cost:	$200
Potential Funding Sources:	General Revenues, Donations
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Complete by Fall 2009

COMMENTS

		Mason County-2
	Proposed Action:	**Install warning signs at low water crossings**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Flooded low water crossing are a major hazard in terms of potential loss of lives. This action will help to save lives

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood, Hurricane & Tropical Storm
Effect on new/existing buildings:	This would inhibit development in floodprone areas.
Priority (High, Moderate, Low):	High
Estimated Cost:	$4,400
Potential Funding Sources:	General Revenues, Grants
Lead Agency/Department Responsible:	County Road Dept.
Implementation Schedule:	July 2010

COMMENTS

		Mason County-3
	Proposed Action:	**Educate individuals and businesses about preparedness for possible terrorist event.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Although Mason County has only a slight risk for a terrorist attack, the possibility of such an event cannot be ignored.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Terrorism
Effect on new/existing buildings:	Will prevent and/or reduce property damage and save lies
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$300
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Ongoing 2009-2014

COMMENTS

		Mason County-4
	Proposed Action:	**Educate the community on the dangers of hazards both natural and man-made in terms of preparedness, proper procedures, and mitigation techniques**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Mason County has experienced natural and man-made hazards. An educated populace will reduce property damages and save lives.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Will prevent and/or reduce property damage and save lies
Priority (High, Moderate, Low):	High
Estimated Cost:	$750
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Ongoing: 2009-2014

COMMENTS

		Mason County-5
	Proposed Action:	**Improve storm drainage at low water crossings by installing tinhorns**
	BACKGROUND INFORMATION	
	Site and Location:	Install at least 18 additional tinhorns around the county
	History of Damages:	Low water crossings without tinhorns tend to wash out when 3-4 inches or more of rain occurs within a short period of time.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Tinhorns would prevent damage to existing property in a flood event.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$5,400
Potential Funding Sources:	General Revenues, Grants
Lead Agency/Department Responsible:	County Road Dept.
Implementation Schedule:	March 2010

COMMENTS

City of Mason

Previous Actions & Analysis

		Mason (Past Action)-1
	Proposed Action:	**Work with the Coalition to undertake a local program assessment of the City's floodplain management ordinance**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The Texas Colorado River Floodplain Coalition is reviewing local floodplain management ordinances and rating them according to whether the jurisdiction is meeting or exceeding minimum NFIP standards. As a new member of the Coalition, the City of Mason has not yet been rated.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	N/A
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	2005

2009 Analysis:
This item has been completed.

		Mason (Past Action)-2
	Proposed Action:	**Educate the public about pipeline safety risk, detecting a pipeline accident, and responding to a pipeline accident. Provide the public with proper design criteria for "tornado safe rooms" and ensure that the public has access to Flood Insurance Rate Maps identifying flood hazard areas.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	An educated public is one of the best protections against disaster. There are three pipelines that cross part of Mason County carrying hazardous liquids. The risk of tornadoes is high, and the public needs to know if they are in a flood hazard area.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Pipeline Failure
Priority (High, Moderate, Low):	High
Estimated Cost:	$200
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	October 2004

2009 Analysis:
This item has been completed. The initial awareness effort was conducted in October 2004.

		Mason (Past Action)-3
	Proposed Action:	**Purchase generators and install quick-connect emergency generator hook-ups for critical facilities.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The Dispatch Office has only battery backup, good for only a few hours, while EMS and Law Enforcement have no generators.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Tornado, Hail, Winter Storm, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	General Revenues, Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	2005

2009 Analysis:
This item has been completed. The City bought a 10 kilowatt generator with an automatic transfer switch for Public Works in October 2004. A 25 kilowatt generator with an automatic transfer switch was purchased for the City EOC in November 2005.

		Mason (Past Action)-4
	Proposed Action:	**Educate the community on the dangers of various hazards, including: (1) wildfires; (2) flash flooding at low water crossings; and (3) extreme heat and drought safety and health issues.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Mason County is at risk from wildfires, flash flooding and extreme heat and drought. An educated public will be better able to mitigate damage from these hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Wildfire, Extreme Heat, Drought
Priority (High, Moderate, Low):	High
Estimated Cost:	$300
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	October 2004; ongoing activity

2009 Analysis:
This item was completed in October 2004, but will be deferred as it is an ongoing activity.

New Actions

		Mason - 1
	Proposed Action:	**Clear excess growth and debris from part of Comanche Creek**
	BACKGROUND INFORMATION	
	Site and Location:	Begin at city limits in the North along Balsam Road and work South and East as time and manpower are available.
	History of Damages:	The excess growth and debris creates obstructions to the flow of water during heavy rains, causing areas to flood that do not normally do so.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm, Winter Storm, Hail
Effect on new/existing buildings:	Will reduce potential property damage for existing buildings
Priority (High, Moderate, Low):	High
Estimated Cost:	$14,400
Potential Funding Sources:	General Revenues, Grants
Lead Agency/Department Responsible:	Floodplain Management/Street Dept.
Implementation Schedule:	Complete by Fall 2009

COMMENTS

		Mason - 2
	Proposed Action:	**Implement a maintenance program for clearing debris from bridges and culverts**
	BACKGROUND INFORMATION	
	Site and Location:	All bridges and culverts inside city limits
	History of Damages:	Debris that collects at bridges and culverts builds dams that cause water to backup and flood areas that are not normally affected by flood.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Will reduce potential property damage
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$4,320
Potential Funding Sources:	General Revenues, Grants
Lead Agency/Department Responsible:	Floodplain Management/Street Dept.
Implementation Schedule:	Begin June 2009 - ongoing

COMMENTS

		Mason -3
	Proposed Action:	**Educate the community on the dangers of hazards both natural and man-made in terms of preparedness, proper procedures, and mitigation techniques**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Mason has experienced natural and man-made hazards. An educated populace will reduce property damages and save lives.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Severe Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Will prevent and/or reduce property damage and save lies
Priority (High, Moderate, Low):	High
Estimated Cost:	$750
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Ongoing: 2009-2014

COMMENTS

		Mason -4
	Proposed Action:	**Obtain Storm Ready Certification from the National Weather Service**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	NWS encourages Storm Ready as a way to protect property and save lives when severe weather occurs, as Storm Ready communities are better prepared.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Will prevent and/or reduce property damage and save lies
Priority (High, Moderate, Low):	High
Estimated Cost:	$200
Potential Funding Sources:	General Revenues, Donations
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Complete by Fall 2009

COMMENTS

		Mason- 5
	Proposed Action:	**Educate individuals and businesses about preparedness for possible terrorist event.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Although the city has only a slight risk for a terrorist attack, the possibility of such an event cannot be ignored.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Terrorism
Effect on new/existing buildings:	Will prevent and/or reduce property damage and save lies
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$300
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Ongoing 2009-2014

COMMENTS

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This section contains both an analysis of previous actions and new actions for the participating communities in TCRFC Region IV. Each community evaluated and analyzed the regional mitigation actions in Section 21.

Brown County

Only the City of Brownwood in Brown County is participating

City of Brownwood

Previous Actions & Analysis

		Brownwood (Past Action)-1
	Proposed Action:	**Undertake a review of the city's floodplain management ordinance**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City of Brownwood is currently rated a level one (Excellent) in the Coalition's Local Floodplain Assessment. The City meets the minimum requirements of State law and of the National Flood Insurance Program for development in the regulatory floodway. All FEMA minimum requirements and criteria are met.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	2005

2009 Analysis:
This action has been completed. The city raised the minimum finished floor elevation in flood prone areas to BFE + 1 in Flood Ordinance#03-20. The effective date was May 27, 2003. This ordinance can be found in the Brownwood Code of Ordinances, Chapter 82, Section 112. The City also follow the current IBC.

		Brownwood (Past Action)-2
	Proposed Action:	**Ensure that erosion and sedimentation controls are used during construction.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Erosion and sedimentation lead to flood damage. Construction practices that prevent erosion and sedimentation can reduce flood damages in flood-prone areas

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Engineering Inspectors, Development Services (previously Code Enforcement)
Implementation Schedule:	Ongoing activity

2009 Analysis:
This is an ongoing activity and therefore deferred. Code Enforcement is now Development Services.

		Brownwood (Past Action)-3
	Proposed Action:	**Require completed elevation certificates pre- and post-construction for buildings located in the special flood hazard area to ensure that elevation requirements are met. Ensure that inspectors are adequately trained in elevation certificate requirements in specific flood-hazard areas.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city of Brownwood is prone to flooding. Elevation Certificates provide critical information for homeowners and the local governments and insurance agents. This action will help ensure that inspectors are knowledgeable about Elevation Certificate requirements.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	Ongoing activity

2009 Analysis:
The City does not require the pre-construction elevation certificate, but post is required. This action should remain in terms of post-construction, but pre-construction no longer applies.

		Brownwood (Past Action)-4
	Proposed Action:	**Cross-train building inspectors in floodplain management requirements.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Many building inspectors have the potential to impact the effectiveness of the floodplain management program. This action will help ensure that building inspectors are cross-trained in floodplain management requirements. Understanding the basics of floodplain management will help inspectors carry out their responsibilities to ensure that City Codes are followed with respect to flood hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Training is available at no cost. However, staff time of building inspectors will be required for the training.
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Developmental Services, Public Works
Implementation Schedule:	Ongoing activity

2009 Analysis:
Deferred – Ongoing: Code Enforcement is now Development Services: RSDE (Residential substantial damage training and floodplain management training).

		Brownwood (Past Action)-5
	Proposed Action:	**Establish a post-disaster debris management plan**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Disasters generate a variety of debris, including vegetative matter, building/construction material, appliances, personal property, mud and sediment. The quantity and type of debris is a function of the location and type of event. This action will foster a unified and coordinated approach to response to any debris-generated disaster.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Emergency Management/ Street and Sanitation Department
Implementation Schedule:	2011

2009 Analysis:
This action is not complete and will be deferred for 2011.

		Brownwood (Past Action)-6
	Proposed Action:	**Develop an enforcement plan for implementing mandatory water rationing.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City of Brownwood currently lacks an enforcement plan and capability should the need arise during drought or extreme heat conditions where mandatory water rationing is necessary.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	Completed in 2004

2009 Analysis:
This action is complete. The plan was updated in 2004.

		Brownwood (Past Action)-7
	Proposed Action:	**Educate the public about extreme heat/drought safety and health issues**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Brown County experiences over $2 million in annualized losses from drought. With 13 significant drought events in the last 110 years, drought and extreme heat are common occurrences in Brown County.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	Emergency Management, Utility Department
Implementation Schedule:	2006

2009 Analysis:
Deferred-ongoing project. City educates citizens through pamphlets with water bills

		Brownwood (Past Action)-8
	Proposed Action:	**Educate residents about water conservation and landscape planting practices to preserve water supplies.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	With a .68 probability of a drought in a six-year period, it is critical that Brownwood residents are educated about water conservation and landscaping practices that conserve water supplies. Topics to be addressed in this educational program include water conservation measures, selection of drought tolerant plants for reducing water demands outdoors, weed and brush control to reduce the impact of drought and increase water yields, drought assistance that may be available through State and Federal agencies, and information to mitigate the effects of drought on wildlife.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Utility Department
Implementation Schedule:	2010

2009 Analysis:
Deferred – ongoing project. City educates through “Brownwood Beautification”

		Brownwood (Past Action)-9
	Proposed Action:	**Promote water and energy conservation to government and the public.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Members of the public and governmental officials can make an important contribution to water and energy conservation efforts. Water conservation awareness is important year-around. However, educational efforts will be intensified upon receipt of an advisory regarding an impending drought

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Utility Department
Implementation Schedule:	2010

2009 Analysis:
Deferred – ongoing project.

		Brownwood (Past Action)-10
	Proposed Action:	**Adopt routine fire hydrant maintenance**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	This action involves routine inspection of fire hydrants to ensure that they are available to firefighters in times of structural or wildland fires. Fire hydrant inspections will be conducted on a routine basis by the fire department.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Fire department, Utility department
Implementation Schedule:	Ongoing Activity

2009 Analysis:
Deferred- Ongoing project

		Brownwood (Past Action)-11
	Proposed Action:	**Remove downed trees that increase fire risk.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Fire risk depends upon climate, fuels, topography and human behavior. Downed trees act as fuel, increasing the risk of fire. This action will remove downed trees and thus lessen the fire danger

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Street and Sanitation Department
Implementation Schedule:	2010

2009 Analysis:
Deferred – ongoing project.

Brownwood (Past Action)-12	
Proposed Action:	**Establish and implement burning standards within the city and Extra Territorial Jurisdiction.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	In order to reduce the risk of a fire spreading, standards setting forth the conditions during which residents and businesses may burn trash are needed.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	City Council, Fire Marshal
Implementation Schedule:	2006

2009 Analysis:
This action is complete. The City of Brownwood enforces bans within City Limits – City of Brownwood Code of Ordinances Chapter 38 “Fire Prevention and Protection” last updated 2007.

		Brownwood (Past Action)-13
	Proposed Action:	**Ensure that city firefighters are properly trained in current fire-fighting techniques, including brush and forest firefighting**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Proper training of firefighters is needed in order for them to handle not only structure fires but brush and forest fires.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues, Grants
Lead Agency/Department Responsible:	Fire department
Implementation Schedule:	Ongoing Activity

2009 Analysis:
This action is deferred as an ongoing activity

		Brownwood (Past Action)-14
	Proposed Action:	**Consider an ordinance requiring fire extinguishers for all homes and businesses**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Fire extinguishers can help extinguish or suppress hostile fires, gaining valuable time until the fire department can respond

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Fire extinguishers cost $15 to $25 each
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Fire Marshal, City Council, Developmental Services
Implementation Schedule:	2006

2009 Analysis:
This action is completed in part and deferred in part. International Fire Code adopted on 7-24-2007, requires all businesses to have fire extinguishers. City does not yet have an ordinance to require fire extinguishers in residential homes.

		Brownwood (Past Action)-15
	Proposed Action:	**Implement a community education program to enhance fire prevention and safety awareness, especially in identified risk areas**.
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	In addition to a quick and effective response to emergencies, fire prevention and safety awareness educational efforts are needed to reduce the risk of fire.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Cost will be covered by routine fire department activities
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Fire Department, Fire Marshal
Implementation Schedule:	Ongoing Activity

2009 Analysis:
This action is deferred as an ongoing activity. The Fire Department continues to visit schools.

		Brownwood (Past Action)-16
	Proposed Action:	**Track and record high-water marks following floods**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	High water marks are a good predictor for future flooding events. This action will involve recording high-water marks following flooding events in the City of Brownwood.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Emergency management
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity

		Brownwood (Past Action)-17
	Proposed Action:	**Verify FEMA's repetitive loss inventory and maintain current loss data. Notify repetitive loss property owners of FEMA funding availability**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	According to FEMA records, Brown County has two properties on FEMA's list of Target Repetitive Loss Properties that have had a total of 7 losses totaling $362,972. This action involves verifying the FEMA data and exploring mitigation options.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	Costs of mitigating the repetitive loss properties would be substantial and are dependent on external grant funds.
Potential Funding Sources:	General revenues, External grant funding
Lead Agency/Department Responsible:	Emergency management, Floodplain coordinator
Implementation Schedule:	Ongoing Activity

2009 Analysis:
This action is deferred as an ongoing activity.

		Brownwood (Past Action)-18
	Proposed Action:	Implement a maintenance program for clearing debris from bridges, stormwater drains and culverts. Maintain sewer manholes with watertight covers and inflow guards. Raise electrical components of sewage lift stations above base flood elevation. Floodproof sewage treatment plants in flood-hazard and low-lying areas. Raise manhole openings using alternative methods.
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Routinely clearing debris can avoid clogging waterways and causing flooding. Routinely cleaning and repairing stormwater drains can help avoid unnoticed clogs that may hamper the efficiency of the stormwater system. When drain covers are broken or clogged, the stormwater system does not perform well and localized flooding is possible. This maintenance program should be undertaken on a routine schedule, with a special round of inspection and maintenance following major storm events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Street Department, Utility Department
Implementation Schedule:	Ongoing Activity

2009 Analysis:
This action is deferred as an ongoing activity

		Brownwood (Past Action)-19
	Proposed Action:	**Work with state and federal agencies to maintain up-to-date hazard data and maps. Ensure that the public has access to local flood insurance rate maps (FIRMs) and flood map ordering information. Enhance GIS system with digital floodplain and topographic data, to assess risk.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	It is critical that the City of Brownwood have current hazard data and map and that residents of the City be aware of hazardous areas as delineated on FEMA's flood maps.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Engineering
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity. The City updated the topographic data in March, 2007. City has digitized FIRM and floodway map digitized (map from 1982). City has hired engineer to do a study and intends to submit a LOMA in 2009. DFIRMS expected in 2011.

		Brownwood (Past Action)-20
	Proposed Action:	**Implement and promote a multi-hazard public awareness program.** • **Educate the community about flooding risks and how to prevent damage and loss of life.** • **Educate the public about the dangers of low-water crossings.** • **Provide "how to" information to residents for installing backflow valves to prevent reverse-flow floods.** • **Educate the public about hazardous materials and household hazardous waste.** • **Offer tree pruning education classes to reduce debris caused by limbs.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	This action will result in a more informed public, aware of the risks they face and knowledgeable about how to protect their families, homes, workplaces and livelihoods against the impact of hazards

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Tropical Storm and Hurricane, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Emergency Management, Utility department, Keep Brownwood Beautiful, and Public Works.
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity.

		Brownwood (Past Action)-21
	Proposed Action:	**Increase capacity and add stormwater detention/retention basins. Minimize the impact of flooding by installing berms and levees when appropriate. Use stream restoration and channelization to ensure adequate draining or diversion of stormwater. Implement on-site retention basin program in conjunction with development to address excessive stormwater.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	This action will increase the capacity of stormwater retention/detention basins to reduce the potential for localized flooding through the storage and gradual release of runoff.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Engineering, Developmental Services, Public Works
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity. Code Enforcement Services is now Developmental Services

Brownwood (Past Action)-22	
Proposed Action:	**Retain and maintain natural vegetation in stormwater channels**
BACKGROUND INFORMATION	
Site and Location:	Countywide
History of Damages:	Plants provide natural mitigation against storm-related hazards. They capture and slow the pace of stormwater, which can promote infiltration and reduce the volume of flooding. In salt marshes, wetlands, and along stream banks, plants absorb waves and slow flood currents. In addition, plants enhance the natural beauty of the landscape and provide food and habitat to many types of animals. Retaining a thick vegetative cover on public lands flanking a river increases the absorption of floodwaters and reduces sedimentation of the river, while achieving wildlife preservation objectives.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Streets and Public Works
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity.

		Brownwood (Past Action)-23
	Proposed Action:	**Enhance warning and alerting of emergency situations.** • **Improve emergency management radio coverage and reception.** • **Implement an area-wide telephone Emergency Notification System.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Early warning of dangerous conditions allows time for individuals to take appropriate action to save lives and property.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Emergency management
Implementation Schedule:	Completed in 2005

2009 Analysis:
This action has been complete with the City implementing “Code Red” Telephone warning system (install in November 2005). This is also supplemented by outdoor warning sirens

		Brownwood (Past Action)-24
	Proposed Action:	**Develop Mutual Aid Agreements with area communities**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Mutual Aid Agreements with area communities will provide additional resources to meet emergency needs and is an efficient and effective use of outside resources

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Emergency Management, City Council
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity. The city currently has MAAs with all area VFDs.

		Brownwood (Past Action)-25
	Proposed Action:	**Acquire, conserve and utilize easements to prevent development of known hazard areas.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Conservation easements will help prevent development in hazard areas and thus reduce future disaster losses.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues, Grants
Lead Agency/Department Responsible:	Public Works, Developmental Services
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred pending funding. Code Enforcement is now Developmental Services

		Brownwood (Past Action)-26
	Proposed Action:	**Add minimum residential street width criteria to development ordinance**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	This action will improve public safety and community amenities.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	Completed in 2005

2009 Analysis:
This action has been completed. Minimum street widths for development are found in Chapter 94 entitled “Subdivisions” of the City’s Code of Ordinances, last updated 2007, sec. 94-122(h) and sec. 94-162 and in Appendix A of said Chapter 94.Code Enforcement is now Developmental Services.

		Brownwood (Past Action)-27
	Proposed Action:	**Enhance code enforcement and inspection services**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	This action will maximize basic delivery of code inspection and enforcement services. Improved code enforcement and inspection services will foster better building practices and reduce risk of loss of life and property.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Developmental Services
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred pending as an ongoing activity. Code Enforcement is now Developmental Services

		Brownwood (Past Action)-28
	Proposed Action:	**Adopt the 2003 International Building Code**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The 2003 International Building Code is part of a comprehensive, coordinated set of codes produced by the International Code Council and is expected to be widely adopted by States and municipalities. The 2003 Code incorporates resistance to natural disasters, fire protection and security of building systems into its construction codes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	Completed in 2005

2009 Analysis:
This action has been completed. The City adopted the International Building codes by Ordinance 07-19 on July 24, 2007. International Codes adopted include: Building, Plumbing, Fire, Energy Conservation, Fuel Gas, Mechanical, Property Maintenance, Existing Building, and Residential for 1 & 2 Family Dwellings. The City adopts new codes every three years (See 2009 Action: Brownwood-1).

		Brownwood (Past Action)-29
	Proposed Action:	**Implement a back-up plan for storing public records and digital copies offsite in a non-hazard area.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	No site currently exists for storing critical City records. In the event of a fire, tornado, or flood, the City may lose valuable and irreplaceable records. This action provides a back-up plan for storing public records, both in digital and hard copies.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	City Council, Emergency Management, City Secretary
Implementation Schedule:	Completed in 2005

2009 Analysis:
This action has been completed. The City has a permanent vault off-site from City Hall in the City Service Center.

		Brownwood (Past Action)-30
	Proposed Action:	**Coordinate with local businesses and city/county offices a post-disaster reconstruction plan.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Having a plan in place before a disaster for recovery and reconstitution saves critical time following a disaster. It will help ensure that critical facilities and services can be reconstituted as quickly and efficiently as possible.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	City Council, Emergency Management, City Secretary
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity.

		Brownwood (Past Action)-31
	Proposed Action:	**Send appropriate local officials to FEMA's Emergency Management Institute for continuing education and to other sponsored training classes.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	This action will help build a trained cadre of local officials knowledgeable in carrying out their duties to protect the citizens of Brownwood against all hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	City Departments
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity

		Brownwood (Past Action)-32
	Proposed Action:	**Distribute pamphlets/information regarding the SBA Pre-Disaster Mitigation Loan Program.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The U.S. Small Business Administration has established a five-year pilot program of low interest, fixed rate loans to small businesses to implement hazard mitigation measures to protect their property from disasters. This action will help provide the financial means for small businesses to protect their property.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Negligible
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Emergency Management, SBA, FEMA, Red Cross
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity.

		Brownwood (Past Action)-33
	Proposed Action:	**Offer hazard susceptibility audits to local businesses**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	This action will help make local businesses more aware of the risks they face and measures they can take to protect their property and business

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity. The City completes annual fire assessments for businesses and have several manufacturing plants – wastewater treatment – and city tests the discharges from the facilities. In addition to Emergency Management, Pre-treatment Coordinator and Sanitation Department are also responsible.

		Brownwood (Past Action)-34
	Proposed Action:	**Recruit local civic groups/high schools for community mitigation projects**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	This effort will help raise public awareness and build a cadre of concerned citizens to safeguard the community before disaster.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Winter Storm, Flood, Tornado, Thunderstorm, Drought, Hurricane and Tropical Storm, Hail, Pipeline Failure, Hazardous Material Release, Terrorism, Dam Failure, Extreme Heat
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Keep Brownwood Beautiful
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity.

		Brownwood (Past Action)-35
	Proposed Action:	**Assess local water supply and water treatment systems**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	This action will help ensure that the City's water supplies are protected against all hazards. It will help reduce the risk and mitigate the consequences of terrorist acts or hazardous materials incidents.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Terrorism, Hazardous Material Release
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues, Grants
Lead Agency/Department Responsible:	Brown County Water Improvement District #1
Implementation Schedule:	2004

2009 Analysis:
This action was completed by the Director of Utilities. The City completed a Vulnerability Assessment (VA) in June 2004 for the VA and in December 2004 for the Emergency Response Plan (ERP).

		Brownwood (Past Action)-36
	Proposed Action:	**Develop an appropriate emergency hazardous materials action plan. Add increased security around fixed hazardous materials sites.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Increased security will help reduce the risk of an intentional act that may cause a hazardous materials incident. Development of an emergency hazardous materials action plan will help ensure that all city officials know how to respond appropriately in a hazardous materials emergency.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Terrorism, Hazardous Material Release
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Emergency Management, Fire Department, Police Department
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity

		Brownwood (Past Action)-37
	Proposed Action:	**Update public community facilities to include severe weather action plans and designated tornado shelter areas.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Lives can be saved by pre-designating tornado shelter areas in public facilities that can withstand extreme wind forces and having severe weather action plans in place.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storm, Thunderstorm, Hail, Tornado
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues, Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	2011

2009 Analysis:
This action is deferred as it is not complete. No public facilities have been designated as tornado shelters. However, several buildings have been designated as shelter areas for evacuation victims. Assessment of existing facilities is not currently planned for the City.

		Brownwood (Past Action)-38
	Proposed Action:	**Routinely prune trees and clear limbs hanging in right-of-way. Survey and remove hazardous trees from drainage systems.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Periodic pruning of trees around right-of-ways and electric power lines will significantly reduce wind damage and thereby reduce the frequency and duration of electric power outages. It will significantly enhance electric power system operations, help save lives, reduce debris and speed recovery.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Street and Sanitation Departments
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity.

		Brownwood (Past Action)-39
	Proposed Action:	**Mandate and inspect to ensure standard tie-downs of mobile homes**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Tie-downs help prevent mobile homes from being lifted by floodwaters or winds and becoming ballistic hazards. Mobile homes are at an increased risk of wind uplift and should be securely attached to the foundation.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Developmental Services
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity. Code Enforcement is now Development Services. Part of the IBC is to have tie downs.

		Brownwood (Past Action)-40
	Proposed Action:	**Provide standards for burial of electrical, telephone, cable lines, and other utilities.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Burying electric, telephone and cable lines and/or reinforcing the connections on existing utility lines will help avoid high wind damage. The force of winds can be strong enough to torque high-tension wires from their connections to utility poles. Even if the wind does not break the wires, objects lifted by the high winds can catch upon and tear utility wires. Better connections between lines and support structures are also a means of lessening the vulnerability, but the burial of lines can avoid the risks altogether.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Winter Storms, Tornado, Hail
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Developmental Services, City Council
Implementation Schedule:	2005

2009 Analysis:
This action will be deleted. The City Council does not want to mandate the expense to bury the power lines, and is not making this action part of any ordinance. Implementing this action would curtail other development due to the City's size.

		Brownwood (Past Action)-41
	Proposed Action:	**Take action through a capital improvement program to deal with creek flooding (widen bridges, replace culverts, make channel improvements)**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City has established a capital improvement program that will mitigate future flood damages. Specific projects to deal with creek flooding are listed below by cost

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$11, 485, 500
Potential Funding Sources:	Brownwood Capital Improvement Plan
Lead Agency/Department Responsible:	City of Brownwood
Implementation Schedule:	2012

2009 Analysis:
This action will be deferred for lack of funding. The City Capital Improvement Program and bonds will be used as possible funding sources.

		Brownwood (Past Action)-42
	Proposed Action:	**Install a levee and pump system in Brook Hollow Subdivision for Pecan Bayou and Willis Creek**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City's Capital Improvement Program has been created to address several flooding problems, including backwater flooding in the Brook Hollow Subdivision

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$3,402,000
Potential Funding Sources:	Brownwood Capital Improvement Plan
Lead Agency/Department Responsible:	City of Brownwood
Implementation Schedule:	2005

2009 Analysis:
This action should be deleted due to lack of funds. A cost-benefit analysis would not be effective for any grant funding and the city cannot afford to undertake this action without the assistance of grants.

		Brownwood (Past Action)-43
	Proposed Action:	**Construct detention ponds to manage localized flooding on South Willis Creek and Willis Creek**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City's Capital Improvement Program has been created to address several flooding problems, including flooding on Willis Creek and South Willis Creek

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$13,132,600
Potential Funding Sources:	Brownwood Capital Improvement Plan
Lead Agency/Department Responsible:	City of Brownwood
Implementation Schedule:	2011

2009 Analysis:
This action is deferred

		Brownwood (Past Action)-44
	Proposed Action:	**Implement the Magnolia Ditch project to construct a ditch and install a new culvert.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Since 1984, there have been at least 5 flooding events that have impacted this area. Approximately 400 residents in 3 apartment complexes and duplexes are at risk from flooding in this area. The Magnolia Ditch project will include construction of a ditch and installation of a new culvert to reduce the flood risk.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$58, 500
Potential Funding Sources:	State and local grant funding
Lead Agency/Department Responsible:	City of Brownwood
Implementation Schedule:	24 months after receipt of funding

2009 Analysis:
This action is deferred pending funding

		Brownwood (Past Action)-45
	Proposed Action:	**Implement the Broadmore/Highland Ditch project to construct a ditch consisting of an easement of 20'X150' with a 14' concrete flat bottom and a flume across Broadmoor Street of 14'X48' concrete.**
	BACKGROUND INFORMATION	
	Site and Location:	Broadmoor STreet
	History of Damages:	Since 1984, there have been at least 5 flooding incidents that have impacted this area. Approximately 25 residents in 8 homes are at risk. This action will mitigate the risk by constructing a ditch consisting of an easement of 20'X150' with a 14' concrete flat bottom and a flume across Broadmoor Street of 14'X48' concrete.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$18,000
Potential Funding Sources:	State and local grant funding
Lead Agency/Department Responsible:	City of Brownwood Engineering Department
Implementation Schedule:	2007

2009 Analysis:
This action is partly complete and therefore deferred. The easement has not been acquired, and the flume hasn't been constructed, but the City has cleaned ditch and removed culvert & replaced with ditch. It is now opened and flowing, completed September 2007.

Brownwood (Past Action)-46	
Proposed Action:	**Construct the Tulane/Alley Berm, from Delwood Street to River Oaks Street along the alley behind Tulane Street. Install 2 new Corrugated Metal Pipes under River Oaks Drive.**
BACKGROUND INFORMATION	
Site and Location:	Tulane Street/River Oaks Drive
History of Damages:	Since 1984, there have been at least 5 flooding incidents that have impacted this area. Approximately 90 residents in 30 homes are at risk.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,600
Potential Funding Sources:	State and local grant funding
Lead Agency/Department Responsible:	City of Brownwood Engineering Department
Implementation Schedule:	12 months after receipt of funds

2009 Analysis:
This action is deferred pending funding

		Brownwood (Past Action)-47
	Proposed Action:	**Undertake the Avalon Court drainage project, interconnecting two storm sewers and replacing two curb inlets.**
	BACKGROUND INFORMATION	
	Site and Location:	Avalon Court – Stonegate and Monticello West Addition
	History of Damages:	Since 1984, there have been at least 5 flooding incidents that have impacted the Stonegate Addition and Monticello West Addition. Approximately 96 residents in 32 homes are at risk. This action will mitigate the risk by undertaking the Avalon Court drainage project, interconnecting two storm sewers and replacing two curb inlets.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$20,000
Potential Funding Sources:	State and local grant funding
Lead Agency/Department Responsible:	City of Brownwood Engineering Department
Implementation Schedule:	2011

2009 Analysis:
This action is deferred pending funding

Brownwood (Past Action)-48	
Proposed Action:	**Finish construction of the Green Acres Ditch, which will include a concrete bottom ditch that is 6'wide and 290' in length.**
BACKGROUND INFORMATION	
Site and Location:	Green Acres Subdivision
History of Damages:	Since 1984, there have been at least 5 flooding incidents that have impacted the Green Acres Subdivision. Approximately 50 residents in 16 homes are at risk. This action will mitigate the risk by finishing construction of the Green Acres Ditch.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$9,860
Potential Funding Sources:	State and local grant funding
Lead Agency/Department Responsible:	City of Brownwood Engineering Department
Implementation Schedule:	2011

2009 Analysis:
This action is partially complete and therefore deferred. Ditch has been cleaned in 2007, but has no concrete bottom.

		Brownwood (Past Action)-49
	Proposed Action:	**Undertake WPA Ditch repairs from 4th Street to Tannehill Streets, repairing sidewalls and the bottom from erosion and cave-ins.**
	BACKGROUND INFORMATION	
	Site and Location:	Tennehill Streets
	History of Damages:	Since 1984, there have been at least 5 flooding incidents that have impacted the area north of, and parallel to, Brady Avenue from 4th Street to Intermediate School, across Austin Avenue to Vine Street and ending at the railroad property. Approximately 200 residents in 7 subdivisions are at risk.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	State and local grant funding
Lead Agency/Department Responsible:	City of Brownwood Engineering Department
Implementation Schedule:	Completed action

2009 Analysis:
This action was completed at the end of 2007.

		Brownwood (Past Action)-50
	Proposed Action:	**Conduct general rip-rap repair and replacement at various locations throughout the City's drainage system.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Since 1984, there have been at least 5 flooding incidents that have impacted the City of Brownwood. The entire population of the City is at risk. This action will mitigate the risk by conducting general rip-rap repair and replacement at various locations throughout the City's drainage system.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	State and local grant funding
Lead Agency/Department Responsible:	City of Brownwood Engineering Department
Implementation Schedule:	12 months after receipt of funds

2009 Analysis:
This action is deferred pending funding.

		Brownwood (Past Action)-51
	Proposed Action:	**Undertake the Nigale Drainage Ditch project. Pave Stonebridge/Brownstone alley consisting of 1580'in length and 20' wide for drainage control from Good Shepherd Drive to Ashbury Street.**
	BACKGROUND INFORMATION	
	Site and Location:	Good Shepherd Drive/Ashbury Street
	History of Damages:	Since 1984, there have been at least 5 flooding incidents that have impacted the Stonegate Additions. Approximately 54 residents in 18 houses are at risk. This action will mitigate the risk by undertaking the Nigale Drainage Ditch project.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$12,000
Potential Funding Sources:	State and local grant funding
Lead Agency/Department Responsible:	City of Brownwood Engineering Department
Implementation Schedule:	2011

2009 Analysis:
This action is deferred pending funding.

		Brownwood (Past Action)-52
	Proposed Action:	**Undertake a project to pave Glenwood Alley behind Glenwood Street from Oakdale Street to Glenwood consisting of 15' wide by 1060' in length.**
	BACKGROUND INFORMATION	
	Site and Location:	Oakdale & Glenwood Streets
	History of Damages:	Since 1984, there have been at least 5 flooding incidents that have impacted the Oakdale Acres Addition. Approximately 80 residents in 26 houses are at risk. This action will mitigate the risk by undertaking a project to pave Glenwood Alley behind Glenwood Street from Oakdale Street to Glenwood Street consisting of 15' wide by 1060' in length.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	State and local grant funding
Lead Agency/Department Responsible:	City of Brownwood Engineering Department
Implementation Schedule:	12 months after receipt of funding

2009 Analysis:
This action is deferred pending funding.

		Brownwood (Past Action)-53
	Proposed Action:	**Implement Alley Drainage Control, paving the alley between 16th Street and 17th Street from Avenue I to Avenue J, consisting of 320' by 15'.**
	BACKGROUND INFORMATION	
	Site and Location:	16th and 17th Streets; Avenue I and Avenue J
	History of Damages:	Since 1984, there have been at least 5 flooding incidents that have impacted the Southview Subdivision. Approximately 25 residents in 5 houses are at risk. This action will mitigate the risk by implementing Alley Drainage Control, paving the alley between 16th Street and 17th Street from Avenue I to Avenue J, consisting of 320' by 15'.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$4,000
Potential Funding Sources:	State and local grant funding
Lead Agency/Department Responsible:	City of Brownwood Engineering Department
Implementation Schedule:	2010

2009 Analysis:
This action is deferred. The City completed drainage improvement, but pavement pending.

		Brownwood (Past Action)-54
	Proposed Action:	**Implement West Main Improvements from 8th Street to 9th Street. Install headwalls in 2 locations on existing pipe structures, construct detention pond and ditch, install new curb, conduct general rehabilitation of street 560' in length, and install new pipe under West Main.**
	BACKGROUND INFORMATION	
	Site and Location:	8th and 9th streets at West Main
	History of Damages:	Since 1984, there have been at least 5 flooding incidents that have impacted Out lots 125 and 126. Approximately 15 residents in 4 houses, two manufacturing businesses, and one railroad yard are at risk. This action will mitigate the risk by undertaking a project to implement West Main Improvements from 8th Street to 9th Street.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$19,000
Potential Funding Sources:	State and local grant funding
Lead Agency/Department Responsible:	City of Brownwood Engineering Department
Implementation Schedule:	Ongoing action

2009 Analysis:
This action is deferred pending funding.

Brownwood (Past Action)-55	
Proposed Action:	**Construct a 9,600 cubic yard Avenue W Detention Pond between Austin Avenue, Durham Street, Avenue W and Schroeder Lane.**
BACKGROUND INFORMATION	
Site and Location:	Avenue W Detention Pond between Austin Avenue, Durham Street, Avenue W and Schroeder Lane
History of Damages:	Since 1984, there have been at least 5 flooding incidents that have impacted the Brooks Hollow Subdivision. Approximately 150 residents in 47 houses are at risk. This action will mitigate the risk by constructing a 9,600 cubic yard Avenue W Detention Pond between Austin Avenue, Durham Street, Avenue W and Schroeder Lane.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$86,400
Potential Funding Sources:	State and local grant funding
Lead Agency/Department Responsible:	City of Brownwood Engineering Department
Implementation Schedule:	12 months after allocation of funds

2009 Analysis:
This action is deferred. The City is negotiating with ONCOR Electric (owners of property). Funds have been allocated for the property acquisition, but not for the construction.

New Actions

		Brownwood-1
	Proposed Action:	**Update International Codes by adopting most current addition every three years**
	BACKGROUND INFORMATION	
	Site and Location:	City of Brownwood
	History of Damages:	The city will help mitigate damage from natural and manmande disasters by ensuring that buildings are built to code.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Thunderstorm, Winter Storm, Wildfire, Tornado, Hurricane & Tropical Storm, Pipeline Failure, Hazardous Materials Release, Pipeline Failure, Terrorism
Effect on new/existing buildings:	Requires all new buildings to meet current code, which can help reduce the cost of insurance.
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,700 for updated e-code
Potential Funding Sources:	Annual Budget
Lead Agency/Department Responsible:	Development Services
Implementation Schedule:	2010 and every three years thereafter

COMMENTS
City proposes to purchase the most current additions of the International Building Codes in a digital format (e-code) every three years. Codes include: Building, Plumbing, Fire, Energy Conservation, Fuel Gas, Mechanical, Property Maintenance, Existing Building, and Residential for 1 & 2 Family Dwellings.

		Brownwood-2
	Proposed Action:	**Extend Service area of Code Red warning system throughout the City's ETJ and Brown County**
	BACKGROUND INFORMATION	
	Site and Location:	City of Brownwood and Brown County
	History of Damages:	The City of Brownwood has not experienced a singular, high-hazard event that has required the implementation/extension of the system.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Thunderstorm, Winter Storm, Wildfire, Tornado, Hurricane & Tropical Storm, Pipeline Failure, Hazardous Materials Release, Pipeline Failure, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$7,500 CodeRed, $15,000 enhanced CodeRed
Potential Funding Sources:	City of Brownwood, Brown County and other Municipalities within the County
Lead Agency/Department Responsible:	Emergency Management Coordinator
Implementation Schedule:	2009

COMMENTS
The City of Brownwood has successfully implemented the CodeRed warning system three years ago (November 2005) and the County along with surrounding municipalities are wanting to join the program.

		Brownwood-3
	Proposed Action:	**Provide Public Service Announcements regarding tree trimming around power lines**
	BACKGROUND INFORMATION	
	Site and Location:	City of Brownwood
	History of Damages:	Power outages and structural damages to buildings

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Winter Storm, Thunderstorm
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	minimal
Potential Funding Sources:	Annual Budget
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	2009 and ongoing

COMMENTS
Advise the public about the major city-wide tree trimming operation conducted by Verizon and ONCOR Electric to cut trees back at least 10 feet from primary electric lines. Inform the public about public safety as a result of the trimming.

Lampasas County

Previous Actions & Analysis

		Lampasas County (Past Action)-1
	Proposed Action:	**Adopt routine fire hydrant maintenance.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	This action involves routine inspection of fire hydrants to ensure that they are available to firefighters in times of structural or wildland fires. Fire hydrant inspections will be conducted on a routine basis by the fire department.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Fire department
Implementation Schedule:	Completed action

2009 Analysis:
This action is complete, since 2005, 90% of the hydrants in the County are on a routine maintenance schedule.

		Lampasas County (Past Action)-2
	Proposed Action:	**Establish and implement burning standards in community.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	This action will result in clear standards prescribing when and how burning may be done. It will reduce the risk of fire spreading uncontrollably.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Fire department
Implementation Schedule:	Ongoing action

2009 Analysis:
This action is continually implemented when necessary and is therefore deferred. Since 2005, the County issues burn bans when necessary.

		Lampasas County (Past Action)-3
	Proposed Action:	**Ensure that area firefighters are properly trained in current firefighting techniques, covering both urban and wildland fires**.
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Proper training of firefighters in the latest techniques and technologies for fighting both urban and wildland fires is critical in reducing the fire risk.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Fire department
Implementation Schedule:	Ongoing action

2009 Analysis:
This action is completed each year since 2005, and is therefore deferred as an ongoing activity. The Fire Department attends training every year and also conducts training in-house.

		Lampasas County(Past Action)-4
	Proposed Action:	**Promote the use of new technologies for detecting and fighting fires.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The technology of detecting and suppressing fires is continuing to progress rapidly. Equipment and systems exist to detect the products of combustion and to control, extinguish or suppress fires. These systems include electronic detectors (smoke, heat and flame), water-based suppression systems, and gaseous, liquid or solid chemical suppression systems.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Fire department
Implementation Schedule:	Completed action

2009 Analysis:
This action was completed in 2006

		Lampasas County (Past Action)-5
	Proposed Action:	**Educate the public about the risks they face and steps that can be taken to reduce their risk.** • **Educate citizens about hazardous materials and household hazardous waste.** • **Educate individuals and businesses regarding actions to take in preparation for possible terrorist events (emergency preparedness kits).**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	This action will result in a more informed public, aware of the risks they face and knowledgeable about how to protect their families, homes, workplaces and livelihoods against the impact of hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	County departments
Implementation Schedule:	Ongoing action

2009 Analysis:
This action is continually implemented and is deferred as an ongoing activity. The County conducts fire prevention programs given to the public and schools annually.

		Lampasas County (Past Action)-6
	Proposed Action:	**Increase security where appropriate**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Increasing security surrounding critical facilities and services can help protect against intentional acts of destruction.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Terrorism, Hazardous Material Release
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Police department
Implementation Schedule:	N/A

2009 Analysis:
This action will be deleted. The county will not undertake this action as it is too broad.

		Lampasas County (Past Action)-7
	Proposed Action:	**Require mobile home parks to provide safe storm shelters.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Mobile homes are particularly susceptible to destruction by relatively minor high-wind events. This action would require that mobile home parks of a given size build a storm shelter for their residents. The shelter has the potential to be an attractive building that functions as a community meeting room and gives a greater sense of permanence to the mobile home park. As a result, it may increase property values.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hurricane and Tropical Storm, Tornado, Thunderstorm
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	County departments
Implementation Schedule:	To be implemented after receipt of funds

2009 Analysis:
This action is deferred. Grant funds will be needed in order to implement.

		Lampasas County (Past Action)-8
	Proposed Action:	**Mandate and inspect to ensure standard tie-downs of mobile homes.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Tie-downs help prevent mobile homes from being lifted by floodwaters or winds and becoming ballistic hazards. Mobile homes are at an increased risk of wind uplift and should be securely attached to the foundation.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	County departments
Implementation Schedule:	Ongoing action

2009 Analysis:
This action is deferred as an ongoing activity.

		Lampasas County (Past Action)-9
	Proposed Action:	**Secure traffic lights and traffic controls from high wind damage.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	This action will protect traffic lights and other traffic controls and install resilient street signs for navigation in an emergency to avoid traffic signal malfunction, which can produce backups and accidents at intersections and subsequently impede evacuation or emergency response.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	Ongoing action

2009 Analysis:
This action is deferred as an ongoing activity.

New Actions

		Lampasas County-1
	Proposed Action:	**Rebuild low water crossing on CR 3372**
	BACKGROUND INFORMATION	
	Site and Location:	Binion Creek and CR 3372
	History of Damages:	Binion Creek crossing has experienced several heavy rains that washed soil from around the crossing and caused heavy damage to the structure. This crossing is used heavily by residence in several housing additions in the area.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm
Effect on new/existing buildings:	This action will reduce the risk of flooding and future costs by mitigating against property damage
Priority (High, Moderate, Low):	High
Estimated Cost:	$88,000
Potential Funding Sources:	State/Federal Grants
Lead Agency/Department Responsible:	Lampasas County
Implementation Schedule:	18 months after grant approval

COMMENTS

		Lampasas County-2
	Proposed Action:	**Conduct surface milling and install side walls at low water crossing at CR 2699**
	BACKGROUND INFORMATION	
	Site and Location:	CR 2699 at Simms Creek
	History of Damages:	Simms Creek experiences fairly heavy flows during rain and storm events. This creek experienced heavy rains in 2007 (DR 1709) that washed the concrete slab and road base downstream. It has been determined that milling the surface of the bedrock and installing side walls would be more cost effective. The alternative is to repeatedly replace culverts and road base material on top of the crossing. Without repair, the low water crossing is a dangerous intersection.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm
Effect on new/existing buildings:	This action will reduce the risk of loss of life and property during flooding as well a future rebuilding costs. It will also protect citizens and emergency personnel
Priority (High, Moderate, Low):	High
Estimated Cost:	$64,000
Potential Funding Sources:	State/Federal Grants
Lead Agency/Department Responsible:	Lampasas County
Implementation Schedule:	18 months after grant approval

COMMENTS

		Lampasas County-3
	Proposed Action:	**Replace low water crossing on CR 2207**
	BACKGROUND INFORMATION	
	Site and Location:	School Creek at CR 2207
	History of Damages:	School Creek low water crossing experiences heavy flows in rain and flood events. Each time the creek rises above the crossing, road material is carried downstream. This creek was repetitively damaged in 2007 with DR 1709. The action calls for upgrade of damaged crossing with concreted approaches to protect the road base, and replacement of crossing structure for increased water flow. In addition, side walls will be installed to protect the structure as the alternative is continual repair with each heavy rain event, leaving the road out of service for longer periods of time.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm
Effect on new/existing buildings:	This action will reduce the risk of flooding and future costs by mitigating against property damage and loss of life.
Priority (High, Moderate, Low):	High
Estimated Cost:	$69,000
Potential Funding Sources:	State/Federal Grants
Lead Agency/Department Responsible:	Lampasas County
Implementation Schedule:	18 months after grant approval

COMMENTS

City of Kempner

Previous Actions & Analysis

		City of Kempner (Past Action)-1
	Proposed Action:	**Digitize hardcopies of public records and store them in hazard-free offsite locations.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	No site exists in which to store critical information belonging to the city. In the event of fire, flood, or tornado, the City may lose valuable and non-replaceable records.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Thunderstorm, Winter Storm, Wildfire, Tornado, Hurricane & Tropical Storm, Pipeline Failure, Hazardous Materials Release, Pipeline Failure, Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$25,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City of Kempner
Implementation Schedule:	Ongoing action

2009 Analysis:
This action is deferred. The City is almost finished digitizing, about 98% complete.

City of Kempner (Past Action)-2	
Proposed Action:	**Develop a mass debris removal plan.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Disasters generate a variety of debris, including vegetative matter, building/construction material, appliances, personal property, mud and sediment. The quantity and type of debris is a function of the location and type of event. To date, Kempner has not had a devastating storm causing damage to private property resulting in very large quantities of materials on streets and sidewalks.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm, Hail, Winter Storm
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$500
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	City of Kempner
Implementation Schedule:	Deferred action until 2011

2009 Analysis:
This action is deferred. The City has developed an ordinance, but not a plan at this time.

		City of Kempner (Past Action)-3
	Proposed Action:	**Employ consulting engineers to assess the adequacy of the City's drainage and culverts.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Heavy rains continue to reveal drainage problems in many areas of the City. The adequacy of City drainage ways needs to be assessed by professional engineers and improvements need to be made. Current code enforcement personnel perform assessments of the adequacy of the City's drainage system and culverts, as time allows.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$280,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City of Kempner
Implementation Schedule:	Deferred action until 2011

2009 Analysis:
This action is deferred for lack of funding.

City of Kempner (Past Action)-4	
Proposed Action:	**Encourage the installation of safe rooms in new and existing homes and businesses.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	The City has no designated storm shelters. Encouraging installation of safe rooms in new and existing homes and businesses would provide some protection.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm, Winter Storm, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$3,000 to $6,000
Potential Funding Sources:	Private funding sources
Lead Agency/Department Responsible:	City of Kempner
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity.

City of Kempner (Past Action)-5	
Proposed Action:	**Bring the City into compliance with the requirements of the National Weather Service program, "Storm Ready."**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	By designating them as "Storm Ready," the National Weather Service recognizes local communities that have demonstrated a strong commitment to putting the infrastructure and systems in place that will save lives and protect property in the event of a severe weather event. "Storm Ready" communities are better prepared and will help serve their citizens when help is needed the most.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm, Winter Storm, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$100
Potential Funding Sources:	General revenues, Grants
Lead Agency/Department Responsible:	City of Kempner
Implementation Schedule:	2010

2009 Analysis:
This action is partially complete and therefore deferred.

		City of Kempner (Past Action)-6
	Proposed Action:	**Determine feasibility of installing outdoor warning sirens (investigate equipment available; determine types of sirens available, installation, operating and maintenance costs; interview system owners to determine level of satisfaction and problems encountered).**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City currently relies on commercial radio, television, and, in limited cases, NOAA Weather Alert Radios to disseminate warnings to the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Thunderstorm, Winter Storm, Wildfire, Tornado, Hurricane & Tropical Storm, Pipeline Failure, Hazardous Materials Release, Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$300,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City of Kempner
Implementation Schedule:	Deferred activity until 2012

2009 Analysis:
This action is deferred as the City of Kempner only has LCRA and NOAA Radio equipment.

New Actions

		Kempner-1
	Proposed Action:	**Develop a pamphlet and public awareness campaign including radio messages to educate the public about the dangers of extreme heat.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Kempner
	History of Damages:	Elderly members of the community and small children are hit hardest by the harsh, extreme summer heat. A public awareness campaign would help to inform the general public about ways to mitigate against the hazard of extreme heat.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Extreme Heat
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000-$5,000 depending on advertising cost
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	Ongoing activity to begin 6 months after funding

COMMENTS

		Kempner-2
	Proposed Action:	**Adopt routine maintenance and cleaning of stormwater drains**
	BACKGROUND INFORMATION	
	Site and Location:	City of Kempner
	History of Damages:	In times of severe thunderstorms or flooding poor drainage quickly becomes an issue. Without proper drainage the floodwaters can overflow and affect city roads and private property.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricanes & Tropical Storms
Effect on new/existing buildings:	Routine maintenance and cleaning will prevent floodwaters from overflowing and damaging existing buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	Undetermined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	To be completed on an annual basis

COMMENTS

		Kempner-3
	Proposed Action:	**Provide training for EMS in conjunction with railway companies to prepare for a derailment where there may be a hazardous material release.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Kempner
	History of Damages:	Major railways go through the City of Kempner. If a train derailment were to occur or a hazardous materials spill, prompt action would need to be taken to ensure the safety of citizens and the surrounding area.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release; Terrorism
Effect on new/existing buildings:	Existing buildings nearby the railways and any new development would benefit from this action in that a hazmat release plan would be in effect.
Priority (High, Moderate, Low):	High
Estimated Cost:	$25,000 per year
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	Annual training to be conducted

COMMENTS

		Kempner-4
	Proposed Action:	**Implement an annual tree trimming program to clear stray branches and limbs from the right of way.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Kempner
	History of Damages:	In a severe thunderstorm or winter storm event, branches and limbs can damage power lines or homes. Trimming trees regularly will help to mitigate the effect of ice-covered limbs in a winter storm event, or stray limbs that down power lines and damage homes in a severe thunderstorm or high wind.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Winter Storm, Thunderstorm
Effect on new/existing buildings:	This action will help to protect current property from downed limbs and branches, and also encourage new growth and development.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	To be completed annually - ongoing

COMMENTS

City of Lampasas

Previous Actions & Analysis

City of Lampasas (Past Action)-1	
Proposed Action:	**Adopt routine fire hydrant maintenance.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	This action involves routine inspection of fire hydrants to ensure that they are available to firefighters in times of structural or wildland fires. Fire hydrant inspections will be conducted on a routine basis by the fire department.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Fire department
Implementation Schedule:	Ongoing Activity

2009 Analysis:
This action is deferred as an ongoing activity.

City of Lampasas (Past Action)-2	
Proposed Action:	**Establish and implement burning standards in community**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	This action will result in clear standards prescribing when and how burning may be done. It will reduce the risk of fire spreading uncontrollably.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Fire department
Implementation Schedule:	Deferred activity for 2010

2009 Analysis:
This action is deferred for the 2014 Plan. The City continues to implement burning standards set in 2005.

		City of Lampasas (Past Action)-3
	Proposed Action:	**Ensure that area firefighters are properly trained in current firefighting techniques, covering both urban and wildland fires.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Proper training of firefighters in the latest techniques and technologies for fighting both urban and wildland fires is critical in reducing the fire risk.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Fire department
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity.

City of Lampasas (Past Action)-4	
Proposed Action:	**Promote the use of new technologies for detecting and fighting fires.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	The technology of detecting and suppressing fires is continuing to progress rapidly. Equipment and systems exist to detect the products of combustion and to control, extinguish or suppress fires. These systems include electronic detectors (smoke, heat and flame), water-based suppression systems, and gaseous, liquid or solid chemical suppression systems.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Fire department
Implementation Schedule:	Ongoing activity began in 2004

2009 Analysis:
This action is deferred as an ongoing activity.

City of Lampasas (Past Action)-5	
Proposed Action:	**Educate the public about the risks they face and steps that can be taken to reduce their risk.** • **Educate citizens about hazardous materials and household hazardous waste.** • **Educate individuals and businesses regarding actions to take in preparation for possible terrorist events (emergency preparedness kits).**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	This action will result in a more informed public, aware of the risks they face and knowledgeable about how to protect their families, homes, workplaces and livelihoods against the impact of hazards.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Thunderstorm, Winter Storm, Wildfire, Tornado, Hurricane & Tropical Storm, Pipeline Failure, Hazardous Materials Release, Terrorism
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	Ongoing activity began in 2004

2009 Analysis:
This action is continually implemented and is deferred as an ongoing activity. The County conducts fire prevention programs given to the public and schools annually.

City of Lampasas (Past Action)-6	
Proposed Action:	**Increase security where appropriate.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Increasing security surrounding critical facilities and services can help protect against intentional acts of destruction.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release, Terrorism
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Police department
Implementation Schedule:	N/A

2009 Analysis:
This action will be deleted. It is too broad and therefore not technically feasible.

		City of Lampasas (Past Action)-7
	Proposed Action:	**Require mobile home parks to provide safe storm shelters.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Mobile homes are particularly susceptible to destruction by relatively minor high-wind events. This action would require that mobile home parks of a given size build a storm shelter for their residents. The shelter has the potential to be an attractive building that functions as a community meeting room and gives a greater sense of permanence to the mobile home park. As a result, it may increase property values.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	To be developed upon receipt of funds

2009 Analysis:
This action is deferred. The action was not economically feasible at the time. Grant funds will be sought in order to implement.

City of Lampasas (Past Action)-8	
Proposed Action:	**Mandate and inspect to ensure standard tie-downs of mobile homes.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Tie-downs help prevent mobile homes from being lifted by floodwaters or winds and becoming ballistic hazards. Mobile homes are at an increased risk of wind uplift and should be securely attached to the foundation.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity. The city continues to mandate and inspect the use of tie-downs.

City of Lampasas (Past Action)-9	
Proposed Action:	**Secure traffic lights and traffic controls from high wind damage.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	This action will protect traffic lights and other traffic controls and install resilient street signs for navigation in an emergency to avoid traffic signal malfunction, which can produce backups and accidents at intersections and subsequently impede evacuation or emergency response.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Mayor
Implementation Schedule:	Ongoing activity

2009 Analysis:
This action is deferred as an ongoing activity.

New Actions

		Lampasas - 1
	Proposed Action:	**Bring the City into compliance with the NWS "Storm Ready" requirements.**
	BACKGROUND INFORMATION	
	Site and Location:	City of Lampasas
	History of Damages:	The City has experienced both natural and man-made hazard events, and becoming "Storm Ready" would better prepare the community for the next disaster event through more timely and effective weather warnings. In addition a Storm Ready community designation can reduce rates through the NFIP.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Tornado
Effect on new/existing buildings:	This action will help to protect current property and also encourage new growth and development.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Low
Potential Funding Sources:	General Fund
Lead Agency/Department Responsible:	City
Implementation Schedule:	Ongoing

COMMENTS

		Lampasas-2
	Proposed Action:	**Undertake Sulphur Creek Drainage project**
	BACKGROUND INFORMATION	
	Site and Location:	Sulphur Creek
	History of Damages:	In May of 2005, debris buildup and severe storms lead to flooding and high flows. Debris and trees collected and backed up the stream channel.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm, Winter Storm
Effect on new/existing buildings:	This action will reduce restriction in the floodway allowing the opportunity for new buildings to be developed and protecting existing building from damage due to flooding.
Priority (High, Moderate, Low):	High
Estimated Cost:	$30,000
Potential Funding Sources:	State/Federal Grants
Lead Agency/Department Responsible:	NRCS
Implementation Schedule:	As funding becomes available

COMMENTS

		Lampasas-3
	Proposed Action:	**Implement Sulphur Creek bank stabilization project, installing rock gabions to reduce erosion of the creek bank.**
	BACKGROUND INFORMATION	
	Site and Location:	Sulphur Creek
	History of Damages:	In May of 2005, debris buildup and severe storms lead to flooding and high flows. High flows at this time and in 2007 changed the course of the stream. It is now getting close to a large wastewater main running along the creek. The bank needs to be stabilized to prevent hazardous waste discharge into the surface water.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm, Hazardous Materials Release
Effect on new/existing buildings:	As the creek bank erodes, existing property becomes at risk for flood damage. This action reduces that risk.
Priority (High, Moderate, Low):	High
Estimated Cost:	$350,000
Potential Funding Sources:	State/Federal Grants
Lead Agency/Department Responsible:	City of Lampasas
Implementation Schedule:	Complete by 2010

COMMENTS

City of Lometa

Previous Actions & Analysis

City of Lometa (Past Action)-1	
Proposed Action:	**Develop a mass debris removal plan.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Disasters generate a variety of debris, including vegetative matter, building/construction material, appliances, personal property, mud and sediment. The quantity and type of debris is a function of the location and type of event. To date, Lometa has had a devastating storm causing damage to private property, resulting in large quantities of materials (couches, carpets, appliances, foodstuffs, building materials, etc.) which would end up on the curbside.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Thunderstorm
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$300 per hour
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City of Lometa Police Department, Volunteer Fire Department, County Road and Bridge, TXDOT
Implementation Schedule:	2005 - Completed action

2009 Analysis:
This action is complete. In 2005 the city implemented a cleanup program.

City of Lometa (Past Action)-2	
Proposed Action:	**Employ consulting engineers to assess the adequacy of the City's drainage ditches and culverts.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Currently the one maintenance employee tries to maintain all culverts and drainage ditches in the city.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$280,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Lometa Maintenance Department
Implementation Schedule:	To be determined upon receipt of funds

2009 Analysis:
This action is deferred.

City of Lometa (Past Action)-3	
Proposed Action:	**Digitize hardcopies of public records and store them in hazard-free offsite locations.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	No site exists in which to store critical information belonging to the city. In the event of fire, flood, or tornado, the City may lose valuable and non-replaceable records.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$35,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City of Lometa
Implementation Schedule:	2011

2009 Analysis:
This action is deferred as the city has not had the staff time to commit to digitizing records. Grant funds may be necessary to make this action feasible.

City of Lometa (Past Action)-4	
Proposed Action:	**Bring the City into compliance with the requirements of the National Weather Service program, "Storm Ready."**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	By designating them as "Storm Ready," the National Weather Service recognizes local communities that have demonstrated a strong commitment to putting the infrastructure and systems in place that will save lives and protect property in the event of a severe weather event. "Storm Ready" communities are better prepared and will help serve their citizens when help is needed the most.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Winter Storms, Thunderstorms, Hurricanes and Tropical Storms
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	More than $1,100
Potential Funding Sources:	Grants, General Revenues
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	2010

2009 Analysis:
This action is deferred. The city has not had staff time available to devote to fulfilling the requirements of becoming a Storm Ready community.

		City of Lometa (Past Action)-5
	Proposed Action:	**Investigate the equipment available for outdoor warning systems, determine the type of sirens recommended, their placement and installed costs. Investigate operating and maintenance costs. Interview existing system owners to determine level of satisfaction and problems encountered.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City currently relies upon the Lampasas Sheriff's Department to notify the Lometa Volunteer Fire Department to disseminate warnings to the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$200,000
Potential Funding Sources:	Grants, Federal and State Funds
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	12 months after receipt of funding

2009 Analysis:
This action is deferred as the city has not received sufficient funds to complete.

City of Lometa (Past Action)-6	
Proposed Action:	**Complete the City of Lometa Emergency Plan.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	In the year 2000, FEMA and the Texas Division of Emergency Management began revising the format for emergency plans used by all jurisdictions in the State. Many of the changes made existing plans obsolete. The City of Lometa has been working with each of the individuals with responsibility for their Plan to update it to current standards. Due to the number of disciplines involved and the detail required, this is a time consuming task.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$200
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Office of Emergency Management
Implementation Schedule:	2006

2009 Analysis:
This action has not been completed and is deferred.

City of Lometa (Past Action)-7	
Proposed Action:	**Define safe zones in public buildings, schools, day care centers and senior citizen facilities.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	When severe storms or tornados threaten, citizens in public buildings need access to a protective shelter. Many times shelter areas are selected by non-experts and are based on general guidelines provided by the National Weather Service and FEMA. They may or may not be the areas within the structure that would provide the maximum protection.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornados, Winter Storm, Thunderstorm, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Lometa Police Department, Volunteer Fire Department
Implementation Schedule:	2012

2009 Analysis:
This action is deferred.

City of Lometa (Past Action)-8	
Proposed Action:	**Encourage the installation of Safe Rooms in new and existing homes and businesses.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	The City has no designated storm shelters. This would provide at least limited shelter information to participants.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Winter Storm, Thunderstorm, Hurricane and Tropical Storm
Priority (High, Moderate, Low):	High
Estimated Cost:	$3,000 to $6,000 per unit
Potential Funding Sources:	Individual homes and business owners
Lead Agency/Department Responsible:	Lometa Police Department, Volunteer Fire Department
Implementation Schedule:	N/A

2009 Analysis:
This action is not feasible or cost effective and will not be implemented. It will be deleted.

City of Lometa (Past Action)-9	
Proposed Action:	**Develop evacuation plans, policies and procedures.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	The City has no plan in place in the event a train derails and spills hazardous materials, or a transport company vehicle is involved in a hazardous spill on the two major highways that run through our city limits. If a train derails and spills hazardous materials we could have to quarantine our town for 3-4 days.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Material Release, Terrorism
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Lometa Police Department and Volunteer Fire Department; Mutual Aid with Goldthwaite and San Saba Counties; Lampasas County; Ft. Hood Military Base; and Department of Public Safety
Implementation Schedule:	2010

2009 Analysis:
This action is deferred until the city can establish routes in conjunction with surrounding cities and the county.

City of Lometa (Past Action)-10	
Proposed Action:	**Recruit and train volunteers to provide support in safeguarding the City before, during and after any disaster.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Lometa experienced a tornado in the late 1990s and was not prepared for cleanup and recovery. The city should be better organized in the event of another disaster.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Tornado, Terrorism, Hazardous Material Release, Pipeline Failure
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Lometa Police Department and Volunteer Fire Department; Mutual Aid with Goldthwaite and San Saba Counties; Lampasas County; Ft. Hood Military Base; and Department of Public Safety
Implementation Schedule:	2011

2009 Analysis:
This action is deferred.

New Actions

		Lometa-1
	Proposed Action:	**Conduct public education program on fire risks as well as wildland fire mitigation, with the assistance of the Texas Forest Service**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	There have been numerous grass fires due to cigarettes or other elements that are preventable. These small fires can cause great damage to land and structures including fencing and trees

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Grass fires can easily spread to the city and damage buildings. Also many buildings are close to areas of vegetation, making them susceptible to wildfire event.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	State/Federal Grants
Lead Agency/Department Responsible:	Lometa Volunteer Fire Department / Texas Forest Service
Implementation Schedule:	Ongoing activity

COMMENTS

		Lometa-2
	Proposed Action:	**Offer free classes to the public on reducing debris through tree trimming and pruning**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Weather related events cause debris to build up where limbs and branches have not been trimmed by residents, or where they have piled up. These also clog up streams and creeks and can harbor trash or pests.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Flood, Thunderstorm, Hail, Winter Storm, Hazardous Materials Release
Effect on new/existing buildings:	Keeping trees and brush trimmed can better protect existing buildings in the event of a fire and prevent flooding by way of reducing debris.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,000 to $5,000
Potential Funding Sources:	State/Federal Grants
Lead Agency/Department Responsible:	City of Lometa
Implementation Schedule:	Ongoing activity

COMMENTS

		Lometa-3
	Proposed Action:	**Educate residents about xeriscape planting.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Inappropriate plant selection and inefficient irrigation have resulted in misuse of water, thereby increasing water waste

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000 to $5,000
Potential Funding Sources:	State/Federal Grants
Lead Agency/Department Responsible:	City of Lometa
Implementation Schedule:	Ongoing activity

COMMENTS

McCulloch County

Only the City of Brady in McCulloch County is participating

City of Brady

Previous Actions & Analysis

The City of Brady is a new member community to the TCRFC. Past actions included in the Concho Valley Council of Governments Plan under McCulloch County are incorporated herein and renewed.

New Actions

		Brady-1
	Proposed Action:	**Improve drainage at low water crossing and install automatic gates as needed to stop traffic**
	BACKGROUND INFORMATION	
	Site and Location:	13th and Blackburn
	History of Damages:	Local flooding of streets during storms results in wash outs and is a danger to citizens in terms of cars being washed downstream

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm
Effect on new/existing buildings:	Flooding and poor drainage can damage city buildings and residential property close to low water crossings. This action will help mitigate the damage due to floods and storms.
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	FEMA, PDM/HMGP Grants
Lead Agency/Department Responsible:	City Public Works
Implementation Schedule:	1 year after grant approval

COMMENTS

		Brady-2
	Proposed Action:	**Upgrade and install 4 additional emergency sirens**
	BACKGROUND INFORMATION	
	Site and Location:	To be determined
	History of Damages:	The city of Brady has experienced natural disasters and due to the rural nature of the community, some areas due not hear sirens in time to heed warnings.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$250,000
Potential Funding Sources:	State/Federal Grants
Lead Agency/Department Responsible:	Emergency Manager
Implementation Schedule:	6 months after grant approval

COMMENTS

		Brady-3
	Proposed Action:	**Install Emergency Generators at water wells throughout the city.**
	BACKGROUND INFORMATION	
	Site and Location:	Water wells throughout city: 900 W. 1st Street 2nd at Pecan W. White at North Grant End of South China Street Fife Street at Brady Lake South Avenue at Martin Street
	History of Damages:	The city has experienced loss of power during hazard events

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm, Hail, Winter Storm
Effect on new/existing buildings:	Generators will help restore power to existing buildings mitigating against damage by allowing for earlier cleanup.
Priority (High, Moderate, Low):	High
Estimated Cost:	$50,000 per generator
Potential Funding Sources:	State/Federal Grants
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	6 months after grant approval

COMMENTS

		Brady-4
	Proposed Action:	**Undertake remapping of the floodplain**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Since 1995, the City has experienced several major floods, none of which have been considered a 100- or 500-year flood event

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm
Effect on new/existing buildings:	This action will affect new development by notifying builders about the importance of flood insurance even when an area is not in a 100 or 500 year zone.
Priority (High, Moderate, Low):	High
Estimated Cost:	$200,000
Potential Funding Sources:	FEMA
Lead Agency/Department Responsible:	FEMA
Implementation Schedule:	2010

COMMENTS
Since most of Brady has not been established with a Base Flood Elevation (BFE), this would establish a BFE for construction and an updated ordinance.

		Brady-5
	Proposed Action:	**Build a community safe room**
	BACKGROUND INFORMATION	
	Site and Location:	To be determined
	History of Damages:	Community Safe rooms provide shelter for citizens and emergency responders. The City of Brady has experienced loss of power, roof damage and numerous downed trees in past hazard events and currently does not have a designated safe room

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm, Tornado, Winter Storm
Effect on new/existing buildings:	This shelter would be beneficial to existing buildings which are currently ill-fitted for the use of a shelter and base of operations.
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	FEMA/ORCA grants
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	1 year after grant award

COMMENTS

		Brady-6
	Proposed Action:	**Undertake remediation of Brady Lake Dam and/or Spillway. Initiate a hydrologic and hydraulic study with the development of a maintenance program**
	BACKGROUND INFORMATION	
	Site and Location:	Dam at Brady Lake
	History of Damages:	The City has not experienced a dam failure in the past, but this action would help the community better prepare

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm, Dam Failure
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	TCEQ/FEMA/ORCA Grants
Lead Agency/Department Responsible:	City Administration
Implementation Schedule:	6 months after grant approval

COMMENTS
Brady Lake Dam is classified as a high hazard structure by TCEQ. The owner of the Dam is the City of Brady.

		Brady-7
	Proposed Action:	**Removal of vegetation in Brady Creek and ditches throughout the city.**
	BACKGROUND INFORMATION	
	Site and Location:	Brady Creek: North Elm Street to Sewer Plant (approximately 3 miles) Citywide
	History of Damages:	In a thunderstorm or flood event, Brady Creek overflows due to vegetation, causing damage to property and potentially endangering lives. In addition, ditches throughout the city hold water during storms resulting in localized flooding

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm, Dam Failure
Effect on new/existing buildings:	This action will reduce the risk of flooding and future costs by mitigating against property damage and loss of life.
Priority (High, Moderate, Low):	High
Estimated Cost:	$550,000 ($300,000 for Brady Creek and $250,000 for ditches throughout the city)
Potential Funding Sources:	Texas Water Development Board, ORCA
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	3 months after grant approval

COMMENTS

		Brady-8
	Proposed Action:	**Removal of city service area, emergency services and equipment from the floodplain**
	BACKGROUND INFORMATION	
	Site and Location:	101 East First Street; Fire Station/EMS
	History of Damages:	Numerous floods over the years have inundated the City Service, Warehouse and Associated buildings. In the early 50's the Fire station received 12 feet of water in a flood event.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm, Dam Failure
Effect on new/existing buildings:	This action will reduce the risk of flooding and future costs by mitigating against property damage and loss of life.
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000,000
Potential Funding Sources:	FEMA, PDM/HMGP, ORCA, City
Lead Agency/Department Responsible:	City Council, Emergency Manager
Implementation Schedule:	1 year after grant approval

COMMENTS
The Fire Department and EMS are located in the same building in the floodplain

		Brady-9
	Proposed Action:	**Rebuild waste water lines in the floodway and associated manholes**
	BACKGROUND INFORMATION	
	Site and Location:	Brady Creek from Hwy 87 to the Sewer Plant
	History of Damages:	Numerous cave-ins and manholes have become weakened due to storm events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm, Dam Failure, Hazardous Materials Release
Effect on new/existing buildings:	Rebuilding the lines will help prevent cave ins which can damage the foundations for existing and/or newly-developed buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	$3,000,000
Potential Funding Sources:	TWDB, ORCA, TDA
Lead Agency/Department Responsible:	Public Works
Implementation Schedule:	1 year after grant approval

COMMENTS

		Brady-10
	Proposed Action:	**Purchase generator for water plant**
	BACKGROUND INFORMATION	
	Site and Location:	Water plant at Brady Lake
	History of Damages:	This plant supplies 75% of the water for the City of Brady. If a hazard event, whether natural or man-caused, were to occur, the city would be without a major water supply.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm, Dam Failure, Hazardous Materials Release, Terrorism, Drought, Extreme Heat
Effect on new/existing buildings:	This action would benefit the existing structure at the water plant and mitigate against potential damage from a natural or manmade hazard event.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000
Potential Funding Sources:	State/Federal Grants
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	6 months after grant approval

COMMENTS

		Brady-11
	Proposed Action:	**Create a HAZMAT education team that provides educational opportunities for responders and educational materials and resources for the public**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	McCulloch County incurs an inordinate amount of hazardous materials traffic for the population. Proper reporting and response procedures are critical to effective response with limited resources.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release, Terrorism
Effect on new/existing buildings:	Establishing a Hazmat team will better ensure that buildings are not affected in a manmade event.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	6 months after grant approval and ongoing

COMMENTS

		Brady-12
	Proposed Action:	**Educate the public on extreme heat and drought safety and health issues.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Brady experiences many days and months of extreme heat. Additionally, a large portion of the community is elderly and more susceptible to the dangers of extreme heat

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Effect on new/existing buildings:	Drought and extreme heat awareness should help citizens focus on at-home mitigation techniques such as water conservation; thereby reducing energy bills and potential foundation damage to homes/existing buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	$2,500
Potential Funding Sources:	General Revenues
Lead Agency/Department Responsible:	City Council
Implementation Schedule:	6 months after grant approval and ongoing

COMMENTS

		Brady-13
	Proposed Action:	**Provide public education for preparing for extended power outages and create a "hot sheet" of citizens that have critical health or other issues that will be adversely affected by an extended power outage for use by emergency dispatch services**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	In rural areas of the county, extended power outages are fairly rare, but those who rely on electricity for critical health care equipment could be put in peril before crews are notified

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Hazardous Materials Release, Terrorism, Dam Failure, Flood, Thunderstorm, Winter Storm, Tornado, Hurricane & Tropical Storm
Effect on new/existing buildings:	This action affects people rather than property.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Minimal
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	2009

COMMENTS

		Brady-14
	Proposed Action:	**Provide NOAA "All Hazard" radios to critical facilities and structures**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Since 1995, the city has experienced four tornadoes and numerous severe storms.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	Learning about hazards in advance allows people to better protect existing structures.
Priority (High, Moderate, Low):	High
Estimated Cost:	$10,000
Potential Funding Sources:	TCRFC, Grants, donations
Lead Agency/Department Responsible:	Emergency Management Coordinator
Implementation Schedule:	6 months after donations received

COMMENTS

		Brady-15
	Proposed Action:	**Obtain and install a generator at the Waste Water Plant and City Hall**
	BACKGROUND INFORMATION	
	Site and Location:	Waste Water Plant and City Hall at 201 East Main Street
	History of Damages:	The plant has lost power in the past, making wastewater treatment during times of a hazard event impossible. In an emergency situation, responders rely on having a base of operations. Currently that is City Hall, which is also susceptible to a power outage.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Tornado, Hurricane & Tropical Storm, Winter Storm, Dam Failure
Effect on new/existing buildings:	Powering city hall and the wastewater plant will allow emergency works to better protect citizens in a disaster and mitigate against property damage by keeping power to existing structures.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$50,000 per generator
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	6 months after grant awarded

COMMENTS

		Brady-16
	Proposed Action:	**Build a berm around the electrical substation with a sump pump.**
	BACKGROUND INFORMATION	
	Site and Location:	101 First Street
	History of Damages:	The power plant substation is located in the floodplain and has a history of flooding

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Winter Storm, Tornado, Hurricane & Tropical Storm
Effect on new/existing buildings:	This would reduce the risk of property damage to the substation
Priority (High, Moderate, Low):	High
Estimated Cost:	$100,000
Potential Funding Sources:	FEMA, ORCA
Lead Agency/Department Responsible:	Electrical Department
Implementation Schedule:	6 months after grant is received

COMMENTS

		Brady-17
	Proposed Action:	**Move the Emergency Operations Center from the floodplain with generator.**
	BACKGROUND INFORMATION	
	Site and Location:	To be determined
	History of Damages:	The EOC is located in the floodplain and has a history of flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	This action would mitigate against damage to the new EOC and the existing structure which has a history of damage during a storm event.
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	1 year after grant award

COMMENTS

		Brady-18
	Proposed Action:	**Take water from wastewater plant and pump it to Brady Lake through a pipeline**
	BACKGROUND INFORMATION	
	Site and Location:	Wastewater plant
	History of Damages:	The city often experiences water shortages during extreme heat and drought conditions

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat
Effect on new/existing buildings:	Drought and extreme heat can lead to cracking and foundation problems for buildings. This action would mitigate against damage by ensuring that water is available.
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,000,000
Potential Funding Sources:	TWDB, ORCA, TCEQ
Lead Agency/Department Responsible:	City manager
Implementation Schedule:	2009

COMMENTS

		Brady-19
	Proposed Action:	**Implement citywide NIMS training for all employees**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The city experiences frequent natural disasters such as flooding or tornado, but should also be prepared for manmade events such as terrorism or hazardous material releases.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	NIMS training will allow for better response and organization, mitigating against damage to existing buildings by following proper procedure.
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	GDEM
Lead Agency/Department Responsible:	Emergency Services
Implementation Schedule:	Ongoing

COMMENTS

Mills County

Previous Actions & Analysis

		Mills County (Past Action)-1
	Proposed Action:	**Work with the City of Goldthwaite to develop and maintain a State-approved Emergency Management Plan for Mills County and the City of Goldthwaite. Assemble a team of volunteers, assign responsibilities, and address the basic plan and each of the twenty-two annexes.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Mills County and the City of Goldthwaite are two of very few entities in the State who do not have approved Emergency Management Plans.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$2000
Potential Funding Sources:	General revenue
Lead Agency/Department Responsible:	Mills County, City of Goldthwaite
Implementation Schedule:	Completed in 2004

2009 Analysis:
Completed: approved by DEM 10/26/2004 Current DEM assessment of planning preparedness: Intermediate

		Mills County (Past Action)-2
	Proposed Action:	**Join the National Flood Insurance Program and develop county-wide floodplain maps.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Mills County is not currently participating in the National Flood Insurance Program and does not have floodplain maps that identify high-hazard areas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues, Grants
Lead Agency/Department Responsible:	Mills County
Implementation Schedule:	Completed action

2009 Analysis:
Completed: Mills County is a member of the NFIP and has floodplain approved a Flood Damage Prevention Court Order

		Mills County (Past Action)-3
	Proposed Action:	**Work with the City of Goldthwaite to establish a section in the Jennie Trent Dew Library with FEMA publications containing information on weather hazards and steps citizens can take to protect themselves and their property.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	Public awareness information is not currently available for the residents of Mills County and the City of Goldthwaite. This is the first step in establishing a public awareness/education program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hurricane and Tropical Storm, Extreme Heat, Drought, Tornado, Winter Storm, Thunderstorm
Priority (High, Moderate, Low):	High
Estimated Cost:	Negligible
Potential Funding Sources:	General revenues, Grants
Lead Agency/Department Responsible:	Mills County
Implementation Schedule:	2004; Completed action

2009 Analysis:
Completed: Spring 2004

		Mills County (Past Action)-4
	Proposed Action:	**Work with the City of Goldthwaite to provide NOAA weather radios to critical facilities as a weather warning system. Facilities where radios will be placed include schools, nursing homes, clinics, government buildings, and communications facilities.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	NOAA Weather Radio is a nationwide network of radio stations broadcasting continuous weather information direct from a nearby National Weather Service office. These stations broadcast National Weather Service warnings, as well as post-event information for all types of hazards, both natural and man-made. NOAA Weather Radios are a single source for the most comprehensive weather and emergency information available to the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$2,500
Potential Funding Sources:	General revenues, Grants, Contributions
Lead Agency/Department Responsible:	Mills County, City of Goldthwaite
Implementation Schedule:	Completed action

2009 Analysis:
Completed: The county purchased NOAA weather radios through the LCRA who provided the radios to the county for 50% of cost. Radios are not in all schools in the county, clinics, senior center, and churches that are possible shelter sites. NOAA weather radios have also been placed at city hall, the county judge's office, and the public library.

		Mills County (Past Action)-5
	Proposed Action:	**Install a concrete wing wall to current low water crossing on Bennett Creek to channel the water back into the stream bed and stop erosion of the stream bank. This will allow water to flow through the current low water crossing, not over unprotected road.**
	BACKGROUND INFORMATION	
	Site and Location:	Bennett Creek
	History of Damages:	Bennett Creek experiences very heavy flows during heavy rains. Since 1991, erosion of one side of the stream channel has been increasing. This erosion of the bank has caused the stream to begin flowing over the roadway as well as flowing through the low water crossing. In addition to the erosion of the bank and the roadway, downstream erosion is occurring. An alternative to this would be to lengthen the low water crossing slab to cover the portion of the roadway that is currently being eroded by the water that has left the stream channel, but this solution does not correct erosion at this site. Another alternative would be to continue to repair the roadway each time heavy rains are experienced in the area. This would do nothing to correct the erosion at this site.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$27,494
Potential Funding Sources:	State and Federal Grants with Office of Rural and Community Affairs for local match
Lead Agency/Department Responsible:	Mills County Engineering Department
Implementation Schedule:	Three months after grant approval

2009 Analysis:
This action will be deferred as no funds are available yet.

		Mills County (Past Action)-6
	Proposed Action:	**Prevent future undermining of the Blanket Creek low water crossing. Remove the concrete cap which is completely undermined at CR 550. Fill all voids and pour a new concrete slab to cap the low water crossing. Construct sloped concrete sidewalls on both the upstream and downstream sides to prevent future undermining of the structure.**
	BACKGROUND INFORMATION	
	Site and Location:	Blanket Creek at CR 550
	History of Damages:	The Blanket Creek low water crossing has been repetitively damaged in DR-1709-TX and each time heavy rains occur in the area. The low water crossing site is potentially dangerous in its current state. Two options have been considered to mitigate the low water crossing site. Option 1, the proposed mitigation action, would repair past damage and protect the site from future damage. Option 2 would involve pumping material into the voids and replacing material that has washed from under the slab. Option 2 would require that material be replaced each time it is washed away; such repetitive repairs would be more costly over time.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$30,000
Potential Funding Sources:	State and Federal Grants with Office of Rural and Community Affairs for local match
Lead Agency/Department Responsible:	Mills County Engineering Department
Implementation Schedule:	Three months after grant approval

2009 Analysis:
Completed in February of 2008 with funds from FEMA for 1709 disaster damage and matching funds from ORCA.

		Mills County (Past Action)-7
	Proposed Action:	**Add concrete approaches to the low water crossing at CR 140 at Mountain Creek, just west of intersection of CR 140 and CR 142**
	BACKGROUND INFORMATION	
	Site and Location:	CR 140 and CR 142
	History of Damages:	The approaches to the low water crossing wash out after heavy rains. These approaches must be repaired repeatedly. Replacing the base material currently used with concrete appears to be the best solution to this costly problem. This low water crossing experiences very heavy flows each time heavy rains are experienced. During these events the approaches to the crossing are eroded, which takes the road out of service for a period of time until repairs can be made. This mitigation action adds concrete approaches to the crossing to protect the road base. This would eliminate repeated work on this site and keep the crossing in service. The alternative option would be to continue repairing the approaches each time they are washed out, a less desirable alternative due to the repeated repair being more costly over time and the crossing being out of service for longer period of time.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,670
Potential Funding Sources:	State and Federal Grants with Office of Rural and Community Affairs for local match
Lead Agency/Department Responsible:	Mills County
Implementation Schedule:	2012

2009 Analysis:
This action will be deferred as no funds are available yet.

		Mills County (Past Action)-8
	Proposed Action:	Install additional culvert at CR 408 at Prescott Creek to handle larger than normal water flow and to install 2 concrete caps to protect road base and culverts in heavy rains. We would install concrete footings on all sides to keep structure from being undermined. This creek has very heavy flows during heavy rain events.
	BACKGROUND INFORMATION	
	Site and Location:	CR 408 at Prescott Creek
	History of Damages:	Prescott Creek experiences very heavy flows in heavy rains. Each time the Creek above the road the road material is carried downstream. The stream crosses the road twice at this site with a high area in between the two crossings. An additional culvert is needed to reduce the number of times the creek overtops the road. The additional culvert and two concrete caps to protect the road base would be the best solution to eliminate costly repeated repairs of the site, prevent erosion of the road material, and keep the road in service except for occasional very heavy rains. During these events the road would be in service again as soon as the excessive water flowed through the crossing. The alternative would be to continue to repair the site with new road base material each time we experience heavy rains in this area.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$20,700
Potential Funding Sources:	State and Federal Grants with Office of Rural and Community Affairs for local match
Lead Agency/Department Responsible:	Mills County Engineering Department
Implementation Schedule:	Three months after grant approval

2009 Analysis:
This action will be deferred as no funds are available yet. Also the cost will now be $30,000 due to the rising cost of materials (concrete/steel).

		Mills County (Past Action)-9
	Proposed Action:	**Install an additional culvert at CR 508 South Brown Creek, low water crossing to handle increased water flow from storms and a concrete cap to protect road base and to keep road in service. Install side or toe walls on the upstream and downstream sides of the cap to protect and anchor the structure.**
	BACKGROUND INFORMATION	
	Site and Location:	CR 508 at South Brown Creek
	History of Damages:	South Brown Creek experiences very heavy flows in heavy rains. Each time the Creek rises above the road the road material is carried downstream. An additional culvert is needed to reduce the number of times the creek overtops the road. Installation of an additional culvert and a concrete cap to protect the road base would be the best solution. This would eliminate costly repeated repairs of the site, prevent erosion of the road material, and keep the road in service except for occasional very heavy rains. During these events the road would be in service again as soon as the excessive water flowed through the crossing. In addition, side walls will be installed to protect the structure from being undermined or fill material under the cap from being washed away. The alternative would be to continue to repair the site with new road base material each time we experience heavy rains in this area, leaving the road inaccessible for a longer period.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$12,400
Potential Funding Sources:	State and Federal Grants with Office of Rural and Community Affairs for local match
Lead Agency/Department Responsible:	Mills County
Implementation Schedule:	Three months after grant approval

2009 Analysis:
This action is partially complete. Additional culvert was added in the summer of 2008 to handle increased stream flow during and after heavy rains, reducing the number of times the stream overtops the road. Concrete cap and sidewalls have not been installed due to lack of funds available. These are still needed and would prevent damage to the structure when water overtops the road. Funds for the new culvert were from FEMA for 1709 disaster damage.

		Mills County (Past Action)-10
	Proposed Action:	**Install a concrete cap at CR 532 at Buffalo Creek low water crossing to protect the road base at this low water crossing and install side walls to prevent undermining of the concrete cap.**
	BACKGROUND INFORMATION	
	Site and Location:	CR 532 at Buffalo Creek
	History of Damages:	This structure was constructed during World War II when this area was part of Camp Bowie. It is 35 feet wide by 72 feet long and is raised approximately 6 feet above the creek. During very heavy rains water overtops this structure and causes erosion of road material. There is also some erosion of fill material between the existing culverts. We would like to install a concrete cap on top of the structure to protect the road base and install concrete side walls between existing culverts to protect the structure from being undermined or fill material being washed away. The alternative to this would be repeated replacement of road material on top of the crossing and to try to replace material between culverts each time it is needed.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$16,000
Potential Funding Sources:	State and Federal Grants with Office of Rural and Community Affairs for local match
Lead Agency/Department Responsible:	Mills County
Implementation Schedule:	Three months after grant approval

2009 Analysis:
This action was completed in February of 2008 with funds from FEMA and ORCA for DR-1709 damage.

New Actions

		Mills-1
	Proposed Action:	**Wildfire awareness Public education campaign: Make materials available to the public on aspects of wildfire safety utilizing materials available from the Texas Governor's Division of Emergency Management Website. The Emergency Management Coordinator will write an article about the danger of wildfires which will include important safety tips and list locations where wildfire safety tip sheets may be picked up. Information will be available at the Mills County Emergency Management Office, and the Jennie Trent Dew Public Library. A link to wildfire safety information will be added to the Mills County website and the Jennie Trent Dew Public Library website.**
	BACKGROUND INFORMATION	
	Site and Location:	Mills County
	History of Damages:	Mills County frequently experiences high fire danger due to drought. Past damage has been primarily loss of grazing for livestock and loss of fences and agricultural buildings. The potential risk for loss of homes from wild land fires is significant in the county due to large amounts of agricultural land with dry grass and brush and lack of water to fight fire in many areas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Buildings should better withstand wild fire if wildfire safety and prevention actions are followed.
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Mills County/ Emergency Management Funds
Lead Agency/Department Responsible:	The Mills County Emergency Management Office
Implementation Schedule:	Spring 2010

COMMENTS
Cost of implementation will be minimal.

		Mills-2
	Proposed Action:	**Send appropriate local officials to FEMA's Emergency Management Institute, Governor's Division of Emergency Management Training, or to other sponsored training classes for continuing education.**
	BACKGROUND INFORMATION	
	Site and Location:	Mills County
	History of Damages:	Mills County has been fortunate and has not experienced major disaster or damage in the past.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hail, Hazardous Material Release, Pipeline Failure, Dam Failure, Terrorism, Thunderstorm, Tornado, Wildfire, Winter Storm
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues free training opportunities
Lead Agency/Department Responsible:	The Mills County Emergency Management Office will facilitate training.
Implementation Schedule:	Beginning in 2009 and ongoing.

COMMENTS
This action will help build a trained key group of local officials knowledgeable in carrying out their duties to protect the citizens of Mills County against all hazards. The city will take advantage of free training opportunities offered through FEMA Emergency Management institute, The Texas Governor's Division of Emergency Management and TEEKS whenever possible.

		Mills - 3
	Proposed Action:	**Conduct study of low water crossing for possible solutions to redirect water into stream channel to avoid repetitive loss of sections of roadway approaching low water crossing and reduce erosion.**
	BACKGROUND INFORMATION	
	Site and Location:	Bennett Creek at County Road 333
	History of Damages:	Bennett Creek experiences very heavy flows during heavy rains. Since 1991, erosion on one side of the stream channel has been increasing. This erosion of the bank has caused the stream to begin flowing over the roadway as well as flowing through the low water crossing. When the stream flows over the roadway rather than through the low water crossing sections of roadway are lost.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Hazard mitigation grant funding or county road funds
Lead Agency/Department Responsible:	Mills County Emergency Management Office
Implementation Schedule:	2009 if funding is available

COMMENTS

		Mills - 4
	Proposed Action:	**Installation of pipe gates with locks and signs on either side of low water crossings to prevent traffic from attempting to cross during high water.**
	BACKGROUND INFORMATION	
	Site and Location:	South Bennett Creek at CR 312, Bennett Creek at CR 550, Prescott Creek at CR 408, South Brown Creek at CR 508, Buffalo Creek at CR 532
	History of Damages:	These crossings are very dangerous to cross when water overtops the roadway. Signs and barricades have been removed by drivers in the past leaving crossing unmarked until removal of signs is reported.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorms, Hurricane & Tropical Storm
Effect on new/existing buildings:	This action will protect people and therefore will not effect existing/new buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Hazard mitigation grant or county road funds
Lead Agency/Department Responsible:	Mills County Emergency Management and County Commissioners
Implementation Schedule:	2009 if funding is available

COMMENTS
Locking gates to prevent attempts to cross high water will potentially save lives of those who might remove existing moveable barricades to cross and those who come to the crossing after signs have been removed by the public and do not know that the crossing is closed.

City of Goldthwaite

Previous Actions & Analysis

		City of Goldthwaite (Past Action)-1
	Proposed Action:	**Join the National Flood Insurance Program and develop county-wide floodplain maps.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City of Goldthwaite is not currently participating in the National Flood Insurance Program and does not have floodplain maps that identify high hazard areas.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Capital Improvement Program
Lead Agency/Department Responsible:	City of Goldthwaite
Implementation Schedule:	To be completed after the floodplain is mapped

2009 Analysis:
This action will be deferred for the 2014 Plan as the floodplain is not mapped yet.

		City of Goldthwaite (Past Action)-2
	Proposed Action:	**Work with Mills County to develop and maintain a State-approved Emergency Management Plan for Mills County and the City of Goldthwaite. Assemble a team of volunteers, assign responsibilities, and address the basic plan and each of the twenty-two annexes.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	Mills County and the City of Goldthwaite are two of very few entities in the State who do not have approved Emergency Management Plans.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$2,000
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	City of Goldthwaite, Mills County
Implementation Schedule:	2004

2009 Analysis:
This action was completed and approved by GDEM on 10/26/04. The current GDEM assessment of planning preparedness is Intermediate.

City of Goldthwaite (Past Action)-3	
Proposed Action:	**Establish a section in the Jennie Trent Dew Library with FEMA publications containing information on weather hazards and steps citizens can take to protect themselves and their property.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Public awareness information is not currently available for the residents of Mills County and the City of Goldthwaite. This is the first step in establishing a public awareness/education program.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Tornado
Priority (High, Moderate, Low):	High
Estimated Cost:	Negligible
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	City of Goldthwaite, Mills County
Implementation Schedule:	2004

2009 Analysis:
This action was completed in the Spring of 2004.

		City of Goldthwaite (Past Action)-4
	Proposed Action:	**Work with Mills County to provide NOAA weather radios to critical facilities as a weather warning system. Facilities where radios will be place include schools, nursing homes, clinics, governmental buildings, and communication facilities.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	NOAA Weather Radio is a nationwide network of radio stations broadcasting continuous weather information direct from a nearly National Weather Service office. These stations broadcast National Weather Service warnings, as well as post-event information for all types of hazards, both natural and man-made. NOAA Weather Radios are a single source for the most comprehensive weather and emergency information available to the public.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Priority (High, Moderate, Low):	High
Estimated Cost:	$2,500
Potential Funding Sources:	General revenues, Contributions, Grants
Lead Agency/Department Responsible:	City of Goldthwaite
Implementation Schedule:	Completed action

2009 Analysis:
Completed: The county purchased NOAA weather radios through the LCRA who provided the radios to the county for 50% of cost. Radios are not in all schools in the county, clinics, senior center, and churches that are possible shelter sites. NOAA weather radios have also been placed at city hall, the county judge's office, and the public library.

City of Goldthwaite (Past Action)-5	
Proposed Action:	**Map the floodplain in Mills County and become active with the National Flood Insurance Program**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Floodplain maps must be developed before flood capital improvements can be identified.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	Capitol Improvement Program
Lead Agency/Department Responsible:	City of Goldthwaite, Mayor
Implementation Schedule:	2010

2009 Analysis:
This action will be deferred as the floodplain is not mapped.

New Actions

		Gold-1
	Proposed Action:	Develop a public awareness campaign regarding wildfire, utilizing resources available through GDEM. This will include an article about the danger of wildfires and safety tips as well as distributing safety tip sheets. Information will also be made available at City Hall, the Emergency Management Office, and libraries.
	BACKGROUND INFORMATION	
	Site and Location:	City of Goldthwaite
	History of Damages:	Mills County frequently experiences high fire danger due to drought. Past damage has been primarily loss of grazing for livestock and loss of fences and agricultural buildings. The potential risk for loss of homes from wild land fires is significant in areas of the city of Goldthwaite where agricultural land with dry grass and brush are adjacent to homes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire
Effect on new/existing buildings:	Buildings should better withstand wild fire if wildfire safety and prevention actions are followed.
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	City of Goldthwaite/Mills County Emergency Management funds
Lead Agency/Department Responsible:	Mills County Emergency Management
Implementation Schedule:	March 2010

COMMENTS
Cost of implementation will be minimal.

		Gold-2
	Proposed Action:	Send appropriate local officials to FEMA's Emergency Management Institute, Governor's Division of Emergency Management Training, or to other sponsored training classes for continuing education.
	BACKGROUND INFORMATION	
	Site and Location:	City of Goldthwaite
	History of Damages:	The city of Goldthwaite has not experienced major disaster or widespread damage in the past.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Hazardous material releases, Dam Failure, Pipeline Failure, Hail, Terrorism, Thunderstorm, Tornadoes, Wildfire, and Winter storms
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues free training opportunities
Lead Agency/Department Responsible:	The Mills County Emergency Management Office will facilitate training.
Implementation Schedule:	Beginning in 2009 and ongoing.

COMMENTS
This action will help build a trained key group of local officials knowledgeable in carrying out their duties to protect the citizens of Goldthwaite. The city will take advantage of free training opportunities whenever possible.

		Gold-3
	Proposed Action:	**Establish a debris management plan for post-disasters**
	BACKGROUND INFORMATION	
	Site and Location:	City of Goldthwaite
	History of Damages:	The city of Goldthwaite has been fortunate and has not experienced major damage resulting in large amounts of debris.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hail, Winter Storm, and Tornado.
Effect on new/existing buildings:	Debris buildup is hazardous to properties during a wildfire or flood event. This action will mitigate damage to homes and new development by keep streams, roads and property clear of debris.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	City of Goldthwaite
Lead Agency/Department Responsible:	City of Goldthwaite and Mills County Emergency Management Office
Implementation Schedule:	2009

COMMENTS

		Gold-4
	Proposed Action:	**Install early warning system for lightning at outdoor public facilities**
	BACKGROUND INFORMATION	
	Site and Location:	City of Goldthwaite swimming pool, baseball and softball park, and golf course.
	History of Damages:	Lightning occurs frequently in advance of thunderstorms and during thunderstorms.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Thunderstorm, Flood
Effect on new/existing buildings:	This action mitigates against injury to people.
Priority (High, Moderate, Low):	High
Estimated Cost:	$2400.00
Potential Funding Sources:	Hazard mitigation grant or other grant funding or city funds.
Lead Agency/Department Responsible:	City of Goldthwaite and Mills County Emergency Management office.
Implementation Schedule:	2009 if funding is available

COMMENTS
This action will potentially save lives of those participating in outdoor recreational activities at these city facilities.

San Saba County

Previous Actions & Analysis

		San Saba County (Past Action)-1
	Proposed Action:	**Undertake a review of the County's floodplain management ordinance.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	San Saba County has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	2005

2009 Analysis:
This action was completed at the end of 2005.

New Actions

		SS County-1
	Proposed Action:	**Place Emergency Management/Floodplain Issue pamphlets and flyers at the San Saba County Library and City of San Saba Chamber of Commerce office.**
	BACKGROUND INFORMATION	
	Site and Location:	Rylander Library on the east side of the courthouse Chamber office at the corner of Wallace and Clear
	History of Damages:	The citizens of San Saba County need better access to information to know what to do in the event of a disaster as the county experiences seasonal floods and other events such as tornadoes.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Extreme Heat, Flood, Thunderstorm, Lightning, Tornado, Wildfire
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown at this time
Potential Funding Sources:	City/County
Lead Agency/Department Responsible:	Emergency Management/Floodplain
Implementation Schedule:	By end of 2009

COMMENTS

		SS County-2
	Proposed Action:	**Work with National Weather Service office out of San Angelo to facilitate SkyWarn classes for all first responders, city/county employees and I.S.D. employees**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The county experiences both natural and man-made hazards. It's imperative that first responders are properly trained

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	This action mitigates against potential damage to existing buildings in a disaster event as responders will be better organized and prepared, including securing buildings before a hazard event.
Priority (High, Moderate, Low):	High
Estimated Cost:	100.00 per class
Potential Funding Sources:	County
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	At least 2 a year

COMMENTS

		SS County-3
	Proposed Action:	**Introduce CoCoRaHS to citizens and encourage them to become official observers**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The county experiences storm and flood events throughout the year. Accurate reporting is necessary to better assess vulnerability.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm, Hail, Winter Storm
Effect on new/existing buildings:	CoCoRaHS is a way of monitoring rain, hail and snow through the National Weather service. Proper recording of events helps to determine damage in the future, thereby mitigating the effect to existing buildings.
Priority (High, Moderate, Low):	High
Estimated Cost:	50.00 per gauge
Potential Funding Sources:	TFMA, TCRFC, Wallingford Software
Lead Agency/Department Responsible:	Emergency Management/Floodplain
Implementation Schedule:	Add at least 10 by end of 2009

COMMENTS
CoCoRaHS stands for “Community Collaborative Rain, Hail and Snow Network”. It is a grassroots volunteer network of backyard weather observers of all ages and backgrounds working together to measure and map precipitation under the guidance of NOAA and the NWS.

		SS County-4
	Proposed Action:	**Become a StormReady community as designated by the National Weather Service**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The County experiences natural and man-made hazards. Becoming a Storm Ready community would increase response to hazards while also reducing costs in the NFIP.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm,Winter Storm, Flood, Tornado
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	County
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	By end of 2009

COMMENTS

		SS County -5
	Proposed Action:	**Develop an engineering study of the area, known as 'Hooten Holler' in the city of Richland Springs, to determine a way to control the severe flooding and washout issues.**
	BACKGROUND INFORMATION	
	Site and Location:	Low water crossing on Main St west of Live Oak St.
	History of Damages:	Every high water incident causes extensive damage to this area of the city

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	This study would help determine how to mitigate against flood to protect existing structures and allow for new development.
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Grant sources
Lead Agency/Department Responsible:	Emergency Management/Floodplain
Implementation Schedule:	By the end of 2010

COMMENTS

		SS County -6
	Proposed Action:	**Add at least 4 more Warning Sirens to the city of San Saba**
	BACKGROUND INFORMATION	
	Site and Location:	The existing one sits behind the business known as Double G Pit Stop
	History of Damages:	This single siren does not carry the warning as far as needed for the city of San Saba.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Grant sources
Lead Agency/Department Responsible:	Emergency Management/City of San Saba
Implementation Schedule:	By the end of 2012

COMMENTS

		SS County -7
	Proposed Action:	**Install a new Warning Siren for the city of Richland Springs**
	BACKGROUND INFORMATION	
	Site and Location:	At the Volunteer Fire Station in Richland Springs
	History of Damages:	Existing one is old and needs replacing

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Grant sources
Lead Agency/Department Responsible:	Emergency Management/City of Richland Springs
Implementation Schedule:	By the end of 2012

COMMENTS

		SS County -8
	Proposed Action:	**Install a new Warning Siren for the town of Cherokee**
	BACKGROUND INFORMATION	
	Site and Location:	At the Volunteer Fire Station in Cherokee
	History of Damages:	Existing one is old and needs replacing

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	Unknown
Potential Funding Sources:	Grant sources
Lead Agency/Department Responsible:	Emergency Management/County of San Saba
Implementation Schedule:	By the end of 2012

COMMENTS

		SS County -9
	Proposed Action:	**Place metal Burn Ban signs at all roads leading into San Saba County [from contiguous counties and out of incorporated cities] and magnetic Burn Ban signs on county, emergency response and law enforcement vehicles.**
	BACKGROUND INFORMATION	
	Site and Location:	Countywide
	History of Damages:	The County experiences grass and brush fire each summer as it also experiences mild to severe drought.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Wildfire, Drought
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	High
Estimated Cost:	1,000.00
Potential Funding Sources:	County
Lead Agency/Department Responsible:	Emergency Management
Implementation Schedule:	By the spring of 2009

COMMENTS

City of San Saba

Previous Actions & Analysis

		City of San Saba (Past Action)-1
	Proposed Action:	**Review floodplain management ordinance to ensure that it meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain, and that all FEMA minimum requirements and criteria are met.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	The City of San Saba has a floodplain management ordinance that meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain. All FEMA minimum requirements and criteria are met.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	To be determined
Potential Funding Sources:	General revenues and special use permits
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	2009

2009 Analysis:
This action will be deferred. The City has a new Council, Manager and Floodplain Administrator. In addition, the previous Administrator's computer was infected with a virus causing the City to lose all data. The City is slowly rebuilding the system and expects to up to date by the end of 2009.

		City of San Saba (Past Action)-2
	Proposed Action:	**Undertake a comprehensive flood insurance policy survey for the City of San Saba.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	With approximately 15 percent of the population having property within the floodplain, it is unknown whether citizens know that flood insurance is available to them.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$10,000
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	City of San Saba
Implementation Schedule:	To be implemented with an increase in staff.

2009 Analysis:
This action will be deferred until San Saba can afford the time and man power to complete.

		City of San Saba (Past Action)-3
	Proposed Action:	**Develop a comprehensive list of structures located in the floodplain and their value.**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	A major flood event has not occurred since 1938 in San Saba. The floodplain management ordinance was adopted in 1991. FIRM maps are dated 1991.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$5,000
Potential Funding Sources:	Grants
Lead Agency/Department Responsible:	City of San Saba
Implementation Schedule:	To be completed after receipt of funds

2009 Analysis:
This action will be deferred until funds are made available through grants.

City of San Saba (Past Action)-4	
Proposed Action:	**Reduce the number of uninhabitable and un-maintained properties in the floodplain.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	Recent property maintenance code adoption gives the City of San Saba authority to remove or have removed dilapidated structures and maintain property.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood
Priority (High, Moderate, Low):	High
Estimated Cost:	$1,200 per structure
Potential Funding Sources:	General revenues, Private fines
Lead Agency/Department Responsible:	City of San Saba
Implementation Schedule:	2008

2009 Analysis:
This action was completed in July of 2008. The properties at East Brown and East Wallace streets were condemned and removed and will not be rebuilt. The BFE for the properties was at an elevation prone to flooding. By condemning and removing the properties, the city was able to stop water from reseeding and endangering surrounding properties. The total cost was $2,000.00 per property.

City of San Saba (Past Action)-5	
Proposed Action:	**Establish pre-disaster debris management plan.**
BACKGROUND INFORMATION	
Site and Location:	Citywide
History of Damages:	There is currently no plan for management of debris caused by flood, wind, or ice for the City of San Saba. A plan is needed before disaster occurs that can be implemented when needed.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$500
Potential Funding Sources:	General revenues
Lead Agency/Department Responsible:	City of San Saba
Implementation Schedule:	2010

2009 Analysis:
This action is not complete and will be deferred for further consideration. The cost should be increased to $800.00

New Actions

		SS -1
	Proposed Action:	**Become a StormReady community as designated by the National Weather Service**
	BACKGROUND INFORMATION	
	Site and Location:	Citywide
	History of Damages:	San Saba experiences natural and man-made hazards. Becoming a Storm Ready community would increase response to hazards while also reducing costs in the NFIP.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Drought, Dam Failure, Wildfire, Extreme Heat, Hail, Hurricane and Tropical Storm, Thunderstorm, Winter Storm, Flood, Hazardous Material Release, Pipeline Failure, Tornado, Terrorism
Effect on new/existing buildings:	N/A
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Unknown
Potential Funding Sources:	General Revenue
Lead Agency/Department Responsible:	Floodplain Administrator
Implementation Schedule:	By end of 2009

COMMENTS

		SS-2
	Proposed Action:	**Implement plans to straighten and widen Mill Pond Creek bed.**
	BACKGROUND INFORMATION	
	Site and Location:	Mill Pond Park
	History of Damages:	Mill Pond Park suffers greatly when the city experiences heavy rains. In fact the creek can flood with just slight rain. It takes much work and man hours to restore the Park to its natural beauty after continual flooding.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	This will prevent erosion of the creek thereby protecting the surrounding structures in the park from flood damage
Priority (High, Moderate, Low):	High
Estimated Cost:	To be determined
Potential Funding Sources:	City Revenue and Grants
Lead Agency/Department Responsible:	City of San Saba
Implementation Schedule:	2009

COMMENTS
Mill Pond Park is a landmark for the city and the Park crew has worked very hard to keep it a beautiful and pristine place to visit. The city wants to ensure that it maintains the beauty of the park by mitigating against flood damage.

		SS -3
	Proposed Action:	**Replace tin horns on 5th street to reduce damages from flooding**
	BACKGROUND INFORMATION	
	Site and Location:	300 BLK N. 5th
	History of Damages:	This is a flood prone area that experiences damages when there are heavy rain or storm events.

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm
Effect on new/existing buildings:	Tinhorns will reduce or prevent damage from flooding to existing structures.
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	$1,355.00
Potential Funding Sources:	City of San Saba
Lead Agency/Department Responsible:	San Saba Street Department
Implementation Schedule:	2009

COMMENTS

		SS - 4
	Proposed Action:	**Clean out ditches and culverts, and divert drains to reduce the impact from floods.**
	BACKGROUND INFORMATION	
	Site and Location:	Several locations throughout the City: 1) 500 to 700 BLK Dry 2) 300 BLK S. Cherokee 3) 300 to 400 BLK (between Annex and Church) 4) 100 N. 6th
	History of Damages:	The above listed locations are flood prone areas as debris and vegetation prevent proper drainage. This results in overflow and flooding during storm events. The ditches need to be cleaned out for better flow of floodwaters and the drainage ditch at 500 to 700 BLK Dry should be diverted to allow high water to move more quickly

MITIGATION ACTION DETAILS	
Hazard(s) Addressed:	Flood, Thunderstorm, Hurricane & Tropical Storm, Winter Storm
Effect on new/existing buildings:	This will prevent backup and flood damage to adjacent properties and any future development
Priority (High, Moderate, Low):	Moderate
Estimated Cost:	Total for Items 2-4: $4710 Item 1 to be determined
Potential Funding Sources:	General Revenue, Grants
Lead Agency/Department Responsible:	San Saba Street Dept.
Implementation Schedule:	2010

COMMENTS

Section 26 – Repetitive Loss Properties and NFIP Compliance

Repetitive Loss Properties 1

National Flood Insurance Program (NFIP) Participation 15

NFIP Compliance 18

Community Rating System (CRS) Participation 19

Repetitive Loss Properties

The Severe Repetitive Loss (SRL) Grant Program under FEMA, provides federal funding to assist states and communities in implementing mitigation measures to reduce or eliminate the long-term risk of flood damage to severe repetitive loss residential structures insured under the National Flood Insurance Program (NFIP). The Texas Water Development Board administers the SRL grant program for the State of Texas.

Severe Repetitive Loss properties are defined as residential properties that are:

a) covered under the NFIP and have at least four (4) flood related damage claim payments (building and contents) over $5,000.00 each, and the cumulative amount of such claims payments exceed $20,000; or

b) for which at least two (2) separate claim payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both of the aforementioned instances, at least two (2) of the referenced claims must have occurred within any ten-year period and must be greater than 10 days apart[1]. Table 26-1 below shows repetitive loss properties for each county participating in the TCRFC plan update.

Table 26-1. Repetitive Loss Properties by County

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
Bastrop	Bastrop County	481193	0013266	3	$21,175.67	N	Vacant Lot

[1] Source: Texas Water Development Board

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
	Bastrop County	481193	0067818	2	$90,163.62	N	Residence
	Bastrop County	481193	0097714	3	$114,396.95	N	Residence
	Bastrop County	481193	0099394	4	$155,620.56	Y	Residence
	Smithville	480024	0098504	2	$59,210.10	N	Residence
Blanco County (no repetitive loss or severe repetitive loss properties)							
Brown[2]	Brownwood	480087	0010726	3	$118,873.34	N	Residence
	Brownwood	480087	0026184	5	$279,867.76	N	Residence
	Brownwood	480087	0043022	2	$98,581.31	N	Residence
	Brownwood	480087	0051519	3	$49,050.83	N	Residence
	Brownwood	480087	0054920	6	$223,801.17	N	Residence
	Brownwood	480087	0056832	2	$114,038.80	N	Residence
	Brownwood	480087	0056848	2	$34,922.79	N	Commercial
	Brownwood	480087	0108843	7	$480,285.11	Y	Residence
	Brownwood	480087	0109144	3	$57,965.34	N	Residence
	Brownwood	480087	0111258	6	$148,721.73	Y	Residence
	Brownwood	480087	0118157	2	$5,101.50	N	Residence
	Brownwood	480087	0118194			N	Residence - Combined with Property # 0026184
	Brownwood	480087	0118196	2	$9,287.50	N	Commercial
	Brownwood	480087	0118550	2	$13,992.48	N	Residence
	Brownwood	480087	0118553	3	$46,563.48	N	Residence
	Brownwood	480087	0134928	2	$87,078.36	N	Residence
	Brownwood	480087	0137737	5	$160,740.11	N	Residence
	Brownwood	480087	172114	2	$56,754.54	N	Residence
	Brownwood	480087	172199	2	$48,106.98	N	Residence
	Brownwood	480087	172689	2	$39,699.02	N	Residence
	Brownwood	480087	172926	2	$85,048.99	N	Residence
	Brownwood	480087	172927	2	$50,239.06	N	Residence

[2] Only instances for the City of Brownwood reported as Brownwood is the only participating jurisdiction.

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
Burnet	Burnet County	481209	4491	2	$2,327.06	N	Residence
	Burnet County	481209	88309	4	$66,727.99	N	Residence
	Burnet County	481209	93890	2	$102,733.97	N	Residence
	Burnet County	481209	169669	3	$161,664.13	N	Residence
	Burnet County	481209	170772	3	$20,538.60	N	Residence
	Granite Shoals	481149	0056258	2	$11,753.17	N	Residence
	Marble Falls	480093	0044690	5	$81,498.36	N	Residence
	Marble Falls	480093	0071588	3	$63,179.12	N	Residence
	Marble Falls	480093	169575	3	$51,807.28	N	Residence
	Marble Falls	480093	169741	2	$37,030.07	N	Residence
Colorado	Colorado County	480144	0098343	2	$36,762.46	N	Residence
Fayette	Fayette County	481565	68805	3	$196,000.00	N	Residence
	Fayette County	481565	0068925	3	$41,961.10	N	Residence
	Fayette County	481565	0099456	2	$101,152.78	N	Residence
	Fayette County	481565	0100356	2	$104,273.07	N	Residence
	Fayette County	481565	0135670	2	$80,575.11	N	Residence
	La Grange	480223	0097180	2	$64,299.23	N	Residence
Lampasas	Lampasas County	480899	0088373	2	$55,946.45	N	Residence
Lee	Giddings	480435	0173387	2	$156,318.07	N	Commercial
Llano	Llano County	481234	0052532	2	$4,591.89	N	Commercial
	Llano County	481234	110937	2	$15,387.81	N	Residence
	Llano County	481234	0110694	2	$33,241.61	N	Commercial
	Llano County	481234	0110946	2	$11,641.42	N	Residence
	Llano County	481234	89237	3	$20,663.47	N	Residence

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
	Llano County	481234	0089564	2	$10,584.04	N	Residence
	Llano County	481234	0067338	2	$3,917.58	N	Residence
Mason County (no repetitive loss or severe repetitive loss properties)							
Matagorda	Matagorda County	485489	0119330	2	$115,685.61	N	Residence
	Matagorda County	485489	0044341	2	$10,172.01	N	Residence
	Matagorda County	485489	0076287	2	$11,704.38	N	Residence
	Matagorda County	485489	0044745	2	$6,068.13	N	Residence
	Matagorda County	485489	0045887	2	$18,462.01	N	Residence
	Matagorda County	485489	0052522	2	$10,727.50	N	Commercial - Duplicate W/ 0116792 0045175
	Matagorda County	485489	0116792	3	$101,568.55	N	Commercial - Duplicate W/ 0052522, 0045175
	Matagorda County	485489	0038937	3	$47,722.66	N	Vacant Lot
	Matagorda County	485489	0044566	2	$28,278.64	N	Residence-Duplicate W/ 0096789
	Matagorda County	485489	0096789	4	$61,396.04	Y	Residence-Duplicate w/ 0044566
	Matagorda County	485489	0045175	4	$75,275.96	N	Commercial - Duplicate

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
							w/ 0042522, 0116792
	Matagorda County	485489	0117866	2	$22,60.83	N	Residence
	Matagorda County	485489	0017433	3	$12,379.10	N	Residence
	Matagorda County	485489	0017266	2	$6,140.30	N	Residence
	Matagorda County	485489	0017344	3	$18,751.60	N	Residence
	Matagorda County	485489	004315	3	$8,290.65	N	Residence
	Matagorda County	485489	0017369	2	9,004.33	N	Residence
	Matagorda County	485489	0026217	3	$14,858.68	N	Residence
	Matagorda County	485489	0067265	3	$7,396.76	N	Residence
	Matagorda County	485489	0118875	2	$13,120.90	N	Residence
	Matagorda County	485489	0123306	2	$6,015.77	N	Residence
	Matagorda County	485489	0132552	3	$77,484.81	N	Residence
	Matagorda County	485489	0124242	2	$19,503.85	N	Residence
	Matagorda County	485489	0045197	2	$17,044.06	N	Residence
	Matagorda County	485489	0124384	2	$16,776.09	N	Residence
	Matagorda County	485489	0123960	2	$18,785.62	N	Residence
	Matagorda County	485489	0123946	2	$9,836.99	N	Residence
	Matagorda County	485489	0025150	2	$5,653.23	N	Residence

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
	Matagorda County	485489	0025698	6	$209,824.92	Y	Residence
	Matagorda County	485489	0120600	3	$27,924.52	N	Residence - Duplicate w/0124424
	Matagorda County	485489	0124424	2	$4,298.05	N	Residence - Duplicate w/ 0120600
	Matagorda County	485489	0123748	2	$38,217.25	N	Residence
	Matagorda County	485489	0040000	2	$5,192.36	N	Residence
	Matagorda County	485489	0124932	2	$21,932.95	N	Residence
	Matagorda County	485489	0124331	2	$8,948.04	N	Residence
	Matagorda County	485489	0044958	4	$25,853.92	N	Residence
	Matagorda County	485489	0119588	3	$156,752.78	N	Residence
	Matagorda County	485489	0015973	3	$14,513.39	N	Residence
	Matagorda County	485489	0083604	3	$62,902.75	N	Residence - Duplicate w/0119316
	Matagorda County	485489	119316	3	$66,227.37	N	Residence - Duplicate w/0083604
	Matagorda County	485489	0015993	4	$34,535.45	N	Residence - Duplicate w/0018666
	Matagorda County	485489	0018666	2	$13,332.06	N	Residence - Duplicate w/0015993
	Matagorda County	485489	0017265	2	$9,547.20	N	Residence
	Matagorda	485489	0006221	4	$14,006.02	N	Residence

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
	County						
	Matagorda County	485489	0116489	2	$47,983.47	N	Residence
	Matagorda County	485489	0096732	3	$66,320.06	N	Residence
	Matagorda County	485489	0077101	3	$16,144.25	N	Residence
	Matagorda County	485489	0026695	6	$50,729.20	N	Residence
	Matagorda County	485489	0093887	3	$37,100.49	N	Residence
	Matagorda County	485489	0016097	2	$8,622.57	N	Residence - Duplicate w/0107881
	Matagorda County	485489	107881	2	$23,857.05	N	Residence - Duplicate w/0016097
	Matagorda County	485489	0005522	5	$174,062.51	Y	Residence
	Matagorda County	485489	0015992	2	$3,090.25	N	Residence
	Matagorda County	485489	0026167	4	$30,688.35	N	Residence - Duplicate w/0128787
	Matagorda County	485489	0128787	2	$18,866.22	N	Residence - Duplicate w/0026167
	Matagorda County	485489	0042168	2	$4,927.32	N	Residence - Duplicate w/0017436
	Matagorda County	485489	0017436	3	$5,277.47	N	Residence - Duplicate w/0042168
	Matagorda County	485489	0017372	2	$11,900.28	N	Residence
	Matagorda County	485489	0017406	2	$11,218.60	N	Residence

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
	Matagorda County	485489	001933	6	$18,260.74	N	Commercial - Duplicate w/0026328
	Matagorda County	485489	0026328	3	$11,489.13	N	Commercial - Duplicate with 0001933
	Matagorda County	485489	0098361	3	$51,685.86	N	Residence
	Matagorda County	485489	0163718	2	$54,801.35	N	Residence
	Matagorda County	485489	0048480	2	$2,389.64	N	Residence
	Matagorda County	485489	0018552	2	$2,591.41	N	Residence
	Matagorda County	485489	0017282	4	$37,234.77	N	Residence - Duplicate w/0126920
	Matagorda County	485489	0126920	2	$207,198.36	N	Residence - Duplicate w/0017282
	Matagorda County	485489	0015183	3	$5,661.84	N	Vacant Lot
	Matagorda County	485489	0018626	3	$5,170.82	N	Residence
	Matagorda County	485489	0025733	2	$6,500.22	N	Residence
	Matagorda County	485489	0048448	3	$40,355.25	N	Commercial
	Matagorda County	485489	0124580	2	$139,646.98	Y	Residence
	Matagorda County	485489	0100162	3	$52,755.09	N	Vacant Lot
	Matagorda County	485489	0025447	2	$2,688.50	N	Vacant Lot
	Matagorda County	485489	0125819	2	$70,450.81	N	Vacant Lot

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
	Matagorda County	485489	0125818	2	$64,068.77	N	Residence
	Matagorda County	485489	0123766	2	$18,768.65	N	Residence
	Matagorda County	485489	0124414	2	$35,145.45	N	Residence
	Matagorda County	485489	0025810	4	$40,707.52	N	Residence
	Matagorda County	485489	0123959	2	$25,053.37	N	Residence
	Matagorda County	485489	0123950	2	$62,375.71	N	Residence
	Matagorda County	485489	0017560	5	$50,714.24	N	Residence
	Matagorda County	485489	0123955	2	$57,856.76	N	Residence
	Matagorda County	485489	0124378	2	$37,012.51	N	Residence
	Matagorda County	485489	0124581	2	$12,289.55	N	Vacant Lot
	Matagorda County	485489	0123767	2	$52,797.34	N	Vacant Lot
	Matagorda County	485489	0122197	3	$15,025.41	N	Residence
	Matagorda County	485489	0172810	2	$14,519.54	N	Residence
	Matagorda County	485489	0125495	2	$7,072.53	N	Residence
	Matagorda County	485489	0124020	2	$3,869.68	N	Commercial
	Matagorda County	485489	0034199	2	$36,312.08	N	Residence
	Matagorda County	485489	0067271	2	$32,674.10	N	Residence
	Matagorda County	485489	0012879	2	$15,360.68	N	Residence
	Matagorda	485489	0091346	3	$62,708.56	N	Residence

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
	County						
	Matagorda County	485489	0041872	3	$4,776.90	N	Residence
	Matagorda County	485489	0128398	2	$32,293.34	N	Residence - Duplicate w/0044041
	Matagorda County	485489	0044041	2	$107,297.46	N	Residence - Duplicate 2/0128398
	Matagorda County	485489	0003509	7	$78,175.99	N	Residence
	Matagorda County	485489	0025619	2	$25,248.00	N	Residence
	Matagorda County	485489	0025209	2	$2,708.03	N	Residence
	Matagorda County	485489	0045999	2	$28,423.09	N	Residence
	Matagorda County	485489	0098947	2	$13,117.45	N	Residence
	Matagorda County	485489	0074020	2	$6,9797.09	N	Residence
	Matagorda County	485489	0165746	2	$21,767.29	N	Residence
	Matagorda County	485489	0017308	2	$8,786.50	N	Residence
	Matagorda County	485489	0025174	3	$4,820.02	N	Residence
	Matagorda County	485489	0018471	3	$11,750.76	N	Residence
	Matagorda County	485489	0044358	3	$25,727.37	N	Commercial
	Bay City	485455	0078068	4	$36,819.93	N	Residence - Duplicate w/44040
	Bay City	485455	0044040	3	$31,890.29	N	Residence - Duplicate w/78068

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
	Bay City	485455	0033834	2	$3,682.60	N	Residence
	Bay City	485455	0067268	2	$10,528.59	N	Residence
	Bay City	485455	0044889	3	$15,659.80	N	Residence
	Bay City	485455	0067264	4	$34,424.97	N	Vacant Lot
	Bay City	485455	0045299	2	$3,689.86	N	Residence
	Bay City	485455	0045300	2	$5,241.78	N	Residence
	Bay City	485455	0004637	4	$47,340.20	N	Residence
	Bay City	485455	0002454	11	$384,724.59	Y	Residence - Duplicate w/0025552, 0091473
	Bay City	485455	002552	3	$24,456.07	N	Residence - Duplicate w/0002454
	Bay City	485455	0091473	5	$36,135.04	Y	Residence - Duplicate w/0002454
	Bay City	485455	0052116	6	$76,707.67	Y	Residence
	Bay City	485455	0050583	2	$6,273.24	N	Residence
	Bay City	485455	0018581	2	$9,523.34	N	Vacant Lot
	Bay City	485455	0046186	4	$37,917.05	N	Residence
	Bay City	485455	0045800	2	$8,002.99	N	Residence
	Bay City	485455	0046484	2	$5,183.50	N	Residence
	Bay City	485455	0041432	2	$5,135.00	N	Residence
	Bay City	485455	0069619	2	$12,273.65	N	Residence
	Bay City	485455	0025849	2	$5,508.00	N	Residence
	Bay City	485455	0003527	5	$42,563.49	N	Commercial
	Bay City	485455	0048742	2	$4,067.52	N	Residence
	Bay City	485455	0033896	4	$44,613.11	N	Residence
	Bay City	485455	0044363	4	$57,030.81	N	Residence
	Bay City	485455	0067266	2	$9,283.10	N	Commercial - Duplicate w/0076938
	Bay City	485455	0076938	3	$28,565.92	N	Commercial - Duplicate w/0067266
	Bay City	485455	0067267	2	$10,734.06	N	Residence

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
	Bay City	485455	0042443	4	$17,295.66	N	Residence
	Bay City	485455	0018721	2	$21,293.10	N	Residence
	Bay City	485455	0044623	4	$27,433.19	N	Residence
	Bay City	485455	0044658	3	$19,666.71	N	Residence
	Bay City	485455	0044809	3	$21,890.28	N	Residence
	Bay City	485455	0044712	2	$5,029.58	N	Residence
	Bay City	485455	0067270	2	$2,377.41	N	Residence
	Bay City	485455	0118937	2	46,225.73	N	Residence
	Bay City	485455	0042883	8	135,633.89	Y	Residence
	Bay City	485455	0026013	3	$6,764.09	N	Residence
	Bay City	485455	0120960	2	$162,371.20	N	Commercial
	Bay City	485455	099020	2	$27,797.63	N	Residence
	Bay City	485455	0044702	2	$2,887.00	N	Residence
	Palacios	485495	0001930	3	$21,924.51	N	Residence
	Palacios	485495	0121457	2	$5,631.86	N	Residence
	Palacios	485495	0125056	2	$34,087.74	N	Residence
	Palacios	485495	0018608	2	$10,423.46	N	Vacant Lot
McCulloch County (no repetitive loss or severe repetitive loss properties)							
Mills County (no repetitive loss or severe repetitive loss properties)							
San Saba	San Saba county	481184	0128911	2	$8.121.42	N	Residence
Travis	Jonestown	481597	0137033	2	$68,989.30	N	Residence
	Jonestown	481597	0089424	2	$21,413.18	N	Residence
	Jonestown	481597	0089429	2	$9,061.77	N	Residence
	Lago Vista	481588	0134857	2	$123,816.48	N	Residence
	Lago Vista	481588	0090236	2	$3,000.00	N	Residence
	Lago Vista	481588	0103225	2	$52,738.88	N	Residence
	Lago Vista	481588	0091029	2	$37,412.28	N	Residence
	Lakeway	481026	0136047	2	$52,149.81	N	Commercial
	West Lake Hills	481030	0049815	3	$42,732.31	N	Residence
Wharton	El Campo	4806553	0008952	4	$56,320.68	N	Residence
	El Campo	4806553	0034287	2	$8,016.44	N	Residence
	El Campo	4806553	0038320	3	$10,700.96	N	Residence
	El Campo	4806553	0039592	5	$49,900.81	N	Residence
	El Campo	4806553	0069798	2	$14,336.28	N	Residence

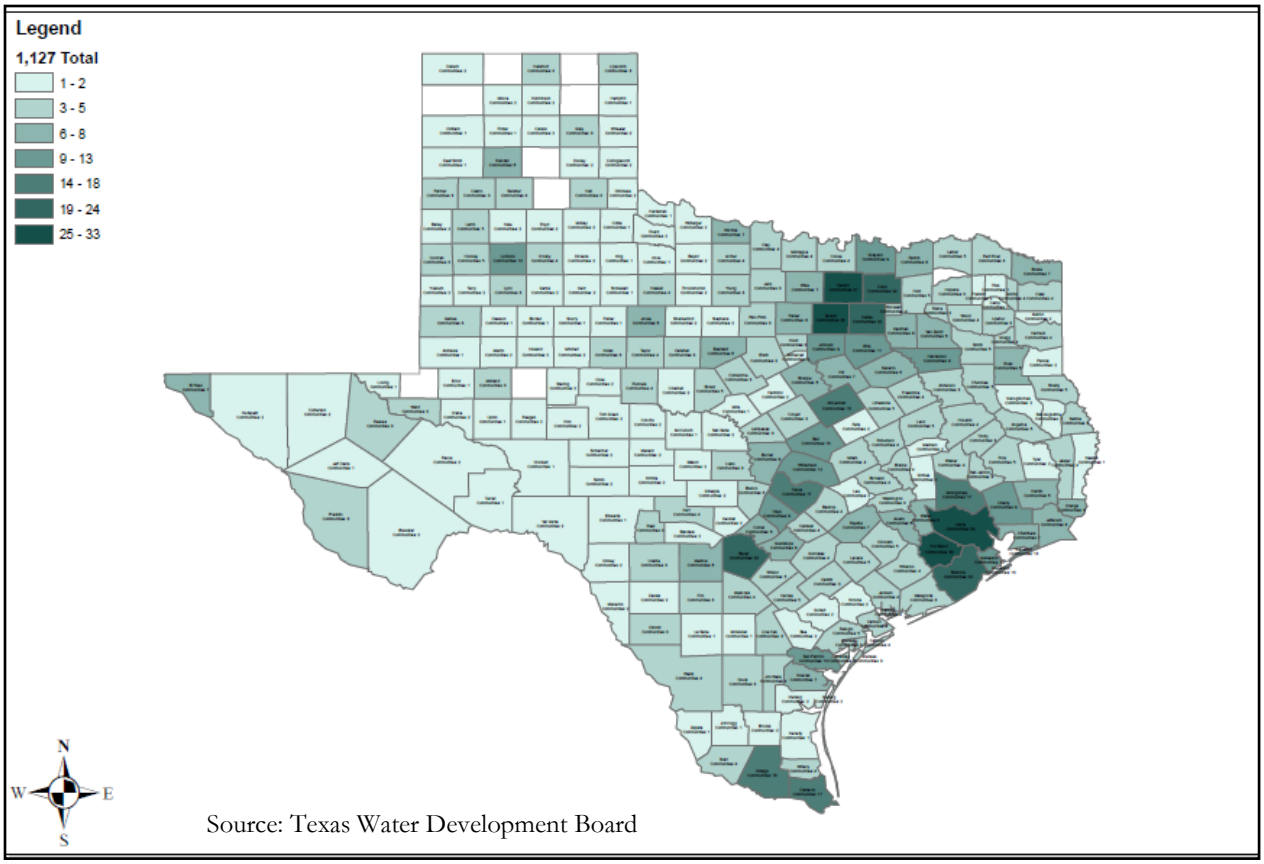
County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
	El Campo	4806553	0073557	2	$19,134.52	N	Residence
	El Campo	4806553	0136044	2	$37,425.31	N	Residence
	El Campo	4806553	0137102	2	$117,289.77	N	Residence
	El Campo	4806553	0137174	2	$111,683.49	N	Residence
	City of Wharton	480654	0119527	2	$22,621.79	N	Vacant lot
	City of Wharton	480654	0100124	3	$48,954.27	N	Residence
	City of Wharton	480654	00101949	2	$5,441.32	N	Residence
	City of Wharton	480654	0067240	2	$8,749.08	N	Residence
	City of Wharton	480654	0123001	2	$9,508.45	N	Residence
	City of Wharton	480654	0125285	3	$18,614.26	N	Residence
	City of Wharton	480654	0133519	2	$24,858.95	N	Residence
	City of Wharton	480654	0136019	2	$60,112.30	N	Residence
	City of Wharton	480654	0136209	2	$57,040.58	Y	Residence
	City of Wharton	480654	0136409	3	$44,526.75	N	Residence
	City of Wharton	480652	013207	2	$78,954.94	N	Residence
	Wharton County	480652	0027660	2	$33,119.91	N	Residence
	Wharton County	480652	0097074	3	$60,436.57	N	Residence
	Wharton County	480652	0116839	2	$20,144.28	N	Residence
	Wharton County	480652	0118690	2	$52,643.35	N	Residence
	Wharton County	480652	0122381	3	$67,151.81	N	Residence
	Wharton	480652	0128623	2	$37,112.36	N	Residence

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
	County						
	Wharton County	480652	0134798	2	$11,893.14	N	Residence
	Wharton County	480652	0134979	2	$20,275.00	N	Residence
	Wharton County	480652	0136018	2	$94,352.55	N	Residence
	Wharton County	480652	0137187	2	$88,183.86	N	Residence
	Wharton County	480652	0138087	2	$125,692.64	N	Residence
Williamson	Cedar Park	481282	0003123	2	$59,992.14	N	Residence
	Cedar Park	481282	0013190	2	$9,551.36	N	Residence
	Cedar Park	481282	50427	2	$4,920.33	N	Residence
	Cedar Park	481282	0051119	3	$64,574.74	N	Residence
	Florence	480669	172622	8	$77,612.58	N	Residence
	Williamson County	481079	0005794	8	$207,935.41	Y	Residence
	Williamson County	481079	0025763	5	$31,691.67	N	Residence
	Williamson County	481079	0047658	5	$93,725.18	N	Vacant lot
	Williamson County	481079	0048193	5	$50,409.71	N	Residence
	Williamson County	481079	0049989	3	$17,362.43	N	Residence
	Williamson County	481079	0050461	3	$40,867.93	N	Residence
	Williamson County	481079	0050465	3	$21,699.30	N	Residence
	Williamson County	481079	0050483	2	$15,756.66	N	Residence
	Williamson County	481079	0074233	3	$20,831.43	N	Residence
	Williamson County	481079	0082223	6	$251,742.02	Y	Residence
	Williamson	481079	0137252	3	$106,448.07	N	Residence

County	Jurisdiction	Community Number	Property Locator Number	NFIP Paid Claims	Total Paid	Severe Repetitive Loss (Y/N)	Building Type
	County						
	Williamson County	481079	173419	2	$50,264.57	N	Residence

Source: Texas Water Development Board – 2009

Figure 26-1. NFIP Participation by County



Source: Texas Water Development Board

Typical mitigation activities for severe repetitive loss properties include acquisition and demolition of structures or the relocation of residential structure when traditional elevation cannot be implemented.

National Flood Insurance Program (NFIP) Participation

Flood insurance offered through the NFIP is the best way for home and business owners to protect themselves financially against the ravages of flooding.

Of the sixty-one (61) communities participating in the 2009 Hazard Mitigation Plan Update[3] only three (3) communities are not also participating in the National Flood Insurance Program (NFIP). Communities participating in the NFIP are listed in Table 26-2 along with the effective map date. Table 26-3 shows communities not participating and a reason for their non-participation.

Table 26-2. Communities Participating in the NFIP

County	Participating Jurisdiction	Effective Map Date
Bastrop County	Bastrop County	01/19/06
	Bastrop	01/19/06
	Elgin	NSFHA[4]
	Smithville	01/19/06
Blanco County	Blanco County	02/06/91
	Johnson City	02/06/91
Brown County	Brownwood	07/06/82
Burnet County	Burnet County	11/06/07
	Bertram	NSFHA
	Burnet	11/06/07
	Cottonwood Shores	11/06/07
	Granite Shoals	11/06/07
	Highland Haven	01/01/50
	Marble Falls	11/06/07
	Meadowlakes	11/06/07
Colorado County	Colorado County	01/03/90
	Columbus	01/03/90
	Eagle Lake	01/03/90
	Weimar	01/03/90
Fayette County	Fayette County	10/17/06
	Carmine	10/17/06
	Flatonia	10/17/06
	La Grange	10/17/06
Lampasas County	Lampasas County	01/02/91
	Kempner	01/01/50
	Lampasas	06/15/82

[3] Although there are 61 communities, there are a total of 63 planning participants as both the TCRFC and LCRA organizations are participating the Plan Update as well.

[4] Non-Special Flood Hazard Area

County	Participating Jurisdiction	Effective Map Date
Lee County	Lee County	04/01/07
	Giddings	09/01/87
Llano County	Llano County	09/18/91
	Horseshoe Bay	09/18/91
	Llano	05/04/82
	Sunrise Beach Village	09/27/91
Mason County	Mason County	01/01/50
	Mason	07/02/79
Matagorda County	Matagorda County	05/04/92
	Bay City	06/05/85
	Palacios	02/05/86
McCulloch County	Brady	10/15/81
Mills County	Mills County	01/01/50
San Saba County	San Saba County	07/02/91
	San Saba	07/02/91
Travis County	Briarcliff	09/26/08
	Jonestown	09/26/08
	Lago Vista	09/26/08
	Lakeway	09/26/08
	Mustang Ridge	09/26/08
	Point Venture	09/26/08
	San Leanna	09/26/08
	Volente	09/26/08
	West Lake Hills	09/26/08
Wharton County	Wharton County	04/05/06
	East Bernard	04/05/06
	El Campo	04/05/06
	Wharton	04/05/06
Williamson County	Williamson County	09/26/08
	Cedar Park	09/26/08
	Florence	09/26/08
	Hutto	09/26/08

Source: FEMA Community Status Book Report-Texas

Table 26-3. Communities Not Participating in the NFIP

County	Jurisdiction	Reason for Non-participation
Lampasas	City of Lometa	Not enough available resources or floodplain administrator
Lee	City of Lexington	Lack of funding for participation
Mills	City of Goldthwaite	The City of Goldthwaite is not currently participating in the National Flood Insurance Program as floodplain maps that identify high hazard areas are not available. The city included NFIP participation as an action in the 2004 Plan. Due to lack of funding this action has also been deferred for the Plan Update (See pages 25-142 and 25-146).

NFIP Compliance

The Texas Colorado River Floodplain Coalition, as part of its mission to encourage comprehensive, consistent management of the floodplain along the Colorado River and its tributaries, established a floodplain management technical assistance program, *Floodplain Management Program Assessment Guidance Manual*, and conducted a series of floodplain management program assessments. The Guidance Manual builds on the minimum permitting criteria of the National Flood Insurance Program for development within the floodplain and identifies criteria, policies, and procedures that will enable communities to consider the effect of future development on the floodplain. The Coalition also provides training opportunities and access to technical assistance and an independent review process.

Flooding was identified by the majority of TCRFC communities as a moderate or high risk hazard (see Section 5, Table 5-4). Many of the mitigation actions, both for communities that participated in the 2004 Plan and those participating in the Plan Update, were developed with flood mitigation in mind. A majority of these flood actions address compliance with the NFIP, from completing buyout or acquisition projects to reviewing floodplain ordinances in order to maintain NFIP compliance.

Basin-wide, communities recognize the need for, and are adopting, higher NFIP regulatory standards to further minimize flood risk in their community. Cross-training key floodplain management personnel, including code enforcement and permit officials has been undertaken, and many communities are encouraging Floodplain Managers to seek CFM Certification through the TFMA.

Smaller no-growth communities that typically do not have personnel or funds to implement more stringent NFIP compliance measures are focusing on NFIP public awareness activities. This includes promoting the availability of flood insurance by placing NFIP brochures and flyers in public libraries or public meeting places. NFIP compliance actions from Sections 21 to 25 are listed in Table 26-5[5] on the following page.

Communities are also increasing compliance with the NFIP and maintain NFIP policy standard through sound planning. Almost all of the counties that participate in the NFIP have a flood management plan in place or under development, and 38 cities have or are developing a floodplain management plan. Several participating jurisdictions are developing flood response plans either as stand-alone plans or as part of the floodplain management plans.

Both Matagorda and Wharton counties, and their respective jurisdictions, have flood mitigation plans. The actions from these plans have been included in Section 22. In addition both plans are incorporated with the Plan Update as Appendix H.

A stormwater management plan is designed to address flooding associated with stormwater runoff. Four counties participating in the NFIP have a stormwater management plan, and twenty-five jurisdictions have or are developing stormwater management plans.

Community Rating System (CRS) Participation

An additional indicator of compliance with the NFIP is the number of participants in the Community Rating System (CRS). The CRS is an incentive-based program that encourages counties and municipalities to undertake defined actions that go beyond the minimum requirements of the National Flood Insurance Program. Each of the 18 activities, or measures, is assigned points. As points are accumulated, communities can apply for a reduced CRS class. Class ratings, which run from 1 to 10, are tied to flood insurance premium reductions. Therefore, as class ratings decrease, the percent reduction in flood insurance policies held in that community decreases as shown in Table 26-4 below.

Bastrop County is the only TCRFC community participating with the CRS. The county's current class is eight (8).

Table 26-4. CRS Premium Discounts

CRS Class	Premium Discount
1	45%
2	40%
3	35%
4	30%

[5] In order to see the entire mitigation action, please see the section referenced in Table 26-5.

CRS Class	Premium Discount
5	25%
6	20%
7	15%
8	10%
9	5%
10	----

Table 26-5. NFIP Compliance Actions

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
Regional Actions – Section 21			
TCRFC	Region-wide	Improve local floodplain management through the adoption of higher regulatory principles and promote the principles of "No Adverse Impact"	21-2
TCRFC	Region-wide	Provide training for elected officials and professional technical staff on floodplain management and emergency management issues	21-5
TCRFC	Region-wide	Complete the production of Digital Flood Insurance Rate Maps for additional basin communities	21-7
TCRFC	Region-wide	Assist in obtaining public input on the USACE Lower Colorado River Basin Study and analyze the potential impact of each flood-reduction alternative on local jurisdictions	21-9
TCRFC	Region-wide	Conduct community education and outreach on flood insurance and floodplain management issues	21-10
TCRFC	Region-wide	Expand rainfall observer program utilizing volunteers through the National Weather Service's CoCoRAHS program.	21-30
TCRFC	Region-wide	Identify sites where stream and rain gauges need to be added or upgraded and coordinate installation requests with the USGS and Lower Colorado River Authority.	21-31

[6] Brown, McCulloch and Travis County are not participating in the plan. See Table 1-3.
[7] Mitigation Actions include those regarding NFIP compliance. Previous actions are included as well if those actions were deferred and not deleted or completed.

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
TCRFC	Region-wide	Implement flood early warning system and response plan	21-32
TCRFC	Region-wide	Encourage floodplain coordinators to become CFMs	21-10
TCRFC	Region-wide	Place flood insurance materials and mortgage lending mandates in libraries	21-38
LCRA	Region-wide	Strengthen the cooperative technical partnership with FEMA, DHS. Reduce the length of time for accomplishing tasks such as mapping.	21-24
LCRA	Region-wide	Identify sites where stream and rain gauges need to be added or upgraded and coordinate installation requests with the USGS and the Lower Colorado River Authority.	21-81
LCRA	Region-wide	Track and record high water marks following a flood	21-82
LCRA	Region-wide	Support education of citizens on dangers of low water crossings through the Turn Around Don't Drown (TADD) campaign	21-83
LCRA	Region-wide	Rebuild hydro-meteorological gauging stations during or following a food event	21-84
Region I Actions – Section 22			
Colorado County	Colorado County	Initiate flood event study of the southern part of the county, with emphasis on the Sandy Oaks Subdivision	22-5
Colorado County	Colorado County	Assess current needs and establish short and long term goals for the county's Floodplain Management Ordinance	22-11
Colorado County	Columbus	Undertake a review of the City's floodplain management ordinance	22-17
Colorado County	Eagle Lake	Implement standards set forth by city ordinance to control new construction and/or substantial improvements to residential and nonresidential structures within flood-hazard areas that may alter the natural floodplain's stream channels and affect protective barriers involved in accommodating flood waters	22-20
Colorado County	Eagle Lake	Coordinate efforts with the county and state agencies to improve drainage outside the city's jurisdiction and, thus, the overall drainage system	22-24

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
Fayette County	Fayette County	Complete the buy-out to acquire all property in the Frish Auf Floodplain	22-37
Fayette County	Carmine	Undertake a review of the City's floodplain management ordinance	22-45
Fayette County	Flatonia	Update floodplain development requirements	22-49
Fayette County	Flatonia	Implement maintenance program for drainage, including waterways, culverts and bridges	22-57
Fayette County	La Grange	Install automated flood warning systems	22-64
Matagorda County	Matagorda County	Track and record high-water marks, institute a maintenance program for cleaning debris from bridges and clearing out deposits on river banks, establish a buy-out program, investigate feasibility of reducing peak flows, encourage the purchase of flood insurance, and limit construction in flood-prone areas.	22-71
Matagorda County	Matagorda County	Institute a buy-out program after enactment of building codes/ordinances and raise bridges above the BFE	22-72
Matagorda County	Matagorda County	Conduct Caney Creek Project to decrease flooding in the lower creek area	22-73
Matagorda County	Matagorda County	Divert water from Caney Creek to the Colorado River and otherwise control flows from tributaries	22-74
Matagorda County	Matagorda County	Conduct Tres Palacios Project to buy out homes n the floodplain	22-75
Matagorda County	Matagorda County	Conduct studies to determine why areas flood that have not previously flooded (Pledger "C" Zone Flooding)	22-76
Matagorda County	Matagorda County	Educate the public on the benefits of purchasing flood insurance to minimize the financial impact of future floods	22-85
Matagorda County	Matagorda County	Institute a buy-out program after enactment of building codes and ordinance and raise bridges above BFE	22-86

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
Matagorda County	Matagorda County	Update the Matagorda County Flood Insurance Study and FIRMs to include detailed floodplain information for all streams in Matagorda County	22-89
Matagorda County	Matagorda County	Adopt "Higher Standard" Riverine Flood Damage Prevention Ordinances and Standards	22-90
Matagorda County	Matagorda County	Adopt "Higher Standard" Coastal Flood Damage Prevention Ordinances and Standards	22-91
Matagorda County	Matagorda County	Participate in FEMA's Community Rating System (CRS)	22-96
Matagorda County	Matagorda County	Inspect, improve and certify flood protection levees and seawalls in Matagorda County	22-102
Matagorda County	Bay City	Undertake a review of the City's floodplain management ordinance	22-110
Matagorda County	Bay City	Implement standard that businesses and private property adhere to the BFE	22-111
Matagorda County	Bay City	Educate the public on the benefits of purchasing flood insurance	22-114
Matagorda County	Bay City	Adopt "Higher Standard" Riverine Flood Damage Prevention Ordinances and Standards	22-116
Matagorda County	Bay City	Participate in FEMA's Community Rating System (CRS)	22-118
Matagorda County	Palacios	Initiate a buy-out program after enactment of building codes and ordinances and raise bridges above the BFE	22-127
Matagorda County	Palacios	Conduct studies to determine why areas flood that have not previously flooded (Pledger "C" Zone Flooding)	22-128
Matagorda County	Palacios	Undertake a review of the City's floodplain management ordinance	22-129
Matagorda County	Palacios	Move existing police station, currently in Flood Zone "B" on FIRMs into old bank building, which is located in Flood Zone "C" on FIRMs, and build a safe room inside to store records and use as EOC during disasters.	22-133
Matagorda County	Palacios	Educate the public on the benefits of purchasing flood insurance	22-134

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
Matagorda County	Palacios	Adopt "Higher Standard" Riverine Flood Damage Prevention Ordinances and Standards	22-136
Matagorda County	Palacios	Participate in FEMA's Community Rating System (CRS)	22-138
Wharton County	Wharton County	Review the County's floodplain management ordinance	22-140
Wharton County	Wharton County	Install stream and rain gauge on San Bernard River upstream from East Bernard	22-184
Wharton County	Wharton County	Reduce flood losses and increase NFIP coverage throughout the county	22-186
Wharton County	Wharton County	Acquisition and relocation, elevation and "demo-rebuild" of floodprone structures	22-188
Wharton County	Wharton County	Update the Wharton County Flood Insurance Study and FIRM's to include detail floodplain information for all streams in Wharton County.	22-189
Wharton County	Wharton County	Adopt "Higher Standard" Riverine Flood Damage Prevention Ordinances and Standards	22-190
Wharton County	Wharton County	Establish countywide bench mark network	22-192
Wharton County	Wharton County	Provide support to the TCRFC and San Bernard River flood reduction projects	22-193
Wharton County	Wharton County	Participate in FEMA's Community Rating System (CRS)	22-194
Wharton County	Wharton County	Implement a Wharton County Flood Warning System	22-196
Wharton County	East Bernard	Complete east and west sections of drainage plan for East Bernard	22-200
Wharton County	East Bernard	Clean debris out of San Bernard River	22-205
Wharton County	East Bernard	Acquisition and relocation, elevation and "demo-rebuild" of floodprone structures	22-206
Wharton County	East Bernard	Participate in FEMA's Community Rating System (CRS)	22-207
Wharton County	El Campo	Implement Master Drainage Plan	22-213

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
Wharton County	El Campo	Acquisition and relocation, elevation and "demo-rebuild" of floodprone structures	22-217
Wharton County	El Campo	Participate in FEMA's Community Rating System (CRS)	22-218
Wharton County	Wharton	Clean and repair storm drains routinely	22-219
Wharton County	Wharton	Implement a comprehensive watershed ordinance for new development	22-222
Wharton County	Wharton	Acquire, reuse and preserve open spaces adjacent to flood prone areas	22-223
Wharton County	Wharton	Adopt a "no rise" in the BFE in the 100 year floodplain	22-224
Wharton County	Wharton	Raise electrical components of sewage lift stations above BFE	22-229
Wharton County	Wharton	Minimize the impact of flooding by installing berms, levees when appropriate	22-232
Wharton County	Wharton	Identify and assess the most at-risk critical facilities and evaluate possible mitigation techniques	22-236
Wharton County	Wharton	Acquisition and relocation, elevation and "demo-rebuild" of floodprone structures	22-239
Wharton County	Wharton	Participate in FEMA's Community Rating System (CRS) program	22-240
Region II Actions – Section 23			
Bastrop County	Bastrop County	Track and record high-water marks following a flood event.	23-4
Bastrop County	Bastrop County	Increase local rating by participating in the NFIP's Community Rating System.	23-6
Bastrop County	Bastrop County	Lessen the impact on the community from riverine and localized flooding of tributaries, creeks, and streams by reviewing the feasibility of a buy-out program, installing more visible notices about areas most prone to flood, and constructing barricades/gates where indicated	23-11
Bastrop County	Bastrop County	Implement a program to monitor and clear vegetation and debris from drains and culverts.	23-17

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
Bastrop County	Bastrop	Conduct Piney Creek Drainage Improvements. Clean up new growth in natural drainage feature and resurface and & build new and existing drainage as a part of the natural creek.	23-47
Bastrop County	Bastrop	Conduct Gills Branch Drainage improvements and cleanup of natural feature & manmade extensions.	23-48
Bastrop County	Bastrop	Conduct flood plain education for the public. Provide a computer with Flood plain information as well as Floodplain maps for the public access.	23-49
Bastrop County	Elgin	Undertake a review of the city's Floodplain Management Ordinance	23-55
Bastrop County	Smithville	Track and record high water marks following a flood	23-62
Bastrop County	Smithville	Implement a maintenance program for clearing debris from drains and culverts	23-63
Lee County	Lee County	Track and record high water marks following a flood	23-69
Travis County	Briarcliff	Install flood gauges for low water crossings	23-97
Travis County	Jonestown	Acquisition of property located in the floodway on Sandy Creek	23-98
Travis County	Jonestown	Engineer study of stormwater run-off for the incorporated city limits	23-99
Travis County	Jonestown	Install operational warning signs/gates at low water crossings	23-100
Travis County	Jonestown	Acquisition of property located in the floodplain of Lake Travis, Cross Street area.	23-101
Travis County	Jonestown	Implement a floodplain early warning system and local response plan.	23-103
Travis County	Jonestown	Advertise and promote the availability of flood insurance, even for property not normally effected by past flood levels	23-106
Travis County	Jonestown	Implement a voluntary buyout program for repetitive flood properties along Lakeside Dr.	23-107
Travis County	Jonestown	Identify repetitive loss properties for future Hazard Mitigation Grant Program funding	23-108
Travis County	Jonestown	Prohibit granting of variances for development in floodplains.	23-109

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
Travis County	Jonestown	Develop a land use study for acquiring, reusing and preserving open spaces within floodplain/floodway areas.	23-110
Travis County	Lago Vista	Conduct a drainage study and disseminate study results.	23-112
Travis County	Lago Vista	Advise flood prone property owners of flood hazard and new flood plain elevations through news articles, letters to property owners and personally communicating with over 50 owners.	23-120
Travis County	Lakeway	Employ consulting engineers to assess the adequacy of the City's drainage ways, culverts, bridges, water-quality zones, and detention ponds; and make needed, feasible improvements.	23-126
Travis County	Lakeway	Submit an application to participate in the National Flood Insurance Program's Community Rating System (CRS)	23-131
Travis County	Mustang Ridge	Review Mustang Ridge's floodplain management ordinance and obtain a rating under the TCRFC's Floodplain Management Assessment Program.	23-139
Travis County	Mustang Ridge	Develop a public awareness program regarding flooding and also distribute Turn Around Don't Drown (TADD) materials.	23-140
Travis County	Point Venture	Establish a hazard mitigation information center for use by local residents	23-143
Travis County	San Leanna	Review San Leanna's floodplain management ordinance and obtain a rating under the TCRFC's Floodplain Management Assessment Program.	23-150
Travis County	San Leanna	Complete engineering studies and determine project designs for stormwater flood prevention	23-154
Travis County	San Leanna	Complete stormwater management projects to reduce or eliminate long-term flood hazard risks.	23-155
Travis County	Volente	Review and update floodplain management plan	23-159
Williamson County	Williamson County	Install or replace culverts where needed in the county	23-177
Williamson County	Williamson County	Eliminate large-scale washout problem on the banks of Brushy Creek through an erosion control project	23-179

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
Williamson County	Williamson County	Undertake a review of the County's floodplain management ordinance.	23-180
Williamson County	Cedar Park	Relocate and maintain a city Emergency Operations Center (EOC) in fire station #5	23-191
Williamson County	Florence	Prohibit fill in floodplain areas and conduct assessment of floodplain management ordinance and implementation.	23-193
Williamson County	Hutto	Join the Community Rating System of the National Flood Insurance Program, to incentivize new development to maintain existing 1% chance floodplain areas and to reward citizens who obtain flood insurance through the NFIP with lower premiums.	23-199
Williamson County	Hutto	Provide access to the public of local Flood Insurance Rate Maps (FIRM) and map ordering information through the City of Hutto website.	23-200
Region III Actions – Section 24			
Blanco County	Blanco County	Implement and maintain a program for clearing debris from drains and culverts and enact driveway permits	24-8
Blanco County	Blanco County	Develop floodplain maps that include the BFE and floodway	24-9
Blanco County	Johnson City	Reduce the number of unoccupied and uninhabitable structures in the floodplain	24-11
Blanco County	Johnson City	Conduct study to assess the city's drainage and culverts and establish the minimum culvert size per location	24-15
Blanco County	Johnson City	Develop floodplain maps that include the BFE and floodway	24-17
Burnet County	Burnet County	Track and record high water marks following a flood event	24-19
Burnet County	Burnet County	Undertake drainage improvements at low water crossings to increase flow through to two-lane flow through structures with the capacity for at least a 25-year event	24-28
Burnet County	Burnet County	Conduct drainage improvements by reinforcing the abutment and concreting the approaches on CR 341	24-34

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
Burnet County	Bertram	Increase local rating by participating in the Community Rating System (CRS)	24-37
Burnet County	Burnet	Undertake a comprehensive review of the City's floodplain management ordinance.	24-46
Burnet County	Burnet	Revise and update community FIRMs.	24-48
Burnet County	Cottonwood Shores	Undertake a review of the city's floodplain management ordinance	24-49
Burnet County	Cottonwood Shores	Establish annual review of the city's floodplain management ordinance	24-50
Burnet County	Granite Shoals	Undertake a review of the city's floodplain management ordinance	24-55
Burnet County	Granite Shoals	Clean main Elm Creek and tributaries	24-56
Burnet County	Highland Haven	Undertake a review of the city's floodplain management ordinance	24-60
Burnet County	Highland Haven	Provide education for subdivisions regarding flood/fire procedures and the Turn Around Don't Drown Program	24-65
Burnet County	Highland Haven	Educate citizens about purchasing flood insurance through the National Flood Insurance Program	24-67
Burnet County	Highland Haven	Close gates for low water crossings at the entrance to Highland Haven.	24-69
Burnet County	Marble Falls	Undertake a review of the city's floodplain management ordinance	24-71
Burnet County	Marble Falls	Purchase floodway that is privately owned with the city limits	24-79
Burnet County	Marble Falls	Develop master drainage plan using currently available data plus new field survey data and information from prior studies to evaluate significant changes and proposals for evaluation of needs based on that research	24-81
Burnet County	Meadowlakes	Undertake a review of the city's floodplain management ordinance	24-84

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
Llano County	Llano County	Inspect drains/culverts for flood debris. Establish inspection program of same with road and ridge department	24-96
Llano County	Llano County	Increase dimensions of drainage culverts in troublesome areas	24-97
Llano County	Llano County	Place flood insurance materials and mortgage lending mandates in libraries	24-99
Llano County	Llano County	Annually distribute flood protection/NFIP pamphlets to owners of flood prone property	24-102
Llano County	Horseshoe Bay	Undertake a comprehensive study of flood risk and reduction alternatives along all major creeks, with the assistance of the US Army Corps of Engineers	24-110
Llano County	Horseshoe Bay	Undertake a comprehensive study of flood risk and reduction alternatives along all major creeks, with the assistance of the US Army Corps of Engineers	24-111
Llano County	Llano	Develop a land acquisition program in floodprone areas	24-114
Llano County	Llano	Revise, upgrade and update FIRMs	24-115
Llano County	Llano	Implement a maintenance program to clear and clean creeks/drains and Llano River bed.	24-116
Llano County	Llano	Prohibit fill in floodplain	24-118
Llano County	Llano	Implement a flood early warning system and response plan	24-121
Llano County	Llano	Distribute flood protection and NFIP pamphlets, including Turn Around Don't Drown materials, to owners of flood prone properties	24-122
Llano County	Sunrise Beach Village	Construct a bridge over a low-lying road area to provide an evacuation route and access to emergency services	24-124
Llano County	Sunrise Beach Village	Increase stormwater runoff capability under roadway on Beach Drive	24-125
Llano County	Sunrise Beach Village	Correct stormwater runoff area on Sandy Mountain Drive	24-126

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
Llano County	Sunrise Beach Village	Clean out and deepen the stormwater drainage ditches in key floodprone areas. Reestablish drainage patterns as designed in 1978 road and drainage site plan	24-127
Mason County	Mason County	Install warning signs at low water crossings	24-134
Mason County	Mason County	Improve storm drainage at low water crossing by installing tinhorns	24-137
Mason County	Mason	Clear excess growth and debris from part of Comanche Creek	24-142
Mason County	Mason	Implement a maintenance program for clearing debris from bridges and culverts	24-143
Region IV Actions – Section 25			
Brown County	Brownwood	Cross-train building inspectors in floodplain management requirements	25-6
Brown County	Brownwood	Verify FEMA's repetitive loss inventory and maintain current loss data. Notify repetitive loss property owners of FEMA funding availability	25-19
Brown County	Brownwood	Install a levee and pump system in Brook Hollow Subdivision for Pecan Bayou and Willis Creek	25-45
Brown County	Brownwood	Construct detention ponds to manage flooding on South Willis Creek and Willis Creek	25-46
Brown County	Brownwood	Update International Codes by adopting most current addition every three years	25-59
Lampasas County	Lampasas County	Rebuild low water crossing on CR 3372	25-70
Lampasas County	Lampasas County	Replace low water crossing on CR 2207	25-73
Lampasas County	Kempner	Adopt routine maintenance and cleaning of stormwater drains	25-81
Lampasas County	Lampasas	Undertake Sulphur Creek Drainage project	25-94
Lampasas County	Lometa	Employ consulting engineers to assess the adequacy of the City's drainage ditches and culverts	25-97
McCulloch County	Brady	Improve drainage at low water crossing and install automatic gates as needed to stop traffic	25-109

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
McCulloch County	Brady	Undertake remapping of the floodplain	25-112
McCulloch County	Brady	Removal of vegetation in Brady Creek and ditches throughout the city	25-115
McCulloch County	Brady	Removal of city service area, emergency services and equipment from the floodplain	25-116
McCulloch County	Brady	Build a berm around the electrical substation with a sump pump	25-124
McCulloch County	Brady	Move the Emergency Operations Center from the floodplain with generator	25-125
Mills County	Mills County	Install a concrete wing wall to current low water crossing on Bennett Creek to channel the water back into the stream bed and stop erosion of the stream bank. This will allow water to flow through the current low water crossing, not over unprotected road.	25-132
Mills County	Mills County	Add concrete approaches to the low water crossing at CR 140 at Mountain Creek, just west of intersection of CR 140 and CR 142	25-134
Mills County	Mills County	Conduct study of low water crossing for possible solutions to redirect water into stream channel to avoid repetitive loss of sections of roadway approaching low water crossing and reduce erosion.	25-140
Mills County	Goldthwaite	Join the National Flood Insurance Program and develop countywide floodplain maps	25-142
Mills County	Goldthwaite	Map the floodplain in Mills County and become active with the National Flood Insurance Program	25-146
San Saba County	San Saba County	Place Emergency Management/Floodplain Issue pamphlets and flyers at the San Saba County Library and the City of San Saba Chamber of Commerce office	25-152
San Saba County	San Saba	Review floodplain management ordinance to ensure that it meets the mandatory minimum criteria under state law and the National Flood Insurance Program for development in the regulatory floodplain, and that all FEMA minimum requirements and criteria are met.	25-161
San Saba County	San Saba	Undertake a comprehensive flood insurance policy survey for the City of San Saba	25-162

County[6]/ Region	Participating Jurisdiction	Mitigation Action[7]	Location in Plan (Sect.-Page No.)
San Saba County	San Saba	Develop a comprehensive list of structures in the floodplain and their value	25-163
San Saba County	San Saba	Clean out ditches and culverts, and divert drains to reduce the impact from floods	25-169

Appendix A– Resolutions Adopting the Plan Update

Sample Resolution to be completed after approval.

RESOLUTION FOR CITY/COUNTY OF _____ APPROVAL OF HAZARD MITIGATION PLAN UPDATE

WHEREAS, natural hazards in the Lower Colorado Basin historically have caused significant disasters with losses of life and property and natural resources damage; and

WHEREAS, the City/County of _____ is a participating member of the Texas Colorado River Floodplain Coalition (TCRFC); and

WHEREAS, the Federal Disaster Mitigation Act of 2000 and Federal Emergency Management Agency (FEMA) require communities to adopt a hazard mitigation action plan to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and

WHEREAS, FEMA requires that communities update hazard mitigation action plans every five years in order to be eligible for the full range of pre-disaster and post-disaster federal funding for mitigation purposes; and

WHEREAS, the City/County of _____ has assessed the community's potential risks and hazards and is committed to planning for a sustainable community and reducing the long-term consequences of natural and man-caused hazards; and

WHEREAS, the TCRFC's Hazard Mitigation Plan Update outlines a mitigation vision, goals and objectives; assesses risk from a range of hazards; and identifies risk reduction strategies and actions for hazards that threaten the community.

NOW THEREFORE BE IT RESOLVED THAT:

1. The TCRFC's Hazard Mitigation Plan Update is approved in its entirety;
2. The City/County of _____ will pursue available funding opportunities for implementation of the proposals designated therein, and will, upon receipt of such funding or other necessary resources, seek to implement the actions contained in the mitigation strategies;
3. The City/County of _____ vests with the Mayor/County Judge the responsibility, authority, and means to inform all parties of this action; assure that the Hazard Mitigation Plan Update will be reviewed at least annually; and that any needed adjustments will be presented to the City Council/Commissioner's Court for consideration; and
4. The City/County of _____ agrees to take such other action as may be reasonably necessary to carry out the objectives of the Plan Update and report on progress as required by FEMA and the Governor's Division of Emergency Management (GDEM).

Approval signatures

Appendix B–Planning Team Members

Table B-1. Advisory Committee (TCRFC and LCRA Planning Team)

Organization	Contact	
	Name	Title
TCRFC	Domingo Montalvo	Chairman
TCRFC	Misti Wilson	Assistant to the Chairman
LCRA	Heidi Carlin	Floodplain Management Coordinator
LCRA	Susan Duarte	Emergency Management Coordinator
LCRA	Mitch Hibbs	Director of Emergency Services
LCRA	Roy Sedwick	Floodplain Management Coordinator

Table B-2. Team Members by County[1]

County	Participating Jurisdiction	Contact	
		Name	Title
Bastrop County	Bastrop County	Sarah Wilson	Emergency Management Coordinator
		Vickie Box	Floodplain Administrator
		Mike Fisher	Emergency Management Coordinator
	Bastrop	Ted Bowers	Building Official
		James Miller	Director of Water/ Wastewater
	Elgin	Gary Cook	City Code Official

[1] Table B-2 lists participating communities by County. The TCRFC and LCRA are planning participants in the effort as showing in Table B-1.

County	Participating Jurisdiction	Contact	
		Name	Title
		Jim Cazares	Emergency Management Coordinator
	Smithville	Dale Dockery	Police Chief
		Jack Page	Emergency Management Coordinator
Blanco County	Blanco County	James Sultemeir	County Commissioner
		Kermit Roeder	Floodplain Administrator / Inspector
	Johnson City	David Dockery	City Manager
Brown County	Brownwood	Jodie Kelly	GIS Coordinator
		Don Hatcher	City Engineer
Burnet County	Burnet County	Herb Darling	Emergency Management Coordinator and Floodplain Administrator
	Bertram	Charles Shell	Utilities Director
	Burnet	Roy Fyffe	Building Official
	Cottonwood Shores	Hans Schneider	City Administrator
		Sylvia Breen	Mayor
	Granite Shoals	Ken Francis	Floodplain Administrator
	Highland Haven	Mayor Pete Freehill	Mayor
		Donna Green	Floodplain Administrator / Emergency Management Coordinator
	Marble Falls	Ralph Hendricks	Assistant City Manager
		Brian Shirley	City Council Member

County	Participating Jurisdiction	Contact	
		Name	Title
	Meadowlakes	Carlton Pullen	Emergency Management
Colorado County	Colorado County	Chuck Rodgers	Emergency Management Coordinator
	Columbus	David Meisell	City Manager
	Eagle Lake	Thurston Webb	Public Works Director
	Weimar	Dolores Stoever	City Secretary
Fayette County	Fayette County	Janet Carrigan	Floodplain Administrator / Emergency Management Coordinator
	Carmine	Mayor Justin Flasowski	Mayor
		Ruth Owen	City Secretary
	Flatonia	Greg Robinson	Code Compliance Officer
		Mellisa Brunner	City Secretary
	La Grange	Jeff Rost	Building Inspector
		Frank Menefee, Jr.	Building Official
Lampasas County	Lampasas County	Angela Rainwater	Emergency Management Coordinator
	Kempner	Paul Cook	City Council/ Emergency Actions Coordinator
		Francis Spinney	City Secretary
	Lampasas	Lance R. Carlson	Building Official
	Lometa	Michelle Schueneman	City Secretary
Lee County	Lee County	Delynn Peschke	Emergency Management Coordinator

County	Participating Jurisdiction	Contact	
		Name	Title
	Giddings	Spencer Schneider	Emergency Management Coordinator
	Lexington	Brian Flowers	Emergency Management Coordinator
		Randy Davenport	Chief of Police
Llano County	Llano County	Ronald Moore	Environmental & Emergency Services
	Horseshoe Bay	Eric Winter	Development Services Manager
	Llano	Randy Farnsworth	Building Official, Emergency Management Coordinator
	Sunrise Beach Village	Patricia Fain	Mayor
		Joyce Horton	City Secretary
Mason County	Mason County	Thomas Starks	Floodplain Administrator
	Mason	Earl Koch	Emergency Management Coordinator
Matagorda County	Matagorda County	Lisa Krobot	Floodplain Administrator
	Bay City	Mayor Richard Knapik	Mayor
		Jim Hendrickson	Floodplain Administrator
	Palacios	Don Guynes	Floodplain Administrator
McCulloch County	Brady	Joe Mosier	Airport Manager
		James Minor	City Manager
Mills County	Mills County	Theresa Strickler	Floodplain Administrator / Emergency Management Coordinator
	Goldthwaite	Rob Lindsey	City Manager

County	Participating Jurisdiction	Contact	
		Name	Title
San Saba County	San Saba County	Marsha Hardy	Emergency Management Coordinator
	San Saba	Al Hamrick	City Inspector
Travis County	Briarcliff	Charles Garrett	Floodplain Administrator
	Jonestown	Lance Wendell	City Council
		Marilee Pfannstiel	Floodplain Administrator
	Lago Vista	Frank Robbins	Assistant City Manager/Development Services Director
	Lakeway	Todd Radford	Police Lieutenant
		Paul Duncan	City Engineer
	Mustang Ridge	Sheri Mack	City Secretary
	Point Venture	Mike Leathers	Floodplain Administrator
		Jeff Warneke	Emergency Management Coordinator
	San Leanna	Kathleen Lessing	City Administrator
	Volente	Jennifer Zufelt	City Secretary
	West Lake Hills	Jim Sterman	City Inspector
Wharton County	Wharton County	Andy Kirkland	Emergency Manager
		Mickey Reynolds	County Commissioner
		Monica Martin	Floodplain Administrator
	East Bernard	Melvin Sands	City Secretary
	El Campo	Andy Waligura	Building Official
	Wharton	Jackie Jansky	City Manager

County	Participating Jurisdiction	Contact	
		Name	Title
		Andres Garza Jr.	City Manager
		Carter Miska	Public Works Director
		Jim Cooper	Emergency Management Coordinator
		Ronnie Bollom	Building Official
Williamson County	Williamson County	Jarred Thomas	Emergency Management Coordinator
	Cedar Park	James Mallinger	Fire Chief
	Florence	Amy Crane	City Secretary
	Hutto	James Devereaux	Water / Wastewater Supervisor
		Jeff Sabin	Planner, Community Development

Appendix C – Public Survey Results

Public Surveys 1

Results 2

Public Surveys

The TCRFC prepared public surveys that asked a wide range of questions concerning the opinions of the public regarding natural and man-caused hazards. This fourteen-question survey was made available on the Coalition website, www.tcrfc.org, as well as the websites of many of the member communities[1]. It was distributed at all public meetings throughout the planning process, and planning team members made hard copies available for their citizens.

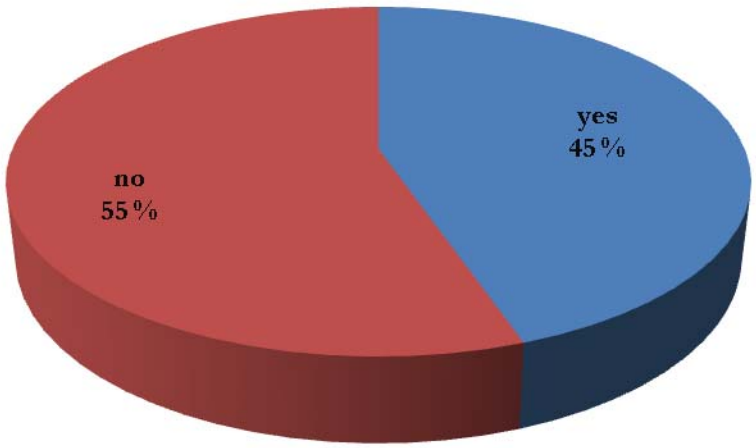
At least one survey was received from each participating jurisdiction, and a total of 293 surveys[2] were collected, the results of which are analyzed in this Appendix. The purpose of the surveys was twofold: 1) to solicit public input during the planning process and 2) to help communities identify any potential actions or problem areas. Of interest is the fact that the Internet received the same percentage of selections as newspapers when people were asked for their preferred method of notification (See Question 11 on page 8). Also, of those that chose to respond to the questions regarding steps local governments can take and options for reducing risk (Questions 12 and 13 respectively), the majority of responses indicate a need for public awareness and dissemination of critical information such as severe weather warnings.

[1] For a discussion on public involvement in the planning process, please see Section 2.

[2] Hard copies of all public surveys are available by request.

Results

Question 1: Have you ever experienced or been impacted by a disaster?



Question 1a: If "Yes," please explain:

Flood

- Floods of 1984, 1992, 1993, 1994, 1997, 1998, 1999, 2004, 2007
- The June 2007caused a break in the Marble Falls public water supply, so we had to be given canned water by emergency workers.
- Roads and fences washed out, had to be rescued by boat, heavy rains caused excessive damage to county roads,
- During the last flood all roads to location were flooded and impassible.

Tornado

- Tornados of 1997, 1999
- In Lavaca County, in City of Burnet

Drought

- Drought affected crops

Hurricane

- Several hurricanes affected crops when farming for a living
- Hurricane Carla and flooding along the Guadalupe River
- Tropical storm damage

- Refugees displaced from their homes cause overcrowding

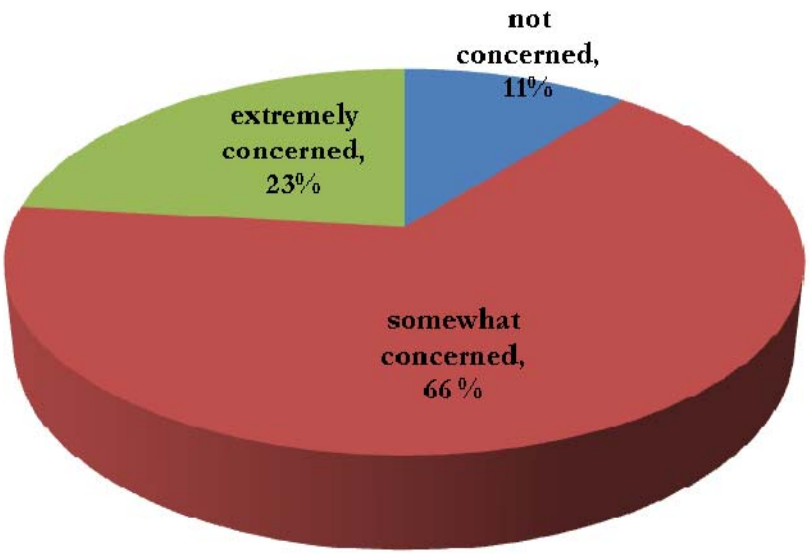
Storms

- Severe thunderstorm and high wind
- Hail damage
- Ice storm in 2005 confined to home for 2-3 days

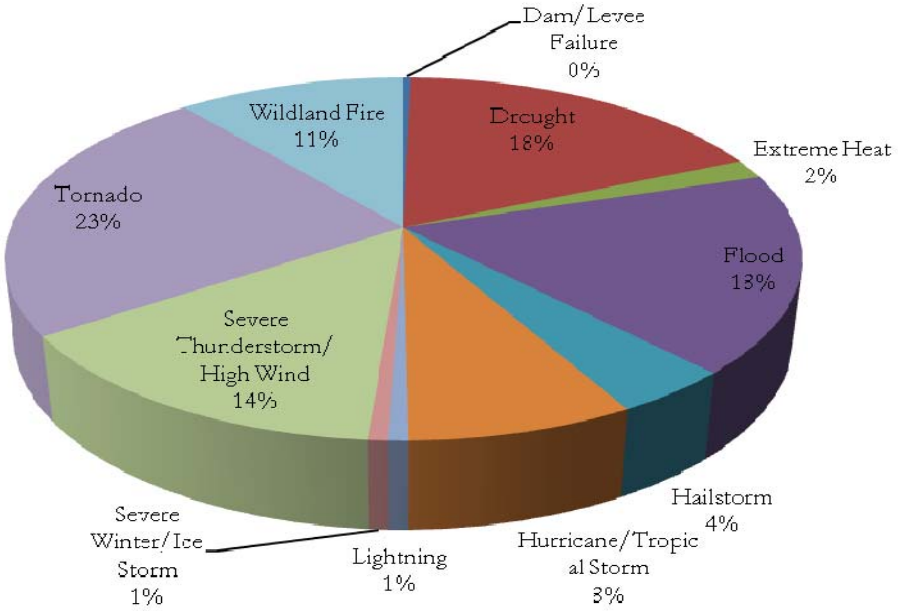
Fire

- 300 acre wildfire
- A fire in the city burned nearly the entire block.

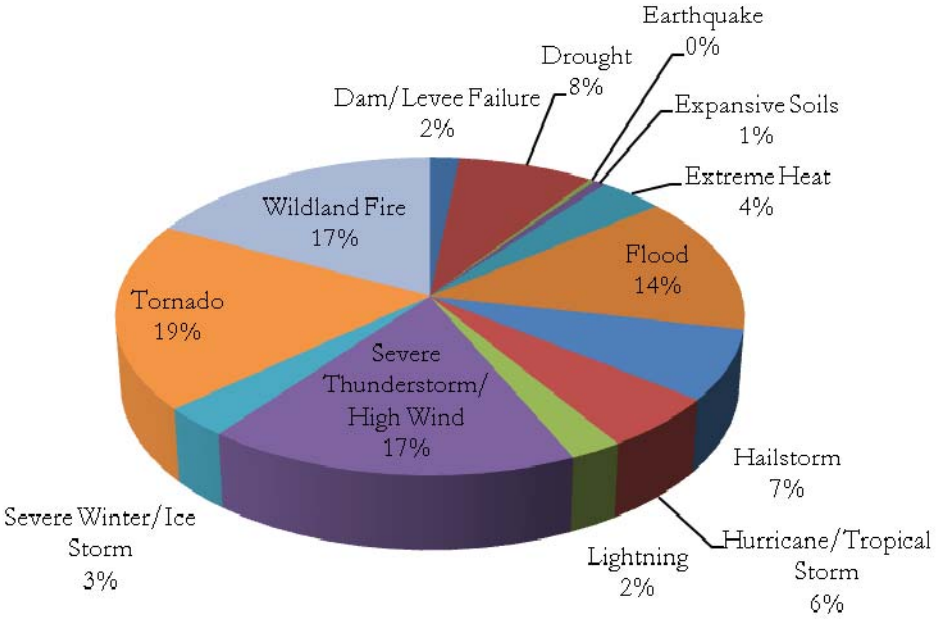
Question 2: How concerned are you about the possibility of our community being impacted by a disaster?



Question 3: Please select the one hazard you think is the highest threat to your neighborhood:



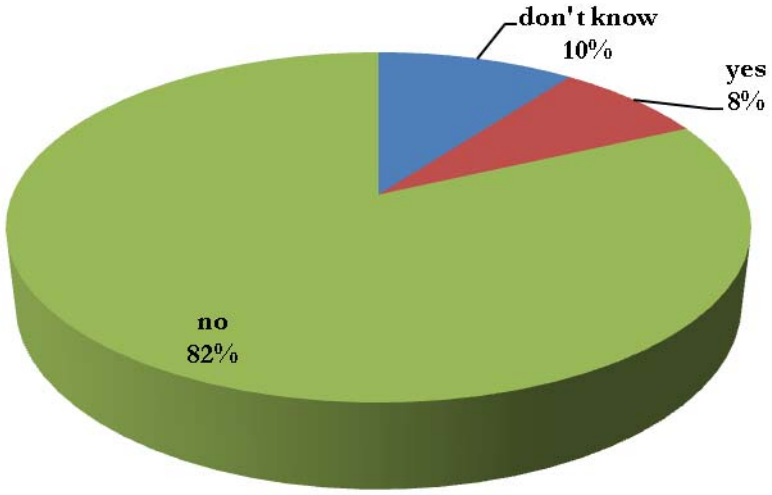
Question 4: Please select the one hazard you think is the second highest threat to your neighborhood:



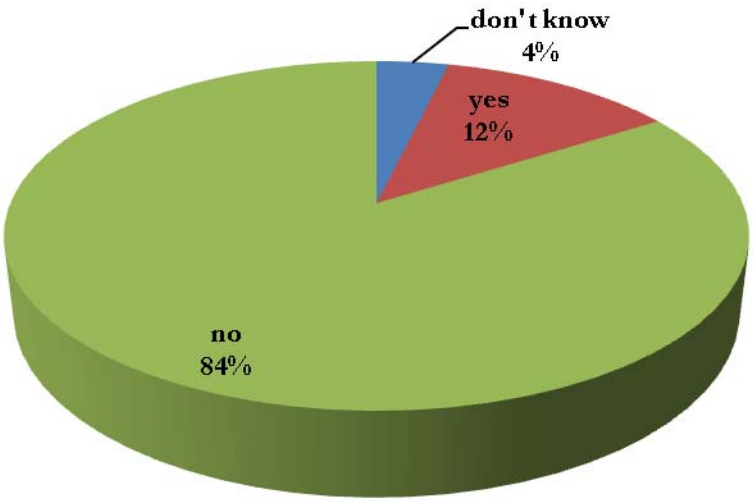
Question 5: Is there another hazard not listed above that you think is a wide-scale threat to your neighborhood?

- Avian flu
- Chemical spill
- Slow response time for emergency response to fire
- Hazardous materials on railways and roadways
- Ice storm
- Meth Labs
- Pollution
- Road blockage
- Runoff from higher ground
- Shortage of water supply
- Sink hole due to salt dome penetration
- Terrorism

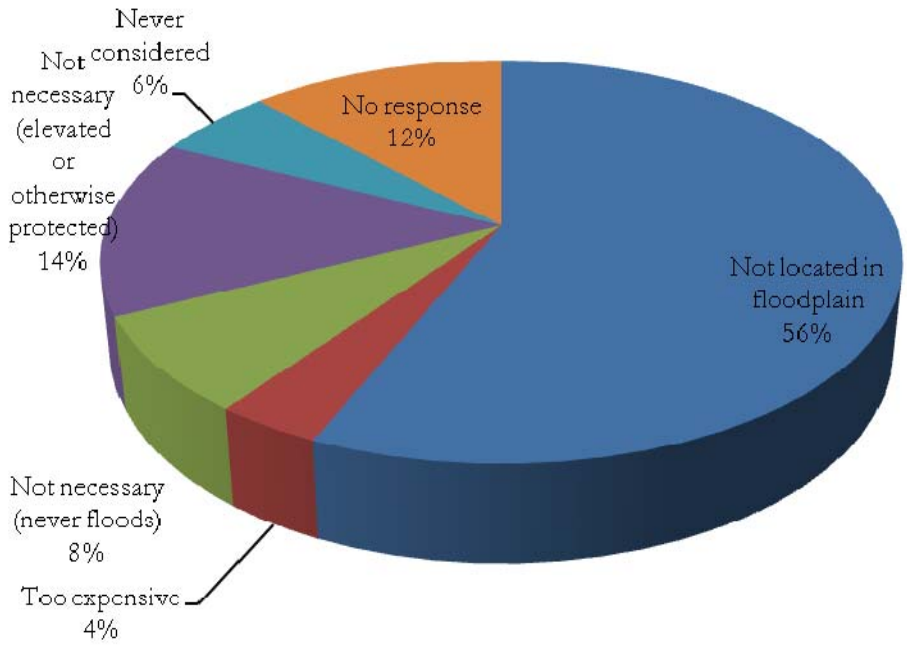
Question 6: Is your home located in a floodplain?



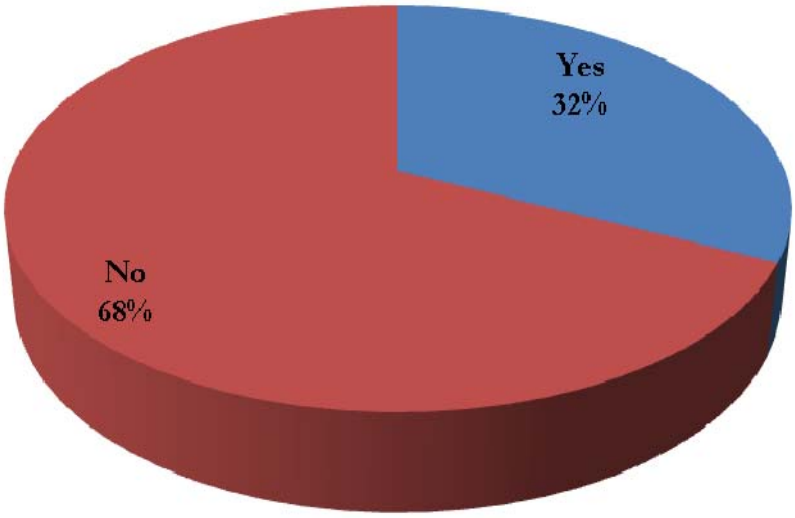
Question 7: Do you have flood insurance?



Question 8: If "No," why not?



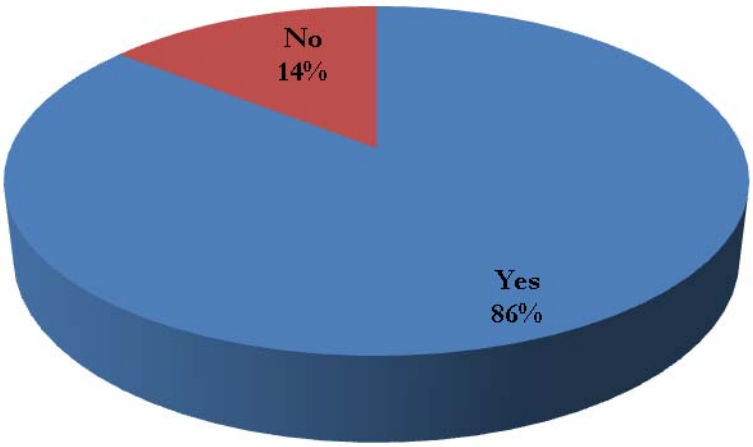
Question 9: Have you taken any actions to make your home or neighborhood more resistant to hazards?



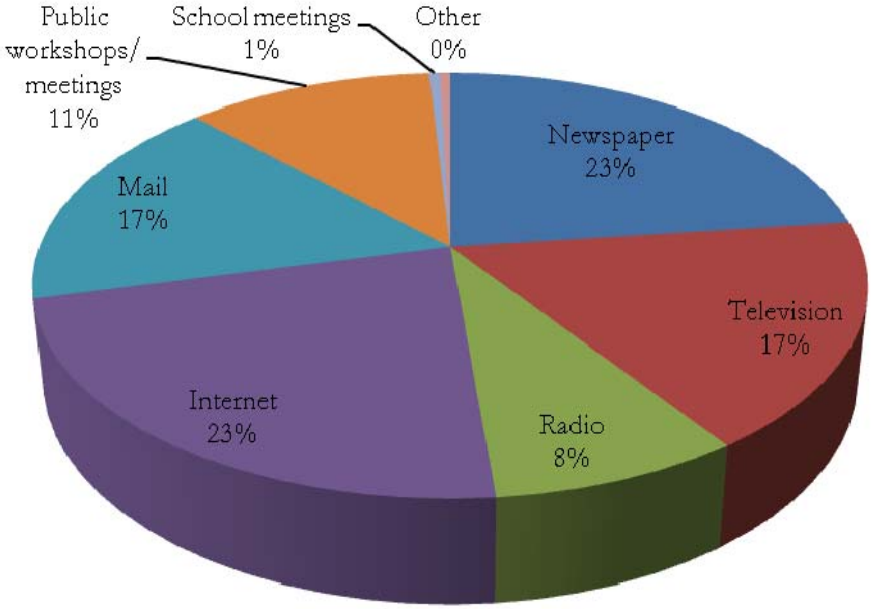
Question 9b: If "Yes," please explain:

- Constructed home 1 foot above the BFE and home is anchored down.
- Built on higher elevation - mobile home hurricane standard tie downs
- Try to keep trees trimmed and yard clean
- House is concrete and steel so fire resistant and wind resistant (up to 160 mph). Have an in residence tornado shelter; maintain & design landscaping to discourage fire near home
- Cutting trees out around house; building retaining walls for soil erosion control
- Created green space around house; removed fire fuel sources (weeds, grass and dead brush); removed fencing to allow the free flow of water around the house during rain event
- Wrote letter of concern regarding high weeds and grass (fire hazard) to councilman requesting existing deed restriction be enforced eliminating the hazard .
- improved drainage channel for runoff after heavy rains
- Storm cellar, double -braced rafters; anchored sill plates; pier and beam
- clean out bar ditch; installed new driveway culverts; install 12" drain from highland to lake canal; sod hill to lake front; built retaining walls
- Have tornado shelter built in home.
- Steel roof; basement sump pump.

Question 10: Are you interested in making your home or neighborhood more resistant to hazards?



Question 11: What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?



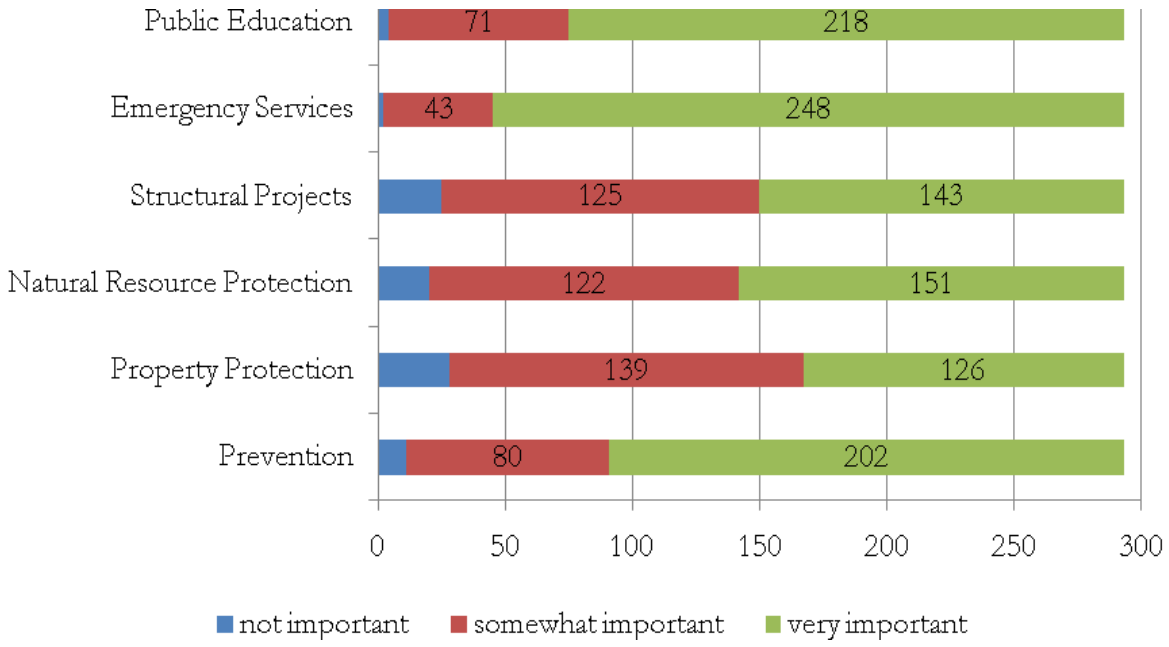
Question 12: In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?

- Mow the ditches more frequently to improve water drainage. Most of the times, the grass is a minimum of 2 ft. tall. Ditches are only mowed twice a year, not nearly enough.
- Clean out rivers and sloughs of trees and debris to create a more effective run off of rising waters.
- Send out flyers for public workshops and meetings for steps to take during emergency situations
- Improve communication.
- Replace old power poles and transformers and demolish old buildings and structures that are abandoned.
- The City has taken numerous steps to reduce flooding. Emergency Management Operations have received the proper training and is active in providing the best service to the citizens.
- Better alert system; faster PEC service for outages
- Encourage people to use fire resistant building materials; encourage folks to follow the Texas Parks & Wildlife fire-scaping design principles
- Have public awareness programs for community and encourage participation in them. The City should identify the possible hazards and find solutions to prevent losses as much as possible (i.e. a drainage system, curbed and guttered roads, clear out creek beds
- Make weather radios available to the public at an affordable price
- Drought and not enough water for proposed development. Start incentives for conservation; especially in urban areas; Xeriscape landscaping; rainfall harvesting cisterns; water storage in off channel reservoirs, especially in areas of heavy rainfall
- Route hazardous materials around the City instead of through town; better warning for tornados
- We need to preserve or restore the function of the natural systems.
- Use available water resource (water going over waterfall) from mill pond. Pump it into a reservoir that could be used for recreation as well as water to fish, fight fires and other needed resources.

Question 13: Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?

- public information and safety information for the public
- stop pumping waste water, etc. into salt dome
- building codes and drainage
- buy floodplain property for parkland
- Town meetings would be a good thing
- Make a plan for local radio stations to be manned and on air during tornado warnings, fires, etc. with accurate information, lately not done in 2008, electricity was off so battery radio was all that came in
- Allowing Lake Buchanan to rise to its intended level when rains are available so that when there is no rain, have additional water for the lower basin. We are more often in a time of drought than too much water. Lake Buchanan was built for water storage
- Junk piles and "dumps" especially in the county pose a potential hazard and breeding of rodents that can carry disease.
- Prevent building structures in flood plain

Question 14: A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.



Guide to Funding and Technical Assistance Programs

To Support Implementation of Hazard Mitigation Plans

2011

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Introduction

A major challenge faced by local and regional governmental entities seeking comprehensive hazard-mitigation planning solutions is to secure funding in an era of constrained resources at all levels of government. A wide range of financial and technical assistance is available from the State of Texas and the Federal Government to protect public and private entities from floods and other natural and human-caused disasters and preserve and enhance the safety and security of the environment.

This Guide was prepared by H2O Partners, Inc. of Austin, Texas. It is a tool for public and private entities to use in leveraging state and federal resources to support their mitigation planning efforts. It identifies and briefly describes funding programs available to help the jurisdiction mitigate, prepare for, respond to, and recover from natural and human-caused hazards.

This guide is organized into two parts. The first includes state-authorized programs, and the second includes federally-authorized programs. Programs are listed alphabetically by agency. The authority for each program is described, as are funding source, purpose, types of assistance and eligible projects, conditions of use, hazards or topics covered, matching requirements, application deadlines and contact points for further information. Questions or comments should be directed to:

Jo Ann Howard, President
H2O Partners, Inc.
P.O. Box 160130
Austin, Texas 78716
Phone: (888) 328-4151
Fax: 512-329-6612
Email: joann@h2opartnersusa.com
Website: www.h2opartnersusa.com

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GUIDE TO FUNDING AND TECHNICAL ASSISTANCE PROGRAMS

TO SUPPORT IMPLEMENTATION OF HAZARD MITIGATION PLANS

Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Texas Clean Rivers Program (CRP)	Texas Clean Rivers Act, 30 TAC 220, Subchapter A.	Texas Commission on Environ-mental Quality (TCEQ)	To maintain and improve the quality of surface water resources within each river basin in Texas. The Program is a partnership involving TCEQ, other state agencies, river authorities, regional entities, local governments, industry, and citizens. It uses a watershed management approach to identify and evaluate surface water quality issues, establish priorities for corrective action, and outline strategies to implement those actions. It encourages comprehensive and cooperative watershed planning; maintains basin-wide water quality monitoring; focuses on priority issues and addresses local initiatives; identifies, analyzes, and reports on water quality issues and potential causes of pollution; and identifies and evaluates alternatives for preventing and reducing pollution.		Only entities designated in the Act are eligible.	Water quality	No match required	The law mandates pass-through of funds to the River Authorities. There is no specific application process.	L'Oreak Stepney, PE, MC145 TCEQ P.O. Box 13087 Austin, TX 78711-3087 512-239-4554 www.tceq.state.tx.us/water/quality/nps

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Clean Water State Revolving Fund	Texas Administrative Code. Sections 375.1 – 375.4; and the Federal Water Pollution Control Act, as amended	Texas Water Development Board (TWDB)	To provide a perpetual fund to provide low interest loan assistance for the planning, design, and construction of wastewater treatment facilities; wastewater recycling and reuse facilities; collection systems; stormwater pollution control projects; and nonpoint source pollution control projects. There is a set-aside within the Clean Water State Revolving Fund for the Nonpoint Source Pollution Loan and Estuary Management Program.	Assistance is in the form of loans at below market interest rates, for a period not to exceed 20 years; or the purchase or refinance of bonds at below market rates; or guarantees or purchase of insurance for local debt obligations. Eligible projects include construction of waste treatment works and nonpoint source pollution control and abatement projects. For entities that are fully authorized to issue bonds, loans are in the form of purchase of bonds, rather than requiring entities to sell them on the open market. Eligible costs include: (a) preliminary planning to determine the feasibility of a project; (b) engineering, architectural, environmental, legal, title, fiscal, or economic studies; (c) the expense of any condemnation or other legal proceeding; (d) surveys, designs, plans, working drawings, specifications, procedures; and (e) the building of a project or the inspection or supervision of any of the foregoing items.	An approved Water Conservation Plan is required. The TWDB will also consider environment-al, social and economic impacts and whether the proposed action is or is not detrimental to the public welfare.	Water quality	No match required. However, funds received from the Clean Water State Revolving Fund may generally be used as a non-Federal match for Federal grants, such as the EPA Nonpoint Source Grant Program (Section 319).	After a Pre-application Conference, TWDB solicits proposed pro-jects for an Intended Use Plan. Then, TWDB sends Notice of Avail-ability of Funds and solicits applications. Applicants are generally given 4 months from the Notice, or until August 31, whichever is sooner, to submit applications. Applications for Nonpoint Source projects are funded on a first-come, first-served basis until available funds are used.	Suzanne Lucignani, Texas Water Development Board Stephen F. Austin Bldg. P.O. Box 13231 Austin, Texas 78711-3231 512-463-6277 www.twdb.state.tx.us

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Research and Planning Fund Grants	Texas Water Code, Chapter 15	TWDB, Research and Planning Fund	To provide financial assistance for research and feasibility studies into practical solutions to water-related problems. The Fund provides for three grant programs: (1) Regional Planning for Water Supply and Wastewater Treatment and Collection program provides funding to prepare plans for regional water supply and wastewater facilities. (2) Water Research Grants are dedicated to enhancing planning, management, conservation, development or protection of Texas's water resources ; and (3) Flood Protection Planning Grants provide funds for regional flood protection planning, considering the needs of the entire watershed, including upstream or downstream effects of proposed solutions.	Regional Planning for Water Supply and Wastewater Treatment and Collection Grants support preparation of plans to develop regional water-supply and wastewater facilities. The facilities must be regional, i.e., systems that incorporate two or more service areas or serve an area involving two or more political subdivisions. Grants have been awarded for nonpoint source pollution control, ground-water protection and recharge, plumbing retrofit programs, reuse of surface water to increase the dependable supply of a reservoir, and watershed yield augmentation. Eligible activities under Flood Protection Planning include studies and analyses to identify problems resulting from or relating to flooding; determining views and needs of the affected public; identifying potential solutions; estimating benefits and costs of solutions (structural and nonstructural); evaluating environmental, social, and cultural factors; and recommending feasible solutions to flooding.	Flood Protection Planning Grants are only awarded to participating NFIP communities. Applicants must consider structural and non-structural flood protection measures; and plan for an entire watershed rather than localized drainage improvements.	Water quality, water supply, flooding	Grants for Regional Planning and Flood Protection are limited to 50% of total project costs, except in areas of high unemployment rates or low per-capita income. In-kind services may be used for any part of the local share. Grants may be awarded for up to 100% of the cost of a Water Research project.	As funds become available and needs are identified, TWDB publishes a notice in the *Texas Register.* Generally, applications for the Flood Protection Planning are due the first week of January.	Kathleen Ligon Texas Water Development Board Research and Planning Fund 1700 North Congress Avenue Austin, TX 78711 512-463-8294 kathleen.ligon@twdb.state.tx.us www.twdb.state.tx.us

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
State Participation and Storage Acquisition Program	Texas Water Code, Chapter 363, 31 TAC 363, Subchapters A and F	TWDB	To help finance regional water or wastewater projects, including water storage facilities and flood retention basins; and to allow for "right sizing" of projects in consideration of future growth. Under this program, the State TWDB absorbs some of the initial costs of projects, but ultimately recovers the actual cash expenditure of funds used in providing assistance.	Assistance is in the form of sale, transfer or lease by the State of regional water and wastewater projects, including water storage acquisition and flood retention basins. The State assumes a temporary ownership interest in a regional project when local sponsors are unable to assume debt for the optimally sized facility. Loan payments that would have been required, if the assistance had been in the form of a loan, are deferred. Ultimately, the cost of funding is repaid to the State when the State's ownership interest is bought out. A Master Agreement will be established with the TWDB to govern the funding arrangements, including provisions for a defined source of revenue that will be used to purchase the State's portion of the facility.	Environment-al Review and an approved Water Conservation Plan are required. The project cannot be reasonably financed without State participation assistance, and the optimum regional development of the project cannot be reasonably financed without State participation.	Flooding, water supply	TWDB's participation is limited to a maximum of 50% of the project costs and to the portion of the project designated as excess capacity. The remaining costs of the project may be funded through other TWDB programs.	Application materials must be submitted by the first business day of the month preceding the month during which the applicant desires TWDB Board consideration. Completed applications are considered by the Board on the third Wednesday of each month.	Office of Project Finance and Construction Assistance, 512-463-7853 www.twdb.state.tx.us

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Texas Natural Resources Information System (TNRIS)	Texas Water Code	TWDB	To provide a clearinghouse and referral center for Texas natural resources information supplied by numerous State and Federal agencies, including the U.S. Census Bureau, the U.S. Geological Survey, the U.S. Federal Emergency Management Agency, and the Texas Department of Transportation.	Assistance is in the form of: (1) access to information through TNRIS's hub for direct electronic access or referral to State natural resources and census data; (2) Internet map services; and (3) technical assistance on Geographical Information Systems displays and Global Positioning Systems. TNRIS's Strategic Mapping Program (StratMap) produces large-scale computerized base map information documenting land features such as soils, elevation and hydrography, and man-made features including political boundaries and roadways. Data provided by StratMap can be used for hydrologic modeling, vegetation analysis, transportation routing, land use planning and management, environmental assessment and monitoring, and business applications. TNRIS has information that can assist in developing Hazard Mitigation Plans.	None	Natural resources information	No match required	N.A.	Texas Natural Resources Information System, Stephen F. Austin State Building - 1700 N. Congress Ave. - Suite B40 Austin, Texas 78701-3231 512-463-8337 www.tnris.state.tx.us

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Texas Water Development Fund	Texas Water Code, Chapter 17	Texas Water Development Board, Development Fund II	To provide loans for the planning, design and construction of water supply, wastewater and flood control projects.	Loans are provided for the acquisition, improvement or construction of such water-related projects as water wells, retail distribution and wholesale transmission, pumping facilities, storage reservoirs and tanks, and water treatment plants. Financing is also provided for purchase of water rights, wastewater collection and treatment projects, and flood control projects. Flood control projects focus on basin- or watershed-wide analysis and projects that are regional in nature. Assistance includes loans for structural and nonstructural flood protection improvements such as construction of storm water retention basins, enlargement of stream channels, modification or reconstruction of bridges, acquisition of floodplain land for use in public open space, acquisition and removal of buildings located in a floodplain, relocation of residents, flood warning systems, control of coastal erosion, and the development of flood management plans.	An approved Water Conservation Plan is required.	Flood control, water supply and water quality	No match required	Applications must be submitted by the first business day of the month preceding the month during which the applicant desires consideration of the loan request by the TWDB.	Office of Project Finance and Construction Assistance, 512-463-7853 www.twdb.state.tx.us

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Texas Coastal Management Program	Coastal Zone Management Act, Sections 306 and 306A	Texas Coastal Coordination Council, chaired by the Texas General Land Office.	For planning and implementation of projects that address environmental problems affecting the coastal area and that promote sustainable economic development.	Two types of funds are provided under this program. Section 306 Administrative Funds may be used for the administration of the Coastal Management Program, to include planning, mapping, geographic information systems, and research projects. Section 306A Funds may be used for projects that meet one or more of the following: (1) preservation or restoration of coastal natural resource areas; (2) redevelopment of deteriorating and underutilized urban waterfronts and ports; (3) provision of access to public beaches and other coastal areas and to coastal waters; and (4) development of a coordinated process among state agencies to regulate and issue permits for aquaculture facilities in the coastal zone. Section 306 eligible activities include acquisition or fee simple or other interest in land; low-cost construction projects; revitalization of deteriorating or underutilized urban waterfronts or ports; engineering designs, specifications; and educational, interpretive, and other management costs.		Coastal zone management	40% non-Federal cost share required.	Grant cycles to be announced in the Texas Register.	Melissa Porter, CMP Grants Manager, General Land Office, 512-475-1393 melissa.porter@glo.state.tx.us

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Drought relief	Reclamation State Emergency Drought Relief Act of 1991	Bureau of Reclamation, Department of the Interior	To conserve and increase the supply of water during drought	Construction, management, and conservation activities conducted by Reclamation; loans	Requires official request from governor	Drilling of wells, diking and dredging, temporary installation of pumps in reservoirs to life water to outlets, and many others	NA	NA	Bureau of Reclamation, 10737 Gateway Blvd. West Suite 350 El Paso, TX 79935-4900 (915) 534-6300 http://www.usbr.gov

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Conservation Reserve Program	Food Security Act of 1985, Title XII, Public Law 99-198, as amended; Food, Agriculture, Conservation, and Trade Act of 1990, Public Law 101-624; Federal Agriculture Improvement and Reform Act of 1996, Public Law 104-127	US Department of Agriculture, Farm Service Agency	To reduce water and wind erosion, protect the nation's long-term capability to produce food and fiber, reduce sedimentation, improve water quality, and create and enhance wildlife habitat.	The Commodity Credit Corporation enters into contracts with eligible participants to convert land to a conserving use for a period not less than 10 years and not more than 15 years in return for financial and technical assistance.	Limited to owners and operators on Conservation Reserve Program land. Land must be highly erodible, normally devoted to agricultural production, and operated for 12 months.	Erosion	At least 50 percent		County FSA office. Go to **http://offices.sc.egov.usda.gov/locator/app?state=tx&agency=fsa** to find county office

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Conservation Technical Assistance	Soil Conservation and Domestic Allotment Act of 1936, as amended, P.L. 74-46	Department of Agriculture, Natural Resources Conservation Service	To provide technical assistance to implement various conservation programs including disaster preparedness, soil erosion control, water quantity and quality enhancement, wildlife habitat development, and soil surveys.	Technical assistance to private land users, communities, units of state and local government, and other federal agencies.	NA	Natural resource concerns including drought.	NA	NA	Local county NRCS office. County contacts available at: http://offices.sc.egov.usda.gov/locator/app

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Cooperative Forestry Assistance	Cooperative Forestry Assistance Act of 1978, Public Law 95-313; Food, Agriculture, Conservation, and Trade Act of 1990, as amended, Public Law 101-624	US Department of Agriculture, United States Forest Service	Fire prevention	Financial and technical assistance to State Foresters	States must compete and demonstrate capability to deliver services	Forest fires, fires in wildland/urban interface areas	NA	NA	US Forest Service Southern Region office 1720 Peachtree Road NW, Atlanta, GA 404-347-4177

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Emergency Community Water Assistance Grants	Consolidated Farm and Rural Development Act, Section 306A; Food, Agriculture, Conservation, and Trade Act of 1990, Title XXIII, Public Law 101-624	US Department of Agriculture, Rural Development	To assist communities with severe water shortages	Project grants	Requires presidential disaster declaration and must be for towns with less than 15,000 population	Determined through competition	NA	NA	Texas USDA Rural Development 101 South Main Street Suite 102 Temple, TX 76501 254-742-9700 http://www.rurdev.usda.gov

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Emergency Conservation Program	Agricultural Credit Act of 1978, Title IV, Public Law 95-334, 16 U.S.C. 2201-2205, as amended	US Department of Agriculture, Farm Service Agency	To provide cost share assistance to agricultural producers who have suffered severe damage to their farmland as a result of a natural disaster	Direct payments to producers who carry out emergency measures to control wind erosion on farmlands or rehabilitate damaged farmlands	Rehabilitation must be so costly that federal assistance is required; county must apply	Wind erosion and other damage of an infrequent nature	Cost sharing required		County FSA office Go to http://offices.sc.egov.usda.gov/locator/app?state=tx&agency=fsa to find county office

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Emergency Loans (Farming Operations)	Consolidated Farm and Rural Development Act, as amended, Subtitle C, Sections 321-330, Public Law 92-419, 7 U.S.C. 1961- 1984; Public Law 96-438; Public Law 97-35; Public Law 98-258; Public Law 99-198; Public Law 100-233; Public Law 100-387; Public Law 101-624	US Department of Agriculture, Farm Service Agency	To assist established family farmers, ranchers, and aquaculture (physical losses only)	Loans	Requires presidential declaration of disaster or emergency; applicant must have incurred substantial crop loss as a result of a natural disaster and be unable to obtain suitable credit from any other source	Crop loss due to natural disaster	NA	Application must be filed within eight months of disaster	County FSA office Go to http://offices.sc.egov.usda.gov/locator/app?state=tx&agency=fsa to find county office

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Emergency Watershed Protection Program	Public Law 104-127, as amended; Public Law 81-516, as amended; and Public Law 95-334, as amended	Department of Agriculture, Natural Resources Conservation Service	To provide relief from imminent hazards and reduce the threat to life and property in watersheds damaged by severe natural events. Hazards include floods and the products of erosion created by floods, fire, windstorms, earthquakes, drought, or other natural disasters.	Assistance includes technical and financial assistance to carry out emergency work such as debris removal from stream channels, road culverts, and bridge abutments; debris removal in upland areas following windstorms and tornadoes; reshaping and protection (hard and soft) of eroding streambanks; repair of damaged drainage facilities, levees and flood prevention structures; reseeding of burned or denuded areas; and promoting appropriate grazing practices under drought conditions to assist in watershed recovery.	Requires an imminent hazard or threat to life and property from severe natural events. However, a Presidential declaration of disaster is not required.	Mulit-hazard, covering floods and erosion caused by floods, fire, windstorms, earthquakes, drought or other natural disasters.	No matching requirements for easements and technical assistance. 25% nonfederal match for other eligible measures.	Letter of request to NRCS is due 90 days from the date of the disaster.	Steven Bednarz, Assistant State Conservationist for Water Resources, Texas State Office, NRCS, 101 South Main Temple, TX 76501 254-742-9871 Steven.bednarz@tx.usda.gov www.nrcs.usda.gov

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Environmental Quality Incentives Program	The Farm Security and Rural Investment Act of 2002 (the 2002 Act) (Public Law 107-171, May 13, 2002) re-authorized and amended the Environmental Quality Incentives Program, which had been added to the Food Security Act of 1985 (the 1985 Act) (16 U.S.C. 3801 et seq.) by the Federal Agriculture Improvement and Reform Act of 1996 (the 1996 Act) (Pub. L. 104-127).	Department of Agriculture, Natural Resources Conservation Service	To address soil, water, and related natural resource concerns on farms and ranches.	Technical, educational, and financial.	Applicant must be an agricultural producer.	Compliance with Federal and State environmental laws and enhancement of the environment.	NA	NA	Local NRCS office. Go to http://offices.sc.egov.usda.gov/locator/app to determine county contacts
Farm and Ranch Lands Protection Program	Food Security Act of 1985, as amended, 16 U.S.C. 3838h and 3838i	Department of Agriculture, Natural Resources Conservation Service	To assist farmers with a purchased agricultural conservation easement (PACE) to develop the required conservation plan.	Technical assistance.	Farms participating in a PACE.	Plan should address mitigation actions in event of drought.	NA		Claude Ross,USDA-Natural Resources Conservation Service 101 South Main Temple, TX 76501 Phone: 254-742-9800 claude.ross@tx.usda.gov

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Federal Crop Insurance Corporation	Federal Crop Insurance Act, as amended, 7 U.S.C. 1501-1520, Agricultural Adjustment Act of 1938, Title V, 52 Stat. 31; Federal Crop Insurance Act of 1980, as amended, Public Law 101-624; Federal Crop Insurance Reform Act of 1994, Public Law 103-354; Federal Agriculture Improvement and Reform Act of 1996, Public Law 104-127	US Department of Agriculture, Risk Management Agency	To improve the economic stability of agriculture	Crop insurance	Must purchase crop insurance	Production losses due to unavoidable causes such as drought, excessive moisture, hail, wind, hurricane, tornado, etc.	NA		Oklahoma City Regional office Risk Management Agency Regional Office 205 NW 63rd Street, Suite 170, Oklahoma City, OK 73116 405-879-2700 rsook@rma.usda.gov
National Fire-Danger Rating System		US Department of Agriculture, United States Forest Service	To monitor and predict conditions for wildland fires through the fire season	Technical assistance	Eligibility includes Federal, State, county, and local government agencies	Control of wildland fires	NA	NA	US Forest Service Southern Region office 1720 Peachtree Road NW, Atlanta, GA 404-347-4177

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Non-Insured Crop Disaster Assistance Programs	Federal Agriculture Improvement and Reform Act of 1996, as amended, 15 U.S.C. 714b and 714c; 7 U.S.C. 7333.	US Department of Agriculture, Farm Service Agency	To pay producers for eligible crops that are not eligible for catastrophic risk protection insurance for crop yield losses caused by natural disasters.	Direct payments equivalent to catastrophic risk protection otherwise available under Section 508(b) of the Federal Crop Insurance Act (7 U.S.C. 508 (b).	Natural disasters, including drought, may result in payments to producers in an area suffering from prevented planting in excess of 35% or loss of yield in excess of 60%.	Commercial crops grown for food or fiber including floriculture, ornamental nurseries, Christmas trees, turf grass sod, and industrial crops. Excludes livestock.	None.		County FSA office. Go to http://offices.sc.egov.usda.gov/locator/app?state=tx&agency=fsa to find county office
Plant Materials Program	Soil Conservation and Domestic Allotment Act of 1936, as amended, Public Law 74-46.	Department of Agriculture, Natural Resources Conservation Service	To provide vegetative solutions for natural resource problems.	Technical assistance through plant science technology.	Conservation cooperators' properties in conjunction with Soil Conservation Districts, State Agricultural Experiment Stations, and State Cooperative Improvement Associations.	Field testing to determine a plants' usefulness, e.g., in resisting drought.	NA		Appropriate Plant Materials Center Go to http://plant-materials.nrcs.usda.gov/centers/ to find appropriate center
Resource Conservation and Development	Public Law 97-98, 95 Stat. 1213	Department of Agriculture, Natural Resources Conservation Service	Assist in projects developed under the Resource Conservation and Development Program.	Technical assistance and loans to finance local costs.	Public agencies or nonprofit organization in approved Resource Conservation District areas.	Drought aid, land or water conservation, water resource improvements, fire prevention, public recreation, and waste disposal.	NA		Local NRCS office Go to http://offices.sc.egov.usda.gov/locator/app to determine county contacts

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Small Watershed Program	PL-566	Department of Agriculture, Natural Resources Conservation Service	To protect watersheds and prevent floods	Technical and financial assistance	At least 20% of total benefits must be to agriculture, including rural communities	Prevention of soil erosion, retard runoff, municipal and industrial water needs	Vary, depending upon the purpose		USDA-Natural Resources Conservation Service 101 South Main Temple, TX 76501 Phone: 254-742-9800
Solid Waste Management Grants, Water and Waste Disposal Direct and Guaranteed Loans, and Water and Waste Disposal Grants	Consolidated Farm and Rural Development Act, as amended, Sections 306, 310B, Public Law 101-624, 7 U.S.C. 1932	US Department of Agriculture Rural Development,	To reduce pollution of water resources, to develop water and wastewater systems, and reduce water and waste disposal costs	Grants, loans, and technical assistance	Must be in towns with population of 10,000 or less	Enhancement of operator skills in water and waste management, identification of threats to water resources, preparation of applications for water and waste disposal systems, and development of water and waste disposal systems	Varies by program		LaVonda Pernell, Loan Specialist 202-720-9635 lavonda.pernell@wdc.usda.gov
Technical Assistance		US Department of Agriculture Rural Development	To help ensure cost-effective operation of rural water systems	Technical assistance and, for nonprofit organizations, grants		Water and waste disposal problems	NA		Anita O'Brien, Loan Specialist 202-690-3789 **anita.obrien@wdc.usda.gov**

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Waste and Water Disposal Loans and Grants	Consolidated Farm and Rural Development Act, as amended, Section 306, Public Law 92-419, 7 U.S.C. 1926	US Department of Agriculture, Rural Utilities Service	To reduce water and waste disposal costs to a reasonable level for rural users	Project grants, direct loans, guaranteed loans	Available to municipalities, counties, special-purpose districts, Indian tribes, and nonprofit corporations	Water and waste disposal	Grants cannot exceed 75% of eligible project costs	NA	Rural Development field offices Go to http://www.rurdev.usda.gov/tx/lolist.htm to locate field offices
Watershed Management Program		US Department of Agriculture, United States Forest Service,	To manage watersheds	Technical assistance	Available to all sectors and customers that depend upon water supplied from national forests and grasslands	Water conservation, construction of storage ponds for wildlife, and measurement of snowpack, rainfall, stream flow, groundwater levels, and other parameters	NA	NA	US Forest Service Southern Region office 1720 Peachtree Road NW, Atlanta, GA 404-347-4177

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Watershed Protection and Flood Prevention Program	Watershed Protection and Flood Prevention Act, as amended (Public Law 83-566)	Department of Agriculture, Natural Resources Conservation Service	To protect, develop, and utilize the land and water resources in small watersheds of 250,000 acres or less. The program is Federally assisted and locally led. Projects are aimed at watershed protection, flood prevention, agricultural and non-agricultural water management, water quality improvement, erosion and sediment reduction, fish and wildlife enhancement, and water supply.	Assistance includes financial and technical assistance for approved watershed projects. Technical assistance is provided in planning, designing and installing watershed improvements. Financial assistance is provided for watershed protection, flood prevention, agricultural water management, sedimentation control, and public water based fish, wildlife, and recreation. Local sponsors are required to obtain land rights and perform operation and maintenance on all works of improvement.		Floods, water quality and water supply	Cost share varies by purpose. No matching requirement for flood prevention; 50% required for agricultural and non-agricultural water management. Sponsors are responsible for land rights costs.	Projects that have watershed plans developed and approved by NRCS for operations are eligible for funding.	Steven Bednarz, Assistant State Conservationist for Water Resources, Texas State Office, NRCS, 254-742-9871 Steven.bednarz@tx.usda.gov www.nrcs.usda.gov
Watershed Surveys and Planning	Watershed Protection and Flood Prevention Act, as amended (Public Law 83-566)	Department of Agriculture, Natural Resources Conservation Service	To provide planning assistance to Federal, State and local agencies for the development of coordinated water and related land resources programs in watersheds and river basins. Emphasis is on flood damage reduction, erosion control, water conservation, preservation of wetlands, and water quality improvements.	Technical assistance is provided. Types of surveys and plans include watershed plans, river basin surveys and studies, watershed resource assessments, flood hazard and floodplain management studies. Special priority is given to upstream rural community flooding; water quality improvements from agricultural nonpoint sources; wetland preservation; and drought management and water supply for agricultural or rural communities.		Floods, erosion control, water supply and water quality	None.	None. Formal request for assistance is required. If purposes qualify for Public Law 83-566 funding, the application process for Federal assistance is required.	Steven Bednarz, Assistant State Conservationist for Water Resources, Texas State Office, NRCS, 254-742-9871 Steven.bednarz@tx.usda.gov www.nrcs.usda.gov

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Wetlands Reserve Program	The FAIR Act of 1996	Department of Agriculture, Natural Resources Conservation Service	To protect and restore wetlands by enabling landowners to sell easements which take wetlands out of production.	Assistance includes purchase by the Federal government of easements from landowners who have owned the land for one year and have farmed the wetlands, or prior converted wetlands. There are no repayment requirements. Landowners submit an intention to enter into the program through the USDA NRCS field office. NCRS, in consultation with the U.S. Fish and Wildlife Service, will determine eligibility and develop a wetland reserve plan of operation.		Wetlands protection	The Federal government provides a lump sum payment for easements; there is a 25% cost-share for wetlands restoration.	Continuous sign-up	Steven Bednarz, Assistant State Conservationist for Water Resources, Texas State Office, NRCS, 254-742-9871 Steven.bednarz@ tx.usda.gov www.nrcs.usda.gov

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Automated Flood Warning System	15 U.S.C. 313: 33 U.S.C. 883d	National Oceanic and Atmospheric Administration , National Weather Service, Department of Commerce	To provide funding to communities with flood or flash flood problems that affect safety of life and property to assist them in creating, renovating, or enhancing Automated Flood Warning Systems (AFWS).	Grants to States, counties, municipalities, educational institutions, and non-profit organizations.	It is strongly recommended that applicants discuss potential interactions with relevant NOAA/NWS personnel prior to submission. This program is excluded from coverage under E.O. 12372	Floods and flash floods	None		For local NWS office go to http://www.nws.noaa.gov/organization.php AFWS Operations Manager, Hydrologic Services Division, National Weather Service Eastern Region - W/ER2, Airport Corporate Center, 630 Johnson Avenue, Bohemia, NY 11716. 631-244-0112.

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Economic Adjustment Assistance Program	Public Works and Economic Development Act of 1965, as amended, Sec.209. 42 U.S.C. 3149	Economic Development Administration Department of Commerce	To alleviate long-term economic deterioration or a sudden and severe economic dislocation	Grants	Available to States, cities, institutions of higher education, and nonprofit organizations	Development of strategies and implementation of projects		NA	Economic Development Administration Regional 504 Lavaca Street Suite 1100 Austin, TX 78701-4037 512-381-8144 pgarza@eda.doc.gov

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Disaster Relief/ Urgent Needs Fund of the Texas Community Development Program (Small Cities' CDBG Program)	Housing and Community Development Act of 1974, as amended	HUD	To rebuild viable communities impacted by a natural disaster or urgent, unanticipated needs posing serious threats to health and safety by providing decent housing, suitable living environments and economic opportunities. Funds are available to cities under 50,000 in population and to small rural communities located in counties that have a non-metropolitan population under 200,000.	Assistance includes Project Grants from the Disaster Relief/Urgent Needs Fund to address damages caused by natural disaster or to meet urgent water or sewer needs where there is an unanticipated, serious threat to health and safety. The focus is on projects that meet "basic human needs" such as safe and sanitary sewer systems, clean drinking water, adequate housing, drainage and flood control, passable streets, economic development and other eligible activities. This Fund may also be used for the nonfederal match for selected Federal disaster programs.	Disaster Relief Fund requires a disaster declaration by the President or Governor. Urgent Needs Fund requires an invitation to submit an application from a Committee composed of ORCA, TCEQ, and TWDB.	Multiple disasters, included in a State or Federal declaration.	Urgent needs funds require 10% non-Federal match for communities with a population less than 1,500; 20% for communities with populations over 1,500.	No specific deadline	Office of Community Rural Affairs 1700 N. Congress, Suite 220 Austin, TX 78701 512-936-6701 www.orca.state.tx.us

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Texas Community Development Program (Small Cities' Community Development Block Grant (CDBG) Program)	Housing and Community Development Act of 1974, as amended	U.S. Department of Housing and Urban Development (HUD)	To build viable communities by providing decent housing and suitable living environments, and by expanding economic opportunities, principally for Texans of low and moderate income. CDBGs provide resources to cities under 50,000 in population and to small rural communities located in counties that have a non-metropolitan population under 200,000. Projects meet "basic human needs" such as safe and sanitary sewer systems, clean drinking water, disaster relief and urgent needs, housing, drainage and flood control, passable streets, and economic development.	Assistance includes competitive grants awarded from several funds. The Planning/Capacity Building Fund provides up to $50,000 for planning to assess local needs, develop strategies to address them, and build or improve local capacity in low to moderate income communities. Emphasis is on public works and housing assistance planning. The Community Development Fund addresses public facility and housing needs, including sewer and water system improvements, street and drainage improvements, service projects and housing rehabilitation.		Flooding, water supply and water quality	A non-Federal match is required for Planning/ Capacity Building Fund, on a sliding scale based on population. Match requirement is determined bv the population of the community.	Availability of funding will be announced in the Texas Register.	Office of Community Rural Affairs 1700 N. Congress, Suite 220 Austin, TX 78701 512-936-6701 www.orca.state.tx.us

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Drinking Water State Revolving Fund	Safe Drinking Water Act, Section 1452	U.S. Environ-mental Protection Agency (EPA) funded and administered in the State by TCEQ and the TWDB.	To finance projects for public drinking water systems that facilitate compliance with primary drinking water regulations or otherwise significantly further the health protection objectives of the Safe Drinking Water Act.	The Drinking Water State Revolving Fund provides loans at below market rates for up to 20 years, although disadvantaged communities may qualify for up to 30 years. Loans can be used for planning, design and construction of projects to upgrade or replace water supply infrastructure, to correct exceedances of Safe Drinking Water Act health standards, to consolidate water supplies and to purchase capacity in water systems. Loan proceeds may also be used to purchase land rights integral to the project. Under the Source Water Protection Program, an applicant may apply for a loan to purchase land or conservation easements, if the purpose of the purchase is to protect the source water of a public water system from contamination and to ensure compliance with national primary drinking water regulations. Loans may also be used o repair, replace, or relocate community water systems damaged by flooding.	An approved Water Conservation Plan and environment-al review are required. While the Drinking Water State Revolving Fund may be used to repair, replace or relocate systems damaged by flooding, a Presidential declaration of disaster is not required.	Water supply and quality	None. Local municipalities receive loans and make payments to the State Revolving Fund.	Prospective applicants submit information to TWDB for inclusion in an Intended Use Plan. TCEQ prioritizes proposed projects. Loan funds are distributed based on priority rating	Suzanne Lucignani Project Finance and Construction Assistance Texas Water Development Board P.O. Box 13231 Austin, TX 78711 **suzanne.lucignani@twdb.state.tx.us**

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Nonpoint Source Grant Program	Federal Clean Water Act, Section 319	EPA TCEQ administers the non-agricultural nonpoint source program. The Texas State Soil and Water Conservation Board (TSSWCB) administers the agricultural and silvicultural nonpoint source program.	To support implementation of management measures and programs to address the problem of nonpoint source pollution through the identification of water quality problems, developing control strategies, and implementing activities or best management practices (BMPs) to prevent or abate nonpoint source pollution problems. Funding priorities are determined, in part, based upon rankings from two lists generated by TNRCC and approved by the U.S. Environmental Protection Agency. The first is a 1998 State of Texas Water Quality Inventory under Section 305(b) of the Clean Water Act. The second is a 2000 Clean Water Act, Section 303(d) list of Impaired Water Bodies.	Competitive grants are awarded for projects such as master planning, BMP implementation, non-regulatory and regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and water quality monitoring. Watershed management projects that comprehensively address the major sources of nonpoint source pollution affecting water quality will be given priority for funding. Projects that implement storm water permit requirements under the Texas Pollutant Discharge Elimination System (TPDES) program are not eligible for funding; however, storm water management activities not required by permit may be eligible for assistance.	To be eligible for funding, a project must target nonpoint source pollution in a watershed designated in the Nonpoint Source Assessment Report and be consistent with the State of Texas Nonpoint Source Management Program. EPA will not allow funding projects that implement conditions of a permit.	Water quality	A 40% non-Federal match is required, which may be in the form of in-kind services or expenditures. Clean Rivers Program funds may be used as a non-Federal match for the Nonpoint Source Grant Program and other Federal programs.		TSSWCB P.O. Box 658, Temple, TX 76503 Richard Egg 254-773-2250, ext. 246, regg@tsswcb.state.tx.us.

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Water Protection Coordination Grants to States	Safe Drinking Water Act: Sec. 1442, Supplemental Appropriations Act of 2002 (PL 107-117))	EPA	Formula grants to support coordination activities on critical water infrastructure protection efforts that include work with water utilities as well as Federal, State, and local agencies.	Funded coordination activities include, but are not limited to: ensuring the quality of drinking water utility vulnerability assessments and related security enhancements; developing and overseeing emergency response and recovery plans; and, providing technical assistance, training and education.		Terrorism and its impact on water quality	No matching requirement.		Donna Miller, Section Chief (6WQ-AT) Phone: (214) 665-7130 Fax: (214) 665-6490 U.S. Environmental Protection Agency, Region 6 1445 Ross Avenue, Suite 1200 Dallas, Texas 75202-2733
Water Quality Cooperative Agreements	Clean Water Act, Section 104(b)(3)	EPA	For unique and innovative projects that address the requirements of the National Pollutant Discharge Elimination Systems (NPDES) program.	Assistance includes financial assistance through Cooperative Agreements with EPA for research, investigations, experiments, training, demonstrations, surveys and studies related to the causes, effects, extent, prevention, reduction, and elimination of water pollution. Special emphasis is placed on “wet weather” activities, i.e., storm water, sanitary sewer overflows, and concentrated animal feeding operations as well as projects that enhance the ability of the regulated community to deal with non-traditional pollution problems in priority watersheds.	Must address “wet weather” pollution discharge.	Water quality	5% minimum nonfederal matching requirement.		Donna Miller, Section Chief (6WQ-AT) Phone: (214) 665-7130 Fax: (214) 665-6490 U.S. Environmental Protection Agency, Region 6 1445 Ross Avenue, Suite 1200 Dallas, Texas 75202-2733

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Watershed Initiative Grants	Clean Water Act, Section 104 (b)(3)	EPA	A competitive grant program to encourage the protection and restoration of water bodies through the use of watershed approaches.	Up to 20 watersheds throughout the country will be selected by EPA under a competitive process to support promising watershed-based approaches to clean water. This initiative encourages Coalition-based strategies for attaining water quality standards and improving water resource protection and restoration at the watershed level. Typical grants will range from $300,000 to $1.3 million, depending on appropriations. Watersheds must be nominated by Governors or Tribal Leaders. Two nominations from each State are invited. Eligible activities include the conduct and promotion of the coordination and acceleration of activities such as demonstrations, training, education, experiment investigations, surveys, studies, and research relating to the cause, effect, extent, prevention, reduction, and elimination of water pollution.		Clean water on a watershed basis.	25% non-Federal matching requirement.		Donna Miller, Section Chief (6WQ-AT) Phone: (214) 665-7130 Fax: (214) 665-6490 U.S. Environmental Protection Agency, Region 6 1445 Ross Avenue, Suite 1200 Dallas, Texas 75202-2733

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Wetlands Grants	Clean Water Act, Section 104(b)(3)	EPA	To encourage wetlands program development and build the capacity of States, Tribes, local governments or associations to effectively protect wetland and riparian resources.	Assistance includes Project Grants that are competitively awarded for development of plans and management tools for protection of wetlands resources; advancing the science and technical tools for evaluating, protecting, and restoring wetlands health; facilitating development of watershed stakeholder partnerships; and improving understanding of wetlands.		Flooding and water quality	25% nonfederal cost share		Donna Miller, Section Chief (6WQ-AT) Phone: (214) 665-7130 Fax: (214) 665-6490 U.S. Environmental Protection Agency, Region 6 1445 Ross Avenue, Suite 1200 Dallas, Texas 75202-2733

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Special Volunteer Programs and Retired and Senior Volunteer Program (RSVP)	Domestic Volunteer Service Act of 1973, as amended, Title II, Part A, Section 201, Public Law 93-113, 42 U.S.C. 5001, as amended; National and Community Service Trust Act of 1993, Public Law 103-82.	Corporation for National and Community Service	To strengthen communities and organizations in using service and volunteers to support public safety, public health and disaster relief and preparedness.	Financial assistance is available to support a volunteer program to support public safety, public health and disaster relief and preparedness. In the area of disaster relief and preparedness, volunteers may support immediate and long-term recovery efforts, as well as preparedness and mitigation. They may assist in disaster preparedness and mitigation, run emergency shelters, help law enforcement, provide food and shelter, manage donations, assess and repair damage, and help families and communities rebuild.		Multiple hazards	No minimum matching requirement for Special Volunteer Programs, although grantees must provide a non-federal contribution. For RSVP grants, there is a 10% match for the first year of the grant; 20% for the second year; and 30% for the third year.		Jerry Thompson 1106 Clayton Lane, Suite 420E 300 E. 8th St., Suite G-169 Austin, TX 78701-3220 (512) 916-7000 (512) 916-7020 tx@cns.gov

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All Hazards Emergency Operational Planning	2002 Supplement-al Appropriations Act for Further Recovery From and Response To Terrorist Attacks on the U.S. (P.L. 107-206)	Department of Homeland Security	To provide for all-hazards emergency operational planning.	This assistance is to conduct emergency operations updating for all hazards, with a special emphasis on incidents of terrorism, including use of weapons of mass destruction. Funds may also be used to incorporate inter- and intra-state mutual aid agreements, facilitate communication and interoperability protocols, establish a common incident command system, address critical infrastructure protection, conduct assessments to determine emergency planning priorities, address continuity of operations and government, and provide for effective use of volunteers in preparedness and response activities. A total of $100 million was available under the Supplemental Appropriations. States apply for the operations planning funds, and local governments are sub-grantees of the state. Funds are allocated to the states on the basis of population. Each state that receives grant funds will be required to pass along at least 75% of the funds to local governments.		Multiple hazards, with a special emphasis on incidents of terrorism.	No matching requirements		Federal Emergency Management Agency (FEMA) Region VI Terrorism Preparedness, 1 (940) 898-5399

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Antiterrorism and Emergency Assistance Program	Victims of Crime Act of 1984 [42 U.S.C. §10601], as amended	Department of Homeland Security	To provide assistance programs for victim needs in the aftermath of an act of mass violence or terrorism occurring within and outside the United States and a compensation program for victims of international terrorism.	A. Crisis Response Grant - emergency/short-term to help rebuild adaptive capacities, decrease stressors, and reduce symptoms of trauma immediately following incident. B. Consequence Management Grant - Funding up to 18 months to help victims adapt to the trauma event and to restore the victims' sense of equilibrium. C. Criminal Justice Support Grant- Funding up to 36 months to help facilitate victim participation in an investigation and prosecution related to an act of terrorism or mass violence. D. Crime Victim Compensation Grant- Funding to reimburse victims for out-of-pocket expenses related to an act of terrorism or mass violence. E. Training and Technical Assistance- Funding to assist in identifying resources, assessing needs, coordinating services to victims, and developing strategies for responding to an act of terrorism or mass violence.		Terrorism or mass violence	No matching requirements		Department of Homeland Security, 1–800–421–6770 www.dhs.gov

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Assistance to Firefighters Grant	Defense Authori-zation Bill of 2001 (P.L. 106-398), as amended by Section 33 of the Fire Prevention and Control Act of 1974.	Department of Homeland Security	Competitively awarded project grants to provide direct assistance, on a competitive basis, to fire departments for the purpose of protecting the health and safety of the public and firefighting personnel against fire and fire-related hazards.	Grants may be used for (1) firefighter operations and firefighter safety, to include: training, wellness and fitness, firefighting equipment, personal protective equipment, and other equipment and supplies; (2) emergency medical services, emergency medical vehicles, training, equipment/props/supplies, transportation, contracts/consultants, and program personnel protecting the public from fire and fire-related hazards, including public awareness, public education, inspector certifications, building code development and enforcement, arson prevention and detection; (3) firefighting vehicles, including pumpers, engines, tankers/tenders, brush trucks/attack pumpers, rescue, quints, aerial apparatus, hazardous material, ambulance/transport, communications/command, foam units, boats, and equipment for the vehicle.		Fire hazard	$485 million available nationwide in FY 2006. Cost shares vary by population served by fire department. Applicants who protect a population of 50,000 or less have a 10% non-Federal cost share. Applicants who protect more than 50,000 have a 30% non-Federal cost share.	Will be announced in the Federal Register	AFG Helpline: 1-866-274-0960 firegrants@dhs.gov

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Citizen Corps	Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 - 5206	Department of Homeland Security	The Citizens Corp Program supports and promotes efforts to involve a wide range of volunteer groups in activities that enhance individual, community, and family preparedness and contribute to the strengthening of homeland security.	Formula grants. See Homeland Security Grant Program. Funds provide resources to State and local communities to: 1) bring together the leadership to form and sustain a Citizens Corp Council; develop and implement a plan for the community to engage all citizens in homeland security, community preparedness and family safety; 3) conduct public education and outreach to inform the public about their role in crime prevention, mitigation, emergency preparedness and public health measures and encourage personal responsibility and action; 4) develop and implement Citizens Corp programs offering training and volunteer opportunities to support Community Emergency Response Teams, Neighborhood Watch, Volunteers in Police Service, and Medical Reserve Program; and 5) coordinate Citizens Corp activities with other DHS funded programs and initiatives.		Multiple hazards	$20 million was obligated in FY 2006. No matching is required.	Local applications for Citizens Corp Program grants go through the Councils of Government. Contact the Criminal Justice Manager of your local Council of Government for the application deadline for 2007 funds.	Regina Chapline 512-275-9308 rchapline@ txregionalcouncil.org www.txregionalcouncil.org www.citizencorps.gov

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Community Emergency Response Teams (CERT)	Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 - 5206	Department of Homeland Security	To assist State and local efforts to start or expand CERT training and activities that contribute to the strengthening of homeland security by enhancing individual, community, family, and workplace preparedness.	Localities receiving grants may use the funding for organizing, training, equipping, and maintaining CERTs.	CERT funds must be used for activities described in the CERT guidance materials.	Multiple hazards	No matching requirements. States are allocated funding on a formula based on legislation.	Contact the Criminal Justice Manager of your local Council of Government for the application deadline for 2007 funds.	Go to http://www.citizencorps.gov/citizenCorps/certsByState.do for local CERTS program contacts or call Regina Chapline 512-275-9308
COPS Interoperable Communications Technology Program	Homeland Security Act of 2002, Public Law 107-296	Department of Justice	To help communities develop effective interoperable communication systems for public safety and emergency services providers. Interoperable Communications Technology grants fund demonstration projects that explore uses of equipment and technologies to increase interoperability among the law enforcement, fire service, and emergency medical service communities. These projects are the result of thorough and rigorous planning, and demonstrate how new technologies and operating methods can help communities achieve interoperability.	- Interoperable communication equipment for multi-disciplinary and multi-jurisdictional public safety communications projects. - Providing local jurisdictions with the equipment or services they need to participate on larger public safety, commercial, or other shared networks. - Purchasing and deploying of portable gateway solutions. - Any other technology that can be demonstrated to significantly increase interoperability within the public safety community.	Local governments nominated by State or Territory government to submit an application.	Communica-tions	Grant awards will require a 25 percent nonfederal cost share. The source of the match funds must be identified in the grant application.	States are asked to nominal local jurisdictions.	Office of Community Oriented Police Services (COPS) Raymond Reid 202.305.0865 ask.Cops@usdoj.gov

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Emergency Management Performance Grant (EMPG)	Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended, Titles II and VI.	Department of Homeland Security	To develop comprehensive, all-hazards emergency management at the State and local levels and to improve capabilities for emergency planning, preparedness, mitigation, response and recovery.	Assistance includes grant funding covering 13 key functional areas of emergency management, including: laws and authorities; hazard identification and risk assessment; hazard management; resource management; planning; direction, control and coordination; communications and warning; operations and procedures; logistics and facilities; training; exercises; public education and information; and finance and administration. The State of Texas will receive $10,000,000 in FY 2007 for this program.		Multiple hazards	50% nonfederal cost share	Target dates and any applicable deadlines are provided annually by the Division of Emergency Management, Texas Department of Public Safety.	Texas Division of Emergency Management, 512-424-2138 www.txdps.state.tx.us/dem
Fire Management Assistance Grants	Robert T. Stafford Disaster Relief and Emergency Assistance Act	Department of Homeland Security	To provide project grants and the provision of specialized services for the mitigation, management, and control of fires that threatens such destruction as would constitute a major disaster.	Grants are used for the mitigation, management and control of any fire on publicly (non-Federal) or privately owned forestland or grassland that threatens such destruction as would constitute a major disaster. This program replaces the former Fire Suppression Assistance Program. This program may cover pre-positioning of resources for up to 21 days.	The Governor or his Authorized Represent-ative must request a fire management assistance declaration through the FEMA Regional Director in order to trigger assistance.	Forest or grassland fire hazard	May be a 25% non-Federal cost share if total eligible costs for the declared fire exceed certain thresholds.	Requests for a fire management assistance declaration and assistance must be submitted when fire is burning uncontrolled and threatens such destruction as would constitute a major disaster.	FEMA Regional VI 800 North Loop 288 Denton, TX 76201-3698 940-898-5399

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Fire Service Hazardous Materials Preparedness and Response	Homeland Security Act of 2002, Public Law 107-296; U.S.A. Patriot Act of 2001, Public Law 107-56; Federal Emergency Management Agency, Executive Order 12127; The Federal Fire Prevention and Control Act of 1974, as amended, and various appropriation bills	Department of Homeland Security	Provide information to the fire and emergency services community, emergency managers, and other local government officials concerning issues related to the planning, mitigation, prevention, and response to hazardous materials incidents which includes acts of terrorism.	Direct Payments for Specified Use. Restricted to recipient designated by Congressional Statue or DHS, and limited in scope to the project description for the purpose of information sharing related to Hazardous Materials and acts of terrorism. Refer to project description or administering program office for specific information. Unsolicited applications for this program will not be accepted.	Restricted to designated private nonprofit institution/organization	Hazardous materials, terrorism	None	Contact headquarters for deadlines	Department of Homeland Security, U.S. Fire Administration, C/O Bldg. #410, 245 Murray Drive, SW., Washington, DC 20523 800-238-3358. http://www.dhs.gov
First Responder Counter-Terrorism Training Assistance	Omnibus Consolidated Appropriations Act of 1997 (P.L. 104-208)	Department of Homeland Security	Project grants to enhance the capabilities of first responders in managing the consequences of terrorist acts.	Training is provided through each of the 50 States through individual State fire training systems. The training is targeted to first responders, those who will come into contact with and will be forced to manage the consequences of terrorist acts.		Terrorist acts	No cost share is required.		Department of Homeland Security, U.S. Fire Administration, C/O Bldg. #410, 245 Murray Drive, SW., Washington, DC 20523 800-238-3358. http://www.dhs.gov

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Flood Hazard Mapping Program	Code of Federal Regulations, Title 42, Chapter 50; April 30, 2002 Federal Register Notice	Department of Homeland Security	To identify, publish and update information on all floodprone areas of the United States in order to inform the public on flooding risks, support sound floodplain management, and set flood insurance premium rates. Because flood hazard conditions change over time due to natural and manmade changes in watersheds and floodplains, FEMA provides grant funds to designated Cooperating Technical Partners (CTPs) and others to develop up-to-date flood hazard data; provide maps and data in digital format; integrate FEMA's community and State partners into the process; and raise public awareness of flood risks.	Assistance includes financial assistance in the form of grants to Cooperating Technical Partners and other entities; and FEMA technical assistance, support and data. Financial assistance is provided for activities such as refinement of Zone A boundaries; hydrologic and hydraulic analyses and floodplain mapping; Digital Flood Insurance Rate Map (DFIRM) production; and re-delineation of floodplain boundaries using updated topographic data. FEMA technical assistance services are provided in the form of base map inventory; digital base map data sharing; DFIRM maintenance; hydrologic and hydraulic review; assessment of community mapping needs to support the Map Needs Update Support System; and technical standards agreements.	Generally, funding flows through Cooperating Technical Partners which have signed a formal agreement to work with FEMA.	Flooding	Cost shares are negotiated between FEMA and recipients; generally a 20% hard or soft match is sought.	Map needs should be included in FEMA's Mapping Needs Update Support System (MNUSS) database. Assistance is requested by letter to the FEMA Region.	Jack Quarles, Mitigation Division, FEMA Region VI, 940-898-5156 Jack.Quarles@fema.gov www.fema.gov

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Flood Mitigation Assistance Grants (FMA)	Section 1366 of the National Flood Insurance Act of 1968 as amended by the National Flood Insurance Reform Act of 1994	Department of Homeland Security	To assist States and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insured through the National Flood Insurance Program (NFIP). FMA Grants are aimed at reducing the number of repetitive loss structures insured through the NFIP. Emphasis is on reducing damage to properties that have experienced four or more losses, or that have experienced two or more losses where the cumulative payments exceed the property value.	Assistance includes Planning and Project Grants for participating NFIP communities. Planning Grants may be used to develop or update Flood Mitigation Plans. Project grants may be used for flood mitigation measures such as: acquisition of insured structures and real property; dry floodproofing of insured structures; and elevation of insured structures.	Only activities specified in a FEMA-approved Flood Mitigation Plan are eligible for an FMA Project Grant. Eligible applicants are state emergency management agencies or a similar office.	Flooding	25% nonfederal cost share, of which up to 12.5% may be provided as an in-kind contribution		Gilbert Ward, Texas Water Development Board, Research and Planning Fund, 512-463-6418 GWard@twdb.state.tx.us www.twdb.state.tx.us Regional Director Federal Regional Center 800 North Loop 288 Denton, TX 76201-3698 940-898-5399
Flood Recovery Mapping	Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended	Department of Homeland Security	To provide funds from FEMA's Disaster Relief Fund to map areas affected by disaster in order to assist in the response and recovery efforts.	Assistance includes grants to Cooperating Technical Partners and other entities; and FEMA technical assistance, support and data. Recovery Maps can be quite detailed and the data collected as part of the recovery mapping process may ultimately be used in the process of developing or updating Flood Insurance Rate Maps.	Requires a Presidential declaration of disaster	Flooding	Cost shares negotiated between FEMA and recipients	No specific deadline	Jack Quarles, FEMA Region VI, 940-898-5156 Jack.Quarles@fema.gov www.fema.gov

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Hazardous Materials Assistance Program (CERCLA Implementa-tion)	Comprehensive Environ-mental Response, Compensation and Liability Act (CERCLA) of 1980, as amended	Department of Homeland Security	To provide technical and financial assistance through the States to support State, local, and tribal governments in oil and hazardous materials emergency planning and exercising. To enhance State, tribal and local governments capabilities to inter-operate with the National Response System. To support the Comprehensive Hazardous Materials Emergency Response-Capability Assessment Program.	Funds are to be used for planning, exercising and educational capabilities for dealing with oil and hazardous materials releases. Certain equipment purchases are not authorized.		Hazardous materials releases	The FEMA Regional PT office determines the allocation for each applicant, based on the proposal, the FEMA/EPA Interagency Agreement, and previous funding and accomplish-ments.		Preparedness Division Director, FEMA Region VI, 940-898-5104 Federal Emergency Management Agency 245 Murray Lane Washington, D.C. 800-621-3363
Hazardous Materials Training Program	Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended	Department of Homeland Security	To make funding available to provide training in support of Tribal governments emergency planning, preparedness, mitigation, response and recovery capabilities. These programs must provide special emphasis on emergencies associated with hazardous chemicals.	Funds must be used for planning, exercising, and educational projects that will serve to enhance emergency management capabilities for dealing with oil and hazardous materials releases. Certain equipment purchases are not authorized.	Funds are available only to Federally-recognized Indian Tribal Governments.	Hazardous materials incidents	20% non-Federal match required		Preparedness Division Director, FEMA Region VI, 940-898-5104 Federal Emergency Management Agency 245 Murray Lane Washington, D.C. 800-621-3363.

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Hazard Mitigation Grant Program (HMGP)	Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 404	Department of Homeland Security	To provide States and local governments financial assistance to permanently reduce or eliminate future damages and losses from natural hazards through safer building practices and improving existing structures and supporting infrastructure.	According to rules issued February 26, 2002 (44 CFR, Parts 201 and 206) and amended Oct. 1, 2002, to be eligible for HMGP Project Grants after November 1, 2004, a local jurisdiction must have in place a FEMA-approved local hazard mitigation plan. Assistance includes Planning Grants and Project Grants. Total grants to States equal up to 7.5% of obligations for Individual and Public Assistance. Project Grants are for acquisition of real property; relocation and demolition of structures; strengthening of existing structures; initial implementation of vegetation management programs; initial training of architects, engineers, building officials, etc. to facilitate the implementation of newly adopted State or local mitigation standards and codes; elevation of residential structures; elevation or dry flood-proofing of non-residential structures; and other activities that bring a structure into compliance with NFIP floodplain management requirements.	Post-disaster, covering all hazards. A Presidential Declaration of disaster is required. Eligible applicants are state emergency management agencies or a similar office.	Multiple hazards	25% non-federal cost share, which can be a combination of cash, in-kind services, or materials.	Within 60 days of a disaster declaration, the State must submit a Letter of Intent to FEMA to participate in HMGP. New project proposals must be submitted for approval within 90 days after FEMA approves the State's hazard mitigation plan for the disaster.	Greg Pekar, Division of Emergency Management, Texas Department of Public Safety, 512-424-2429 Gregory.Pekar@ txdps.state.tx.us www.txdps.state.tx.us/dem

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Homeland Security Grant Program	Department of Homeland Security Appropriations Act of 2005, Public Law 108-334.	Department of Homeland Security	To enhance the capacity of State and local emergency responders to prevent, respond to, and recover from a weapons of mass destruction (WMD) terrorism incident involving chemical, biological, radiological, nuclear, and explosive (CBRNE) devices and cyber attacks.	Formula Grants. The HSGP solicitation integrates the following five (5) programs: 1) State Homeland Security Program (SHSP); 2) Urban Areas Security Initiative (UASI); 3) Law Enforcement Terrorism Prevention Program (LETPP); 4) Citizen Corps Program (CCP); and 5) Metropolitan Medical Response System (MMRS). See each discussion of each program in this guide.	States apply for the grant funds and are responsible for distributing them to local units of government.	Terrorism, WMDs, cyber attacks, etc.	See individual programs.		Department of Homeland Security, Preparedness Directorate, Office of Grants and Training, 245 Murray Lane Bldg. #410, Washington, DC 20531. The G&T Centralized Scheduling and Information Desk (CSID) 800-368-6498 askcsid@dhs.gov.
Homeland Security Outreach, Education, and Technical Assistance	Homeland Security Act of 2002, Public Law 107-296, 6 U.S.C. 101 et. seq.	Department of Homeland Security	To provide funding for outreach, education, and technical assistance in order to raise public awareness of homeland security issues and to work with communities to help them forge partnerships across agencies and disciplines to address preparedness and response. Outreach and technical assistance may take several forms, such as the provision of written information, person-to-person exchange, seminars, workshops or training sessions.	Project grants; dissemination of technical information	Financial and non-financial assistance may be provided for the following: salaries, materials and supplies, equipment, travel, publication costs, subcontractor and supporting costs required for technical and other activities necessary to achieve the objective.	Various homeland security issues	Identified in the funding opportunity announcement	Identified in the funding opportunity announcement	Marilyn Morgan, Director, Grants and Financial Assistance Division, Office of Procurement Operations, Office of the Chief Procurement Officer. 202-772-9826. www.dhs.gov

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Hurricane Local Grant Program	Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended	Department of Homeland Security	To enhance hurricane-related public awareness and education. This program is open to all incorporated cities and inter-jurisdictional emergency management agencies within the 22 counties in which hurricane risk areas have been identified by the State of Texas Department of Public Safety.	Assistance includes competitive grant awards. Eligible uses include one-time expenses for pamphlets, hurricane preparedness materials, hurricane-related computer software, and purchase of audio-visual equipment.		Hurricane hazards	In 2003 and subsequent years, a 50% non-Federal match may be instituted.		Division of Emergency Management, Texas Department of Public Safety, 512-424-2597
Law Enforce-ment Terrorism Prevention Program	U.S. Patriot Act	Department of Homeland Security	To provide law enforcement communities with enhanced capabilities for detecting, deterring, disruption, and preventing acts of terrorism.	Formula grants. See Homeland Security Grant Program. Assistance is provided for activities such as: 1) information sharing to preempt terrorist attacks; target hardening to reduce vulnerability of selected high value targets; 3) threat recognition to recognize the potential or development of a threat; 4) intervention activities to interdict terrorists before they can execute a threat; 5) interoperable communications; and 6) management and administration.		Terrorist attack	There is no non-Federal matching requirement.	States are to obligate not less than 80% of the total grant amount to local units of government within 60 days after grant award to the State.	Department of Homeland Security, Preparedness Directorate, Office of Grants and Training, 245 Murray Lane - Bldg. #410, Washington, DC 20523. 800-368-6498 askcsid@dhs.gov.

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Metropolitan Medical Response System	Public Law 104-201, National Defense Authorization Act for Fiscal Year 1997: The Defense Against Weapons of Mass Destruction Act of 1996.	Department of Homeland Security	The MMRS program funds highly populated jurisdictions to develop plans, conduct training and exercises, and acquire pharmaceuticals and personal protective equipment, to achieve the enhanced capability necessary to respond to a mass casualty event caused by a WMD with their locally controlled and operated resources, until significant external resources arrive. Key components of the program require activation/notification procedures, a concept of operations plan, the forward movement of patients (coordinated with using the National Disaster Medical System), hospital and healthcare system surge capacity management, the provision of specially trained responders and equipment through exercises and drills, public information dissemination, coordination response protocols, a bioterrorism plan including customized pharmaceuticals, and plans for the prophylaxis of an affected population for up to 1,000 chemical victims, and 10,000 biological victims.	Formula grants. See Homeland Security Grant Program.	Must not duplicate other federal funding.	WMDs	None.		Office of State and Local Government Coordination and Preparedness, Office for Domestic Preparedness (ODP) 800-368-6498 askcsid@dhs.gov

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National Dam Safety Program	Water Resources Development Act of 1996, Section 215	Department of Homeland Security	To encourage the establishment and maintenance of effective State programs intended to ensure dam safety, to protect life and property, and to improve State Dam Safety Programs.	Assistance includes Project Grants to States to establish and maintain effective Dam Safety Programs. While only States are eligible for financial assistance, the State program provides periodic inspections during dam construction; approval upon completion of dam construction; inspections at least every 5 years of all dams and reservoirs that would pose a significant threat to human life and property in case of failure; and a system of emergency procedures to use if a dam fails or if failure is imminent.	Pre-disaster, covering dam failures and resultant flooding hazards.	Flooding	50% nonfederal cost share required	October 1 of each year.	Warren D. Samuelson, Dam Safety Program Coordinator Texas Commission on Environmental Quality (TCEQ) MC-174 P.O. Box 13087 Austin, TX 78711 Tel: 512/239-5195 Fax: 512/239-0404 wsamuels@tceq.state.tx.us

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National Flood Insurance Program (NFIP)	National Flood Insurance Act of 1968, as amended by the Flood Disaster Protection Act of 1973 and the National Flood Insurance Reform Act of 1994	Department of Homeland Security	To (1) provide financial protection by enabling persons to purchase insurance against physical damage to, or loss of, buildings and/or contents caused by floods, mudslide, or flood-related erosion; and (2) promote wise floodplain management practices in the Nation's flood-prone areas.	Assistance includes Federally backed insurance against flooding, available to individuals and businesses in communities that participate in the NFIP. Insurance is sold to the public through State licensed property and casualty insurance agents and brokers. Discounted premiums are available in communities that participate in the Community Rating System. Increased Cost of Compliance coverage provides to help policyholders offset the costs associated with floodproofing, elevating, demolishing or relocating buildings that are substantially damaged or subject to repetitive flood loss. Local governments are encouraged to purchase insurance covering public facilities.	Pre-disaster covering losses from floods, mud-slides or flood-related erosion Insurance must be in effect for 30 days before coverage begins.	Flooding			State NFIP Coordinator, Texas Water Development Board (TWDB) 512-463-8294 www.twdb.state.tx.us

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Port Security Grant Program	DHS Appropriations Act for Fiscal Year 2005, Public Law 108-334	Department of Homeland Security	To create a sustainable program for the protection of regulated ports from terrorism, especially explosives and non-conventional threats which would result in major loss of life and severe disruption.	Project grants. In general, funds may be used for planning, organizational activities, equipment acquisitions, training, exercises, management and administrative activities, and other costs the Secretary deems appropriate.	Available for critical national seaports and terminals	Terrorism	25% of total project costs	Deadlines will be detailed in the program guidance and will also be posted on the grants.gov website	Department of Homeland Security, Preparedness Directorate, Office of Grants and Training, Transportation Infrastructure Security Division, 245 Murray Lane - Bldg. #410, Washington, DC 20523. 800-368-6498. https://www.portsecurity grants.dottsa.net/

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Pre-Disaster Mitigation Grant Program (PDM)	Robert T. Stafford Act, Section 203, as amended by Section 102 of the Disaster Mitigation Act of 2000	Department of Homeland Security	To provide funding for States and communities for cost-effective hazard mitigation activities that complement a comprehensive hazard mitigation program and reduce injuries, loss of life, and damage and destruction of property. FEMA rules are in the Federal Register (February 26, 2002, 44 CFR 201 and 206) and amendments (October 1, 2002). These rules require that local governments have a FEMA-approved local hazard mitigation plan by November 1, 2004 to be eligible to receive project funding from the Hazard Mitigation Grant Program. For the Pre-Disaster Mitigation Grant program, plans must be approved by November 1, 2003 to remain eligible for project grants. Regional watershed- or basin-wide projects involving a number of jurisdictions will get favorable consideration in the selection process.	Assistance includes Planning and Project Grants. Eligible activities include planning, risk assessment, and implementation of cost-effective loss reduction measures. Eligible activities include: management costs, information dissemination, planning, technical assistance (including risk assessments and engineering and design studies), and cost-effective mitigation projects. Mitigation projects include any actions that result in elimination or long-term reduction of damages to public or private property from natural hazards, including: property acquisition or relocation; structural and non-structural retrofitting for wildfire, seismic, wind, or flood hazards; minor structural hazard control or protection projects such as vegetative and stormwater management (culverts, floodgates, retention basins); and localized flood control projects designed to protect critical facilities.	State and local plans are required prior to approval of project grants. Major flood control projects such as dikes, levees, floodwalls, groins, dams, jetties, beach nourishment, and waterway channelization are not eligible. Eligible applicants are state emergency management agencies or a similar office.	Multiple hazards	25% nonfederal cost share, except for small, impoverished communities which have a 10% cost share		Division of Emergency Management, Texas Dept. of Public Safety, 512-424-2397 www.tceq.state.tx.us/dem

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Public Alert Radios for Schools	Department of Homeland Security Appropriations Act	Department of Homeland Security	To disseminate public alerts and warnings by providing Public Alert Radios to eligible schools. Public alerts and warnings can be disseminated nationwide, regionally, or locally. This program will: a) expand delivery of public alert services to designated schools; and b) enhance and strengthen the capability of designated schools to provide alert and warning information directly to students and the public.	NA	NA	NA	NA	NA	Information Analysis and Infrastructure Protection Directorate (IAIP), Department of Homeland Security, Special 245 Murray Lane, Bldg. # 410, Washington, DC, 202-82-8396

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Public Assistance Grants (PA)	Robert T. Stafford Disaster Relief and Emergency Assistance Act	Department of Homeland Security	To provide supplemental assistance to States, local governments, political subdivisions of the State, Indian Tribes, and certain private non-profit organizations to meet emergency needs and repair infrastructure.	According to rules issued February 26, 2002 (44 Code of Federal Regulations, Parts 201 and 206), a local jurisdiction must have in place a FEMA-approved local hazard mitigation plan to be eligible for certain forms of PA grants after November 1, 2003. Assistance includes Project Grants for removal of wreckage and debris from private and public lands; performance of emergency protective measures; provision of emergency transportation and communications; and permanent restoration of eligible facilities.	Post-disaster, covering all hazards. A Presidential Declaration of disaster is required.	Multiple hazards	25% nonfederal cost share	A request must be submitted by the applicant within 30 days of the President's emergency or major disaster declaration.	Division of Emergency Management, Texas Department of Public Safety, 512-424-2445 www.txdps.state.tx.us/dem
Repetitive Flood Claims Program	Flood Insurance Reform Act of 2004 (P.L. 108-264) which amended the National Flood Insurance Act of 1968 (P.L. 108-264)	Department of Homeland Security	To assist States and communities reduce flood damages to insured properties that have had one on more claims to the National Flood Insurance Program	Grants for acquisition of properties, and either demolition or relocation of flood-prone structures, where the property is deed restricted for open space use in perpetuity	Applicant must demonstrate that the proposed activities cannot be funded under the Flood Mitigation Assistance Program. Eligible applicants include States, tribes, and territories which provide sub-grants to local governments	Floods	None	Applications for 2007 funds must be received by February 28, 2007 in the regional office.	FEMA Federal Regional Center 800 North Loop 288 Denton, TX 76201-3698 940-898-5399

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Section 406 Hazard Mitigation Funding	Robert T. Stafford Disaster Relief and Emergency Assistance Act	Department of Homeland Security	To provide discretionary funding to add hazard mitigation measures to permanent work restoration under the PA grant program, in order to enhance a facility's ability to resist similar damage in future disaster events.	Section 406 Hazard Mitigation is a discretionary spending program to fund mitigation measures in conjunction with the repair of damaged facilities. The mitigation measures must be related to eligible disaster-related damages and must directly reduce the potential of future similar disaster damages to the eligible facility. Mitigation measures must be cost-effective. Examples include: dry floodproofing; elevation of electrical panels, machinery rooms, and emergency generators above base flood elevation; drainage structures; installing debris traps; dry floodproofing of pump stations; elevation of equipment and controls and dry or wet floodproofing of wastewater treatment plants; installation of shut-off valves so that damaged sections of underground pipelines can be isolated; strengthening base connections on above ground storage tanks; burying electric lines; and replacing damaged electrical poles with higher-class poles.	A Presidential Declaration of emergency or major disaster is required, with PA grant assistance provided. All hazards may be covered. Eligible work must be carried out in conjunction with the repair of disaster-related damages under the PA program.	Multiple hazards	25% nonfederal cost share	60 days after Presidential disaster declaration	Division of Emergency Management, Texas Department of Public Safety, 512-424-2445 www.txdps.state.tx.us/dem

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Severe Repetitive Loss Program	Section 1361A of the National Flood Insurance Act of 1968 42 U.S.C. 4102a as amended by FIRA 2004, Public Law 108-264.	Department of Homeland Security	To reduce or eliminate the long-term risk of damage to sever repetitive loss properties and the associated drain on the National Flood Insurance Fund.	Mitigation activities that reduce or eliminate the long-term risk of flood damage to severe repetitive loss properties.	Only activities specified in a FEMA-approved Flood Mitigation Plan are eligible. Eligible applicants are state emergency management agencies or a similar office.	Flooding	Up to 75% Federal.	To be determined.	Jack Quarles, Mitigation Division, FEMA Region VI, 940-898-5156 Jack.Quarles@fema.gov www.fema.gov
State and Local Homeland Security Exercise Support	U.S.A. Patriot Act of 2001, Public Law 107-56; Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act of 2002, Public Law 107-117; Consolidated Appropriations Resolution of 2003, Public Law 108-7; Department of Homeland Security Appropriations Act of 2004, Public Law 108-90	Department of Homeland Security	To enhance the capacity of State and local first responders to respond to a weapons of mass destruction (WMD) terrorism incident involving chemical, biological, radiological, nuclear, and explosive devices	Project grants. Eligible applicants are public or private organizations with the expertise and experience to provide assistance to State and local jurisdictions; to facilitate, conduct, and evaluate exercises; and/or to develop guidance, materials and publications related to the conduct of exercises or identification of lessons learned	Funds will be used to provide support for planning and conducting exercises at the National, State, and local levels	Terrorism	None	To be announced	Department of Homeland Security Preparedness Directorate, Office of Grants and Training, 245 Murray Drive, SW., Washington, DC 20528. 202-282-8000. http://www.ojp.usdoj.gov/odp

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
State and Local Homeland Security Training Program	Department of Homeland Security Appropriations Act	Department of Homeland Security	To enhance the capacity of State and local emergency responders prevent, protect, respond to and recover from incidents of terrorism involving weapons of mass destruction (WMD).	Project grants. The Office of Grants and Training (G&T) will maintain and expand current WMD training programs and may develop several new training programs. Training activities of the National Domestic Preparedness Consortium will continue and grow. Consortium Members include: G&T's Center for Domestic Preparedness; the Energetic Materials Research and Test Center at the New Mexico Institute of Mining and Technology; Louisiana State University; the Nevada Test Site in the Department of Energy; and the National Emergency Response and Rescue Training Center at Texas A&M University. Other training partners that provide G&T-sponsored WMD training will be notified of their eligibility to apply for training program funds.	NA	WMDs	None	NA	Department of Homeland Security, Preparedness Directorate Office of Grants and Training, 245 Murray Lane, Bldg. #410, Washington, DC, 20523. 800-368-6498 http://www.ojp.usdoj.gov/odp

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
State Domestic Preparedness Equipment Support Program	U.S.A. Patriot Act of 2001, Public Law 107-56	Department of Homeland Security	To enhance the capacity of State and local first responders to respond to terrorism incident involving chemical, biological, nuclear, radiological, incendiary, and explosive devices. The program was re-named as the State Homeland Security Grant Program (SHSGP) (97.073). SHSGP is one of the six (6) component programs which have been merged or consolidated into the Homeland Security Grant Program (97.067**).**	Formula grants. States will receive an allocation of funds to purchase equipment for State and local first responders, in accordance with the authorized equipment list included in the Application Kit, and an allocation to support the planning and conduct of exercises. Administrative funds will be provided to conduct comprehensive threat and needs assessments and to develop and implement a Statewide Domestic Preparedness Strategy to enhance first responder capabilities to respond to a terrorist incident.	To qualify to apply for grant funds, States were required to conduct a comprehensive threat and needs assessment and to develop a Statewide Domestic Preparedness Strategy.	Terrorism.	None.	Provided in application kits given to state agencies.	Department of Homeland Security, Office of State and Local Government Coordination and Preparedness, Office for Domestic Preparedness (ODP), 245 Murray Lane, Bldg. #410, Washington, DC 20523. 800-368-6498. http://www.ojp.usdoj.gov

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
State Homeland Security Program	U.S. Patriot Act	Department of Homeland Security	To provide funds to enhance capability of State and local units of government to prevent, deter, respond to, and recover from incidents of terrorism involving chemical, biological, radiological, nuclear, and explosive weapons and cyber attacks. The funds support costs related to homeland security and emergency operations planning activities; the purchase of specialized equipment; the design, development and conduct of a State CBRNE and cyber security training programs and attendance at Office of Domestic Preparedness-sponsored courses; the design, development, conduct and evaluation of CBRNE and cyber security exercises; and other costs to implement the State Homeland Security Strategies. This program also provides certain funding to address agricultural security.	Formula grants. See Homeland Security Grant Program. Funding may be used in any of five categories: 1) planning; 2) equipment acquisitions; 3) training; 4) exercise; 5) management and administration. Other than a 3% cap on Management and Administration funds, there are no restrictions on allocation of funds across these categories.		Terrorist events	There is no non-Federal matching requirement.	States are to obligate not less than 80% of the total grant amount to local units of government within 60 days after grant award to the State.	Steve McCraw Director, Office of Homeland Security 512-936-1882 www.texashomelandsecurity.com

PROTECTED PROPRIETARY INFORMATION
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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Urban Area Security Initiative	Department of Homeland Security Appropriations Act of 2005, Public Law 108-334.	Department of Homeland Security	UASI program provides financial assistance to address the unique multi-discipline planning, operations, equipment, training, and exercise needs of high-threat, high density Urban Areas, and to assist them in building and sustaining capabilities to prevent, protect against, respond to, and recover from threats or acts of terrorism; however, in light of several major new national planning priorities, which address such issues as pandemic influenza and the aftermath of Hurricane Katrina, the allowable scope of UASI activities including catastrophic events, provided that these activities also build capabilities that relate to terrorism.	Formula grants. See Homeland Security Grant Program.	Funds provided under this grant address the unique needs of large urban areas and mass transit authorities. Funds can be used for equipment, training, exercises and planning. No more than 5 percent of the grant award may be used for management and administrative purposes. Urban Areas must utilize their Urban Area Homeland Security Strategy and the State's Program and Capability Enhancement Plan as the basis for requesting funds to support Investments identified in the Investment Justification. There must be a clear correlation between the goals, objectives, and priorities identified in the Urban Area Homeland Security Strategy and UASI program activities.	Terrorism and other catastrophic events.	None.		Department of Homeland Security, Preparedness Directorate, Office of Grants and Training, 245 Murray Lane, Bldg. #410, Washington, DC 20523 800-368-6498. http://www.dhs.gov

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Aquatic Ecosystem Restoration	Water Resources Development Act of 1996, Section 206	U.S. Army Corps of Engineers	To restore degraded aquatic ecosystems.	Assistance includes all project-related costs for feasibility studies, planning, engineering, construction, supervision, and administration for adopted restoration projects.		Flooding and habitat restoration	35% non-Federal contribution is required for project costs.	No specific application deadline. Contact the appropriate District Engineer to assist with filing the correct documentation .	Mike Mocek, Deputy District Engineer, Ft. Worth Office, U.S. ACE, 817-886-1515 Michael.J.Mocek@swf02.usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Office 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil
Emergency Advance Measures for Flood Prevention	Flood Control Act of 1941, as amended	U.S. Army Corps of Engineers	To protect against loss of life or damages to property given an immediate threat of unusual flooding.	Assistance includes aid from USACE for removal of waterway obstructions, and work necessary to prevent dam failure and prepare for abnormal snowmelt. Work performed must be temporary in nature and have a favorable benefit/cost ratio.	Immediate threat of flooding. A Presidential disaster declaration is not required.	Flooding	No match required	The Governor of the affected State must request assistance under an immediate threat of flooding.	Mike Mocek, Deputy District Engineer, Ft. Worth Office, U.S. ACE, 817-886-1515 Michael.J.Mocek@swf02.usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Office 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil

PROTECTED PROPRIETARY INFORMATION
H2O PARTNERS

Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Emergency Rehabilitation of Flood Control Works or Federally Authorized Coastal Protection Works	Flood Control Act of 1941, as amended	U.S. Army Corps of Engineers	To assist in the repair and restoration of flood control works damaged by flood, or of federally-authorized hurricane flood and shore protection works damaged by extraordinary wind, wave or water action.	Assistance includes emergency repair or rehabilitation of flood control works damaged by flood, and restoration of federally authorized coastal protection structures damaged by extraordinary wind, wave, or water action. Assistance does not extend to major improvements of flood control or federally authorized coastal protection structures, nor to reimbursement of individuals or communities for funds expended in repair or rehabilitation efforts.	Post-disaster. A Presidential disaster declaration is not required.	Flooding, including coastal flooding	20% non-Federal cost share required, in cash or in-kind services	No specific application deadline. Contact the appropriate District Engineer to assist with filing the correct documentation .	Mike Mocek, Deputy District Engineer, Ft. Worth Office, U.S. ACE, 817-886-1515 Michael.J.Mocek@swf02.usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Office 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil
Emergency Streambank and Shoreline Protection	Flood Control Act, as amended, Section 14	U.S. Army Corps of Engineers	To prevent erosion damages to public facilities by the emergency construction or repair of streambank and shoreline protection works.	Assistance includes studies and projects for the construction and repair of streambank and shoreline protection.	A Presidential disaster declaration is not required. However, the program emphasizes the emergency construction or repair needs.	Flooding, including coastal flooding	No cost share is required for the first $40,000 of study costs. After $40,000, a 35% non-Federal cost share is required. A 35% non-Federal cost share is required for project costs.	No specific application deadline. Contact the appropriate District Engineer to assist with filing the correct documentation .	Elston D. Eckhardt,Project Manager, Ft. Worth Office, U.S. ACE, 817-886-1378 Elston.D.Eckhardt@usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Office 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Emergency Water Supply/ Drought Assistance Programs		U.S. Army Corps of Engineers	To increase water supply in shortage areas and under drought conditions	Construction of wells and transportation of water during emergencies	Requires official declaration from governor; water must be for human use and not for recreation; available only when all local sources are expended and there must be plan for long-term solution	Emergency water supply	Applicant must pay for water to be transported and repay costs of well construction	NA	Elston D. Eckhardt,Project Manager, Ft. Worth Office, U.S. ACE, 817-886-1378 Elston.D.Eckhardt@usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Office 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil
Environmental Protection and Restoration, Beneficial Use of Dredged Material	Water Resources Development Act of 1992, Section 204	U.S. Army Corps of Engineers	To protect, restore and create aquatic and/or wetland habitats associated with dredging for authorized projects.	Assistance includes studies and projects for the protection, restoration and creation of aquatic and/or wetland habitats associated with dredging for authorized projects.		Flooding and habitat restoration	No non-Federal match required for Initial Appraisal costs. 25% match required for Feasibility studies. 25% non-Federal cost share for project costs.	No specific application deadline. Contact the appropriate District Engineer to assist with filing the correct documentation .	Elston D. Eckhardt,Project Manager, Ft. Worth Office, U.S. ACE, 817-886-1378 Elston.D.Eckhardt@usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Office 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Flood Plain Management Services	Flood Control Act of 1960, as amended, Section 206	U.S. Army Corps of Engineers	To promote appropriate recognition of flood hazards in land and water use planning and development through the provision of flood and floodplain related data, technical services and guidance.	Assistance includes General Technical Services and Planning Guidance. General Technical Services include development or interpretation of site-specific data on floodplain patterns, and provision of technical information on natural and cultural floodplain resources, and flood loss potentials. General Planning Guidance includes studies of floodplain delineation; flood hazard evaluation; dam break analysis; hurricane evacuation; flood warning/preparedness; comprehensive floodplain management; flood damage reduction; stormwater management; floodproofing; and an inventory of floodprone structures.		Flooding	No match required for services to State, regional and local governments and other non-Federal public agencies. 100% match required for services to other Federal agencies and the private sector.	No specific application deadline. Requests are made in the form of a letter to the District Engineer.	Elston D. Eckhardt,Project Manager, Ft. Worth Office, U.S. ACE, 817-886-1378 Elston.D.Eckhardt@usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Office 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Navigation Projects	River and Harbor Act of 1960, Section 107	U.S. Army Corps of Engineers	To improve navigation, including dredging of channels, widening of turning basins and construction of navigation aids.	Assistance includes studies and projects to aid navigation.		Flooding and navigation	No cost share required for the first $100,000 of study costs. Over $100,000, a 50% non-Federal match is required. 20% non-Federal cost share is required for project costs during construction and over a 30-year period.	No specific application deadline. Contact the appropriate District Engineer to assist with filing the correct documentation .	Elston D. Eckhardt,Project Manager, Ft. Worth Office, U.S. ACE, 817-886-1378 Elston.D.Eckhardt@usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Office 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil
Nonstructural Alternatives to Structural Rehabilitation of Damaged Flood Control Works	Public Law 84-99	U.S. Army Corps of Engineers	This program provides a nonstructural alternative to the structural rehabilitation of flood control works damaged in floods or coastal storms.	Direct planning and construction assistance is provided to assist in the event of damage to an existing flood control work. The project must involve damaged flood control works eligible for rehabilitation under Public Law 84-99.	A Presidential disaster declaration is not required. However, damage to flood control works is required.	Flooding	The USACE may fund 100% of the project costs, up to a project-specific cap. Costs above the cap are the responsibility of the participating State, tribal, local and/or Federal agencies.	Normally, an application is due 30 days after a river returns to bankfull conditions.	Elston D. Eckhardt,Project Manager, Ft. Worth Office, U.S. ACE, 817-886-1378 Elston.D.Eckhardt@usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Office 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Planning Assistance to States	Water Resources Development Act of 1974	U.S. Army Corps of Engineers	To assist States, local governments and other non-Federal entities in the preparation of comprehensive plans for the development, utilization, and conservation of water and related land resources.	Assistance includes studies and technical assistance.		Flooding and water supply	50% non-Federal match required	No specific application deadline. Contact the appropriate District Engineer to assist with filing the correct documentation .	Elston D. Eckhardt,Project Manager, Ft. Worth Office, U.S. ACE, 817-886-1378 Elston.D.Eckhardt@usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Office 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil
Small Ecosystem Restoration	Water Resources Development Act of 1988, Section 1135	U.S. Army Corps of Engineers	To restore degraded ecosystems through modifications to U.S. Army Corps of Engineers' structures and operations of Corps structures or implementation of measures in affected areas.	Assistance includes development of a Preliminary Restoration Plan and a Project Modification Report.		Flooding and ecosystem restoration	No non-Federal match required for development of a Preliminary Restoration Plan. A Project Modification Report requires a 25% non-Federal cost share.	No specific application deadline. Contact the appropriate District Engineer to assist with filing the correct documentation .	Elston D. Eckhardt,Project Manager, Ft. Worth Office, U.S. ACE, 817-886-1378 Elston.D.Eckhardt@usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Office 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Small Flood Control Projects	Flood Control Act of 1948, as amended, Section 205	U.S. Army Corps of Engineers	To reduce flood damages through small flood control projects not specifically authorized by Congress.	Assistance includes studies and projects for the design and construction of small flood control projects by the USACE. Flood control projects are required to be feasible from an engineering perspective, complete within themselves, and economically justified. State or local government officials should consult the nearest District Engineer regarding specific problems and the possibility of a remedial project under this program.		Flooding	No cost share required for the first $100,000 of planning study costs. Over $100,000, a 50% cost share is required. A 35% cost share is required for project costs, of which 5% is in cash. The balance may consist of the provision of lands, easements, rights-of-way, and necessary relocations.	No specific application deadline. A letter to the District Engineer is required.	Elston D. Eckhardt,Project Manager, Ft. Worth Office, U.S. ACE, 817-886-1378 Elston.D.Eckhardt@usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Ofc., 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil

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Program	Authority	Funding Source	Purpose	Types of Assistance and Eligible Projects	Condition	Hazards or Topics Covered	Matching Required	Application Deadlines	Contact
Snagging and Clearing for Flood Control	Flood Control Act of 1954, as amended, Section 208	U.S. Army Corps of Engineers	Provides for channel clearing and excavation, with limited embankment construction by use of materials from the clearing operations only.	Assistance includes studies and projects for channel clearing and excavation.		Flooding	No match required for study costs under $40,000. Over $40,000 there is a 35% non-Federal cost share. 35% non-Federal cost share required for project costs, of which 5% is required in cash.	No specific application deadline. Contact the appropriate District Engineer to assist with filing the correct documentation .	Elston D. Eckhardt,Project Manager, Ft. Worth Office, U.S. ACE, 817-886-1378 Elston.D.Eckhardt@usace.army.mil www.usace.army.mil Arthur Janecka, Deputy District Engineer, Galveston Office 409-766-3018 Arthur.J.Janecka@usace.army.mil www.usace.army.mil

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Kickoff Workshops

Figure E-1. Kickoff Workshop – TCRFC Spring Meeting
April 16, 2008

Texas Colorado River Floodplain Coalition
Sign In Sheet April 16, 2008
Hazard Mitigation Plan Update Kickoff

Name	Jurisdiction	Organization	Phone	Fax	Email Address
KERMIT ROEDER	BLANCO CO		830-868-2117	830-868-9018	BCINSPECT@MOMENT.NET
David Dockery	Johnson City	City of Johnson City	830-868-7111	830-868-7718	jcpworks@moment.net
Jim STEARMAN	WEST LAKE HILLS		(512) 327-3628	512-327-1863	codeinspec@westlakehills.org
Herb Darling	Burnet Co		512 756 5437		inspect@burnetcountytexas.org
JAMES SOLTEMANN	BLANCO CO	BLANCO CO	830-868-7471	830-868-2585	BLCOMM2@MOMENT.NET
Rob Lindsey	City of Gatesville + Mills Co.		325-648-3186	325-648-2570	mcojudge@centex.net
Mickey Reynolds	Wharton County		979 532 1991	979 532 0838	mickey.reynolds@co.wharton.tx.us
BRIAN SHIRLEY	City of Marble Falls		(512) 525-0324		bshirley@ci.marble-falls.tx.us
Monica Martin	Wharton County		979/533-8587	979/532-8947	monica.martin@co.wharton.tx.us
Vickie Box	BASTROP CO.		512/581-7159		vickie.box@co.bastrop.tx.us
MISTI WILSON	TCRFC	TCRFC	512/473-4034	512/473-3551	misti.wilson@lcra.org

Texas Colorado River Floodplain Coalition
Sign In Sheet April 16, 2008
Hazard Mitigation Plan Update Kickoff

Name	Jurisdiction	Organization	Phone	Fax	Email Address
Marsha B. Hardy	San Saba County		325-372-8570	325-372-6484	emergencymgmt@sansabacounty.org
DON E. GUYNES	CITY OF PALACIOS		361-972-3603	361-972-6555	dguynes@cityofpalacios.com
LISA Krobot	MATAGORDA COUNTY		979-244-2717	979-244-1967	l-krobot@yahoo.com
Richard Frazier		City of Cottonwood Shores	830 693 3820		richardfrs@yahoo.com
Ronnie Bollom	City of Wharton		979-532-2491	979-532-0181	rbollom@cityofwharton.com
CARTER MISKA	CITY OF WHARTON		979-532-2491	979-531-1744	cmiska@cityofwharton.com
Jackie Jansky	City of Wharton		979-532-2491	979-532-0181	jjansky@cityofwharton.com
Paulo Pinto	Williamson Co.		512 9433620	512 9303110	ppinto@wcchd.org

Texas Colorado River Floodplain Coalition
Sign In Sheet April 16, 2008
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Name	Jurisdiction	Organization	Phone	Fax	Email Address
ERIC WINTER	CITY OF HORSESHOE BAY	DEVELOPMENT SERVICES	830-598-8741 X270	830-598-2977	ewinter@horseshoe-bay-tx.gov
Jodie Kelly	City of Brownwood	GIS/Engineering	325-646-5775 x 3245	325-641-2162	jkelly@ci.brownwood.tx.us
Don Hatcher	"	City Engr	325 643 6626	325 641 2162	dhatcher@ci.brownwood.tx.us
Dawn Moore	Fayette County		979/968-6469	979/968-8621	dmoore@capcog.org
Janet Carrigan	Fayette County	EMC/Floodplain	979) 249-6215	979) 968-8621	janet.carrigan@co.fayette.tx.us
MIKE FISHER	BASTROP County	EMC	512/581/4022	512/581/4024	mike@co.bastrop.tx.us
Susana Duarte	LCRA	EMC	512/469-6833	512-473-3295	susana.duarte@lcra.org
Amanda McPherson	LCRA	LCRA	512 473-3583		amanda.mcpherson@lcra.org
Sara Wilson	Bastrop County	Assistant EMC	(512)581-4023		sara.wilson@co.bastrop.tx.us
Duane Stuart	Llano County		325-388-3092	325-388-8011	duane.com3@hotmail.com
Cristy Kelso	Llano County		325-247-2039	325-247-3785	llanodnr@verizon.net

Texas Colorado River Floodplain Coalition
Sign In Sheet April 16, 2008
Hazard Mitigation Plan Update Kickoff

Name	Jurisdiction	Organization	Phone	Fax	Email Address
Thomas Starks	Flood Plain Administrator	Mason County	325 347 5719	325 347 5719	tstarks@tstar.net
Earl Koch	City of Mason	Emer. Mgmt	325-347-6449	325-347-5955	emgmgm@tstar.net
Donna Green	Highland Haven	Flood Plain Adm; CFM	830 2650113C	830 6932382	HLAdonna@NCTV.com
Joseph P. Fernandez	"	"	830 598 7838	same	JoeFernandez06@yahoo.com
Vickie Box	Bastrop Co.	FPA	512/581-7159	vickie	box@co.bastrop.tx.us
Marsha B. Hardy	San Saba County	FPA/EMC	325-372-8570	325-372-6484	emergencymgmt@SanSabaCounty.org
Hugh Farmer	City of Lago Vista		512/267-1353		hfarmer@austin.rr.com
Marilee Pfannstiel	City of Jonestown		512-267-3243x102	267-1712	marilee@jonestown.org
Mike Leathers	Village of Point Venture		512-267-5511	512 267-1275	@VOPV.ORG, FLOODPLAIN, ADMINISTRATOR

Texas Colorado River Floodplain Coalition
Sign In Sheet April 16, 2008
Hazard Mitigation Plan Update Kickoff

Name	Jurisdiction	Organization	Phone	Fax	Email Address
Ted Bowers	City of Bastrop	Planning & Development	(512) 321-0457	512 332-0279	tebowers51@msn.com
James Miller	City of Bastrop	Water & Wastewater	512 321-2124	512 332-0279	JMiller@cityofbastrop.org
Lisa Krobot	Matagorda County	Floodplain Admin	979-244-2717	979-244-1967	L-Krobot@yahoo.com

Figure E-2. Kickoff Workshop – Region I
July 17, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H$_2$O Partners

4:00-5:00

.....Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION I STAKEHOLDERS MEETING
July 17, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
Mickey Reynolds	Wharton Co.	979 532 1991	Mickey.reynolds@co.wharton.tx.us
LISA Krobot	Matagorda	979-244-2717	l.krobot@matagordacounty.tx.us.
Andy Kirkland	Wharton Co. OEM-Emc	979-532-1123	Andy.kirkland@co.wharton.tx.us
ANDY WALIGURA	CITY OF EL CAMPO - BLDG OFFICIAL	979-541-5020	awaliguira@ci.el-campo.tx.us
Cathy Meek	H2O Partners	281-565-0527	cathymeek@comcast.net
JAMES Cooper	city of Wharton OEM.Emc	979.532.4811 x570	jcooper@cityofwharton.com
Monica Martin	Wharton Co. Permits	979/532-8581	monica.martin@co.wharton.tx.us

Figure E-3. Kickoff Workshop – Region II
July 21, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H$_2$O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION II PLANNING MEETING
July 21, 2008

SIGN-IN SHEET
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Name	Organization & Title	Phone	Email
Marilee Hannstiel	City of Jonestown CFM	512-267-3243	marilee.e.jones
LANCE WENDELL	" " "		" LANCE.WENDELL@LACE.4 austin.rr.com
Sam Wilson	Bastrop County Asst. EMC	(512) 281-4523	sam.wilson@co.bastrop.tx
Maurice Pitts	Lee County Prot./Coord.	979-542-6665	mpitts@gkg.net
Spencer Schneider	City of Giddings		sschneider@giddings.net
Roy Sedwick	LCRA		rsedwick@lcra.org
GENNA CONNER	LEE CO OEM	979-542-4050	leecoem@hotmail.com

Figure E-4. Kickoff Workshop – Region III
July 17, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H2O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION III PLANNING MEETING
July 17, 2008

SIGN-IN SHEET
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Name	Organization & Title	Phone	Email
Mike Steele	City of Burnet City Manager	512-756-6093 x205	msteele@cityofburnet.com
Earl Koch	City of Mason	325-347-6449	
Roy Sedwick	LCRA	(512) 473-3200 x2815	rsedwick@lcra.org
Jeff Turner	Hays County	512-393-7301	jeff.turner@co.hays.tx.us
Richard Frazier	Cottonwood Shores	830 693 3830	inspector@cottonwoodshores.com
Brian Shirley	City of Marble Falls	830-693-3615	bshirley@ci.marble-falls.tx.us
~~Tony Carmouche~~	~~307 Lakeview~~		
Erin Capps	H2O		ecapps@h2opartners.com
Pam Hawkins	H2O		pam@h2opartners.com
Eric Winter	City of Horseshoe Bay	830-598-8741 x270	~~[illegible]~~ ewinter@horseshoe-bay-tx.gov
Herb Darling	Burnet Co.		
Ralph Hendricks	City of Marble Falls	830-693-3615	
Jim Barho	Burnet County EMC	(512) 756-8080	
Sylvia Breen	Cottonwood Shores	830 693 3830	breen@cottonwoodshores.org
Ron Moore	Llano County	325 247 2039	rlmoore@llanocounty.org
Lorraine Stieren	" "	325-388-3092	

Figure E-5. Kickoff Workshop – Region IV
July 18, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H_2O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION IV PLANNING MEETING
July 18, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
Paul F. Cook	Kempner (Mayor Pro Tem)	512 932 2180	doinfine@wildblue.net
Robert Crane	Kempner	512 932-2648	BC Crane@Juno.com
Joe Mosier	FP Mgr - Ci. of Brady	325-597-1461	crtisfld@
	fax: 325-792-9151	cell: 325-456-1555	Centex.net
Tommy Payne	bradypd@cityofbrady.com	-325-597-2121	
Susan Horton	City of Brad	325-597-252	bradyco@brady/tx.us

Risk Assessment Workshops

Figure E-6. Risk Assessment Workshop – Region I
Nov. 12, 2008

Region 1

SIGN-IN SHEET
STAKEHOLDER MEETING
TCRPC MAP
NOV. 12, 2008

NAME	JURISDICTION	PH #
Andy Kirkland	WHARTON Co.	979-532-2541
Jim Hendrickson	Bay City	979-323 1636
LISA Krubot	Matagorda Co.	979-244-2717
Ron CHASTAIN	COLORADO CO	979-732-2435
Cathy Meek	NZO Partners	713-530-4343
JimCooper	City of WHARTON	979.532.4811 x570
David Schwedes	Wharton EDC	979-532-0999
Mitch Hibbs	LCRA	512-592-8931

Figure E-7. Risk Assessment Workshop – Region II
Nov. 13, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H$_2$O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION II RISK ASSESSMENT WORKSHOP
NOV. 13, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
WES NEUMYER	J.W. NEUMYER ENGINEERS	512-845-4052	NEW-WEST @MINDSPRING.COM
JIM LOYD	WMSON. CO. & CITIES HEALTH DIST.	512-943-3624	JLOYD@ WCCHD.ORG
MIKE FISHER	BASTROP CO. EMC	512-581-4022	EMC@co.bastrop.Tx.US
TERRY COLGAN	SUTRON CORPORATION	512-351-9208	tcolgan@sutron.com
James Mallinger	City of Cedar Park EMC	512-401-5220	mallinger@cedarparktx.us
Heidi M. Carlin	LCRA FPM	512-473-3524	heidi.carlin@lcra.org
Ted C Bowers	City of Bastrop	512 988-0541	tcbowers51@msn
Susie Duarte	LCRA O&M	512-469-6833	susana.duarte@lcra.org
Rachel Andrews	Texas Water Development Board	512-463-4350	
Fang Yu	City of Austin	974-3580	Fang.Yu@Ci.Austin.Tx.US
TODD RADFORD	City of LAKEWAY - EMS Lieutenant	5123147583	toddradford@cityofLakeway.com
MISTI WILSON	TCRFC	512 473-4036	MISTI.WILSON@LCRA.ORG
Mitch Hibbs	LCRA DEMC	512 592-8931	mhibbs@LCRA.org
Sara Wilson	Bastrop Co.	581-4023	saramlson@co.bastrop.tx.us

Figure E-8. Risk Assessment Workshop – Region III
Nov. 12, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H$_2$O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION III RISK ASSESSMENT WORKSHOP
NOV. 12, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
Earl Koch	EMC City of Mason	325-347-6449	emgmgm@tstar.net
Coy Guenter	City of Marble Falls	693-4060	cguenter@ci.marble-falls.tx.us
Larry Wright	"	"	lwright@ci.marble-falls.tx.us
Bill Neve	Burnet Co.	512/715-4112	bcepct1@moment.net
Thomas Starks	Mason 8	3253475719	tstarks@tstar.net
Ralph Hendricks	City of Marble Falls	830-613-2324	rhendricks@ci.marble-falls.tx.us
Richard Frazier	Cottonwood Shores	830693-3830	richardfis@yahoo.com
Cales Kraenzel	City of M.F	830-798-9060	ckraenzel@ci.marble-falls.tx.us
Hans Schneider	City of Cottonwood Shores	830 693-3830	admin.hjsc@cottonwoodshores.org
Roy Fyffe	City of Burnet	512-715-3211	rfyffe@cityofburnet.com
Susana Duarte	LCRA DFM	512-469-6833	susana.duarte@lcra.org
Heidi M. Carlin	LCRA FPM	512-473-3524	Heidi.Carlin@lcra.org
Eric Winter	City of HSB	830-598-8741 X 270	ewinter@horseshoebay-tx.gov
Herb Darling	Burnet Co	5127565430	mapper@burnetmaptech.org

Figure E-9. Risk Assessment Workshop – Region IV
Nov. 10, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H2O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION IV RISK ASSESSMENT WORKSHOP
NOV. 10, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
Erin Capps	H2O Partners	512-769-5493	ecapps@h2opartnerscom.com
Susana Dourte	LCRA	512-469-6833	susana.dourte@lcra.org
Mitch Hibbs	LCRA	512-592-8931	mhibbs@lcra.org
Jodie Kelly	City of Brownwood	325-646-5775	jkelly@ci.brownwood.tx.us
Don Hatcher	" Brownwood	325 643 6626	dhatcher@ " "
Roy Sedwick	LCRA	(512) 473-3200	rsedwick@lcra.org
Theresa Strickler	Mills County	325-648-2748	theresa.strickler@co.mills.tx.us
Thom L. Alsto	City Richland Springs	325-452-3382	
Marsha Hardy	San Saba County	325-372-8570	emergencymgmt@sansabacounty.org
AL J. Hamrick	San Saba City Inspector	325.372-7908	inspector@centex.net

Mitigation Workshops

Figure E-10. Mitigation Workshop – Region I
Dec. 8, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H_2O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION I MITIGATION WORKSHOP
DEC. 8, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
JAMES Cooper	city of Wharton EMC	979.532.4811x570	jcooper@cityofwharton.tx.us
Doug Matthes	Matagorda Co EMC	979 323 0707	dmatthese@matagordatx.us
BOB WATTS	MATAGORDA Co. Asst EMC	979-323-0707	bwatts1946@yahoo.com
LISA Krobot	Mat. County Floodplain Admin	979-244-2717	Lkrobot@yahoo.com
Jim Hendrickson	city of Bay City	979-323-1456	jhendrickson@cityofbaycity.com
Jackie Jansky	City of Wharton	979-532-2491	jjansky@cityofwharton.com
Amy Owens	City of Wharton	979.532.2491	aowens@cityofwhartoncom
Carter Miska	City of Wharton	979-532-2491	cmiska@cityofwhartoncom
Charles Rogers	Colorado County	979-733-0184	cctxoem@co.colorado.tx.us
Andy Kirkham	Wharton County EMC	979-532-1127	andy.kirkham@co.wharton.tx.us
Ron Chastain	Colorado County	979-732-2435	drs.fm@co.colorado.tx.us
Dave Guynes	CITY OF PALACIOS	361-972-3605	dguynes@cityofpalacios.org
Heidi M. Carlin	LCRA	512-473-3524	heidi.carlin@lcra.org
Domingo Montalvo	City of Wharton Councilman		
ANDREW WALIGURA	CITY OF EL CAMPO/BUILDING OFFICIAL	(979)541-5020	awaligura@ci.el-campo.tx.us
THURSTON WEBB	City of Eagle Lake, Public Works Dir.	979-234-2640	citymanager@ci.el.tx.us
Gregory Robinson	City of Palacios,	361-865-3413,	grobinson@ci.palacios.tx.us

Figure E-11. Mitigation Workshop – Region II
Dec. 2, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H$_2$O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION II MITIGATION WORKSHOP
DEC. 2, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
Sara Wilson	Bastrop OEM - Asst. Coor.	581-4023	sara.wilson@co.bastrop.tx.us
Ted Bowers	City of Bastrop - CFM	(512) 988-0541	tebowers51@msn.com
MIKE LEATHERS	VILLAGE OF POINT VENTURE FP ADMIN	267-5511	FLOODPLAIN ADMINISTRATOR @VOPV.ORG
JIM STEARMAN	City of Westlake Hills	(512) 327-3628 X306	codeinspec@westlakehills.org
Roy Sedwick	LCRA		
Heidi M. Carlin	LCRA	512-473-3524	heidi.carlin@lcra.org
James Mallinger	City of Cedar Park	512-401-5270	mallinger@cedarparktx.us
TODD RADFORD	City of Lakeway	314-7583	toddradford@cityoflakeway.com
Vickie Box	Bastrop Co. FPA	581-7159	vickie.box@co.
JAMES DEVEREAUX	Hutto / EMC	512-759-4020	JAMES.DEVEREAUX@HUTTOTX.GOV
Jeff Sabin	City of Hutto Planner I	512-759-5960	Jeffrey.Sabin@HuttoTx.gov
JEFF HOOGHEEM	WCCHD	512-943-3665	jhoogheem@wcchd.org
Jarred Thomas	Williamson County / EMC	(512) 943-3747	jthomas@wilco.org

Figure E-12. Mitigation Workshop – Region III
Dec. 3, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H_2O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION III MITIGATION WORKSHOP
DEC. 3, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
Roy Fuffe	City of Burnet	715-3211	rfuffe@cityofburnet.com
Richard Frazier	City of Cottonwood Shores	693-5830	city-inspector@cottonwoodshores.org
David Dockery	City of Johnson City	830-868-7111	jcpworks@moment.net
Kermit Roeder	Blanco County	830-868-217	BCINSPECT@MOMENT.NET
Earl Koch	City of Mason	325-347-4449	earl.koch@cityofmason.us
Ron Moore	Llano County	325 247 2039	RLMOORE48@VERIZON.NET
Thomas Starks	Mason County	325347 -5719	tstarks@tstar.net
Marilee Phanstiel	City of Jonestown	267-3243x102	marilee@jonestown.org
Lance Wendell	"	267-7820	LANCEWENDELL PLACE 4@ DUSTN-AR.COM
Colton Pullen	City of Meadowlakes	830-693-1993	seageepes@hctv.com
Eric Winter	City of Horseshoe Bay	830-598-8741 x270	~~ericwinter@~~
Brian Shirley	City of Marble Falls	512-525-0324	bshirley@ci.marblefalls.tx.us
Michelle Schuenemann	City of Lometa	512-752-3331	cityoflometa@wildblue.net
Ralph Hendricks	City of Marble Falls		
Donna L Green	Highland Haven	6932503	hladonna@hctv.com
Charles Henicke	Kingsland Municipal Utility Dist		c.shenicke@moment.net
Crista Bromley	City of Burnet	512.715.3217	cbromley@cityofburnet.com
David Vaughn	City of Burnet	512 715 3208	dvaughn@cityofburnet.com

Figure E-13. Mitigation Workshop – Region IV
Dec. 4, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H$_2$O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION IV MITIGATION WORKSHOP
DEC. 4, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
AL HAMRICK	City of San Saba	325-372-7908	inspector@reuter.net
LANCE R. CARLSON	City of Lampasas	512-556-6831	lance@cityoflampasas.com
Jodie Kelly	City of Brownwood	325-646-5775	jKelly@ci.brownwood.tx.us
BOB CRANE	KEMPNER	760-964-2454	BC CRANE@JUNO.COM
Don Hatcher	City of Brownwood	325 643 6626	dhatcher@ci.brownwood.tx.us
Roy Schwick	LCRA		
Theresa Strickler	Mills Co. EMC	325-648-2748	theresa.strickler@co.mills.tx.us
Marsha Hardy	San Saba Co EMC	325-372-8570	emergencymgmt@sansabacounty.org
Joe Misier	City of BRADY	325-597-1461	CRTISFAD@City of Brady.com
JAMES MINOR	CITY - BRADY	325-456-7863 cell	BRADYCO@BRADYTX.US

Public Meetings

First Series

Figure E-14. First Series of Public Meetings
Region I – July 17, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H_2O Partners

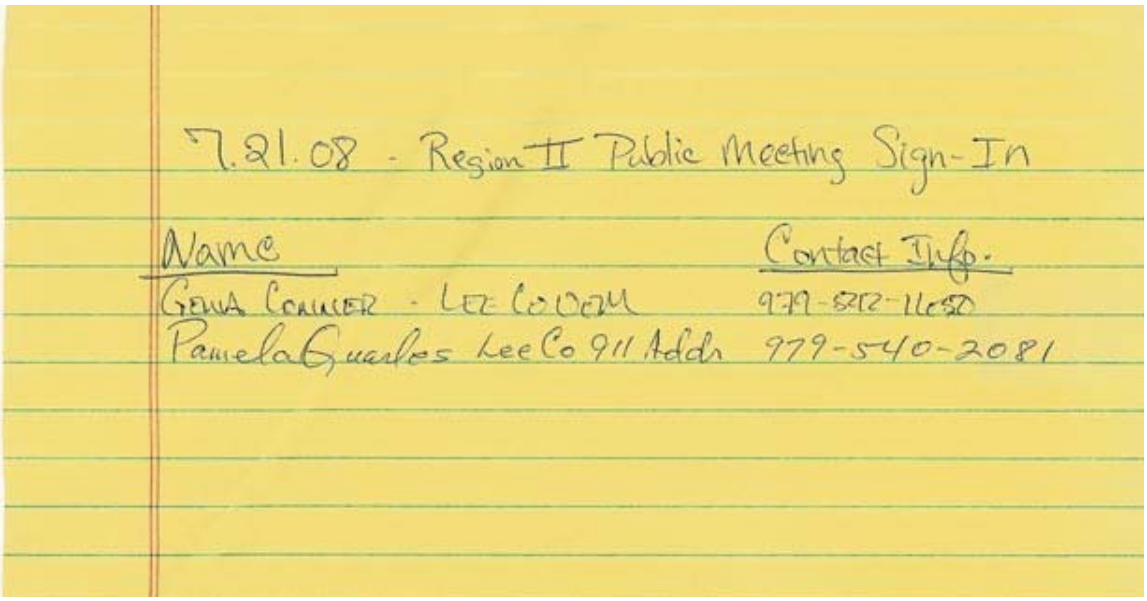
5:00-6:00

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION I PUBLIC MEETING
July 17, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
Andy Kirkland	Wharton County Emc	979-532-2541	bigdog17@sbcglobal.net
Jim Cooper	City of Wharton Emc	979-532-4811x570	jcooper@cityofwharton.com
Jackie Jansky	City of Wharton City Hall	979-532-4811 x229	jjansky@cityofwharton.com
Monica Martin	Wharton County/Floodplain Adm.	979/532-8587	monica.martin@co.wharton.tx.us
Lisa Krobot	MATAGORDA CO./FLOODPL. ADMIN.	979/244-2717	l-krobot@yahoo.com
ANDY WALIGURA	CITY OF EL CAMPO/BLDG OFFICIAL	979-541-5020	awaligura@ci.el-campo.tx.us
Cathy Meek	H2O Partners	281-565-0527	cathymeek@comcast.net

Figure E-15. First Series of Public Meetings
Region II – July 21, 2008



7.21.08 - Region II Public Meeting Sign-In

Name	Contact Info.
Gena Conner - Lee County	979-542-1650
Pamela Guarles Lee Co 911 Addr	979-540-2081

Figure E-16. First Series of Public Meetings
Region III – July 17, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H_2O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION III PUBLIC MEETING
July 17, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
Jay Gannaway	307 Lake View	830-693-5019	jgannaway yahoo.com
Carlton Pollen	63 Augusta MLakes	830 693-1993	seagreepea@hctv.com
Hesto Darling	Burnet	512 756 2437	inspect@burnetcountytexas.org
BRIAN SHIRLEY	City of Marble Falls	830-693-3615	bshirley@ci.marble-falls.tx.us

Figure E-17. First Series of Public Meetings
Region IV – July 18, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H_2O Partners

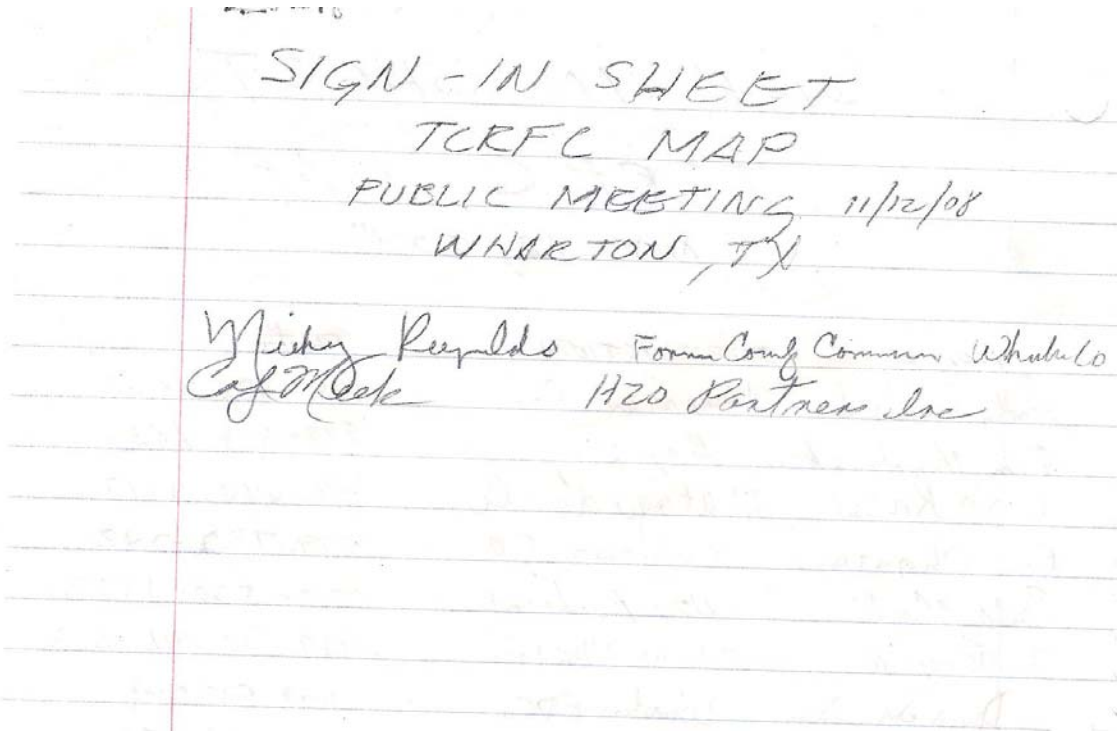
Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION IV PUBLIC MEETING
July 18, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
Jon Mosier		325 792 5658	Elgblkmosier@yahoo.com
Andrew Williams		325 456-9365	

Second Series

Figure E-18. Second Series of Public Meetings
Region I –Nov. 12, 2008


SIGN - IN SHEET
TCRFC MAP
PUBLIC MEETING 11/12/08
WHARTON, TX

Mickey Reynolds Fort Coug Commun Wharton Co
Carl Meek H2O Partners Inc

Figure E-19. Second Series of Public Meetings
Region III[1] –Nov. 12, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H$_2$O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION III PUBLIC MEETING
NOV. 12, 2008

SIGN-IN SHEET

Name	Phone	Email
EARL KOCH	325-347-6449	[illegible]
[illegible]	830-693-3615	[illegible]

[1] There is not a sign-in sheet for the Region II Public Meeting in November as there was no attendance.

Figure E-20. Second Series of Public Meetings
Region IV –Nov. 10, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H_2O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
REGION IV PUBLIC MEETING
NOV. 10, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
B. Theodosis	San Saba County Judge	(325) 372-3635	judge@sansabacounty.org
Bob Hanby	San Saba Resident	372-8570	
Robert H. Carroll	City of San Saba	372-7157	
[illegible]	City of San Saba	372-8885	
Darul Michalez	" " "	372-4533	
James W Harbrough	City of San Saba	372-7355	
Scott Alsup	City of San Saba	372-7730	
Denver Daniel	City of San Saba	372-7568	
Kenneth Shand	City of San Saba	372-7875	
Stan Weik	City of San Saba		
Tim Woerndell	City of San Saba		

Stakeholder Meetings

Figure E-21. CAPCOG Homeland Security Task Force
June 5, 2008

DATE: June 5, 2008

GUESTS - PLEASE SIGN IN

HOMELAND SECURITY TASK FORCE

Please print clearly

NAME	ORGANIZATION	E-mail
Jane Bachirk	H2O Partners	jane@h2opartnersusa.com
Erin Capps	" "	erin@h2opartnersusa.com
Lindy McGinnis	CATOEM	
Stacy Moore-Quinones	TCOEM	
Carol Davis	DSHS R7	Carol.davis@dshs.state.tx.us
Sharon Jeczmnek	Fayette Co. EMS	
James Leiskau	Grainger	James.Leiskau@Grainger.com
Roger Hull	HCPND	Roger.Hull@co.Hays.tx.u
Janet Pichette	ATCHHSD	
Heidi Carlin	LCRA	Heidi.Carlin@lcra.org
CHUCK BROTHERTON	TRAVIS CO	
Mike Elliott	ATC EMS	mike.elliott@ci.austin.tx.u
Billy Atkins	COA HSEM	billy.atkins@ci.austin.tx.us
DAVE REIMER	CATRAC	executivedirector@catrac.org
James Morgan	WCCHD	jmorgan@wcchd.org
James Gabriel	UTPD	jag.4@mail.utexas.edu
Sara Wilson	Bastrop County	sara.wilson@co.bastrop.state.tx.u

Figure E-22. Llano and San Saba River Advisory Panel
July 18, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H_2O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
STAKEHOLDER MEETING
July 18, 2008

SIGN-IN SHEET

Name	Organization & Title	Phone	Email
Robert L. Yantis	LLANO RIVER PANEL	325-388-8849	RLYANTIS@HOTMAIL.COM
Sheryl L. Taylor	"		"
David Leeper	San Saba River	817 902-3106	dwilbeleiofficer
Kirnan Golemon	KG Strategies, LLC	512/633-9428	kg@kgstrategies.com
Randy Young	McCulloch County	325/597-0733 x4	
Drew Bearden	Mason County	325/347-5110	
Jarrett Tripp	San Saba River	214-521-8343	
Martha Gorry	San Saba River	325/247-3132	mrgcong@ctecc.net
Roy Inks	Llano River Ad. Panel	325/247-3475	buck_i_46@yahoo.com
Connie Stockbridge	Llano River Auth. Panel	325-425-6381	rcstockb@hotmail.com
Caroline Runge	Menard County UWD	325-396-3670	menwd@wcc.net
Steve Dyer	LCRA	(325) 372-5784	dyerlcra@hotmail

Figure E-23. Pedernales River Advisory Panel
August 26, 2008

TEXAS COLORADO RIVER FLOODPLAIN COALITION

H$_2$O Partners

Texas Colorado River Floodplain Coalition Hazard Mitigation
STAKEHOLDER MEETING- Pedernales River Advisory Panel
August 26, 2008

Name	Organization & Title	Phone	Email
[illegible]		830 [illegible] 5005	[illegible]
JAMES WRIGHT		830 997 5246	jwright@beecreek.net
BRENDA ADAIR	LCRA	830 833 5835	
CONNIE GRANBERG		830-833-5149	hikemoment.net
EDGAR HULLUM	POD RIVER PANEL	830-868-9342	EDHULLUM@HUMCONNECT.[illegible]
Robert Moss		512-296-9660	moss@hughes.net
Rick Arnic		800-776-5272	rick.arnic@lcra.org
[illegible]	H$_2$O		
Roland Penz	LCRA	512-638-1613	rpenz@lcra.org

Copies of sign-in sheets for Stakeholder meetings held on August 11, 25 and 26, with the Buchanan and Inks Lake Advisory Panel; the Austin and Travis Lake Advisory Panel; and the Colorado, Wharton and Matagorda Lower Basin Panel Meeting, are available upon request[2].

[2] Sign in documents for these stakeholder meetings were too large to scan and attach electronically.

Advertisements for Workshops and Meetings

STATE OF TEXAS

COUNTY OF SAN SABA

Before me, the undersigned authority, on this day personally appeared Karen Faught, who being by me duly sworn, deposes and says that:

"She is the Editor of the San Saba News & Star, Inc., a newspaper published in San Saba County, Texas, and having a general circulation in San Saba County, Texas, and that the foregoing attached notice was published in said newspaper on the following date, to wit:

July 17, 2008."

Karen Faught

Subscribed and sworn to before me this the 8 day of Aug, 2008, to certify which witness my hand and seal of office.

SHELE GILGER
Notary Public
STATE OF TEXAS
My Comm Exp 07/02/2012

Shele Gilger
Notary Public in and for the State of Texas

7/2/12
My Commission Expires

Shele Gilger
Print Name of Notary Public

PUBLIC NOTICE

The Public is Invited to Participate in Hazard Mitigation Planning for the Texas Colorado River Floodplain Coalition

Counties of Lampasas, Mills, San Saba and the communities within and the City of Brady, your assistance is needed in updating the Multi-jurisdictional **Hazard Mitigation Plan** that will address all natural hazards that could potentially affect your community

Friday, July 18, 2008
5:00-6:00p.m
Brady Curtis Field Airport
Hanger B, Conference Room
377 North
Brady, TX 76825

7-17-08

An opportunity will be provided for the public to offer thoughts on their hazards of concern and recommended ways to reduce future risk.

If you cannot attend the public meeting, information about the planning process and a public participation survey are available at www.tcrfc.org.

Mason County News Publishing - Printing - Office Supplies

Phone 325/347-5757
Fax 325/347-5668
Email: masonnew@tstar.net
Gerry Gamel, Editor

110 Live Oak Street
P.O. Drawer 1729
Mason, Texas 76856
Scott G. Wesner, Publisher

PUBLISHER'S AFFIDAVIT

I solemnly swear that the above notice was published once in the MASON COUNTY NEWS, a newspaper printed in Mason, Mason County, Texas, and of general circulation in said county, as provided in the Texas Probate Code for the service of citation or notice by publication, and the date that the issue of said newspaper bore in which said notice was published was July 16, 2008. A copy of the notice as published, clipped from the newspaper, is attached hereto.

_____
Publisher

OR

_____
Editor

SWORN TO AND SUBSCRIBED BEFORE ME by Jerry Gamel this 21st day of July, 2008, to certify which witness my hand and seal of office.

Gayle Bartlett
Notary Public in and for the State of Texas

GAYLE BARTLETT
NOTARY PUBLIC
STATE OF TEXAS
My Commission Expires 03-22-2009

_____
(Typed or Printed Name of Notary)

My Commission Expires: _____

STATE OF TEXAS
COUNTY OF WHARTON

Before me, the undersigned authority, on this day personally appeared *Frances M. Deiterich*, the *Office Manager* (TITLE) of the *Wharton Journal-Spectator* (NAME OF NEWSPAPER), a newspaper having general circulation in Wharton County, Texas, who being by me duly sworn, deposes and says that the foregoing attached notice was published in said newspaper on the following dates, to wit: July 16, 2008.

Frances M Deiterich

Subscribed and sworn to before me this the 21st day of July, 2008, to certify which witness my hand and seal of office.

HELEN F. SEVIER NOTARY PUBLIC STATE OF TEXAS EXPIRES 01-10-2011

Helen F. Sevier
Notary Public in and for
Wharton County, Texas

unior College
uction
rton, Texas 77488
19, 2008
AUCTION 10 A.M.

sting of items in the auction. '95
r–New AC (Reserve–subject to
r Van, Honda 4 Wheeler, Riding
metology Carts, Drafting Tables,
rcise Bike, Vertical Blinds, Filing
ers, Overhead Projectors, Tables,
ning Unit, Pallets, TV's, TV Cart,
Drill Press Milling Machines, Drill
reak

l jmmoore65@sbcglobal.net
979-541-6227 (Cell)
uction.com
remium No Minimums
A Little Country Auction

The Public is Invited to Participate in Hazard Mitigation Planning for the Texas Colorado River Floodplain Coalition

Counties of Matagorda, Wharton, Colorado, and Fayette and the communities within, your assistance is needed in updating the Multi-jurisdictional Hazard Mitigation Plan that will address all natural hazards that could potentially affect your community

Thursday, July 17, 2008
5:00-6:00p.m
Caney Church,
118 Milam Street,
Wharton, TX 77488

An opportunity will be provided for the public to offer thoughts on their hazards of concern and recommended ways to reduce future risk.

If you cannot attend the public meeting, information about the planning process and a public participation survey are available at www.tcrfc.org.

NEWS PAPER COMMERCIAL PRINTING OFFICE SUPPLIES AND FURNITURE

The Goldthwaite Eagle

PUBLISHED EVERY THURSDAY
ESTABLISHED IN 1894
P.O. BOX 249 • PHONE 325/648-2244
GOLDTHWAITE, TEXAS 76844
GOLDNEWS@CENTEX.NET

MRS. FRANK BRIDGES
EDITOR

G. FRANK BRIDGES
PUBLISHER

PUBLISHER'S AFFIDAVIT

I solemnly swear that the attached notice was published in ***The Goldthwaite Eagle***, a newspaper printed in Mills County, Texas and of general circulation in said county, as provided by The State of Texas for the service of citation or notice of publication, and the date the issue of said newspaper bore in which said notice was published was July 16, 2008.

A copy of this notice as published, clipped from the newspaper, is attached hereto.

Mrs. Frank Bridges
Mrs. Frank Bridges
Editor

SUBSCRIBED AND SWORN TO BEFORE ME by Mrs. Frank Bridges, this _____ day of _____, 20_____, to certify which witness my hand and seal of office.

Bonita F. Mackey
Notary public In and For Mills County, Texas

My Commission Expires: _____ BONITA F. MACKEY MY COMMISSION EXPIRES October 24, 2011

STATE OF TEXAS
COUNTY OF WHARTON

Before me, the undersigned authority, on this day personally appeared *Frances M. Deiterich*, the *Office Manager* (TITLE) of the *East Bernard Express* (NAME OF NEWSPAPER), a newspaper having general circulation in Wharton County, Texas, who being by me duly sworn, deposes and says that the foregoing attached notice was published in said newspaper on the following dates, to wit: July 17, 2008.

Frances M Deiterich

Subscribed and sworn to before me this the 21st day of July, 2008, to certify which witness my hand and seal of office.

HELEN F SEVIER NOTARY PUBLIC STATE OF TEXAS EXPIRES 01-10-2011

Helen F. Sevier
Notary Public in and for
Wharton County, Texas

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ner prescribed by law to the following:

1. David Paul Rabius
   Independent Co-Executor
   15468 County Road 266
   East Bernard, Texas 77435
2. Carl Edward Rabius
   Independent Co-Executor
   5623 County Road 264
   East Bernard, Texas 77435
3. V. O. CARDEN, JR.
   Attorney for the Estate
   P.O. Box 1264
   East Bernard, Texas 77435

Dated this the 11th day July, 2008.

V.O. CARDEN, JR.,
Attorney for the
Estate of John H. Rabius, Deceased
P.O. Box 1264
East Bernard, Texas 77435
Phone.: (979)335-7353
Fax: (979)335-7173

This notice was published in the East Bernard Express on Thursday, July 17, 2008.

East Bernard Express

Giddings, Texas, Times & News - Thursday, July 17, 2008

■ 2nd Month RENT FREE
■ 6 Months FREE Parking
PLUS:
GIVE A TIMES & NEWS SUBSCRIPTION!!!
FREE $100 GAS CARD
OFFER EXPIRES JULY 31st
WITH PURCHASE OF NEW MOWER*
0% FINANCING for 36 Mo.**
LEE COUNTY ACE HARDWARE
1120 County Road 208 - 542-2413
Giddings, Texas 78942
**Subject to credit approval.
des all riding models. Gas card will be delivered to consumer upon receipt of warrant tration from dealer. Please allow 6-8 weeks for delivery. See your local dealer for details.

Manhole barriers damaged at motel

Festival
300 HIGHWAY 77 NORTH
GIDDINGS, TEXAS
CELEBRATING 125 YEARS IN GIDDINGS

The Public is Invited to Participate in Hazard Mitigation Planning for the Texas Colorado River Floodplain Coalition

The Counties of Bastrop, Hays, Lee, Travis and Williamson and the communities within, your assistance is needed in updating the Multi-jurisdictional **Hazard Mitigation Plan** that will address all natural hazards that could potentially affect your community

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Monday, July 21, 2008
5:00-6:00p.m
1st Floor Courtroom
Lee County Courthouse
200 S Main Street
Giddings, TX 78942

STATE OF TEXAS

COUNTY OF SAN SABA

Before me, the undersigned authority, on this day personally appeared Karen Faught, who being by me duly sworn, deposes and says that:

"She is the Editor of the San Saba News & Star, Inc., a newspaper published in San Saba County, Texas, and having a general circulation in San Saba County, Texas, and that the foregoing attached notice was published in said newspaper on the following date, to wit:

July 17, 2008."

Karen Faught

Subscribed and sworn to before me this the 8 day of Aug, 2008, to certify which witness my hand and seal of office.

SHELE GILGER
Notary Public
STATE OF TEXAS
My Comm Exp 07/02/2012

Shele Gilger
Notary Public in and for the State of Texas

7/2/12
My Commission Expires

Shele Gilger
Print Name of Notary Public

Affidavit of Publisher

STATE OF TEXAS
COUNTY OF BASTROP

Before me, the undersigned authority, on this day personally appeared _____EMMETT MCKINLEY_____ known to me, who being duly sworn on his oath deposes and says that (s)he is the __PUBLISHER_____ of *The Bastrop Advertiser*, a newspaper of general circulation, published in said County; this said newspaper has been continuously and regularly published in said County for a period of more than one year; that a copy of the within and foregoing _____.

Hazard Mitigation Plan Case No. _____
Styled_____

was published in said newspaper _____1_____ successive issues, being on the following dates:

7/19/08

and a newspaper copy is hereto attached.

Signed Emmett J. McKinley
Emmett McKinley, Publisher

Subscribed and sworn to before me this, the 22ND day of July A.D. 2008.

Virginia T. Pickering
Virginia T. Pickering
Notary Public in and for Bastrop County, Texas

VIRGINIA T. PICKERING
Notary Public, State of Texas
My Commission Expires
AUG. 3, 2011

Seal

PAGE 4B ★ The Bastrop Advertiser SATURDAY, JULY 19, 2008

The Bastrop Advertiser
(512) 321-2557
classifieds@bastropadvertiser.com
CLASSIF
REACH MORE THAN 35,800 BASTR

Legal

It is understood that the City Council of the City of Bastrop reserves the right to reject any and/or all bids for any or all items covered in the bid request and to waive informalities on defects in bids or to accept such bids, as it shall deem to be in the best interest of the City of Bastrop.

The City Finance Office is located at 904 Main Street, Bastrop, Texas 78602. Questions should be addressed to the Finance Director, Lamar A. Ozley, 512-581-0895.

PUBLIC NOTICE
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1st Floor Courtroom
Lee County Courthouse
200 S Main Street
Giddings, TX 78942

BASTROP INDEPENDENT SCHOOL DISTRICT
906 FARM STREET
BASTROP, TEXAS 78602
(512) 321-2292

Bastrop Independent School District is extending invitations in order to secure a list of contractors who can provide materials and installation for a Wireless Temperature Monitoring System for cafeterias located within Bastrop ISD. Submit in writing the name, address, telephone number, fax number, and email address of the person(s) authorized by your company to provide competitive price

Legal

BASTROP INDEPENDENT SCHOOL DISTRICT
906 Farm Street
Bastrop, Texas 78602
(512) 321-2292

The Bastrop Independent School District is soliciting prospective vendors for future formal quotations and bids/proposals on categories of personal property as required by Section 44.033 of the Texas Education Code.

A vendor application may be obtained by contacting Bastrop ISD Purchasing, 906 Farm Street, Bastrop, Texas 78602, telephone (512) 321-2292, or via e-mail to cbarron@bastrop.isd.tenet.edu.

The following categories of personal property may be purchased during the 2008-2009 school year:

Custodial: Chemicals, janitorial supplies, paper products & dispensers, trash disposal, pest control supplies & services, various related supplies, equipment, and services.

Instructional: Office and school furniture & supplies, art supplies, art paper, audio visual supplies & equipment, audio visual equipment repair, science supplies & equipment, music supplies & equipment, band instruments, band instrument repair, PE supplies & equipment, teaching & instructional supplies, and athletic supplies & equipment.

Maintenance: Glass replacement & supplies, electrical & lighting supplies and services, lumber, hardwood laminate and related materials, HVAC parts/supplies and equipment, air filters, plumbing supplies, roofing supplies, painting supplies and equipment, flooring supplies, lawn mowers and tractor supplies and services, fire extinguishers and services, fence materials, masonry materials, asphalt materials and services, drainage/dirt work materials and services, gym floor refinishing, locker parts and services, tires, batteries, equipment/vehicle repair parts and services, lubricants & oils, grease trap pumping, equipment rentals, and signage.

Transportation: Gasoline and diesel fuel

Miscellaneous: General office

Legal

or promotional items, apparel and/or equipment for band, cheerleaders, color guard, and dance/drill team, and contracted services.

PUBLIC NOTICE

The City of Bastrop has updated our unclaimed property list. This information may be obtained by visiting our website at www.cityofbastrop.org.

Notice for Publication
NOTICE OF APPLICATION FOR CERTIFICATE OF CONVENIENCE AND NECESSITY (CCN) TO PROVIDE WATER UTILITY SERVICE IN BASTROP COUNTY

Aqua Water Supply Corporation has filed an application to decertify a portion of CCN No. 10294 with the Texas Commission on Environmental Quality to provide water utility service in Bastrop County.

The proposed utility service area is located approximately 3 miles northwest of downtown Bastrop on Highway FM 969 and is generally bounded approximately 1 1/4 miles north of State Highway 71; on the east by the Colorado River; on the south by State Highway 71; and on the west by approximately 37 miles east of FM 969. The total area being requested includes approximately 203.230 acres and has 0 current customers.

A copy of the proposed service area map is available a Armbrust & Brown, L.L.P., 100 Congress Avenue, Suite 1300 Austin, Texas 78701. Telephone: (512) 435-2300.

A request for a public hearing must be in writing. You mus state (1) your name, mailing address, and daytime telephone number; (2) the applicant's name, application number o another recognizable referenc to this application; (3) the statement, "I/we request a publi hearing"; (4) a brief descriptio of how you or the persons yo represent, would be adversel affected by the granting of th application for a CCN; and (5 your proposed adjustment t the application or CCN whic would satisfy your concern and cause you to withdraw you request for a hearing.

Persons who wish to interven

Affidavit of Publication

STATE OF TEXAS
COUNTY OF MATAGORDA

Before me, the undersigned authority, on this day personally appeared Susana Brito who on his/her oath stated: I am the Classified Representative of The Bay City Tribune, a newspaper published in Matagorda County, Texas, and know the facts herein stated to be true and correct: attached is a printed copy of publication of the notice/citation of which it purports to be a copy, as the same appeared in such newspaper in the respective issues of the 16th day of July.

Susana Brito
Classified Representative

ROSARIO RESENDEZ
MY COMMISSION EXPIRES
August 5, 2009

Sworn to before me this
22nd day of July 2008

Rosario Resendez
Notary Public in and for Matagorda County, Texas

6B The Bay City Tribune Wednesday, July 16, 2008

e-mail us your ad today
classified@baycitytribune.com

INVITATION TO BID ON VEGETATION

The Port of Bay City Authority is accepting sealed bi
contracts for vegetation control work at its properties
Texas and the Port of Bay City on FM 3057, approx.
of Bay City, Texas. Sealed bids must be delivered to
of the Port Of bay City, Texas 77414 by 5:00 p.m. or
late or faxed bids will not be accepted. The Port Auth
at its regular meeting at 7:00 p.m. on August 14, 200
work to the lowest and best bidder. Bidders may with
before 5:00 p.m., August 14, 2008, by submitting a w
withdrawel to the Port Authority's business office.

Work shall consist of mowing/shredding and/or spray
Port's discretion, approx. 390.8 acres, or part thereo
maps included with bid package. It is the responsibil
bidder to verify acreage and ground conditions and r
ly. Bidders may include cost-of-fuel escalator clause
Vegetation control will be ordered as needed throug
successful bidder will be given Notice To Proceed ea
will supply all necessary material and equipment to p
lined in bid specifications. On-site storage area for e
provided during job. All sealed bids must be accomp
Workman's Compensation with Statutory Coverages
General Liability Insurance with coverages of $2,000
$1,000,000 per claim/occurrence.

Bid specifications and maps of properties can be ob
ness office of the Port of Bay City, 1305 7th Street, B
77414. There will be a mandatory pre-bid meeting at
City, terminus of FM 3057 at 10:30 a.m. on August 6
specifications, site measures and location. The meet
ued at Matagorda to review those properties; bidders
portation.

Once Notice To Proceed has been issued to success
must be started within two weeks and finished in a re
of time. Failure to start within two weeks of Notice wi
$200 per day, unless delayed by weather. Once work
ed and accepted by Harbor Master, invoice may be s
ment will be made within 30 days of acceptance.

The Port of Bay City Authority reserves the right to wo
irregularities and to accept or reject any bid or bidder
be addressed to Craig Hlavinka, Harbor Master, at (9

NOTICE OF SALE

STATE OF TEXAS § BY VIRTUE OF AN OR
§
MATAGORDA COUNTY § DATED JUNE 27, 20

and issued pursuant to judgment decree(s) of the District Court of Matagorda County, T
said Court on said date, in the hereinafter numbered and styled suit(s) and to me direc

500 Trucks and Vans

1999 Oldsmobile mini van. Equipped w/ scooter chair & power lift. Leather interior. 134,000 mi. everything in good working condition. Fully loaded. 979-863-7357 or 979-429-6176

500 Trucks and Vans

86 Ford Dually. Show truck bew paint, new interior, new tires. $7500 Call 241-5267

96 Jeep Cherokee for sale. $2500 Good cond. A/C, CD player, new tires. 979-244-8899

510 Real Estate

WANTED, 1-2 year lease for executive home with water across the Colorado river with possible option to buy. Call Joy 408-660-0409

CLASSIFIED 245-5555

Call us today today to see how you can place your in Matagorda County's leading News Source. 979-245-5555

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THOMPSON LAND COMPANY
Lindsey Thompson
Realtor

Cattle Ranch w/minerals, Creek, VVISD
ice w/warehouse - $175,000
a original townsite corner lot, $89,000
Ranchettes. BCISD
Cattle & wildlife ranch. $2550/AC
w/3-2-2 Brick Home, Barn Collegeport - $320,000
50 Ac, 40 Ac Grass Farms
q. ft. warehouse, $168,000
cial Corner - Across from Whataburger
s Caney Creek - Cedar Lane - $250,000
River Lot Selkirk - $136,500
ront Lots Sargent - $105,000
ffice on 2 acres Nichols - $98,000
s/Developers: 450+/- Ac Next to Bay City
St - Build to Suit/Ground Lease
rime Cattle Ranch w/minerals - Midfield

t's Talk Land . . .

PUBLISHER'S AFFADAVIT

STATE OF TEXAS

COLORADO COUNTY

Before me, the undersigned authority, this day appeared Cindy Parkhurst

and after being by me duly sworn, says that she is the Publisher

of *The Colorado County Citizen*, a newspaper published in Colorado County, Texas, and that the notice, a copy of which is hereto attached, was published in said newspaper on the following dates:

July 16 A.D. 2008

C Parkhurst

SUBSCRIBE AND SWORN TO before me, this the 7 day of Aug A.D. 2008

JULIE MILBURN
NOTARY PUBLIC
STATE OF TEXAS
MY C... 03-22-2012

Julie Milburn

Notary Public in and for Colorado County, Texas

Legals Legals Legals Legals

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COPY

Texas Colorado River Floodplain Coalition

Public Notice - Addendum

STATE OF TEXAS

COUNTY OF WHARTON

Before me, the undersigned authority, on this day personally appeared **Chris Barbee**, the managing editor of the **El Campo Leader-News**, a newspaper having general circulation in Wharton County, Texas, who being by me duly sworn, deposes and says that the foregoing attached notice was published in said newspaper on the following date(s), to wit:

July 16

Subscribed and sworn to before me this

The 16th day of **July, 2008**.

to certify which witness my hand and seal of office.

Chris Barbee, Publisher

PENNY JANAK
Notary Public, State of Texas
My Commission Expires
March 11, 2010

Penny Janak

Notary Public in and for
Wharton County, Texas

2 Special Notices | 172 Special Notices | 172 Special Notices

Wharton County Junior College
Surplus Auction

911 Boling Highway Wharton, Texas 77488

Saturday, July 19, 2008

VIEWING 8:30 A.M. AUCTION 10 A.M.

LOCATION: Maintenance Department

Items of Interest: This is only a partial listing of items in the auction. '95 Bluebird Bus 88,000 miles--40 Passenger--New AC (Reserve--subject to approval), 1990 Ambulance, 18 Passenger Van, Honda 4 Wheeler, Riding Lawn Mower, Lockers, Scrap Metal, Cosmetology Carts, Drafting Tables, Tarps, Air Hockey Table, Microscopes, Exercise Bike, Vertical Blinds, Filing Cabinets, Old Maps, Office Chairs, Computers, Overhead Projectors, Tables, Folding Tables, Folding Chairs, Air Conditioning Unit, Pallets, TV's, TV Cart, Metal Patio Furniture, 9 Metal Lathes, 5 Drill Press Milling Machines, Drill Press UCIMU Made in Italy, Sheet Metal Break

Moore's Hillje Auction

Auctioneer: James M. Moore #12824

Phone 979-543-5340 (Home) E-Mail jmmoore65@sbcglobal.net

979-648-2176 (Day of Auction) 979-541-6227 (Cell)

www.mooreshilljeauction.com

MasterCard and Visa No Buyers Premium No Minimums

Concessions A/C A Little Country Auction

Going to Coushatta

Saturday, July 26

Leave New Wal-Mart in El Campo at 6 a.m.

$18.00 per person

Call Mary or J.W.

979-543-1084

Defensive Driving Class

Forrest Newton, Instructor

Helen Johnson, Instructor

at El Campo Civic Center

Saturday, July 19th

7:45 a.m. till 2:30 p.m.

For more information Call

979-543-4674

or 979-543-8181

Ticket Dismissal & Insurance Discount

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175 Public Notices

NOTICE TO CREDITORS

Notice is hereby given that original Letters Testamentary for the Estate of HOMER R. TAYLOR, Deceased, were issued on July 8, 2008. in Cause No. 13,573, pending in the County Court of Wharton County, Texas, to: Pat Ann Baca Taylor.

All persons having claims against this Estate which is currently being administered are required to present them to the undersigned within the time and in the manner prescribed by law.

Pat Ann Baca Taylor
502 Avenue A
El Campo, Texas 77437

Dated the 14th day of July, 2008.

Paul Webb
State Bar No. 21023500
Paul Webb, P.C.
221 N. Houston Street
Wharton, Texas 77488

Moore's Hillje Auction

5 mi. S. of El Campo on Hwy 59 **Viewing 10:30 a.m.**
5 mi. N. of Louise on Hwy 59 **Auction 12:30 p.m.**

Sunday, July 20, 2008

Glassware/Pottery: McCoy, Fenton, Capodimonte, Sarah's Angels, Tiara, Czechoslovakia, Remington Plate,

Men's Corner: Deer Feeder, Humps—M-11, F 25X, M-5, Rods and Reels, Reflex Bow (Left Hand),

Furniture: Bed Frames, Wardrobe, Rocker, Dining Table

PUBLISHER'S AFFADAVIT

STATE OF TEXAS

COLORADO COUNTY

Before me, the undersigned authority, this day appeared Cindy Parkhurst and after being by me duly sworn, says that she is the Publisher of *The Colorado County Citizen*, a newspaper published in Colorado County, Texas, and that the notice, a copy of which is hereto attached, was published in said newspaper on the following dates:

July 16 A.D. 2008

C Parkhurst

SUBSCRIBE AND SWORN TO before me, this the 21 day of July A.D. 2008

JULIE WILBURN
NOTARY PUBLIC
STATE OF TEXAS
MY COMM. EXP. 02-22-2012

Julie Wilburn

Notary Public in and for Colorado County, Texas

Legals Legals Legals Legals

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Publisher's Affidavit

STATE OF TEXAS
County of McCulloch

Before me, the undersigned authority in and for said County and State, on this day personally appeared James Stewart, to me known, who after being by me first duly sworn on oath says: That he is editor of The Brady Standard-Herald, a newspaper of general circulation, published in the town of Brady, in McCulloch County, Texas, and which has been continuously and regularly published therein for a period of more than one year next before the first publication of the attached writ and notice; that the said writ and notice was printed and published in said newspaper once in each consecutive week for the period of time required, and on the following dates as appears from a printed copy thereof attached. 10/22

Witness my hand this 10th day of November 2008.

James Stewart, Editor

Subscribed and sworn to before me by James Stewart
on this date: 11-10-08.

JAMES HOLLOWAY
Notary Public
STATE OF TEXAS
My Commission
Expires 08/20/2012

Printer's Fee $ 25.00

Notary Public in and for McCulloch County, Texas

Jimmie Holloway

PUBLIC NOTICE

Counties of Lampasas, Mills, San Saba and the communities within and the City of Brady

The hazard identification process is not complete without your feedback!

The public is invited and encouraged to attend.

When: November 10, 2008
5:30-6:30 p.m.

Where: Council Chambers
303 South Clear
San Saba, TX
76877

What: Hazard Mitigation Plan

The purpose of this open meeting is to update the community on our progress in developing the plan and to solicit information that can help the project team in identifying and analyzing hazards affecting residents of the participating jurisdictions and in recommending possible actions that can be taken to reduce the impact of those hazards.

To find out more information visit our Web site at www.tcrfc.org.

PUBLISHER'S AFFIDAVIT

STATE OF TEXAS,
COUNTY OF FAYETTE

Before me, the undersigned authority, on this day personally appeared Larry C. Jackson of **The Fayette County Record,** a twice-weekly newspaper of general circulation, which has been continuously and regularly published for a period of not less than one year in said State and County, who after being duly sworn by me, upon his oath deposes and says that he is publisher of said newspaper, and that the attached Notice or Citation was published in said newspaper **The Fayette County Record** and that said publication was made on the following date:

10-28 2008

Printed copy of said Notice or Citation is hereto attached.

Larry Jackson
Publisher
The Fayette County Record.

Sworn to and subscribed before me, this the 5th day of November, A.D. 2008.

Aileen Loehr
Notary Public in and for
Fayette County, Texas

AILEEN LOEHR
Notary Public, State of Texas
My Commission Expires
OCTOBER 28, 2012

(SEAL)

Thursday, November 6th 2008 for:

Limestone Commercial Base, Grade 3, Grade 4, and Grade 5
Structural Select Limestone
2-1/2" Limestone
Hauling of Road Material
Road Oil (MC 30, AE-P, AC 5, MS-1, CRS 2)

Specifications can be obtained from:

Fayette County
Auditor's Office
Attn: Kathy Kleiber
151 N. Washington, Room 108
La Grange, Texas 78945
979-968-3055

Bids must conform to specifications and will not be returned. All rights reserved.
(101-2wc)

LEGAL NOTICE:
These Texas Lottery Commission Scratch-Off games will close on November 24, 2008. You have until May 23, 2009,

Sealed proposals for contracts listed below will be received by TxDOT until the date(s) shown below, and then publicly read.

CONSTRUCTION/MAINTENANCE/BUILDING FACILITIES CONTRACT(S)

Dist/Div: Yoakum
Contract 6183-32-001 for REHAB ROADWAY in FAYETTE County will be opened on December 05, 2008 at 1:00 pm at the State Office for an estimate of $525,978.10.
Contract 6187-27-001 for CRACK SEAL ON VARIOUS ROADWAYS in FAYETTE County will be opened on November 25, 2008 at 1:30 pm at the District Office for an estimate of $90,350.00.

Plans and specifications are available for inspection, along with bidding proposals, and applications for the TxDOT Prequalified Contractor's list, at the applicable State and/or Dist/Div Offices listed below. If applicable, bidders must submit prequalification information to TxDOT at least 10

on, and consider re-adopt
and approval of, the propo
Management Plan at the I
trict's public Board meet
that is scheduled for Mon
November 3, 2008 at 8:30 a
at the Fayette County Agri
tural Building, 255 Svob
Lane, Conference Room 1
La Grange, Texas. At s
time the Board of Direc
will discuss and may take
action that it may determ
would be appropriate on e
item on the following agen

PUBLIC HEARING AGENDA

1. Call to order.
2. Public comment on t District's proposed revisions to the Management Plan.
3. Consider and take appropriate action on the District's propose revisions to the Management Plan.
4. Adjournment.

Copies of the District's
posed revised Managen
Plan are available for pu
viewing at the District's O
located at 255 Svoboda L
Room 115, La Grange, T
78945 during the office h
of 8:00 a.m. to 3:00 p.m. M
day through Friday. It is
available for viewing on
District's website, www.fa
tecountygroundwater.com.

Any person wishing to c
ment on the District's prop
revisions to the Manager
Plan should place such c
ments in writing to be rece
at the District Office by c
of business at 3 p.m. on
day, October 31, 2008. Ve
comments regarding the
posed revisions to the M
agement Plan will be acce
by the Board during the Pu
Hearing on Monday, Nov
ber 3, 2008 at 8:30 a.m.
(103

Counties of Matagorda, Wharton, Colorado, and Fayette and the communities within

THE HAZARD IDENTIFICATION PROCESS IS NOT COMPLETE WITHOUT YOUR FEEDBACK!

THE PUBLIC IS INVITED AND ENCOURAGED TO ATTEND.

WHEN: NOVEMBER 12, 2008
5:30–6:30 P.M.

WHERE: CANEY CHURCH
118 MILAM STREET
WHARTON, TX 77488

WHAT: HAZARD MITIGATION PLAN UPDATE

WHY: THE PUBLIC'S INPUT IS CRUCIAL

The Texas Colorado River Floodplain Coalition (TCRFC or Coalition) will hold the second in a series of public meetings as part of the Coalition's ongoing efforts to update the 2004 Hazard Mitigation Plan. The purpose of this open meeting is to update the community on our progress in developing the plan and to solicit information that can help the project team in identifying and analyzing hazards affecting residents of the participating jurisdictions and in recommending possible actions that can be taken to reduce the impact of those hazards.

To find out more information about this initiative or if you cannot attend the public meeting, information about the planning process and a public participation survey are available at www.tcrfc.org

Misti Wilson

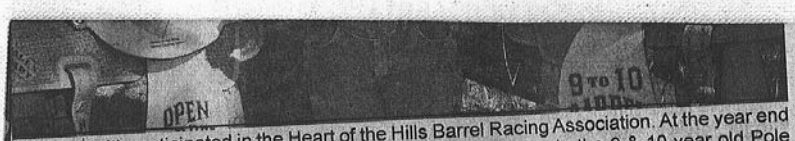
From: Roy Fyffe [rfyffe@cityofburnet.com]
Sent: Tuesday, October 21, 2008 10:13 AM
To: TX Colorado River Floodplain Coalition
Subject: Hazard Mitigation Plan Update

Good Morning, Misti:

We have taken the flyer announcing the update meeting for the Hazard Mitigation Plan (12 Nov 08) and posted it in several of the local banks, the public library, Chamber office and will be publishing a copy in the local Burnet Bulletin.

Roy L Fyffe
Building Official
City of Burnet, TX
(512) 756-6093, Ext 211

1



Steeley Smith participated in the Heart of the Hills Barrel Racing Association. At the year end awards banquet she received a buckle for Reserve Champion in the 9 & 10 year old Pole Bending division. She won a saddle in the 9 & 10 year old Barrel division that was donated by Mason Feed Store. She won a saddle in the Open Barrels for her first place in the 3-D division that was donated by Pedernales Veterinary.

Counties of Blanco, Burnet, Llano, and Mason and the communities within

THE HAZARD IDENTIFICATION PROCESS IS NOT COMPLETE WITHOUT YOUR FEEDBACK!

THE PUBLIC IS INVITED AND ENCOURAGED TO ATTEND.

WHEN: NOVEMBER 12, 2008
5:30–6:30 P.M.

WHERE: LAKESIDE PAVILION
307 BUENA VISTA
MARBLE FALLS, TX 78654

WHAT: HAZARD MITIGATION PLAN UPDATE

WHY: THE PUBLIC'S INPUT IS CRUCIAL

The Texas Colorado River Floodplain Coalition (TCRFC or Coalition) will hold the second in a series of public meetings as part of the Coalition's ongoing efforts to update the 2004 Hazard Mitigation Plan. The purpose of this open meeting is to update the community on our progress in developing the plan and to solicit information that can help the project team in identifying and analyzing hazards affecting residents of the participating jurisdictions and in recommending possible actions that can be taken to reduce the impact of those hazards.

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STATE OF TEXAS
COUNTY OF WHARTON

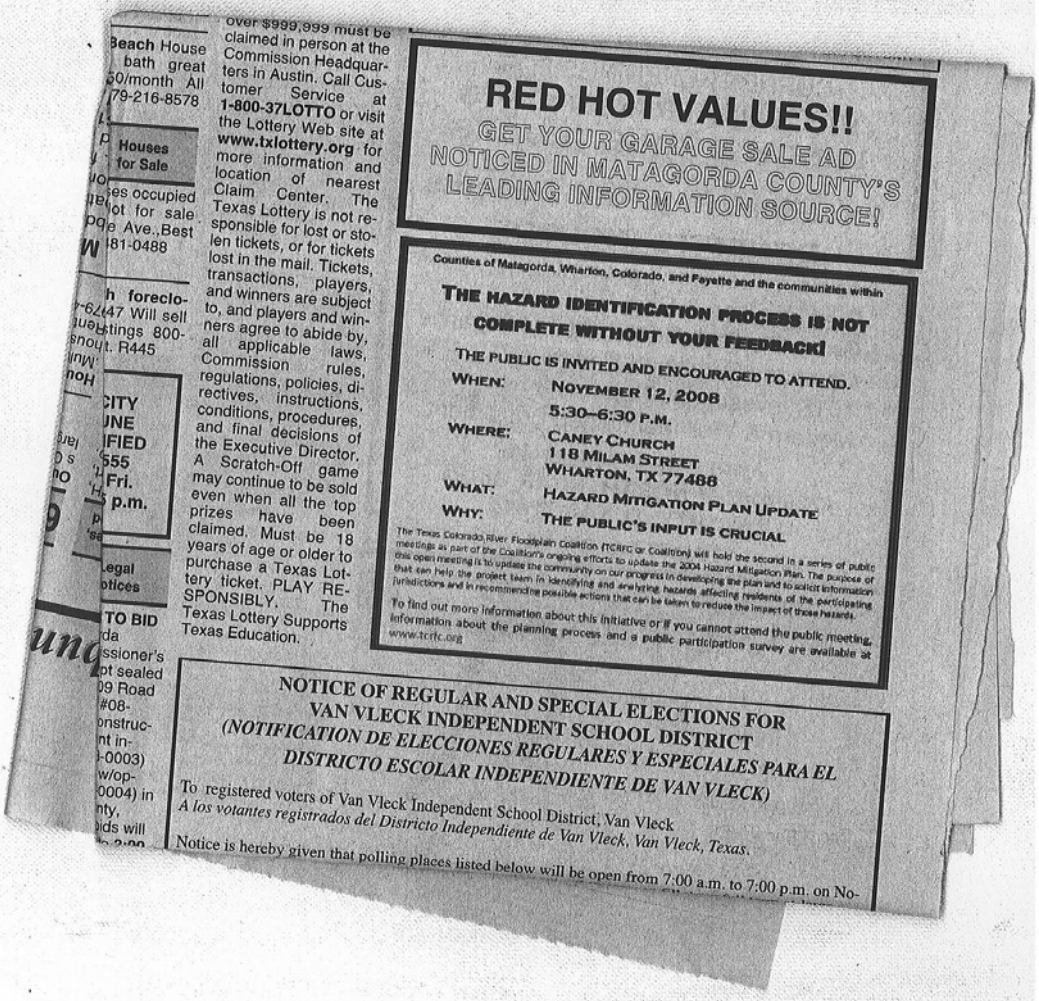
Before me, the undersigned authority, on this day personally appeared *Frances M. Deiterich*, the *Office Manager* (TITLE) of the *Wharton Journal-Spectator* (NAME OF NEWSPAPER), a newspaper having general circulation in Wharton County, Texas, who being by me duly sworn, deposes and says that the foregoing attached notice was published in said newspaper on the following dates, to wit: October 29, 2008.

Frances M Deiterich

Subscribed and sworn to before me this the 5th day of November, 2008, to certify which witness my hand and seal of office.

HELEN F. SEVIER NOTARY PUBLIC STATE OF TEXAS EXPIRES 01-10-2011

Helen F. Sevier
Notary Public in and for
Wharton County, Texas



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over $999,999 must be claimed in person at the Commission Headquarters in Austin. Call Customer Service at **1-800-37LOTTO** or visit the Lottery Web site at **www.txlottery.org** for more information and location of nearest Claim Center. The Texas Lottery is not responsible for lost or stolen tickets, or for tickets lost in the mail. Tickets, transactions, players, and winners are subject to, and players and winners agree to abide by, all applicable laws, Commission rules, regulations, policies, directives, instructions, conditions, procedures, and final decisions of the Executive Director. A Scratch-Off game may continue to be sold even when all the top prizes have been claimed. Must be 18 years of age or older to purchase a Texas Lottery ticket. PLAY RESPONSIBLY. The Texas Lottery Supports Texas Education.

RED HOT VALUES!!
GET YOUR GARAGE SALE AD NOTICED IN MATAGORDA COUNTY'S LEADING INFORMATION SOURCE!

Counties of Matagorda, Wharton, Colorado, and Fayette and the communities within

THE HAZARD IDENTIFICATION PROCESS IS NOT COMPLETE WITHOUT YOUR FEEDBACK!

THE PUBLIC IS INVITED AND ENCOURAGED TO ATTEND.

WHEN: NOVEMBER 12, 2008
5:30–6:30 P.M.

WHERE: CANEY CHURCH
118 MILAM STREET
WHARTON, TX 77488

WHAT: HAZARD MITIGATION PLAN UPDATE

WHY: THE PUBLIC'S INPUT IS CRUCIAL

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To find out more information about this initiative or if you cannot attend the public meeting, information about the planning process and a public participation survey are available at www.tcrfc.org

NOTICE OF REGULAR AND SPECIAL ELECTIONS FOR VAN VLECK INDEPENDENT SCHOOL DISTRICT
(NOTIFICATION DE ELECCIONES REGULARES Y ESPECIALES PARA EL DISTRICTO ESCOLAR INDEPENDIENTE DE VAN VLECK)

To registered voters of Van Vleck Independent School District, Van Vleck
A los votantes registrados del Districto Independiente de Van Vleck, Van Vleck, Texas.

Notice is hereby given that polling places listed below will be open from 7:00 a.m. to 7:00 p.m. on No-

Appendix F– Critical Facilities Analyzed in TCRFC Generated by HAZUS-MH

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
BASTROP	BASTROP	BASTROP COUNTY J J A E P	SCHOOL	474.54
BASTROP	BASTROP	BASTROP H S	SCHOOL	15,004.95
BASTROP	BASTROP	BASTROP INT	SCHOOL	9,177.60
BASTROP	BASTROP	BASTROP MIDDLE	SCHOOL	9,082.70
BASTROP	BASTROP	EMILE EL	SCHOOL	6,225.96
BASTROP	BASTROP	GENESIS H S	SCHOOL	550.47
BASTROP	BASTROP	HILL STREET EL	SCHOOL	3,018.07
BASTROP	BASTROP	MINA EL	SCHOOL	5,181.98
BASTROP	BASTROP	PINE STREET ALTER	SCHOOL	474.54
BASTROP	BASTROP	BASTROP COUNTY FIRE FIGHTERS	FIRE STATION	534
BASTROP	BASTROP	BASTROP FIRE DEPARTMENT	FIRE STATION	534
BASTROP	BASTROP	FIVE POINTS VFD	FIRE STATION	534
BASTROP	BASTROP	BASTROP POLICE DEPT	POLICE STATION	1,246.00
BASTROP	BASTROP	COUNTY SHERIFF	POLICE STATION	1,246.00
BASTROP	COUNTY	CIRCLE D VFD	FIRE STATION	534
BASTROP	COUNTY	LAKE BASTROP VFD	FIRE STATION	534
BASTROP	COUNTY	BASTROP NAZARENE CHRISTIAN	SCHOOL	949.08
BASTROP	COUNTY	GATEWAY SCH	SCHOOL	512.5

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
BASTROP	ELGIN	B T WASHINGTON MIDDLE	SCHOOL	6,206.98
BASTROP	ELGIN	ELGIN H S	SCHOOL	7,213.01
BASTROP	ELGIN	ELGIN PRI	SCHOOL	8,019.73
BASTROP	ELGIN	GREENBRIAR SCHOOL	SCHOOL	474.54
BASTROP	ELGIN	PHOENIX LRN CTR	SCHOOL	474.54
BASTROP	ELGIN	ELGIN FIRE DEPARTMENT	FIRE STATION	534
BASTROP	ELGIN	ELGIN FIRE STATION	FIRE STATION	534
BASTROP	ELGIN	ELGIN POLICE DEPT	POLICE STATION	1,246.00
BASTROP	ELGIN	SHERIFF'S SUB STATION	POLICE STATION	1,246.00
BASTROP	ELGIN	ELGIN EL	SCHOOL	3,805.81
BASTROP	ELGIN	ELGIN S D A JR ACADEMY	SCHOOL	474.54
BASTROP	SMITHVILLE	SMITHVILLE REGIONAL HOSPITAL	MEDICAL CARE FACILITY	4,697.75
BASTROP	SMITHVILLE	BASTROP DEPUTY SHERIFF'S OFC	POLICE STATION	1,246.00
BASTROP	SMITHVILLE	SMITHVILLE COMMUNITY	POLICE STATION	1,246.00
BASTROP	SMITHVILLE	SMITHVILLE POLICE DEPT	POLICE STATION	1,246.00
BASTROP	SMITHVILLE	BROWN PRI	SCHOOL	5,988.69
BASTROP	SMITHVILLE	SMITHVILLE EL	SCHOOL	3,758.36
BASTROP	SMITHVILLE	SMITHVILLE H S	SCHOOL	4,441.69
BASTROP	SMITHVILLE	SMITHVILLE J H	SCHOOL	2,590.99
BLANCO	BLANCO	HENLY VFD	FIRE STATION	534
BLANCO	BLANCO	BLANCO EL	SCHOOL	4,119.01

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
BLANCO	BLANCO	BLANCO H S	SCHOOL	2,790.30
BLANCO	BLANCO	BLANCO MIDDLE	SCHOOL	1,879.18
BLANCO	JOHNSON CITY	JOHNSON CITY FIRE DEPT	FIRE STATION	534
BLANCO	JOHNSON CITY	SHERIFF'S OFFICE	POLICE STATION	1,246.00
BLANCO	JOHNSON CITY	LYNDON B JOHNSON EL	SCHOOL	2,258.81
BLANCO	JOHNSON CITY	LYNDON B JOHNSON H S	SCHOOL	2,021.54
BLANCO	JOHNSON CITY	LYNDON B JOHNSON MIDDLE	SCHOOL	1,983.58
BROWN	BROWNWOOD	BROWNWOOD REGIONAL	MEDICAL CARE FACILITY	33,275.73
BROWN	BROWNWOOD	BROWNWOOD FIRE DEPT	FIRE STATION	534
BROWN	BROWNWOOD	BROWNWOOD FIRE STATION	FIRE STATION	534
BROWN	BROWNWOOD	DAM VFD	FIRE STATION	534
BROWN	BROWNWOOD	FIRE MARSHALL	FIRE STATION	534
BROWN	BROWNWOOD	BROWNWOOD POLICE DEPT	POLICE STATION	1,246.00
BROWN	BROWNWOOD	CRIME STOPPERS INC	POLICE STATION	1,246.00
BROWN	BROWNWOOD	BROWNWOOD A E P	SCHOOL	474.54
BROWN	BROWNWOOD	BROWNWOOD H S	SCHOOL	9,936.87
BROWN	BROWNWOOD	BROWNWOOD INT	SCHOOL	5,352.81
BROWN	BROWNWOOD	BROWNWOOD MIDDLE	SCHOOL	5,798.88
BROWN	BROWNWOOD	CAREER PREP	SCHOOL	474.54
BROWN	BROWNWOOD	CAREER PREP H S	SCHOOL	920.61
BROWN	BROWNWOOD	COGGIN EL	SCHOOL	1,993.07

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
BROWN	BROWNWOOD	EAST EL	SCHOOL	1,974.09
BROWN	BROWNWOOD	LIVING WORD CHRISTIAN ACADEMY	SCHOOL	474.54
BROWN	BROWNWOOD	NORTHWEST EL	SCHOOL	4,641.00
BROWN	BROWNWOOD	SOUTH EL	SCHOOL	2,980.11
BROWN	BROWNWOOD	WOODLAND HEIGHTS EL	SCHOOL	3,805.81
BURNET	BERTRAM	BERTRAM EL	SCHOOL	2,733.35
BURNET	BURNET	BURNET FIRE DEPT	FIRE STATION	534
BURNET	BURNET	SETON HIGHLAND LAKES	MEDICAL CARE FACILITY	5,089.23
BURNET	BURNET	BURNET COUNTY SHERIFF	POLICE STATION	1,246.00
BURNET	BURNET	BURNET HS CRIMESTOPPERS	POLICE STATION	1,246.00
BURNET	BURNET	BURNET POLICE DEPT	POLICE STATION	1,246.00
BURNET	BURNET	BURNET EL	SCHOOL	6,150.04
BURNET	BURNET	BURNET H S	SCHOOL	7,127.59
BURNET	BURNET	BURNET MIDDLE	SCHOOL	6,330.36
BURNET	BURNET	HIGHLAND LAKES ACHIEVEMENT	SCHOOL	4,555.58
BURNET	BURNET	QUEST	SCHOOL	588.43
BURNET	COTTONWOOD SHORES	COTTONWOOD SHORES FIRE DEPT	FIRE STATION	534
BURNET	COTTONWOOD SHORES	COTTONWOOD SHORES	POLICE STATION	1,246.00
BURNET	COUNTY	EAST LAKE BUCAHANAN FIRE	FIRE STATION	534

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
		DEPT		
BURNET	COUNTY	OAKALLA VFD	FIRE STATION	534
BURNET	COUNTY	BURNET COUNTY CRIMESTOPPERS	POLICE STATION	1,246.00
BURNET	COUNTY	SHADY GROVE EL	SCHOOL	2,913.68
BURNET	GRANITE SHOALS	VFD	FIRE STATION	534
BURNET	GRANITE SHOALS	HIGHLAND LAKES EL	SCHOOL	5,001.65
BURNET	MARBLE FALLS	GRANITE SHOALS FIRE DEPT	FIRE STATION	534
BURNET	MARBLE FALLS	MARBLE FALLS FIRE DEPT	FIRE STATION	534
BURNET	MARBLE FALLS	NORTH SHORE FIRE & RESCUE SVC	FIRE STATION	534
BURNET	MARBLE FALLS	MARBLE FALLS POLICE DEPT	POLICE STATION	1,246.00
BURNET	MARBLE FALLS	MARBLE FALLS POLICE-ANIMAL	POLICE STATION	1,246.00
BURNET	MARBLE FALLS	MARBLE FALLS EL	SCHOOL	5,134.52
BURNET	MARBLE FALLS	MARBLE FALLS H S	SCHOOL	9,386.40
BURNET	MARBLE FALLS	MARBLE FALLS MIDDLE	SCHOOL	7,763.47
BURNET	MARBLE FALLS	MARBLE FALLS PRI	SCHOOL	5,476.19
BURNET	MARBLE FALLS	ST PETERS LUTHERAN	SCHOOL	474.54
COLORADO	COLUMBUS	COLORADO AMBULANCE EMERG	FIRE STATION	534
COLORADO	COLUMBUS	COLUMBUS FIRE DEPT	FIRE STATION	534

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
COLORADO	COLUMBUS	COLUMBUS COMMUNITY HOSP	MEDICAL CARE FACILITY	7,046.63
COLORADO	COLUMBUS	COLORADO JUSTICE OF PEACE	POLICE STATION	1,246.00
COLORADO	COLUMBUS	COLORADO COUNTY SHERIFF	POLICE STATION	1,246.00
COLORADO	COLUMBUS	COLUMBUS POLICE DEPT	POLICE STATION	1,246.00
COLORADO	COLUMBUS	COLUMBUS EL	SCHOOL	7,915.33
COLORADO	COLUMBUS	COLUMBUS H S	SCHOOL	5,362.30
COLORADO	COLUMBUS	COLUMBUS J H	SCHOOL	2,410.66
COLORADO	COLUMBUS	SAINT ANTHONY SCHOOL	SCHOOL	1,376.17
COLORADO	EAGLE LAKE	EAGLE LAKE FIRE DEPT	FIRE STATION	534
COLORADO	EAGLE LAKE	ROCK ISLAND VFD	FIRE STATION	534
COLORADO	EAGLE LAKE	RICE MEDICAL CENTER	MEDICAL CARE FACILITY	4,893.49
COLORADO	EAGLE LAKE	EAGLE LAKE CRIME STOPPERS INC	POLICE STATION	1,246.00
COLORADO	EAGLE LAKE	EAGLE LAKE POLICE DEPT	POLICE STATION	1,246.00
COLORADO	EAGLE LAKE	EAGLE LAKE MIDDLE	SCHOOL	3,075.02
COLORADO	EAGLE LAKE	EAGLE LAKE PRI	SCHOOL	2,980.11
COLORADO	WEIMAR	WEIMAR FIRE DEPT	FIRE STATION	534
COLORADO	WEIMAR	COLORADO-FAYETTE MED CENTER	MEDICAL CARE FACILITY	7,438.10
COLORADO	WEIMAR	WEIMAR CITY POLICE	POLICE STATION	1,246.00
COLORADO	WEIMAR	ST MICHAEL ELEMENTARY SCHOOL	SCHOOL	1,357.18

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
COLORADO	WEIMAR	WEIMAR EL	SCHOOL	2,638.44
COLORADO	WEIMAR	WEIMAR H S	SCHOOL	2,268.30
COLORADO	WEIMAR	WEIMAR J H	SCHOOL	1,395.15
FAYETTE	CARMINE	CARMINE H S	SCHOOL	1,138.90
FAYETTE	FLATONIA	FLATONIA FIRE DEPT	FIRE STATION	534
FAYETTE	FLATONIA	FAYETTE COUNTY POLICE DEPT	POLICE STATION	1,246.00
FAYETTE	FLATONIA	FLATONIA POLICE DEPT	POLICE STATION	1,246.00
FAYETTE	FLATONIA	FLATONIA EL	SCHOOL	2,913.68
FAYETTE	FLATONIA	FLATONIA H S	SCHOOL	2,543.53
FAYETTE	LA GRANGE	LA GRANGE FIRE DEPT	FIRE STATION	534
FAYETTE	LA GRANGE	FAYETTE MEMORIAL HOSPITAL	MEDICAL CARE FACILITY	8,808.28
FAYETTE	LA GRANGE	FAYETTE COUNTY SHERIFF	POLICE STATION	1,246.00
FAYETTE	LA GRANGE	LA GRANGE CHIEF OF POLICE	POLICE STATION	1,246.00
FAYETTE	LA GRANGE	HERMES EL	SCHOOL	5,295.87
FAYETTE	LA GRANGE	LA GRANGE H S	SCHOOL	6,045.64
FAYETTE	LA GRANGE	LA GRANGE INT	SCHOOL	3,644.47
FAYETTE	LA GRANGE	LA GRANGE MIDDLE	SCHOOL	3,075.02
FAYETTE	LA GRANGE	SACRED HEART SCHOOL	SCHOOL	1,784.27
LAMPASAS	KEMPNER	KEMPNER VFD	FIRE STATION	534
LAMPASAS	LAMPASAS	LAMPASAS FIRE DEPT	FIRE STATION	534
LAMPASAS	LAMPASAS	LAMPASAS CNTY SHERIFF'S OFFICE	POLICE STATION	1,246.00

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
LAMPASAS	LAMPASAS	LAMPASAS POLICE DEPT	POLICE STATION	1,246.00
LAMPASAS	LAMPASAS	CHALLENGER H S	SCHOOL	474.54
LAMPASAS	LAMPASAS	FIRST BAPTIST CHURCH PRESCH	SCHOOL	692.83
LAMPASAS	LAMPASAS	HANNA SPRINGS INT	SCHOOL	9,073.20
LAMPASAS	LAMPASAS	LAMPASAS H S	SCHOOL	9,348.44
LAMPASAS	LAMPASAS	LAMPASAS MIDDLE	SCHOOL	5,134.52
LAMPASAS	LAMPASAS	RESIDENTIAL TREAT CTR	SCHOOL	474.54
LAMPASAS	LAMPASAS	WHITIS EL	SCHOOL	6,691.01
LAMPASAS	LOMETA	LOMETA VFD	FIRE STATION	534
LAMPASAS	LOMETA	CEDAR RIDGE CHARTER SCHOOL	SCHOOL	474.54
LAMPASAS	LOMETA	LOMETA SCHOOL	SCHOOL	2,790.30
LEE	GIDDINGS	GIDDINGS FIRE DEPT	FIRE STATION	534
LEE	GIDDINGS	GIDDINGS POLICE DEPT	POLICE STATION	1,246.00
LEE	GIDDINGS	LEE COUNTY SHERIFF'S OFFICE	POLICE STATION	1,246.00
LEE	GIDDINGS	GIDDINGS EL	SCHOOL	5,552.12
LEE	GIDDINGS	GIDDINGS H S	SCHOOL	5,447.72
LEE	GIDDINGS	GIDDINGS INT	SCHOOL	3,359.74
LEE	GIDDINGS	GIDDINGS MIDDLE	SCHOOL	2,144.92
LEE	GIDDINGS	IMMANUEL LUTHERAN SCHOOL	SCHOOL	1,471.07
LEE	GIDDINGS	KNOX LEARNING CTR	SCHOOL	474.54

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
LEE	GIDDINGS	ST JOHN LUTHERAN SCHOOL	SCHOOL	559.96
LEE	GIDDINGS	ST PAUL LUTHERAN SERBIN	SCHOOL	711.81
LEE	LEXINGTON	LEXINGTON POLICE DEPT	POLICE STATION	1,246.00
LEE	LEXINGTON	LEXINGTON EL	SCHOOL	1,917.14
LEE	LEXINGTON	LEXINGTON H S	SCHOOL	2,989.60
LEE	LEXINGTON	LEXINGTON MIDDLE	SCHOOL	2,534.04
LEE	LEXINGTON	LEXINGTON PRI	SCHOOL	1,993.07
LLANO	COUNTY	BUCHANAN VFD	FIRE STATION	534
LLANO	COUNTY	TOW VFD	FIRE STATION	534
LLANO	HORSESHOE BAY	LAKE LBJ FIRE STATION 2	FIRE STATION	534
LLANO	HORSESHOE BAY	POLICE DEPT	POLICE STATION	1,246.00
LLANO	LLANO	LLANO FIRE HALL	FIRE STATION	534
LLANO	LLANO	VFD	FIRE STATION	534
LLANO	LLANO	LLANO MEMORIAL HEALTHCARE	MEDICAL CARE FACILITY	5,872.19
LLANO	LLANO	LLANO COUNTY SHERIFF	POLICE STATION	1,246.00
LLANO	LLANO	LLANO POLICE DEPT	POLICE STATION	1,246.00
LLANO	LLANO	LLANO EL	SCHOOL	6,387.31
LLANO	LLANO	LLANO H S	SCHOOL	4,403.73
LLANO	LLANO	LLANO J H	SCHOOL	3,919.70
LLANO	SUNRISE BEACH	SUNRISE BEACH VFD	FIRE STATION	534

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
MASON	MASON	MASON COUNTY SHERIFF OFC	POLICE STATION	1,246.00
MASON	MASON	MASON POLICE DEPT	POLICE STATION	1,246.00
MASON	MASON	MASON EL/J H	SCHOOL	3,615.99
MASON	MASON	MASON H S	SCHOOL	2,154.41
MATAGORDA	BAY CITY	BAY CITY FIRE DEPT	FIRE STATION	534
MATAGORDA	BAY CITY	BAY CITY FIRE MARSHALL	FIRE STATION	534
MATAGORDA	BAY CITY	MATAGORDA GENERAL HOSPITAL	MEDICAL CARE FACILITY	13,114.55
MATAGORDA	BAY CITY	BAY CITY POLICE DEPT	POLICE STATION	1,246.00
MATAGORDA	BAY CITY	MATAGORDA COUNTY SHERIFF	POLICE STATION	1,246.00
MATAGORDA	BAY CITY	SHERIFF'S OFFICE-INVESTIGATIVE	POLICE STATION	1,246.00
MATAGORDA	BAY CITY	BAY CITY H S	SCHOOL	11,996.37
MATAGORDA	BAY CITY	BAY CITY J H	SCHOOL	4,954.20
MATAGORDA	BAY CITY	CHERRY EL	SCHOOL	4,612.53
MATAGORDA	BAY CITY	HOLMES EL	SCHOOL	4,963.69
MATAGORDA	BAY CITY	HOLY CROSS SCHOOL	SCHOOL	1,575.47
MATAGORDA	BAY CITY	MATAGORDA CO J J A E P	SCHOOL	474.54
MATAGORDA	BAY CITY	MCALLISTER J H	SCHOOL	5,163.00
MATAGORDA	BAY CITY	PIERCE EL	SCHOOL	6,653.05
MATAGORDA	BAY CITY	ROBERTS EL	SCHOOL	4,194.93
MATAGORDA	COUNTY	MATAGORDA VFD	FIRE STATION	534

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
MATAGORDA	COUNTY	MATAGORDA EL	SCHOOL	787.74
MATAGORDA	PALACIOS	COLLEGEPORT VFD	FIRE STATION	534
MATAGORDA	PALACIOS	PALICIOS COMMUNITY MED CTR	MEDICAL CARE FACILITY	1,174.44
MATAGORDA	PALACIOS	SHERIFF'S OFFICE	POLICE STATION	1,246.00
MATAGORDA	PALACIOS	CENTRAL EL	SCHOOL	3,929.19
MATAGORDA	PALACIOS	EAST SIDE EL	SCHOOL	3,691.92
MATAGORDA	PALACIOS	MATAGORDA CO ALTER	SCHOOL	474.54
MATAGORDA	PALACIOS	PALACIOS H S	SCHOOL	4,707.44
MATAGORDA	PALACIOS	PALACIOS J H	SCHOOL	3,786.83
MCCULLOCH	BRADY	BRADY FIRE MARSHALL	FIRE STATION	534
MCCULLOCH	BRADY	FIRE HALL	FIRE STATION	534
MCCULLOCH	BRADY	HEART OF TEXAS MEM HOSPITAL	MEDICAL CARE FACILITY	5,284.97
MCCULLOCH	BRADY	MCCULLOCH COUNTY SHERIFF	POLICE STATION	1,246.00
MCCULLOCH	BRADY	BRADY EL	SCHOOL	4,973.18
MCCULLOCH	BRADY	BRADY H S	SCHOOL	3,454.65
MCCULLOCH	BRADY	BRADY MIDDLE SCHOOL	SCHOOL	3,350.25
MCCULLOCH	BRADY	NORTH WARD PRI	SCHOOL	1,328.71
MILLS	GOLDTHWAITE	MILLS COUNTY HIGHWAY PATROL	POLICE STATION	1,246.00
MILLS	GOLDTHWAITE	MILLS COUNTY SHERIFF'S DEPT	POLICE STATION	1,246.00
MILLS	GOLDTHWAITE	GOLDTHWAITE EL	SCHOOL	2,505.57

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
MILLS	GOLDTHWAITE	GOLDTHWAITE HIGH SCHOOL	SCHOOL	1,736.82
MILLS	GOLDTHWAITE	NEW HORIZONS RANCH	SCHOOL	664.36
SAN SABA	SAN SABA	SAN SABA FIRE DEPT	FIRE STATION	534
SAN SABA	SAN SABA	SHERIFF'S OFFICE	POLICE STATION	1,246.00
SAN SABA	SAN SABA	ALTER SCHOOL	SCHOOL	474.54
SAN SABA	SAN SABA	SAN SABA EL	SCHOOL	3,179.42
SAN SABA	SAN SABA	SAN SABA H S	SCHOOL	2,078.49
SAN SABA	SAN SABA	SAN SABA INT	SCHOOL	4,555.58
SAN SABA	SAN SABA	SAN SABA MIDDLE SCHOOL	SCHOOL	2,334.74
TRAVIS	JONESTOWN	EMERGENCY SERVICES DIST 7	FIRE STATION	534
TRAVIS	JONESTOWN	JONESTOWN VFD	FIRE STATION	534
TRAVIS	LAGO VISTA	SANDY CREEK VFD	FIRE STATION	534
TRAVIS	LAGO VISTA	TRAVIS COUNTY ESD 1	FIRE STATION	534
TRAVIS	LAGO VISTA	LAGO VISTA POLICE DEPT	POLICE STATION	1,246.00
TRAVIS	LAGO VISTA	LAGO VISTA EL	SCHOOL	3,796.32
TRAVIS	LAGO VISTA	LAGO VISTA H S	SCHOOL	2,372.70
TRAVIS	LAGO VISTA	LAGO VISTA MIDDLE	SCHOOL	2,125.94
TRAVIS	LAKEWAY	LAKEWAY EL	SCHOOL	474.54
TRAVIS	LAKEWAY	LAKEWAY POLICE DEPT	SCHOOL	3729.88
TRAVIS	MUSTANG RIDGE	MUSTANG RIDGE POLICE DEPT	POLICE STATION	1,246.00
TRAVIS	WEST LAKE HILLS	ROLLINGWOOD FIRE DEPT	FIRE STATION	534

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
TRAVIS	WEST LAKE HILLS	TRAVIS COUNTY EMERGENCY SVC	FIRE STATION	534
TRAVIS	WEST LAKE HILLS	TRAVIS COUNTY ESD#9	FIRE STATION	534
TRAVIS	WEST LAKE HILLS	WARRANT OFFICER	POLICE STATION	1246
TRAVIS	WEST LAKE HILLS	EANES EL	SCHOOL	5675.5
WHARTON	EAST BERNARD	EAST BERNARD FIRE DEPT	FIRE STATION	534
WHARTON	EAST BERNARD	EAST BERNARD VFD	FIRE STATION	534
WHARTON	EAST BERNARD	EAST BERNARD EL	SCHOOL	2,714.37
WHARTON	EAST BERNARD	EAST BERNARD H S	SCHOOL	2,609.97
WHARTON	EAST BERNARD	EAST BERNARD J H	SCHOOL	2,524.55
WHARTON	EL CAMPO	EL CAMPO FIRE DEPT	FIRE STATION	534
WHARTON	EL CAMPO	EL CAMPO MEMORIAL HOSPITAL	MEDICAL CARE FACILITY	8,221.06
WHARTON	EL CAMPO	EL CAMPO CITY POLICE DEPT	POLICE STATION	1,246.00
WHARTON	EL CAMPO	WHARTON COUNTY SHERIFF	POLICE STATION	1,246.00
WHARTON	EL CAMPO	EL CAMPO H S	SCHOOL	11,189.65
WHARTON	EL CAMPO	EL CAMPO MIDDLE	SCHOOL	8,010.24
WHARTON	EL CAMPO	HUTCHINS EL	SCHOOL	5,125.03
WHARTON	EL CAMPO	MYATT EL	SCHOOL	5,941.24
WHARTON	EL CAMPO	NORTHSIDE EL	SCHOOL	5,210.45
WHARTON	EL CAMPO	PRESBYTERIAN PRE-SCHOOL	SCHOOL	493.52

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
WHARTON	EL CAMPO	ST PHILIP CATHOLIC ELEM SCHOOL	SCHOOL	2,135.43
WHARTON	WHARTON	WHARTON FIRE DEPARTMENT	FIRE STATION	534
WHARTON	WHARTON	GULF COAST MEDICAL CENTER	MEDICAL CARE FACILITY	25,054.67
WHARTON	WHARTON	WHARTON POLICE DEPT	POLICE STATION	1,246.00
WHARTON	WHARTON	WHARTON SHERIFF'S OFC	POLICE STATION	1,246.00
WHARTON	WHARTON	C G SIVELLS EL	SCHOOL	5,722.95
WHARTON	WHARTON	C W DAWSON EL	SCHOOL	5,210.45
WHARTON	WHARTON	MINNIE MAE HOPPER EL	SCHOOL	2,723.86
WHARTON	WHARTON	ST THOMAS EPISCOPAL SCHOOL	SCHOOL	1,338.20
WHARTON	WHARTON	WHARTON H S	SCHOOL	7,791.95
WHARTON	WHARTON	WHARTON J H	SCHOOL	3,796.32
WILLIAMSON	CEDAR PARK	CEDAR PARK VFD	FIRE STATION	534
WILLIAMSON	CEDAR PARK	ADA MAE FAUBION EL	SCHOOL	7,440.79
WILLIAMSON	CEDAR PARK	CEDAR PARK H S	SCHOOL	11,996.37
WILLIAMSON	CEDAR PARK	CEDAR PARK MIDDLE	SCHOOL	14,331.11
WILLIAMSON	CEDAR PARK	CYPRESS EL	SCHOOL	6,368.33
WILLIAMSON	CEDAR PARK	CEDAR PARK FIRE DEPT	FIRE STATION	534
WILLIAMSON	CEDAR PARK	CITY OF CEDAR PARK FIRE DEPT	FIRE STATION	534
WILLIAMSON	CEDAR PARK	CEDAR PARK POLICE DEPT	POLICE STATION	1,246.00

COUNTY	JURISDICTION	NAME	TYPE	COST (IN THOUSANDS)
WILLIAMSON	CEDAR PARK	C C MASON EL	SCHOOL	6,558.14
WILLIAMSON	CEDAR PARK	HILLTOP CHRISTIAN ACADEMY	SCHOOL	2,201.87
WILLIAMSON	CEDAR PARK	LOIS F GIDDENS EL	SCHOOL	7,526.20
WILLIAMSON	CEDAR PARK	MERIDALE-WINDRIDGE	SCHOOL	474.54
WILLIAMSON	CEDAR PARK	PAULINE NAUMANN EL	SCHOOL	9,006.77
WILLIAMSON	FLORENCE	FLORENCE-ANDICE FIRE DEPT	FIRE STATION	534
WILLIAMSON	FLORENCE	FLORENCE POLICE DEPT	POLICE STATION	1,246.00
WILLIAMSON	FLORENCE	FLORENCE ALTER	SCHOOL	474.54
WILLIAMSON	FLORENCE	FLORENCE EL	SCHOOL	4,194.93
WILLIAMSON	FLORENCE	FLORENCE H S	SCHOOL	2,600.48
WILLIAMSON	FLORENCE	FLORENCE MIDDLE	SCHOOL	2,106.96
WILLIAMSON	FLORENCE	WILLIAMSON CO J J A E P	SCHOOL	4,555.58
WILLIAMSON	HUTTO	POLICE DEPT	POLICE STATION	1,246.00
WILLIAMSON	HUTTO	HUTTO EL	SCHOOL	4,745.40
WILLIAMSON	HUTTO	HUTTO H S	SCHOOL	3,027.57
WILLIAMSON	HUTTO	HUTTO MIDDLE SCHOOL	SCHOOL	2,306.26

Appendix G– Toxic Sites in the TCRFC

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
TIER II SITES			
BASTROP	BASTROP	HILBIG GA	389 HUMBL
BASTROP	BASTROP	HILBIG SU	1441 LOWE
BASTROP	BASTROP	SHARP PRO	1198 HWY.
BASTROP	BASTROP	LOWER COL	257 POWER
BASTROP	BASTROP	S STATION	HIGHWAY 3
BASTROP	BASTROP	STATION M	PINE HILL
BASTROP	BASTROP	BASTROP W	110 S. SC
BASTROP	BASTROP	AT&T MOBI	460 HWY 7
BASTROP	BASTROP	FLINT HIL	SE CORNER
BASTROP	BASTROP	FCI BASTR	1341 HIGH
BASTROP	BASTROP	SHARP PRO	515 HWY.
BASTROP	BASTROP	BASTROP P	850 HIGHW
BASTROP	BASTROP	TXDOT-AUS	174 STATE
BASTROP	BASTROP	BASTROP C	2500 MAIN
BASTROP	BASTROP	VALERO- L	POWER PLA
BASTROP	BASTROP	SIM GIDEO	247 POWER
BASTROP	BASTROP	LOST PINE	256 POWER
BASTROP	BASTROP	BASTROP C	LATITUDE/
BASTROP	BASTROP	CAMP SWIF	PERSHING
BASTROP	BASTROP	SWIFTEX S	108 PERSH
BASTROP	BASTROP	BASTROP C	UNIT C, 1
BASTROP	BUTLER	STATION C	OLD MCDAD

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
BASTROP	CEDAR CREEK	TXDOT-AUS	FM 535 @
BASTROP	CEDAR CREEK	BLUEBONNE	266 FM 12
BASTROP	CEDAR CREEK	BASTROP E	125 OLD B
BASTROP	CEDAR CREEK	WOLF LANE	1216 PEAR
BASTROP	CEDAR CREEK	GARFIELD	100 HIGH
BASTROP	DEL VALLE	STONY POI	8403 WOLF
BASTROP	ELGIN	TIFFANY B	506 HWY 2
BASTROP	ELGIN	STATION E	3 MILES S
BASTROP	ELGIN	CEDAR HIL	1497 FM 1
BASTROP	ELGIN	ELGIN PLA	505 HWY 2
BASTROP	ELGIN	INERGY PR	1070 E. H
BASTROP	ELGIN	INTEGRATE	619 MOGON
BASTROP	ELGIN	ELGIN SWI	1160 OLD
BASTROP	MCDADE	MCDADE ST	DUBE ROAD
BASTROP	MCDADE	MCI - MCD	MARLIN ST
BASTROP	PAIGE	HIGHWAY 2	EAST OF S
BASTROP	RED ROCK	RED ROCK	122 FM 81
BASTROP	ROSANKY	ROSANKY S	197 JEDDO
BASTROP	ROSANKY	ROSANKY S	29°55'18.
BASTROP	ROSANKY	ROSANKY S	2 MI S/E
BASTROP	ROSANKY	ROSANKY S	HIGHWAY 3
BASTROP	ROSANKY	DORADO OI	LATITUDE
BASTROP	SMITHVILLE	LEVEL 3 -	495 HIGHW
BASTROP	SMITHVILLE	SMITHVILL	196 AMERI
BASTROP	SMITHVILLE	L STATION	FM2104 &
BASTROP	SMITHVILLE	LA GRANGE	1400 W. S

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
BASTROP	ROSANKY	DORADO OI	LATITUDE
BLANCO	JOHNSON C	TXDOT-AUS	FM 32 & U
BLANCO	JOHNSON C	MOUNTAIN	1079 MOUN
BLANCO	JOHNSON C	TXDOT-AUS	US 290; 1
BLANCO	JOHNSON C	TXDOT-AUS	US 281 N.
BLANCO	JOHNSON C	IESI BLA	2021 HIGH
BLANCO	JOHNSON C	MILLER CR	1040B YEA
BLANCO	JOHNSON C	TXDOT-AUS	608 US 28
BLANCO	JOHNSON C	PHILLIPS	1209 PEDE
BLANCO	JOHNSON C	TXDOT-AUS	US281 N.
BROWN	BANGS	BOB'S L.	1201 EAST
BROWN	BROWNWOOD	SUPERIOR	2900 MORR
BROWN	BROWNWOOD	BROWNWOOD	2304 CROC
BROWN	BROWNWOOD	BROWNWOOD	2 MILES S
BROWN	BROWNWOOD	KOHLER CO	2901 MILA
BROWN	BROWNWOOD	KOHLER CO	4601 HIGH
BROWN	BROWNWOOD	3M COMPAN	4501 HIGH
BROWN	BROWNWOOD	SCHWAN'S	1408 CUST
BROWN	BROWNWOOD	BROWN COU	RR 3, 10
BROWN	BROWNWOOD	BROWNWOOD	1500 MELW
BROWN	BROWNWOOD	AT&T MOBI	221BECK R
BROWN	BROWNWOOD	THE HOME	100 MARKE
BROWN	BROWNWOOD	THRIFTY C	SEE LAT/L
BROWN	BROWNWOOD	WEEDON CO	SEE LAT L
BROWN	BROWNWOOO	CAMP BOWI	7400 SOUT
BROWN	BURKETT	BURKETT C	SEE LAT L

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
BROWN	CROSS PLA	KILGORE-S	15 MILES
BROWN	CROSS PLA	EUBANK	17 SOUTH
BROWN	CROSS PLA	DELGADO F	18 MILES
BROWN	CROSS PLA	ALLEN-GAR	10 MILES
BROWN	CROSS PLA	MADISON	10 MILES
BROWN	EARLY	BOB'S L.P	1415 EARL
BROWN	EARLY	CITY OF E	201 HILLC
BROWN	GROSVENOR	JAMESON G	RURAL
BROWN	LAKE BROW	VERIZON L	FM RD 263
BROWN	LAKE BROW	BUCY-THOM	1 MILE NO
BROWN	MAY	COMANCHE-	SEE LAT/L
BROWN	MAY	NORTH BYR	SEE LAT/L
BROWN	MAY	MAY COMPR	SEE LAT/L
BROWN	MAY	WILLIAMS	SEE LAT L
BROWN	MAY	WILLIAMS	SEE LAT L
BURNET	BERTRAM	VERIZON B	FARM MARK
BURNET	BERTRAM	TXDOT-AUS	ON SH 29
BURNET	BURNET	ATMI	706 HOUST
BURNET	BURNET	SETON HIG	3201 S. W
BURNET	BURNET	TXDOT-AUS	3029 EAST
BURNET	BURNET	BURNET SU	711 HAMIL
BURNET	BURNET	TXDOT-AUS	US 281 3.
BURNET	HORSESHOE	CITY OF H	6201 FM-2
BURNET	MARBLE FALLS	CAPITOL A	2 MILES W
BURNET	MARBLE FALLS	INERGY PR	5723 EAST
BURNET	MARBLE FALLS	MARBLE FA	1050 MAX

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
BURNET	MARBLE FALLS	WIRTZ SUB	3017 WIRT
BURNET	MARBLE FALLS	CITY OF M	603 LAKES
BURNET	MARBLE FALLS	CITY OF M	2508 CIRC
BURNET	MARBLE FALLS	CITY OF M	1100 YETT
BURNET	MARBLE FALLS	JM HUBER	90 AVE. N
BURNET	MARBLE FALLS	CITY OF M	1001 SECO
BURNET	MARBLE FALLS	TXDOT-AUS	1 MILE EA
BURNET	MARBLE FALLS	THE HOME	1307 MORM
BURNET	MARBLE FALLS	COLD SPRI	941 WIRTZ
BURNET	MARBLE FALLS	ALAMO CON	5525 NORT
BURNET	MARBLE FALLS	COLD SPRI	2945 WEST
BURNETT	MARBLE FALLS	SPICEWOOD	5723 HIGH
BURNETT	ROUND ROCK	ROUND ROC	2947 CR 1
BURNETT	SPICEWOOD	SHARP PRO	9807 HWY.
COLORADO	ALLEYTON	BARCO IND	1169 FM 1
COLORADO	ALTAIR	L. B. CLI	COUNTY RD
COLORADO	ALTAIR	R. A. TAI	COUNTY RD
COLORADO	ALTAIR	ALTAIR ST	JCT OF HW
COLORADO	ALTAIR	TXDOT-YOA	LAT/LONG
COLORADO	ALTAIR	TCC-ALTAI	SOUTH ON
COLORADO	COLUMBUS	COLUMBUS	1340 WALN
COLORADO	COLUMBUS	GLIDDEN S	2058 MONT
COLORADO	COLUMBUS	SAND EXPR	1083 KLEI
COLORADO	COLUMBUS	TXDOT-YOA	LAT/LONG
COLORADO	COLUMBUS	TXDOT-YOA	LAT/LONG
COLORADO	COLUMBUS	FRELSBURG	FIVE MILE

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
COLORADO	COLUMBUS	LEVEL 3 -	4239 HIGH
COLORADO	COLUMBUS	MCI - CLM	TRAVIS ST
COLORADO	COLUMBUS	TXDOT-YOA	LAT/LONG
COLORADO	COLUMBUS	COLUMBUS	JCT HWYS
COLORADO	COLUMBUS	COLUMBUS	1311 SCHO
COLORADO	COLUMBUS	DUNE OPER	N/A
COLORADO	COLUMBUS	ZIMMERSCH	LAT29.794
COLORADO	COLUMBUS	800795 EL	1481 HILD
COLORADO	COLUMBUS	HAMEL	NA
COLORADO	EAGLE LAKE	ADKINS LE	COUNTY RD
COLORADO	EAGLE LAKE	SPECIALTY	1096 PARK
COLORADO	EAGLE LAKE	NORTH CHE	FM 3013 (
COLORADO	EAGLE LAKE	TXDOT-YOA	LAT/LONG
COLORADO	EAGLE LAKE	TXDOT-YOA	LAT/LONG
COLORADO	EAGLE LAKE	GRIFFITH	LAT/LONG
COLORADO	EAGLE LAKE	GERTSON N	LAT29.614
COLORADO	EAGLE LAKE	WINTERMAN	LAT/29.62
COLORADO	EAGLE LAKE	NORTH CHE	LAT29.627
COLORADO	EAGLE LAKE	EAGLE LAK	4 MILES W
COLORADO	EAGLE LAKE	MCI - EGL	90' EAST
COLORADO	EAGLE LAKE	LCRA LAKE	COLORADO
COLORADO	FAYETTEVILLE	PISEK SUB	1116 FISC
COLORADO	GARWOOD	GUENTHER	COUNTY RD
COLORADO	GARWOOD	HLAVINKA	COUNTY RD
COLORADO	GARWOOD	PAVLU	COUNTY RD
COLORADO	GARWOOD	COLORADO	SOUTH OF

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
COLORADO	GARWOOD	LEHRER LE	LAT29.409
COLORADO	GARWOOD	LEHRER D4	LAT - 96.
COLORADO	GARWOOD	LEHRER NO	LAT - 96.
COLORADO	GARWOOD	TCC-GARWO	SE OF GAR
COLORADO	GARWOOD	TXDOT-YOA	LAT/LONG
COLORADO	GARWOOD	INERGY PR	1047 FM 9
COLORADO	GARWOOD	COLORADO	LAT. / LO
COLORADO	GARWOOD	TCC-IDEAL	FROM GARW
COLORADO	GARWOOD	MARTIN MA	6747 HIGH
COLORADO	GARWOOD	SHERIDAN	COUNTY RD
COLORADO	HOUSTON	BROYLES N	WALTER OI
COLORADO	ROCK ISLAND	KAISER-FR	SEE LAT &
COLORADO	ROCK ISLAND	KAISER-FR	SEE LAT &
COLORADO	ROCK ISLAND	KAISER-FR	SEE LAT &
COLORADO	ROCK ISLAND	KAISER-FR	SEE LAT &
COLORADO	ROCK ISLAND	ROCK ISLA	2 MILES E
COLORADO	SHERIDAN	PLOW REAL	N/A
COLORADO	SHERIDAN	COLORADO	1075 RENN
COLORADO	WEIMAR	UTEX INDU	605 UTEX
COLORADO	WEIMAR	BOEKER #	LAT / LON
COLORADO	WEIMAR	BOEKER #	LAT / LON
COLORADO	WEIMAR	SELMA TAY	LAT / LON
COLORADO	WEIMAR	TXDOT-YOA	LAT/LONG
COLORADO	WEIMAR	WEIMAR SU	1103 CR 2
COLORADO	WEIMAR	TXDOT-YOA	LAT/LONG
COLORADO	WEIMAR	TXDOT-YOA	LAT/LONG

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
COLORADO	WEIMAR	TXDOT-YOA	LAT/LONG
FAYETTE	CARMINE	MARGIE	GOEHRING
FAYETTE	CARMINE	CHARLES C	HILLS ROA
FAYETTE	CARMINE	LEDBETTER	ROUND TOP
FAYETTE	CARMINE	LUCILLE M	CARMINE C
FAYETTE	CARMINE	LA NELL K	HW 290
FAYETTE	CLEAR LAKE	TXDOT-YOA	LAT/LONG
FAYETTE	ELINGER	OASIS EAS	ZAPALAC R
FAYETTE	ELLINGER	TE-RAY RE	2.6 MILES
FAYETTE	ELLINGER	TE-RAY RE	2.6 MILES
FAYETTE	ELLINGER	TE-RAY RE	2.2 MILES
FAYETTE	FAYETTE C	GIDDINGS	SRV: MCFA
FAYETTE	FAYETTE C	VASTINE P	TJH CARTW
FAYETTE	FAYETTEVILLE	ROZNOV	FM 1291
FAYETTE	FAYETTEVILLE	KOCIAN OL	S. A. AND
FAYETTE	FAYETTEVILLE	SUPAK #1-	J. M. BUR
FAYETTE	FAYETTEVILLE	ORSAK #1-	WILLIAM O
FAYETTE	FAYETTEVILLE	KONVICKA	J. M. BUR
FAYETTE	FAYETTEVILLE	PETROFSKY	S. A. AND
FAYETTE	FAYETTEVILLE	ZAPALAC #	S. A. AND
FAYETTE	FAYETTEVILLE	WECHETA #	WILLIAM O
FAYETTE	FAYETTEVILLE	SCOUT #1-	LUCY KERR
FAYETTE	FAYETTEVILLE	TE-RAY RE	.9 MILES
FAYETTE	FAYETTEVILLE	HAUSMANN	E. SAVAGE
FAYETTE	FAYETTEVILLE	TE-RAY RE	1 MILES I
FAYETTE	FAYETTEVILLE	TXDOT-YOA	LAT/LONG

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
FAYETTE	FAYETTEVILLE	GAU #1	FRANKLIN
FAYETTE	FAYETTEVILLE	FAYETTEVI	2147 HAW
FAYETTE	FLATONIA	FLATONIA	218 E. OL
FAYETTE	FLATONIA	TXDOT-YOA	LAT/LONG
FAYETTE	FLATONIA	ALICE PAU	I 10 WEST
FAYETTE	FLATONIA	SHARP PRO	1410 STRY
FAYETTE	FLATONIA	TXDOT-YOA	LAT/LONG
FAYETTE	GIDDINGS	MACH LEAS	LAT/LONG
FAYETTE	GIDDINGS	LIERE LEA	LAT/LONG
FAYETTE	GIDDINGS	CANIK #1-	LUCY KERR
FAYETTE	GIDDINGS	CANNAE #1	PALAPO HI
FAYETTE	GIDDINGS	LEHMAN-SC	WILLIAM G
FAYETTE	GIDDINGS	GRAFF LEA	H. R. CRA
FAYETTE	HOUSTON	GIDDINGS	SEE SITE
FAYETTE	LA GRANGE	SAM K. SE	6549 POWE
FAYETTE	LA GRANGE	LA GRANGE	44515 HWY
FAYETTE	LA GRANGE	MONUMENT	29.87777;
FAYETTE	LA GRANGE	TXDOT-YOA	LAT/LONG
FAYETTE	LA GRANGE	LA GRANGE	2404 OLD
FAYETTE	LA GRANGE	FPP 138 S	6549 E. S
FAYETTE	LA GRANGE	FPP 345 Y	6549 E. S
FAYETTE	LA GRANGE	ROSE MARI	29.93533;
FAYETTE	LA GRANGE	BAUMBACH	3213 TIET
FAYETTE	LA GRANGE	JOHN QUIN	1.5 MILES
FAYETTE	LA GRANGE	LOIS LEAS	LAT 29.94
FAYETTE	LA GRANGE	PLUM SUBS	1511 E. S

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
FAYETTE	LA GRANGE	KERN #2	HWY 77
FAYETTE	LA GRANGE	LA GRANGE	FM 2145 1
FAYETTE	LA GRANGE	LPB #1	FM 159
FAYETTE	LA GRANGE	LA GRANGE	ON FARM R
FAYETTE	LA GRANGE	ORVILLE H	5 MILES E
FAYETTE	LA GRANGE	PIETSCH #	FRANKLIN
FAYETTE	LA GRANGE	ETHELMAE	29.95833;
FAYETTE	LA GRANGE	MUESSE UN	29.97066;
FAYETTE	LA GRANGE	A L	FM 2981
FAYETTE	LA GRANGE	LEE	FM 159
FAYETTE	LA GRANGE	WOOD	WIED ROAD
FAYETTE	LA GRANGE	JERRY J.	WILLIAM R
FAYETTE	LA GRANGE	KEILERS F	29.9875;
FAYETTE	LA GRANGE	PHILLIPS-	5.5 MILES
FAYETTE	LA GRANGE	WILBURN H	7 MILES E
FAYETTE	LA GRANGE	KESSLER U	5.5 MILES
FAYETTE	LA GRANGE	HRABACEK-	30.0075;
FAYETTE	LA GRANGE	PIETSCH-S	9 MILES N
FAYETTE	LA GRANGE	PIETSCH #	10 MILES
FAYETTE	LA GRANGE	BERNICE #	FM 2145
FAYETTE	LA GRANGE	PIETSCH-Z	10 MILES
FAYETTE	LAGRANGE	KNAPE TIE	SEE LAT/L
FAYETTE	LAGRANGE	ROCKY CRE	7 MILES N
FAYETTE	LAGRANGE	THOMAS PE	450 AIRPO
FAYETTE	LAGRANGE	MOORE	HATTERMAN
FAYETTE	LAGRANGE	SHARP PRO	4252 PROP

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
FAYETTE	LAGRANGE	FPP 345 Y	6549 EAST
FAYETTE	LAGRANGE	LAGRANGE	2231 VON
FAYETTE	LAGRANGE	RAUCH	MUELLER R
FAYETTE	LAGRANGE	NABORS WE	416 AIRPO
FAYETTE	LAGRANGE	LAGRANGE	29° 58' 4
FAYETTE	LAGRANGE	RIVERS	FM 237 NO
FAYETTE	LAGRANGE	STEINMANN	RACE TRAC
FAYETTE	LAGRANGE	LAGRANGE	HWY 77
FAYETTE	LAGRANGE	WINCHESTE	3234 FM 4
FAYETTE	LAGRANGE	FAYETTE C	LATITUDE/
FAYETTE	LAGRANGE	GOLDAPP F	9 MILES N
FAYETTE	LEDBETTER	SCHULMACH	30.0455;
FAYETTE	LEDBETTER	RANCH NO.	30.05283;
FAYETTE	LEDBETTER	GOELLEHER	30.05333;
FAYETTE	LEDBETTER	ETZEL NO.	30.05505;
FAYETTE	LEDBETTER	SCHOTT-RO	LAT. 30.0
FAYETTE	LEDBETTER	GINI FIEL	GOEHRING
FAYETTE	LEDBETTER	KRISTINA	LAT 30.10
FAYETTE	LEDBETTER	CIRRUS-ED	GIDDINGS
FAYETTE	LEDBETTER	CINCINNAT	FM 1291
FAYETTE	LEDBETTER	TXDOT-YOA	LAT/LONG
FAYETTE	LEDBETTER	ANSELL-ST	LAT 30.16
FAYETTE	LEDBETTER	LEDBETTER	3.5 MILES
FAYETTE	LEDBETTER	GILPIN #1	LAT 30.18
FAYETTE	LEDBETTER	FUCHS FAC	3 MILES S
FAYETTE	LEDBETTER	TXDOT-YOA	LAT/LONG

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
FAYETTE	LEDBETTER	BERNSHAUS	LAT 30.26
FAYETTE	LEDBETTER	GOLDAPP-W	LAT 30.27
FAYETTE	LEDBETTER	BRITTA FA	7.6 MILES
FAYETTE	LEDBETTER	WEISS-VAL	LAT 30.34
FAYETTE	LEDBETTER	BADD-DRAW	LAT 30.35
FAYETTE	LEDBETTER	STUERMER	LAT 30.43
FAYETTE	LEDBETTER	WENDLER #	LAT 30.34
FAYETTE	LEDBETTER	FUCHS-BOE	LAT 30.45
FAYETTE	LEDBETTER	SVRCEK #	LAT 30.61
FAYETTE	MULDOON	CIRRUS-AL	GIDDINGS
FAYETTE	PLUM	PLUM	OLD LOCKH
FAYETTE	ROUND TOP	ANDREW JA	WEYAND RO
FAYETTE	RURAL	DOPSLAUF	SL: R M C
FAYETTE	RURAL	GARTH BAT	SL: REUBE
FAYETTE	RURAL	SUMP 1OL	SL: GEORG
FAYETTE	RURAL	DONELLA 1	SL: JOHN
FAYETTE	RURAL	SKALITSKY	SL: ROBER
FAYETTE	RURAL	M WEST OL	SL: ROBER
FAYETTE	RURAL	HILSHER O	SL: THOMA
FAYETTE	RURAL	NEWTON-CU	SL: WILLI
FAYETTE	RURAL	AUSTIN CH	SEE LAT/L
FAYETTE	RURAL	MARIE 1-H	SL: J PHI
FAYETTE	RURAL	KAY 1-H	SL: J G W
FAYETTE	RURAL	GLORIA 1-	SL: CHARL
FAYETTE	RURAL	LEIGH 1-H	SL: J VAN
FAYETTE	RURAL	ABBIE 1-H	GREEN DEW

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
FAYETTE	RURAL	MIN BROWN	SL: JOHN
FAYETTE	RURAL	NORA 1-H	SL: GREEN
FAYETTE	RURAL	KARLA 1-H	SL: GREEN
FAYETTE	SCHULENBU	SCHULENBU	706 KALLU
FAYETTE	SCHULENBU	ENGLE SUB	600 KLEKA
FAYETTE	SCHULENBU	DAIRY FAM	801 JAMES
FAYETTE	SCHULENBU	ALAMO CON	137 FM 26
FAYETTE	SCHULENBU	TXDOT-YOA	LAT/LONG
FAYETTE	SCHULENBU	SILVER OA	3 MILES N
FAYETTE	SCHULENBU	SILVER OA	3 MILES N
FAYETTE	SCHULENBU	SILVER OA	4 MILES N
FAYETTE	SCHULENBU	SILVER OA	4 MILES N
FAYETTE	SMITHVILL	CIRRUS-RI	GIDDINGS
FAYETTE	WALDECK	TXDOT-YOA	LAT/LONG
FAYETTE	WARDA	WINCHESTE	SEE LAT/L
FAYETTE	WARDA	WARDA SUB	400 WARDA
FAYETTE	WEST POINT	CIRRUS-SI	GIDDINGS
FAYETTE	WEST POINT	CIRRUS-VA	GIDDINGS
FAYETTE	WEST POINT	WEST POIN	3 MI. S.
FAYETTE	WEST POINT	MIRANDA L	HW 71
FAYETTE	WEST POINT	TXDOT-YOA	LAT/LONG
FAYETTE	WEST POINT	WESTPOINT	2 MILES S
FAYETTE	WINCHESTER	CIRRUS-GU	GIDDINGS
FAYETTE	WINCHESTER	CIRRUS-E.	GIDDINGS
FAYETTE	WINCHESTER	OASIS WES	OFF 448 B
FAYETTE	WINCHESTER	FAYETTE N	3540 TIEN

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
FAYETTE	MULDOON	CIRRUS-CO	GIDDINGS
LAMPASAS	COPPERAS	COPPERAS	2469 BIG
LAMPASAS	COPPERAS	ADAMSVILL	1027 FM 1
LAMPASAS	EVANT	EVANT SUB	25961 N.
LAMPASAS	KEMPNER	CHRISTENS	6740 FM 2
LAMPASAS	LAMPASAS	LAMPASAS	1203 MCLE
LAMPASAS	LAMPASAS	WINDSOR Q	601 E THI
LAMPASAS	LAMPASAS	NARUNA SU	1409 S. H
LAMPASAS	LAMPASAS	STAR PROP	110 FM 58
LAMPASAS	LAMPASAS	LAMPASAS	494 C.R.
LAMPASAS	LAMPASAS	KEMPNER S	5163 CR 3
LAMPASAS	LAMPASAS	STAR PROP	2596 FM 2
LAMPASAS	LAMPASAS	TXDOT-BRO	LAT. 31.2
LAMPASAS	LOMETA	TXDOT-BRO	LAT.31.20
LAMPASAS	LOMETA	LOMETA SU	313 E. RA
LEE	DIME BOX	LEITKO NO	LEE COUNT
LEE	DIME BOX	WOLTZ	FM-1697
LEE	DIME BOX	HESTER SH	FM 141
LEE	DIME BOX	OLGA LEAS	CR 430
LEE	DIME BOX	DIME BOX	SEE LAT/L
LEE	DIME BOX	KOCUREK L	CR 426
LEE	GIDDINGS	LEE COUNT	LATITUDE/
LEE	GIDDINGS	ZOCK-NOAC	8 MILES S
LEE	GIDDINGS	WILLIE ZO	8 MILES S
LEE	GIDDINGS	KNOBBS CR	SEE LAT/L
LEE	GIDDINGS	A.M. KRAU	8 MILES S

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
LEE	GIDDINGS	WEIDER UN	S. MCDAID
LEE	GIDDINGS	MCI - GNG	1009 COUN
LEE	GIDDINGS	SOUTH WAS	P.R. 2055
LEE	GIDDINGS	MAASS BUT	2186 FM 4
LEE	GIDDINGS	ALAMO CON	1069 COUN
LEE	GIDDINGS	WATER WEL	P. R. 226
LEE	GIDDINGS	L.F. MANU	HWY 290 E
LEE	GIDDINGS	GIDDINGS	2249 NORT
LEE	GIDDINGS	LEE COUNT	HIGHWAY 2
LEE	GIDDINGS	GIDDINGS	1398 W. A
LEE	GIDDINGS	S.P. RAIL	N. DALLAS
LEE	GIDDINGS	L.F. MANU	HWY 290 E
LEE	GIDDINGS	SCHULZE L	LAT/LONG
LEE	GIDDINGS	PARRISH	LEE COUNT
LEE	GIDDINGS	GIDDINGS	5 MILES N
LEE	GIDDINGS	TXDOT-AUS	US 290 &
LEE	GIDDINGS	MAMIE SCH	6.5 MILES
LEE	GIDDINGS	GIDDINGS	6 1/2 MI
LEE	GIDDINGS	GIDDINGS	5 MILES N
LEE	GIDDINGS	PATSY LEA	LAT 30.24
LEE	GIDDINGS	TANK BATT	SEE LAT/L
LEE	GIDDINGS	GRIM LEAS	LAT/LONG
LEE	GIDDINGS	DONNA W.	FM 180
LEE	GIDDINGS	CIRRUS-GE	GIDDINGS
LEE	GIDDINGS	EVELYN ST	LAT 30.25
LEE	GIDDINGS	CIRRUS-GE	GIDDINGS

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
LEE	GIDDINGS	LEVEL 3 -	2230 HWY
LEE	GIDDINGS	GIDDINGS	9 MILES N
LEE	GIDDINGS	MARY B #1	12 MILES
LEE	GIDDINGS	EVA MAE L	FM 180
LEE	GIDDINGS	TXDOT-AUS	US 290 AN
LEE	GIDDINGS	BURTSCHEL	CR 121
LEE	GIDDINGS	CIRRUS-GE	GIDDINGS
LEE	GIDDINGS	CIRRUS-SH	GIDDINGS
LEE	GIDDINGS	GERDES ST	1053 CR 1
LEE	GIDDINGS	CIRRUS-GE	GIDDINGS
LEE	GIDDINGS	CIRRUS-GE	GIDDINGS
LEE	GIDDINGS	CIRRUS-GE	GIDDINGS
LEE	GIDDINGS	COLVIN #1	FM 180
LEE	GIDDINGS	KAISER-FR	SEE LAT &
LEE	GIDDINGS	TXDOT-AUS	US 77 .2
LEE	GIDDINGS	CIRRUS-GE	GIDDINGS
LEE	GIDDINGS	CIRRUS-GE	GIDDINGS
LEE	GIDDINGS	CIRRUS-GE	GIDDINGS
LEE	GIDDINGS	CIRRUS-GE	GIDDINGS
LEE	GIDDINGS	CIRRUS-GE	GIDDINGS
LEE	GIDDINGS	TXDOT-AUS	FM 696 @
LEE	GIDDINGS	WARD"N" #	8.5 MILES
LEE	GIDDINGS	CHESTER #	LAT 30.47
LEE	GIDDINGS	BURTTSCHE	LAT 30.48
LEE	GIDDINGS	HARRELL "	17 MILES
LEE	GIDDINGS	RANDOLPH	LAT 30.56

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
LEE	GIDDINGS	HUFF "C"	12 MILES
LEE	GIDDINGS	WOOD "K"	9 MILES N
LEE	LEDBETTER	GIDDINGS	11 MILES
LEE	LEE	HAWN LEAS	LAT 30.25
LEE	LEXINGTON	STATION B	5 MILES W
LEE	LEXINGTON	LEXINGTON	6068 CR.
LEE	LEXINGTON	LEXINGTON	8800 N. H
LEE	LEXINGTON	DUPLICATE	9923 N. H
LEE	RURAL	AUSTIN CH	SEE LAT/L
LEE	SOMERVILLE	TANK BATT	SEE LAT/L
LEE	SOMERVILLE	TANK BATT	SEE LAT/L
LEE	SOMERVILLE	TANK BATT	SEE LAT/L
LEE	SOMERVILLE	TANK BATT	SEE LAT/L
LEE	SOMERVILLE	TANK BATT	SEE LAT/L
LEE	SOMERVILLE	TANK BATT	SEE LAT/L
LEE	SOMERVILLE	TANK BATT	SEE LAT/L
LLANO	BUCHANAN	INKS DAM	2639 CR 3
LLANO	BUCHANAN	CORONADO	813 BUCHA
LLANO	BUCHANAN	INERGY PR	15294 E.
LLANO	HORSESHOE	CITY OF	301 FM 28
LLANO	HORSESHOE	LOWER COL	2001 FERG
LLANO	HORSESHOE	CITY OF H	201 GRANI
LLANO	LLANO	TXDOT-AUS	2504 SH 1
LLANO	LLANO	BEN E. KE	1604 BESS
LLANO	LLANO	SANDY CRE	126 RANCH
LLANO	LLANO	CITY OF L	100 EVELY

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
LLANO	LLANO	TXDOT-AUS	SH 71 EAS
LLANO	LLANO	INERGY PR	1605 E. H
LLANO	LLANO	TXDOT-AUS	SH 29 EAS
LLANO	LLANO	PITSBURG	1504 BIRM
LLANO	LLANO	TEXAS CRU	7 MILES E
LLANO	MARBLE FALLS	HORSESHOE	9760 W. F
LLANO	MARBLE FALLS	FERGUSON	1205 FERG
LLANO	TOW	TOW VILLA	LAT/LONG
MASON	MASON	FORT MASO	1459 POST
MASON	MASON	TXDOT-AUS	2424 STAT
MASON	MASON	TNC-MASON	9537 W. S
MATAGORDA	ALVIN	DUNCAN SL	C.G. COX
MATAGORDA	BAY CITY	TRULL #7	3.4 MILES
MATAGORDA	BAY CITY	CELANESE	SW 1.5 MI
MATAGORDA	BAY CITY	OXEA CORP	2001 FM 3
MATAGORDA	BAY CITY	N. E. LAR	COUNTY RD
MATAGORDA	BAY CITY	HARDY HOR	COUNTY RD
MATAGORDA	BAY CITY	DAWDY LUC	COUNTY RD
MATAGORDA	BAY CITY	PETRUCHA	STATE HWY
MATAGORDA	BAY CITY	POTTHAST	3.2 MILES
MATAGORDA	BAY CITY	SUTHERLAN	LAT/LONG
MATAGORDA	BAY CITY	BAY CITY	FM 2268 &
MATAGORDA	BAY CITY	WADSWORTH	9 MILES S
MATAGORDA	BAY CITY	SUTHERLAN	LAT/LONG
MATAGORDA	BAY CITY	TXDOT-YOA	LAT/LONG
MATAGORDA	BAY CITY	PROVEDENC	7 MILES S

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
MATAGORDA	BAY CITY	STAUBACH	6 MILES S
MATAGORDA	BAY CITY	SOUTH LUC	SEE LAT L
MATAGORDA	BAY CITY	TXDOT-YOA	LAT/LONG
MATAGORDA	BAY CITY	PONDEROSA	LAT/LONG
MATAGORDA	BAY CITY	BOULDIN L	HWY 457
MATAGORDA	BAY CITY	ALAMO CON	KNIGHTS O
MATAGORDA	BAY CITY	STATION 8	HWY 35 WE
MATAGORDA	BAY CITY	FERRELLGA	4405 7TH
MATAGORDA	BAY CITY	BURKHART	LAT/LONG
MATAGORDA	BAY CITY	MATAGORDA	1710 AVEN
MATAGORDA	BAY CITY	DUPLICATE	6200 SEVE
MATAGORDA	BAY CITY	HUEBNER #	LAT/LONG
MATAGORDA	BAY CITY	FONDREN-L	LAT/LONG
MATAGORDA	BAY CITY	WENDT	LAT/LONG
MATAGORDA	BAY CITY	BASS #1	LAT/LONG
MATAGORDA	BAY CITY	MILLER #1	LAT/LONG
MATAGORDA	BAY CITY	TAYLOR #1	LAT/LONG
MATAGORDA	BAY CITY	TAYLOR #3	LAT/LONG
MATAGORDA	BAY CITY	LEWIS #1	LAT/LONG
MATAGORDA	BAY CITY	SIMON #1	LAT/LONG
MATAGORDA	BAY CITY	BADOUH HE	LAT/LONG
MATAGORDA	BAY CITY	SITTEL #1	LAT/LONG
MATAGORDA	BAY CITY	JOHNSON F	LAT/LONG
MATAGORDA	BAY CITY	HPL CANEY	OFF BUCKS
MATAGORDA	BLESSING	BLESSING	COUNTY RD
MATAGORDA	BLESSING	AGRO DIST	15926 SH

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
MATAGORDA	BLESSING	MATAGORDA	EAST AND
MATAGORDA	BLESSING	TRES PALA	MEADOWLAR
MATAGORDA	BLESSING	HPL EL GO	1 MI S OF
MATAGORDA	BLESSING	HERMAN A.	LAT./LONG
MATAGORDA	BLESSING	MFP PETRO	1 MI EAST
MATAGORDA	BLESSING	VERIZON B	LIVE OAK
MATAGORDA	BLESSING	TCC-BLESS	NORTH OF
MATAGORDA	BLESSING,	BLESSING	4220 CR 3
MATAGORDA	CLEMVILLE	MARKHAM L	1.0 MILE
MATAGORDA	CLEMVILLE	MARKHAM S	FM 1468
MATAGORDA	CLEMVILLE	MARKHAM S	1 MI EAST
MATAGORDA	CLEMVILLE	MARKHAM S	FM 1468
MATAGORDA	COLLEGEPO	OYSTER LA	8 MILE SO
MATAGORDA	COLUMBUS	MATAGORDA	1311 SCHO
MATAGORDA	EL MATON	TIDEHAVEN	HWY 35 &
MATAGORDA	HOUSTON	TURTLE CR	SEE SITES
MATAGORDA	HOUSTON	KASMAN	WALTER OI
MATAGORDA	MARKHAM	MARKHAM C	4.5 MILES
MATAGORDA	MARKHAM	MID-COAST	BROADWAY
MATAGORDA	MARKHAM	EQUISTAR	4833 COUN
MATAGORDA	MARKHAM	TRANSCONT	3767 CR 4
MATAGORDA	MARKHAM	MARKHAM U	SEE LAT L
MATAGORDA	MARKHAM	MARKHAM G	4367 CR 4
MATAGORDA	MARKHAM	NORTHERN	SOUTH OF
MATAGORDA	MATAGORDA	MATAGORDA	LAT/LONG
MATAGORDA	MATAGORDA	LCRA MATA	LAT/LONG

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
MATAGORDA	MATAGORDA	MATAGORDA	775 LEWIS
MATAGORDA	MATAGORDA	MATAGORDA	30 MATAGO
MATAGORDA	MATAGORDA	MATAGORDA	362 PEACH
MATAGORDA	MATAGORDA	MATAGORDA	900 CR 25
MATAGORDA	MATAGORDA	BAER RANC	LAT 28.74
MATAGORDA	MIDFIELD	FERRELLGA	3754 C
MATAGORDA	MIDFIELD	TXDOT-YOA	LAT/LONG
MATAGORDA	PALACIO	FRANKSON	FM COUNTY
MATAGORDA	PALACIOS	CAPT. TOM	102 - 12T
MATAGORDA	PALACIOS	CAPT. TOM	1311 TRAC
MATAGORDA	PALACIOS	DOMINO'S	109 - 12T
MATAGORDA	PALACIOS	PALACIOS	#9 EIGHTH
MATAGORDA	PALACIOS	JOHNSON L	COUNTY RD
MATAGORDA	PALACIOS	TRULL LEA	COUNTY RD
MATAGORDA	PALACIOS	BEULAH	COUNTY RD
MATAGORDA	PALACIOS	COLLEGEPO	3.6 MILES
MATAGORDA	PALACIOS	STATE TRA	2 MILES S
MATAGORDA	PALACIOS	PALACIOS	1304 NEWS
MATAGORDA	PALACIOS	BOWERS SH	24781 SH
MATAGORDA	PALACIOS	MATAGORDA	FM 521 CH
MATAGORDA	PALACIOS	ALAMO CON	SOUTH HIG
MATAGORDA	PALACIOS	COLLEGEPO	3.8 MILES
MATAGORDA	PALACIOS	HARRISON	3 MILES N
MATAGORDA	PALACIOS	HARRIMAN	5.6 MILES
MATAGORDA	PALACIOS	WILSON TR	1 MILE E
MATAGORDA	PALACIOS	TURTLE CR	SEE LAT/L

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
MATAGORDA	PLEDGER	FLORIDA G	6660 FM 1
MATAGORDA	RURAL ARE	ZENERGY	NONE
MATAGORDA	RURAL ARE	ZENERGY	NONE
MATAGORDA	VAN VLECK	MATAGORDA	221 7TH S
MATAGORDA	VAN VLECK	BOULDIN T	P. A. BUR
MATAGORDA	VAN VLECK	BOULDIN,	P. A. BUR
MATAGORDA	VAN VLECK	TRUITT &	FREEMAN G
MATAGORDA	VAN VLECK	LONGMIRE,	P. A. BUR
MATAGORDA	VAN VLECK	CULBERTSO	P. A. BUR
MATAGORDA	VAN VLECK	COCKE B #	P. A. BUR
MATAGORDA	VAN VLECK	TALCOTT C	P. A. BUR
MATAGORDA	VAN VLECK	LAURENCE	P. A. BUR
MATAGORDA	VAN VLECK	TALCOTT A	P. A. BUR
MATAGORDA	VAN VLECK	GRANT, JO	P. A. BUR
MATAGORDA	VAN VLECK	BRAMAN C	AMOS RAWL
MATAGORDA	VAN VLECK	ROBERTSON	FREEMAN P
MATAGORDA	VAN VLECK	THOMASSON	P. A. BUR
MATAGORDA	VAN VLECK	BAKER HUG	HWY 35 EA
MATAGORDA	VAN VLECK	HECKENDOR	5.4 MILES
MATAGORDA	WADSWORTH	SOUTH WAD	SEE LAT/L
MATAGORDA	WADSWORTH	SOUTH TEX	LON/LAT:
MATAGORDA	WADSWORTH	HOLLOWAY	9 MILES S
MATAGORDA	WADSWORTH	HPL EQUIS	WEST SIDE
MCCULLOCH	BRADY	BRADY BUT	1907 S. B
MCCULLOCH	BRADY	BRADY BUT	2 MI EAST
MCCULLOCH	BRADY	G.& R.G.	2628 S. B

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
MCCULLOCH	BRADY	TEXAS MIN	1000 OGLE
MCCULLOCH	BRADY	DUTTON SU	362 EAST
MCCULLOCH	BRADY	TXDOT-BRO	LAT. 31.3
MCCULLOCH	VOCA	TEXAS MIN	363 FM RO
MILLS	GOLDTHWAITHE	CITY OF G	1902 6TH
MILLS	GOLDTHWAITHE	CITY OF G	1809 PRID
MILLS	GOLDTHWAITHE	CITY OF G	2149 HWY
MILLS	GOLDTHWAITHE	CITY OF G	111 FM 30
MILLS	GOLDTHWAITHE	CITY OF G	19 US HWY
MILLS	GOLDTHWAITHE	GOLDTHWAITHE	131 US HW
SAN SABA	SAN SABA	SAN SABA	808 WEST
SAN SABA	SAN SABA	CITY OF S	303 SOUTH
SAN SABA	SAN SABA	CITY OF S	303 SOUTH
SAN SABA	SAN SABA	SAN SABA	130 PR 40
SAN SABA	SAN SABA	TXDOT-BRO	LAT. 31.1
TRAVIS	AUSTIN	HANSON PI	10926 US
TRAVIS	AUSTIN	GTI COATI	3733 DROS
TRAVIS	AUSTIN	CITY OF A	3600 PRES
TRAVIS	AUSTIN	SHARP PRO	9325 FM 9
TRAVIS	AUSTIN	BOC EDWAR	4117 E. C
TRAVIS	AUSTIN	INTERNAL	3651 S. I
TRAVIS	AUSTIN	HAROLD GR	12900 HAL
TRAVIS	AUSTIN	COLTON SU	8116 FM 9
TRAVIS	AUSTIN	CAPITOL A	8900 RAMI
TRAVIS	AUSTIN	HOLLY POW	2401 HOLL
TRAVIS	AUSTIN	HANSON PI	801 AIRPO

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
TRAVIS	AUSTIN	LIQUID EN	5119 EAST
TRAVIS	AUSTIN	IESI AUS	9904 FM 8
TRAVIS	AUSTIN	IESI TRA	9600 FM 8
TRAVIS	AUSTIN	TXDOT-AUS	9725 IH 3
TRAVIS	AUSTIN	DEL VALLE	10212 BUR
TRAVIS	AUSTIN	ALPHA REA	8000 DEE
TRAVIS	AUSTIN	THE HOME	8801 SOUT
TRAVIS	AUSTIN	AUSTIN PO	8201 E. R
TRAVIS	AUSTIN	ESCARPMEN	5900 SH 4
TRAVIS	AUSTIN	DECKER PO	8003 DECK
TRAVIS	AUSTIN	FERRELLGA	4803 LOCK
TRAVIS	AUSTIN	HI CROSS	6718 BLUF
TRAVIS	AUSTIN	TGSC AUST	5613 AVEN
TRAVIS	AUSTIN	MCI - AUS	APPROXIMA
TRAVIS	AUSTIN	APPLIED M	9700 US H
TRAVIS	AUSTIN	FLINTROCK	6200 LOHM
TRAVIS	AUSTIN	SAM?S CLU	5107 I-35
TRAVIS	AUSTIN	TRAVIS CO	2106 1/2
TRAVIS	AUSTIN	CHAMPION	4800 IH 3
TRAVIS	AUSTIN	AUSTIN SW	3512B MON
TRAVIS	AUSTIN	LCRA'S, D	3505 MONT
TRAVIS	AUSTIN	DELTA AIR	3600 PRES
TRAVIS	AUSTIN	ALAMO CON	4200 TODD
TRAVIS	AUSTIN	CITY OF A	4411- A M
TRAVIS	AUSTIN	OLDCASTLE	4433 TERR
TRAVIS	AUSTIN	APPLIED B	2130 WOOD

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
TRAVIS	AUSTIN	PRAXAIR D	2801 MONT
TRAVIS	AUSTIN	ERCOT	7620 METR
TRAVIS	AUSTIN	AIR PRODU	5204 BEN
TRAVIS	AUSTIN	TRAVIS CO	3506 -D S
TRAVIS	AUSTIN	TRAVIS CO	3315 1/2
TRAVIS	AUSTIN	AIR PRODU	12100 SAM
TRAVIS	AUSTIN	THE HOME	3600 INTE
TRAVIS	AUSTIN	COSTCO #	4301 WEST
TRAVIS	AUSTIN	STAKTEK G	8900 SHOA
TRAVIS	AUSTIN	AUSTIN CO	9600 BURN
TRAVIS	AUSTIN	SACHEM, I	821 WOODW
TRAVIS	AUSTIN	TOKYO ELE	2400 GROV
TRAVIS	AUSTIN	SETON SOU	7900 FM 1
TRAVIS	AUSTIN	AUSTIN CO	LAT: 30.2
TRAVIS	AUSTIN	TXI - AUS	12900 HAR
TRAVIS	AUSTIN	TXI - AUS	13101 HAR
TRAVIS	AUSTIN	SAM?S CLU	4970 HWY
TRAVIS	AUSTIN	TRAVIS CO	6003 COMM
TRAVIS	AUSTIN	FREESCALE	6501 WILL
TRAVIS	AUSTIN	TRAVIS CO	3812 ECK
TRAVIS	AUSTIN	MILK PROD	71 STRAND
TRAVIS	AUSTIN	BAE SYSTE	6500 TRAC
TRAVIS	AUSTIN	PURE CAST	2110 EAST
TRAVIS	AUSTIN	AUSTIN AM	305 S. CO
TRAVIS	AUSTIN	GRANDE CO	13505 BUR
TRAVIS	AUSTIN	CITY OF A	6301 HARO

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
TRAVIS	AUSTIN	LEVEL 3 -	500 B C
TRAVIS	AUSTIN	BRACKENRI	601 E. 15
TRAVIS	AUSTIN	TXDOT-AUS	8902 FM 9
TRAVIS	AUSTIN	PENTAGON	8201 E. R
TRAVIS	AUSTIN	DRESSER W	3814 JARR
TRAVIS	AUSTIN	FEDERAL A	10102 AIR
TRAVIS	AUSTIN	CAPITAL M	5316 ED B
TRAVIS	AUSTIN	PRESERVE	LAT: 30.2
TRAVIS	AUSTIN	SETON MED	1201 W. 3
TRAVIS	AUSTIN	SETON SHO	3501 MILL
TRAVIS	AUSTIN	DELL CHIL	4900 MUEL
TRAVIS	AUSTIN	AUSTIN ST	2203 W. 3
TRAVIS	AUSTIN	SENNA HIL	LAT: 30.3
TRAVIS	AUSTIN	ROB ROY R	LAT: 30.3
TRAVIS	AUSTIN	REDDY ICE	7901 SPRI
TRAVIS	AUSTIN	AMERIGAS	10000 DEC
TRAVIS	AUSTIN	THE HOME	7211 NORT
TRAVIS	AUSTIN	SHARP COM	107 ARIA
TRAVIS	AUSTIN	MINCO TEC	1805 RUTH
TRAVIS	AUSTIN	SHARP COM	FLINTROCK
TRAVIS	AUSTIN	CASLANO	LAT: 30.3
TRAVIS	AUSTIN	STERLING	LAT: 30.3
TRAVIS	AUSTIN	PEPSI BOT	9010 WALL
TRAVIS	AUSTIN	TXDOT-AUS	7901 IH35
TRAVIS	AUSTIN	ADVANCED	8601 CROS
TRAVIS	AUSTIN	JACARANDA	LAT: 30.3

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
TRAVIS	AUSTIN	SHARP COM	2800 OEST
TRAVIS	AUSTIN	CHAMPION	8107 RESE
TRAVIS	AUSTIN	AUSTIN DC	9807 MIDD
TRAVIS	AUSTIN	THE HOME	10515 NOR
TRAVIS	AUSTIN	AUSTIN LI	2011 WEST
TRAVIS	AUSTIN	AUSTIN CO	11108 BLU
TRAVIS	AUSTIN	SAMSUNG A	12100 SAM
TRAVIS	AUSTIN	SEMMATERI	8803 NORT
TRAVIS	AUSTIN	TXDOT-AUS	LOOP 1 AN
TRAVIS	AUSTIN	GEMAIRE D	10220 MET
TRAVIS	AUSTIN	LEVEL 3 -	1825 - A
TRAVIS	AUSTIN	MARSHALL	13808 LOW
TRAVIS	AUSTIN	TERAVICTA	2535 BROC
TRAVIS	AUSTIN	MCNEIL SU	11900 KNO
TRAVIS	AUSTIN	CITY OF A	2412-B KR
TRAVIS	AUSTIN	COSTCO #	10401 RES
TRAVIS	AUSTIN	TXDOT-AUS	1001 EAST
TRAVIS	AUSTIN	NATIONAL	11500 NOR
TRAVIS	AUSTIN	INTERNATI	11400 BUR
TRAVIS	AUSTIN	SETON NOR	11113 RES
TRAVIS	AUSTIN	LAKE WIND	LAT: 30.4
TRAVIS	AUSTIN	OASIS BLU	6801 OASI
TRAVIS	AUSTIN	CHAMPION	11400 RES
TRAVIS	AUSTIN	SHARP PRO	4711 DOSS
TRAVIS	AUSTIN	THE HOME	7900 NORT
TRAVIS	AUSTIN	3M RESEAR	11705 RES

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
TRAVIS	AUSTIN	SPICEWOOD	9011 OLD
TRAVIS	AUSTIN	THE HOME	13309 I-3
TRAVIS	AUSTIN	COMMERCIA	1704 HOWA
TRAVIS	AUSTIN	FLAGSHIP	5973 HILI
TRAVIS	AUSTIN	AUTO-CHLO	2105 HOWA
TRAVIS	AUSTIN	SUN MICRO	5300 RIAT
TRAVIS	AUSTIN	ALAMO CON	2807 HOWA
TRAVIS	AUSTIN	HOSPIRA,	3900 HOWA
TRAVIS	AUSTIN	WELLS BRA	14608 1/2
TRAVIS	AUSTIN	AUSTIN WH	14001 MCN
TRAVIS	AUSTIN	SUNSTATE	16436 IH
TRAVIS	AUSTIN	MICHAEL A	200 MICHA
TRAVIS	AUSTIN	KOMICO TE	201 MICHA
TRAVIS	AUSTIN	SUN COAST	2915 E CE
TRAVIS	AUSTIN	SAM'S CLUB	9700 NO.
TRAVIS	AUSTIN	TXDOT-AUS	LOOP 1 AN
TRAVIS	AUSTIN, T	AUSTIN PR	7300 HWY.
TRAVIS	BEE CAVE	THE HOME	3600 FM 6
TRAVIS	CEDAR PAR	TXDOT-AUS	LOOP 360
TRAVIS	CEDAR PAR	OLDCASTLE	2002 WIN
TRAVIS	DEL VALLE	SHARP PRO	4972 HWY.
TRAVIS	ELGIN	ALAMO CON	13101 BAL
TRAVIS	LAGO VISTA	THE COVE	2705 1/2
TRAVIS	LAGO VISTA	LOWER BOO	3401 BOON
TRAVIS	LAGO VISTA	WASTEWATE	5206 1/2
TRAVIS	LAGO VISTA	THE HOLLO	LAT: 30.4

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
TRAVIS	LAGO VISTA	WATER TRE	21011 SEM
TRAVIS	LAGO VISTA	WATER TRE	5927 LAGO
TRAVIS	LAGO VISTA	LAGO VIST	9715 LOHM
TRAVIS	LAGO VISTA	LAKESHORE	6504 LAKE
TRAVIS	LAKEWAY	WATER PLA	4105 LAKE
TRAVIS	LAKEWAY	S-4 WASTE	417 PALOS
TRAVIS	LAKEWAY	IMPOUNDME	203 CLUBH
TRAVIS	LEANDER	LAGO VIST	6707 LOHM
TRAVIS	MANCHACA	ARROYO DO	13001 RUN
TRAVIS	MANCHACA	ARROYO DO	722 1/2 M
TRAVIS	MANCHACA	MANCHACA	2111 W. F
TRAVIS	MANCHACA	SHARP PRO	2310 BLIS
TRAVIS	MANCHACA	SCHWAN'S	11209 CON
TRAVIS	MANOR	WEBBERVIL	21163 BLA
TRAVIS	MANOR	AUSTROP S	21121 BLA
TRAVIS	MANOR	AIR LIQUI	12700 BEL
TRAVIS	MANOR	AIR PRODU	12712 BEL
TRAVIS	MANOR	FSTI, INC	12704 BEL
TRAVIS	MANOR	MANOR SUB	13711 E.
TRAVIS	MANOR	HARRIS BR	13650 GRE
TRAVIS	MANOR	HUMANETIC	12918 BEL
TRAVIS	NOT IN CI	CITY OF M	5311 GILB
TRAVIS	PFLUGARVILLE	INERGY PR	1602 THRE
TRAVIS	PFLUGERVILLE	NUCO2 INC	2309 INVE
TRAVIS	PFLUGERVILLE	GILLELAND	16275 CAM
TRAVIS	PFLUGERVILLE	IESI NORT	15711 CAM

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
TRAVIS	PFLUGERVILLE	JOHN DEER	1938 WAUK
TRAVIS	PFUGERVILLE	SCOTTS LA	1007 S. H
TRAVIS	ROUND ROCK	SAM'S CLUB	130 SUNDA
TRAVIS	ROUND ROCK	OLDCASTLE	1409 ROYS
TRAVIS	SPICEWOOD	PALEFACE	1100 S. P
TRAVIS	SUNSET VALLEY	THE HOME	1200 HOME
TRAVIS	VOLENTE	VOLENTE P	12210 VOL
TRAVIS	WEBBERVILLE	TXI - OWE	2637 POST
TRAVIS	AUSTIN	SUNBELT R	8300 S -
TRAVIS	AUSTIN	SUNBELT R	6111 HIGH
WHARTON	BOLING	WILSON ST	2020 COUN
WHARTON	BOLING	J B GARY	STEPHEN A
WHARTON	BOLING	M L WEEMS	SETH INGR
WHARTON	BOLING	M L WEEMS	SETH INGR
WHARTON	BOLING	ADA	11840 NEW
WHARTON	BOLING	M L WEEMS	SETH INGR
WHARTON	BOLING	M L WEEMS	SETH INGR
WHARTON	BOLING	M L WEEMS	SETH INGR
WHARTON	BOLING	M L WEEMS	SETH INGR
WHARTON	BOLING	M L WEEMS	SETH INGR
WHARTON	BOLING	M L WEEMS	SETH INGR
WHARTON	BOLING	M L WEEMS	SETH INGR
WHARTON	BOLING	S. T. TAY	11840 NEW
WHARTON	BOLING	TAYLOR-GA	FM 442 AT
WHARTON	BOLING	M L WEEMS	SETH INGR
WHARTON	BOLING	A. A. MUL	10139 FM

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
WHARTON	BOLING	A. A. MUL	10139 FM
WHARTON	BOLING	T & NO RR	9539 FM 1
WHARTON	BOLING	TEXASGULF	9103 FM 1
WHARTON	BOLING	S. L. BAY	12313 FM
WHARTON	COLUMBUS	FRNKA LEA	SEC. 12-W
WHARTON	DANEVANG	FERRELLGA	11338 SOU
WHARTON	DANEVANG	DANEVANG	HIGHWAY 7
WHARTON	EAGLE LAKE	E.G. GOFF	LATITUDE/
WHARTON	EAGLE LAKE	PEACH CRE	6 MLS N O
WHARTON	EAGLE LAKE	BONUS FIE	SEE LAT-L
WHARTON	EAGLE LAKE	DUNCAN LE	LAT/29.51
WHARTON	EAGLE LAKE	G. CAMERO	LAT/29.52
WHARTON	EAGLE LAKE	WELLS (SO	SEE LAT/L
WHARTON	EAST BERN	EAST BERN	723 COLLE
WHARTON	EAST BERN	WHARTON C	LAT. / LO
WHARTON	EDNA	HUTCHINS	SEE LAT/L
WHARTON	EDNA	STOCKTON	SEE LAT/L
WHARTON	EGYPT	DUNCAN A	SEE LAT/L
WHARTON	EGYPT	ROCKING M	LAT. 29.4
WHARTON	EL CAMPO	ETTA OIL	10 MI NE
WHARTON	EL CAMPO	MAGNET WI	8 MI NE O
WHARTON	EL CAMPO	NORTH WIT	5 MI E OF
WHARTON	EL CAMPO	DANEVANG	COUNTY RO
WHARTON	EL CAMPO	WHARTON C	1271 CR 3
WHARTON	EL CAMPO	WEARALLOY	2117 FM 1
WHARTON	EL CAMPO	COCA COLA	1001 WEST

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
WHARTON	EL CAMPO	FARMERS C	911 SOUTH
WHARTON	EL CAMPO	COUNTY OF	605 E. CA
WHARTON	EL CAMPO	DORADO OI	LATITUDE
WHARTON	EL CAMPO	EL CAMPO	2402 HIGH
WHARTON	EL CAMPO	WILBUR-EL	27274 US
WHARTON	EL CAMPO	FERRELLGA	704 SOUTH
WHARTON	EL CAMPO	FARMERS C	INTERSECT
WHARTON	EL CAMPO	TXDOT-YOA	LAT/LONG
WHARTON	EL CAMPO	TXDOT-YOA	LAT/LONG
WHARTON	EL CAMPO	TCC-EL CA	615 WEST
WHARTON	EL CAMPO	EL CAMPO	SEE LAT-L
WHARTON	EL CAMPO	STOVALL-P	LAT/LONG
WHARTON	EL CAMPO	THE NEW W	1102 NORT
WHARTON	EL CAMPO	QUALITY H	1703 NORT
WHARTON	EL CAMPO	STOVALL-P	LAT/LONG
WHARTON	EL CAMPO	NABORS WE	1408 E. J
WHARTON	EL CAMPO	WHARTON C	1815 E. J
WHARTON	EL CAMPO	ALAMO CON	BUSINESS
WHARTON	EL CAMPO	STOVALL-P	LAT/LONG
WHARTON	EL CAMPO	SWANSON-M	LAT/LONG
WHARTON	EL CAMPO	DUSON #1	LAT/LONG
WHARTON	EL CAMPO	MARTHA GA	1.5 MILES
WHARTON	EL CAMPO	WHARTON C	18479 US
WHARTON	EL CAMPO	WITTIG SI	18992 US
WHARTON	EL CAMPO	LANGE-BOA	LAT/LONG
WHARTON	EL CAMPO	GOLD-ZAPP	LAT/LONG

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
WHARTON	EL CAMPO	JOHNNIE M	LAT/LONG
WHARTON	EL CAMPO	CLARINE G	LAT/LONG
WHARTON	EL CAMPO	PHASE FOU	LAT/LONG
WHARTON	EL CAMPO	DUPLICATE	3 MI. N O
WHARTON	EL CAMPO	INDEPENDE	315 COUNT
WHARTON	EL CAMPO	WHARTON C	LAT. / LO
WHARTON	EL CAMPO	TRANSCONT	2648 FM 2
WHARTON	EL CAMPO	GLAZE #1	CR 457
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	KIASER-FR	SEE LAT &
WHARTON	EL CAMPO	HICKS #1	CR 461
WHARTON	EL CAMPO	PIERCE RA	FM 961
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	KRESTA #1	FM 961
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	NAISER-ST	LAT/LONG
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	ZBORIL #3	N/A
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	ZBORIL #2	N/A
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	ZBORIL #1	N/A
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	SRUBAR #1	N/A
WHARTON	EL CAMPO	ST JOHN C	LAT/LONG
WHARTON	EL CAMPO	WENDEL-RI	FM 961

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
WHARTON	EL CAMPO	WENDEL	FM 961
WHARTON	EL CAMPO	NAISER, J	LAT/LONG
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	NAISER #1	N/A
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	ZBORIL-BO	N/A
WHARTON	EL CAMPO	NAISER #4	N/A
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	KAISER-FR	SEE LAT &
WHARTON	EL CAMPO	QUALITY H	RT. 1 BOX
WHARTON	EL CAMPO	MILLER, I	LAT/LONG
WHARTON	EL CAMPO	ASCENT -	RURAL
WHARTON	EL CAMPO	MILLER, I	LAT/LONG
WHARTON	EL CAMPO	MILLER, I	LAT/LONG
WHARTON	EL CAMPO	ASCENT -	RURAL
WHARTON	EL CAMPO	WITHERS F	9625 PIER
WHARTON	EL CAMPO	SCHWEINKE	LAT. / LO
WHARTON	EL CAMPO	WHARTON C	LAT. / LO
WHARTON	EL CAMPO	PICKET RI	SOUTH PIE
WHARTON	EL CAMPO	GUENTHER	LAT. / LO
WHARTON	EL-CAMPO	RASMUSSEN	SEE LAT/L
WHARTON	EL-CAMPO	RICHARDS	SEE LAT/L
WHARTON	ELM GROVE	TE-RAY RE	4 MILES S

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
WHARTON	HILLJE	FARMERS C	RURAL ROU
WHARTON	HILLJE	VRANA #1	LAT/LONG
WHARTON	HILLJE	VRANA SCR	LAT/LONG
WHARTON	HOUSTON	VASTAR DU	WALTER OI
WHARTON	HUNGERFORD	HLAVINKA	COUNTY RD
WHARTON	HUNGERFORD	HPL HUNGE	EAST SIDE
WHARTON	HUNGERFORD	STATION 3	3 MLS W O
WHARTON	HUNGERFORD	DUNCAN TR	WEST SIDE
WHARTON	LANE CITY	LANE CITY	0.7 MI W/
WHARTON	LISSIE	LISSIE FL	1000 CR 2
WHARTON	LOUISA	WENDEL	FM 1160
WHARTON	LOUISE	LOUISE FI	5 MI S.,
WHARTON	LOUISE	WEAVER ES	LAT / LON
WHARTON	LOUISE	WHARTON C	104 N. MA
WHARTON	LOUISE	WHARTON C	300 FM 11
WHARTON	LOUISE	BROTHERS	COUNTY RD
WHARTON	LOUISE	BROWNSON	5072 CR 3
WHARTON	LOUISE	EDWIN HAW	LAT/LONG
WHARTON	LOUISE	EDWIN HAW	LAT/LONG
WHARTON	LOUISE	FENNER #1	LAT/LONG
WHARTON	LOUISE	FENNER, K	J. M. HAR
WHARTON	LOUISE	FENNER #1	N/A
WHARTON	LOUISE	FENNER #2	N/A
WHARTON	LOUISE	FENNER -	P. DAUGHE
WHARTON	LOUISE	FENNER-MO	N/A
WHARTON	LOUISE	FENNER-MO	N/A

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
WHARTON	LOUISE	HILL #1	706 N CR
WHARTON	LOUISE	BRUCE ROY	LAT: 29.
WHARTON	MAGNET	MAGNET FI	NEAR MAGN
WHARTON	N/A	PEACH CRE	N/A
WHARTON	N/A	CARRIERE	NA
WHARTON	N/A	ROBERT M	NA
WHARTON	N/A	JAMES HOL	NA
WHARTON	N/A	JAMES HOL	NA
WHARTON	N/A	EVELYN CA	NA
WHARTON	N/A	CARRIERE	NA
WHARTON	N/A	HALAMICEK	NA
WHARTON	N/A	HAHN SCRU	NA
WHARTON	N/A	PETER HAH	NA
WHARTON	N/A	NORTH POR	NA
WHARTON	N/A	RICHTER N	NA
WHARTON	N/A	BELL FARM	NA
WHARTON	N/A	EDDIE SCH	NA
WHARTON	N/A	EDDIE SCH	NA
WHARTON	PIERCE	PIERCE RA	1.5 MI. E
WHARTON	PIERCE	PIERCE RA	5 M S OF
WHARTON	RURAL	DOW TIE-I	SEE LAT L
WHARTON	RURAL	LHA #1 (S	SEE LAT L
WHARTON	RURAL	LEXI #2 (	SEE LAT L
WHARTON	RURAL	BROOKS #1	SEE LAT L
WHARTON	RURAL	LEXI #1 (	SEE LAT L
WHARTON	RURAL	NILSON 2	S AUSTIN

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
WHARTON	RURAL	NILSON 1	STEPHEN F
WHARTON	RURAL	DAVIS GAS	STEPHEN A
WHARTON	WHARTON	ALAMO CON	5114 HWY
WHARTON	WEST BERN	WEST BERN	NEAR WES
WHARTON	WHARTON	AGRO DIST	905 NELSO
WHARTON	WHARTON	DABOVAL F	SEE LAT/L
WHARTON	WHARTON	MENEFEE (	SEE LAT/L
WHARTON	WHARTON	MAGNET WI	SEE LAT/L
WHARTON	WHARTON	MAGNET WI	2755 COCK
WHARTON	WHARTON	COCKBURN	15330 HWY
WHARTON	WHARTON	FUCIK	FM 1160
WHARTON	WHARTON	BROCKMAN	COUNTY RD
WHARTON	WHARTON	VINEYAD E	COUNTY RD
WHARTON	WHARTON	R. J. PRA	11678 HWY
WHARTON	WHARTON	COUNTY OF	315 E. EL
WHARTON	WHARTON	COUNTY OF	315 E. EL
WHARTON	WHARTON	WHARTON C	2029 FM 1
WHARTON	WHARTON	MENEFEE (	SEE LAT/L
WHARTON	WHARTON	DORNAK UN	COUNTY RD
WHARTON	WHARTON	HAWES	COUNTY RD
WHARTON	WHARTON	EGYPT LEA	COUNTY RD
WHARTON	WHARTON	MENEFEE (	SEE LAT/L
WHARTON	WHARTON	FERRELLGA	4702 FM 3
WHARTON	WHARTON	COLORADO	3821 SOUT
WHARTON	WHARTON	TXDOT-YOA	LAT/LONG
WHARTON	WHARTON	MOTT SLOU	SEE LAT/L

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
WHARTON	WHARTON	GULF COAS	1400 HIGH
WHARTON	WHARTON	RANCHO GR	FM 961
WHARTON	WHARTON	FUCIK	LAT/LONG
WHARTON	WHARTON	MOTT SLOU	SEE LAT/L
WHARTON	WHARTON	SCHUMAKER	LAT/LONG
WHARTON	WHARTON	AMMANN LS	LAT/LONG
WHARTON	WHARTON	MILLER ET	LAT/LONG
WHARTON	WHARTON	J. DOVOTI	LAT/LONG
WHARTON	WHARTON	WILSON	LAT/LONG
WHARTON	WHARTON	FERRELLGA	5610 LEES
WHARTON	WHARTON	DAVIS - L	N/A
WHARTON	WHARTON	FORGASON	N/A
WHARTON	WHARTON	FORGESON	6 MLS N O
WHARTON	WHARTON	BSE - DUN	N/A
WHARTON	WITHERS	WITHERS S	6 MILES S
WILLIAMSON	AUSTIN	AVERY RAN	14125 1/2
WILLIAMSON	AUSTIN	THE HOME	11301 LAK
WILLIAMSON	BARTLETT	BARTLETT	116 E. AI
WILLIAMSON	CEDAR PAR	CEDAR PAR	880 BRUSH
WILLIAMSON	CEDAR PAR	TXDOT-AUS	2001 WEST
WILLIAMSON	CEDAR PAR	THE HOME	2700 WHIT
WILLIAMSON	FLORENCE	SMITH & S	LAT/LONG
WILLIAMSON	FLORENCE	CULP & SO	FM 2843
WILLIAMSON	FLORENCE	INERGY PR	12295 W.
WILLIAMSON	GEORGETOWN	JONAH WAT	706 COUNT
WILLIAMSON	GEORGETOWN	JONAH WAT	2181 COUN

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
WILLIAMSON	GEORGETOWN	CAPITOL A	3 MILES W
WILLIAMSON	GEORGETOWN	JONAH WAT	107 WARBO
WILLIAMSON	GEORGETOWN	JONAH WAT	COUNTY RD
WILLIAMSON	GEORGETOWN	TEXAS CRU	5300 SOUT
WILLIAMSON	GEORGETOWN	DON HEWLE	7601 SOUT
WILLIAMSON	GEORGETOWN	CHIEF BRA	5290 S IH
WILLIAMSON	GEORGETOWN	SHARP PRO	100 MIDNI
WILLIAMSON	GEORGETOWN	ALAMO CON	1375 WEIR
WILLIAMSON	GEORGETOWN	MANITEX I	3000 S. A
WILLIAMSON	GEORGETOWN	TXDOT-AUS	2727 SOUT
WILLIAMSON	GEORGETOWN	GEORGETOW	918 W UNI
WILLIAMSON	GEORGETOWN	GEORGETOW	6504 WEST
WILLIAMSON	GEORGETOWN	RIVERY SU	401 HACIA
WILLIAMSON	GEORGETOWN	SAN GABRI	1107 COLL
WILLIAMSON	GEORGETOWN	INERGY PR	2100 OLD
WILLIAMSON	GEORGETOWN	AUSTIN BR	900 WEIR
WILLIAMSON	GEORGETOWN	GABRIEL S	200 C.R.
WILLIAMSON	GEORGETOWN	CITIGROUP	600 INNER
WILLIAMSON	GEORGETOWN	THE HOME	1303 RIVE
WILLIAMSON	GEORGETOWN	PECAN BRA	3502 FM 9
WILLIAMSON	GEORGETOWN	VERIZON G	4121 WILL
WILLIAMSON	GEORGETOWN	OLDCASTLE	1581 HIGH
WILLIAMSON	GEORGETOWN	GLASSCOCK	3540 STAT
WILLIAMSON	GRANGER	LEVEL 3 -	MESQUITE
WILLIAMSON	HUTTO	HUTTO WAS	1300 E. O
WILLIAMSON	HUTTO	THE HOME	600 WEST

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
WILLIAMSON	JARRELL	JARRELL-S	CR 310 ON
WILLIAMSON	JARRELL	JARRELL-S	AVENUE G
WILLIAMSON	JARRELL	JARRELL-S	AVENUE G
WILLIAMSON	LEANDER	LEANDER P	1600 HWY
WILLIAMSON	LEANDER	AQUATIC I	11880 RR
WILLIAMSON	ROUND ROCK	CHRISTIAN	1950 LOUI
WILLIAMSON	ROUND ROCK	THE HOME	2551 S. I
WILLIAMSON	ROUND ROCK	CITY OF R	501 N MAY
WILLIAMSON	ROUND ROCK	BRUSHY CR	3939 PALM
WILLIAMSON	ROUND ROCK	TOPPAN PH	400 TEXAS
WILLIAMSON	ROUND ROCK	CERILLIAN	811 PALOM
WILLIAMSON	ROUND ROCK	CYPRESS S	17 CYPRES
WILLIAMSON	ROUND ROCK	TRUGREEN/	594 GREEN
WILLIAMSON	ROUND ROCK	HOSPIRA,	2820 OAKM
WILLIAMSON	ROUND ROCK	SETON MED	201 SETON
WILLIAMSON	ROUND ROCK	CITY OF R	5400 N IH
WILLIAMSON	ROUND ROCK	CITY OF R	WESTINGHO
WILLIAMSON	TAYLOR	GEMINI IN	102 WAGNE
WILLIAMSON	TAYLOR	TXDOT-AUS	3101 WEST
WILLIAMSON	TAYLOR	ERCOT	2705 WEST
WILLIAMSON	TAYLOR	AGRO DIST	20,000 HW
WILLIAMSON	TAYLOR	TAYLOR PL	2101 HWY
WILLIAMSON	TAYLOR	INERGY PR	627 E. LA
WILLIAMSON	TAYLOR	EAST WILL	201 COUNT
WILLIAMSON	WALBURG	JONAH WAT	COUNTY RD
WILLIAMSON	WALBURG	JONAH WAT	FM 1105

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
TRI SITES			
BASTROP	ELGIN	ACME BRICK CO - ELGIN PLANT	RT 5, BOX 89
BASTROP	ELGIN	TIFFANY BRICK - ELGIN BRICK	HWY 290 E TR. 6 BOX 338
BROWN	BROWNWOOD	3M CO - BROWNWOOD	4501 HWY 377 S
BROWN	BROWNWOOD	CHEVRON PHILLIPS CHEMICAL CO PERFORMANCE PIPE DIV	1400 DRISCO DR
BROWN	BROWNWOOD	KOHLER CO	2901 MILAM DR
BROWN	BROWNWOOD	KOHLER CO	4601 HWY 377 S
BROWN	BROWNWOOD	POTTERS INDUSTRIES INC.	CROSS PLAINS HWY 5650 HWY 279 N, HC 30, BOX 20
BROWN	BROWNWOOD	ROTONICS MFG. INC.	2807 S.F.AUSTIN DR
BROWN	BROWNWOOD	SUPERIOR ESSEX COMMUNICATIONS LP.	2900 MORRIS SHEPPARD DR
BURNET	BURNET	ATMI MATERIALS,LTD.	706 HOUSTON CLINTON DR
BURNET	BURNET	CHEMICAL LIME LTD MARBLE FALLS PLANT	7829 S U.S. HWY 281
BURNET	BURNET	SURE CAST INC	200 SURE CAST DR
COLORADO	EAGLE LAKE	EAGLE-CORDELL CONCRETE PRODUCTS	5559 HWY 90 A W
COLORADO	COLUMBUS	GREAT SOUTHERN WOOD PRESERVING LLC TEXAS	1050 GREAT SOUTHERN WAY
COLORADO	ALLEYTON	HCM BLOCK & BRICK ALLEYTON PLANT	2088 FM 949
COLORADO	COLUMBUS	TEXAS MANUFACTURED MARBLE INC.	1217 BUSINESS 71
COLORADO	WEIMAR	UTEX INDUSTRIES INC.	605 UTEX DR
FAYETTE	SCHULENBURG	DAIRY FARMERS OF AMERICA INC	801 JAMES AVE PO BOX 176
FAYETTE	LA GRANGE	L.C.R.A. FAYETTE POWER PROJECT	6549 POWER PLANT RD
LAMPASAS	LAMPASAS	CUSTOM MOLDED PRODUCTS	HWY 190 E
LEE	GIDDINGS	CARGILL, INC	1502 INDUSTRIAL PARK RD
LEE	GIDDINGS	L.F. MANUFACTURING INC MAIN PLANT	HWY 290, 3 MI W OF GIDDINGS
LEE	GIDDINGS	L.F. MANUFACTURING INC QFRP PLANT	HWY 290, 3 MI W OF GIDDINGS

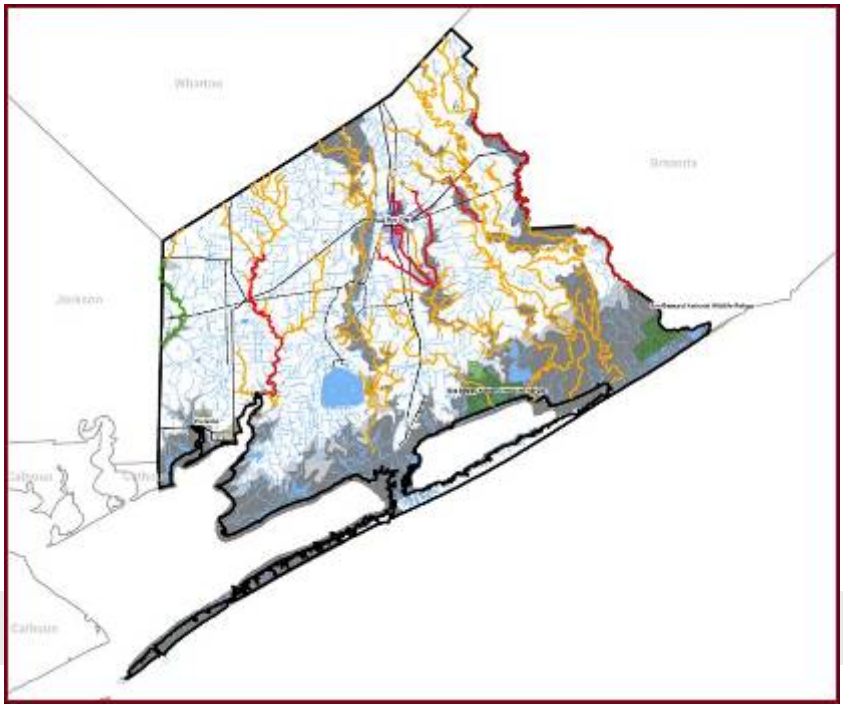
COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
MATAGORDA	BAY CITY	CELANESE LIMITED BAY CITY PLANT	FM 3057
MATAGORDA	WADSWORTH	EQUISTAR CHEMICALS LP MATAGOR DA FACILITY	13 MI SO OF BAY CITY ON HWY 60
MC CULLOCH	BRADY	HEXION SPECIALITY CHEMICAL INC	45 ACFRAC RD
TRAVIS	AUSTIN	3M CO - AUSTIN RESEARCH BOULEVARD SITE	11705 RESEARCH BLVD
TRAVIS	AUSTIN	AUSTIN COUNTER TOPS INC.	11108 BLUFF BEND DR
TRAVIS	AUSTIN	AUSTIN MANUFACTURING SERVICES	9715A BURNET RD SUITE 500
TRAVIS	AUSTIN	AUSTIN WHITE LIME CO	14001 MCNEIL RD
TRAVIS	AUSTIN	AVANT TECHNOLOGY	9715A BURNET RD SUITE 500
TRAVIS	AUSTIN	BAE SYSTEMS INFORMATION & ELECTRONIC SYSTEMS INTEGRATION IN	6500 TRACOR LN
TRAVIS	AUSTIN	CELESTICA AEROSPACE TECHNOLOGIES CORP	4616 W HOWARD LN BLDG 1, SUITE 100
TRAVIS	AUSTIN	CUSTOM QUALITY MARBLE INC	303 E FM 1626
TRAVIS	AUSTIN	DRESSER WAYNE	3814 JARRETT WAY
TRAVIS	AUSTIN	FLINT HILLS RESOURCES LP AUS TIN TERMINAL	9011 JOHNNY MORRIS RD
TRAVIS	AUSTIN	FREESCALE SEMICONDUCTOR - ED BLUESTEIN FACILITY	3501 ED BLUESTEIN BLVD
TRAVIS	AUSTIN	FREESCALE SEMICONDUCTOR OAK HI LL FACILITY	6501 WILLIAM CANNON DR W
TRAVIS	AUSTIN	GTI COATINGS INC.	3733 DROSSETT DR
TRAVIS	AUSTIN	HANSON PIPE & PRODUCTS INC AUSTIN	801 AIRPORT BLVD
TRAVIS	AUSTIN	HOSPIRA, INC-AUSTIN SITE	3900 HOWARD LN
TRAVIS	AUSTIN	KACHINA (EDWARDS INC)	4117 E COMMERCIAL CENTER DR
TRAVIS	AUSTIN	MILK PRODUCTS LP	71 STRANDTMAN COVE
TRAVIS	AUSTIN	OLDCASTLE APG TEXAS INC. DBA CUSTOM-CRETE	4433 TERRY-O LN

COUNTY	CITY	FACILITY NAME	FACILITY ADDRESS
TRAVIS	AUSTIN	PALM HARBOR HOMES	830 BASTROP HWY
TRAVIS	AUSTIN	PURE CASTINGS CO	2110 E 4TH ST
TRAVIS	AUSTIN	SACHEM, INC.	821 WOODWARD ST
TRAVIS	AUSTIN	SAMSUNG AUSTIN SEMICONDUCTOR	12100 SAMSUNG BLVD
TRAVIS	AUSTIN	SOLECTRON TEXAS L.P.	12455 RESEARCH BLVD
TRAVIS	AUSTIN	SPANSION LLC FAB 25	5204 E BEN WHITE BLVD
TRAVIS	AUSTIN	STAKTEK GROUP LP	8900 SHOAL CREEK BLVD #125
WHARTON	EL CAMPO	BLUE CREEK FOUNDRY	729 FM1162
WHARTON	EL CAMPO	CARDELL CABINETS INC. EL CAMPO	1301 N BLUE CREEK RD
WHARTON	HUNGERFORD	LAMBERTI USA INC. - WHARTON CHEMICAL COMPLEX	HWY 59 AT COUNTY RD 212
WILLIAMSON	LEANDER	AQUATIC INDUSTRIES INC.	11880 RR 2243
WILLIAMSON	ROUND ROCK	CERILLIANT CORP	811 PALOMA DR, SUITE A
WILLIAMSON	ROUND ROCK	CYPRESS SEMICONDUCTOR	17 CYPRESS BLVD
WILLIAMSON	CEDAR PARK	ETS-LINDGREN, L.P.	1301 ARROW POINT DR
WILLIAMSON	ROUND ROCK	HOSPIRA, INC-ROUND ROCK SITE	2820 OAKMONT DR
WILLIAMSON	CEDAR PARK	OLDCASTLE APG TEXAS INC (DBA CUSTOM-CRETE)	WINDY TERRACE
WILLIAMSON	GEORGETOWN	RTI HOT MIX NORTH ASPHALT PLANT	5301 STATE HWY 195

MATAGORDA COUNTY
FLOOD MITIGATION PLAN

MATAGORDA COUNTY
CITY OF BAY CITY
CITY OF PALACIOS

PREPARED BY
MATAGORDA COUNTY FLOOD MITIGATION PLANNING COMMITTEE



HALFF ASSOCIATES, INC.
July 2009

TEXAS COLORADO RIVER FLOODPLAIN COALITION

Matagorda County Flood Mitigation Actions

The Matagorda County Flood Mitigation Plan will be maintained by the Matagorda County Floodplain Administrator in cooperation with floodplain managers and emergency managers from the cities of Bay City and Palacios. The Matagorda County Floodplain Administrator is responsible for retaining copies of the plan, coordinating review of the plan, and future updates to the plan.

The Matagorda County Flood Mitigation Planning Committee evaluated the proposed TCRFC regional mitigation actions to identify mitigation actions that may be implemented by Matagorda County and the cities of Bay City and Palacios. The actions identified below were determined to be the most appropriate actions given the current resources and hazard vulnerabilities for Matagorda County and participating communities.

A total of eighteen (18) Flood Mitigation Actions have been identified to address the Floodplain Management Planning Goals established by the Matagorda County Flood Mitigation Planning Committee. Separate Flood Mitigation Actions have been identified for Matagorda County and each participating community as follows:

Matagorda County	City of Bay City	City of Palacios
F1	F1	F1
F2	F2	F2
F3	F3	F3
F4	F4	F4
F5	F5	F5
F6		F6
F7	F7	F7
F8	F8	F8
F9	F9	F9
F10	F10	
F11	F11	F11
F12	F12	F12
F13	F13	F13
F14		
F15	F15	F15
F16	F16	F16
F17	F17	F17
F18	F18	

Flood Damage Reduction (F)

Addresses: **Flooding**
Goal: **Make Matagorda County more flood resistant:**

F.1 Reduce Flood Losses and Increase NFIP Flood Insurance Coverage throughout Matagorda County

Based on NFIP flood insurance policy and claims data, there are only 3,789 flood insurance policies in force which is approximately 20% of the 18,611 structures in Matagorda County. Based on FEMA's NFIP policy data on www.fema.gov there is $673M in flood insurance coverage in Matagorda County and the cities of Bay city and Palacios. There have been 1,309 paid flood insurance claims for a total of $10.05M (Average claim = $7,681) in Matagorda County since 1978. FEMA has identified 108 Repetitive Loss Properties in Matagorda County. A Repetitive Loss Property is a property that has received two or more paid flood insurance claims that exceed $1,000.00 within a ten year period. FEMA designates communities with 10 or more Repetitive Loss Properties as a Category "C" community. By utilizing FEMA funding administered by TxDEM and TWDB, Matagorda County and participating communities can address problems in flood loss and repetitive loss areas by initiating acquisition and elevation projects for identified structures and by designing and constructing drainage improvements.

In the survey, conducted as part of the Flood Mitigation Plan preparation, 86% of the responders know that they live in a designated flood hazard zone. See Plan Section 1.3.2. The Texas Colorado River Floodplain Coalition (TCRFC) developed "TIMS" to assist and inform the public by utilizing the TIMS interactive map to determine if their home or place of business is located in a flood zone. TIMS has a search engine where the user can enter an address to locate the specific site. TIMS can be found on the following link: http://tims.lcra.org/Launch.aspx

This Mitigation Action Item recommends bi-annual Flood Insurance Workshops to be coordinated by the FEMA and/or the NFIP Region 6 Office utilizing "Flood Smart" publications. Matagorda County and the cities of Bay City and Palacios are members of the Houston Galveston Area Council (HGAC) and the TCRFC, the likely sponsors of future workshops and outreach events. Community floodplain managers, insurance agents, developers, homeowners and the general public are target workshop attendees. The purpose of the workshop is to inform attendees that flood insurance is available for all structures located in communities that participate in the NFIP and that flood insurance policies protect against losses both for structures and contents.

Goal: Educate the public with the goal to increase the flood insurance policy base to minimize the financial impact of future floods.

Responsibility: Matagorda County Floodplain Administrator
City of Bay City Floodplain Administrator

City of Palacios Floodplain Administrator
TCRFC (continue to post website information)
HGAC
FEMA Region VI
Flood Smart
NFIP Regional Office
TWDB – State Floodplain Coordinator

Cost: (estimate) $641 = Average NFIP annual premium for insurance policies

$64,100 Annual premiums for 100 new NFIP policies
FEMA, NFIP/Flood Smart and TWDB provide workshops at no cost

Funding Sources: NFIP Policies (Flood Policy Fund)
Owners of residential and nonresidential structures
Renters and building occupants

Workshops: TCRFC
HGAC
FEMA/DHS
NFIP (National Flood Insurance Program Region VI)
TWDB (Texas Water Development Board)

Timing: Flood Insurance workshops to be held in the 2010 – 2015 time period.

Beneficiary: All citizens and property owners in Matagorda County

F-2 Design, construct and maintain drainage improvement projects to minimize the risk of loss of life and future flood damages by utilizing funding from Federal, State, Capital Improvement Program (CIP), Development or Stormwater Utility Fee and other funding sources.

The National Weather Service reports that the national 30-year average for deaths related to flooding is 127 per year. Of that yearly average, nearly half are related to motorists attempting to cross roadways that are overtopped by floodwaters and recent (2007 and 2008) Texas flood deaths have exceeded the annual State average. The Matagorda County Consolidated Reclamation and Drainage District Study, currently underway, will identify problem areas including roadway crossings that are overtopped by floodwaters in the Tres Palacios River watershed. These problem areas present public danger and potential loss of human life. Detail information for each creek and watershed improvement will be described in the Matagorda County Consolidated Reclamation and Drainage District Study.

This proposed action includes the implementation of the Matagorda County Consolidated Reclamation and Drainage District Study recommendations to construct needed improvements to reduce the risk of loss of life and property damage. Annual revisions of the Matagorda County Flood Mitigation Plan will identify future drainage improvement projects and estimated costs.

Responsibility: Matagorda County
City of Bay City
City of Palacios

Cost: To be determined by the Matagorda County Consolidated Reclamation and Drainage District Study

Funding Sources: FEMA/DEM - Hazard Mitigation Grant Program
FEMA/TWDB – Flood Mitigation Assistance funds
TWDB - Flood Protection Planning Grants and Loans
NRCS – Stream Restoration Project funding
Storm Water Utility Fee and/or Bond Program (Under consideration)
Matagorda County and participating communities Capital Improvements Program (CIP)

Timing: Design and construction to be phased as funding becomes available.

Beneficiary: All citizens and property owners in Matagorda County

F-3 Acquisition and Relocation, Elevation and "Demo-Rebuild" of Floodprone Structures

This proposed action should assist local community efforts to identify potential structures and initiate acquisition and relocation, elevation and demo-rebuild projects to reduce the risk of future flood losses. A database has been created as part of the Matagorda County Flood Mitigation Plan listing Repetitive Loss Properties, properties that have had flood insurance claims, and properties located in areas of high flood risk. This information is confidential in nature and used by the Flood Mitigation Planning Committee and participating communities for planning purposes only.

This proposed action identifies funding opportunities for future HMGP, FMA, Severe Repetitive Loss (SRL), Repetitive Flood Claims (RFC), USACE Federal Flood Protection Projects, TWDB Flood Protection Planning Grants, NRCS Floodplain Easement and Elevation Projects, and county and community funded buyout and elevation projects. It is recommended that Matagorda County, TCRFC and HGAC sponsor Buyout Conferences to inform and assist local communities and the general public regarding options, methods and funding sources to reduce flood losses.

Several successful mitigation projects were completed in Matagorda County following Tropical Storm Claudette when coastal structures were substantially damaged and rebuilt above the base flood elevation (BFE) referenced on the Flood Insurance Rate Map (FIRM). All structures substantially damaged by Hurricane Ike (September 2008) are required to be reconstructed in compliance (elevated) with BFE's defined in the current FIRM's.

FEMA's Flood Mitigation Assistance (FMA) Program provides funding to communities for acquisition and relocation and elevation but does not currently fund "demo-rebuild" projects. "Demo-Rebuild" projects, funded by Texas Department of Housing and Community Affairs (HCA) have been completed in nearby Wharton and El Campo. Substandard properties, located in blighted areas with low income owners, are eligible and should be targeted for HCA funding. Selected properties may be floodprone, repetitive loss, or severe repetitive loss. These properties, when rebuilt, must be elevated above the base flood elevation.

To support this Mitigation Action, the Flood Mitigation Planning Committee recommends identifying, surveying lowest floors and documenting Matagorda County Appraisal District values for Repetitive Loss and selected floodprone properties targeted for future acquisition, relocation, elevation, demo-rebuild, and flood protection projects that may be eligible for funded with HMGP, FMA, HCA and ORCA funding. The Matagorda County Repetitive Loss database, prepared as part of the Matagorda County Flood Mitigation Plan, lists repetitive loss properties identified by FEMA. This Mitigation Action recommends expanding the database to include:

- Properties located in the FEMA Floodway
- Properties with known flood hazards
- Appraisal District values (structure and land)
- Elevation Certificates and structure data (Lowest floor, type structure, etc)
- Property owner contact information (confidential)
- Base Flood Elevation data
- GIS mapping

FEMA requires submittal of a detailed benefit:cost (b:c) analysis to justify expenditure of federal funds (HMGP, FMA, SRL and RFC) for these projects. This information needs to be readily available in the database but safeguarded to protect property owner's privacy.

FEMA Region VI provided NFIP flood loss records, for planning purposes only, identifying a total of 155 properties in Matagorda County have receive 2 or more paid flood insurance claims that exceed $1,000 for each claim. FEMA has designated 5 of the 155 as Severe Repetitive Loss Properties:

	RL Properties	% of Total
Matagorda County -	155 Repetitive Loss Properties	77.5%
City of Bay City-	41 Properties	20.5%
City of Palacios -	4 Properties	2.0%

Matagorda County Total 200 Properties

The estimated cost to acquire approximately 200 Matagorda County repetitive loss properties and to relocate the owners/tenants is $ 35.5M for acquisition and relocation cost, and $ 6.0M demolition cost that includes an estimated $30,000 for demolition cost for each structure. (Note: the average flood insurance policy in Matagorda County is $177,759 and each policy includes a maximum of $30,000 Increased Cost of Construction (ICC) available for elevation or demolition of NFIP insured structures located in the Special Flood Hazard Area.)

The estimated cost to perform a "demo-rebuild" project is considered to be comparable to acquisition and relocation options. Specialized conditions such as soil type, proximity to the floodway and coastal erosion rates may encourage the County or community to select one option over another or the decision may entirely become b:c ratio influenced. However the ultimate mitigation action decision lies with the community and the homeowner.

Responsibility: Matagorda County Floodplain Administrator
City of Bay City Floodplain Administrator
City of Palacios Floodplain Administrator
Individual property owners (voluntary):
FEMA/DHS
Governor's Division of Emergency Management (DEM)
Texas Water Development Board (TWDB)

Cost: $20,000 estimated cost to prepare the RL Database with GIS data
$ 35.5M estimate acquisition and relocation cost (200 parcels)
[$ 26.6M = 75% Federal Share]
[$ 8.9M = 25% Local Share]
$6.0M estimated demolition cost for 200 parcels (may be eligible for ICC funding)

Cost breakdown per Community:
Matagorda County – (Total) $ 27.5 M Acquisition + $ 4.65M Demolition (155 properties)
(25% Local Share) $ 6.87M Acquisition + $ 1.16M Demolition
City of Bay City- (Total) $ 7.3M Acquisition + $ 1.23M Demolition (41 properties)
(25% Local Share) $ 1.82M Acquisition + $ 307,500 Demolition
City of Palacios - $ 710,000 Acquisition + $ 120,000 Demolition (4 properties)
(25% Local Share) $ 177,500 Acquisition + $ 30,000 Demolition

Funding Sources: FEMA/DEM - Hazard Mitigation Grant Program (HMGP)
FEMA/DEM – Pre Disaster Mitigation (PDM) Program
FEMA/TWDB – Flood Mitigation Assistance (FMA) Program
FEMA/DEM – Repetitive Flood Claims (RFC) Program

FEMA/TWDB – Severe Repetitive Loss Program
NRCS – Floodplain Easement Program
NRCS – Structure Elevation Program
Increased Cost of Construction (ICC) NFIP Policy Fund
Funding available from a future Presidential declared disaster
Office of Rural Community Affairs (ORCA) – (Texas)
Texas Department of Housing and Community Affairs
Other Federal and State Agencies programs
Individual property owners
Matagorda County
City of Bay City
City of Palacios

Timing: Repetitive Loss Buyout plan to be developed in 2010 and 2011 and carried out as funding becomes available or a disaster occurs.

Beneficiary: Property Owners in Matagorda County

F-4 Floodplain Mapping for unmapped streams in Matagorda County

In 2006, FEMA initiated a $1.3M remapping effort for Matagorda County. The major cost elements include new LIDAR mapping and updated coastal storm surge modeling. Unfortunately only a small portion of the remapping effort was allocated to updating hydrology and hydraulics. As part of the remapping effort, the Texas Natural Resources Information System (TNRIS) flew new LIDAR mapping of counties along the Texas Gulf Coast and provided the mapping products to the USACE and FEMA. Following Hurricane Rita (2005), the US Army Corps of Engineers and FEMA initiated the USACE/FEMA Joint Texas Coastal Hurricane Surge Project to produce new hurricane storm surge and wave run-up elevations along the Texas Gulf Coast. This joint remapping effort will produce new flood insurance rate maps for coastal counties in Texas including Matagorda County. This massive study effort was delayed in 2008 to incorporate technical data from Hurricane Ike and new FIRM's are scheduled to be published in 2010.

The effective flood insurance studies for Matagorda County, Bay City and Palacios were published from 1985 to 1992 and are considered to be out-of-date and inadequate for floodplain management purposes. The Matagorda County Consolidated Reclamation and Drainage District initiated studies in 2009 to remap floodprone areas not scheduled for remapping by FEMA. The Matagorda County Consolidated Reclamation and Drainage District study includes two major tasks: (1) new hydrology and hydraulics studies of the Tres Palacios River in Matagorda County and (2) conversion of 39.28 river miles of the US Army Corps of Engineers Lower Colorado River Flood Damage Reduction Study to FEMA mapping criteria. This important data, funded entirely by the Matagorda County Consolidated Reclamation and Drainage District, will be incorporated into FEMA's Matagorda County remapping effort.

FEMA's remapping budget was minimal therefore many streams in Matagorda County will not be studied and mapped as approximate Zone A's without base flood elevations and floodways identified. The Matagorda County Flood Mitigation Plan Committee recommends that detail floodplain mapping be developed for all streams in Matagorda County and participating communities to establish and enforce sound floodplain management programs.

This flood mitigation action is to conduct detail hydrologic and hydraulic studies and map the 100-year, 500-year and floodway boundaries and establish BFE's for all streams in Matagorda County. To accomplish this task, Matagorda County and participating communities will need technical and financial assistance from the TCRFC, LCRA, TWDB and FEMA. The goal of this mitigation action is to update the Matagorda County Flood Insurance Study and FIRM's to include detail floodplain information for all streams in Matagorda County.

In 2009, FEMA initiated Risk MAP as a Phase II Map Mod Initiative to address mapping needs not addressed during Map Mod (2003 to 2009). Matagorda County and the cities of Bay City and Palacios, working with LCRA and TWDB/TNRIS, can capitalize on future Federal and state funding to map the remaining streams in Matagorda County and update the Matagorda County FIRM. Both LCRA and TWDB/TNRIS are FEMA Cooperative Technical Partners (CTP) and either would be ideal to lead this mapping update effort.

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Phase 1	USACE/FEMA Joint Texas Coastal Hurricane Surge Study
Phase 2	Matagorda County Consolidated Reclamation and Drainage District Study
Phase 3	Inspection and certification of flood protection levees in Matagorda County
Phase 4	FEMA's Matagorda County remapping effort
Phase 5	Study and mapping of unstudied streams in Matagorda County

Responsibility: Matagorda County
City of Bay City
City of Palacios
LCRA as a FEMA CTP
TNRIS as a FEMA CTP
Matagorda County Consolidated Reclamation and Drainage District

Cost: Phase 1 – funded 2005-2009 [FEMA]
Phase 2 – funded 2009-2010 [MCCRD]
Phase 3 – funded 2009-2010 [MCCRD]
Phase 4 – funded 2006-2010 [FEMA]
Phase 5 - $5.0M (estimated)

Funding Sources: FEMA Risk MAP funding (2010-2014)
(Phase 5 only) Federal funding following a future Presidential declared disaster when funding is available for flood recovery mapping

TWDB/CTP
LCRA/CTP

Timing: 2010-2014 Mapping will be phased as funding becomes available.

Beneficiary: All citizens and property owners in Matagorda County

F-5 Adopt "Higher Standard" Riverine Flood Damage Prevention Ordinances and Standards

The Matagorda County Flood Mitigation Planning Committee reviewed the current ordinances for Matagorda County and the cities of Bay City and Palacios and compared each to several "Higher Standard" Flood Damage Prevention Ordinances that have been adopted by other Texas communities and the model ordinance prepared by FEMA Region VI. The TCRFC also developed a "Higher Standard" Ordinance for consideration by TCRFC communities. A "Higher Standard" Flood Damage Prevention Ordinance can assist a community's efforts to reduce future flood losses and provide additional Community Rating System (CRS) credits for communities desiring to participate in FEMA's CRS Program. In 2010 Matagorda County and the cities of Bay City and Palacios will be required to adopt the new Matagorda County (county-wide) Digital Flood Insurance Rate Maps (DFIRMs) by a new flood damage prevention ordinance. Should a community choose to adopt a "higher standard" flood damage prevention ordinance, that community will receive a higher CRS rating should they elect to enroll in the CRS Program. One "higher standard" recommended by the Committee is to require future critical facilities to be constructed outside the 500-year (0.2% annual chance) flood boundary or to be elevated or floodproofed above the 500-year (0.2% annual chance) flood elevation. Matagorda County and the cities of Bay City and Palacios will continue to participate in TCRFC and HGAC Floodplain Management activities where NFIP requirements and "higher standards" are discussed with representatives from FEMA, TWDB and other TCRFC and HGAC communities. The TCRFC "higher standard" model ordinance contains options where a community can select key floodplain management requirements similar to the following listing developed by FEMA Region VI:

- 1', 2' or 3' freeboard
- Base Flood Elevations (BFE's) defined by fully developed watershed conditions
- Floodways defined by fully developed watershed conditions
- Floodways defined by zero rise
- On–site detention to compensate for the effects of proposed development
- Regional detention facilities funded by site development fees
- Minimum setbacks from floodways and stream banks
- Protection of critical facilities
  - -Meet 500-year floodplain standards
- Protection of floodplain storage capacity
  - -Prohibit fill in the 100-year floodplain
- Cumulative substantial improvement/substantial damage

-Combination of multiple improvements/damage in reaching less than 50% threshold

- Regulate development in the Zone B or *shaded* X and Zone C or *unshaded* X
  City of Friendswood is a model requiring lowest floors to be elevated in Zone X
- Regulations for natural and beneficial functions
  -Restrictions on development in sensitive areas, i.e.: wetlands, riparian areas, shorelines, stream channels, banks, and habitats
- Low Density Zoning
  -Limit development i.e.: no more than one building constructed per acre of floodplain

Responsibility:	Matagorda County (Adopt Higher Standard Ordinance) City of Bay City (Adopt Higher Standard Ordinance) City of Palacios (Adopt Higher Standard Ordinance) All - Evaluate and possibly enroll in FEMA's CRS Program TCRFC and TFMA – Technical assistance HGAC and TCRFC (Floodplain Management Workshops)
Cost: (higher standards)	$500 to $2,000 per residential structure (estimated cost) $1,000 to $10,000 nonresidential structure (estimated cost)
Administrative Cost:	Staff Time under current budgets
Funding Sources:	Not Required
Timing:	2010 to 2015
Beneficiary:	Citizens and property owners in Matagorda County

F-6 Adopt "Higher Standard" Coastal Flood Damage Prevention Ordinances and Standards (Coastal High Hazard Areas - Zone VE and Coastal A Zones)

The Matagorda County Flood Mitigation Planning Committee reviewed the current ordinances for Matagorda County and the city of Palacios and compared them to several "Higher Standard" Flood Damage Prevention Ordinances that have been adopted by other Texas coastal communities and the model "higher standard" ordinance prepared by TCRFC. A "higher standard" Flood Damage Prevention Ordinance can assist a community's efforts to reduce future flood losses and provide additional Community Rating System (CRS) credits for communities desiring to participate in FEMA's CRS Program. In 2010 Matagorda County and the cities of Bay City and Palacios will be required to adopt the new Matagorda County (county-wide) Digital Flood Insurance Rate Maps (DFIRMs) by a new flood damage prevention ordinance. Should a community choose to adopt a "higher standard" flood damage prevention ordinance, that community will receive a higher CRS rating should they elect to enroll in the CRS Program. Several

coastal "higher standards" were evaluated by the Committee including compensation for sea level rise and coastal erosion:

- New construction, in coastal areas subject to a high erosion rate, would be required to be set back from the waters edge to compensate for future erosion based on a retreat rate reported by the Texas General Land Office.
- New construction in Coastal High Hazard Areas (Zone VE) would be required to be elevated a minimum of two feet above the base flood elevation, based on existing conditions, to compensate for projected sea level rise over a 50-year period.
- Require new construction in designated Coastal A Zones to comply with Zone VE construction requirements.
- Construction in Coastal Barrier Resource Act (CBRA) Zones will be discouraged and prohibited if allowable by law.

Matagorda County and the city of Palacios will continue to participate in TCRFC, TFMA and HGAC Floodplain Management activities where NFIP coastal requirements and "higher standards" are discussed with representatives from FEMA, TWDB and other coastal communities. The TCRFC "higher standard" model ordinance contains options where a coastal community can select key floodplain management requirements such as:

- 1', 2' or 3' freeboard in Zone VE
- Require Zone VE construction standards in Coastal A Zones
- Adoption of Coastal A Zone requirements based on a 1.5' breaking wave
- Establish minimum setbacks from water edge in areas with high erosion (retreat) rates
- Protection of critical facilities
  -New construction must be elevated or flood-proofed to 500-year elevation
- Cumulative substantial improvement/substantial damage
  -Combination of multiple improvements/damage in reaching less than 50% threshold
- Regulations for natural and beneficial functions
  -Restricting or prohibiting development in sensitive areas, i.e.: CBRA Zones, wetlands, riparian areas, coastal shorelines and wildlife habitats
- Restricting enclosures below BFE in Zone VE (100 sf, 200 sf or 300 sf)

Responsibility:	Matagorda County (Adopt Higher Standard Coastal Ordinance) City of Palacios (Adopt Higher Standard Coastal Ordinance) TCRFC (provide technical assistance) HGAC and TCRFC (Floodplain Management Workshops) FEMA, TWDB, TFMA (provide technical assistance)
Cost: (higher standards)	$500 to $2,000 per residential structure (estimated cost) $1,000 to $10,000 nonresidential structure (estimated cost)
Administrative Cost:	Staff Time under current budgets

Funding Sources: Not Required

Timing: 2010 to 2015

Beneficiary: Citizens and property owners in Matagorda County coastal areas

F-7 Provide Training for Community Floodplain Managers, Community Emergency Managers, CEM's and CFM's.

TWDB, TxDEM, TCRFC, TFMA and HGAC currently host numerous floodplain and emergency manager training opportunities including: FEMA's FPM Training Course, E-273 "Managing Floodplain Development through the NFIP"; TWDB Floodplain Management 101; NFIP Workshops and Flood Forums; Community Rating System (CRS) Workshops; Hurricane Preparedness and exercises; Emergency Management and Home Land Security workshops; tabletop emergency exercises and numerous other training opportunities. These conferences and workshops enhance public awareness, assist local communities and provide training and continuing education credits (CEC's) for local floodplain administrators, certified floodplain managers (CFM's), certified emergency managers (CEM's), professional engineers (PE's), registered public land surveyors (RPLS) and the general public.

The proposed Flood Mitigation Plan Action Item is to initiate a coordination effort to provide workshops and training activities that can benefit Matagorda County and:

Agencies	Associations and others
FEMA Region VI	TFMA
NFIP Regional Office	EMAT
TWDB/TNRIS	ASFPM
TxDEM	IBC
LCRA	Texas Tech Wind Engineering
GLO	TCRFC
NRCS	ASCE
HGAC	SAME
NWS/NOAA	Texas A&M

Note: Agency and association acronyms are listed in Plan Attachment "A".

Proposed Workshops and Training Activities:

FEMA Flood Forums
TCRFC Quarterly Meetings and Workshops
HAZMAP Plan adoption and Plan maintenance (TxDEM)
Managing Floodplain Development through the NFIP (FEMA)
Flood Mitigation Assistance (FMA) Plans (TWDB)
Flood Protection Planning Grants (TWDB)
Floodplain Manager Workshops (TWDB)

NFIP Workshops for community officials, lenders, agents, developers
Coastal Construction Workshops (FEMA, TWDB, ASCE)
Community Rating System (CRS) Workshops (FEMA/ISO)
TFMA Conferences and Mutual Aid activities
HAZUS Workshops (FEMA)
Substantial Damage Estimator Program (RSDE) FEMA/TWDB
Building Code Workshops (HGAC/IBC)
Tornado Safe Room Design and Coastal Construction Workshops (Texas Tech/FEMA)

Potential Funding Sources for Workshops and Training:
TWDB – Flood Protection Planning and FMA Program funding
TxDEM – Disaster Exercises and HMGP Program funding
Skyward/Storm Ready (NWS)
Hazardous Weather Partner Workshops (NWS)
HYDROMET System (LCRA)

Responsibility: Matagorda County (Lead community to host training)
TCRFC
HGAC

Cost: Staff Time under current budgets

Funding Sources: Not Required

Timing: Annually 2010 to 2015

Beneficiary: Matagorda County and all participating communities

F-8 Identify Funding Opportunities for Drainage System Improvements

The Matagorda County Consolidated Reclamation and Drainage District Study will identify needed drainage improvements in the Tres Palacios River watershed in Matagorda County. FEMA's Matagorda County remapping effort will identify new riverine and coastal floodprone areas where flood protection and drainage improvements are needed. The Flood Mitigation Planning Committee identified the following funding possibilities:

- TWDB Flood Protection Planning Grants and Project Loans
- Flood Mitigation Assistance (FMA) Project grants to design and construct flood protection projects to protect flood prone properties
- Hazard Mitigation Grant Program (HMGP) funding to design and construct flood protection projects to protect flood prone properties
- Public Assistance (PA) funding following a major disaster to design and construct repairs and improvements to damaged flood protection and drainage facilities

- Federal Flood Protection Projects (USACE)
- Corps of Engineers 1140-1-211 "Support for Others" reimbursement of planning, design and construction (USACE)
- Steam Restoration Projects (USACE and NRCS)
- Floodplain Easement Program (NRCS)
- FEMA funding programs: Hazard Mitigation Grant Program (HMGP), Severe Repetitive Loss (SRL) and Repetitive Flood Claims (RFC) – Acquisition and Relocation, Elevation and Demo-Rebuild of flood prone properties
- Texas Office of Rural Community Affairs (ORCA)
- Development fees for new construction to offset cost of regional drainage improvements
- County-wide storm drainage utility or impact fee
- Watershed Development Fees to offset watershed projects such as regional detention and channel improvements
- Creation of a county-wide drainage district
- Developer constructed improvements resulting in tax benefits and pay backs

This mitigation action is to identify and actively pursue funding mechanisms for future drainage improvements. Matagorda County and participating communities working together can plan, coordinate and fund the design, construction, and maintenance of (county-wide) drainage improvements and flood control projects that benefit entire watersheds and drainage basins.

Responsibility: Matagorda County
City of Bay City
City of Palacios

Cost: To be determined by the Matagorda County Consolidated Reclamation and Drainage District Study
1. Identify funding sources
2. Submit applications for funding
3. Project planning
4. Design and construction – based on approved projects
5. Maintenance (annual expense)

Administrative Cost: Staff Time under current budgets

Funding Sources: TWDB
USACE
FEMA
HMGP/PDM/SRL/RFC
FMA
NRCS
Local Share - Funded by development fees, bonds and tax revenues

Timing: 2010 Tres Palacios River Study completion
2010 Levee certification needs identified
2010 FEMA's remapping of Matagorda County completion
2010 to 2015 Obtain funding and initiate design and construction

F-9 Establish County-Wide Bench Mark Network

The new Matagorda County FIRM's, scheduled to be published in 2010, will identify Elevation Reference Marks (ERM) or Bench Marks (BM) and Base Flood Elevations (BFEs) that are referenced to NAVD 1988 Elevation Datum. The Elevation Reference Marks and Base Flood Elevations (BFEs) on previously published FIRMs for Matagorda County and the cities of Bay City and Palacios identify Elevation Reference Marks and Base Flood Elevations referenced to NGVD 1929 which is no longer acceptable for National Flood Insurance Program (NFIP) purposes. Only 177 usable ERMs and BMs are identified in the National Geodetic Survey (NGS) database and available for floodplain management purposes (1,114 square miles or 1 BM per 6.3 square miles) presenting a major problem for local community administrators that must reference NAVD 1988 for new development permits. To assist local floodplain administrators, LCRA's High Accuracy Reference Network (HARN) System, accessible on line at www.harn.lcra.org, identifies 30 additional BMs that are referenced to NAVD 1988. The LCRA maintained HARN Network is mapped and described on the LCRA website. In 2006, LCRA installed a GPS base station in Bay City to assist surveyors in the Lower Colorado River Basin that includes Matagorda County. In 2009, Matagorda County funded installation of five (5) survey monuments (NAVD 88) as part of the Matagorda County Flood Mitigation Plan. Individual datasheets for these seven monuments are included in Appendix "B". The Matagorda County Flood Mitigation Planning Committee recommends establishing a county-wide network of NAVD 1988 bench marks that can be shared by Matagorda County and the cities of Bay City and Palacios, along with USACE, TxDOT, LCRA, FEMA and others. This network must be readily available to surveyors, engineers, homeowners, insurance agents and general public for NFIP, floodplain management and general construction purposes. Participation by TxDOT, LCRA, NRCS, local surveyors and engineers is needed for this to be a successful mitigation action. Matagorda County's subdivision ordinance requires developers to establish a permanent survey monument in each new subdivision referenced to NAVD 1988 as part of all new subdivision developments.

Phase 1 - LCRA established GPS base station in Bay City (2006)
Phase 2 - LCRA established additional NAVD 1988 Bench Marks within Matagorda County as part of the LCRA HARN Network (2007)
Phase 3 - Matagorda County installed five (5) additional NAVD 1988 Bench Marks (2009)
Phase 4- Matagorda County establishes a detailed database of NAVD 1988 bench marks
Phase 5- Identify areas where additional NAVD 1988 bench marks are needed.
Phase 6- Install (establish) new NAVD 1988 bench marks (2nd Order)
Phase 7 - TxDOT installs a GPS base station in Matagorda County (Base Sta #2)

Phase 8- LCRA installs a GPS base station in Matagorda County (Base Sta #3)
Phase 9- Annual review and update of the bench mark system including replacing missing or disturbed bench marks.

Responsibility: Matagorda County (establish and manage bench mark system)
City of Bay City (technical support)
City of Palacios (technical support)
LCRA – maintain HARN network and GPS base stations
TxDOT – provide NAVD 1988 data on TxDOT BM's

Cost: Phase 1 – Project completed October 2006 by LCRA
Phase 2 – Project completed in April 2007 by LCRA
Phase 3 – Project completed June 2009 by Matagorda County Consolidated Reclamation and Drainage District
Phase 4- $5,000 (estimated cost to prepare BM Database)
Phase 5- $5,000 (estimated study and mapping cost)
Phase 6- $20,000 (estimated cost for 20 new Bench marks)
Phase 7- $20,000 (estimated cost to install GPS base station)
Phase 8- $20,000 (estimated cost to install GPS base station)
Phase 9- $10,000 (estimated annual maintenance cost)

Administrative Cost: Staff time under current budgets

Funding Sources: Federal funding following a future Presidential declared disaster
HMGP/PDM
FMA
TxDOT
TWDB/TNRIS
USACE
NRCS
LCRA/TCRFC
Local Share - Funded by bonds and tax revenues

Timing: Phase 1 – October 2006
Phase 2 – June 2009
Phase 3 – April 2007
Phase 4 – Planned in 2010
Phases 5, 6, 7 & 8 – Planned in 2010 - 2011
Phase 9 - 2010 – 2015 annual maintenance needed

F-10 Support Future Colorado River Flood Reduction Projects

LCRA and TCRFC, working closely with the USACE, continue to identify flood reduction projects on the Lower Colorado River that will reduce future flood losses in Matagorda County. The Matagorda County Flood Mitigation Planning Committee recommends supporting these actions and projects as a long range mitigation action by

Matagorda County and the city of Bay City. By supporting these proposed projects and the efforts of LCRA, USACE and Wharton County, both politically and financially, Matagorda County can help save lives and reduce property damages from future flood events.

Responsibility:	Colorado River Matagorda County City of Bay City Wharton County LCRA TCRFC USACE NRCS TWDB
Cost:	Federal and local share to be determined by each project
Administrative Cost:	Staff time under current budgets
Funding Sources:	Federal funding following a future Presidential declared disaster USACE FEMA HMGP FMA TWDB NRCS (stream restoration) Matagorda County (local share if required) City of Bay City (local share if required)
Timing:	2010 to 2015 support projects as identified

F-11 Participation in FEMA's Community Rating System (CRS) Program.

Currently no Matagorda County communities participate in FEMA's CRS Program. FEMA recognizes community efforts that exceed the minimum requirements of the National Flood Insurance Program (NFIP) by designating communities that have adopted "higher standards" as CRS Communities. All flood insurance policies within communities that participate in FEMA's CRS program are rewarded with reduced flood insurance premiums. There are only 45 Texas counties and communities that are enrolled in the CRS Program.

The TCRFC has established a CRS Coordinators role to assist Coalition communities with CRS activities such as:

Outreach (letters to owners of repetitive loss properties)
TCRFC website as a CRS Program resource
Newspaper articles within the basin to support floodplain management outreach activities
Floodplain management workshops sponsored by TCRFC
CRS Program technical resource for coalition communities

This Mitigation Plan Action Item is for the Matagorda County and the cities of Bay City and Palacios to evaluate the benefits of FEMA's CRS program and if warranted submit a CRS Program Application, document CRS activities, prepare annual reports, host CRS workshops and training activities, and develop programs that will result in future CRS credits. The Flood Mitigation Committee recognizes that the CRS Program may not be economically feasible for a community with a small number of flood insurance policies in force. Therefore, not all Matagorda County communities are likely candidates to enroll in the CRS Program. Based on NFIP records, the annual premiums for Matagorda County and participating communities are as follows:

Matagorda County:	2133 policies with $1,706,024 annual premiums
City of Bay City:	1178 policies with $476,308 annual premiums
City of Palacios:	478 policies with $249,825 annual premiums

Source: www.fema.gov policy statistics as of 08/31/08

The estimated flood insurance policy savings for a CRS Class 9 rating is estimated to be:

Matagorda County:	$85,301 annual savings ($426,000 over 5-years)
City of Bay City:	$23,815 annual savings ($119,000 over 5-years)
City of Palacios:	$12,491 annual savings ($62,500 over 5-years)

Source: www.fema.gov policy statistics as of 08/31/08
Note: CRS ratings are for a 5-year period and reviewed annually

Responsibility: Matagorda County Floodplain Administrator
City of Bay City Floodplain Administrator
City of Palacios Floodplain Administrator
TCRFC CRS Coordinator (Technical Support)

Cost: Staff time under current budgets

Funding Sources: Not required

Timing: 2009 – County and participating communities evaluate CRS Program

2010 – County or participating community submits CRS Application

2010 – FEMA conducts a Community Assistance Visit (CAV)
2010 – ISO conducts community verification visit
2011 – County and/or participating community enters the CRS Program
2012 - CRS program 1st evaluation (annual)
2016 – ISO 5-year verification visit

Beneficiary: NFIP policy holders in each CRS community

F-12 Create a Matagorda County Disaster Response Team

As part of the TCRFC All-Hazards Mitigation Plan, Matagorda County and the cities of Bay City and Palacios identified possible hurricane and tornado paths, floodprone properties, repetitive loss properties, HAZMAT corridors, and areas where emergency assistance may be needed. The Matagorda County Flood Mitigation Planning Committee recommended establishing a Matagorda County Disaster Response Team with identified procedures to assist local officials with important decisions regarding disaster response and recovery. Halff Associates executed a similar Disaster Response Contract with Galveston County in 2006 that was activated following Hurricane Ike in September 2008.

Step 1 – Select a consultant or consultants to assist Matagorda County and the cities of Bay City and Palacios during a disaster event. Define the engineering consultants scope of work based on set salary and expenses rates. Matagorda County and the cities of Bay City and Palacios can select a single engineering consultant or the County and each community can select their own engineering consultant to assist with disaster recovery. Should the disaster event become a Presidential declared disaster the expenses associated with this mitigation action may be eligible for reimbursement from FEMA.

Step 2 – Execute a consultant "on call" contract to include response tasks:

1. Deployment of consultant's response team at Matagorda County and/or participating community request
2. Coordination with each community elected officials, floodplain administrator, emergency management coordinator, engineering consultants, LCRA representative, and Federal and state agencies.
3. Utilize Matagorda County, TWDB/TNRIS, FEMA, TCRFC, LCRA, GLO and other sources data such as NFIP flood loss data and GIS mapping
4. Identify and inspect damaged properties, areas, subdivisions and specific structures
5. Identify substandard housing that may be eligible for Federal and state funding for possible "demo-rebuild" projects
6. Assist County and communities with requests to FEMA for flood recovery mapping
7. Identify and survey high water marks (HWM) and prepare flood inundation maps
8. Monitor Flood Warning Sites and gauges to forecast downstream flooding

9. Prepare maps of damage areas for hurricane, tornado, HAZMAT or other event
10. Compile daily reports with photographs and engineering data
11. Document flood depths and calculate estimated damages to all damaged structures
12. Utilize FEMA's Residential Substantial Damage Estimator Program (RSDE), Substantial Damage Estimator (SDE) and Matagorda County Appraisal District data to classify and document substantially damaged structures
13. Assist Matagorda County and participating communities with damage inspections and preparation of Federal and State agency reports
14. Assist Matagorda County and participating communities with coordination efforts with State and Federal agencies
15. Assist Matagorda County and participating communities with applications for State and Federal funding
16. Assist Matagorda County and participating communities with design, construction and management of flood recovery (Public Assistance), Hazard Mitigation Grant Program (HMGP), Flood mitigation Assistance (FMA) and ORCA funded projects
17. Assist Matagorda County and participating communities with coastal construction requirements and coordination with GLO, USACE, DEM, FEMA and others
18. Assist Matagorda County and participating communities with documentation and project closeout of state and Federally funded projects
19. Assist Matagorda County and participating communities with FEMA map revisions to correct errors in FIRM's.

Step 3 – Annually review and update, if necessary, consultants "on call" contracts

Responsibility:	Matagorda County (Disaster will be declared by county) City of Bay City City of Palacios FEMA/DHS Texas General Land Office (GLO) Governor's Division of Emergency Management (TxDEM) LCRA (Technical Assistance) TCRFC
Cost:	Execute "on call" contracts only after hazard events Cost will be hourly and dependent on magnitude of the event Each engineering consultant will be required to submit a rate schedule of salary and expenses
Funding Sources:	Governor's Division of Emergency Management (TxDEM) Public Assistance Funding available from a future Presidential declared disaster

FEMA – Flood Recovery Mapping funds
TxDEM - Hazard Mitigation Grant Program (HMGP)
TxDEM – Repetitive Flood Claims (RFC) Program
TWDB – Flood Mitigation Assistance (FMA) Program
TWDB – Severe Repetitive Loss (SRL) Program
TWDB – Flood Protection Planning Grant and Loan Programs
NRCS – Steam Restoration Program
ORCA – Office of Rural Community Affairs
Matagorda County and participating communities

Timing: Any disaster event during the 5 year plan life (2010-2015)

Beneficiaries: Matagorda County and participating communities
Property owners and citizens of Matagorda County

F-13 Installation of additional Stream and Precipitation Gauges in the Colorado Watershed

This Action Item is to identify sites where additional stream and precipitation gauges are needed in Matagorda County and coordinate installation requests with the USGS, LCRA and NWS. The USGS maintains two "real time" USGS gauges located in Matagorda County that can be viewed on line at http://waterdata.usgs.gov/tx/nwis/current/?type=flow .

USGS 08162500 Colorado River near Bay City, TX

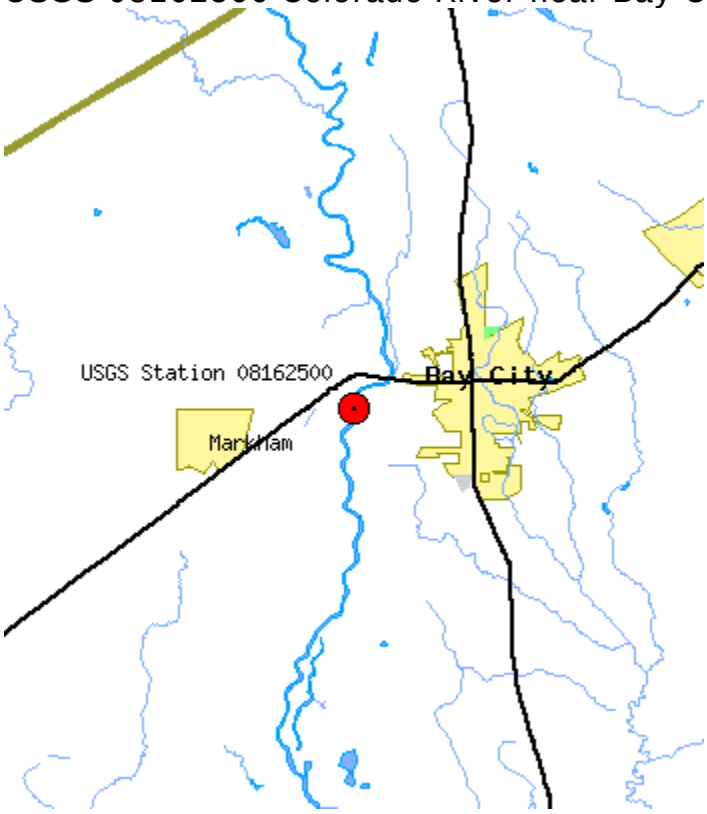


Figure ___ Site Map for USGS Station 08162500 near Bay City, Texas

Streamflow records for the Colorado River gage near Bay City are summarized below:

USGS 08162500 COLORADO RV NR BAY CITY, TX

GO

Matagorda County, Texas
Hydrologic Unit Code 12090302
Latitude 28°58'26", Longitude 96°00'44" NAD27
Drainage area 42,240 square miles
Contributing drainage area 30,837 square miles

Water Year	Date	Gage Height (feet)	Stream-flow (cfs)	Water Year	Date	Gage Height (feet)	Stream-flow (cfs)
1869	Jul. 1869	56.1[5]	[7,B]	1973	Jun. 15, 1973	38.70	60,800[6]
1914	Dec. 10, 1913	56.1[5]	[7]	1974	Sep. 16, 1974	32.14	38,400[6]
1922	May 08, 1922	55.4[5]	[7]	1975	May 28, 1975	34.45	48,900[6]
1929	Jun. 1929	55.0[5]	[7,B]	1976	Apr. 22, 1976	23.47	19,900[6]
1935	Jun. 22, 1935	54.6[5]	[7]	1977	Apr. 24, 1977	34.20	50,300[6]
1937	Oct. 05, 1936	52.2[5]	[7]	1978	Sep. 15, 1978	22.96	19,700[6]
1938	Aug. 02, 1938	53.4[5]	[7]	1979	Jun. 09, 1979	29.90	40,400[6]
1940	Jul. 04, 1940	46.60	83,300[7]	1980	May 19, 1980	19.20	14,300[6]
1941	Nov. 27, 1940	47.6[5]	[7]				

1948	May 28, 1948	22.73	6,390[6]	1981	Jun. 18, 1981	30.95	42,100[6]
1949	Apr. 28, 1949	34.00	36,000[6]	1982	Nov. 03, 1981	32.48	46,400[6]
1950	Jun. 04, 1950	30.51	24,800[6]	1983	May 23, 1983	22.90	22,600[6]
1951	Jun. 07, 1951	25.75	12,000[6]	1984	Oct. 17, 1983	16.02	10,700[6]
1952	May 29, 1952	29.07	20,100[6]	1985	Oct. 25, 1984	24.60	24,500[6]
1953	May 01, 1953	30.00	23,300[6]	1986	Nov. 28, 1985	24.23	23,600[6]
1954	Dec. 05, 1953	24.83	10,000[6]	1987	Jun. 17, 1987	34.32	50,500[6]
1955	May 21, 1955	25.74	11,900[6]	1988	Mar. 19, 1988	18.24	12,200[6]
1956	Oct. 10, 1955	20.95	4,460[6]	1989	May 16, 1989	14.60	7,740[6]
1957	May 01, 1957	41.83	53,000[6]	1990	Feb. 22, 1990	13.74	6,720[6]
1958	Oct. 17, 1957	42.77	59,200[6]	1991	Apr. 16, 1991	24.04	23,200[6]
1959	Apr. 13, 1959	34.48	34,200[6]	1992	Dec. 27, 1991	38.90	69,600[6]
1960	Jun. 26, 1960	46.40	84,100[6]	1993	Jun. 22, 1993	30.28	38,500[6]
1961	Sep. 15, 1961	44.09	66,400[6]	1994	May 17, 1994	18.69	12,000[6]
1962	Nov. 15, 1961	29.80	21,000[6]	1995	Oct. 20, 1994	38.67	71,100[6]
1963	Feb. 22, 1963	22.69	8,580[6]	1996	Jun. 26, 1996	16.76	12,200[6]
1964	Sep. 19, 1964	21.96	7,800[6]	1997	Mar. 19, 1997	29.29	37,900[6]
1965	May 20, 1965	31.05	27,000[6]	1998	Oct. 15, 1997	26.09	33,000[6]
1966	Dec. 06, 1965	25.64	15,200[6]	1999	Oct. 24, 1998	40.95	81,800[6]
1967	Sep. 23,	27.50	19,000	2000	Jun. 12,	12.98	7,380[6]

	1967		[6]		2000		
1968	Jun. 26, 1968	37.49	49,500 [6]	2001	Sep. 01, 2001	22.36	22,800 [6]
1969	Feb. 23, 1969	27.92	24,200 [6]	2002	Jul. 16, 2002	27.05	33,000 [6]
1970	May 19, 1970	26.34	21,900 [6]	2003	Nov. 08, 2002	32.56	48,300 [6]
1971	Oct. 25, 1970	24.76	19,400 [6]	2004	Jun. 26, 2004	24.38	25,300 [6]
1972	May 13, 1972	27.34	24,600 [6]	2005	Nov. 27, 2004	41.73	73,800 [6]
				2006	Jul. 26, 2006	12.53	6,930[6]
				2007	Jul. 05, 2007	31.81	40,800 [6]

Peak Gage-Height Qualification Codes.

- 5 -- Gage height is an estimate

Peak Streamflow Qualification Codes.

- 6 -- Discharge affected by Regulation or Diversion
- 7 -- Discharge is an Historic Peak
- B -- Month or Day of occurrence is unknown or not exact

AVAILABLE DATA for the Colorado River Gage at Bay City:

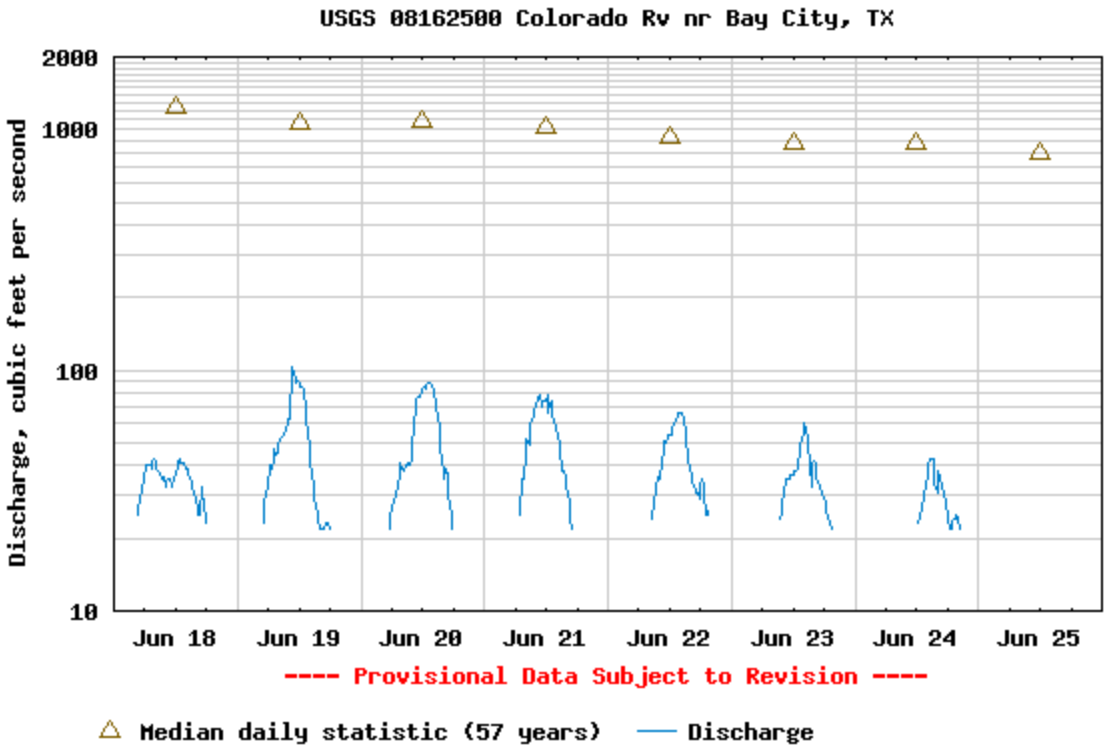
Data Type	Begin Date	End Date	Count
Real-time	-- Previous 60 days --		
Daily Data			
Discharge, cubic feet per second	1948-05-01	2009-05-30	22292
Gage height, feet	1996-07-03	2009-06-25	4359
Daily Statistics			

Discharge, cubic feet per second	1948-05-01	2009-01-01	20610
Gage height, feet	1996-07-03	2008-03-23	4189
Monthly Statistics			
Discharge, cubic feet per second	1948-05	2009-01	
Gage height, feet	1996-07	2008-03	
Annual Statistics			
Discharge, cubic feet per second	1948	2009	
Gage height, feet	1996	2008	
Peak streamflow	1869-07-00	2007-07-05	69
Field measurements	1940-07-03	2009-05-12	651
Field/Lab water-quality samples	1974-10-16	2001-06-26	29
Additional Data Sources	**Begin Date**	**End Date**	**Count**
Instantaneous-Data Archive **offsite**	1990-10-01	2007-09-30	276104
Annual Water-Data Report (pdf) **offsite**	2005	2008	4

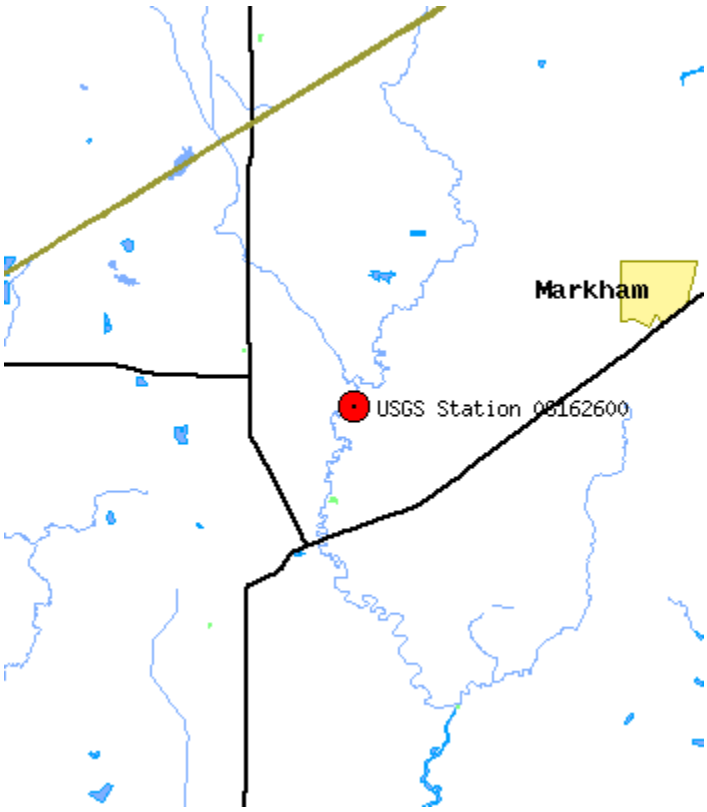
OPERATION:

Record for this site is maintained by the USGS Texas Water Science Center

Email questions about this site to Texas Water Science Center Water-Data Inquiries


USGS 08162500 Colorado Rv nr Bay City, TX
Discharge, cubic feet per second
2000
1000
100
10
Jun 18
Jun 19
Jun 20
Jun 21
Jun 22
Jun 23
Jun 24
Jun 25
---- Provisional Data Subject to Revision ----
Median daily statistic (57 years)
Discharge

USGS 08162600 TRES PALACIOS RIVER NEAR MIDFIELD, TX STREAM SITE



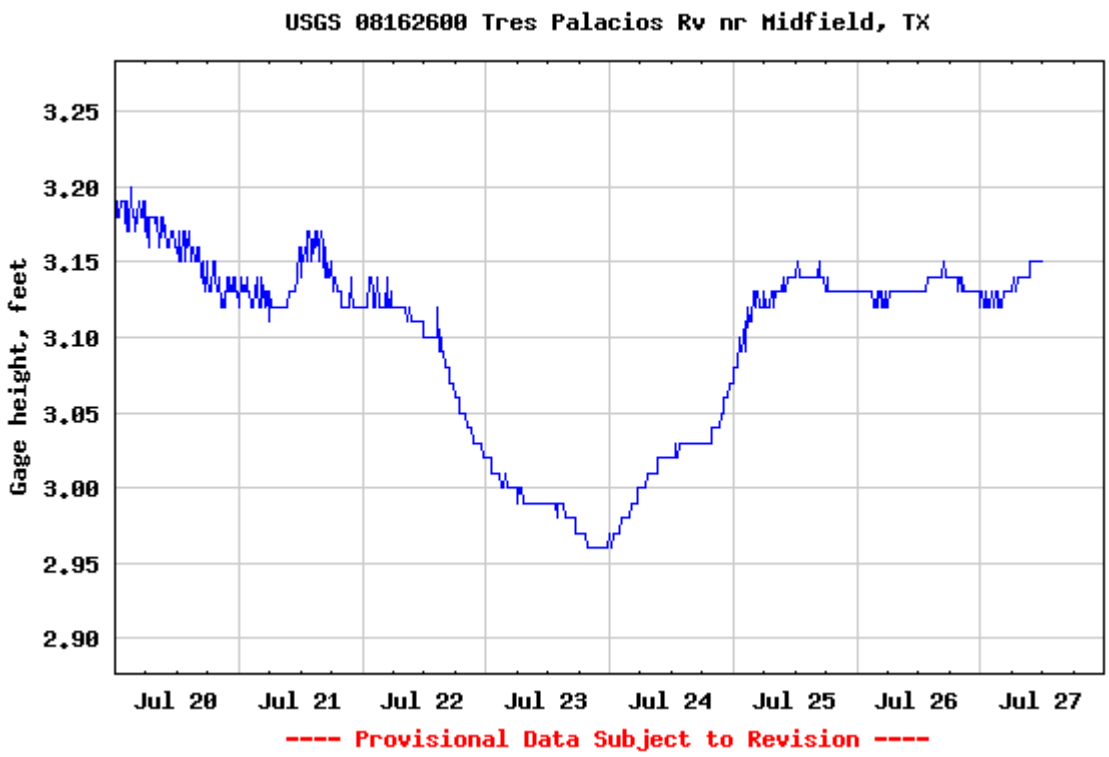
DESCRIPTION:

Latitude 28°55'40", Longitude 96°10'15" NAD27
Matagorda County, Texas, Hydrologic Unit 12100401
Drainage area: 145 square miles
Contributing drainage area: 145 square miles,
Datum of gage: 5.38 feet above sea level NGVD29

	00060, Discharge, cubic feet per second	
Water Year	Period-of-record for statistical calculation restricted by user	
	1971	131.4
	1972	121.6
	1973	281.4

Water Year	00060, Discharge, cubic feet per second	
	1974	155.7
1975	135.5	
1976	76.4	
1977	98.8	
1978	89.4	
1979	307.1	
1980	105.2	
1981	176.0	
1982	169.5	
1983	205.3	
1984	143.5	
1985	268.8	
1986	42.2	
1987	170.2	
1988	47.3	
1989	59.9	
1990	66.2	
1991	155.7	
1992	325.4	
1993	217.3	
1994	84.2	
1995	269.3	
1996	144.4	
1997	320.5	
1998	237.4	
1999	112.0	
2000	60.6	
2001	180.6	
2002	126.1	

Water Year	00060, Discharge, cubic feet per second
2003	203.3
2004	230.4
2005	202.4
2006	83.8
2007	317.2
2008	78.4



The LCRA website, www.lcra.org provides access to the LCRA HYDROMET System

The LCRA website www.lcra.org contains rain and weather surveillance information which is updated in 5 minute intervals.

The LCRA is currently installing Crest Stage Gauges on the Colorado River to capture storm stage peaks.

Both the LCRA and the National Weather Service (NWS) monitors rain gauges in Matagorda County. LCRA has established a network of volunteers in Matagorda County that operate rain gauges and report data to LCRA that is incorporated into the LCRA HYDROMET System. LCRA is exploring the possibility of expanding the volunteer network in Matagorda County.

The estimated installation cost for a stream gauge meeting USGS and LCRA criteria is $20,000 with an estimated monthly maintenance cost of $1,000.

Responsibility:	Matagorda County City of Bay City City of Palacios Lower Colorado River Authority
Cost:	Phase 1 - 1 gage - $20,000 estimated installation cost Phase 2 - 1 gage - $ 20,000 estimated installation cost Phase 3 - Expand LCRA volunteer raingage network - $1,000 (estimated) Phase 1 Annual maintenance cost $ 12,000 (estimated for Year 1) Phase 2 Annual maintenance cost $ 24,000 (estimated after Year 1) Phase 3 Annual maintenance cost $200 (estimated)
Funding Sources:	HMGP – Governor's Division of Emergency Management Texas Water Development Board Matagorda County City of Bay City City of Palacios LCRA
Timing:	Phased 2010 to 2015
Beneficiary:	Countywide

F-14 Install Reverse 911 Emergency Warning System

This action item builds on the current Matagorda County 911 System. A mitigation evaluation (study) is recommended to determine the feasibility of installing a Matagorda County (countywide) Reverse 911 System. The evaluation should identify flood-prone or "at risk" structures that should be notified and possibly evacuated when flooding is eminent. By identifying structures and phone numbers, a Reverse 911 database could be created. The Matagorda County 911 System will allow coordination between the Matagorda County, City of Bay City and City of Palacios Office of Emergency Management, the National Weather Service (NWS), LCRA and law enforcement agencies and could issue Emergency Warnings via the Reverse 911 System.

Responsibility:	Matagorda County (co-lead with cities of Bay City and Palacios) City of Bay City (co lead with Matagorda County) City of Palacios (co lead with Matagorda County) HGAC (Technical Support) HCFCD (Technical Support)
Cost:	$10,000 estimated survey cost $60,000 estimated equipment cost $5,000 estimated cost for annual maintenance and training
Funding Sources:	FEMA/DHS HGAC TxDEM LCRA/TCRFC Matagorda County City of Bay City City of Palacios
Timing:	Phased over 5 years (2010-2015)
Beneficiary:	Countywide

F-15 "Storm Ready" Designation for Matagorda County Communities

There are no communities within Matagorda County that have been designated as a "Storm Ready" community by the National Weather Service (NWS). The NWS Office in Houston is available to assist Matagorda County communities to become "Storm Ready". The mitigation plan goal is to classify every community within Matagorda County as "Storm Ready". HGAC and/or LCRA/TCRFC may be able to assist with the coordination effort with the NWS.

Responsibility:	Matagorda County (co-lead with cities of Bay City and Palacios) City of Bay City (co lead with Matagorda County) City of Palacios (co lead with Matagorda County) NWS HGAC

	LCRA TCRFC
Cost:	Staff time under current budgets
Funding Sources:	Not required
Timing:	Phased over 5 years (2010-2015)
Beneficiary:	Countywide

F-16 Backup Power for Matagorda County Critical Facilities

Install emergency generators or redundant power for the Matagorda County critical facilities such as the County Court House, City Halls (2), Public Safety Buildings, fire stations, police facilities, communication towers and fuel dispensing facilities. A study is recommended to evaluate options and estimate costs for Matagorda County and participating communities to select, design and construct backup power systems that can fulfill the need.

As a possible alternative, Matagorda County and participating communities can consider purchasing a mobile power generator as noted in the following *Texas Government Insider* article referencing action by the city of Victoria in July 2006:

VICTORIA CONSIDERS $100K MOBILE POWER GENERATOR

With a goal of keeping the city's water and sewer system operating during a sustained power loss, the city of Victoria is contemplating purchasing a mobile power generator at a cost of more than $100,000. The generator could be used for everything from operating pumps that send water to the treatment plant to keeping sewer system lift stations up and running. The 600-kilowatt generator is mounted on a trailer so that it can be moved to the location where it is needed. Victoria city officials remember a few years ago when Hurricane Claudette left the city without power for an extended period of time.

Responsibility:	Matagorda County OEM City of Bay City OEM City of Palacios OEM HGAC (Technical support) LCRA (Technical support) TCRFC (Technical support)
Cost:	$ 3,000 estimated study cost $30,000 estimated cost to install backup power per facility (Option 1) $20,000 estimated cost to install redundant power per facility (Option 2)

	$80,000 estimated cost to construct a secondary tower (Option 3) $100,000 estimated cost to purchase a 600 KW mobile power generator
Funding Sources:	TxDEM Department of Homeland Security (FEMA) FEMA Project Initiative Program Matagorda County City of Bay City City of Palacios
Timing:	Study initiated in 2010 Phased construction from 2010 to 2015
Beneficiary:	Countywide

F-17 Inspect, Improve and Certify flood protection levees and seawalls in Matagorda County

In 2009, the Matagorda County Consolidated Reclamation and Drainage District hired Halff Associates to initiate a levee inspection and evaluation of the Town of Matagorda Levee and 42.05 miles of Colorado River levee through Bay City. This study will identify needed improvements and actions needed for certification of the various levees before they will be mapped by FEMA as providing flood protection. This mitigation action is to initiate the recommended actions from the Matagorda County Consolidated Reclamation and Drainage District study.

Responsibility:	Matagorda County (co-lead with cities of Bay City and Palacios) City of Bay City (co lead with Matagorda County) City of Palacios (co lead with Matagorda County) LCRA (Technical Support)
Cost:	To be determined by the Drainage District Study
Funding Sources:	U.S Army Corps of Engineers TxDEM – HMGP funding TWDB – FMA Program funding ORCA LCRA/TCRFC Matagorda County City of Bay City City of Palacios
Timing:	Phased over 5 years (2010-2015)
Beneficiary:	Town of Matagorda

Areas along Colorado River

F-18 Cottonwood Creel Letter of Map Revision (LOMR)

The City of Bay City received a TWDB Flood Protection Planning Grant to conduct a drainage improvement study for Cottonwood Creek. The project was designed and constructed and as of 2009 the Cottonwood Creek area in Bay City has not flooded. A LOMR was not submitted to FEMA and the Cottonwood Creek floodplain has not been officially revised.

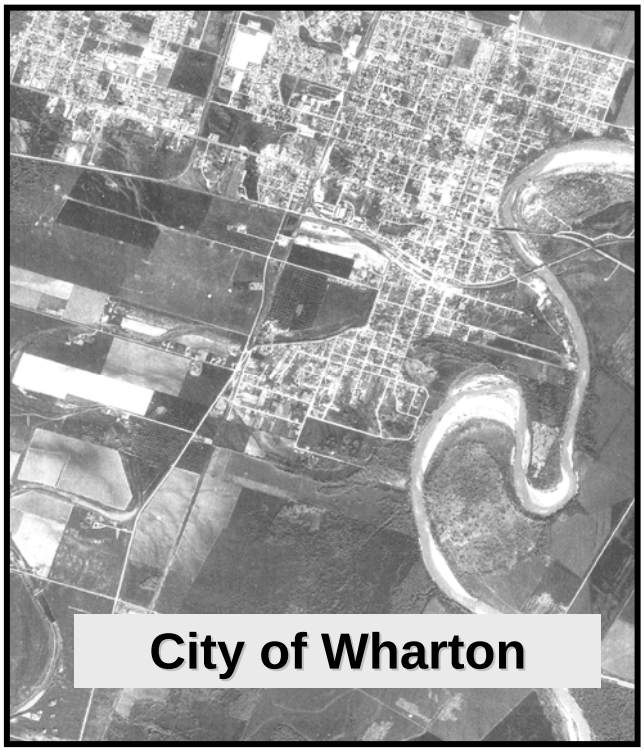
This mitigation action is to prepare and submit the Cottonwood Creek LOMR to FEMA for approval. The Matagorda County Flood Mitigation Planning Committee recommends that this mitigation action be initiated and completed as soon as possible to provide the technical information to FEMA to be incorporated into the Matagorda County remapping effort scheduled to be completed in mid 2010.

Responsibility	City of Bay City
Cost	To be determioned by the Bay City engineering consultant
Funding Sources	City of Bay City
Timing	Oct 2009 - Submit LOMR to FEMA Jan 2010 - FEMA issues a LOMR Feb 2010 - FEMA incorporates updated technical information into the Matagorda County remapping effort June 2010 – FEMA publishes Preliminary DFIRM
Beneficiary	Bay City property owners in the Cottonwood Watershed

WHARTON COUNTY
FLOOD MITIGATION PLAN

WHARTON COUNTY
CITY OF EAST BERNARD
CITY OF EL CAMPO
CITY OF WHARTON

PREPARED BY
WHARTON COUNTY FLOOD MITIGATION PLANNING COMMITTEE



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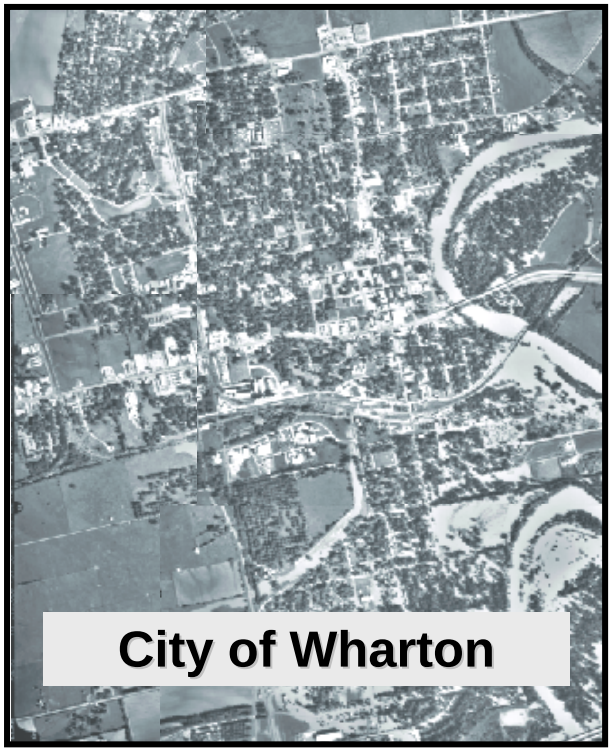

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HALFF ASSOCIATES, INC.
June 2008

Wharton County Flood Mitigation Actions

The Wharton County Flood Mitigation Plan is maintained by the Wharton County Permit and Inspection Department in cooperation with floodplain managers and emergency managers from the cities of East Bernard, El Campo and Wharton. The Wharton County Floodplain Manager is responsible for retaining copies of the plan, coordinating review of the plan, and any future updates to the plan.

The Wharton County Flood Mitigation Planning Committee evaluated the proposed TCRFC regional mitigation actions to identify mitigation actions that may be implemented by Wharton County and the cities of East Bernard, El Campo, and Wharton. The actions identified below were determined to be the most appropriate actions given the current resources and hazard vulnerabilities for Wharton County and participating communities.

A total of sixteen (16) Flood Mitigation Actions to address flood hazards were identified along with Floodplain Management Planning Goals by the Wharton County Flood Mitigation Planning Committee. Individual Flood Mitigation Actions are identified for Wharton County and each participating community as follows:

Wharton County	City of East Bernard	City of El Campo	City of Wharton
F1	F1	F1	F1
F2			
F4	F4	F4	
F5	F5	F5	F5
F6			
F7			
F8	F8		
F9	F9	F9	
	F10		
F11	F11	F11	F11
F12	F12	F12	F12
F13	F13	F13	
F14			
F15	F15	F15	F15
F16	F16	F16	F16

Flood Damage Reduction (F)

Addresses: **Flooding**
Goal: **Make Wharton County more flood resistant:**

F.1 Reduce Flood Losses and Increase NFIP Flood Insurance Coverage throughout Wharton County

Based on NFIP flood insurance policy and claims data, there are only 2,144 flood insurance policies in force which is approximately 15% of the 14,000 structures in Wharton County and $330in coverage in Wharton County and the cities of East Bernard, El Campo and Wharton. There have been 458 paid flood insurance claims for a total of $8.6M (Average claim = $18,826) in Wharton County since 1978. FEMA has identified 44 Repetitive Loss Properties in Wharton County (16 in unincorporated Wharton County, 15 (city has reduced to 12 by recent elevation projects) in the City of Wharton, 13 in the City of El Campo and 1 in the City of East Barnard). A Repetitive Loss Property is a property that has received two or more paid flood insurance claims that exceed $1,000.00 within a ten year period. FEMA designates communities with 10 or more Repetitive Loss Properties as a Category "C" community. By utilizing FEMA funding administered by TxDEM and TWDB, Wharton County and participating communities can address problems in flood loss and repetitive loss areas by initiating acquisition and elevation projects for identified structures and by designing and constructing drainage improvements.

In the survey, conducted as part of the Flood Mitigation Plan preparation, only 57% of the responders know that they live in a designated flood hazard zone. See Plan Section 1.3.2. The Texas Colorado River flood Coalition (TCRFC) TIMS can assist in helping inform the public by having an interactive map that people can easily use to help find their home or place of business to see if it is in a flood zone. TIMS has an option of entering an address to help the user find the specific site. TIMS can be found on the following link: http://tims.lcra.org/Launch.aspx

This Mitigation Action Item recommends bi-annual Flood Insurance Workshops to be coordinated by the NFIP Region 6 Office utilizing "Flood Smart" publications. Wharton County and the cities of East Bernard, El Campo and Wharton are members of the Houston Galveston Area Council (HGAC) and the TCRFC, the likely sponsors of future workshops and outreach events. Community floodplain managers, insurance agents, developers, homeowners and the general public can be invited. The purpose of the workshop is to inform attendees that flood insurance is available for all structures located in communities that participate in the NFIP and that flood insurance policies protect against losses both for structures and contents.

Goal:	Educate the public with the goal to increase the flood insurance policy base to minimize the financial impact of future floods.
Responsibility:	Wharton County Floodplain Administrator (also represents the City of East Bernard) City of El Campo Floodplain Administrator City of Wharton Floodplain Administrator TCRFC (continue to post website information) HGAC FEMA Region VI/CSC Flood Smart

NFIP Regional Office
TWDB – State Floodplain Coordinator

Cost: $425 = Average NFIP annual premium (estimate)
$42,500 Annual premiums for 100 new policies
FEMA, NFIP/CSC/Flood Smart and TWDB provide workshops at no cost

Funding Sources: NFIP Policies (Flood Policy Fund)
Owners of residential and nonresidential structures
Renters and building occupants

Workshops: TCRFC
HGAC
FEMA/DHS
NFIP (National Flood Insurance Program Region VI)
TWDB (Texas Water Development Board)

Timing: Flood Insurance workshops to be held in the 2008 – 2012 time period.

Beneficiary: All citizens and property owners in Wharton County

F-2 Design, construct and maintain drainage improvement projects to minimize the risk of loss of life and future flood damages by utilizing funding from Federal, State, Capital Improvement Program (CIP), Development or Stormwater Utility Fee and other funding sources.

The National Weather Service reports that the national 30-year average for deaths related to flooding is 127 per year. Of that yearly average, nearly half are related to motorists attempting to cross roadways that are overtopped by floodwaters and Texas flood deaths in the first half of 2007 have exceeded the annual State average. The Wharton County Master Drainage Plan and San Bernard River Watershed Study, currently underway, will identify problem areas including roadway crossings that are overtopped by floodwaters. These problem areas present public danger and potential loss of human life. Detail information for each creek and watershed improvement will be described in the Wharton County Master Drainage Plan and San Bernard River Watershed Study.

This proposed action includes the implementation of the Wharton County Master Drainage Plan and San Bernard River Watershed Study recommendations to construct needed improvements to reduce the risk of loss of life and property damage. Annual revisions of the Wharton County Flood Mitigation Plan will identify future drainage improvement projects and estimated costs.

Responsibility: Wharton County
City of East Bernard

City of El Campo
City of Wharton

Cost: Will be described in the Wharton County Master Drainage Plan and San Bernard River Watershed Study

Funding Sources: FEMA/DEM - Hazard Mitigation Grant Program
FEMA/TWDB – Flood Mitigation Assistance funds
TWDB Flood Protection Planning Grants and Loans
NRCS – Stream Restoration Project funding
Storm Water Utility Fee and/or Bond Program (Under consideration)
Wharton County and participating communities Capital Improvements Program

Timing: Design and construction to be phased as funding becomes available.

Beneficiary: All citizens and property owners in Wharton County

F-3 Acquisition and Relocation, Elevation and "Demo-Rebuild" of Floodprone Structures

This proposed action assists local community efforts to identify potential structures and initiate acquisition and relocation, elevation and demo-rebuild projects to reduce the risk of future flood losses. A database has been created as part of the Wharton County Flood Mitigation Plan listing Repetitive Loss Properties, properties that have had flood insurance claims, and properties located in areas of high flood risk. This information is confidential in nature and used by the Flood Mitigation Planning Committee and participating communities for planning purposes only.

This proposed action identifies future HMGP, FMA, Federal Flood Protection Projects, TWDB Flood Protection Planning Grants, and county and community funded buyout and elevation projects. It is recommended that Wharton County, TCRFC and HGAC sponsor Buyout Conferences, similar to the Houston 1999 Buyout Conference sponsored by Bayou Preservation Association and HCFCD (200+ attendees) to inform and assist local communities and the general public on options and methods to reduce flood losses.

The City of El Campo and City of Wharton have completed successful mitigation projects of this type. The City of Wharton has completed two "elevation" projects that were funded by HMGP. The City of Wharton has completed 37 demo-rebuild projects and nine additional demo-rebuild projects are underway in 2007 funded by the Texas Department of Housing and Community Affairs (HCA) Home Investment Program. The City of El Campo has initiated nine (9) "demo-rebuild" projects funded by ORCA. FEMA's Flood Mitigation Assistance (FMA) Program provides funding to communities

for acquisition and relocation and elevation but does not currently fund "demo-rebuild" projects. The cities of El Campo and Wharton have initiated "Demo-Rebuild" projects funded by HCA. Properties that are substandard, located in blighted areas with low income owners are eligible for this program. Selected properties may be floodprone, repeteitive loss, or severe repetitive loss. These properties, when rebuilt, must be elevated above BFE.

To support this Mitigation Action, the Flood Mitigation Planning Committee recommends identifying, surveying lowest floors and documenting Wharton County Appraisal District values for Repetitive Loss and selected floodprone properties for future acquisition, relocation, elevation, demo-rebuild, and flood protection projects that may be eligible for funded with HMGP, FMA and ORCA funding. The Wharton County Repetitive Loss database, prepared as part of the Wharton County Flood Mitigation Plan includes repetitive loss properties identified by FEMA. This Mitigation Action recommends expanding the database to include:

- Properties located in the FEMA Floodway
- Properties with known flood hazards
- Appraisal District values (structure and land)
- Elevation Certificates and structure data (Lowest floor, type structure, etc)
- Property owner contact information (confidential)
- Base Flood Elevation data
- GIS mapping

FEMA requires submittal of a detailed cost:benefit analysis to justify expenditure of federal funds for these projects. This information needs to be readily available in the database.

The City of Wharton has submitted an application to enroll in FEMA's CRS Program. The application addresses flood prone and repetitive loss properties within the city. This information will be incorporated into the Wharton County database to allow the County and communities to jointly address projects to reduce flood risks in entire watersheds rather than city by city.

FEMA Region VI provided NFIP flood loss records, for planning purposes only, identifying a total of 44 properties in Wharton County have receive 2 or more paid flood insurance claims that exceed $1,000 for each claim. FEMA has designated 3 of the 44 as Severe Repetitive Loss Properties:

Mitigation	RL Properties	% of Total	
Wharton County -	15 Repetitive Loss Properties	34%	
City of East Bernard -	1 Property	2%	
City of El Campo - demo-rebuild	13 Properties	30%	9 homes
City of Wharton -	15 Properties	34%	

Wharton County Total 44 Properties

The estimated cost to acquire approximately 44 Wharton County repetitive loss properties and to relocate the owners/tenants is $ 5,500,000 for acquisition and relocation cost, and $1,320,000 demolition cost, estimated to be $30,000 for demolition cost for each structure.

The estimated cost to perform a "demo-rebuild" project is considered to be comparable to acquisition and relocation options. Specialized conditions may encourage the County or community to select one option over another or the decision may become b:c ratio influenced. However the ultimate decision lies with the community and the homeowner.

Responsibility: Wharton County Floodplain Administrator (also represents the City of East Bernard)
City of El Campo Floodplain Administrator
City of Wharton Floodplain Administrator
Individual property owners (voluntary):
FEMA/DHS
Governor's Division of Emergency Management (TxDEM)
Texas Water Development Board (TWDB)

Cost: $20,000 estimated cost to prepare the RL Database with GIS data
$ 5,500,000 estimate acquisition and relocation cost (44 parcels)
[$4.125M = 75% Federal Share]
[$1.375M = 25% Local Share]
$1,320,000 estimated demolition cost for 44 parcels (ICC Funds)

Cost breakdown per Community:

Wharton County -	$1.87M Acquisition + $0.45M Demolition (15 properties)
City of East Bernard -	$125,000 Acquisition + $30,000 Demolition (1 property)
City of El Campo -	$1.625M Acquisition + $0.39M Demolition (13 properties)
City of Wharton -	$1.87M Acquisition + $0.45M Demolition (15 properties)

Funding Sources: FEMA/DEM - Hazard Mitigation Grant Program (HMGP)
FEMA/DEM – Pre Disaster Mitigation (PDM) Program
FEMA/TWDB – Flood Mitigation Assistance (FMA) Program
FEMA/DEM – Repetitive Flood Claims (RFC) Program
FEMA/TWDB – Severe Repetitive Loss Program
Increased Cost of Construction (ICC) NFIP Policy Fund
Funding available from a future Presidential declared disaster
Office of Rural Community Affairs (ORCA) – (Texas)
Other Federal and State Agencies programs
Individual property owners
Wharton County
City of East Bernard

City of El Campo
City of Wharton

Timing: Repetitive Loss Buyout plan to be developed in 2008 and 2009 and carried out as funding becomes available or a disaster occurs.

Beneficiary: Property Owners in Wharton County

F-4 Floodplain Mapping for unmapped streams in Wharton County

The April 6, 2006 Wharton County Flood Insurance Study and FIRM's published by FEMA mapped floodplains, floodways and established base flood elevation (BFE's) on selected portions of 14 streams in Wharton County. The remaining 67 streams were mapped by approximate methods and designated as Approximate Zone A without identifying the 100-year, 500-year, and floodway boundaries and BFE's. Detail floodplain mapping is necessary for Wharton County and participating communities to establish and enforce sound floodplain management programs.

This flood mitigation action is to conduct detail hydrologic and hydraulic studies and map the 100-year, 500-year and floodway boundaries and establish BFE's for all streams in Wharton County. To accomplish this task, Wharton County and participating communities have initiated the Wharton County Master Drainage Plan and San Bernard River Watershed Study funded by the Texas Water Development Board. By coordinating this effort with the TCRFC, LCRA and FEMA, the Wharton County FIRM's can be updated to show detail floodplain information for all streams in Wharton County.

FEMA's 5-year Map Modernization Initiative, ending in FY 2008, will provide digitial FIRM's for a major portion of the United States. FEMA has proposed a Phase II Map Mod Initiative to begin in FY 2009 to address mapping needs not addressed in Phase I. Wharton County and the cities of East Bernard, El Campo and Wharton, working with LCRA and TNRIS, can capitalize on available Federal and state funding to map streams in Wharton County and update the Wharton County FIRM. The LCRA is a FEMA Cooperative Technical Partner (CTP) and would be ideal to lead this mapping update effort.

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Phase 1A	Wharton County Drainage Master Plan
Phase 1B	San Bernard River Watershed Study
Phase 2	Revise Wharton County FIRM's to incorporate Wharton County Master Drainage Plan data
Phase 3	Revise Austin, Brazoria, Colorado, Fort Bend and Wharton County FIRM's to incorporate San Bernard River study data

Responsibility: Wharton County
City of East Bernard
City of El Campo
City of Wharton

	LCRA as a FEMA CTP TNRIS as a FEMA CTP
Cost:	Phase 1A $ 2,300,000 (Estimated Cost) Phase 1B $2,767,130 (TWDB Flood Protection Project) Phase 2 Cost to be determined in Phase 1A Phase 3 Cost to be determined in Phase 1B
Funding Sources:	Federal funding following a future Presidential declared disaster when funding is available for flood recovery mapping Phase 1A - TWDB, USACE, Wharton County, cities of East Bernard, El Campo and Wharton Phase 1B - TWDB, USACE, Wharton County and East Bernard Phase 2 FEMA, LCRA/CTP, TWDB/CTP Phase 3 FEMA Map Mod Phase 2 (2009-2013)
Timing:	2008-2013 Mapping will be phased as funding becomes available.
Beneficiary:	All citizens and property owners in Wharton County

F-5 Adopt "Higher Standard" Flood Damage Prevention Ordinances and Standards.

The Wharton County Flood Mitigation Planning Committee reviewed the current ordinances for Wharton County and the cities of East Bernard, El Campo and Wharton and compared each to several "Higher Standard" Flood Damage Prevention Ordinances that have been adopted by other Texas communities and the 2005 model ordinance prepared by FEMA Region VI. The TCRFC is currently developing a "Higher Standard" Ordinance for consideration by TCRFC communities. A "Higher Standard" Flood Damage Prevention Ordinance can assist a community's efforts to reduce future flood losses and provide additional Community Rating System (CRS) credits for communities desiring to participate in FEMA's CRS Program. In April 2006 Wharton County and the cities of East Bernard, El Campo and Wharton adopted the new Wharton County Digital Flood Insurance Rate Maps (DFIRMs) by either a new flood damage prevention ordinance or by automatic adoption where the current ordinance adopts future FIRM's published by FEMA. Should a community choose to adopt a "higher standard" flood damage prevention ordinance, that community will receive a higher CRS rating should they elect to enroll in the CRS Program. One "higher standard" considered by the Committee is to require future critical facilities to be constructed outside the 500-year (0.2% annual chance) flood boundary or to be elevated or floodproofed above the 500-year (0.2% annual chance) flood elevation. Wharton County and the cities of East Bernard, El Campo, and Wharton will continue to participate in TCRFC and HGAC Floodplain Management activities where NFIP requirements and "higher standards" are discussed with representatives from FEMA, TWDB and other TCRFC and HGAC

communities. The TCRFC is currently developing a "higher standard" model ordinance that will contain options where a community can select key floodplain management requirements similar to the following listing developed by FEMA Region VI:

- 1', 2' or 3' freeboard
- Base Flood Elevations (BFE's) defined by fully developed watershed conditions
- Floodways defined by fully developed watershed conditions
- Floodways defined by zero rise
- On–site detention to compensate for the effects of proposed development
- Regional detention facilities funded by site development fees
- Minimum setbacks from floodways and stream banks
- Protection of critical facilities
  -Meet 500-year floodplain standards
- Protection of floodplain storage capacity
  -Prohibit fill in the 100-year floodplain
- Cumulative substantial improvement/substantial damage
  -Combination of multiple improvements/damage in reaching certain threshold
- Regulate development in the B or *shaded* X Zone and C or *unshaded* X Zone
  City of Friendswood requires lowest floor to be elevated in Zone X
- Regulations for natural and beneficial functions
  -Restrictions on development in sensitive areas, i.e.: wetlands, riparian areas, shorelines, stream channels, banks, and habitats
- Low Density Zoning
  -Limit development i.e.: no more than one building constructed per acre of floodplain

Responsibility:	Wharton County (Adopt Higher Standard Ordinance) City of East Bernard (Adopt Higher Standard Ordinance) City of El Campo (Adopt Higher Standard Ordinance) City of Wharton (Enroll in FEMA's CRS Program) TCRFC (develop model Higher Standard ordinance) HGAC and TCRFC (Floodplain Management Workshops)
Cost:	$500 to $2,000 per residential structure (estimated cost) $1,000 to $10,000 nonresidential structure (estimated cost)
Administrative Cost:	Staff Time under current budgets
Funding Sources:	Not Required
Timing:	2008 to 2012
Beneficiary:	Citizens and property owners in Wharton County

F-6 Provide Training for Community Floodplain Managers, Community Emergency Managers, CEM's and CFM's.

Both TCRFC and HGAC currently host numerous floodplain and emergency manager training opportunities including: FEMA's FPM Training Course, "Managing Floodplain Development through the NFIP"- E-273; NFIP Workshops and Flood Forums; and Community Rating System (CRS) Workshops; and Emergency Management and Home Land Security workshops, tabletop exercises and training opportunities. These TCRFC and HGAC programs assist local communities and provide continuing education credits (CEC's) for local floodplain administrators, certified floodplain managers (CFM's), certified emergency managers (CEM's), professional engineers (PE's), registered public land surveyors (RPLS) and the general public.

The proposed Mitigation Plan Action Item is to initiate a coordination effort to identify workshops and training activities that can benefit Wharton County and:

Agencies	**Associations**
FEMA Region VI	TFMA
NFIP Regional Office	EMAT
TWDB	ASFPM
TNRIS	IBC
LCRA	Texas Tech Wind Engineering
TxDEM	TCRFC
NRCS	
HGAC	
NWS/NOAA	

Note: Agency and association acronyms are listed in Plan Attachment "A".

Proposed Workshops and Training Activities:

FEMA Flood Forums (similar to 2004-2006 events)
TCRFC Quarterly Meetings and Workshops
HAZMAP Plan adoption and Plan maintenance (TxDEM)
Managing Floodplain Development through the NFIP (FEMA)
Flood Mitigation Assistance Plans (TWDB)
Flood Protection Planning Grants (TWDB)
Floodplain Manager Workshops (TWDB)
NFIP Workshops for community officials, lenders, agents, developers
Substantial Damage Estimator (FEMA)
CRS Workshop (FEMA/ISO)
TFMA Conferences and Mutual Aid
HAZUS Workshop (FEMA)
Building Code Workshops (HGAC/IBC)

	Tornado Safe Room Design and Construction Workshops (Texas Tech/FEMA) Potential Funding Sources for Workshops and Training: TWDB – Flood Protection Planning and FMA Program funding TxDEM – Disaster Exercises and HMGP Program funding Skyward/Storm Ready (NWS) Hazardous Weather Partner Workshops (NWS) HYDROMET System (LCRA)
Responsibility:	Wharton County (Lead community to host training) TCRFC HGAC
Cost:	Staff Time under current budgets
Funding Sources:	Not Required
Timing:	Annually 2008 to 2012
Beneficiary:	Wharton County and all participating communities

F-7 Develop Funding Opportunities for Drainage System Improvements

The Wharton County Master Drainage Plan and San Bernard River Watershed Study will identify needed drainage improvements in Wharton County. The Flood Mitigation Planning Committee discussed funding possibilities such as:

- TWDB Flood Protection Planning Grants and Project Loans
- Flood Mitigation Assistance (FMA) Project grants to acquire flood prone properties and create open space within the SFHA
- Federal Flood Protection Projects (USACE)
- Corps of Engineers 1140-1-211 “Support for Others” reimbursement of planning, design and construction (USACE)
- Steam Restoration Projects (USACE and NRCS)
- FEMA funding programs: Hazard Mitigation Grant Program (HMGP), Severe Repetitive Loss (SRL) and Repetitive Flood Claims (RFC) – Acquisition and Relocation, Elevation and Demo-Rebuild of flood prone properties
- Development fees for new construction to offset cost of regional drainage improvements
- Establish a county-wide storm drainage utility or impact fee
- Establishing Watershed Development Fees to offset watershed projects such as regional detention and channel improvements
- Evaluate the creation of a county-wide drainage district
- Developer constructed improvements resulting in tax benefit pay backs

Identify and actively pursue funding mechanisms for future drainage improvements. Wharton County and participating communities working together can plan, coordinate and fund the design, construction, and maintenance of (county-wide) drainage improvements and flood control projects that benefit entire watersheds and drainage basins.

Responsibility: Wharton County
City of East Bernard
City of El Campo
City of Wharton

Cost: To be determined by the Wharton Co. Drainage Master Plan
1. Identify funding sources
2. Submit applications for funding
3. Project planning
4. Design and construction – based on approved projects
5. Maintenance (annual expense)

Administrative Cost: Staff Time under current budgets

Funding Sources: TWDB
USACE
HMGP/PDM/SRL/RFC
FMA
NRCS
Local Share - Funded by development fees, bonds and tax revenues

Timing: 2008 Drainage Master Plan completion
2008 to 2012 Obtain funding and initiate design and construction

F-8 Establish County-Wide Bench Mark Network

The Wharton County FIRM's, dated April 2006, identify Elevation Reference Marks (ERM) or Bench Marks (BM) and Base Flood Elevations (BFEs) that are referenced to NAVD 1988 Elevation Datum. The Elevation Reference Marks and Base Flood Elevations (BFEs) on previously published FIRMs for Wharton County and the cities of El Campo and Wharton show Elevation Reference Marks and Base Flood Elevations referenced to NGVD 1929 which is no longer acceptable for National Flood Insurance Program purposes. Only 188 ERMs and BMs are shown on the new FIRM's (1,094 square miles or 1 BM per 5.8 square miles) presenting a major problem for local community administrators that must reference NAVD 1988 for new development permits. To assist local floodplain administrators, LCRA's High Accuracy Reference Network (HARN) System, accessible on line at www.harn.lcra.org, identifies 23 additional BMs that are referenced to NAVD 1988. The LCRA maintained HARN

Network is mapped and described on the LCRA website. LCRA has also installed a GPS base station in Bay City to assist surveyors in the Lower Colorado River Basin that includes Matagorda and Wharton counties. In 2007, Wharton County funded installation of seven (7) brass survey monuments (NAVD 88) as part of the Wharton County Flood Mitigation Plan. Individual datasheets for these seven monuments are included in Appendix "B". The Wharton County Flood Mitigation Planning Committee recommends establishing a county-wide network of NAVD 1988 bench marks that can be shared by Wharton County and the cities of East Bernard, El Campo, and Wharton, along with USACE, TxDOT, LCRA, FEMA and others. This network must be readily available to surveyors, engineers, homeowners, insurance agents and general public for NFIP, floodplain management and general construction purposes. Participation by TxDOT, LCRA, NRCS, local surveyors and engineers is needed for this to be a successful mitigation action. Wharton County's subdivision ordinance requires developers to establish two (2) permanent survey monument per subdivision referenced to NAVD 1988 as part of all new subdivision developments.

Phase 1 - LCRA established GPS base station in Bay City
Phase 2 - Wharton County installed seven (7) additional NAVD 1988 Bench Marks as part of the Wharton County Drainage Master Plan and San Bernard River Watershed Study
Phase 3 - LCRA established additional NAVD 1988 Bench Marks within Wharton County as part of the LCRA HARN Network
Phase 4- Wharton County established an inventory of NAVD 1988 bench marks
Phase 5- Identify areas where additional NAVD 1988 bench marks are needed.
Phase 6- Install (establish) new NAVD 1988 bench marks (2nd Order)
Phase 7- LCRA installs a GPS base station in Wharton County
Phase 8- Annual review and update of the bench mark system including replacing missing or disturbed bench marks.

Responsibility: Wharton County (establish and manage bench mark system)
City of East Bernard (technical support)
City of El Campo (technical support)
City of Wharton (technical support)
LCRA – maintain HARN network and GPS base stations

Cost: Phase 1 – Project completed October 2006 by LCRA
Phase 2 – Project completed October 2007 by Wharton County
Phase 3 – Project completed in April 2007 by LCRA
Phase 4- $5,000 (estimated cost to prepare BM Inventory)
Phase 5- $5,000 (estimated study and mapping cost)
Phase 6- $20,000 (estimated cost for 20 new Bench marks)
Phase 7- $20,000 (estimated cost to install GPS base station)
Phase 8- $10,000 (estimated annual maintenance cost)

Administrative Cost: Staff time under current budgets

Funding Sources:	Federal funding following a future Presidential declared disaster HMGP/PDM FMA TxDOT TWDB/TNRIS USACE NRCS LCRA/TCRFC Local Share - Funded by bonds and tax revenues
Timing:	Phase 1 – October 2006 Phases 2, 3 & 4 – October 2007 Phases 5, 6 & 7 – 2008 - 2009 Phase 8 - 2008 – 2012 annual maintenance needed

F-9 Support Future Colorado River and San Bernard River Flood Reduction Projects

LCRA and TCRFC, working closely with the USACE, continue to identify flood reduction projects on the Colorado and San Bernard Rivers that will reduce future flood losses in Wharton County, in the lower Colorado River Basin, and along the San Bernard River. The Wharton County Flood Mitigation Planning Committee has identified support of these actions and projects as a long range mitigation action by Wharton County and the cities of East Bernard, El Campo, and Wharton. By supporting these proposed projects, both politically and financially, Wharton County can help save lives and reduce property damages from future flood events.

Responsibility:	Colorado River	San Bernard River
	Wharton County	Austin County
	City of El Campo	Colorado County
	City of Wharton	Fort Bend County
	LCRA	Wharton County
	TCRFC	Brazoria County
	USACE	City of East Bernard
	NRCS	LCRA
	TWDB	TCRFC
		USACE
		NRCS
		TWDB

Cost:	Federal and local share to be determined by each project
Administrative Cost:	Staff time under current budgets
Funding Sources:	Federal funding following a future Presidential declared disaster USACE

FEMA
HMGP
FMA
TWDB
NRCS (stream restoration)
Wharton County (local share if required)
City of East Bernard (local share if required)
City of El Campo (local share if required)
City of Wharton (local share if required)
San Bernard watershed cities and counties

Timing: 2008 to 2012 support projects as identified

F-10 Participation in FEMA's Community Rating System (CRS) Program.

Currently no Wharton County communities participate in FEMA's CRS Program. FEMA recognizes community efforts that exceed the minimum requirements of the National Flood Insurance Program (NFIP) by designating communities that have adopted "higher standards" as CRS Communities. All flood insurance policies within communities that participate in FEMA's CRS program are rewarded with reduced flood insurance premiums. There are only 45 Texas counties and communities that are enrolled in the CRS Program. The City of Wharton submitted a CRS Application to FEMA in 2007 to enroll in the CRS Program.

The TCRFC has established a CRS Coordinators role to assist Coalition communities with CRS activities such as:

Outreach (letters to owners of repetitive loss properties)
TCRFC website as a CRS Program source
Newspaper articles within the basin to support floodplain management activities
Floodplain management workshops sponsored by TCRFC
CRS Program technical resource for coalition communities

This Mitigation Plan Action Item is for the Wharton County and the cities of East Bernard, El Campo and Wharton to evaluate the benefits of FEMA's CRS program and if warranted prepare a CRS Program Application, document CRS activities, prepare annual reports, host CRS workshops and training activities, and develop programs that will result in future CRS credits. The Flood Mitigation Committee recognizes that the CRS Program may not be economically feasible for a community with a small number of flood insurance policies in force. Therefore, not all Wharton County communities are likely candidates to enroll in the CRS Program. Based on NFIP records, the annual premiums for Wharton County and participating communities are as follows:

Wharton County:	930 policies with $392,165 annual premiums
City of East Bernard:	24 policies with $7,762 annual premiums
City of El Campo:	546 policies with $210,847 annual premiums

City of Wharton: 930 policies with $392,165 annual premiums
Source: www.fema.gov policy statistics as of 09/30/07

The estimated flood insurance policy savings for a CRS Class 9 rating is estimated to be:

Wharton County: $19,600 annual savings ($98,000 over 5-years)
City of East Bernard: $388 annual savings ($1,940 over 5-years)
City of El Campo: $10,500 annual savings ($52,500 over 5-years)
City of Wharton: $14,300 annual savings ($71,500 over 5-years)
Source: www.fema.gov policy statistics as of 09/30/07
Note: CRS ratings are for a 5-year period and reviewed annually

Responsibility: Wharton County Floodplain Administrator (also represents the City of East Bernard)
City of El Campo Floodplain Administrator
City of Wharton Floodplain Administrator
TCRFC CRS Coordinator (Technical Support)

Cost: Staff time under current budgets

Funding Sources: Not required

Timing: 2007 – City of Wharton submits CRS Application
2007 – FEMA conducts a Community Assistance Visit (CAV)
2008 – ISO conducts community verification visit
2008 - City of Wharton enters the CRS Program
2009 - CRS program 1st evaluation (annual)

Beneficiary: NFIP policy holders in each CRS community

F-11 Create a Wharton County Disaster Response Team

As part of the TCRFC All-Hazards Mitigation Plan, Wharton County and the cities of East Bernard, El Campo and Wharton identified possible hurricane and tornado paths, floodprone properties, repetitive loss properties, HAZMAT corridors, and areas where emergency assistance may be needed. The Wharton County Flood Mitigation Planning Committee recommended establishing a Wharton County Disaster Response Team with identified procedures to assist local officials with important decisions regarding disaster response and recovery.

Step 1 – Select a consultant or consultants or develop in-house staff necessary to assist Wharton County and the cities of East Bernard, El Campo and Wharton during a disaster event. Wharton County and the cities of East Bernard, El Campo and Wharton can select a single engineering consultant or the County and each community can select their own engineering consultant to assist with disaster recovery. Should the disaster event become

a Presidential declared disaster the expenses associated with this mitigation action may be eligible for reimbursement from FEMA.

Step 2 – Execute a consultant "on call" contract to include response tasks:

20. Deployment of consultant's response team at Wharton County and/or participating community request
21. Coordination with each community elected officials, floodplain administrator, emergency management coordinator, engineering consultants, LCRA representative, and Federal and state agencies.
22. Define the engineering consultants scope of work based on set salary and expenses rates
23. Utilize Wharton County flood loss data and GIS mapping
24. Identify damaged properties, areas, subdivisions and specific structures
25. Identify substandard housing that may be eligible for Federal and state funding for possible "demo-rebuild" projects
26. Assist County and communities with requests to FEMA for flood recovery mapping
27. Identify and survey high water marks (HWM) and prepare flood inundation maps
28. Monitor Flood Warning Sites and gauges to forecast downstream flooding
29. Prepare maps of damage areas for hurricane, tornado, HAZMAT or other event
30. Compile daily reports with photographs and engineering data
31. Document flood depths and calculate estimated damages to all damaged structures
32. Utilize FEMA's Residential Substantial Damage Estimator Program (RSDE)
33. Assist Wharton County and participating communities with damage inspections and Federal and State agency reports
34. Assist Wharton County and participating communities with coordination efforts with State and Federal agencies
35. Assist Wharton County and participating communities with applications for State and Federal funding
36. Assist Wharton County and participating communities with design, construction and management of flood recovery (Public Assistance) and Hazard Mitigation Grant Program (HMGP) projects
37. Assist Wharton County and participating communities with documentation and project closeout of state and Federally funded projects
38. Assist Wharton County and participating communities with FEMA map revisions to correct errors in FIRM's.

Step 3 – Annually review and update, if necessary, consultants "on call" contract

Responsibility: Wharton County (Disaster will be declared by county)
City of East Bernard

	City of El Campo City of Wharton FEMA Governor's Division of Emergency Management (TxDEM) LCRA (Technical Assistance) TCRFC
Cost:	On call contracts will not be executed unless there is a hazard event Cost will be hourly and dependent on magnitude of the event Each engineering consultant will be required to submit a rate schedule of salary and expenses
Funding Sources:	Governor's Division of Emergency Management (TxDEM) Public Assistance Funding available from a future Presidential declared disaster FEMA – Flood Recovery Mapping funds TxDEM - Hazard Mitigation Grant Program TWDB – Flood Mitigation Assistance (FMA) Program TWDB – Flood Disaster Planning Grant and Loan Programs NRCS – Steam Restoration Program Wharton County and participating communities (if event is not declared a disaster)
Timing:	Any disaster event during the 5 year plan life
Beneficiaries:	Wharton County and participating communities Property owners and citizens of Wharton County

F-12 Wharton County Flood Warning System

There are roadways and low lying areas in Wharton County that are subject to flooding. Flood warning systems installed on selected roadways and bridges may save lives during future flood events.

Federal funding is available to assist communities with flood warning programs. Both HMGP and NOAA's proposed Automated Local Flood Warning System (ALFWS) grant program provide funding for design and installation of these systems.

The Wharton County Drainage Master plan and San Bernard River Watershed Study will identify possible locations for installation of flood warning systems. The LCRA Hydromet System addresses flood warning in the Lower Colorado River Watershed and flood warning systems installed in Wharton County can be incorporated into the LCRA system.

Phase 1 of this Action Item is to identify low water crossings and existing bridges that will be inundated during flood events and install signage and automated warning devices or barricades to warn and restrict vehicular or pedestrian crossings during flood events. The TxDOT District Office in Victoria will be requested to assist in identifying and prioritizing crossings and bridges. Option 1 to Phase 1 is installation of an automated flood warning system monitored by the Wharton County Sheriffs Office and each participating community emergency manager. A similar flood warning system has been installed in Hays County with a cost of $800,000. The Hays County experiences, good or bad, can help Wharton County to evaluate the need of an automated warning system. During and following major flood events, computer modeling may used data from one site to help forecast at several points downstream. Once the flood warning sites are selected, a record of depths and flood events should be recorded for future use in calibration of models in the area. Phase 1 should include systematic record keeping in a format that can be used and accessed by USACE, LCRA and others in addition to the office of the Emergency Managers in Wharton County. Documentation should be provided to LCRA and stored in the LCRA highwater marks system.

Responsibility: Wharton County Office of Emergency Management (OEM)
City of El Campo OEM
City of Wharton OEM
LCRA
TxDOT Victoria District Office

Cost: $80,000 (estimate) to install signage at selected locations
$150,000 (estimate) for 10 sites for automated warning devices
$800,000 (estimate) for optional automated system to monitor and warn
$ 20,000 (estimate) for maintenance for 10 sites
$ 10,000 (estimate) flood response modeling (May be addressed in F-12)

Funding Sources: FEMA/TxDEM – HMGP funding
FEMA/TxDEM Disaster Response Funding
NOAA's Automated Local Flood Warning System (ALFWS)

Timing: Applications submitted in March 2007
Study initiation in late 2007 and installation in 2008-2009

Beneficiary of Action: Wharton County rural areas

Phase 2 of this Action Item is maintenance of flood warning systems.

Responsibility: Wharton County Office of Emergency Management (OEM)
City of El Campo OEM
City of Wharton OEM

Cost:	$ 20,000 (estimate) per year for maintenance for 10 sites $15,000 (estimate) for installation of additional devices
Funding Sources:	FEMA/TxDEM – HMGP funding FEMA/TxDEM Disaster Response Funding NOAA's Automated Local Flood Warning System (ALFWS)
Timing:	2008 to 2012
Beneficiary:	All citizens in Wharton County

Recommendations for bid documents for the proposed flood warning device specifications:

- Each unit shall consist of one high water warning sensor device and two flashing "Danger High Water" post-mounted signs adjacent to road at each side of river/creek.
- Sensor device shall be set off at 2" of water on road and signal to be sent to county at multiple sites.
- Sensor device shall be set off at 6" of water on road and begin flashing "Danger High Water" at post-mounted signs adjacent to road at each side of river/creek. Sensor device shall extend no more that 2' above high water alarm elevation and shall be protected from floodwaters.
- Warning flashers shall be capable of operation at least 300' from sensor device.
- Battery packs shall have 72-hr battery reserve and include solar collection system for continuous recharging.
- All components shall be protected against tampering and theft.
- Data relay shall be by radio, cellular, or satellite.
- Two year maintenance shall be included with bid.
- Bidder will be responsible for installation
- County will identify sites.

F-13 Installation of additional Stream Gauges in the Colorado and San Bernard Watersheds

This Action Item is to identify sites where stream and precipitation gauges are needed in Wharton County and coordinate installation requests with the USGS, LCRA and NWS. In addition to one gage on the san Bernard River maintained by LCRA, the USGS maintains two (2) "real time" USGS gauges located in Wharton County that can be viewed on line at http://waterdata.usgs.gov/tx/nwis/current/?type=flow .

Examples of the "real time" data accessible on line is shown in Figures 13 and 14.:

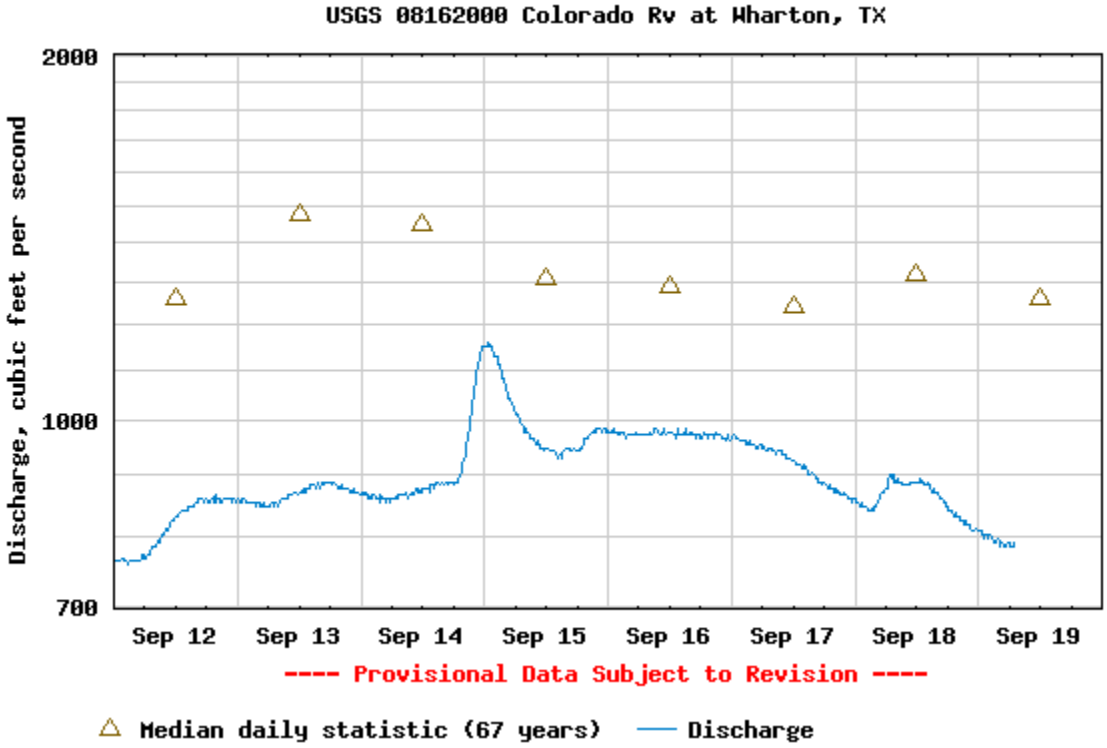
Figure 13 – USGS 08162000 Colorado River at Wharton, Texas
Figure 14 – USGS 08164504 East Mustang Creek at Louise, Texas

USGS

Wharton County

08162000	Colorado River at Wharton, TX Located at US 59 Drainage Area = 42,003 square miles Period of Record – June 1916 with breaks	09/19 07:00	9.68	792	1,260
08164504	East Mustang Creek near Louise, TX Located at FM 647 Drainage Area = 90.8 square miles Period of Record – June 1996 to current	09/19 06:15	3.53	0.09	2.10

Discharge, cubic feet per second
Most recent value: 792 09-19-2006 07:00



Create presentation-quality graph

Parameter 00060; DD

Daily discharge statistics, in cfs, for Sep 19 based on 67 years of record

Min (1954)	Current	20 %	Median	Mean	80 %	Max (1964)
482	792	796	1260	1720	2210	7100

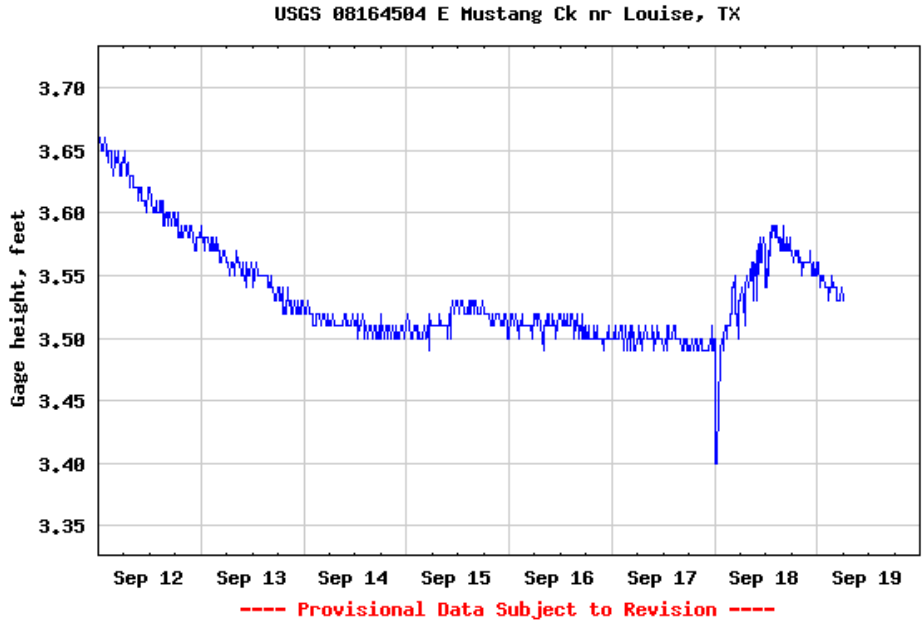
Daily discharge statistics, in cfs, for Sep 19 based on 67 years of record

Min (1954)	Current	20 %	Median	Mean	80 %	Max (1964)
482	792	796	1260	1720	2210	7100

Figure 1 : USGS 08162000 Colorado River at Wharton, Texas

Gauge height, feet

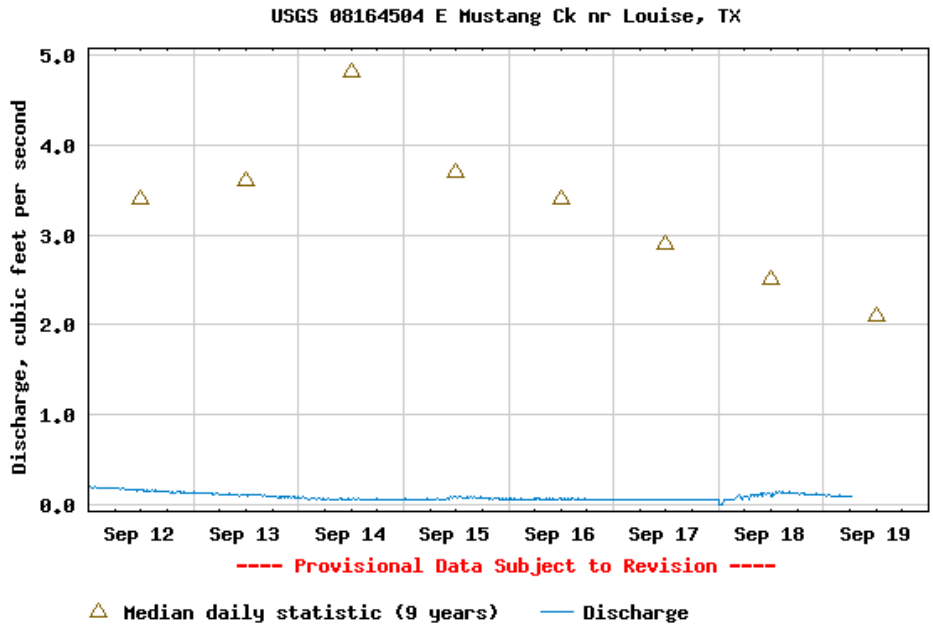
Most recent value: 3.53 09-19-2006 06:15



Create presentation-quality graph Parameter 00065; DD 01

Discharge, cubic feet per second

Most recent value: 0.09 09-19-2006 06:15



Create presentation-quality graph Parameter 00060; DD 02

Daily discharge statistics, in cfs, for Sep 19 based on 9 years of record

Min (2000)	20 %	Current	Median	Mean	80 %	Max (2002)
0.00	0.01	0.09	2.1	42	92	196

Figure 2: USGS 08164504 East Mustang Creek at Louise, Texas

The LCRA website, www.lcra.org provides access to the LCRA HYDROMET System

The LCRA website www.lcra.org contains rain and weather surveillance information which is updated in 5 minute intervals.

The LCRA is currently installing Crest Stage Gauges on the Colorado River to capture storm stage peaks.

Both the LCRA and the National Weather Service (NWS) monitors rain gauges in Wharton County. LCRA has established a network of volunteers in Wharton County that operate rain gauges and report data to LCRA that is incorporated into the LCRA HYDROMET System. LCRA is exploring the possibility of expanding the volunteer network in Wharton County.

The estimated installation cost for a stream gauge meeting USGS and GBRA criteria is $20,000 with an estimated monthly maintenance cost of $1,000.

Responsibility:	Wharton County City of El Campo City of Wharton Lower Colorado River Authority
Cost:	Phase 1 - 4 gauges - $80,000 estimated installation cost Phase 2 - 4 gauges - $ 80,000 estimated installation cost Phase 3 - Expand LCRA volunteer raingauge network - $1,000 (estimated) Phase 1 Annual maintenance cost $ 48,000 (estimated) Phase 2 Annual maintenance cost $ 48,000 (estimated) Phase 3 Annual maintenance cost $200 (estimated)
Funding Sources:	HMGP – Governor's Division of Emergency Management Texas Water Development Board Wharton County City of El Campo City of Wharton LCRA
Timing:	Phased 2008 to 2012
Beneficiary:	Countywide

F-14 Install Reverse 911 Emergency Warning System

This action item builds on the current Wharton County 911 System. A mitigation evaluation is recommended to determine the feasibility of installing a Wharton County

(countywide) Reverse 911 System. The evaluation should identify flood-prone or "at risk" structures that should be notified and possibly evacuated when flooding is eminent. By identifying structures and phone numbers, a Reverse 911 database could be created. The Wharton County 911 System coordinates with the City of El Campo and City of Wharton Office of Emergency Management, the National Weather Service (NWS), LCRA and law enforcement agencies and could issue Emergency Warnings via the Reverse 911 System.

Responsibility:	Wharton County (co-lead with cities of El Campo and Wharton) City of El Campo (co lead with Wharton County) City of Wharton (co lead with Wharton County) HGAC (Technical Support)
Cost:	$10,000 estimated survey cost $60,000 estimated equipment cost $5,000 estimated cost for annual maintenance and training
Funding Sources:	HGAC TxDEM LCRA/TCRFC Wharton County City of El Campo City of Wharton
Timing:	Phased over 5 years (2008-2012)
Beneficiary:	Countywide

F-15 "Storm Ready" Designation for Wharton County Communities

There are no communities within Wharton County that have been designated as a "Storm Ready" community by the National Weather Service (NWS). The NWS Office in Houston is available to assist Wharton County communities to become "Storm Ready". The mitigation plan goal is to classify every community within Wharton County as "Storm Ready". There is the possibility that HGAC and/or LCRA/TCRFC may be able to assist with the coordination effort with the NWS.

Responsibility:	Wharton County (co-lead with cities of El Campo and Wharton) City of El Campo (co lead with Wharton County) City of Wharton (co lead with Wharton County) NWS HGAC LCRA TCRFC
Cost:	Staff time under current budgets

Funding Sources: Not required

Timing: Phased over 5 years (2008-2012)

Beneficiary: Countywide

F-16 Backup Power for Wharton County Critical Facilities

Install emergency generators or redundant power for the Wharton County critical facilities such as the County Court House, City Halls (3), Public Safety Buildings, fire stations, police facilities, communication towers and fuel dispensing facilities. A study should be conducted to evaluate options and estimated costs to assist Wharton County and participating communities in selecting, designing and constructing backup power systems that can fulfill the need.

AS A POSSIBLE ALTERNATIVE, WHARTON COUNTY AND PARTICIPATING COMMUNITIES CAN CONSIDERED PURCHASING A MOBILE POWER GENERATOR AS NOTED IN THE FOLLOWING *TEXAS GOVERNMENT INSIDER* ARTICLE REFERENCING ACTION BY THE CITY OF VICTORIA IN JULY 2006:

VICTORIA CONSIDERS $100K MOBILE POWER GENERATOR

With a goal of keeping the city's water and sewer system operating during a sustained power loss, the city of Victoria is contemplating purchasing a mobile power generator at a cost of more than $100,000. The generator could be used for everything from operating pumps that send water to the treatment plant to keeping sewer system lift stations up and running. The 600-kilowatt generator is mounted on a trailer so that it can be moved to the location where it is needed. Victoria city officials remember a few years ago when Hurricane Claudette left the city without power for an extended period of time.

Responsibility: Wharton County OEM
City of El Campo OEM
City of Wharton OEM
HGAC (Technical support)
LCRA (Technical support)
TCRFC (Technical support)

Cost: $ 3,000 estimated study cost
$30,000 estimated cost to install backup power per facility (Option 1)
$20,000 estimated cost to install redundant power per facility (Option 2)
$80,000 estimated cost to construct a secondary tower (Option 3)
$100,000 estimated cost to purchase a 600 KW mobile power generator

Funding Sources:	TxDEM Department of Homeland Security (FEMA) Wharton County City of El Campo City of Wharton
Timing:	Study initiated in 2007 Phased construction from 2008 to 2011
Beneficiary:	Countywide