City of Mountain City
Hays County Hazard Mitigation Plan Update
2017

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Mountain City Annex
Section 1: Organize and Review

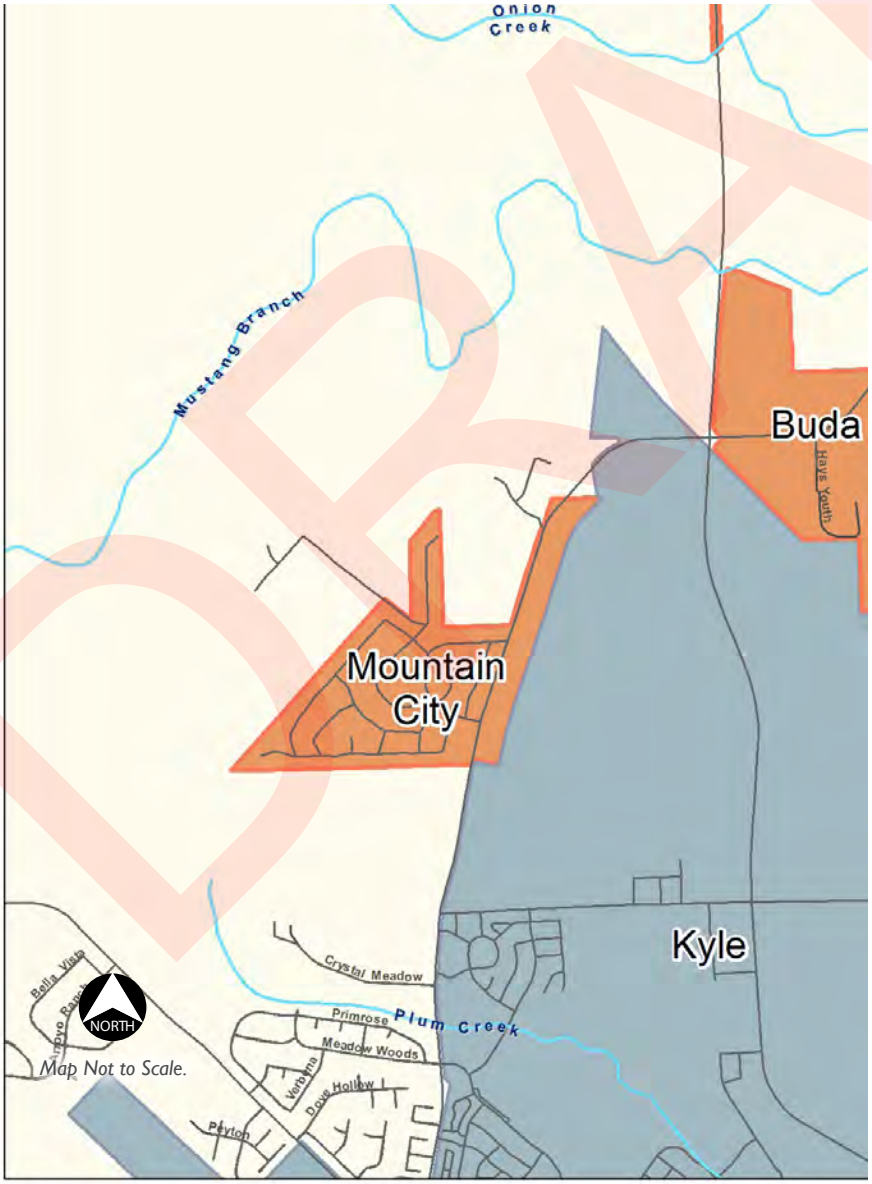
This section contains a brief description of Mountain City and its jurisdictional features. In addition, Section 1 contains the following details regarding Mountain City's:

- participation in the Hays County HMP Update process,
- stakeholder engagement,
- public outreach strategy,
- incorporation efforts, and
- plan maintenance procedures.

*Population :	537
Size of Community:	0.42 sq. miles
*Population over 65 years old	55
*Population under 16 years old	130
Mountain City is serviced by the following responders:	
Fire - Kyle Fire Department	
EMS - San Marcos Hays County EMS	
Law Enforcement - Hays County Sheriff's Office	

HAZUS-MH 3.2 Updated Census 2010 Population Estimates

Figure MC.1, Mountain City



Community Description

When planning, it is important to take into account the characteristics that make a community unique. Consideration of unique needs when it comes to mitigating or recovering from natural hazards ensures that all members of the community and their needs are addressed.

Located 12 miles north of San Marcos in Central Hays County, Mountain City is less than a square mile in size. The community previously existed as a subdivision called Mountain City Oaks and incorporated as Mountain City in 1984. (Mountain City, Texas, 2017)

Served by Hays Consolidated Independent School District, the community has no school structures located within the City limits.

The community is 100% residential with 237 structures making up the entire City.

Mountain City is governed by a Mayor, Mayor Pro-Tem, 3 Aldermen, and supported by a City Secretary, City Treasurer and City Administrator.

Mountain City's main utility providers are shown in Table MC.1.

Major Employers

Mountain City is 100% residential and does not have any employers besides home-based operations run and operated by community members.

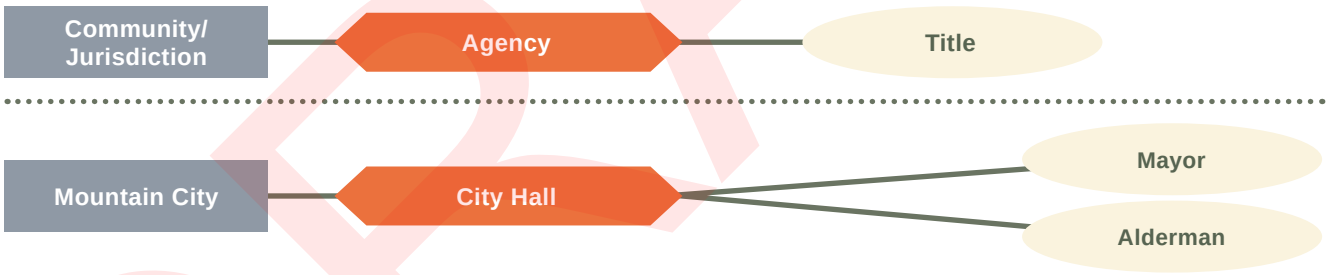
Table MC.1, Utility Providers

Type	Provider
Electric	Pedernales Electric Cooperative (PEC)
Natural Gas	Individually resourced
Water	Mountain City Oaks Water System

Planning Committee

Planners who represented Mountain City in the update process are collectively known as the Mountain City Mitigation Planning Committee (MPC) and are shown in Figure MC.2.

Figure MC.2, Planning Committee Membership



Community Planning Involvement

MPC planning activities for the Hays County Hazard Mitigation Plan (HMP) Update are captured in Figure MC.3, which utilizes check-marks to indicate each of the activities that were completed by the Mountain City MPC.

Figure MC.3, Mountain City Plan Participation

Meetings	Data Submission	Public Involvement
✓ Kick-Off ✓ Risk Assessment ✓ Mitigation Strategy	✓ Planner's Survey Data Collection Spreadsheet/ GIS Data ✓ Planning Worksheets ✓ Phone Interview	✓ City Council/Commissioner's Court Agenda Items ✓ Public Survey Posting/ Collection

Stakeholders

During the Phase 1 Kick-Off Meeting, planners were provided with a Planner/Stakeholder worksheet, referred to in Chapter 1, the Plan Process portion of the Hays County HMP Update. This document allowed planners to identify stakeholders for inclusion in the Risk Assessment and Mitigation Strategy Meetings. Table MC.2 identifies the stakeholders that were invited to participate by the following email:

Good Morning,

You or your organization has been identified by a local community planner as a stakeholder (interested/affected party) for the Hays County Hazard Mitigation Plan Update process. The planning team, made up of community officials from throughout Hays County, is working to update this plan that identifies actions for reducing and mitigating the risk from natural hazards (flood, tornado, severe winter, etc…) affecting Hays County and the communities within it. If your schedule allows, your insight would be valuable at a meeting being held on Thursday, January 12, 2017, from 1 p.m. to 4 p.m. at

Wimberley Community Center
14068 Ranch Road 12
Wimberley, TX 78676

Please register for the Hazard Mitigation Plan Update- Risk Assessment Meeting. https://www.eventbrite.com/e/hays-county-hazard-mitigation-plan-update-risk-assessment-meeting-registration-30892049953

If unable to complete registration on the Eventbrite site, please reply to this email and indicate who will attend from your organization so that the meeting facility can be prepared for the proper number of attendees.

JWSA and Halff Associates are providing coordination and facilitation support for this process for Hays County and participating communities utilizing FEMA mitigation grant funding. Any questions regarding this meeting can be directed to Paloma Alaniz at palaniz@halff.com.

Thank you.

Table MC.2, Plan Stakeholders

Jurisdiction	Agency	Title
Mountain City	Pedernales Electric Cooperative	Chief Executive Officer
Mountain City (ESD)	Kyle Fire Dept./EMS	Fire Chief
Hays County	Sheriff's Office	Sheriff
Hays CISD	Education	Director of Student Services
Travis County	Office of Emergency Management	Emergency Management Coordinator
Hays County	Office of Emergency Services	Director/Emergency Management Coordinator
Niederwald	City Hall	Mayor
Pedernales Electric Cooperative	Utilities	Chief Executive Officer

Outreach Strategy

Mountain City was very active in their outreach activities used to inform the public of their participation in the Hays County HMP Update.

Public Survey Promotion

Mountain City advertised the Hays County HMP Update Public Survey through the community email list, which is a self-subscribed list to which community members may subscribe.

As of March 10, 2017, Mountain City had 25 residents respond to the public survey. A copy of the survey questions can be found in Appendix A of the Hays County HMP Update. Details on how the survey data was directly incorporated into the Risk Ranking process for hazards is included in Chapter 2, the Risk Assessment portion of the Hays County HMP Update.

City Council Meeting Announcement

On February 13, 2017, the Mayor presented information on the Hays County HMP Update to the Mountain City Council. The Council agenda and item report for this presentation are included in Appendix A of the Hays County HMP Update.

Plan Phase Newsletters

Mountain City MPC utilized newsletters for each phase of the planning process in order to share updates on the planning process with stakeholders, elected officials, City staff and the public. Copies of the newsletters can be found in Plan Appendix A of the Hays County HMP Update.

Plan Draft Public Review and Comment Period

The link to the draft Hays County HMP Update was posted on the Mountain City website from July 12, 2017 to July 26, 2017. A hard copy was placed in the Mountain City Hall. Email comments were collected by the Mayor.

Incorporation of Sources

In addition to stakeholder and public input, the MPC also reviewed other planning resources that could provide useful information to the plan update process. Table MC.3 lists the documents reviewed and how they were considered for incorporation in the updated plan.

Table MC.3, Review/Incorporation of Sources

Name of Document	Type	How Incorporated
2013 State of Texas Hazard Mitigation Plan	Plan	Utilized hazard definitions and hazard classification names.
Flood Insurance Study	Study	Incorporated best available hydraulic and hydrologic study results for flood hazard profile.
Mountain City Waste Management Program	Program	Reviewed for opportunities for enhancement to incorporate brush pick-up service for wildfire and lightning mitigation (Mountain City, TX, 2016)
Mountain City Building Permit	Program	Research for applicability of floodplain management elements (Mountain City, TX, 2017)
Mountain City Directory Information Request Form	Program	Review for opportunities to enhance the current contact system for residents in Mountain City (Mountain City, TX, 2017)
Mountain City Ordinances	Regulations	Reviewing ordinances for possible incorporation of mitigation practices, such as flood damage prevention ordinance, building code
Interlocal Agreement for Emergency Water Service	Agreement	Agreement between Hays Consolidated Independent School district and Mountain City Oaks Water System in order to interconnect their water systems to serve as alternative sources of water for emergency situations. Seeking ways to enhance to reduce the impacts of drought. (Hays County, 2010)

Continued Public Participation in Maintenance Process

The strategy for updates at the local level for Mountain City will include opportunities for public involvement, as shown in Table MC.4.

Table MC.4, Public Involvement for Updates

Activity	Public Involvement	Method Available
Monitoring	The public will be given notice when items will be reviewed and receive the opportunity to review the notes from any notable developments.	Newspaper/Social Media
Evaluation	The public will be given a means to voice their opinion on the completed actions.	SurveyMonkey/Paper Survey
Updates	Once updates are made, the changes will be recorded in a public revision history document.	Newspaper/Social Media/ Council Meeting Announcements/ SurveyMonkey

Maintenance

Table MC.5 lists the method, schedule, and responsible agent for the monitoring, evaluation, and updating of the adopted 2017 HMP within the Plan's 5-year update cycle.

Table MC.5, Hays County Hazard Mitigation Plan Maintenance Schedule, Mountain City

Task	Scope	Method	Schedule	Responsible Agent
Monitoring	Jurisdictional	Review of mitigation action items using Mitigation Action Progress Report Worksheets (Appendix C of the Hays County HMP Update)	Every 12 months	Mountain City, City Hall, Mayor
Evaluation	Jurisdictional	Complete Online Planner Survey (using SurveyMonkey) with evaluation of plan process.	Every 12 months	Mountain City, City Hall, Mayor
Updates	Jurisdictional	Perform updates to Mitigation Strategy to edit/add/omit actions identified during monitoring activities. Conduct post-disaster review of community annex in order to update for significant occurrences, construction of new critical infrastructure or facilities, changes in jurisdictional boundaries and development. Participate in MPC for 5-year HMP update process.	As needed	Mountain City, City Hall, Mayor

Section 2: Risk Assessment

Mountain City Jurisdictional Hazards

This section contains Mountain City's hazard profiles for each natural hazard included in the Hays County HMP Update. Profiles include:

- Location - the area where the hazard is known to occur
- Previous Occurrences - a history of reported events for the hazard
- Significant Previous Occurrences (when applicable) - notable hazard events within the community
- Extent - the strength or magnitude of the hazard
- Probability - the likelihood of the hazard event occurring in the future
- Impact - the consequence or effect (or possible effect) of hazard events
- Vulnerability Summary - identification of structures, systems, populations or assets susceptible to loss or damage

Hazard descriptions and extent scales for hazard magnitudes, are found in Chapter 2, the Risk Assessment portion of the Hays County HMP Update.

When available, data specific to Mountain City was used for hazard analysis. When no instances were reported specifically for the jurisdiction for regional hazards, County-level data was applied.

State and national datasets were used to determine occurrence, extent, and the respective probabilities, rather than verbal testimonies, in an effort to retain data consistency. For some hazards, the National Oceanic and Atmospheric Administration (NOAA) Storm Events Database was used as the most comprehensive data available for hazards. As a result, , injury and damage amounts shown for previous hazard occurrences do not always reflect the most recent totals. The Previous Occurrences paragraph identifies instances in which this may occur. Verbal testimony, when available, was integrated into impact or vulnerability summaries.

Hazards profiled within the Risk Assessment include:

Drought

Extreme Heat

Severe Winter Storms

Lightning

Hailstorms

Windstorms

Tornadoes

Expansive Soils

Floods

Land Subsidence

Hurricanes/Tropical Storms

Earthquakes

Dam/Levee Failure

Wildfires

Drought

Drought: Location

Drought occurs on a regional scale, therefore, all of Mountain City is equally at risk as it can occur anywhere in the jurisdiction.

Drought: Previous Occurrences

NOAA Storm Events Database documents 27 drought events for Hays County since the year 1996 (see Table MC.7). Although there were no drought events reported specifically for Mountain City, the jurisdiction would have been affected by the events that were reported for the surrounding County area.

Fatality, injury and damage amounts are shown in Table MC.6, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table MC.6, Reported Drought Occurrence, Hays County

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
HAYS (ZONE)	4/1/1996	Drought	0	0	0.00	0.00
HAYS (ZONE)	5/1/1996	Drought	0	0	0.00	0.00
HAYS (ZONE)	6/1/1996	Drought	0	0	0.00	0.00
HAYS (ZONE)	7/1/1996	Drought	0	0	0.00	0.00
HAYS (ZONE)	8/1/1996	Drought	0	0	0.00	0.00
HAYS (ZONE)	7/1/2000	Drought	0	0	0.00	0.00
HAYS (ZONE)	8/1/2000	Drought	0	0	0.00	0.00
HAYS (ZONE)	9/1/2000	Drought	0	0	0.00	0.00
HAYS (ZONE)	10/1/2000	Drought	0	0	0.00	0.00
HAYS (ZONE)	5/1/2011	Drought	0	0	0.00	0.00
HAYS (ZONE)	6/1/2011	Drought	0	0	0.00	0.00
HAYS (ZONE)	7/1/2011	Drought	0	0	0.00	0.00
HAYS (ZONE)	8/1/2011	Drought	0	0	0.00	0.00
HAYS (ZONE)	9/1/2011	Drought	0	0	0.00	0.00
HAYS (ZONE)	10/1/2011	Drought	0	0	0.00	0.00
HAYS (ZONE)	11/1/2011	Drought	0	0	0.00	0.00
HAYS (ZONE)	12/1/2011	Drought	0	0	0.00	0.00
HAYS (ZONE)	1/1/2012	Drought	0	0	0.00	0.00
HAYS (ZONE)	6/1/2012	Drought	0	0	0.00	0.00
HAYS (ZONE)	12/1/2012	Drought	0	0	0.00	0.00
HAYS (ZONE)	2/1/2013	Drought	0	0	0.00	0.00
HAYS (ZONE)	3/1/2013	Drought	0	0	0.00	0.00
HAYS (ZONE)	4/1/2013	Drought	0	0	0.00	0.00
HAYS (ZONE)	6/1/2013	Drought	0	0	0.00	0.00
HAYS (ZONE)	7/1/2013	Drought	0	0	0.00	0.00
HAYS (ZONE)	8/1/2013	Drought	0	0	0.00	0.00
HAYS (ZONE)	8/1/2014	Drought	0	0	0.00	0.00
Total					$0.00	$0.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Drought: Significant Past Events

Several significant regional drought events have previously impacted the City. Refer to the *Drought: Significant Past Events* paragraph within Section 2, the Risk Assessment portion of the Hays County Annex for narratives discussing these events.

Drought: Extent

The US Drought Monitor Drought Intensity scale classifies drought by 5 categories, D0 through D4. According to the reported previous drought occurrences in the jurisdiction, the maximum drought extent experienced is a Category D4 drought. Refer to Chapter 2, the Risk Assessment portion of the Hays County HMP Update, for a description of the US Drought Monitor Drought Intensity Index.

Drought: Probability

Based on 6 years with reported drought events from the NOAA Storm Events Database within 20 years, a drought event occurs approximately once every 3 years on average in Hays County. Since drought events can happen anywhere throughout the HMP update area and occur on a regional scale, Mountain City's future probability is assumed to be similar to the surrounding County areas, and therefore can expect a drought event approximately once every 3 years on average, with up to a Category D4 Drought.

Number of Years with Reported Event (Drought Year)	Number of Years in Dataset	Probability
6	20	0.30

Drought: Impact

Table MC.7 lists the impact of drought from the years 1996 to 2016 for Hays County according to the Drought Impact Reporter. The DIR is the nation's first comprehensive database of drought impacts. This database contains information from multiple Federal agencies, such as NOAA and United States Geological Survey (USGS), related to drought impacts from a national to city level by category and extent of impact. While there are no impacts reported specifically for Mountain City, the effects of drought are not confined to jurisdictional boundaries and occur on a regional scale. Impacts reported at the Hays County level are applicable in illustrating impact to Mountain City.

Table MC.7, Reported Drought Impacts, Hays County

Hays County Drought Impacts 1996-2016	
Category	**# of Incidents Reported**
Agriculture	45
Business & Industry	3
Energy	2
Fire	24
Plants & Wildlife	33
Relief, Response & Restrictions	48
Society & Public Health	7
Tourism & Recreation	3
Water Supply & Quality	53

(University of Nebraska-Lincoln, 2016)

Drought: Vulnerability Summary

Although the community is at risk for drought, along with the rest of the Hays County area, Mountain City has taken measures to lessen their risk for water shortage through an interlocal agreement for Emergency Water Service with the Hays Consolidated Independent School District. This agreement allows the 2 water systems to interconnect in order to serve as back-up for each other. In the event of a regional drought, however, both sources would be equally at risk for water shortage. The community is currently in the process of completing the purchase of their water system. Once the purchase is complete, Mountain City can begin to enforce conservation practices and measures during periods of high risk.

Extreme Heat

Extreme Heat: Location

Extreme heat occurs on a regional scale; therefore, all of Mountain City is equally at risk as it can occur anywhere in the jurisdiction.

Extreme Heat: Previous Occurrences

NOAA's Online Weather Data (NOWData) provides temperature data ranging from the year 2000 to 2016. NOAA's National Weather Service (NWS) Heat Index (located in Chapter 2, the Risk Assessment portion of the Hays County HMP Update) indicates that temperatures meeting or exceeding 90°F are designated with an "Extreme Caution" or greater warning classification. According to Canyon Dam Station, the closest local weather data collection center with comprehensive data, the mean number of days with a daily max temperature equal or greater to 90°F is 94 days. Currently, the greatest number of days during which the jurisdiction experienced extreme heat is 119 in 2008 while the highest temperature experienced was 109°F in August 2011 (a "Danger" NWS Heat Index classification). Canyon Dam Station is the closest reporting NOWData station to the jurisdiction and applies equally to Mountain City due to the regional and zonal nature of extreme heat occurrence.

Extreme Heat: Extent

Extreme heat extent is classified by temperatures, as well as event level designations, within the NWS Heat Index. The extent of extreme heat that the Mountain City has experienced can be derived from the data provided from NOWData at Canyon Dam Station since the year 2000. The highest daily mean temperature experienced was 109°F in August 2011. This event is classified by the NWS Heat Index as "Danger". Refer to Chapter 2, the Risk Assessment portion of the Hays County HMP Update, for a description of heat extent scale, NOAA's NWS Heat Index.

Extreme Heat: Probability

The probability of future events can be determined by assessing historical averages. Since extreme heat events occur on a regional scale, Mountain City's future probability is assumed to be similar to the area surrounding Canyon Dam Station. Based on NOWData, the City can expect, on average, approximately 94 days a year with temperatures equal or greater to 90°F, and up to a "Danger" warning classification per the NOAA NWS Heat Index. As extreme heat events have occurred every year since 2000, the probability of extreme heat affecting the community is 100% in any given year.

Extreme Heat: Impact

Extreme heat has physical impacts on the public and the infrastructure that supports them. According to the Texas Health Care Information Collection and Trauma Registry from the Texas Department of State Health Services' Injury Epidemiology & Surveillance Branch, the following number of patients were received in Hays County medical facilities for Heat Related Injuries and Trauma, as shown in Tables MC.8 and MC.9.

Table MC.8, Hays County Hospital Inpatient Data, Extreme Heat

Description	2010	2011	2012	2013	2014
Accidents caused by excessive heat due to weather conditions	1	3	5	0	0
Accidents due to excessive heat of unspecified origin	1	0	0	0	0

(Texas Department of State Health Services- Injury Epidemiology & Surveillance Branch, 2017)

Table MC.9, Hays County Trauma Data, Extreme Heat

Description	2010	2011	2012	2013	2014
Accidents due to excessive heat of unspecified origin	0	1	0	0	0

(Texas Department of State Health Services- Injury Epidemiology & Surveillance Branch, 2017)

In addition to the physical impacts, an excessive heat event can also be the cause of cascading incidents. Electrical outages could occur due to the high demands of electricity needed to power cooling systems. A loss of critical resources, such as power, has significant impact on the entire population, with higher impacts to those with vulnerabilities to such conditions. The following portion of Mountain City's population, according to HAZUS-MH 3.2 updated Census 2010 population estimates, would be greatly impacted by the severe temperatures related to excessive heat and/or the loss of electrical energy in their dwellings.

Population over 65 years old: 55

Population under 16 years old: 130

An organization called Inside Energy (http://insideenergy.org) provided a compiled database outlining 15 years of power outages across the United States from annual data available at the Department of Energy. Within the database, the following excessive heat events affected electrical availability in the areas in or near Hays County (Table MC.10).

Table MC.10, Extreme Heat Affecting Electrical Availability

Event Description	Year	Start Date	Start Time	End Date	Respondent	Location	Customers Affected
Declared Energy Emergency Alert2/Heat Wave	2007	8/14/2007	2:00 p.m.	8/14/2007	American Electric Power (CSWS)	CSWS Control Area of Southwest Power Pool Parts of Oklahoma, Texas, Louisiana, Arkansas	N/A

(Wirfs-Brock, 2014)

Extreme Heat: Vulnerability Summary

Mountain City does not have a cooling station plan for the community. They have 1 public building that serves as City Hall, however it does not have generator back-up to provide a cool place in the case of a power outage during Extreme Heat events.

Severe Winter Storms

Severe Winter Storms: Location

Severe winter storms occur on a regional scale; therefore, all of Mountain City is equally at risk.

Severe Winter Storms: Previous Occurrences

NOAA Storm Events Database documents 13 winter storm events for Hays County since the year 1996 (see Table MC.11). Although there were no winter storm events reported specifically for Mountain City, the jurisdiction would have been affected by the events that were reported for the surrounding County area.

Fatality, injury and damage amounts are shown in Table MC.11, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table MC.11, Winter Weather Occurrences, Hays County

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
HAYS (ZONE)	2/1/1996	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	1/7/1997	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	1/11/1997	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	12/23/1998	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	12/12/2000	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	11/28/2001	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	2/24/2003	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	12/7/2005	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	1/15/2007	Winter Storm	0	0	125,000.00	0.00
HAYS (ZONE)	2/3/2011	Winter Storm	0	0	0.00	0.00
HAYS (ZONE)	11/26/2013	Winter Weather	0	0	0.00	0.00
HAYS (ZONE)	1/23/2015	Winter Weather	0	0	0.00	0.00
HAYS (ZONE)	2/16/2015	Winter Weather	0	0	0.00	0.00
Total			0	0	$125,000.00	$0.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Severe Winter Storms: Significant Past Events

Regionally, there were significant winter weather events reported as Hays (Zone) that may have impacted the City, as shown in Table MC.11. Refer to the *Severe Winter Storms: Significant Past Events* section within the Hays County Annex for narratives discussing these events.

Severe Winter Storms: Extent

Ice accumulation is captured and measured with the Regional Snowfall Index (RSI) and the Sperry-Piltz Ice Accumulation (SPIA) Index, as detailed in Chapter 2, the Risk Assessment portion of the Hays County HMP Update. According to the reported previous winter weather occurrences in the jurisdiction, the maximum winter weather extent experienced is a RSI Category 1 snowfall event or SPIA Ice Index Category 2 ice event. Refer to Chapter 2, the Risk Assessment portion of the Hays County HMP Update, for a description of winter weather extent scales.

Severe Winter Storms: Probability

Based on 13 reported events from the NOAA Storm Events Database in 20 years, a winter weather event occurs approximately every 2 years on average in Hays County. There were no events reported specifically for Mountain City. Since these events can happen anywhere throughout the HMP update area and occur on a regional scale, the City's future probability is assumed to be similar to the surrounding county area. The jurisdiction can expect a winter weather event approximately once every 2 years on average in the future, with up to a RSI Category 1 snowfall event or SPIA Ice Index Category 2 ice event.

Number of Reported Events	Number of Years in Dataset	Probability
13	20	0.65

Severe Winter Storms: Impact

Severe winter storms has physical impacts upon the public and the infrastructure that supports them. According to the Texas Health Care Information Collection and Trauma Registry from the Texas Department of State Health Services' Injury Epidemiology & Surveillance Branch, the following number of patients were received in Hays County medical facilities for Cold Related Injuries and Trauma (shown in Table MC.12 & MC.13).

Table MC.12, Hays County Hospital Inpatient Data, Severe Winter Storms

Description	2010	2011	2012	2013	2014
Accidents caused by excessive cold due to weather conditions	2	0	0	0	0
Accidents due to excessive cold of unspecified origin	1	0	0	0	1

(Texas Department of State Health Services- Injury Epidemiology & Surveillance Branch, 2017)

Table MC.13, Hays County Trauma Data, Severe Winter Storms

Description	2010	2011	2012	2013	2014
Accidents due to excessive cold due to weather conditions	1	0	0	0	0

(Texas Department of State Health Services- Injury Epidemiology & Surveillance Branch, 2017)

In addition to the physical impacts, a severe winter storm event can also be the cause of cascading incidents. Electrical outages could occur due to the high demands of electricity needed to power heating systems. A loss of critical resources, such as power, has significant impact on the entire population, with higher impacts to those with vulnerabilities to such conditions. The following portion of Mountain City's population, according to HAZUS-MH 3.2 updated Census 2010 population estimates, would be greatly impacted by the extreme temperature conditions related to severe winter storms and/or the loss of electrical energy in their dwellings.

Population over 65 years old:	55
Population under 16 years old:	130

An organization called Inside Energy (http://insideenergy.org) provided a compiled database outlining 15 years of power outages across the United States from annual data available at the Department of Energy. Within the database, the following winter storm events affected electrical availability in the areas in or near Hays County (Table MC.14).

Table MC.14, Severe Winter Storms Affecting Electrical Availability

Event Description	Year	Start Date	Start Time	End Date	Respondent	Location	Customers Affected
Cold Weather Event	2011	2/9/2011	4:30 PM	2/10/2011	ERCOT ISO	Texas	N/A
Public Appeal due to Severe Weather - Cold	2014	1/6/2014	7:01 AM	1/7/2014	ERCOT	Texas	N/A
Public Appeal due to Severe Weather - Cold	2014	3/2/2014	7:00 PM	3/4/2014	ERCOT	ERCOT Region Texas	N/A

**Electrical Reliability Council of Texas (ERCOT)*

(Wirfs-Brock, 2014)

In addition, severe winter storms and the icy roads that accompany them lead to dangerous driving conditions. Although there were no reports specifically for Mountain City, data available from the Texas Department of Transportation's Crash Records Information System shows that between the years of 2010 and 2017, rural Hays County experienced 42 crashes related to sleet/hail and snow conditions. Injuries sustained from these crash events included 12 incapacitating injuries, 6 non-incapacitating injuries, and 2 possible injuries (shown in Table MC.15). Since winter weather occurs on a regional scale, it is assumed that weather related crashes in the surrounding county area would be similar to those experienced in these conditions within Mountain City.

Table MC.15, Severe Winter Storms, Vehicle Accidents, Hays County

City	Fatality	Incapacitating Injury	Non-Incapacitating	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Rural Hays County	0	0	1	0	2010	US0290	Slush	Snow
Rural Hays County	0	0	1	0	2010	US0290	Slush	Snow
Rural Hays County	0	0	0	0	2010	W FITZHUGH RD	Slush	Snow
Rural Hays County	0	0	0	0	2010	US0290	Slush	Snow
Rural Hays County	0	0	0	0	2010	RM0012	Slush	Snow
Rural Hays County	0	0	0	0	2010	RM0012	Slush	Snow
Rural Hays County	0	0	0	0	2011	RM0967	Ice	Sleet/Hail
Rural Hays County	0	0	0	0	2011	US0290	Ice	Sleet/Hail
Rural Hays County	0	0	0	0	2011	MCGREGOR LN	Ice	Sleet/Hail
Rural Hays County	0	1	0	0	2011	RM0012	Ice	Sleet/Hail
Rural Hays County	0	1	0	0	2011	RM0012	Ice	Sleet/Hail
Rural Hays County	0	1	0	0	2011	RM0012	Ice	Sleet/Hail
Rural Hays County	0	0	0	0	2011	MCGREGOR LN	Ice	Sleet/Hail
Rural Hays County	0	0	0	0	2011	HILLIARD RD	Snow	Snow
Rural Hays County	0	0	0	1	2011	FM1626	Snow	Snow
Rural Hays County	0	0	0	0	2011	IH0035	Snow	Snow
Rural Hays County	0	0	0	0	2011	IH0035	Snow	Snow
Rural Hays County	0	0	0	0	2011	US0290	Ice	Snow
Rural Hays County	0	0	0	0	2011	US0290	Ice	Snow
Rural Hays County	0	3	0	0	2014	RM0012	Wet	Sleet/Hail
Rural Hays County	0	3	0	0	2014	RM0012	Wet	Sleet/Hail
Rural Hays County	0	3	0	0	2014	RM0012	Wet	Sleet/Hail
Rural Hays County	0	0	0	0	2014	RM0012	Wet	Sleet/Hail
Rural Hays County	0	0	0	0	2014	FM1626	Ice	Sleet/Hail
Rural Hays County	0	0	0	0	2014	FM1626	Ice	Sleet/Hail
Rural Hays County	0	0	0	0	2014	FM1626	Ice	Sleet/Hail
Rural Hays County	0	0	0	0	2014	FM1626	Ice	Sleet/Hail
Rural Hays County	0	0	0	0	2014	FM1626	Ice	Sleet/Hail
Rural Hays County	0	0	1	0	2014	DOVE DR	Ice	Sleet/Hail

Table MC.15, Severe Winter Storms, Vehicle Accidents, Hays County (cont.)

City	Fatality	Incapacitating Injury	Non-Incapacitating	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Rural Hays County	0	0	0	0	2014	US0290	Ice	Sleet/Hail
Rural Hays County	0	0	0	0	2014	US0290	Ice	Sleet/Hail
Rural Hays County	0	0	0	0	2014	US0290	Ice	Sleet/Hail
Rural Hays County	0	0	0	0	2014	STAPLES RD	Ice	Sleet/Hail
Rural Hays County	0	0	0	1	2014	RM0165	Wet	Sleet/Hail
Rural Hays County	0	0	0	0	2015	RM0012	Wet	Sleet/Hail
Rural Hays County	0	0	0	0	2015	RM0012	Wet	Sleet/Hail
Rural Hays County	0	0	0	0	2015	RM0012	Wet	Sleet/Hail
Rural Hays County	0	0	0	0	2015	RM0012	Wet	Sleet/Hail
Rural Hays County	0	0	0	0	2015	RM0012	Wet	Sleet/Hail
Rural Hays County	0	0	1	0	2015	RM0150	Ice	Sleet/Hail
Rural Hays County	0	0	1	0	2015	RM0150	Ice	Sleet/Hail
Rural Hays County	0	0	1	0	2015	RM0150	Ice	Sleet/Hail

Crash Records Information System Query for Accidents in Hays County from 2010-2017 from non-Clear Weather Conditions (Texas Department of Transportation, 2017)

Severe Winter Storms: Vulnerability Summary

Mountain City has many surface powerlines. This poses a vulnerability due to the impact on electricity to homes and businesses during cold temperatures when an accumulation of ice and snow on branches could cause them to fall on the exposed powerlines.

Mountain City is comprised of residential streets maintained by the City, with no capabilities for de-icing. There are 2 entrances to the community, Pin Oak and Mountain City Drive. If these streets are iced over, there is no ingress or egress for the community. Although there are no bridges, steep hills or low water crossings, this lack of connectivity to outside roads lends to vulnerability.

Lightning

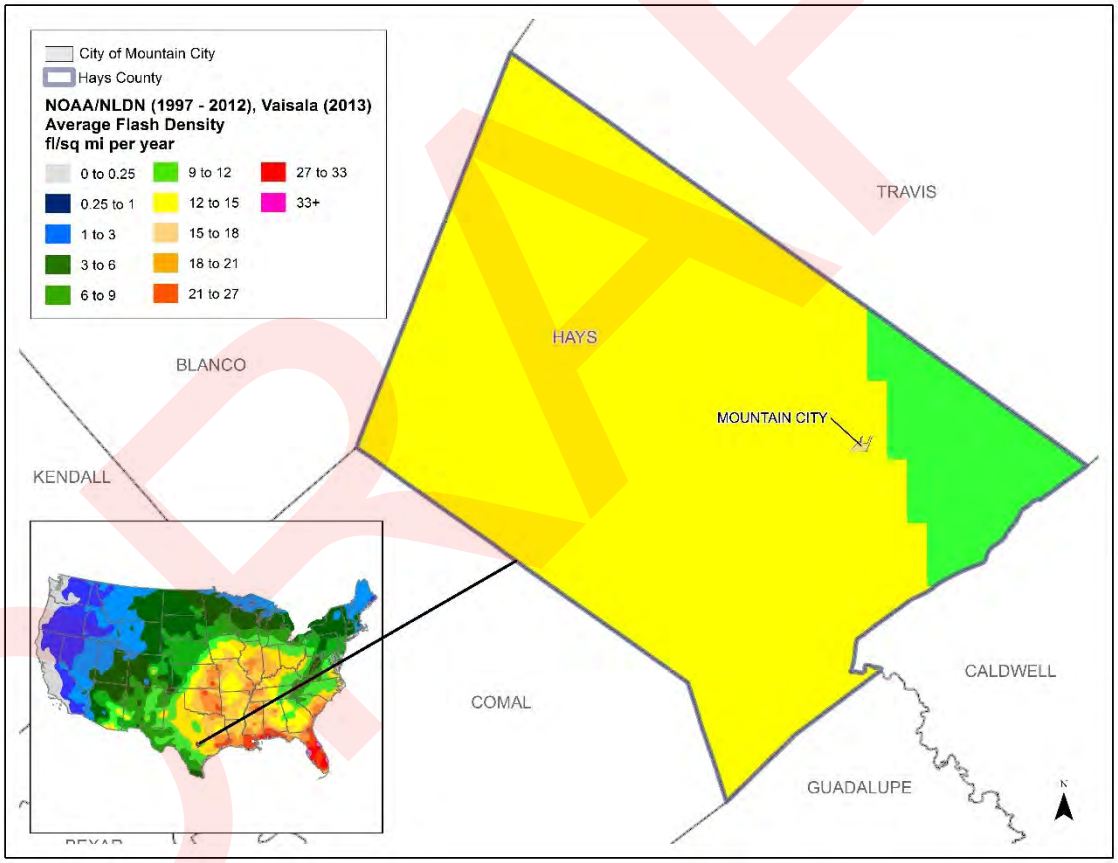
Lightning: Location

The entire extent of Mountain City is exposed to some degree of lightning hazard. Since lightning can occur at any location, lightning events could be experienced anywhere within the jurisdiction.

Lightning: Previous Occurrences

Figure MC.4 reflects Mountain City within the area that was calculated to receive approximately 12 to 15 lightning strikes per square mile per year according to NLDN data for the years 1997 to 2012. There were no lightning events reported specifically for the jurisdiction in the NOAA Storm Events Database.

Figure MC.4, Average Annual Lightning Density



(Vaisala NLDN, 2016)

Lightning: Extent

Due to the lack of reported occurrences, there is not sufficient data to determine the maximum Lightning Activity Level (LAL) for the jurisdiction (refer to Chapter 2, the Risk Assessment portion of the Hays County HMP Update, for a description of the LAL Grids). However, with the data available, the magnitudes of lightning events that Mountain City has experienced can be derived from the NOAA/NLDL data in Figure MC.4, up to 12 to 15 strikes per square mile per year where the City is approximately 0.42 square miles.

Lightning: Probability

Since lightning can occur at any location, lightning events could be experienced anywhere within the jurisdiction. Based on the data provided in Figure MC.4, Mountain City can expect future events to fall in line with NLDN data from previous years with a probability of up to approximately 12 to 15 lightning strikes per square mile per year.

Lightning: Impact

The National Lightning Detection Network (NLDN) reported 217 lightning fatalities within the State between the years 1959 and 2013. According to the Texas Health Care Information Collection and Trauma Registry from the Texas Department of State Health Services' Injury Epidemiology & Surveillance Branch, the following number of patients were received in Hays County medical facilities for Lightning Related Trauma (shown in Table MC.16).

Table MC.16, Hays County Trauma Registry Data, Lightning Events

E-Code	Description	2010	2011	2012	2013	2014
907.0	Accidents due to lightning	0	1	0	0	1

(Texas Department of State Health Services- Injury Epidemiology & Surveillance Branch, 2017)

In addition to the physical impacts that lightning can directly have on human beings, a lightning event can also be the cause of cascading incidents such as electrical outage events due to the impact that lightning strikes can have on electrical utility infrastructure. A loss of critical resources such as power has significant impact on the entire population, with higher impacts to those with vulnerabilities to such conditions. The following portion of Mountain City's population, according to HAZUS-MH 3.2 updated Census 2010 population estimates, would be greatly impacted by the loss of electrical energy in their dwellings.

Population over 65 years old	55
Population under 16 years old	130

An organization called Inside Energy (http://insideenergy.org) provided a compiled database outlining 15 years of power outages across the United States from annual data available at the Department of Energy. Within the database, the following thunderstorm/severe storm events affected electrical availability in the areas in or near Hays County (shown in Table MC.17).

Table MC.17, Lightning Affecting Electrical Availability

Event Description	Year	Start Date	Start Time	End Date	Respondent	Location	Customers Affected
Severe Weather	2008	4/9/2008	4:00 p.m.	4/13/2008	Oncor Electric Delivery Company LLC	North, Central and East Texas	488,689
Severe Thunderstorms	2008	6/17/2008	9:01 a.m.	6/19/2008	Oncor Electric Delivery Company LLC	North, Central and East Texas	234,393
Severe Thunderstorms	2008	8/3/2008	1:30 a.m.	8/3/2008	Entergy Corporation	Mississippi, Louisiana, Texas	59,500
Severe Storms	2009	6/10/2009	6:00 p.m.	6/14/2009	Oncor Electric Delivery Company, LLC	North and Central Texas	800,000
Thunderstorms	2010	6/8/2010	11:00 a.m.	6/8/2010	Centerpoint Energy	Southeastern Texas	79,741

(Wirfs-Brock, 2014)

Lightning strikes can also cause wildfire ignitions. According to the National Fire Protection Association (NFPA), "during 2007-2011, U.S. local fire departments responded to an average of 22,600 fires per year that were started by lightning. These fires caused an average of 9 civilian deaths, 53 civilian injuries and $451 million in direct property damage per year." The source also cites that the fires are more common in June through August and in the late afternoon and evening.

Lightning: Vulnerability Summary

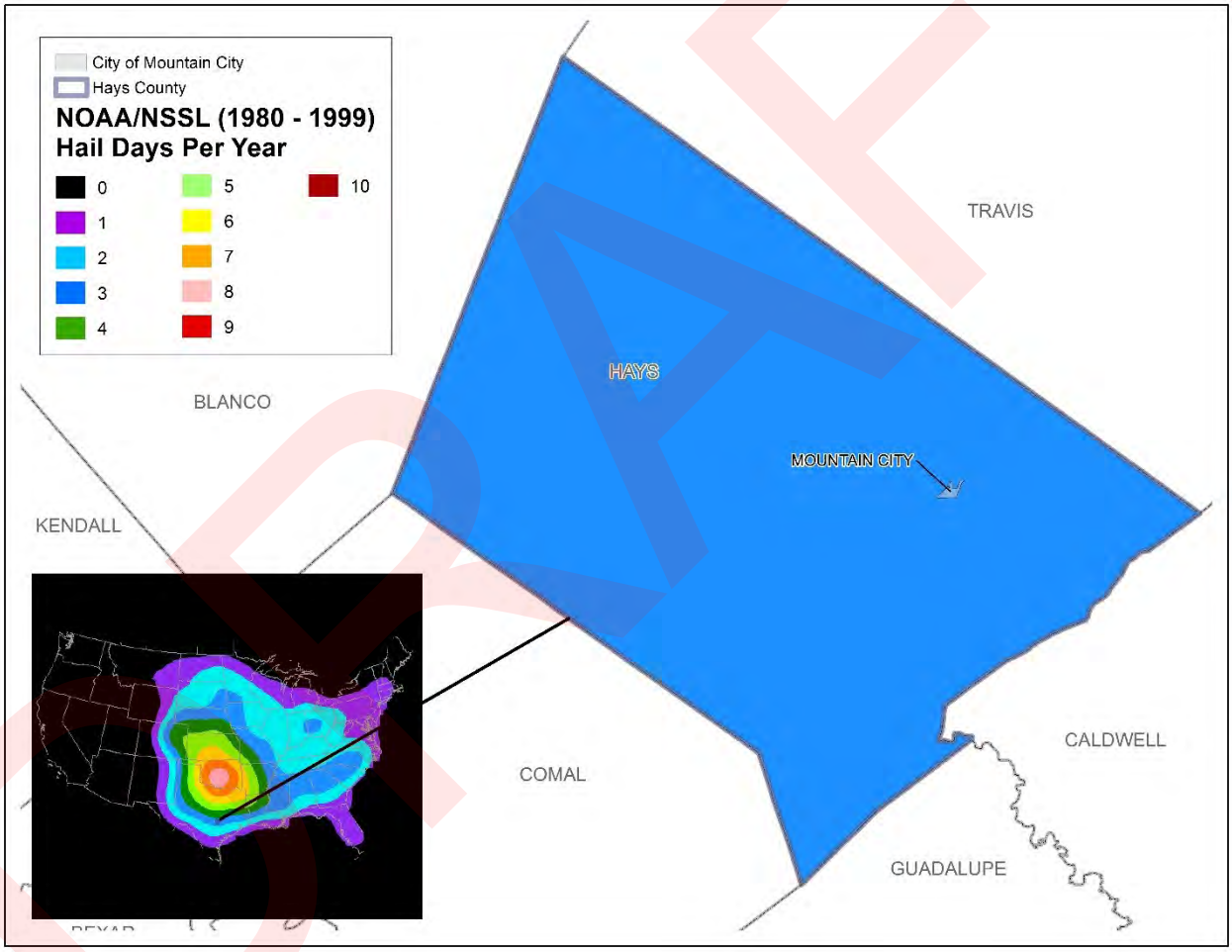
Surface powerlines create a vulnerability to natural hazards. In Mountain City's recent history, there have been several undocumented incidents (resident testimony without data to provide for analysis purposes) that have resulted in transformer damage that have affected the community's access to power for several hours. There is no generator back-up in City Hall, impacting continuity of operations for the City Government.

Hailstorms

Hailstorms: Location

The entire extent of Mountain City is exposed to some degree of hail hazard. Since hail can occur at any location, hail events could be experienced anywhere within the jurisdiction. NOAA's National Severe Storms Laboratory used historical data from 1980-1999 to estimate the daily probability of hail occurrences (of at least 0.75-inch diameter hail) across the U.S. Figure MC.5 shows the average number of hail days per year determined from this analysis and the corresponding location of the City. The density per 25-square-miles in the map's legend indicates the probable number of hail days for each 25 square mile cell within the contoured zone that can be expected per year. It should be noted that the density number does not indicate the number of events that can be expected within each cell, rather the average number of days per year with 1 or more event occurring within each cell.

Figure MC.5, National Hail Days Per Year, Mountain City



(National Severe Storms Laboratory, 2016)

Hailstorms: Previous Occurrences

Since hail can occur at any location, hail events could be experienced anywhere within the jurisdiction. While Mountain City has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, it would be similar in size and magnitude to events within the surrounding county area. Table MC.18 lists the 57 hail events reported for Hays County and its unincorporated jurisdictions since the year 1967. Note that multiple listings for the same dates are the result of reports from different affected parts of the County for the given event.

Fatality, injury and damage amounts are shown in Table MC.18, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table MC.18, Hail Events, Hays County, Texas

Location	Date	Type	Extent (mm)	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	5/20/1967	Hail	76.20	0	0	0.00	0.00
Hays County	5/8/1969	Hail	25.40	0	0	0.00	0.00
Hays County	10/27/1970	Hail	25.40	0	0	0.00	0.00
Hays County	2/25/1971	Hail	57.15	0	0	0.00	0.00
Hays County	3/12/1971	Hail	76.20	0	0	0.00	0.00
Hays County	5/29/1975	Hail	44.45	0	0	0.00	0.00
Hays County	3/30/1976	Hail	44.45	0	0	0.00	0.00
Hays County	4/7/1976	Hail	44.45	0	0	0.00	0.00
Hays County	4/7/1976	Hail	44.45	0	0	0.00	0.00
Hays County	4/7/1976	Hail	44.45	0	0	0.00	0.00
Hays County	4/7/1976	Hail	44.45	0	0	0.00	0.00
Hays County	4/7/1976	Hail	44.45	0	0	0.00	0.00
Hays County	5/5/1976	Hail	44.45	0	0	0.00	0.00
Hays County	4/3/1977	Hail	25.40	0	0	0.00	0.00
Hays County	4/14/1977	Hail	50.80	0	0	0.00	0.00
Hays County	4/14/1977	Hail	50.80	0	0	0.00	0.00
Hays County	4/18/1979	Hail	25.40	0	0	0.00	0.00
Hays County	1/17/1980	Hail	44.45	0	0	0.00	0.00
Hays County	1/17/1980	Hail	25.40	0	0	0.00	0.00
Hays County	2/29/1980	Hail	44.45	0	0	0.00	0.00
Hays County	4/11/1980	Hail	25.40	0	0	0.00	0.00
Hays County	5/8/1980	Hail	25.40	0	0	0.00	0.00
Hays County	5/9/1981	Hail	25.40	0	0	0.00	0.00
Hays County	4/20/1982	Hail	25.40	0	0	0.00	0.00
Hays County	5/13/1982	Hail	25.40	0	0	0.00	0.00
Hays County	3/30/1983	Hail	25.40	0	0	0.00	0.00
Hays County	5/20/1983	Hail	25.40	0	0	0.00	0.00
Hays County	5/20/1983	Hail	31.75	0	0	0.00	0.00

Table MC.18, Hail Events, Hays County, Texas (cont.)

Location	Date	Type	Extent (mm)	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	5/20/1987	Hail	50.80	0	0	0.00	0.00
Hays County	5/5/1989	Hail	19.05	0	0	0.00	0.00
Hays County	5/5/1989	Hail	38.10	0	0	0.00	0.00
Hays County	5/10/1989	Hail	19.05	0	0	0.00	0.00
Hays County	5/10/1989	Hail	38.10	0	0	0.00	0.00
Hays County	2/1/1990	Hail	38.10	0	0	0.00	0.00
Hays County	4/14/1991	Hail	19.05	0	0	0.00	0.00
Hays County	4/28/1991	Hail	19.05	0	0	0.00	0.00
Hays County	4/19/1992	Hail	38.10	0	0	0.00	0.00
Hays County	5/12/1992	Hail	44.45	0	0	0.00	0.00
Hays County	5/12/1992	Hail	19.05	0	0	0.00	0.00
Hays County	5/27/1992	Hail	19.05	0	0	0.00	0.00
Hays County	5/27/1992	Hail	25.40	0	0	0.00	0.00
Henly	11/1/1995	Hail	44.45	0	0	0.00	0.00
Henly	3/7/1998	Hail	19.05	0	0	0.00	0.00
Henly	2/10/2009	Hail	25.4	0	0	0.00	0.00
Driftwood	5/11/2011	Hail	44.45	0	0	0.00	0.00
Mt. Gaynor	5/20/2011	Hail	19.05	0	0	0.00	0.00
Driftwood	5/20/2011	Hail	25.40	0	0	0.00	0.00
Driftwood	5/20/2011	Hail	25.40	0	0	0.00	0.00
Mt. Gaynor	5/20/2011	Hail	25.40	0	0	0.00	0.00
Driftwood	5/20/2011	Hail	25.40	0	0	0.00	0.00
Driftwood	5/20/2011	Hail	22.35	0	0	0.00	0.00
Fitzhugh	1/24/2012	Hail	25.40	0	0	0.00	0.00
Fitzhugh	3/19/2013	Hail	38.10	0	0	0.00	0.00
Driftwood	4/27/2013	Hail	44.45	0	0	0.00	0.00
Driftwood	5/27/2014	Hail	25.40	0	0	0.00	0.00
Fitzhugh	5/27/2014	Hail	19.05	0	0	0.00	0.00
Driftwood	4/16/2015	Hail	22.35	0	0	0.00	0.00
Total				**0**	**0**	**$0.00**	**$0.00**

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Hailstorms: Extent

The Tornado and Storm Research Organization (TORRO) created a hail extent index to measure hail called the Hailstorm Intensity Scale. According to the reported previous hail occurrences in the jurisdiction, the maximum hail extent experienced is hail up to 3 in., or 76.20 mm. in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of a "Super Hailstorm." Refer to Chapter 2, the Risk Assessment portion of the Hays County HMP Update, for hail extent scale descriptions.

Hailstorms: Probability

Figure MC.5 reports 3 hail days per year as a result of NLDN's nationwide analysis. Since this calculation is based on national data, a more specific calculation based on local-level NOAA reports was utilized to calculate probability. Based on 57 reported events in 49 years, a hail event occurs approximately once a year on average in Hays County. Since hail events can happen anywhere throughout the HMP update area, Mountain City's future probability is assumed to be similar to the surrounding county area. The City can expect a hail event approximately once every year on average in the future, with hail up to 3 in., or 76.20 mm. in diameter, corresponding to a TORRO Hailstorm Intensity Scale classification of a "Super Hailstorm."

Number of Reported Events	Number of Years in Dataset	Probability
57	49	1.16

Hailstorms: Impact

Although there are no specific occurrences for which hailstorm damages are captured, based on the maximum hail extent experienced (76.20 mm) in the surrounding county area, the TORRO Hailstorm Intensity Scale (found in Chapter 2, the Risk Assessment portion of the Hays County HMP Update) indicates that impact can be expected to include any of the following:

- Varying degrees of damage to vegetation and crops
- Damage to plastic structures
- Varying degrees of damage to glass
- Paint and wood scored
- Vehicle bodywork damage
- Varying degrees of roof damage
- Varying degrees of risk of injuries
- Varying degrees of aircraft damage
- Brick walls pitted
- Risk of severe or even fatal injuries to persons caught in the open

During undocumented past instances of hail (based on resident testimony without dates or measurement data to include in this analysis), there are typically 3-5 roofs that need to be restored after a typical hail event.

Hailstorms: Vulnerability Summary

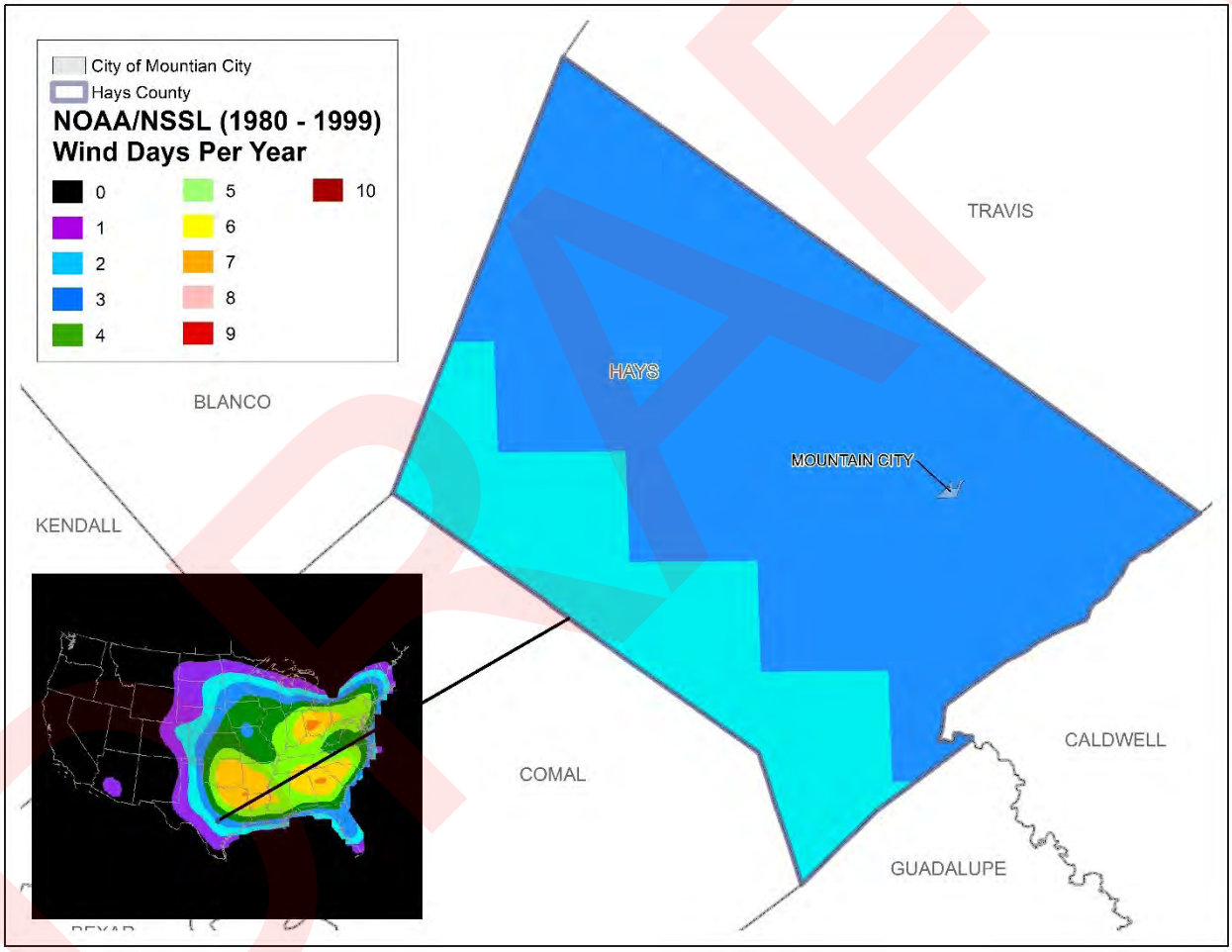
The roof type on the residential structure that serves as City Hall could be susceptible to hail. There is no critical City equipment or vehicles.

Windstorms

Windstorms: Location

The entire extent of Mountain City is exposed to some degree of wind hazard. Since wind can occur at any location, wind events could be experienced anywhere within the jurisdiction. NOAA's National Severe Storms Laboratory used historical data from 1980 to 1999 to estimate the daily probability of wind occurrences across the U.S., with gusts of at least 58 mph. Figure MC.6 shows the estimates for wind days determined from this analysis and the corresponding location of the City. The density of wind days per year in the map's legend indicates the probable number of wind days for each 25-square-mile cell within the contoured zone that can be expected per year. It should be noted that the density number does not indicate the number of events that can be expected within each cell, rather the average number of days per year with 1 or more events occurring within each cell.

Figure MC.6, National Wind Days Per Year, Mountain City



(National Severe Storms Laboratory, 2016)

Windstorms: Previous Occurrences

Since windstorms can occur at any location, wind events could be experienced anywhere within the jurisdiction. While Mountain City has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, it would be similar in size and magnitude to events within the surrounding county area. Table MC.19 lists the 38 wind events reported for Hays County and its unincorporated jurisdictions from year 1974.

Fatality, injury and damage amounts are shown in Table MC.19, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table MC.19, Reported Wind Events, Hays County

Location	Date	Type	Extent (knots)	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	5/9/1974	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	4/7/1975	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	5/19/1975	Thunderstorm Wind	70 kts.	0	0	0.00	0.00
Hays County	5/31/1976	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	5/31/1976	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	5/11/1978	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	5/29/1978	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	4/18/1979	Thunderstorm Wind	52 kts.	0	0	0.00	0.00
Hays County	7/10/1979	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	2/29/1980	Thunderstorm Wind	55 kts.	0	0	0.00	0.00
Hays County	5/13/1980	Thunderstorm Wind	52 kts.	0	0	0.00	0.00
Hays County	7/28/1980	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	5/13/1982	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	6/22/1982	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	3/30/1983	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	10/21/1984	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	12/31/1984	Thunderstorm Wind	NA	0	0	0.00	0.00

Table MC.19, Reported Wind Events, Hays County (cont.)

Location	Date	Type	Extent (knots)	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	5/8/1985	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	6/12/1986	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	5/5/1989	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	5/20/1989	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	4/26/1990	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	4/26/1990	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	5/18/1990	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	4/7/1991	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	5/27/1992	Thunderstorm Wind	53 kts.	0	0	0.00	0.00
Hays County	6/12/1992	Thunderstorm Wind	60 kts.	0	0	0.00	0.00
Hays County	6/12/1992	Thunderstorm Wind	NA	0	0	0.00	0.00
Hays County	9/3/1992	Thunderstorm Wind	50 kts.	0	0	0.00	0.00
Hays County	9/3/1992	Thunderstorm Wind	50 kts.	0	0	0.00	0.00
Countywide	3/8/1995	Thunderstorm Wind	55 kts.	0	0	0.00	0.00
Countywide	6/11/1995	Thunderstorm Wind	NA	0	0	0.00	3,000.00
Countywide	3/19/2002	Thunderstorm Wind	NA	0	0	100,000.00	100,000.00
Driftwood	4/14/2014	Thunderstorm Wind	50 kts. EG	0	0	0.00	0.00
Driftwood	6/12/2014	Thunderstorm Wind	61 kts. EG	0	0	0.00	0.00
Fitzhugh	6/12/2014	Thunderstorm Wind	61 kts. EG	0	0	0.00	0.00
Fitzhugh	6/12/2014	Thunderstorm Wind	56 kts. EG	0	0	0.00	0.00
Mt. Gaynor	4/30/2016	Thunderstorm Wind	61 kts. EG	0	0	0.00	0.00
Total				**0**	**0**	**$100,000.00**	**$103,000.00**

NA - No data available
EG - Estimated Gust

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Windstorms: Extent

Wind is measured by the Beaufort Wind Scale that relates wind speed to observed conditions on land and sea. According to the reported previous windstorm occurrences in the jurisdiction, the maximum wind extent experienced was 70 knots (Hurricane Classification in the Beaufort Wind Scale). Refer to Chapter 2, the Risk Assessment portion of the Hays County HMP Update, for a description of wind extent scales.

Windstorms: Probability

Figure MC.6 reports 3 wind days per year as a result of NLDN's nationwide analysis. Since this calculation is based on national data, a more specific calculation based on local-level NOAA reports was utilized to calculate probability. Based on 38 reported events in 42 years, a wind event occurs approximately once every year on average in Hays County. Since wind events can happen anywhere throughout the HMP update area, Mountain City's future probability is assumed to be similar to the surrounding county area. In the future, the City can expect a wind event of up to 70 knots or 80.55 miles per hour (Hurricane Classification in the Beaufort Wind Scale), approximately once every year on average in the future.

Number of Reported Events	Number of Years in Dataset	Probability
38	42	0.90

Windstorms: Impact

Although there were no reports specifically for Mountain City, data available from the Texas Department of Transportation's Crash Records Information System shows that between the years of 2010 and 2017, rural Hays County experienced 5 crashes related to severe crosswind weather conditions. There were no injuries reported from these crash events (see Table MC.20). Since wind events occur on a regional scale, it is assumed that weather related crashes in the surrounding county area would be similar to those experienced in these conditions within Mountain City.

Table MC.20, Windstorms, Vehicle Accidents, Hays County

City	Fatality	Incapacitating Injury	Non-Incapacitating	Possible Injury	Crash Year	Street Name	Surface Condition	Weather Condition
Rural Hays County	0	0	0	0	2010	LIME KILN RD	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2014	IH0035	Dry	Severe Crosswinds
Rural Hays County	0	0	0	0	2017	US0290	Wet	Severe Crosswinds

(Texas Department of Transportation, 2017)

Windstorms: Vulnerability Summary

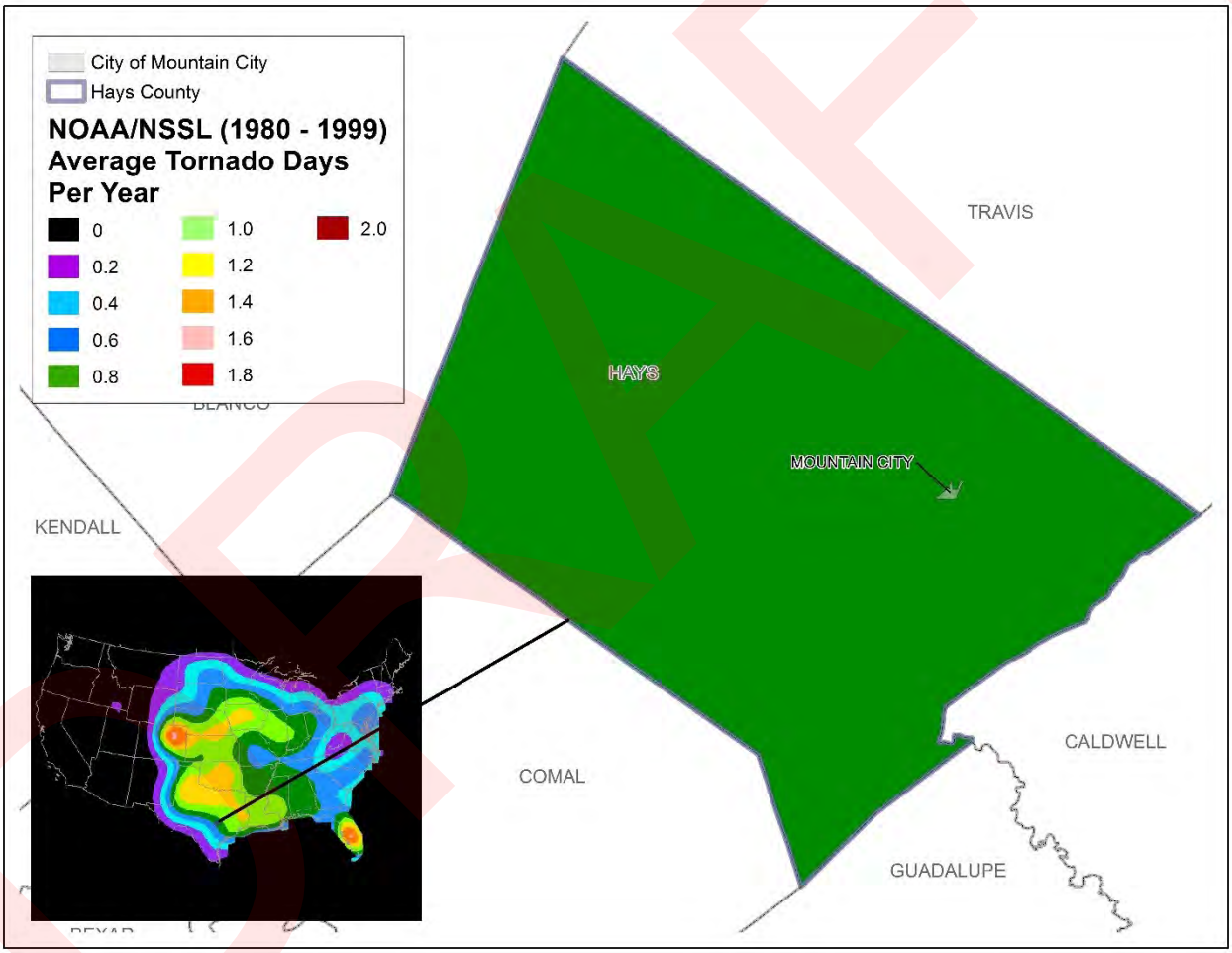
Mountain City has previously experienced debris accumulation on roadways during past windstorm events. Such incidents could cause impact on the ability of public safety officials to access emergency calls. Undocumented accounts of wind events (without dates or magnitude that could be included in analysis) indicated that in April of 2016, straight line winds caused downed trees and powerlines. Pedernales Electric Cooperative performed repairs on the lines, however power was interrupted for residents for several hours. City Hall does not have generator back-up for these kind of events.

Tornadoes

Tornadoes: Location

The entire extent of Mountain City is exposed to some degree of tornado hazard. Since tornadoes can occur at any location, tornado events could be experienced anywhere within the jurisdiction. NOAA's National Severe Storms Laboratory used historical data from 1980 to 1999 to estimate the daily probability of tornado occurrences across the U.S., regardless of tornado magnitude. Figure MC.7 shows the average number of tornado days resulting from this analysis and the respective location of Mountain City. The density of average tornado days per year in the map's legend indicates the probable number of tornado days for each 25-square-mile cell within the contoured zone that can be expected per year. This density number does not indicate the number of events that can be expected within each cell, rather the average number of days per year with 1 or more events occurring within each cell.

Figure MC.7, National Tornado Days Per Year, Mountain City



(National Severe Storms Laboratory, 2016)

Tornadoes: Previous Occurrences

Since tornadoes can occur at any location, tornado events could be experienced anywhere within the jurisdiction. While Mountain City has not had any previous occurrences reported through the NOAA Storm Events Database, if an event were to occur, the event would be similar in size and magnitude to events within the surrounding county area. Table MC.21 lists the 16 tornado events reported for Hays County and its unincorporated jurisdictions since year 1953.

Fatality, injury and damage amounts are shown in Table MC.21, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table MC.21, Tornado Events, Hays County

Location	Date	Type	Extent	Fatalities	Injuries	Property Damage	Crop Damage
Hays County	4/28/1953	Tornado	F3	1	5	250,000.00	0.00
Hays County	4/30/1954	Tornado	F1	0	0	250,000.00	0.00
Hays County	5/2/1958	Tornado	F1	0	0	30.00	0.00
Hays County	11/12/1961	Tornado	F2	0	0	2,500.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	250.00	0.00
Hays County	9/20/1967	Tornado	NA	0	0	30.00	0.00
Hays County	5/10/1975	Tornado	F1	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	0	25,000.00	0.00
Hays County	3/30/1976	Tornado	F2	0	1	250,000.00	0.00
Hays County	8/10/1980	Tornado	F2	0	0	25,000,000.00	0.00
Hays County	4/22/1985	Tornado	F2	0	0	250,000.00	0.00
Hays County	8/22/1991	Tornado	F1	0	0	2,500.00	0.00
Countywide	5/13/1994	Tornado	F0	0	0	500.00	500.00
Henly	11/15/2001	Tornado	F0	0	1	50,000.00	0.00
Driftwood	10/8/2002	Tornado	F0	0	0	70,000.00	0.00
M. Gaynor	5/23/2015	Tornado	EF0	0	0	0.00	0.00
Total				1	7	$26,175,810.00	$500.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Tornadoes: Extent

Tornadoes are measured by severity on the Enhanced Fujita Scale, with a range from 0-6. According to the reported previous tornado occurrences in the jurisdiction, the maximum tornado extent experienced was a category F3 tornado in 1953. Refer to Chapter 2, the Risk Assessment portion of the Hays County HMP Update, for a description of the Fujita (F) Scale and Operational Enhanced Fujita (EF) Scale.

Tornadoes: Probability

Figure MC.7 reports 0.8 tornado days per year as a result of NLDN's nationwide analysis. Since this calculation is based on national data, a more specific calculation based on local-level NOAA reports was utilized to calculate probability. Based on 16 reported events in 63 years, a tornado event occurs approximately every 4 years on average in Hays County. Since tornado events can happen anywhere throughout the HMP update area, Mountain City's future probability is assumed to be similar to the surrounding county area. The City can expect a tornado event approximately once every 4 years on average in the future, with up to an F3 magnitude.

Number of Reported Events	Number of Years in Dataset	Probability
16	63	0.25

Tornadoes: Impact

There is not specific event data available for Mountain City, from which impacts would be calculated. However, it can be assumed that impacts would be similar to those that the surrounding County area experiences.

Based on Hays County having experienced tornadoes between F0 and F3 levels in the past, if similar events were to happen in the future in the City, the type of impacts that the jurisdiction can expect associated with those magnitudes (according to Tornado Facts, an educational website on tornadoes) would include (from least to greatest severity):

- Light Damage - Broken branches; shallow rooted trees pushed over; some chimney damage.
- Moderate Damage - Surface damage to roofs; mobile homes pushed off foundation; moving vehicles pushed off the road.
- Significant Damage - Frame houses have roof torn off; mobile homes completely destroyed; train boxcars overturned; large trees snapped or uprooted; smaller debris turned into missiles.
- Severe Damage - Roofs completely torn off well-constructed buildings, along with some walls; majority of trees uprooted; trains overturned; vehicles lifted off the ground.

(Tornado Facts, 2016)

Additional impacts from tornado events could include downed utility poles, communication towers, street signals, and debris created from residential and urban property.

Critical infrastructure could be disrupted, resulting in periods of impact to service due to the lack of back-up utility resources. See Lightning: Impact section within this annex for more information on utility interruption.

Tornadoes: Vulnerability Summary

Mountain City is 100% residential. There are no shelters or other buildings available to provide temporary shelter for residents after a disaster event. Sheltering efforts would have to be coordinated through Hays County. There is no dedicated reverse-911 system or emergency communications source for residents, besides the email lists that they can subscribe to for emails regarding administrative issues and upcoming events. Receiving notification regarding tornado watches and warnings would be necessary through County resources.

Expansive Soils

Expansive Soils: Location

Areas within Mountain City with structures that are underlain by soils containing clays with swelling potential are most affected by expansive soils. Figure 2.4 within Chapter 2 (the Risk Assessment portion of the Hays County HMP Update) shows the location of expansive soil areas for the City. The jurisdiction has the same expansive soil composition throughout the area.

Expansive Soils: Previous Occurrences

There was no documentation of site-specific past events of structural damage due to expansive soils from local, state, or national databases queried.

Expansive soils cannot be documented as a time-specific event, except when they lead to structural and infrastructure damage. There are no specific damage reports or historical records of events in the City, however future events can occur.

Expansive Soils: Extent

According to the USGS Expansive Soils Regions, Figure 2.4 in Chapter 2 (the Risk Assessment portion of the Hays County HMP Update), less than 50% of Mountain City is underlain with soils with clay textures that have high shrink-swell properties.

Expansive Soils: Probability

Considering the amount of swelling potential within the jurisdiction as well as the lack of reported events, the probability of a future event is low (unlikely in next 10 years) for the jurisdiction.

Expansive Soils: Impact

There have been a few undocumented foundation problems that have occurred within the community that could possibly be attributed to the presence of expansive soils.

Expansive Soils: Vulnerability Summary

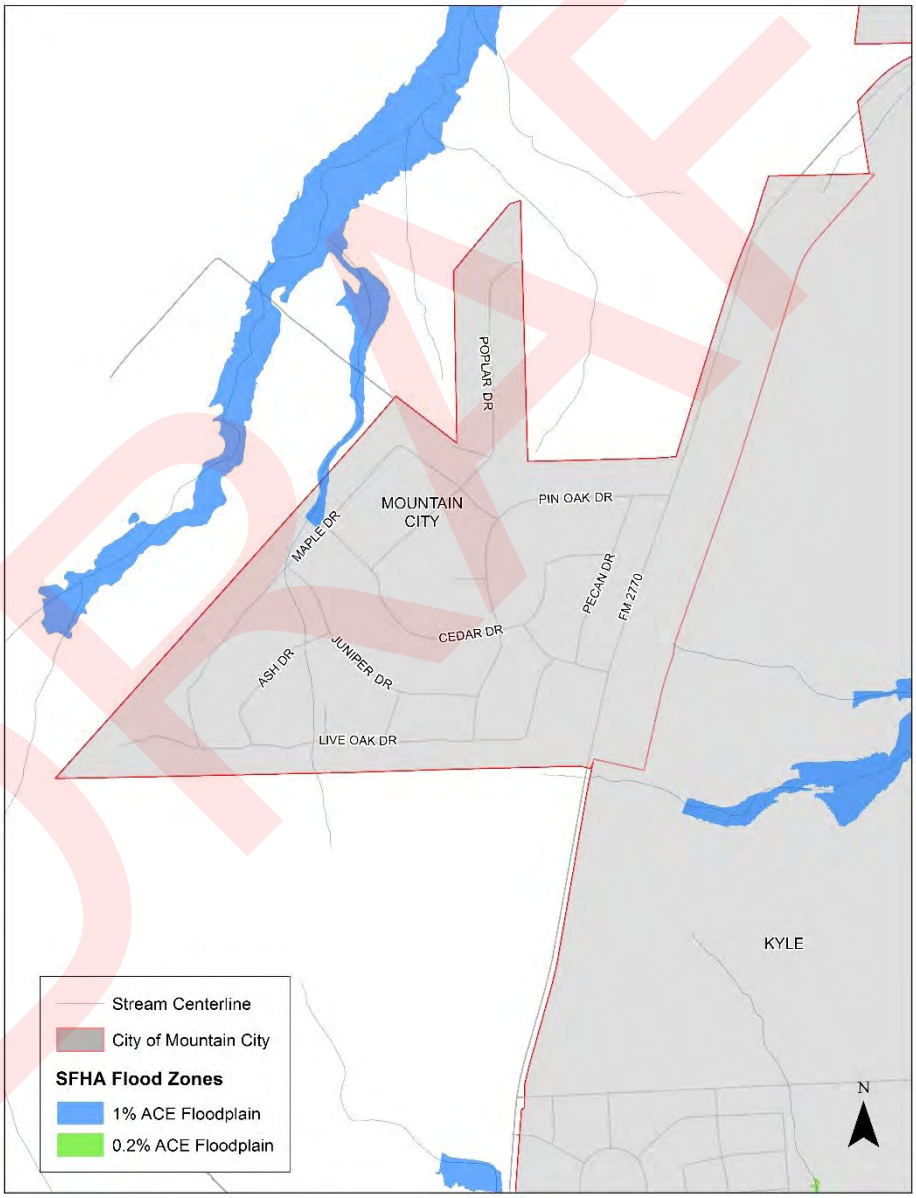
The lack of current problems faced in the community leads to a lessened concern for the issue. The residences in the community were mostly constructed between 20 and 30 years ago, before the community was incorporated and before National Building Codes were adopted with specific codes for foundation work. As time progresses and the structures continue to age, the number of foundation issues could continue to emerge. A general lack of concern for the hazard creates a vulnerability due to the resulting lack of individual-level (homeowner) mitigation action for expansive soils.

Floods

Floods: Location

Current effective Flood Insurance Rate Maps for the community show very little Special Flood Hazard Area (SFHA) within the City limits. Recent flood studies that are not yet effective were used as the best data available for the purposes of this analysis. The 1% Annual Chance Event (ACE) floodplain based on best available data for Mountain City is shown in Figure MC.8. As the figure illustrates, there is currently minimal Special Flood Hazard Area (SFHA) identified and no documented low water crossings within the jurisdiction. According to this data, an unnamed tributary to Mustang Branch is located within the City, therefore localized flooding could still occur. Homes and roads located adjacent to this unnamed tributary within the HMP update area would be the areas most affected if a flooding event were to occur.

Figure MC.8, Special Flood Hazard Areas, Mountain City



(Texas Natural Resources Information System, 2011)

Floods: Previous Occurrences

Hays County was included in 3 Federal disaster declarations between 2013 and 2015, all related to flooding. Although there were no flood events reported specifically for Mountain City in the NOAA Storm Events Database, Table MC.22 lists the 69 documented events reported for Hays County and its unincorporated jurisdictions from year 1997 to 2016. Due to the size and extent of some flood occurrences as well as the regional nature of reports in the NOAA Storm Events Database, the jurisdiction may have been affected by many of the events that were reported for the surrounding areas.

Fatality, injury and damage amounts are shown in Table MC.22, per the NOAA Storm Events Database. Community testimony indicates that these amounts do not reflect the most recent totals, however NOAA data is being used as the best source of information available for the record period.

Table MC.22, Flood Events, Hays County

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Countywide	5/23/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/6/1997	Flash Flood	0	0	10,000.00	0.00
Countywide	6/7/1997	Flash Flood	0	0	15,000.00	0.00
Countywide	6/8/1997	Flash Flood	2	7	2,500,000.00	50,000.00
Countywide	6/21/1997	Flash Flood	0	0	5,000.00	0.00
Countywide	6/22/1997	Flash Flood	0	0	50,000.00	50,000.00
Countywide	2/21/1998	Flash Flood	0	0	5,000.00	0.00
Countywide	7/3/1998	Flash Flood	0	0	20,000.00	0.00
Countywide	8/22/1998	Flash Flood	0	0	20,000.00	10,000.00
Countywide	8/23/1998	Flash Flood	0	0	10,000.00	0.00
Countywide	10/17/1998	Flash Flood	0	100	500,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
HAYS (ZONE)	10/17/1998	Flood	0	25	4,000,000.00	50,000.00
Countywide	6/21/1999	Flash Flood	0	0	3,000.00	0.00
Countywide	6/9/2000	Flash Flood	0	0	15,000.00	0.00
Countywide	11/2/2000	Flash Flood	0	0	20,000.00	0.00
HAYS (ZONE)	11/4/2000	Flood	0	0	0.00	0.00
North Portion	8/26/2001	Flash Flood	0	0	10,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	20,000.00	0.00
Countywide	8/31/2001	Flash Flood	0	0	30,000.00	20,000.00
Countywide	11/15/2001	Flash Flood	0	20	200,000.00	50,000.00
HAYS (ZONE)	11/15/2001	Flood	0	0	0.00	0.00
West Portion	6/30/2002	Flash Flood	0	0	10,000.00	0.00
HAYS (ZONE)	7/1/2002	Flood	0	0	0.00	0.00
South Portion	7/1/2002	Flash Flood	0	0	0.00	0.00
Countywide	7/2/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/3/2002	Flash Flood	0	0	0.00	0.00
West Portion	7/5/2002	Flash Flood	0	0	0.00	0.00

Table MC.22, Flood Events, Hays County (cont.)

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
South Portion	9/19/2002	Flash Flood	0	0	0.00	0.00
South Portion	10/24/2002	Flash Flood	0	0	0.00	0.00
Countywide	11/4/2002	Flash Flood	0	0	0.00	0.00
Countywide	2/20/2003	Flash Flood	0	0	10,000.00	0.00
West Portion	6/13/2003	Flash Flood	0	0	5,000.00	0.00
South Portion	9/11/2003	Flash Flood	0	0	3,000.00	0.00
Northwest Portion	1/16/2004	Flash Flood	0	0	3,000.00	0.00
East Portion	6/5/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/9/2004	Flash Flood	0	0	350,000.00	0.00
Driftwood	6/26/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/27/2004	Flash Flood	0	0	0.00	0.00
West Portion	6/28/2004	Flash Flood	0	0	0.00	0.00
Countywide	6/29/2004	Flash Flood	0	0	0.00	0.00
South Portion	6/30/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	6/30/2004	Flood	0	0	0.00	0.00
West Portion	7/25/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/2/2004	Flash Flood	0	0	0.00	0.00
Countywide	10/23/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	10/23/2004	Flood	0	0	0.00	0.00
HAYS (ZONE)	10/24/2004	Flood	0	0	0.00	0.00
Countywide	11/16/2004	Flash Flood	0	0	0.00	0.00
HAYS (ZONE)	11/17/2004	Flood	0	0	0.00	0.00
Countywide	11/21/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Countywide	11/22/2004	Flash Flood	0	0	0.00	0.00
Southeast Portion	11/23/2004	Flash Flood	0	0	0.00	0.00
South Portion	5/6/2006	Flash Flood	0	0	0.00	0.00
Henly	3/30/2007	Flash Flood	0	0	0.00	0.00
Driftwood	3/30/2007	Flood	0	0	0.00	0.00
Henly	5/2/2007	Flash Flood	0	0	0.00	0.00
Henly	7/2/2007	Flash Flood	0	0	0.00	0.00
Henly	5/17/2010	Flash Flood	0	0	0.00	0.00
Driftwood	9/7/2010	Flash Flood	0	0	0.00	0.00
Driftwood	5/10/2012	Flash Flood	0	0	0.00	0.00
Driftwood	5/11/2012	Flash Flood	0	0	0.00	0.00
Fitzhugh	5/17/2015	Flash Flood	0	0	0.00	0.00
Henly	5/30/2015	Flash Flood	0	0	0.00	0.00
Fitzhugh	6/14/2015	Flash Flood	0	0	0.00	0.00

Table MC.22, Flood Events, Hays County

Location	Date	Type	Fatalities	Injuries	Property Damage	Crop Damage
Driftwood	10/30/2015	Flash Flood	0	0	10,000,000.00	0.00
Fitzhugh	5/19/2016	Flash Flood	0	0	0.00	0.00
Driftwood	8/16/2016	Flash Flood	0	0	0.00	0.00
Totals			2	177	$21,824,000.00	$330,000.00

(National Oceanic and Atmospheric Administration Storm Event Database, 2016)

Floods: Significant Past Events

Hays County experienced 3 disaster declarations discussed under Floods: Previous Occurrences. Refer to the *Floods: Significant Past Events* section within the Hays County Annex for narratives discussing these events.

Floods: Extent

As there are negligible mapped floodplains within the City (0.77 acres), flood depths and Base Flood Elevations (BFE's) are unknown for the area. Therefore, the extent, water depth and corresponding Water Depth Extent Scale designation, is unknown. Despite the lack of data, localized flooding could still occur within the jurisdiction. An example of flooding within the jurisdiction is the area long an unnamed tributary of Mustang Branch. The current overbank elevation range of this unnamed tributary within the City (per Light Detection and Ranging [LiDAR] data) is 800 – 811 ft.

Large events have occurred outside the jurisdiction. The maximum flood extent experienced by Onion Creek, located approximately 1.5 miles north of Mountain City, was a "Major Flood Stage." Refer to the Water Depth Extent Scale in Chapter 2 (the Risk Assessment portion of the Hays County HMP Update).

Floods: Probability

Probability has been calculated on the basis of NOAA reported events, as a standard, consistent calculation method for all hazards profiled with the Hays County HMP. Based on 69 reported events in 19 years, a flood event occurs approximately 3 to 4 times per year on average in Hays County and its unincorporated jurisdictions. Due to the size and extent of some flood occurrences, as well as the regional nature of reports in the NOAA Storm Events Database, Mountain City's future probability is assumed to be similar to the surrounding County area. The City can expect a flood event approximately 3 to 4 times per year on average in the future, up to a "Major Flood Stage."

Number of Reported Events	Number of Years in Dataset	Probability
69	19	3.63

Floods Impact

The following describes the inventory counts and building replacement values for the jurisdictional area.

Mountain City Building Counts			
Residential	Commercial	Other	Total
131	11	9	151

Mountain City Building Replacement Value		
Building ($)	Content ($)	Total ($)
63,243,144	35,328,106	98,571,249

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on the participating community. HAZUS results are calculated to census blocks. This analysis utilized the best available LiDAR (COA 2012 and CAPCOG 2008) and Depth Grids. These blocks where then intersected with the participating community to run a weighted area analysis to get jurisdictional results. The following describes results of the 100-year Return (1% Annual Chance Event) weighted area analysis.

While this analysis did not produce any damages due to its upstream location on the Mustang Branch Tributary 2 - 1, the area could experience damages from an extreme event or localized flooding.

HAZUS-MH Results

General Building Stock Damage

HAZUS estimates that no buildings will be at least moderately damaged in Mountain City. 'At least moderately damaged' is defined by HAZUS as greater than 10% damage to a building. For this scenario, no buildings received any damages.

Residential Buildings	Commercial Buildings	Other Buildings	Total Buildings
0	0	0	0

Building-Related Losses

Exposed Value is the total building and content values for structures within the community. The exposed value for the community is $101,284,964. The total building-related losses were $0 for this scenario. This represents 0% of the total replacement value of the community. Loss values are divided into building and content loss dollars. There were no building interruption losses.

Building Loss ($)	Content Loss ($)	Total Loss ($)
0	0	0

Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure to be out of service for more than 1 day on the day of the event. Additionally, the model estimates that 100% of available hospital beds are ready for use by patients already in the hospital and those injured by an event.

Debris Generation

HAZUS estimates the amount of debris that will be generated in this scenario. The model estimates that a total of 0 tons of debris will be generated. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (with 1 to 25 tons per truck) to remove the building debris generated in this scenario.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates no households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, no people are estimated to seek temporary shelter in public shelters.

Floods: Vulnerability Summary

According to community testimony, a recent change to the impervious cover on the side of the City that borders the high school led to an increase in flooding to homes that backup to the property. The intent of the school was to reduce the strain that a row of cedar trees had on the local water supply. The unintended consequence of the removal of the trees negatively impacted the several residents of Mountain City.

National Flood Insurance Program Repetitive Loss

Mountain City is a current participant in the National Flood Insurance Program (NFIP) and has 2 tallied Repetitive Loss payments (as of September of 2016) with an average total (building & contents) payment of $11,602.33. Details regarding Repetitive Loss can be found in Chapter 2: Step 4 National Flood Insurance Program Participation/Losses (within the Risk Assessment portion of the Hays County HMP Update).

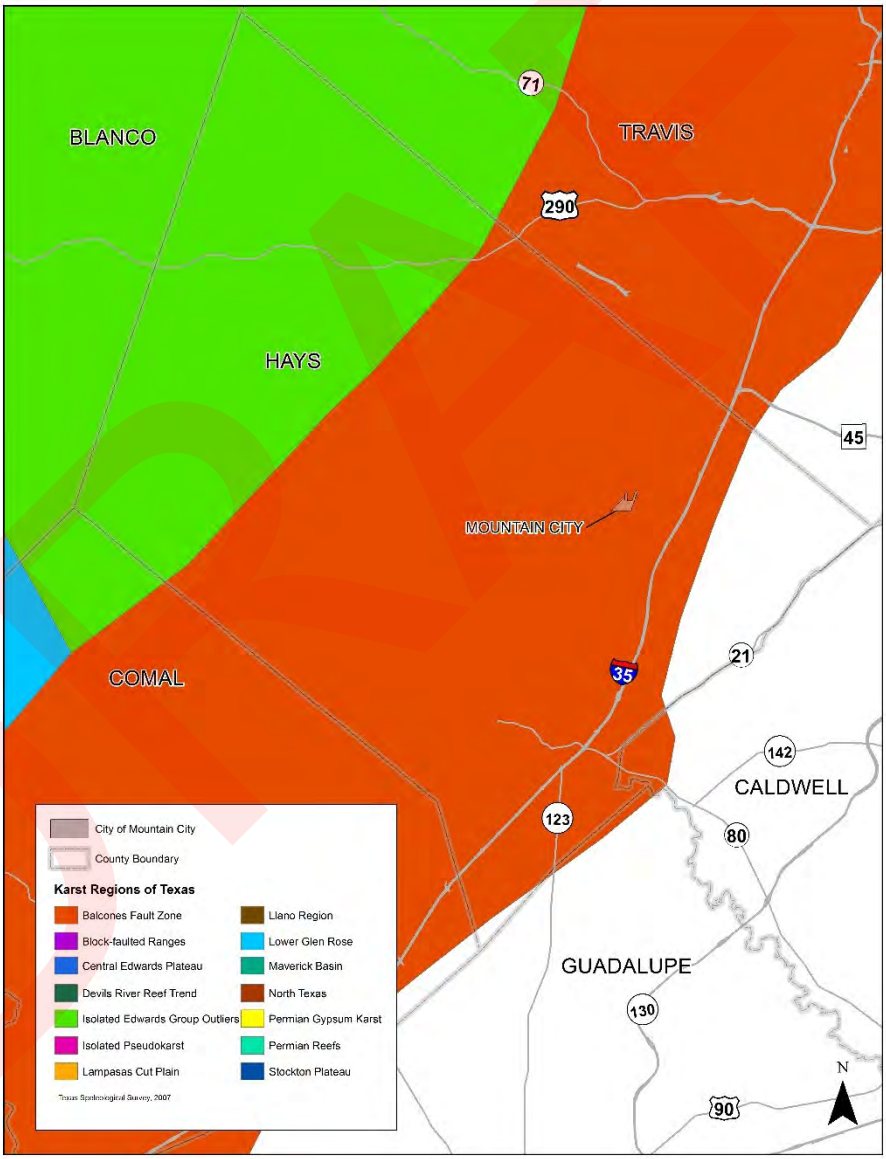
Structure Type	Number of Structures	Number of Claims	Amount of Claims
Residential	1	2	$23,204.66
Non-Residential	0	0	N/A

Land Subsidence

Land Subsidence: Location

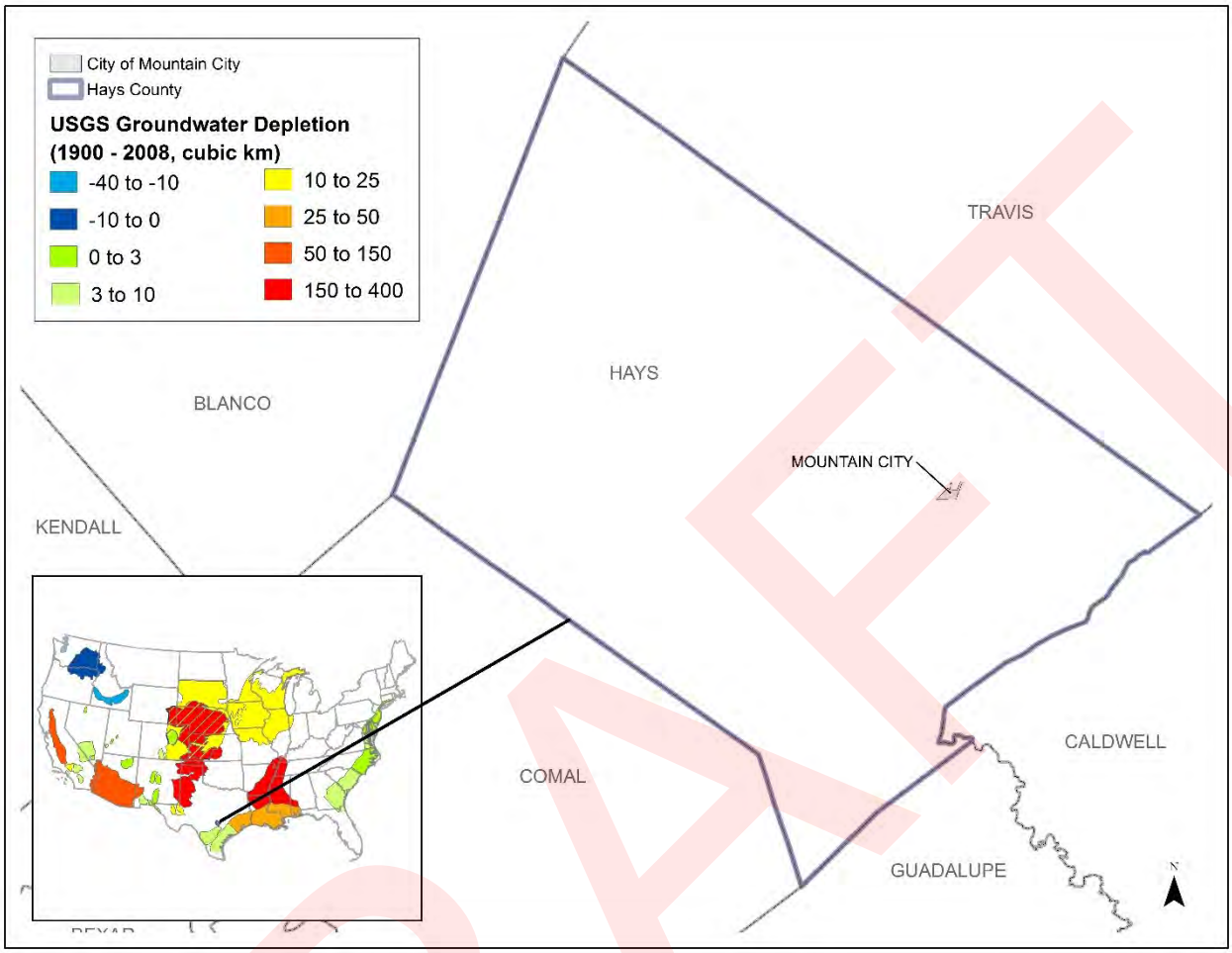
Karst features are a landscape formed from the dissolution of soluble rocks, such as limestone, that can cause sinkholes and caves. Locations within Mountain City that are underlain by karst features or that are experiencing extensive groundwater depletion, are most at risk. Figures MC.9 and MC.10 illustrate the jurisdiction's location in conjunction with the karst regions of Texas and USGS Groundwater Depletion Zones. According to Figure MC.9, Mountain City is located within the Balcones Fault Zone.

Figure MC.9, Karst Regions of Texas, Mountain City



(Texas Speleological Survey, 2007)

Figure MC.10, Groundwater Depletion Zones, Mountain City



(Groundwater depletion in the United States (1900–2008), 2013)

Land Subsidence: Previous Occurrences

There were no sinkhole or land subsidence events documented specifically for Mountain City. As the data displayed in Figure MC.10 illustrates, the HMP update area does not have a significant history of groundwater depletion.

Land subsidence can occur in the Central Texas Hill County Area. Recently, a small event occurred in Travis County (located ~ 12 miles north of the study area) when a 25-foot-wide and 12-foot-deep sinkhole opened up at a Costco parking lot in Austin, Texas (Mashhood, 2012), *Shopping center sinkhole provides chance to study runoff*, www.statesman.com). The update area could potentially experience an event of similar depths, widths, and impact as the event described above, but conditions would vary depending on the location and geography of the event. Since future events cannot be predicted, the estimated extents previously described are hypothetical.

Land Subsidence: Extent

Due to the lack of reported occurrences, there is not sufficient data to determine the maximum extent of land subsidence for the jurisdiction. However, if a future event were to occur, it can be assumed it would be similar in extent to previous events in the area. This includes the aforementioned sinkhole in Austin, Texas measuring 25-feet wide and 12-feet deep.

Land Subsidence: Probability

The occurrence of subsidence is an ongoing process resulting from natural and human-induced causes. As seen in Figure MC.9, the entire jurisdiction is located within a known karst region, the Balcones Fault Zone. However, with no documented history of subsidence, the probability of a future land subsidence event for the City is low (unlikely in next 10 years). If a future event were to occur, however unlikely, it can be assumed it would be similar in extent to previous events in the area. This includes the previously mentioned sinkhole documented in Austin, Texas.

Land Subsidence: Impact

When considering the impact of land subsidence, it is important to note that many areas within the karst zone have structures and infrastructure that could be affected by a collapsed area. The possible impact of isolated incidents within the karst region could include damage to any, but not all, of the 213 structures located in the zone in the unlikely event of a future occurrence. All structures are cumulatively valued at approximately $101,284,964 based on HAZUS building and content values.

Land Subsidence: Vulnerability Summary

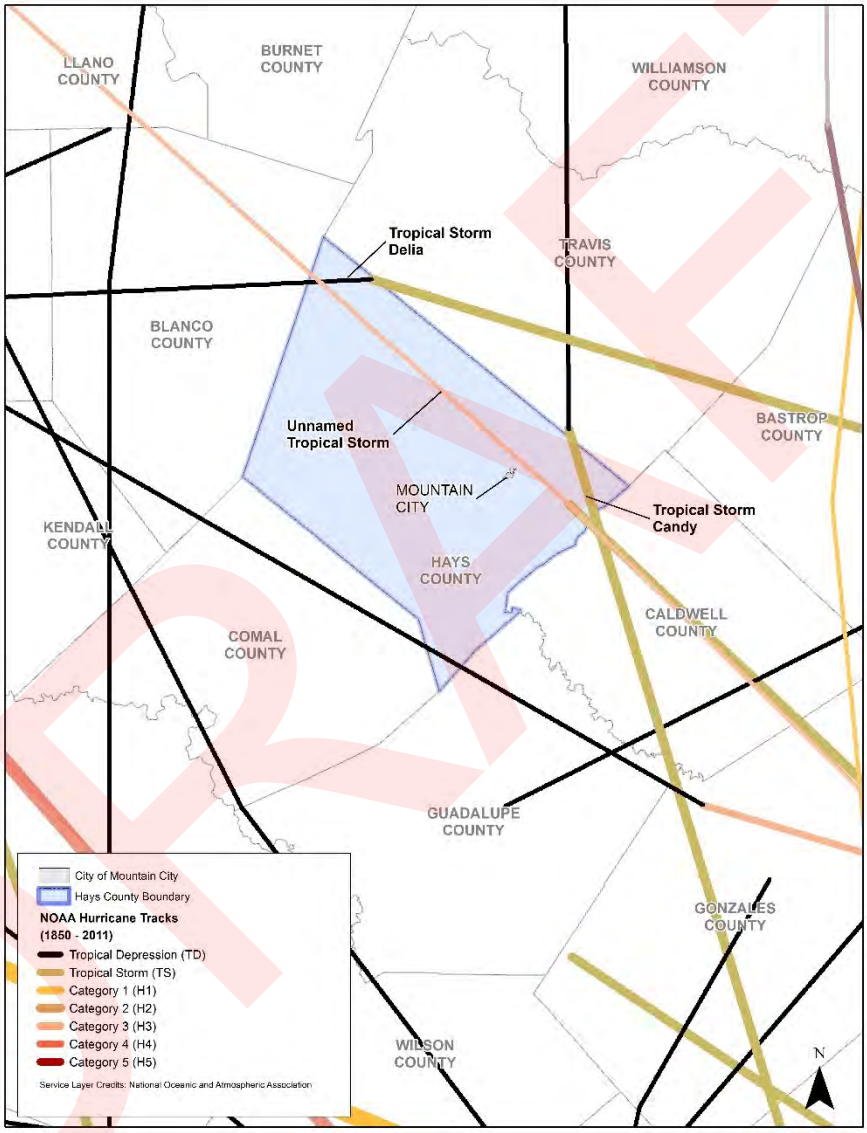
The lack of incidences and testimony of impact can lend to a general dismissal of the risks of land subsidence. As the community experiences periods of a depletion of groundwater, the chances of land subsidence are increased and may impact the community. As water may become a more scarce resource in the State, and in the County, a lack of mitigation could lead to increased damages to structures and roads.

Hurricanes/Tropical Storms

Hurricanes/Tropical Storms: Location

Due to the regional nature of a hurricane or tropical storm event, the entire extent of Mountain City is equally exposed to a hurricane or tropical storm. Figure MC.11 illustrates the location of the jurisdiction with historical hurricane and tropical storm paths documented by NOAA's Hurricane Tracker from 1850 to 2011.

Figure MC.11, Historical Hurricane/Tropical Storm Paths, Mountain City



(National Oceanic and Atmospheric Administration, 2016)

Hurricanes/Tropical Storms: Previous Occurrences

Previous events are listed below from NOAA Storm Events Database for Tropical Storm Hermine and NOAA Hurricane Tracker for all other events. By the time most hurricanes reach the County, they are tropical storms, depressions or thunderstorms. Because hurricane and tropical storm events occur on a regional scale, all events listed for Hays County have been included as they would impact Mountain City.

July 13 to July 22, 1909 – An unnamed storm made landfall near Freeport, as a Category 3 Hurricane. This storm impacted Hays County and participating communities as a tropical depression with wind speeds up to 30 knots. No significant damages, injuries, or fatalities were reported for the City.

June 22 to June 26, 1968 – Tropical Storm Candy made landfall near Port Aransas. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the jurisdiction.

September 1 to September 7, 1973 – Tropical Storm Delia made landfall near the border of Brazoria and Matagorda counties. This storm impacted Hays County and participating communities as a tropical storm with wind speeds slowing to 30 knots as a tropical depression just after leaving the County. No significant damages, injuries, or fatalities were reported for the HMP update area.

September 6 to September 8, 2010 – According to the NOAA Storm Events Database, Tropical Storm Hermine made landfall near the Texas/Mexico border on the night of September 6. South Central Texas was hit very hard with widespread rains of 8-12 inches across much of the IH-35 corridor from Austin down to San Antonio.

Hurricanes/Tropical Storms: Extent

The Saffir-Simpson Scale measures pressure, wind speed, and storm surge in 5 categories. According to the reported previous hurricane occurrences in the jurisdiction, the maximum hurricane extent experienced was categorized as a Tropical Storm. Refer to Chapter 2, the Risk Assessment portion of the Hays County HMP Update, for a description of storm extents.

Hurricanes/Tropical Storms: Probability

Based on 4 reported events in 107 years, a hurricane or tropical storm event occurs approximately every 27 years on average in Hays County. Since hurricane and tropical storm events can happen anywhere throughout the HMP update area, Mountain City's future probability is assumed to be similar to the surrounding county area. In the future, the City can expect an event approximately once every 27 years on average, up to a magnitude of a Tropical Storm based on historical extents for the jurisdiction.

Number of Events Reported	Number of Years in Dataset	Probability	100yr Max Wind Speed (mph)
4	107	0.04	72

Hurricanes/Tropical Storms: Impact

A Probabilistic 100-year Return Period HAZUS-MH 3.2 analysis was run on the participating community. The following describes the results of this analysis. HAZUS-MH Results

HAZUS-MH Results

General Building Stock Damage

The total property damage losses were $14,035. The majority of damage can be expected to impact residential areas (98%). The remaining damages (2%) are for commercial, industrial, agriculture and religious buildings. While some building damage is experienced, it is estimated that no buildings will be completely destroyed or experience severe damage. Exposed Value is the total building and content values for structures within the community. Loss values are divided separately for building and content loss in dollars.

Exposed Value ($) (Building + Content)	Building Loss ($)	Content Loss ($)	Total Loss ($)
101,284,964	14,035	4	14,040

Essential Facility Damage

HAZUS does not estimate any critical facilities or infrastructure to be out of service for more than 1 day on the day of the event. Additionally, the model estimates that 100% of available hospital beds are ready for use by patients already in the hospital and for those injured by the hurricane.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the hurricane at a total of 1 ton. Of the total amount, Brick/Wood comprises 100% of the total. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckload (with 1 to 25 tons per truck) to remove the building debris generated by the hurricane.

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates no households to be displaced due to the hurricane. While there is an estimation of over $14,000 in property damages expected, it is aforementioned that “no buildings are estimated to be completely destroyed or experience severe damage.” Residents would likely remain in their homes as damages were repaired, therefore it is estimated that no temporary shelter is needed.

Hurricane/Tropical Storms: Vulnerability Summary

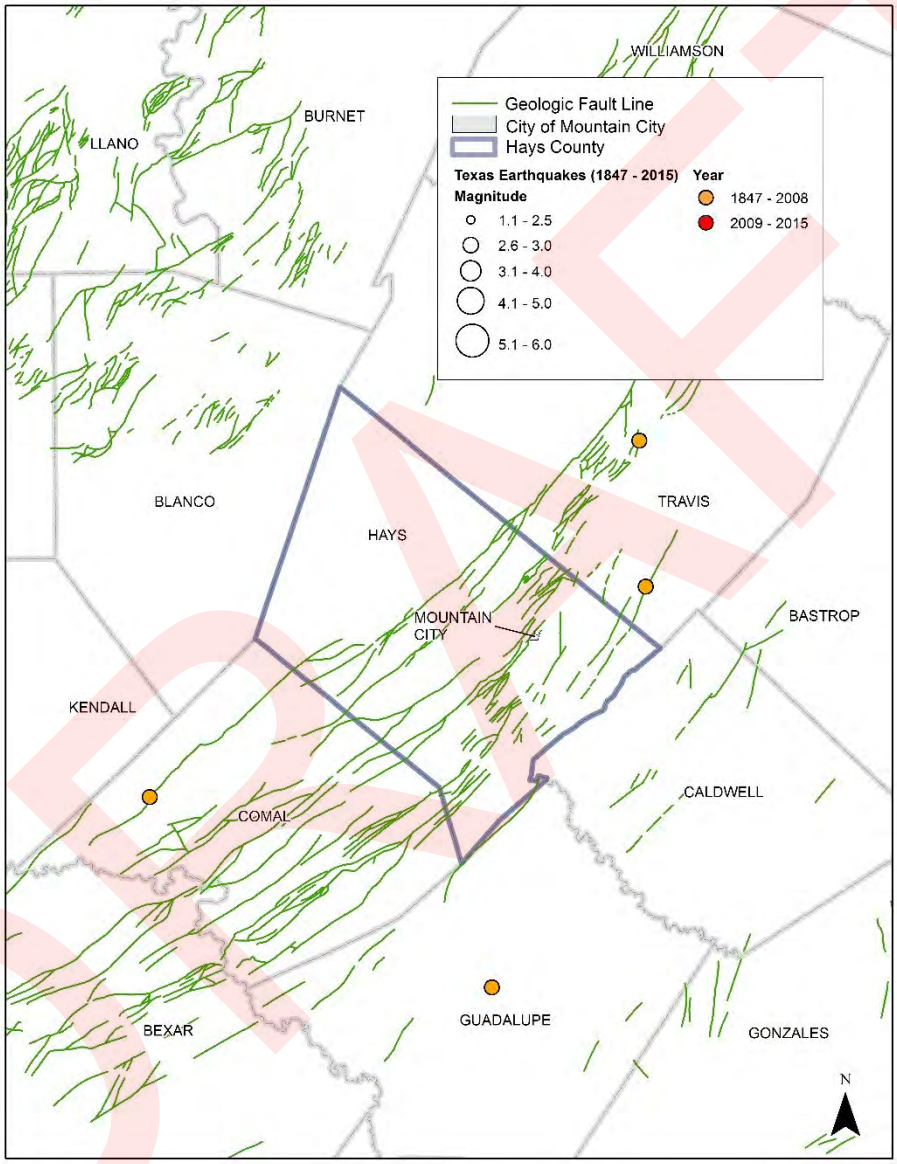
Similar to the impacts of windstorms, hailstorms, and lightning, Mountain City can expect to be impacted with debris and possible interruptions of critical infrastructure. In addition, the community’s proximity to Interstate Highway 35 could lead to traffic delays caused by major evacuation efforts if the highway is used as an evacuation route for coastal residents.

Earthquakes

Earthquakes: Location

Figure MC.12, shows no notable locations of USGS documented earthquake events in Texas from 1847 to 2015 and the respective location of Mountain City.

Figure MC.12, Texas Earthquakes, 1847 – 2015, Mountain City



(USGS Earthquake Hazard Program, 2015)

Earthquakes: Previous Occurrences

There have been no documented earthquake events for Mountain City according to USGS 1847-2015 data as illustrated in Figure MC.12.

Earthquakes: Extent

Earthquakes are measured by Peak Ground Acceleration (PGA). The HAZUS Max Peak Ground Acceleration (PGA) for the jurisdiction is 1.56% (see Mountain City Impact Section for a description of the HAZUS Analysis). This corresponds to the Modified Mercalli Scale Category IV, with light perceived shaking and

no potential structure damage. HAZUS measures PGA on a census tract level. Cities within more than 1 census tract were assigned the highest PGA level to reflect the maximum possible extent. Refer to Chapter 2, the Risk Assessment portion of the Hays County HMP Update, for extent scale and PGA descriptions.

Earthquakes: Probability

As there have been no recorded previous occurrences of earthquakes for Mountain City and the PGA is less than 2% for the area, the probability of an earthquake for the City in the future is low (unlikely within the next 10 years).

Number of Events Reported	Number of Years in Dataset	500yr PGA
0	170	1.56

Earthquakes: Impact

The FEMA How-To Guidance, Understanding Your Risks (FEMA 386-2, page 1-7), suggests the earthquake hazard should be profiled if the PGA is greater than 3%g, where PGA is measured in the acceleration of gravity (g). The City's PGA is less than 3%g (0.03) and there have been no recorded earthquakes in or near the update area. Therefore, only a minimum level-1 HAZUS analysis was profiled using the 500-year probability event scenario. The HAZUS analysis produced a PGA of 1.56%. HAZUS also produced $0 in building damages (Residential, Commercial, Agriculture, Religious and Government) from an event. Critical facilities and infrastructure did not experience any loss of service. There were no critical facilities or infrastructure that experienced moderate to complete damage. No debris were generated from this event and no people or households required temporary housing. There were no moderate, extensive or completely damaged s by this event. HAZUS estimates no households are expected to be displaced from their homes or will require accommodations in temporary public shelters due to the earthquake. Additionally, there were no causalities or fatalities from this event.

Earthquakes: Vulnerability Summary

While the probability of an earthquake in Mountain City is low, with no significant prior events on file, there are fault lines within the community that could cause impact if there were to be an increase in seismic activity in the area. There is 1 fault line located on the west side of the City running along Maple Drive according to USGS data. If an event were to incapacitate a roadway, emergency responders would be hindered from responding, thus leaving the residents who were affected at risk. Mountain City could expect to be impacted with debris and possible interruptions if an event were to occur in this unlikely and unprecedented scenario.

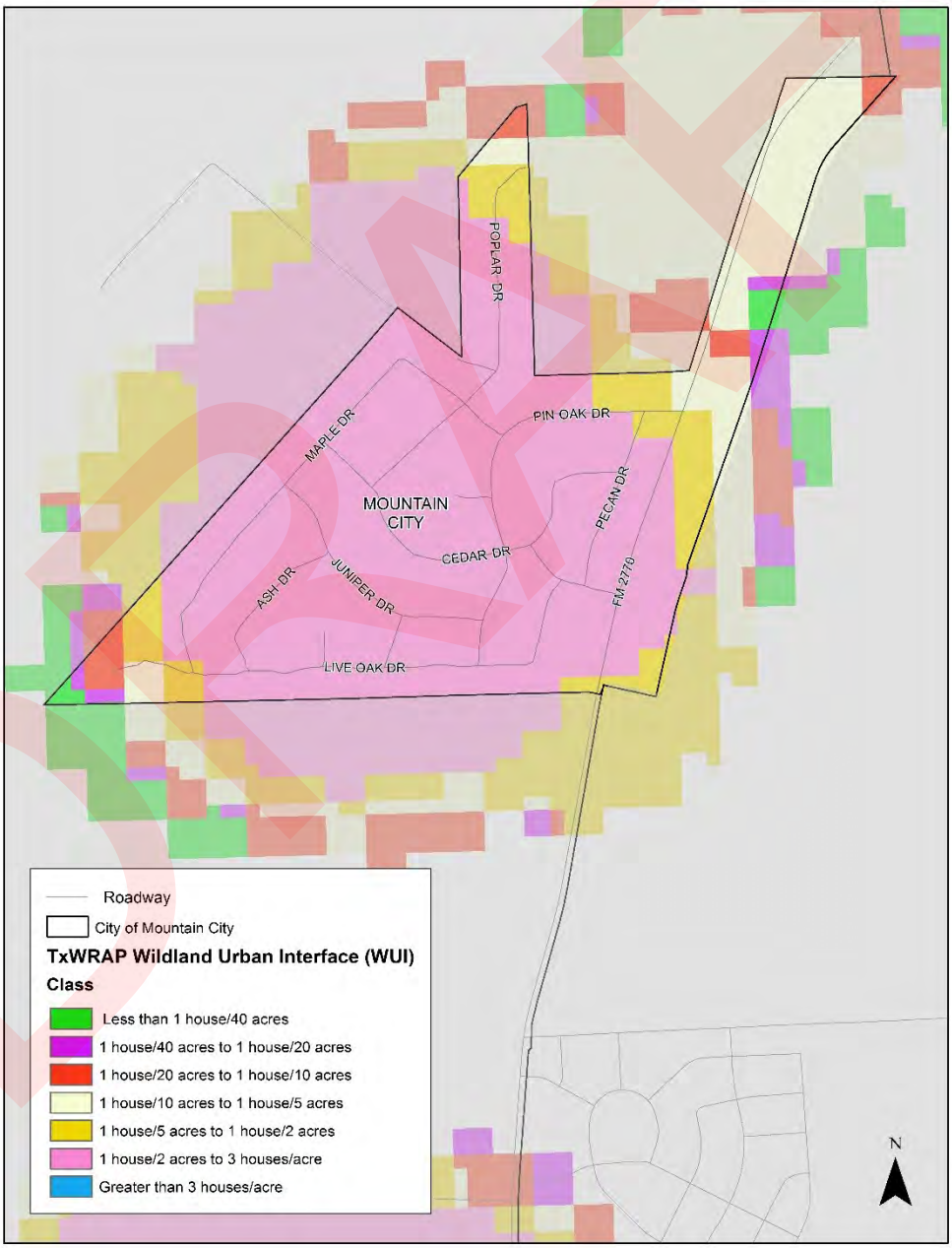
Page 47, Dam/Levee Failure have been redacted from this copy of the plan.

Wildfires

Wildfires: Location

The Texas A&M Forest Service's Texas Wildfire Risk Assessment Portal (TxWRAP) can be used to help communities understand their wildfire risk. Figure MC.13 below shows the location of TxWRAP's documented wildfire occurrences with Wildland Urban Interface (WUI) classifications within Mountain City. The WUI illustrates areas of development that are abutting natural areas. Here, communities and the built environment have an increased vulnerability to a wildfire event. Wildfires can be ignited from a variety of sources including lightning or human activity such as campfires, smoking, arson, or equipment use.

Figure MC.13, Wildland Urban Interface (WUI), Mountain City



(Texas A&M Forest Service, 2016)

Wildfires: Previous Occurrences

There were no reported wildfire ignitions within Mountain City according to TxWRAP and USGS Federal Fire Occurrence data from the years 1980 to 2015.

Wildfires: Extent

Table MC.23 lists the Fire Intensity Acreage for the City according to the Texas A&M Forest Service TxWRAP Community Summary Report. Refer to Chapter 2, the Risk Assessment portion of the Hays County HMP Update, for a description of the Characteristic Fire Intensity Scale (FIS).

Table MC.23, TxWRAP Fire Intensity Acreage, Mountain City, Texas

Class	Acres	Percent
Non-Burnable	189	74.00%
1 (Very Low)	1	0.50%
1.5	12	4.60%
2 (Low)	7	2.80%
2.5	11	4.30%
3 (Moderate)	15	6.00%
3.5	7	2.70%
4 (High)	8	3.20%
4.5	5	1.80%
5 (Very High)	0	0.00%
Total	255	100.0 %

Wildfires: Probability

There were no reported ignitions from TxWRAP and USGS Federal Fire Occurrence data in 35 years for Mountain City. However, a wildfire can be ignited from a variety of sources including lightning or by human activity such as campfires, smoking, arson, or equipment use. When considering the lack of reported previous events for the City, a wildfire event in the future is moderate, (possible in the next 10 years) with up to a potential fire intensity of 4.5, or “High” classification on the TxWRAP Characteristic Fire Intensity Scale.

Wildfires: Impact

Impact on the community can be measured using TxWRAP Housing Density levels within the WUI. Areas with a higher housing and population density would be affected to a greater extent than more rural areas, and especially areas near burnable fuels. Table MC.24 below lists the population, percent of total population, WUI acreage and percent of WUI acreage for Mountain City, according to the Texas A&M Forest Service TxWRAP Community Summary Report. See Figure MC.13 for the location of WUI areas within the jurisdiction.

Table MC.24, WUI Acreage, Mountain City

Housing Density		WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
	LT 1hs/40ac	0	0.0 %	3	1.0 %
	1hs/40ac to 1hs/20ac	0	0.0 %	1	0.4 %
	1hs/20ac to 1hs/10ac	0	0.0 %	7	2.6 %
	1hs/10ac to 1hs/5ac	0	0.0 %	30	11.6 %
	1hs/5ac to 1hs/2ac	5	0.5 %	22	8.5 %
	1hs/2ac to 3hs/1ac	1,101	99.5 %	193	75.8 %
	GT 3hs/1ac	0	0.0 %	0	0.0 %
Total		1,106	100.0 %	255	100.0 %

Wildfires: Vulnerability Summary

Mountain City has residences that backup to ranches that place them in the WUI and at risk for ignition of structures. There is infrastructure that supports the water supply as well as Pedernales Electric Cooperative powerlines located in an area that backs up to ranches as well. The area is kept mowed, however a risk remains if private lots are not kept from becoming overgrown with vegetation.

The community has no official fire hydrants. There are pipestands that can be used to fill water tanks for the purposes of fighting fires, however a pump could not be used by fire apparatus to fight a structure fire without causing water lines to collapse.

The community is serviced by an Emergency Services District that is dedicated to a portion of the county rather than just Mountain City.

Risk Ranking Result

On January 12, 2017, planning representatives from Mountain City completed a questionnaire as part of the Hays County Hazard Mitigation Plan Update: Risk Assessment. The questions covered the risk associated with the hazards that affect each community based on the level of concern over each profiled hazard, the hazards' impact on health and safety as well as property damage and business continuity. The answers from this questionnaire were combined with public survey results on perception of risk, and the values from both sources were analyzed using the Halff Risk Ranking Tool (details regarding the risk ranking tool are in Chapter 2, the Risk Assessment portion of the Hays County HMP Update). The results provided a quantified ranking of risk with values ranging from 0 to 100. The results for Mountain City are shown below (hazard values are shown from highest to lowest risk):

Ranking Order	Hazard	Risk Ranking Value
1	Wildfire	92.8
2	Tornadoes	70.3
3	Drought	60.5
4	Wind Storms	55.3
5	Lightning	54.8
6	Floods	54.7
7	Hail Storms	45.8
8	Extreme Heat	44.7
9	Earthquakes	40.6
10	Expansive Soils	38.9
11	Severe Winter Storms	38.9 (Exact same value as Expansive Soils)
12	Land Subsidence	38.3
13	Dam/Levee Failure	35.8
14	Hurricanes/Tropical Storms	32.8

Section 3: Mitigation Strategy

This section examines the community's ability to perform mitigation (review of existing capabilities, shown in Table MC.25) and identifies specific actions to address vulnerabilities for each hazard profiled in the Hays County HMP Update. The mitigation strategy is the application of actions into an approach for performing structural and non-structural mitigation efforts within the jurisdiction. Actions are also prioritized and considered for incorporation into other community programs, regulations, projects or plans.

Completed and canceled actions are also included in a separate section for future reference.

Table MC.25, Existing Capabilities

Capability Name	Capability Type	How it can Accomplish Mitigation
Mayor/Emergency Management Coordinator	Elected Official	Political support and funding for mitigation actions./ Management of City-level HMP updates.
Aldermen	Elected Officials	Political support and participation in HMP MPC
City Administrator	City Staff	Support for implementation of mitigation actions.
Engineer/Floodplain Administrator	Consultant	Expertise in structural mitigation projects and compliance with flood damage preventation ordinance.
Sales Tax	Funding	Provides potential funding for Hazard Mitigation items.
Property Tax	Funding	Provides potential funding for Hazard Mitigation items.
Permitting and Licensing Fees	Funding	Provides potential funding for Hazard Mitigation items.
Chapter 211 of the Local Government Code: Zoning	Authority	Authorizes the City to regulate zoning (State of Texas, 1987)
Chapter 213 of the Local Government Code: Municipal Comprehensive Plans	Authority	Authorizes the City to adopt a comprehensive plan for the long-range development of the City (State of Texas, 1997)
Chapter 214 of the Local Government Code	Authority	Authorizes the City to have regulatory authority as it relates to building codes (such as structural integrity and plumbing) (State of Texas , 1995)
Ordinance No. 021609	Authority	Gives the City authority to establish and maintain a uniform ordinance for development, maintenance and use of the property within its jurisdiction (Mountain City, TX, 2014)
Ordinance No. 121514A	Authority	Adopts National Model Building and Rehabilitation Codes (National Codes) (Mountain City, TX, 2014)
Waste Management	Program	Adopts an official vendor for Waste Management for Mountain City (Mountain City, TX, 2016)
Interlocal Agreement for Emergency Water Service	Agreement	Provide opportunity for conservation measures. (Hays County, 2010)

National Flood Insurance Program Participation

Mountain City currently participates in the National Flood Insurance Program. Currently, there are not any Certified Floodplain Managers on staff, due to a lack of resources and staff. The amount of mapped floodplain in Mountain City is very small. The City has adopted minimum standards in their flood damage prevention ordinance and regulation of the development within the floodplain are done through Hays County Development Services as part of a Memorandum of Understanding between the City and the County.The City will continue to explore options for higher standards. Mountain City has a total of 8 NFIP policies in force, as of June 2016. This totals $2,520,000.00 in total insurance coverage.

Mitigation Goals

The plan-level Mitigation Goals can be found in Chapter 3, the Mitigation Strategy portion of the Hays County HMP Update. These goals apply to each community and were mutually decided upon as the guiding goals for the development of actions in each jurisdiction.

Mitigation Actions

Risk Focus is defined as:
***E= Actions reducing risk to existing buildings and infrastructure**
***F= Actions reducing risk to new development and redevelopment**

Number/Title	Hazard	Item Description	Implementation Agency
1 Adopt Higher Standards for Flood Damage Prevention Ordinance (previously action 2 in 2011 plan)	Floods	Create a plan to review the ordinance every 5 years and if possible, adopt 1 foot of freeboard in existing ordinance for new development and substantial repairs and also to include a field that requires City staff to check Flood Insurance Rate Maps before permits for building are approved.	Mountain City Council

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing Staff	6 months	Not started	E/F

Cost and Benefit Considerations
This item would only take the amount of time/labor required to amend an ordinance within the City. The benefit would be for substantially improved or new development.

Number/Title	Hazard	Item Description	Implementation Agency
2 Attend Local Floodplain Management Courses to receive Certification (previously action 3 in 2011 plan, modified)	Floods	Send member of the staff or elected official to training in order to become a Certified Floodplain Manager.	Mountain City Council

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing Staff, cost of accommodations for FEMA E-273 Floodplain Course and CFM testing session	6 months	Not started	E/F

Cost and Benefit Considerations
If attending the course at the Emergency Management Institute, the cost of the course would be very low, and only include a minimal meal ticket purchase. The benefit of an informed floodplain administrator would help both new and existing residents through guidance on how to mitigate flood damages to development.

Number/Title	Hazard	Item Description	Implementation Agency
3 Improve Emergency Communication Capabilities- Phone Tree Plan (previously action 4 in 2011 plan, modified)	All hazards, except Land Subsidence and Expansive Soils	Continue existing City directory program and add phone tree responsibilities for non-critical hazard call down messaging, such as drought alerts.	Mountain City Council

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing Staff, Community Volunteer hours	6 months	Ongoing	N/A

Cost and Benefit Considerations
The implementation of this action would be a low-cost way to go beyond the current email communication that the community has with its members. The benefit would be to all who register to receive calls.

Number/Title	Hazard	Item Description	Implementation Agency
4 StormReady Designation for Mountain City (previously action 6 in 2011 plan)	Windstorm, Hailstorm, Severe Winter Storms, Lightning, Hurricanes/ Tropical Storms, Tornadoes, Floods	Application preparation and submission for StormReady designation from the National Weather Service that attests to the community's level of preparedness for severe winter.	Mountain City Secretary

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing Staff	12 months	Not started	N/A

Cost and Benefit Considerations
This free application would benefit all members of the community as Mountain City.

Number/Title	Hazard	Item Description	Implementation Agency
5 Cooling Plan for vulnerable members of the community during periods of extreme heat that result in power loss (previously item 7 in 2011 plan, modified)	Extreme Heat	Documented plan for how to provide cool accommodations for vulnerable populations during periods of extreme heat when electrical power is interrupted.	Mountain City Council

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing Staff, free brochures from FEMA	6 months	Not started	N/A

Cost and Benefit Considerations
With existing staff documenting the interlocal agreements for assisting each other with accommodating their vulnerable populations, this effort would benefit approximately 185 who are either over 65 or under 16 years of age.

Number/Title	Hazard	Item Description	Implementation Agency
6 Promote Flood Insurance in the community (previously action 8 in 2011 plan)	Floods	Placing National Flood Insurance Program information brochures in City Hall.	Mountain City Secretary

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing Staff, Community Volunteer hours	1 month	Not started	N/A

Cost and Benefit Considerations
The cost and labor required to promote the NFIP is negligible. The benefit is difficult to estimate.

Number/Title	Hazard	Item Description	Implementation Agency
7 Increase Public Awareness of Hazards (previously action 9 in 2011 plan)	All Hazards	Public awareness campaign of providing natural hazard information on the City website, with links to HaysInformed.com also being included.	Mountain City Mayor

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing Staff	1 month	Not started	N/A

Cost and Benefit Considerations
There is minimal cost and labor required to make this enhancement to the existing Mountain City website.

Number/Title	Hazard	Item Description	Implementation Agency
8 Monitor Drought Conditions (previously action 11 in 2011 action plan, modified)	Drought, Land Subsidence	Provide widget on Mountain City homepage that provides the latest US Drought Monitor conditions for the day, in addition to monitoring local water levels.	Mountain City Council

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing staff, costs for water system monitoring	6 months	Ongoing. Water system purchase ongoing.	N/A

Cost and Benefit Considerations
The cost for sharing the drought monitor should be minimal, however there may be more cost associated with monitoring the Mountain City Water System.

Number/Title	Hazard	Item Description	Implementation Agency
9 Develop water use restrictions to ensure water for firefighting, provision of drinking water and reduction of groundwater depletion (previously action 12 in 2011 plan, modified)	Drought, Land Subsidence	Water conservation level triggers and actions documented and publicized.	Mountain City Water

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing staff, consultant fees from plan writers	6 months	Not started.	N/A

Cost and Benefit Considerations
Although the cost of professional help for establishing a water conservation plan (drought plan) would be costly at the onset, the benefit to current and future residents is critical.

Number/Title	Hazard	Item Description	Implementation Agency
10 Generator Purchase for City Hall	Lightning, Extreme Heat, Severe Winter Storm, Windstorms, Hurricanes/ Tropical Storms, Tornadoes	Back-up electrical power available to City Hall to ensure continuity of government operations and to also provide temporary sheltering for vulnerable populations in the City.	Mountain City Mayor

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing staff, grant writing assistance, Hazard Mitigation Grant program funding, if applicable and eligible	18 months	Not started	E

Cost and Benefit Considerations

If grant funding is eligible, the cost/benefit of this project would have to be positive. There is only 1 public building in the City in use and it has no back-up source for power.

Number/Title	Hazard	Item Description	Implementation Agency
11 Icy Roads Response Plan (previously action 14 in 2011 plan, modified)	Severe Winter Storms	Documentation of how to keep ingress and egress to the community clear of ice so that first responders can access residents during severe winter storms.	Mountain City Council

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing staff, County Support, possible contractor for ice removal	6 months	Not started	N/A

Cost and Benefit Considerations

This planning effort would only take the time of City employees and could be critical to saving lives if a medical emergency occurred during a Severe Winter Storms event.

Number/Title	Hazard	Item Description	Implementation Agency
12 Coordination of new Limb and Large Item Pick-up day (Dumpster Day) for Wildfire Mitigation (previously action 15 in 2011 plan, modified)	Wildland Fire, Lightning, Windstorms, Tornadoes	Enhancement of existing large item pick-up or "Dumpster Day" to emphasize the wildfire mitigation benefits of cleaning brush and overgrown lots.	Mountain City Council

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing staff	2 months	Not started	N/A

Cost and Benefit Considerations

This slight change to marketing an existing event would likely lessen the risk for wildland fire for residents located within the Wildland urban interface.

Number/Title	Hazard	Item Description	Implementation Agency
13 Floodproofing repetitive loss structure that has been identified by FEMA for the number of flood insurance claims (previously action 16 in 2011 plan, modified)	Floods	Taking flood mitigation measures to reduce the amount of flood damage impacting a private residence in Mountain City that is classified as a Repetitive Loss structure by the National Flood Insurance Program.	Mountain City Council/ Hays County Planning & Development

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing staff hours, cost-share for mitigating structure if Hazard Mitigation Grant funding is pursued	24 months	Not started	E

Cost and Benefit Considerations

In order to qualify for grant funding for mitigation, the project would have to be cost-benefit effective. The City needs to analyze the actions available and cost-effective for mitigating the home.

Number/Title	Hazard	Item Description	Implementation Agency
14 Tree Removal Ordinance to enforce when and how trees should be removed (previously action 17 in 2011 plan, modified)	Floods, Wildfire, Windstorms, Lightning, Tornadoes, Severe Winter Storms	Development of an ordinance that would prohibit tree removal that would negatively impact neighboring properties. Also mitigate the effects of falling trees by calling for the removal of dead trees that could harm people or property or become debris during a wind event, or fuel during a fire event or lightning strike.	Mountain City Council

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing staff hours, legal consultation fees for review	6 months	Ongoing	N/A

Cost and Benefit Considerations

This regulation would help the community enforce measures that would minimize adverse impact on neighbors, saving them an undetermined amount in damages or injuries.

Number/Title	Hazard	Item Description	Implementation Agency
15 Encroachment audit to ensure that the floodway in the City limits does not have any unauthorized dams or obstructions on a quarterly basis (previously action 18 in 2011 plan, modified)	Floods, Dam/Levee Failure	Creation of an encroachment audit program to perform quarterly audits to visually inspect and document any violations to the flood prevention ordinance in the form of waste, debris or unauthorized private dams in the floodplain/floodway located near Maple Road.	Mountain City Council

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing staff, volunteer hours to do inspections from the public street	2 months	Not started	E

Cost and Benefit Considerations

The visual inspection of this property from the public road that runs parallel to it is virtually cost-free, besides the time to physically visit the site and the time to document the findings. The benefit to homeowners near the floodplain would be the prevention of adverse impacts in the future that could cause damage.

Number/Title	Hazard	Item Description	Implementation Agency
16 Evacuation Plan Development (previously action 19 in 2011 plan, modified)	Wildfire, Floods, Dam/ Levee Failure	Creation of a formal evacuation plan that would provide residents with procedures for receiving evacuation messaging, evacuating the community, alternate routes and repatriation procedures for returning to the community safely.	Mountain City Council

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing staff, possible acquisition of easement to create additional connectivity to community through creation of additional entrance/exit	24 months	Not started	N/A

Cost and Benefit Considerations
With just the creation of a plan, the cost of this project could be minimal, however with the consideration of the creation of an additional point of entry/exit, the cost could increase substantially.

Number/Title	Hazard	Item Description	Implementation Agency
17 Homeowner maintenance workshops including expansive soil mitigation instruction	Severe Winter Storms, Windstorms, Expansive Soils, Tornadoes, Drought, Wildfire, Floods	Public education workshops that feature experts from various fields that can provide advice on measures that can mitigate (xeriscaping for drought, foundation care for expansive soils, yard care for mitigating wildfire, safe room construction, retrofitting for flood or high winds), weatherproofing, protecting plumbing from cold, and rainwater harvesting.	Mountain City Mayor

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing staff for research or coordination of speakers, volunteer hours from speakers, cost of materials for hand outs	12 months	Not started	E

Cost and Benefit Considerations
These overall low-cost workshops would save attendees an unknown amount in damages that could be mitigated.

Number/Title	Hazard	Item Description	Implementation Agency
18 Energy prioritization plan for citizens of the community for submittal to PEC	Extreme Heat, Severe Winter Storms, Windstorms, Tornadoes, Hurricanes/ Tropical Storms, Lightning	Identification and documentation of members of the community who depend on electricity for survival (medical).	Mountain City Council

Cost Estimate/Funding	Schedule	Status as of 2017	*Risk Focus:
Existing staff, hours from Pedernales Electrical Cooperative	6 months	Not started	N/A

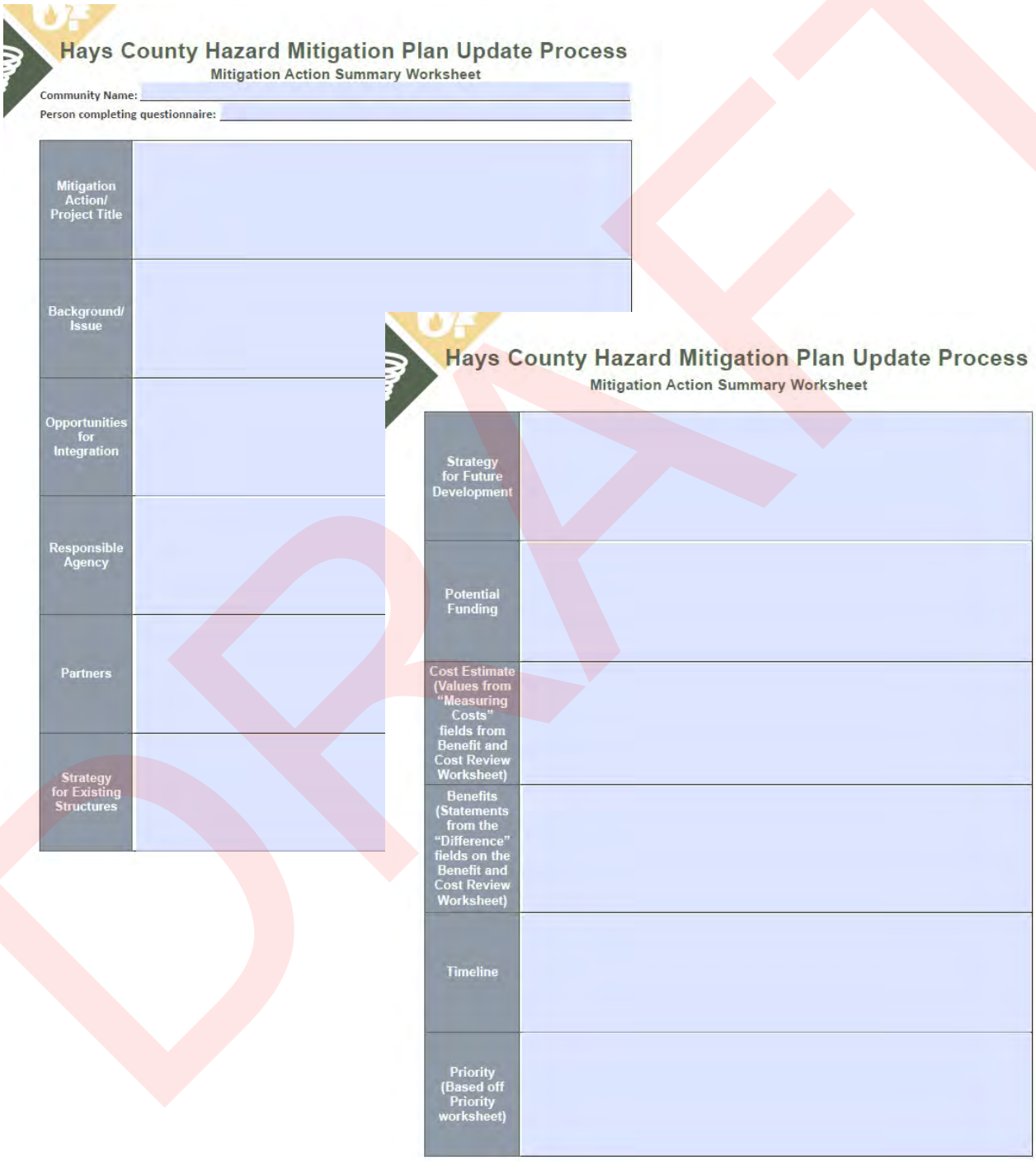
Cost and Benefit Considerations
The benefit of this survey to prioritize special needs in the community will assist and perhaps save lives.

Capabilities Assessment

Evaluation/Prioritization of Actions

Each action added to the plan was developed using the Mitigation Action Summary Worksheet shown in Figure MC.14. Non-cost effective projects were not included in prioritization activity.

Figure MC.14, Mitigation Action Summary Worksheet



Hays County Hazard Mitigation Plan Update Process

Mitigation Action Summary Worksheet

Community Name: _____

Person completing questionnaire: _____

Mitigation Action/ Project Title	
Background/ Issue	
Opportunities for Integration	
Responsible Agency	
Partners	
Strategy for Existing Structures	

Hays County Hazard Mitigation Plan Update Process

Mitigation Action Summary Worksheet

Strategy for Future Development	
Potential Funding	
Cost Estimate (Values from "Measuring Costs" fields from Benefit and Cost Review Worksheet)	
Benefits (Statements from the "Difference" fields on the Benefit and Cost Review Worksheet)	
Timeline	
Priority (Based off Priority worksheet)	

Table MC.26, Mitigation Action Prioritization (with Hazards in order of highest priority to lowest)

Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community	Risk Ranking Score	Total Score
3 Improve Emergency Communication Capabilities- Phone Tree Plan	1	1	1	1	1	1	1	1	0	1	93	102
7 Increase Public Awareness of Hazards	1	1	1	1	1	0	1	1	0	1	93	101
12 Coordination of New Limb and Large Item Pick-up day (Dumpster Day) for Wildfire Mitigation	1	1	1	1	1	0	1	1	0	1	93	101
17 Homeowner maintenance mitigation workshops including expansive soil mitigation instruction	0	1	1	1	1	1	1	1	0	1	93	101
16 Evacuation Plan Development	1	0	0	0	1	0	0	1	0	0	93	96
14 Tree Removal Ordinance- to enforce when and how trees should be removed	1	1	-1	0	1	0	0	-1	0	1	93	95
4 Storm Ready Designation for Mountain City	1	1	1	0	1	1	1	1	0	1	70	78
10 Generator Purchase for City Hall	1	0	1	1	1	0	1	1	0	1	70	77
18 Energy prioritization plan for citizens of the community for submittal to PEC	1	0	1	1	-1	0	1	1	0	1	70	75
15 Encroachment audit to ensure that the floodway in the City limits does not have any unauthorized dams or obstructions on a quarterly basis	0	1	1	1	1	1	1	1	0	1	55	63
13 Floodproofing repetitive loss structure that has been identified by FEMA for the number of flood insurance claims	0	1	-1	1	0	1	1	-1	1	1	55	59
11. Icy Roads Response Plan (ensuring process does not harm environment)	1	0	1	1	1	0	1	1	0	0	39	45
4. Storm Ready Designation from National Weather Service	0	0	0	0	0	0	0	0	0	0	95	95
3. Floodplain Management Training	0	0	0	0	0	0	0	-1	0	0	95	94.1
5. Energy Restore Priority Effort	1	0	-1	0	0	0	1	-1	0	0	90	90
9. De-icing Contract Research/Plan Development	1	0	0	1	0	0	0	0	0	0	68	70

Mitigation Actions by Hazard

The mitigation actions in Table MC.27 are shown with corresponding hazards.

Table MC.27, Mitigation Action Impact, Mountain City

Action Number	Drought	Extreme Heat	Severe Winter Storms	Lightning	Hailstorms	Windstorms	Tornadoes	Expansive Soils	Floods	Land Subsidence	Hurricanes/ Tropical Storms	Earthquakes	Dam/ Levee Failure	Wildfire
1									X					
2									X					
3	X	X	X	X	X	X	X		X		X	X	X	X
4			X	X	X	X	X		X		X			
5		X												
6									X					
7	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	X									X				
9	X									X				
10		X	X	X		X	X				X			
11			X											
12			X	X		X	X							X
13									X					
14			X	X		X	X		X					X
15									X				X	
16									X				X	X
17	X		X			X	X	X	X					X
18		X	X	X		X	X				X			

Integration Efforts

Table MC.28 captures ways that the Risk Assessment, Goals and Actions developed in the HMP can be integrated into other Mountain City documents, programs and regulations.

Table MC.28, Plan Integration Efforts, Mountain City

Name of Document	Type	Item Type	Opportunity for Integration
Mountain City Building Permit	Form	Action	Add field on building permit to require Mountain City staff to check flood insurance rate maps to ensure that development is not occurring within the floodplain. If it is, the plans and details will be forwarded to Hays County for support in ensuring the flood damage prevention ordinance is followed.
"Dumpster Day"	Program	Action	Enhance existing large-item pick-up event to provide wildfire mitigation focus to the event marketing.
HaysInformed.com	Program	Goals	Use HaysInformed.com links on the Mountain City website Hazard Information page to provide residents with additional resources and information regarding the hazards that affect Hays County.
Hazard Mitigation Grant Program (HMGP)	Funding	Action	Identify actions that can be funded through new and existing grant awards.
Pre-Disaster Mitigation (PDM)	Funding	Action	Identify actions that can be funded through new and existing grant awards.
Flood Mitigation Assistance (FMA)	Funding	Action	Identify actions that can be funded through new and existing grant awards.
TWDB Flood Protection Planning (FPP) Grant	Funding	Action	Identify actions that can be funded through new and existing grant awards.
TWDB Clean Water State Revolving Fund (CWSRF)	Funding	Action	Identify actions that can be funded through new and existing grant awards.
Texas Water Development Fund (DFund)	Funding	Action	Identify actions that can be funded through new and existing loans.

Section 4: Finalize Plan Update (Review, Evaluation, and Implementation)

Changes in Development

With little changes in development, the majority of the activity in Mountain City construction is from home renovations and repairs. As the community is nearly completely built-out, there are not any new significant changes in development that have occurred in the last 5 years.

Past Mitigation Action Progress Reports Summary - Completed and Canceled

2011 Action Number	Hazard	Item Description	Lead Department
10	Drought	Wildfire Hazard Areas	Mountain City
Cost Estimate/Funding		**Schedule**	**Status as of 2017**
$500		TBD; likely initiated in 2011	Canceled due to lack of applicability to activities at the local level. This projects is being undertaken by Hays County as an application to the Firewise program.
Cost Effectiveness			
Not independently cost-effective but essential in minimizing loss of life and injuries during significant storms			

2011 Action Number	Hazard	Item Description	Lead Department
13	Extreme Heat	Evaluate Excessive Heat Risks	Mountain City
Cost Estimate/Funding		**Schedule**	**Status as of 2017**
No addition cost-uses existing staff resources		TBD; probably initiated in 2011	Canceled due to lack of priority, feasibility, and benefit to community.
Cost Effectiveness			
Not independently cost-effective, but needed to develop adequate risk reduction efforts			

Changes in Priorities

As new elected officials have brought new platforms for their governance of the community, the latest officials seek to enhance and improve existing regulations. In addition they wish to prioritize the structural integrity of critical facilities and infrastructure, as well as the safety of residents.

Section 5: Approval and Adoption

Approval and Adoption Procedure

Table MC.29, Municipal Jurisdiction Adoption Date

Municipality	APA Date	Adoption Date
Mountain City		

Jurisdiction Adoption Documentation Placeholder

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