Harrison County 2019

Mitigation Action Plan

Harrison County and the cities of Marshall, Hallsville, Waskom and Scottsville

DEVELOPED BY THE HARRISON COUNTY HAZARD MITIGATION ACTION TEAM MAY 3RD 2018

BASIC PLAN

RECORD OF CHANGES

Change #	Date of Change	Description of Change	Initials and Date Entered

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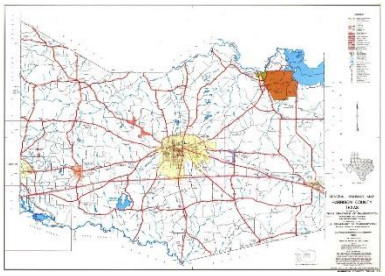
County Overview and Demographics Overview:

Harrison County is located in northeastern Texas along the Louisiana border. Marshall, the county seat located near the center of the county, is 152 miles east of Dallas and 39 miles west of Shreveport. The center of the county lies at 32°30′ north latitude and 94°30′ west longitude. Harrison County comprises 900 square miles of the East Texas timberlands, an area that is heavily forested with a variety of soft wood and hard wood, especially pine and oak. The terrain is gently rolling, with an elevation ranging from 200 to 400 feet above sea level. Northern and Eastern Harrison County, about two-thirds of the total area, is drained to the Red River in Louisiana. The other third of the county is drained by the Sabine River, which forms a part of its southern boundary. Mineral resources include oil, gas, lignite and clays. Harrison County is crisscrossed with federal and State Highways 59, 80, 43, and 154 including Interstate Highway 20, the major artery from the east coast to Dallas. The county operates a general aviation airport. Railroads provide freight and passenger service.

Caddo Lake, Lake O' the Pines, and other lakes provide water recreation. About 20,000 acres on Caddo Lake were designated a wetland of international importance in 1993. The following cities lie within Harrison County: Marshall, Hallsville, Scottsville, Uncertain, and Waskom.



Demographics Information

According to the 2010 census, the population of
Harrison County is 65,631 (estimated as of April 1, 2010).

Harrison County has a slightly higher percentage of females (51.2%) than the State of Texas as a whole (50.4%).
No jurisdiction within Harrison County is designated for special consideration because of minority or economically disadvantaged population.

The following table shows the population change of each Harrison County city, from 2000 to 2016, with the rate of growth or decline, as compared to that of the county and state as a whole, from the 2000 census to the 2016 census. According to the Harrison County Profile provided by Texas Association of Counties, the last census occurred in 2016. The information provided below is the most current available.

	2000	2010	2016	Rate of change 2010 - 2016
Marshall	23,935	23,523	23,651	9.80%
Hallsville	2,772	3,577	3,966	9.84%
Waskom	2,068	2,160	2,055	9.56%
Scottsville	358	376	387	9.81%

Data from: https://www.census.gov/quickfacts/fact/table/harrisoncountytexas/PST045216

Approximately 25.5% of the residents of Harrison County are under the age of 18, compared to 26.2% of all Texans; approximately 15.9% of Harrison County residents are 65 years old or older, compared to 12.0% of all Texans.
The following table shows the age distribution found in Harrison County and its four cities:

Age	Marshall	Hallsville	Waskom	Scottsville	State of Texas
<5 yrs.	7.6%	4.5%	4.1%	11.4%	7.3%
5-9 yrs.	7.4%	13.8%	4.7%	5.2%	7.5%
10-14	6.9%	6.8%	4.2%	7.0%	7.4%
15-19	7.7%	6.0%	6.9%	5.9%	7.1%
20-24	7.9%	2.8%	6.1%	3.6%	7.3%
25-29	5.6%	7.3%	6.3%	4.1%	7.3%
30-34	6.0%	5.8%	5.5%	8.8%	7.2%
35-39	6.2%	9.1%	7.3%	6.5%	6.8%
40-44	5.8%	12.0%	7.8%	2.3%	6.7%
45-49	6.8%	8.4%	5.2%	7.5%	6.4%
50-54	6.5%	3.8%	10.0%	9.0%	6.5%
55-59	5.0%	1.2%	9.3%	4.9%	5.9%
60-64	5.8%	4.3%	5.9%	9.0%	5.0%
65-69	3.9%	4.5%	5.9%	4.9%	4.0%
70-74	3.6%	5.7%	6.1%	3.6%	2.8%
75-79	2.4%	1.5%	1.1%	1.6%	2.0%
80-84	1.9%	1.7%	1.3%	2.3%	1.4%
85 & ↑	3.0%	0.7%	2.2%	2.3%	1.3%
Median age	**35.5 years**	**35.9 years**	**43.4 years**	**37.8 years**	**34.2 years**

Data from: https://www.census.gov/quickfacts/fact/table/harrisoncountytexas/PST045216

Climate

The climate in Harrison County temperatures range from an average high of 95° F in July to an average low of 37° in January, rainfall averages slightly more than forty-six inches a year, and the growing season extends 245 days.

Data from: ***Handbook of Texas – Online***
https://tshaonline.org/handbook-search-results?arfarf=harrison%20county

Topography, Soils, Vegetation, and Mineral Resources

The terrain is gently rolling, with an elevation ranging from 200 to 400 feet above sea level. Northern and eastern Harrison County, about two-thirds of the total area, is drained to the Red River in Louisiana by Little Cypress Creek, Cypress Bayou, and Caddo Lake. The other third of the county is drained by the Sabine River, which forms a part of its southern boundary. Two soil types, upland sedimentary and lowland alluvial, are found in the county. The former, although not so rich as the alluvial, is primarily a sandy loam noted for being loose and easily cultivated. Mineral resources include oil, gas, and clays that have proved valuable for making bricks and pottery.

Data from: ***Handbook of Texas – Online***
https://tshaonline.org/handbook-search-results?arfarf=harrison%20

Document Organization

Provided below is brief explanation on the lay-out and content of this document. The sections included in this plan are:

Adoption
This plan will be formally adopted by Harrison County, the City of Marshall, Hallsville, Scottsville, and Waskom after the document had been reviewed by both the Texas Division of Emergency Management (TDEM) and the Federal Emergency Management Agency (FEMA) to ensure it met current state and federal guidelines governing local MAPs.

Authorities
This section provides a description of the legal authorities under which this plan was developed.

Purpose
This section explains why the plan was written and identifies the benefits to the participating jurisdictions within the Harrison County area of having a current Hazard Mitigation Plan.

Element A – The Planning Process
This section explains how the plan was organized and the process followed in developing this document, including:

- Establishing the Mitigation Action Team: Identifies the process Harrison County and the plan participants followed in establishing their mitigation action team.
- Establishing an Open Public Process: Identifies the planning team's efforts to encourage public participation during the development of this plan.

Element B– Hazard Identification and Risk Assessment
This section identifies and analyzes the hazards that affect Harrison County-and their impacts on the County' jurisdictions

Hazards – Describes the hazards that impact Harrison County and the plan participants.

History of Local Hazards – Provides historical and statistical data related to the specific hazards that have impacted the jurisdictions within Harrison County.

Risk Summary – Community priorities on specific hazards.

Vulnerability Worksheets – Provides a graphical representation of each jurisdiction's vulnerability to the identified hazards.

Loss Estimates – Provides an estimate of the impact each hazard would have on the critical infrastructure located within the County and its Cities.

Past Mitigation – Provides a summary view of previous mitigation efforts undertaken by the jurisdictions within Harrison County.

Development Trends – Provides an analysis of a growth trends within the County which were considered in developing the mitigation strategies discussed in Element C.

Element C– Mitigation Strategies

- Mitigation Goals and Objectives – Provides the framework for the development of the long- term and short-term strategies identified with the Mitigation Actions.
- Mitigation Actions – Describes the actions that each participating jurisdictions proposes to undertake in order to mitigate the impact of future hazard events.

Element D – Plan Review, Evaluation and Implementation

- Utilizing development patterns and new hazard or risk information; jurisdictions will evaluate progress on the action items and make changes based on new findings.
- Jurisdiction will resubmit plan for approval within 5 years.

Element E– Plan Adoption

- Plans will be adopted by each jurisdiction through their appropriate governing body. This adoption takes place after plan draft has been approved by state and FEMA for applicable content

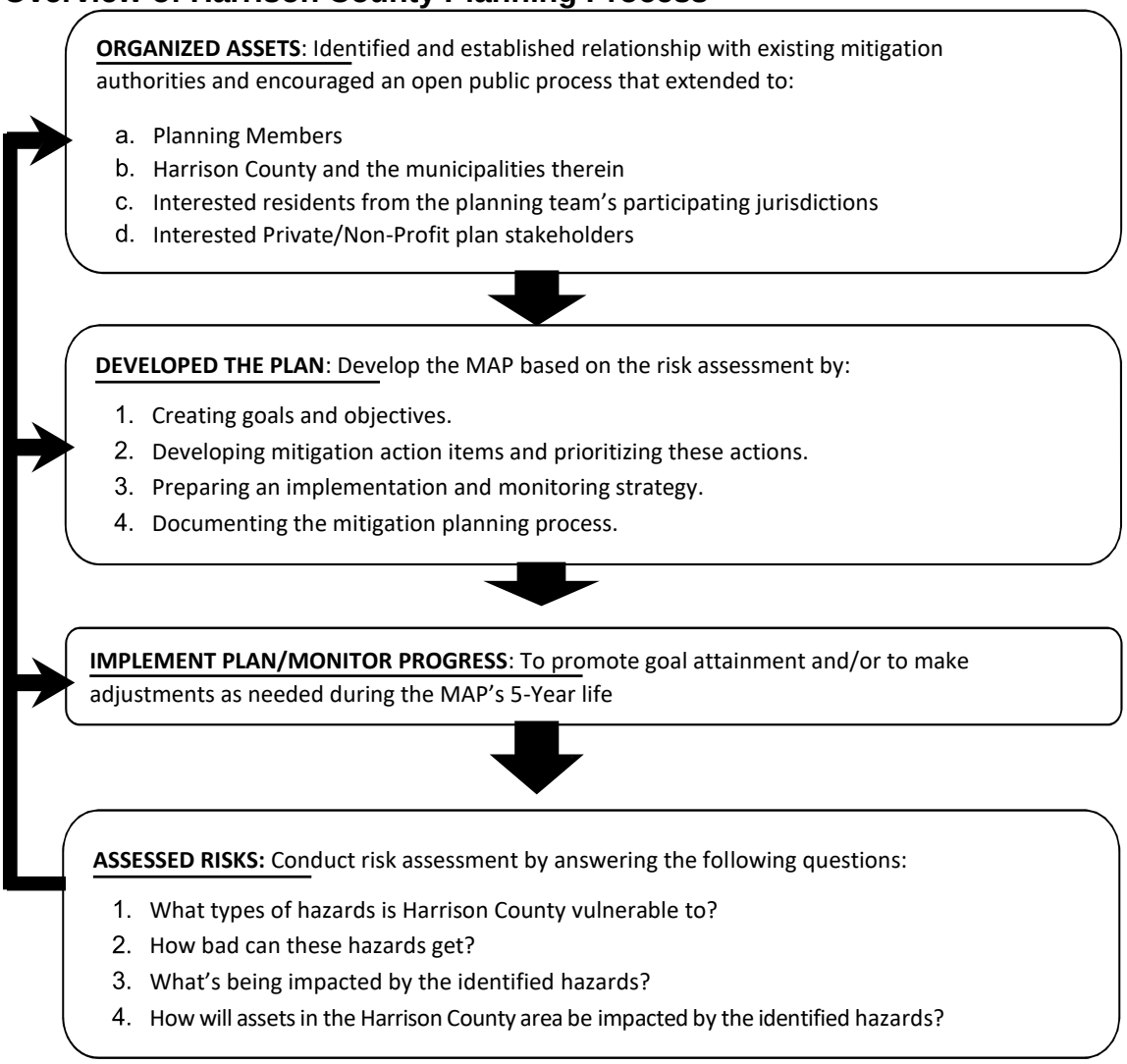
Element A - Planning Process

Plan Preparation (A1)

The Hazard Mitigation Plan was developed through the active participation of representatives of Harrison County and the plan participants. Through their expertise in emergency management, engineering, administrative, public works, building and road maintenance, their contributions were critical in the plan development. The team also included stakeholders such as: local business owners, industry representatives, neighboring jurisdictions, regional and state partners. The list of mitigation team members is located on page 9 and 10.

This graphic below illustrates the steps taken by the Harrison County planning team in developing this document.

Overview of Harrison County Planning Process



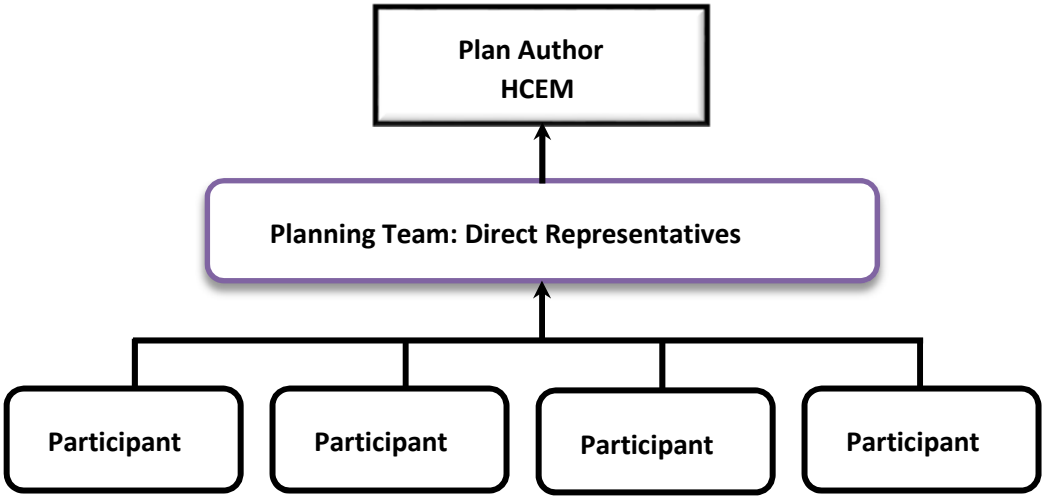
Planning Process

Date	Activity Description	Invited/Attendees
10/05/2016 & 10/06/2016	Outreach Training G-318 Class	Harrison County EMC
04/23/2018 t& 04/24/2018	Local Mitigation Planning Workshop G-318 Class	Harrison County Longview
7/19/2017	Initial invitation for planning team participation	Local government leaders, EMC's & State Partners
10/24/2018	FEMA Review of Hazard Mitigation Plan	Harrison County, State Partners
02/26/2018 to 10/24/2018	Technical Assistance and Plan development review	Harrison County, State Partners
03/07/2018	Public meeting draft stage.	Local government leaders, Municipal department heads, ISD Superintendents, Responder group leaders, Stake Holders, Regional and State Partners & Neighboring counties
03/07/2018	Continue developing Actions and prioritize hazards	Local government leaders, Municipal department heads, ISD Superintendents, Responder group leaders, Stake Holders, Regional and State Partners, Public & Neighboring counties
03/14/2018	Conference Call with EMC's about priorities	City EMC's, State partners
01/17/2018	Emergency Pipeline Response Liaison Services	City ,EMC, State Partners
08/23/2018	Local Emergency Planning Committee Meeting	City and County EMC's, Fire Departments, Local Judge, Municipal Department Heads, Hospital Administrator, Nursing Homes, Local Police Department, Public & Local Businesses
10/02/2018	Public Meeting	Local government leaders, Municipal department heads, ISD Superintendents, Responder group leaders, Stake Holders, Regional and State Partners & Neighboring counties
02/18/2016 & 02/19/2016	ISC 400 Advance ICS for Command and General Staff, Complex Incidents/MACS Operational First Responders	City, EMC, State Partners, Local Government Leaders
Meetings were posted 72 hours in advanced at the County Courthouse. Invitations were sent out via email. The public was invited to attend through County Courthouse/City Hall information board. Sign-in sheets were utilized and agendas were available at each meeting.		

Establishing the Mitigation Action Team (A2)

The ***first*** Harrison County Hazard Mitigation Planning Action Team began the planning process August, 2001 and was approved in early 2002. In January 16, 2012, the Harrison County Mitigation Team chairman began the process of updating the plan and was approved by FEMA September 18, 2013. This process included reviewing previous mitigation strategies and determining the status of each action. In addition, due to turnover, the chairman began to actively recruit new members to begin the update process.

Harrison County Mitigation Action Team Hierarchy



At the outset of the planning process, the Harrison County Judge mailed a solicitation to the other jurisdictions and plan stakeholder groups in their County; inviting their participation on the Harrison County planning team. In addition, the planning team meetings were all well-advertised and the meeting postings encouraged and welcomed the public's participation.

H.C. EMC followed up by sending an email to each of the agencies/ organizations in the planning area that had been contacted by the Judge and thought to have a direct stake or interest in the MAP update process to encourage them to participate or be represented at the initial planning team meeting.

Each of the participating jurisdictions made an effort to elicit involvement on the planning team from the various groups within their jurisdiction and neighboring communities. Particular focus was placed on inviting participation by the local school districts and neighboring counties. Overall, the list of agencies/ organizations thought to have a direct stake or interest in this MAP update process or that could somehow inform the planning process included:

Mitigation Action Team – Participating Jurisdictions

Mitigation Action Team Members		
	Agency and Position	**Potential Stake, Interest or Contribution**
Harrison County	County Judge County Commissioners	County officials would have a stake in any mitigation actions undertaken by the County and would ultimately be responsible for recommending the update's adoption by the Commissioners' Court
	County Administrator's Office County Flood Plain *Administrator*	The FPA could inform the planning team on matters related to SFHAs in Harrison County and have an interest in flood mitigation actions proposed for the County
	County Road & Bridge *Superintendent*	R&B could inform the planning team on the impacts of natural hazards on the County's road system and have input on the development of proposed mitigation actions
	Sheriff's Office County Sheriff	SO could inform the MAT on public safety issues related to natural hazards and have input on the development of proposed mitigation actions
	County Appraisal District *Chief Appraiser*	The Appraisal District could inform loss value determinations made by the planning team
	Office of Emergency Mgmt. *County EMC*	The OEM could provide mitigation ideas and presumably, would be charged with carrying a number of the mitigation actions out
	Hospital District *Hospital CEO*	The Department could both inform and have a direct interest in the MAP's mitigation measures, particularly those that apply to mass casualties.
City of Marshall, Hallsville, Waskom, Scottsville	Elected Officials *Mayor*	City Officials would have a stake in any mitigation actions undertaken by the City and would ultimately be responsible for recommending the update's adoption by the City Commission
	City Administration *City Managers*	City Administration would have a stake in any mitigation actions undertaken by the City and would ultimately be responsible for recommending the update's adoption by the City Commission
	Public Works *Public Works Director*	Could provide detail on how hazards and proposed mitigation actions could impact the City's utility systems
	Fire Department *Fire Chief*	The Department could both inform and have a direct interest in the planning team mitigation measures, particularly those that apply to wildfires
	Office of Emergency Mgmt. *EMC*	The OEM could provide mitigation ideas and presumably, would be charged with carrying a number of the mitigation actions out

Stakeholders		
	Agency and Position	**Potential Stake, Interest or Contribution**
Local Partners and Industry	Economic Development Corp. *EDC Executive Director*	The EDC resources could inform future economic development trends in the City
	Texas AgriLife Extension Harrison County Extension Agent	AgriLife could inform some of the decisions that might impact area farmers/ranchers and help in promoting certain mitigation actions.
	Industry	Industry in the planning area would have a direct stake and interest in the outcome of this planning process
	THE PUBLIC	The residents of the planning area would have a direct stake and interest in the outcome of this planning process
	Neighboring Communities: Longview, Nesbitt, Harleton, Woodlong, Gregg County EMC's	Jurisdictions that border the planning area have an interest in the outcome of this planning process and could contribute to the development of hazard profiling.
Regional, State & Federal Partners	Shreveport Office of the National Weather Service (NWS) *Warning Coordinator* *Meteorologist*	The NWS could provide regionalized data with regard to past/forecasted weather trends that could inform the formation of mitigation actions
	Texas Forest Service (TFS) *Regional Fire Coordinator.*	TFS resources could inform the MAT's development of wildfire mitigation actions
	Parks and Wildlife Meredith Director	TFS resources could inform the MAT's development of wildfire mitigation actions
	Army Corps of Engineers (ACE) *SW Div.,Fort Worth, TX*	ACE resources could inform local flood control efforts with streambed/wetland data
	Texas State Data Center (TSDC) *On-line Resources*	TSDC resources could provide data to forecast future population growth in the Harrison County Planning area
	Texas Water Development Board (TWDB) *On-line Resources*	TWDB resources could provide the Cities and County with severe repetitive loss data and inform actions focused on drought contingencies

In some form or fashion, all the participating jurisdictions/stakeholders listed above played a part in the MAP update process. State and federal agency participation was primarily obtained through the use of their websites. Information was gleaned from their sites to develop the hazard profiles found later in this document, to estimate future hazard impacts, for projecting future growth and development and for identifying potential actions that could be employed in mitigating the impacts of future hazard events in the planning area.

The MAT planning process was open throughout and with participation from the public in the meetings. The Household Natural/Hazards Preparedness Survey and the attitudes and opinions reflected by the resident responses were considered as the mitigation actions in this MAP update were being developed. Each participant was able to enter their zip code to separate results by jurisdiction.

In following FEMA's Local Mitigation Planning Handbook suggestions, the individuals invited to participate on the MAT brought certain skill sets or experiences to the process that helped to ensure the overall relevance of the plan. The types of MAT member contributions included:

- Emergency managers/first responders – had direct experience with past hazard events and existing preparedness measures, and/or had a direct line of communication with the State emergency management agency.
- Local community planners – were able to assist the planning team in understanding current, and future community development trends, the policies or activities that affect development, and the relationship between hazards and development.
- Mapping specialists – were able to analyze and interpret map data to support the planning process and communicate complex information, such as the locations of assets at risk in threat- or hazard-prone areas and estimates of damage for a particular disaster scenario.
- Public works/engineering staff – were able to identify current or projected problems for the community's infrastructure that could be addressed through capital improvements supported by the mitigation plan.
- Elected and executive officials – were familiar with the total needs of their jurisdiction and were able to communicate how the mitigation plan could support other social, economic, or environmental goals locally.
- Floodplain administrators – were able to provide information on local flood hazard maps, floodplain ordinance and actions that could be undertaken to support the goals of the National Flood Insurance

Program and help reduce flood losses.

- Code Enforcement Officials – were able to help the team understand how local codes can be used in support of the Harrison County plan's mitigation goals.
- State/Federal Partners – were able to serve as a data resource; providing the MAT with relevant statistics, historical account, etc. that could be used to inform the planning process.

The table below lists the current membership of the MAT and describes the contributions each member made with the development of this document.

Harrison County Planning Team and Contributions		
TITLE	**JURISDICTION**	**CONTRIBUTION**
EMC/Planning Team Chairperson	Harrison County Office of Emergency Mgmt.	*Emergency Manager*; coordinated the planning team meetings, obtained data to profile hazards, provided background on past mitigation actions in the planning area; identified potential mitigation actions
City Administrator	City of Marshall, Hallsville, Waskom, Scottsville	*Executive official*; helped the MAT in discerning the "P" (political) element in the assessments of potential mitigation actions and with the development of mitigation actions
Mayor	City of Marshall, Hallsville, Waskom, Scottsville	*Executive official*; helped the MAT in quantifying the "L" (legal) element of the assessments and with the development of mitigation actions
Director Public Works	City of Marshall, Hallsville, Waskom, Scottsville	*Public works/engineering*; assisted the MAT in understanding some of the technical implications of proposed mitigation actions; particularly as they applied to key City infrastructure
Fire Chief	City of Marshall, Hallsville, Waskom, Scottsville	*First responder*; assisted with gathering wildfire data and identification of potential wildfire mitigation actions

Harrison County Mitigation Action Team and Contributions		
TITLE	**JURISDICTION**	**CONTRIBUTION**
County Judge	Harrison County	*Elected official*; assisted with the development of mitigation actions for the County and presented the MAP to the Commissioners' Court for adoption
Sheriff's Office	Harrison County	*Law Enforcement*; familiarized the MAT with the County's law enforcement prevention activities and assisted with the development of mitigation actions
Chief Appraiser County Appraisal District	Harrison County	The Appraiser could develop loss value determinations made by the MAT
Emergency Planner	North East Texas Public Health District	*Local community planner*, assisted the MAT Team leader with public communications; served as an interface with TDEM/FEMA as the MAP was being reviewed

Establishing an Open Public Process (A3)

As previously noted, the development of this plan followed the requirements set out by FEMA under 44 CFR §201.6. One of the foundational pieces of those requirements calls for the public to be given ample opportunity to observe, if not participate, in the planning process. §201.6(b)(1) required the County to provide, *"(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;*".
(2) During the public meeting: a question was asked concerning warning sirens in the outer areas of Harrison County. Feedback was received and incorporated into the action plan on page 90.

To that end, a meeting was scheduled to involve the public in the planning process and during plan development. These meetings were posted at the county courthouse at least 72 hours prior to the meeting. The following information is an excerpt from the invitation:

This notice was posted on the Harrison County Website at http://harrisoncountytexas.org/, Waskom City Hall, Scottsville Post Office and the local gas station in Scottsville, Marshall City Hall and Hallsville City Hall, and through email. The survey was also posted on the Harrison County Website 72 hours before the meeting and the results are as follows:

NOTICE TO THE PUBLIC

The Harrison County Mitigation Action Team has scheduled a meeting on 10/02/2018 at 10:00 A.M., in the Jury Room on the second floor of the Harrison County Historical Courthouse located at #1 Peter Whetstone Square Marshall, TX 75670. The Harrison County Hazard Mitigation Plan is being updated. When completed, it will serve as a guide for implementing mitigation strategies which are intended to help reduce the human, economic, and environmental costs of natural disasters. The public is invited to attend. For more information, please contact Thomas Mock, with the Harrison County OEM, at (903) 935-4870.

The draft will be available for public comment in the Harrison County Historical Courthouse at, #1 Peter Whetstone Square Marshall, TX 75670 for 72 hours in Judge Chad Sims' office on the 3rd floor. The meeting is open to the public and interested residents, stakeholders in participating communities, including business operators, property owners, local officials, and institutional or organizational partners are encouraged to attend to offer feedback and comment on the mitigation plan.

http://harrisoncountytexas.org/

A sign in sheet will also be provided for those who attend.

The final draft will be discussed in open session during the Commissioners meeting, with a call for public comment, before the adopting resolution is considered and passed.

The Harrison County Hazard Mitigation Plan will remain available to the public until it's replaced by the next 5-year update. The public will also be notified of and invited to the meetings when the planning team gathers to conduct its annual review of the MAP.

Existing Document Reviewed for Plan Development (A4)

Documents and Databases	How the information was applied.
State of Texas Hazard Mitigation Plan	State of Texas Hazard Mitigation Plan was used as a guide and reference to follow.
Harrisoncountytexas.org	Harrisoncountytexas.org was used as a reference for the history of Harrison County, and background information.
Texas Association of Counties Profiles	Population data, census, county finances, and road inventory.
Texas A&M Forest Service Fire Reports	Fire risk, wildfire risk, fire danger, and data.
US Census American Fact Finder	Annual Population Estimates, Demographic and statistics.
NOAA Storm Event Database	Storm Data and Events
FEMA Flood Map Center	Flood Maps for Marshal, Hallsville, Scottsville, Waskom
StormerSite	Hail, tornado and wind reports
Sabine River Authority	Lake reports
Texas Water Development Board	Map of drought rain conditions and for data.
Natural Disasters & Weather Extremes	Information on natural disasters and extreme weather
FEMA Disaster Declarations	Incident reports and declarations that have been declared for Harrison County.
Texas Almanac	Records on extreme weather history.
National Drought Mitigation Center (NDMC)	Drought monitoring, scales and publications.
CoCoRaHS	View data, maps, and weather

Continued Public Participation Process (A5)

The planning team will conduct annual public mitigation action strategy update presentations during the 5 year period. Harrison County will host a local workshop and invite the plan participants as well as the public residing in each of their jurisdictions. A press release will be issued to the Harrison County Monitor. Annual meetings held locally will ensure public participation with the focus being on their own strategies. County and City residents will be given a forum to submit any additional identified areas of concern to possibly vet out action items in the future. Two years prior to the expiration; the mitigation team will convene to update the existing plan with actions gleaned from the local meetings.

The MAP will be available in the County Courthouse, which will allow the public to access the document during operational business hours. Harrison County OEM will be responsible for ensuring the contact list stays current.

Monitoring (A6)

The Hazard Mitigation Team will be in charge of organizing an implementation of plan action items and undertaking a formal review process. The Harrison County Commissioners Court will make sure that the membership of this team continues to include the County Hazard Mitigation Coordinator (HMC), the county Emergency Management Coordinator (EMC), representatives from each jurisdiction, and members from local establishments, businesses, and concerned residents. Regular meetings regarding changes and concerns will be planned in advance. Meetings about the plan will be posted on the Website for the Commissioners Meeting, local newspapers, City Hall, brochures, through email to local participating businesses and if possible on social media. The Hazard Mitigation Team will meet at least once per year to assess progress, with monthly meetings to be held in the fourth year after adoption, for the purpose of review and revision of the final Plan. A record of those changes will be maintained in the plan. The planning team Chairman will be responsible for monitoring the overall plan for updates on an annual basis.

Monitoring and evaluation involves the ongoing process of compiling information on the outcomes from the implementation of the hazard mitigation objectives. The goal is to determine whether the planning area's vulnerability has decreased as a result of the plan. When vulnerability has decreased as a result of identified mitigation actions, the plan participants will determine why and will implement successful mitigation actions in other locations. Where vulnerability has increased, or remained constant, the plan participants will identify if other potential mitigation strategies may be more successful.

Method and Schedule for Keeping Plan Current

Method and Schedule for Keeping Plan Current			
	How	**When**	**By Whom**
Monitoring/Evaluate	The plan and action items will be evaluated on an annual basis to determine effectiveness of the programs. **Element A**: Continue to recruit members for the mitigation team members. Evaluate public satisfaction with the outreach method and level of input they were allowed to provide through an annual survey. **Element B**: Participants will provide any new development of hazard history that may impact changes in priorities. Monitor new information from the NWS and TFS Wildfire Risk for new maps and history. Monitor new versions of CHAMPS for new data. **Element C:** Existing strategies will be evaluated and priorities adjusted based on hazard history. Lead agency/departments will continually monitor action items as they are implemented. Through the Mitigation Action Item Monitoring Form, they will inform the planning team of the status of the action and target completion date. **Element D:** Monitor the status for existing strategies. Identify how the plan was utilized to recognize new projects or to re-prioritize existing strategies. As development changes occur they will be incorporated in to the plan and strategies can be adjusted according to the increase or decrease in growth. Review of the overall goals and using the scoring criteria – will provide clear measurement of the actions.	Quarterly updates and upon completion	Responsible Departments identified for each action for each jurisdiction. Participating Jurisdictions, Responsible Departments, MAT Members

Update	The planning team will update this plan every 5 years. However, through the annual evaluation, each participating jurisdiction will provide any changes to the existing plan to the planning team Chairmen. Two years prior to the expiration, all participating jurisdictions will begin the formal update process. The Formal process will begin with a county-wide meeting which will include all participating jurisdictions. Tasks will be established for each jurisdiction: 1) to review prior mitigation action items and 2) document hazards that have occurred in the last several years. Each participating jurisdiction will hold "jurisdictional" meetings to solicit feedback from the public during this process. Surveys will be extended to the entire county to determine changes in mitigation planning at the resident level. This process will culminate in the several meetings to review the information gleaned and to formally update plan. Plan will be submitted to the State for review and to FEMA for approval.	Every 5 years	Participating Jurisdictions, Responsible Departments, Planning Team Members

The planning team will conduct an annual meeting intended for all plan participants for the purpose of monitoring and evaluating the progress being made in fulfilling the MAP's goals, objectives, and Mitigation Actions. The objectives of the annual planning team review will be:

- to identify mitigation activities that are in progress, have been deferred or been completed;
- to assess whether the MAP's current mitigations goals and objectives continue to address existing (at the time of the review) and expected conditions;
- to determine whether or not the nature and/or magnitude of each plan participant's risks have changed; and
- to determine, by plan participant, if resources are available and appropriate for implementing prioritized actions in the coming year.

Any changes made during the annual review process(es) will be noted on the Record of Changes found page 2 of this document. As part of the monitoring of the mitigation actions, responsible parties will be provided the form below to update the planning team on the progress of strategies that have been implemented.

Sample Mitigation Action Item Monitor Form

Mitigation Action Item Monitoring Form (Sample)	
Date Submitted	**Dept. Responsible**
Mitigation Action	**Installation of Additional Early Warning Sirens**
Objectives	Provide early warning sirens to warn citizens of approaching weather dangers.
Target	Erect multidirectional sirens within the county limits
Progress	The city of Marshall has 7 multidirectional sirens that have been erected and tested on the first Saturday of the month between 10:00 A.M. and noon. There are no warning sirens outside the county limits.

-

Element B – Hazard Identification and Risk Assessment

The purpose of hazard mitigation is to reduce potential losses from future natural disasters. The intent of mitigation planning, therefore, is to maintain a process that leads to hazard mitigation actions. This mitigation plan will identify only natural hazards that impact our community and identify actions to reduce losses from those hazards and establish a coordinated process to implement the plan.

Throughout the plan, each hazard addressed will be considered in light of its history, likelihood of future events, extent, jurisdictional vulnerability, location and impact.
Likelihood of Future Events is measured based on a hazard's expected frequency of occurrence in light of its previous frequency. Each hazard's likelihood of future events will be considered using the following standardized parameters:

- **Highly likely** – event probable in the next year
- **Likely** – event probable in the next three years
- **Occasional** – event possible in the next five years
- **Unlikely** – event possible in the next 10 years

Given this plan's five-year duration, hazards likely to occur during that period will be given priority when selecting and prioritizing mitigation actions.

Hazards Analysis

Early in the update process, the committee completed an analysis of the plan and decided that much of the contents on hazard analysis remained relevant. As with the original plan, the committee for this update found the following natural hazards continue to be present and could have an effect to the planning area.		
Natural Hazards		
Flood	Hail	Winter Storm/Ice Storm
Drought	Tornado	Windstorms
Thunderstorm/Lightning	Wildfire	

The mitigation team studied the entire list of possible natural hazards that could affect the jurisdiction and found that while some hazards could be considered, historical data did not support the need to include the following hazards. Data of the following hazards found that the possibility of a future event would have less than a 1.5% chance of occurring in the next 65 years, therefore, the risk is negligible, additionally, based on the history there have been no impacts to the jurisdictions, therefore we do not expect any impacts in the future, or that history has never recorded any such event for the jurisdiction and the event is not likely to occur in the next 5 years.

Some of these hazards are interconnected (e.g., lightning striking transformers starting wildfires) while some hazards could be characterized as elements of a broader hazard agent. For example, hail and severe winds can be produced by thunderstorms and they may all occur during a single thunderstorm event. It should also be noted that some hazards, such as severe winter storms, may impact a large area and cause little damage, while other hazards, such as a tornadoes, may impact a small area but cause extensive damage.

Four categories were developed to define the impact (magnitude or severity) of each hazard:

Substantial
- Multiple deaths;
- Complete shutdown of facilities for 30 days or more;
- More than 50% of property destroyed or with major damage.

Major
- Injuries result in permanent disability;
- Complete shutdown of critical facilities for at least two weeks;
- More than 25% of property destroyed or with major damage.

Minor
- Injuries do not result in permanent disability ;
- Complete shutdown of facilities for more than one week;
- More than 10% of property destroyed or with major damage.

Limited

- Injuries treatable with first aid;
- Minor quality of life lost;
- Shutdown of critical facilities and services for 24 hours or less;
- Less than 10% of property destroyed or with major damage;

The following disasters have been omitted for the reason that the chance of them occurring in Harrison County is either slight or nonexistent.

- Earthquake – 1.5% chance of occurring in the next 65 years.
- Extreme Heat
- Hurricanes/Tropical Storms
- Expansive Soils
- Dam Failure
- Land Subsidence

FLOOD

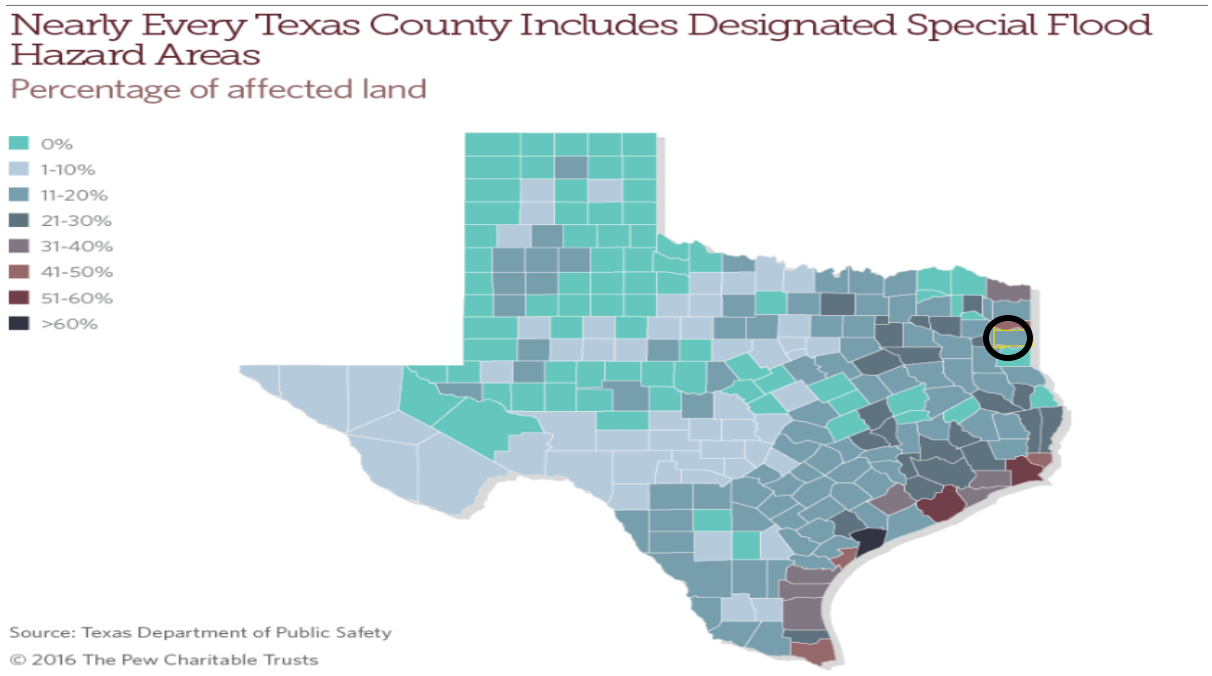
Description

Flooding is the most frequent and costly natural hazard in the United States, causing more than 10,000 deaths in the past century. Historically, nearly 90% of presidential disaster declarations have resulted from floods. Floods are generally caused by excessive precipitation, and can be broadly classified as general or flash floods. General floods are defined as precipitation over a given river basin, while flash floods are the product of heavy, localized precipitation falling in a short time period. The severity of a flood event is determined by a combination of stream and river basin topography and physiographic; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing.

Location

The maps provided above shows areas in Harrison County that have a – percent or greater likelihood of flooding in any given year (the 1% annual flood risk zones). Streams and watershed boundaries are also shown. Normally after receiving 1 inch or more of rain Cox Rd. in Marshall, Texas floods over.

The map below displays the number of flood events between 1960 and 2010 for all Texas counties. Harrison County is ranked in the Middle 20% of Texas counties, based on the 19 flood events that have been reported over the period.



Harrison County
Flood Events Table

The table below includes a list of the of the most significant flood events in Harrison that occurred since the last mitigation plan in 2013 to 2018. These are listed in order of the reported property damage.

Flood Events Table

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	216.00K	0.00K
MARSHALL	HARRISON CO.	TX	09/20/2013	14:00	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	03/09/2015	20:44	CST-6	Flash Flood		0	0	0.00K	0.00K
HARLETON	HARRISON CO.	TX	05/08/2015	05:11	CST-6	Flash Flood		0	0	6.00K	0.00K
HARLETON	HARRISON CO.	TX	05/08/2015	05:11	CST-6	Flash Flood		0	0	100.00K	0.00K
MARSHALL	HARRISON CO.	TX	05/08/2015	06:30	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	05/08/2015	06:37	CST-6	Flash Flood		0	0	0.00K	0.00K
WALKERS MILL	HARRISON CO.	TX	05/11/2015	00:55	CST-6	Flash Flood		0	0	0.00K	0.00K
WALKERS MILL	HARRISON CO.	TX	05/11/2015	01:45	CST-6	Flash Flood		0	0	10.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	05/11/2015	01:45	CST-6	Flash Flood		0	0	50.00K	0.00K
LONGVIEW HGTS	HARRISON CO.	TX	05/11/2015	02:04	CST-6	Flash Flood		0	0	50.00K	0.00K
MARSHALL NORTHEAST	HARRISON CO.	TX	05/11/2015	02:52	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	05/11/2015	04:25	CST-6	Flash Flood		0	0	0.00K	0.00K
KARNACK	HARRISON CO.	TX	05/11/2015	04:25	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	05/25/2015	18:48	CST-6	Flash Flood		0	0	0.00K	0.00K
WASKOM	HARRISON CO.	TX	08/19/2015	16:30	CST-6	Flash Flood		0	0	0.00K	0.00K
BALDWIN	HARRISON CO.	TX	03/08/2016	17:50	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	03/09/2016	07:10	CST-6	Flash Flood		0	0	0.00K	0.00K

MARSHALL	HARRISON CO.	TX	03/09/2016	07:49	CST-6	Flash Flood		0	0	0.00K	0.00K
LEIGH	HARRISON CO.	TX	03/09/2016	08:50	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL ARPT	HARRISON CO.	TX	03/09/2016	09:20	CST-6	Flash Flood		0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	03/09/2016	12:00	CST-6	Flash Flood		0	0	0.00K	0.00K
DARCO	HARRISON CO.	TX	03/09/2016	15:24	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL ARPT	HARRISON CO.	TX	04/30/2016	02:00	CST-6	Flash Flood		0	0	0.00K	0.00K
GILL	HARRISON CO.	TX	04/30/2016	02:00	CST-6	Flash Flood		0	0	0.00K	0.00K
GILL	HARRISON CO.	TX	04/30/2016	02:00	CST-6	Flash Flood		0	0	0.00K	0.00K
Totals:								0	0	216.00K	0.00K

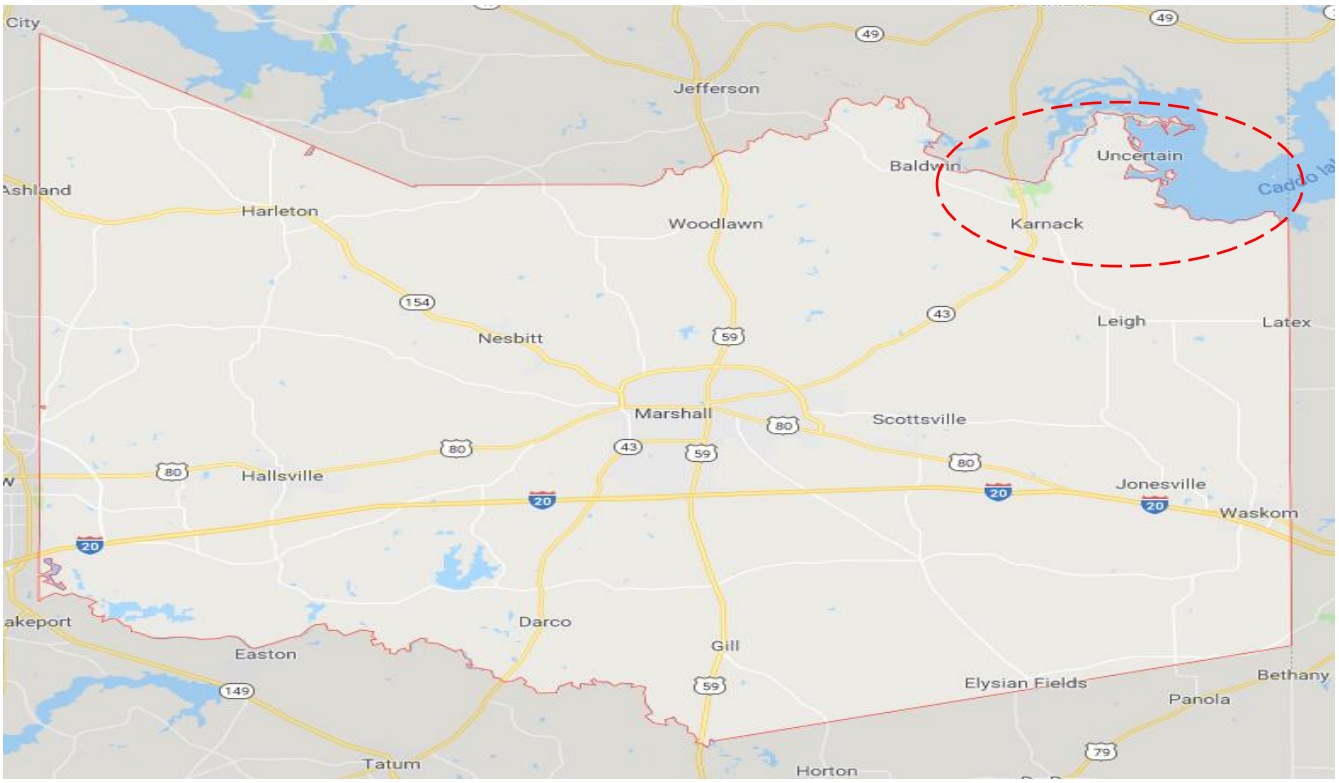
During the flood of April 5th, 2016 there was a total of 155 homes flooded – 59 destroyed (4.5' floodwater), 45 (3 to 4' floodwater) with major damages 33 with minor and 18 with up to (6" floodwater).

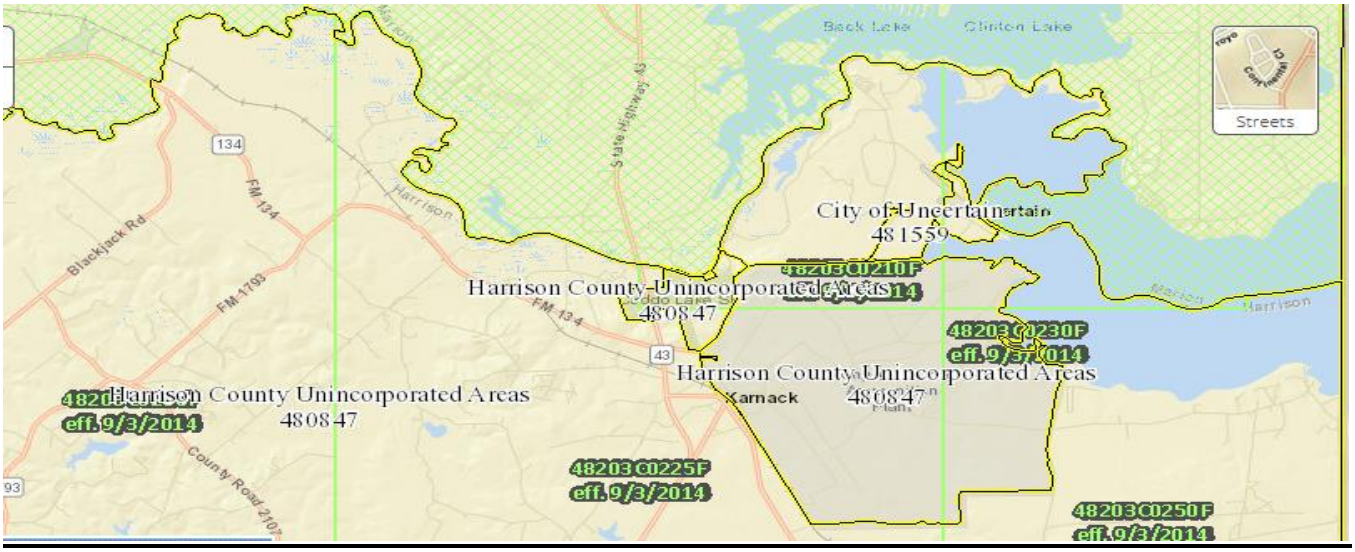
***Source**: This table was produced from data collected from:*
https://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=48%2CTEXAS

According to the Floodplain Assistant & CFM Floodplain Coordinator for the Harrison County Road and Bridge Department Lisa Benson:

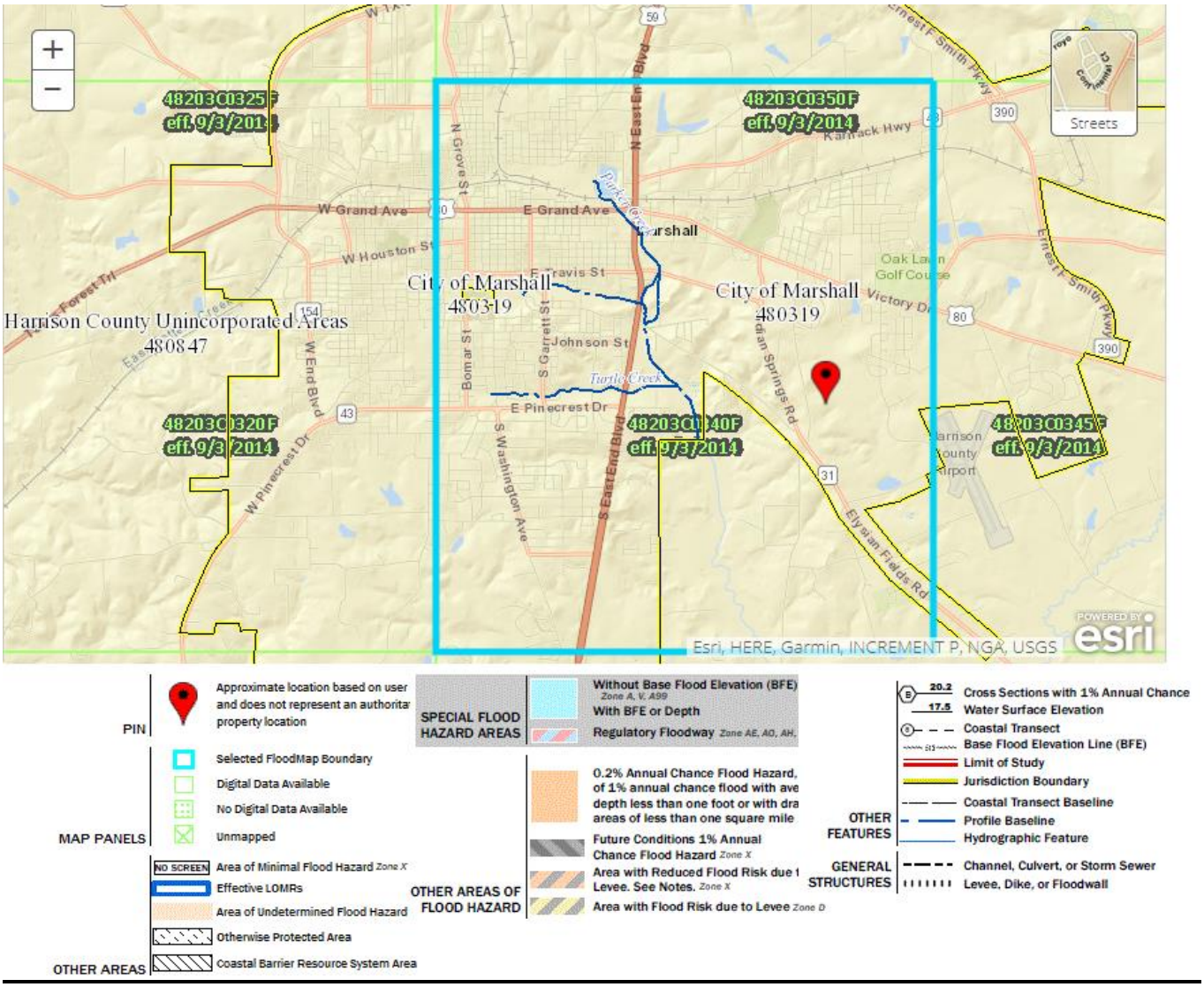
The unincorporated areas of Harrison County have never had a detailed study performed to determine the base flood elevation (BFE) related to mean sea level. Therefore, the FEMA floodplain maps that were adopted for use by the Harrison County Commissioner's Court on September 28, 2014, indicate either Zone A or Zone X for the majority of area. The primary area of flooding concern in Harrison County is the Caddo Lake watershed. The Commissioner's Court adopted a BFE of 185 feet above mean sea level for areas located in the Zone A around Caddo Lake on March 8, 2004. The adopted BFE for the area was based on the recommendation of the US Army Corp of Engineers out of Fort Worth, Texas, from information obtained during studies performed by that agency. There are other relatively small areas in Harrison County that are subject to inundation by floodwaters. BFE determination in those areas are the responsibility of the landowner as a part of the floodplain permitting process.

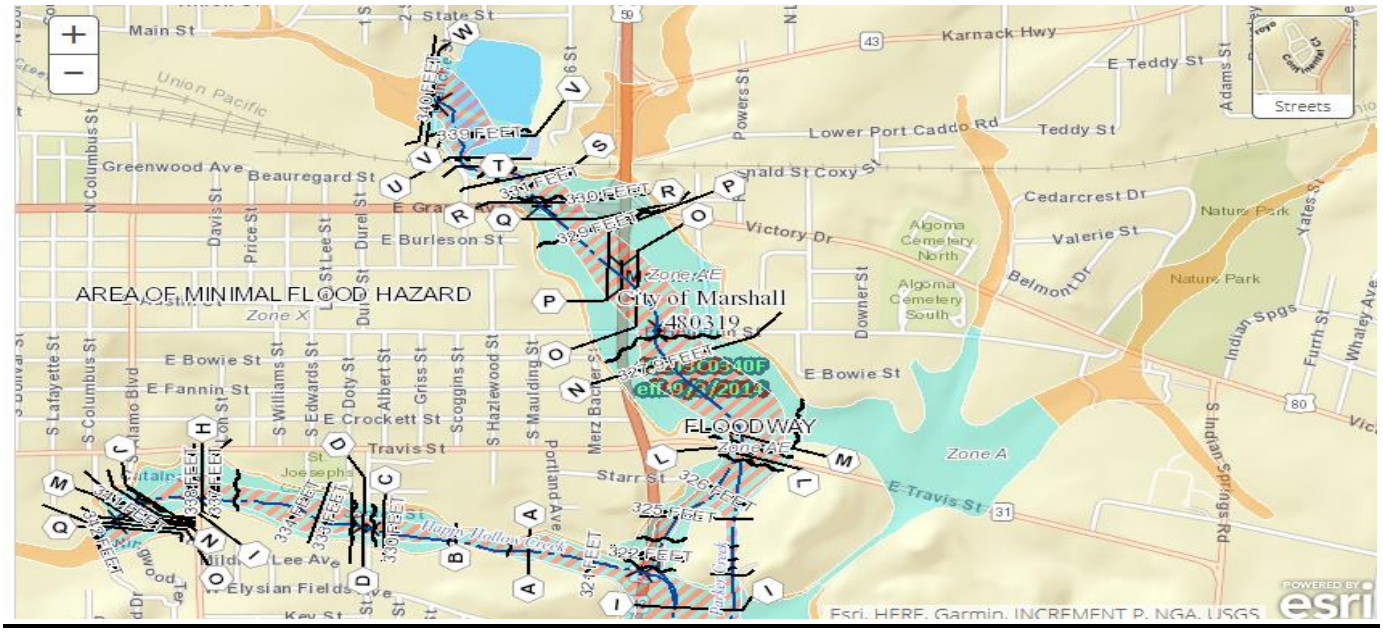
FEMA's National Flood Hazard Layer for Harrison County
Flooding that occurs in the area circled.
According to Lisa Benson, (Floodplain Assistant & CFM) roads that may also be affected are: Moxley Grocery Rd., Moxley Camp Rd., Longs Point Rd., Lake Cooper Rd., Shelly Rd., Sabrina Lane, Pine Island, Dorough Island, Big Oak Rd., Private Roads past lighthouse grocery, Cypress Village Rd., Swansons Landing and several private roads in the area.

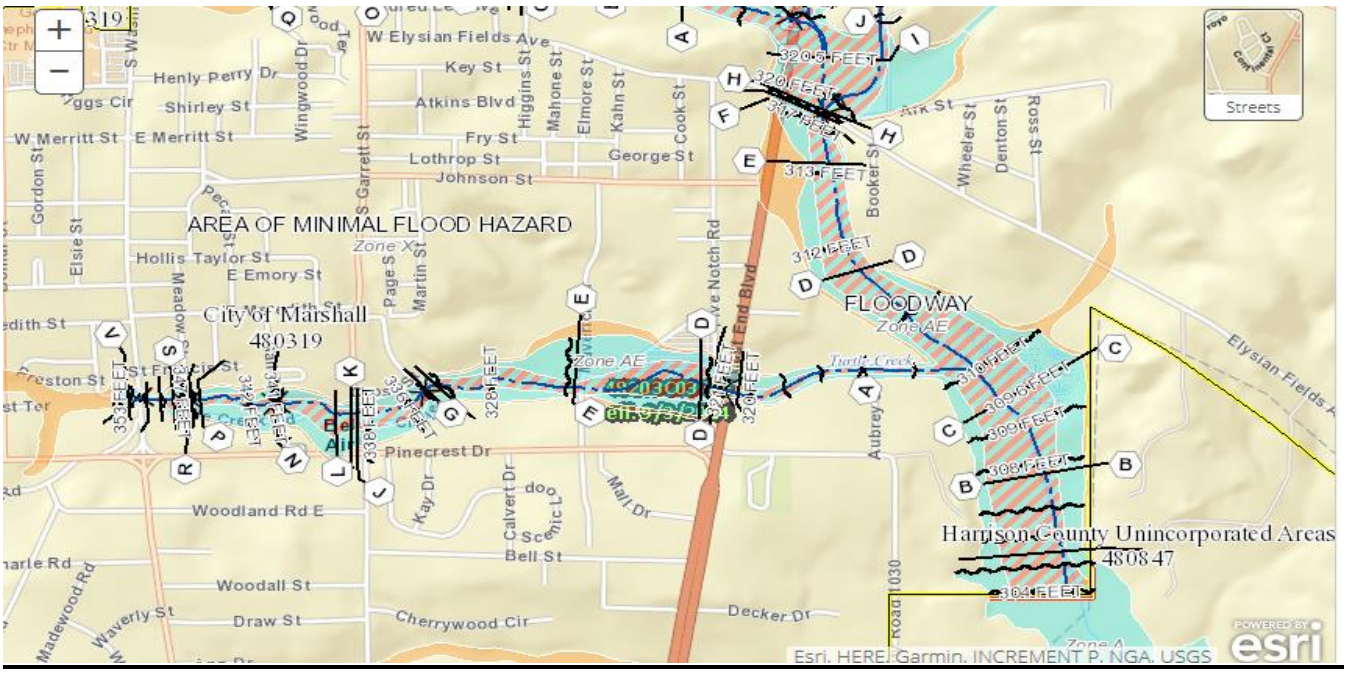




CITY OF MARSHALL

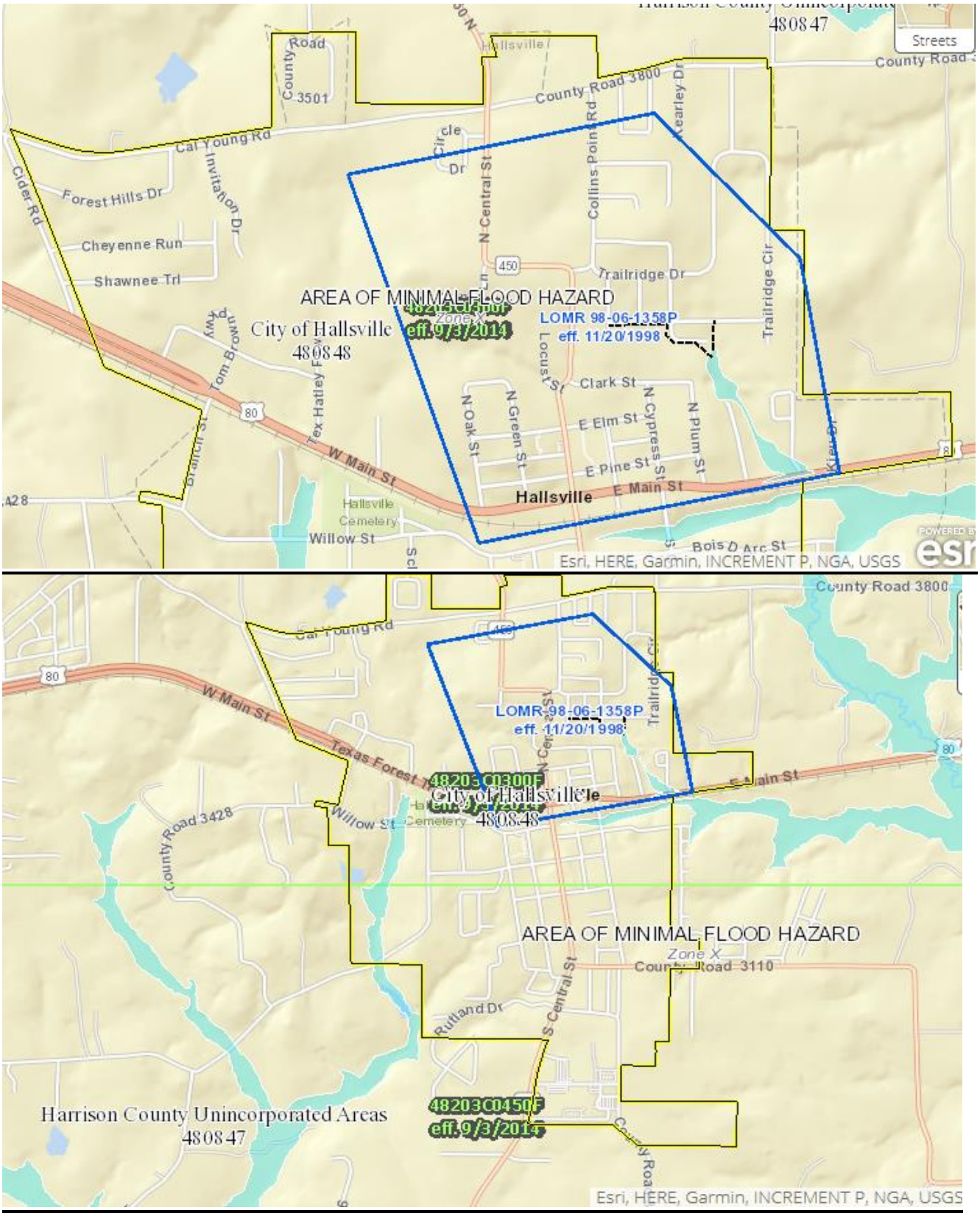




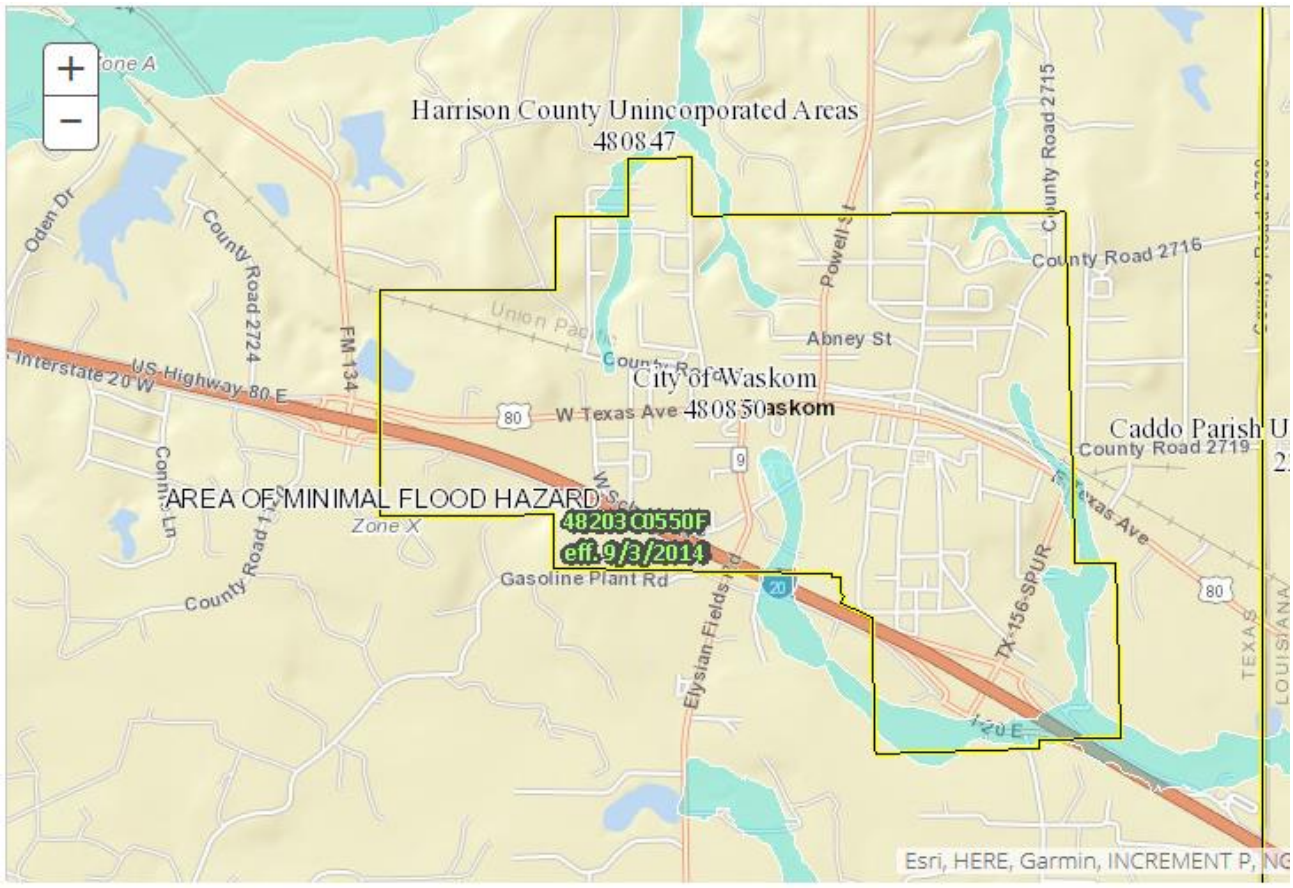


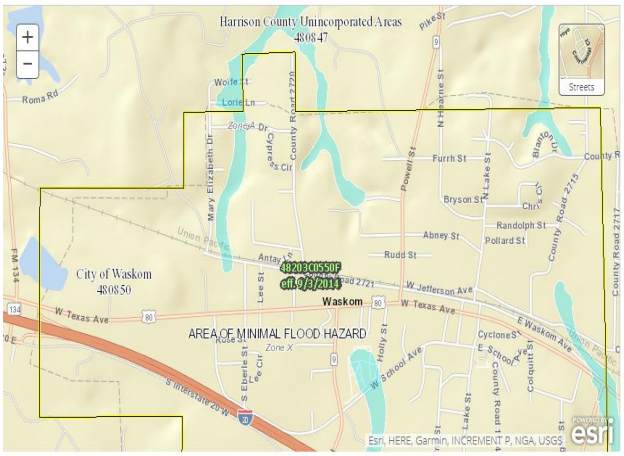
https://msc.fema.gov/portal/search?AddressQuery=harrison%20county20tx#searchresultsanchor

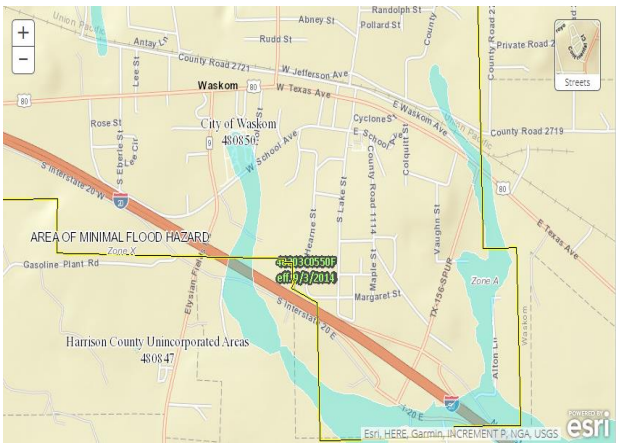
CITY OF HALLSVILLE



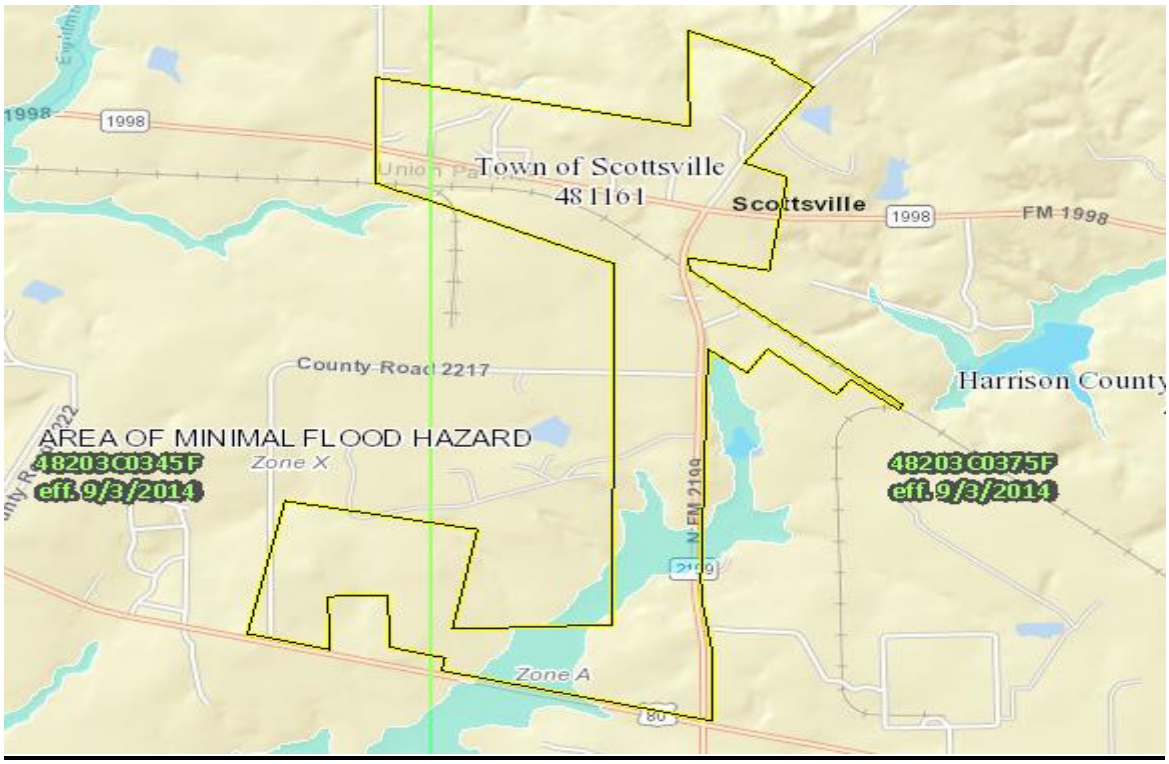
CITY OF WASKOM







CITY OF SCOTTSVILLE



Source: FEMA's National Flood Hazard Layer Map (Official)
https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd

Extent

Throughout Harrison County and the participating jurisdictions, the worst flood events have been associated with major riverine flooding. The National Weather Service (NWS) has produced flood scenarios that identify infrastructure vulnerable to flooding as local rivers and creeks enter the flood stage. The primary source of flooding, the Caddo Lake, enters the flood stage at 168.5', the moderate flood stage at 173.5', and the major flood stage at 179.8'.

The worst flooding events in Harrison County and the participating jurisdictions have inflicted as high as $636,364 in property damages. Crop damages during the worst flooding in Harrison County and the participating jurisdictions have been as high as $63,636 with a combined total of $700,000. The worst flood events in Harrison County and the participating jurisdictions have caused 0 fatalities and no injuries. The worst flooding throughout the County and the participating jurisdictions occurred when 20 to 26 inches of rain fell in portions of Harrison, Smith, Morris, Upshur, Gregg, Marion and Harrison counties. Nineteen persons drowned in the rampaging rivers and creeks that swept away bridges, roads and dams, and caused estimated $12 million damage with only one person in Harrison County amongst the 19 drowned.

According the Harrison County's NFIP Participation, no elevation is determined. Therefore Harrison County can expect to fall in the Below Flood Stage category and receive up to 15 feet of water.

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

Probability

In the case of the FEMA 100 – year floodplain, there's a 1% annual chance, and in the 500 – year floodplain it's a 0.02% annual chance. The likelihood of a 100 – year flood event is therefore occasional. The likelihood of a 500 – year flood event is therefore unlikely.

However, based on the frequency of previous flood events, every jurisdiction can expect to experience some type of flooding that may or may not meet the definition of a 100 – year or 500-year event on a more regular basis.

In the Cities of Marshall, Waskom, Hallsville, and Scottsville, previous flood history indicates that a future flood event is likely.

Historical patterns are assumed to be a dominant factor in determining future flood events. Based upon the historical instances of flood events that have occurred in the area during the last 52 years, the annual probability of occurrence for these events was estimated as follows.

Since 1966, multiple flood events occurred in the planning area in 52 years. Based on this data, the planning team estimates the probability for multiple floods in any given year to be over 34%. The probability of flooding in Harrison County is occasional.

Probability of Future Events	Years in Record Span 1966-2017	No. of Events in the Span	Computation	Future Probability of 1 or more events year
Planning Area	52	18	(18/52) * 100=	34%
All other jurisdictions within the planning area can be equally affected. The probability of future occurrence can be anticipated to impact all jurisdictions significantly at once every year.				

Impact

The impact of a FEMA 100 – year flood event will vary depending on the specific location, size of the affected area, and number of structures affected. Parts of the community may temporarily lose power due to downed power lines. Motorists and residents may be left stranded and needing rescue. Affected structures may be flooded, damaged by flood borne contaminants, damaged by debris flow, or even completely washed away. Estimated damage totals to vulnerable parcels affected during a 100 – year flood event may meet or exceed the totals outlined in the Flood Events Table above.

Despite the unlikely probability of a so-called 500 – year flood, 0.02% in any given year, the danger isn't negligible. Moreover, the relatively limited information on the 500-year flood zone should not be interpreted to mean that a 500 – year flood will only occur in the areas depicted in the 500-year flood zone. Parts of the community may temporarily lose power due to downed power lines. Motorists and residents may be left stranded and needing rescue. Affected structures may be flooded, damaged by flood borne contaminants, damaged by debris flow, or even completely washed away. A 500 – year flood event is expected to affect a larger area and more structures than a 100 – year flood. Estimated damage totals to vulnerable parcels affected during a 500 – year flood event may meet or exceed the totals outlined in the Flood Events Table above.

The planning team analyzed storm history events as reported by the National Climatic Data Center and used information from personal past experience to profile flooding, and determined that the potential severity of impact for flash flooding is significant.

Jurisdiction	Vulnerabilities
Unincorporated Area Harrison County	• Critical county facilities to include County Courthouse, Sheriff's Office, County Jail. • Power lines, transformers, transformer banks and power stations. • County Radio tower, communications system. • Impassable county roads due to flooding. • Stranded motorists. • All remaining critical facilities. Electrical outages.
Cities of Marshall, Waskom, Hallsville, and Scottsville	• Critical facilities; city hall, library, fire department, designated shelter facilities, electrical outages. • Power lines, transmission lines, transformers, transformer bank • U.S Highway 80 - possible road closures; runs through Waskom, Marshall, Scottsville and Hallsville

Previous Occurrences

The table below summarizes the flood events recorded for the planning area between the years 1966 and 2018. During that 52-year span, the planning area witnessed more than 34 separate flood events. Only county level information is available however, flood events do not consider boundary lines therefore the entire planning area is equally susceptible and county data can be used to reflect city possible impacts.

Flood Highlights for the Planning Area: 1966 - 2018

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	441.00K	0.00K
KNOX (ZONE)	KNOX (ZONE)	TX	09/17/1996	23:55	CST	Flash Flood		0	0	0.00K	0.00K
BAYLOR (ZONE)	BAYLOR (ZONE)	TX	09/17/1996	23:55	CST	Flash Flood		0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	09/26/1996	18:15	CST	Flash Flood		0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	10/21/1996	21:42	CST	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	02/12/1997	23:00	CST	Flash Flood		0	0	0.00K	0.00K
SCOTTSVILLE	HARRISON CO.	TX	04/04/1997	23:35	CST	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	05/27/1997	15:30	CST	Flash Flood		0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	01/06/1998	06:00	CST	Flash Flood		0	0	0.00K	0.00K
WASKOM	HARRISON CO.	TX	04/04/1999	20:15	CST	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	06/24/1999	18:55	CST	Flash Flood		0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	06/08/2001	21:30	CST	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	04/07/2002	22:55	CST	Flash Flood		0	0	0.00K	0.00K
SCOTTSVILLE	HARRISON CO.	TX	12/18/2002	22:00	CST	Flash Flood		0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	12/18/2002	22:30	CST	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	04/11/2005	06:35	CST	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	03/27/2007	12:29	CST-6	Flash Flood		0	0	0.00K	0.00K
ELYSIAN FLDS	HARRISON CO.	TX	07/06/2007	06:00	CST-6	Flash Flood		0	0	0.00K	0.00K

MARSHALL	HARRISON CO.	TX	07/06/2007	06:00	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	03/03/2008	10:38	CST-6	Flash Flood		0	0	5.00K	0.00K
LONGVIEW HGTS	HARRISON CO.	TX	03/30/2008	08:45	CST-6	Flash Flood		0	0	0.00K	0.00K
ELYSIAN FLDS	HARRISON CO.	TX	05/14/2008	05:20	CST-6	Flash Flood		0	0	0.00K	0.00K
BIG SPRING	ANDREWS (ZONE)	TX	10/05/2008	19:22	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	07/28/2009	07:55	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	07/28/2009	08:41	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	07/28/2009	09:00	CST-6	Flash Flood		0	0	20.00K	0.00K
WALKERS MILL	HARRISON CO.	TX	07/28/2009	10:00	CST-6	Flash Flood		0	0	0.00K	0.00K
LEIGH	HARRISON CO.	TX	07/28/2009	11:23	CST-6	Flash Flood		0	0	0.00K	0.00K
HARLETON	HARRISON CO.	TX	07/28/2009	12:44	CST-6	Flash Flood		0	0	100.00K	0.00K
MARSHALL ARPT	HARRISON CO.	TX	08/01/2009	13:35	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL NORTHEAST	HARRISON CO.	TX	10/12/2009	09:35	CST-6	Flash Flood		0	0	0.00K	0.00K
WASKOM	HARRISON CO.	TX	10/12/2009	09:38	CST-6	Flash Flood		0	0	0.00K	0.00K
SCOTTSVILLE	HARRISON CO.	TX	10/12/2009	09:40	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL NORTHEAST	HARRISON CO.	TX	10/13/2009	12:34	CST-6	Flash Flood		0	0	100.00K	0.00K
MARSHALL ARPT	HARRISON CO.	TX	10/29/2009	16:30	CST-6	Flash Flood		0	0	0.00K	0.00K
WOODLAWN	HARRISON CO.	TX	10/29/2009	21:17	CST-6	Flash Flood		0	0	0.00K	0.00K
ELYSIAN FLDS	HARRISON CO.	TX	10/30/2009	00:15	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	09/20/2013	14:00	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	03/09/2015	20:44	CST-6	Flash Flood		0	0	0.00K	0.00K
HARLETON	HARRISON CO.	TX	05/08/2015	05:11	CST-6	Flash Flood		0	0	6.00K	0.00K
HARLETON	HARRISON CO.	TX	05/08/2015	05:11	CST-6	Flash Flood		0	0	100.00K	0.00K
MARSHALL	HARRISON CO.	TX	05/08/2015	06:30	CST-6	Flash Flood		0	0	0.00K	0.00K

MARSHALL	HARRISON CO.	TX	05/08/2015	06:37	CST-6	Flash Flood		0	0	0.00K	0.00K
WALKERS MILL	HARRISON CO.	TX	05/11/2015	00:55	CST-6	Flash Flood		0	0	0.00K	0.00K
WALKERS MILL	HARRISON CO.	TX	05/11/2015	01:45	CST-6	Flash Flood		0	0	10.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	05/11/2015	01:45	CST-6	Flash Flood		0	0	50.00K	0.00K
LONGVIEW HGTS	HARRISON CO.	TX	05/11/2015	02:04	CST-6	Flash Flood		0	0	50.00K	0.00K
MARSHALL NORTHEAST	HARRISON CO.	TX	05/11/2015	02:52	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	05/11/2015	04:25	CST-6	Flash Flood		0	0	0.00K	0.00K
KARNACK	HARRISON CO.	TX	05/11/2015	04:25	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	05/25/2015	18:48	CST-6	Flash Flood		0	0	0.00K	0.00K
WASKOM	HARRISON CO.	TX	08/19/2015	16:30	CST-6	Flash Flood		0	0	0.00K	0.00K
BALDWIN	HARRISON CO.	TX	03/08/2016	17:50	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	03/09/2016	07:10	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	03/09/2016	07:49	CST-6	Flash Flood		0	0	0.00K	0.00K
LEIGH	HARRISON CO.	TX	03/09/2016	08:50	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL ARPT	HARRISON CO.	TX	03/09/2016	09:20	CST-6	Flash Flood		0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	03/09/2016	12:00	CST-6	Flash Flood		0	0	0.00K	0.00K
DARCO	HARRISON CO.	TX	03/09/2016	15:24	CST-6	Flash Flood		0	0	0.00K	0.00K
MARSHALL ARPT	HARRISON CO.	TX	04/30/2016	02:00	CST-6	Flash Flood		0	0	0.00K	0.00K
GILL	HARRISON CO.	TX	04/30/2016	02:00	CST-6	Flash Flood		0	0	0.00K	0.00K
GILL	HARRISON CO.	TX	04/30/2016	02:00	CST-6	Flash Flood		0	0	0.00K	0.00K
Totals:								0	0	441.00K	0.00K

https://www.ncdc.noaa.gov/stormevents/listevents

NFIP Insured Structures and Severe Repetitive Loss (B4):

Through the Severe Repetitive Loss (SRL) Grant Program FEMA provides federal funding to assist to states and communities in implementing mitigation measures to reduce or eliminate the long – term risk of flood damage to severe repetitive loss residential structures insured under the National Flood Insurance Program (NFIP). The TWDB administers the SRL grant program for the State of Texas.

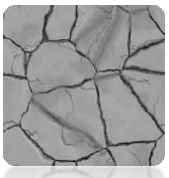
Severe Repetitive Loss properties are defined as residential properties that are:

a) covered under the NFIP and have at least four (4) flood related damage claim payments (building and contents) over $5,000.00 each, and the cumulative amount of such claims payments exceed $20,000; or

b) for which at least two (2) separate claim payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

According to the NFIP, between 1966 and 2018, there have been a total of 5 flood damage claims and no history or repetitive loss properties in the planning area.

DROUGHT



Description

A **Drought** is, "*a period of unusually dry weather that persists long enough to cause environmental or economic problems, such as crop damage and water supply shortages.*" Extreme weather such as heat waves, heavy downpours and droughts are expected to accompanying climate change.

Drought is a frequent hazard encountered in Harrison County, damaging the local economy through destruction of agricultural products. The standard severities of impact categories do not accurately measure the impact of drought on a rural economy.

Droughts are frequently classified as one of following four types:
Meteorological – Drought defined by the level of "dryness" when compared to an average, or normal amount of precipitation over a given period of time.
Agricultural - Agricultural droughts relate common characteristics of drought to their specific agricultural-related impacts. Emphasis tends to be placed on factors such as soil water deficits, water needs based on differing stages of crop development, and water reservoir levels.

Anticipating the range of future droughts that could impact the entire planning are, the planning team then considered the effects those events might have. The table below describes the impacts the various stages of drought could potentially have on the planning area.

Drought Severity Classification

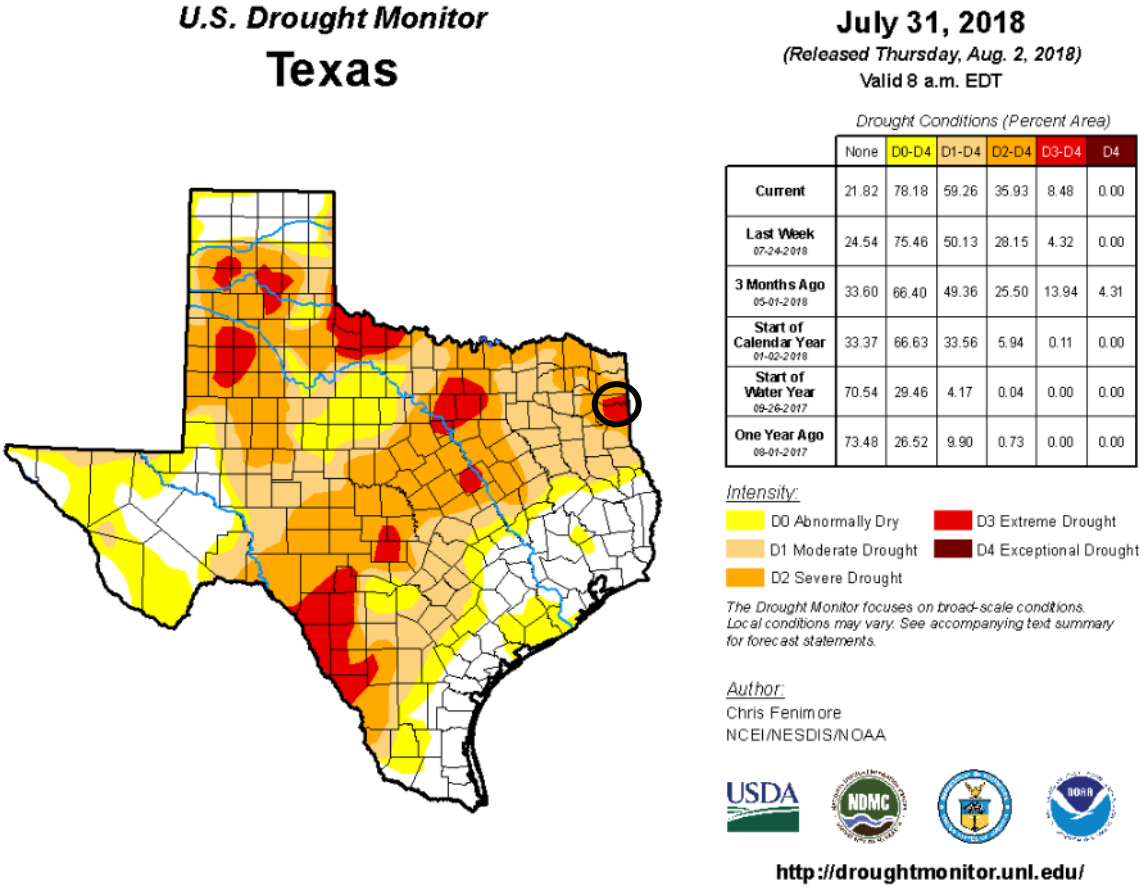
Drought Severity	Return Period (years)	Description of Possible Impacts	Drought Monitoring Indices		
			Standardized Precipitation Index (SPI)	NDMC* Drought Category	Palmer Drought Index
Minor Drought	3 to 4	Going into drought; short-term dryness slowing growth of crops or pastures; fire risk above average. Coming out of drought; some lingering water deficits; pastures or crops not fully recovered.	-0.5 to -0.7	D0	-1.0 to -1.9
Moderate Drought	5 to 9	Some damage to crops or pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested.	-0.8 to -1.2	D1	-2.0 to -2.9
Sèvere Drought	10 to 17	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-1.3 to -1.5	D2	-3.0 to -3.9
Extreme Drought	18 to 43	Major crop and pasture losses; extreme fire danger; widespread water shortages or restrictions.	-1.6 to -1.9	D3	-4.0 to -4.9
Exceptional Drought	44+	Exceptional and widespread crop and pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells creating water emergencies.	less than -2	D4	-5.0 or less

*NDMC - National Drought Mitigation Center

Location

The graphic below depicts drought conditions comparison across Texas. Harrison County has been experiencing drought conditions with a rating of D2. At the current path, Harrison County could be at the D4 level by summer of 2018.
Drought conditions can affect the entire planning area equally.

See graphic below for Harrison County and plan participant's drought conditions.



Extent and Previous Occurrences

Harrison County and the plan participants can expect to see drought conditions up to a rating of D4. In 2011, was described as a 500 year drought which is the worst one year drought in Texas history.

See table below for more information on those events.

Based on empirical data from the planning team and the public, additional events have occurred and are expanded upon in the Impacts portion of this hazard.

Harrison County

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	01/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	02/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	03/01/2012	00:00	CST-6	Drought		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	07/01/2013	00:00	CST-6	Drought		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	08/01/2013	00:00	CST-6	Drought		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	09/01/2013	00:00	CST-6	Drought		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	08/11/2015	00:00	CST-6	Drought		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	09/01/2015	00:00	CST-6	Drought		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	10/01/2015	00:00	CST-6	Drought		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	11/01/2016	00:00	CST-6	Drought		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	11/22/2017	00:00	CST-6	Drought		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	12/01/2017	00:00	CST-6	Drought		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

https://www.ncdc.noaa.gov/stormevents/listevents

Probability of Future Events

Historical patterns are assumed to be a dominant factor in determining future drought events. Probability estimates will be .28%.

Years in the Record Span 1975-2018	No. of times in the Span in which the Event occurred	Computation	Future Probability of 1 or more events per Year
43	12	(12/43) * 100 =	.28%

Impacts

Drought has been a hazard that East Texas has become familiar with. Droughts are one of the most complex natural hazards to identify because it is difficult to determine their precise beginning or end. In addition, droughts can lead to other hazards such as extreme heat and wildfires. Their impact on wildlife and area farming is enormous, often killing crops, grazing land, edible plants and even in severe cases, trees. A secondary hazard to drought is wildfire because dying vegetation serves as a prime ignition source. Therefore, a heat wave combined with a drought is a very dangerous situation. Below is a list of impacts Harrison County has experienced based off drought conditions in the past 7 years.

- Pastures and hay meadows in East Texas were going dormant
- The shortage of hay in East Texas and persistent drought has kept hay prices steady
- East Texas trees stressed by drought
- Grass regrowth poor in East Texas
- 90-day burn bans in August 2011, 2013, 2015, 2017 and 2018
- Livestock receiving supplemental feed in East Texas

Jurisdiction	Vulnerabilities & Impact
Unincorporated Area	• All residents/homes/property are vulnerable to the secondary impacts of drought which is wildfire. In extreme drought conditions grass land is more susceptible to catch on fire from sparks from railcars, cigarette butts and transformer malfunctions with little to limited structures to stop the spread. • Crops & Agricultural accounts/economy: crop damage is likely to occur in the event of a drought. Decreased cattle profits due to increased supplemental feed due to loss of grasses.
City of Marshall, Hallsville, Waskom, and Scottsville	• Vegetation – Landscape/lawn/garden: Around city hall and the parks. • Damage landscape and lawns to residential homes. • Landscape: is vulnerable to dry conditions and lack of water. The impact of drought is increased water use to maintain the existing landscape. • Experience water shortage due to wells in the country. Farmers increase their water usage, thus shortage in the aquifer.

THUNDERSTORMS AND LIGHTNING

Description

Thunderstorms and Lightning may occur year round; however, the peak season is in the spring of each year, is expected to occur at least once a year, and can occur anywhere in Harrison County and the Cities in the planning area. They occur most often between the hours of noon and 10:00 PM. Thunderstorms are associated with lightning and hail. There is not a separate record of lightning and hail for Harrison County; however, about 80% of the severe thunderstorms that occur in Harrison County include lightning. Additional events associated with severe thunderstorms and lightning, are tornadoes, hail, flood, and high wind, which are profiled separately.

Thunderstorm and Lightning events are generated by atmospheric imbalance and turbulence due to the combination of the following conditions: unstable warm air rising rapidly into the atmosphere; sufficient moisture to form clouds and rain; and upward lift of air currents caused by colliding cold and warm weather fronts, sea breezes or mountains. Thunderstorm and Lightning is generated by the buildup of charged ions in a thundercloud, and the discharge of a lightning bolt interacts with the best conducting object or surface on the ground. The air channel of a lightning strike reaches temperatures higher than 50,000 degrees Fahrenheit.
Dry lightning is lightning that occurs without rain nearby. The NOAA Storm Prediction Center routinely forecasts dry lightning because this kind is more likely to cause wildfires.

Extent

Thunderstorms and lightning affect the entire county and can occur anywhere. Based on the frequency of lightning in the planning area, it falls under a scale of LAL4 in the Lightning Activity Level scale, meaning it is anticipated to experience 11-15 cloud to ground strikes in a 5 minute period.

Location

The entire planning area is uniformly exposed to lightning which strikes in very small, specific geographic areas.

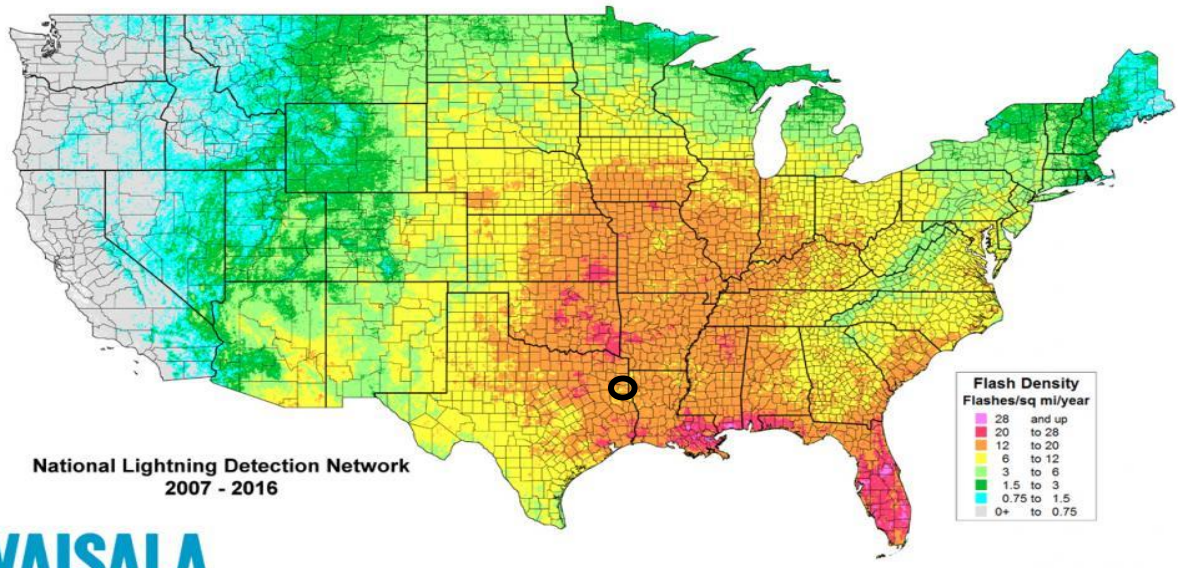
Impact

Thunderstorms and lightning cause considerable damage to crops and property. Injuries and deaths can occur as direct result both to people and to livestock who are not under shelter especially in the rural county area. According to the "Longview News Journal" May 23, 2018, a lightning strike ignited a tank battery (used for oilfield production sites) near Hallsville, TX and caught 7 acres of hay to catch on fire.

https://www.news-journal.com/news/police/lightning-strike-ignites-tank-battery-near-hallsville/article_c7c752fa-5e99-11e8-b332-23f9ee5727e2.html

Lightning Activity Level (LAL)
Is a scale which describes lightning activity. Values are labeled 1-6:

LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a five minute period.
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a 5 minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced Lightning is frequent, 11 to 15 cloud to ground strikes in a 5 minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater then 15 cloud to ground strikes in a 5 minute period.
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag Warning.



Harrison County Thunderstorm Events

Location	County/Zone	St.	Date	Time	T.Z.	Type	Dth	Inj	PrD	CrD
Totals:							0	0	285.00K	0.00K
MARSHALL	HARRISON CO.	TX	04/02/2012	12:37	CST-6	Thunderstorm	0	0	0.00K	0.00K
HARLETON	HARRISON CO.	TX	04/03/2012	19:30	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	05/07/2012	20:40	CST-6	Thunderstorm	0	0	20.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	05/07/2012	20:50	CST-6	Thunderstorm	0	0	15.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	05/07/2012	20:50	CST-6	Thunderstorm	0	0	15.00K	0.00K
MARSHALL	HARRISON CO.	TX	06/12/2012	03:00	CST-6	Thunderstorm	0	0	0.00K	0.00K
KARNACK	HARRISON CO.	TX	06/12/2012	03:00	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	06/15/2012	16:30	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	08/08/2012	16:35	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	08/08/2012	16:45	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	08/15/2012	13:51	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	11/11/2012	16:45	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	12/20/2012	00:30	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	01/29/2013	19:55	CST-6	Thunderstorm	0	0	40.00K	0.00K
WALKERS MILL	HARRISON CO.	TX	05/21/2013	16:45	CST-6	Thunderstorm	0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	05/21/2013	17:30	CST-6	Thunderstorm	0	0	0.00K	0.00K
JONESVILLE	HARRISON CO.	TX	07/11/2013	17:55	CST-6	Thunderstorm	0	0	0.00K	0.00K
WASKOM	HARRISON CO.	TX	07/11/2013	18:00	CST-6	Thunderstorm	0	0	0.00K	0.00K
WASKOM	HARRISON CO.	TX	07/11/2013	18:00	CST-6	Thunderstorm	0	0	25.00K	0.00K
MARSHALL BEERS ARPT	HARRISON CO.	TX	04/03/2014	23:42	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	07/23/2014	18:20	CST-6	Thunderstorm	0	0	0.00K	0.00K
JONESVILLE	HARRISON CO.	TX	10/02/2014	19:10	CST-6	Thunderstorm	0	0	20.00K	0.00K

UNCERTAIN	HARRISON CO.	TX	10/12/2014	16:53	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	04/16/2015	18:30	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	04/16/2015	18:30	CST-6	Thunderstorm	0	0	0.00K	0.00K
WOODLAWN	HARRISON CO.	TX	04/24/2015	20:40	CST-6	Thunderstorm	0	0	0.00K	0.00K
WOODLAWN	HARRISON CO.	TX	04/24/2015	21:40	CST-6	Thunderstorm	0	0	0.00K	0.00K
LEIGH	HARRISON CO.	TX	05/24/2015	11:00	CST-6	Thunderstorm	0	0	150.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	03/24/2016	01:25	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	03/24/2016	01:35	CST-6	Thunderstorm	0	0	0.00K	0.00K
HARLETON	HARRISON CO.	TX	04/11/2016	17:49	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	07/15/2016	16:45	CST-6	Thunderstorm	0	0	0.00K	0.00K
DARCO	HARRISON CO.	TX	03/24/2017	19:30	CST-6	Thunderstorm	0	0	0.00K	0.00K
SCOTTSVILLE	HARRISON CO.	TX	03/24/2017	19:35	CST-6	Thunderstorm	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	03/24/2017	19:35	CST-6	Thunderstorm	0	0	0.00K	0.00K
WALKERS MILL	HARRISON CO.	TX	03/29/2017	04:55	CST-6	Thunderstorm	0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	05/28/2017	16:15	CST-6	Thunderstorm	0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	05/28/2017	16:20	CST-6	Thunderstorm	0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	05/28/2017	16:20	CST-6	Thunderstorm	0	0	0.00K	0.00K
GILL	HARRISON CO.	TX	05/28/2017	16:35	CST-6	Thunderstorm	0	0	0.00K	0.00K
WASKOM	HARRISON CO.	TX	07/01/2017	14:30	CST-6	Thunderstorm	0	0	0.00K	0.00K
WOODLAWN	HARRISON CO.	TX	07/08/2017	15:18	CST-6	Thunderstorm	0	0	0.00K	0.00K
HARLETON	HARRISON CO.	TX	07/08/2017	15:27	CST-6	Thunderstorm	0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	02/24/2018	16:20	CST-6	Thunderstorm	0	0	0.00K	0.00K
WASKOM	HARRISON CO.	TX	04/03/2018	14:48	CST-6	Thunderstorm	0	0	0.00K	0.00K
HARLETON	HARRISON CO.	TX	04/13/2018	22:12	CST-6	Thunderstorm	0	0	0.00K	0.00K

MARSHALL ARPT	HARRISON CO.	TX	04/13/2018	22:35	CST-6	Thunderstorm	0	0	0.00K	0.00K
Totals:							0	0	285.00K	0.00K

https://www.ncdc.noaa.gov/stormevents/listevents

Jurisdiction	Vulnerabilities
Unincorporated Area of Harrison County	• Power lines, transformers, transformer banks and power stations, to include power surges generated by a lightning strike, resulting in loss of electricity for critical systems such as the County 911 system, • County Radio tower, County communications system to include the disruption of emergency 911 systems • HVAC – damage of electronic control systems and sensitive electronic computer equipment. Loss of data, records damage
Cities of Marshal, Hallsville, Waskom and Scottsville	• Electrical surges for computer and other sensitive office equipment at City Hall, library, bank. Damage to City water and sewer control systems. HVAC units. • Power lines, transformers & transformer banks and several power stations. • Serious injury of death to those not in a sheltered area by electrocution.

Previous Occurrences

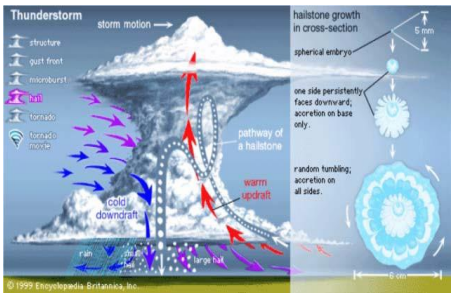
A lightning strike impacting one of the participants has occurred in every jurisdiction at least each year to date. As stated in the vulnerability chart, the municipal well systems are to be most affected.

Probability of Future Events

Statewide Texas has a significant exposure to thunderstorms and lightning. Overall, lightning is the most constant and widespread threat to people and property during the thunderstorm season. The recurrence of lightning is high. Dry lightning has the likelihood of being the spark for large fires in the county. Reporting of lightning strikes to the weather service is very limited. A history based on repairs to government systems was used to develop the probability of future events and to also populate the previous occurrences.

Probability of a lightning event occurring anywhere in the planning area is 100% probable in the next 5 years.

Hailstorms



Description

Hailstorms are an outgrowth of severe thunderstorms. People outdoors would be the most likely victims during a hailstorm, but the biggest threat would come from large hailstones and damage they would cause to property.

The table below provides definition to the various sizes or categories of hail and the potential damage that can be caused by hail of that size. Hail is a form of solid precipitation. It consists of balls or irregular lumps of ice, each of which is called a hailstone. A Hailstorm is, “any storm that produces hailstones that reach the ground.” Hail is produced by ice crystals that form in a low pressure front due to the rapid rising of warm air into the upper atmosphere and subsequent cooling of the air mass. Hail usually falls as shaped masses of ice greater than 0.25 inches in diameter. The size of the hail can be directly correlated with the size of the thunderstorm.

Location

The entire planning area is equally exposed to Hail which can fall in very small, specific geographic areas and can anticipate frequent hailstorms that can contribute to property and crop damage.

Extent

While the average size of hail encountered throughout the planning area, measured by the diameter, is 2.36”, there have been many occurrences when the diameter measured 0.75” and as high as 2.75” a range of H2-H7 on the combined NOAA/TORRO Hailstorm Intensity Scale. Therefore, the entire planning area can experience up to a H7, with hail diameter of up to 3.0”.

NWS/TORRO Hail Scale

Combined NOAA/TORRO Hailstorm Intensity Scales				
Size Code	**Intensity Category**	**Typical Hail Diameter (inches)**	**Approximate Size**	**Typical Damage Impacts**
H0	Hard Hail	up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33-0.60	Marble or Mothball	Slight damage to plants, crops
H2	Potentially Damaging	0.60-0.80	Dime or grape	Significant damage to fruit, crops, vegetation
H3	Severe	0.80-1.20	Nickel to Quarter	Severe damage to fruit and crops, damage to glass and

				plastic structures, paint and Harrison scored
H4	Severe	1.2-1.6	Half Dollar to Ping Pong Ball	Widespread glass damage, vehicle bodywork damage
H5	Destructive	1.6-2.0	Silver dollar to Golf Ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0-2.4	Lime or Egg	Aircraft bodywork dented, brick walls pitted
H7	Very destructive	2.4-3.0	Tennis ball	Severe roof damage, risk of serious injuries
H8	Very destructive	3.0-3.5	Baseball to Orange	Severe damage to aircraft bodywork
H9	Super Hailstorms	3.5-4.0	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	4+	Softball and up	Extensive structural damage. Risk of severe/fatal injuries to persons in the open

Source: www.noaa.gov and www.torro.org

Impact

Hail can cause considerable damage to crops and property. Injuries and deaths can occur as direct result both to people and to livestock who are not under shelter especially in the rural county area. Hail damage to both vehicles and buildings (glass) can be costly and increase insurance premiums. Glass repairs can cause a significant reduction in workforce as employees are without transportation to go to work due to reparation of vehicles or waiting for contractors to conduct home repairs, schools could be forced to relocate their students into other rooms if damage to classroom windows is severely damaged.

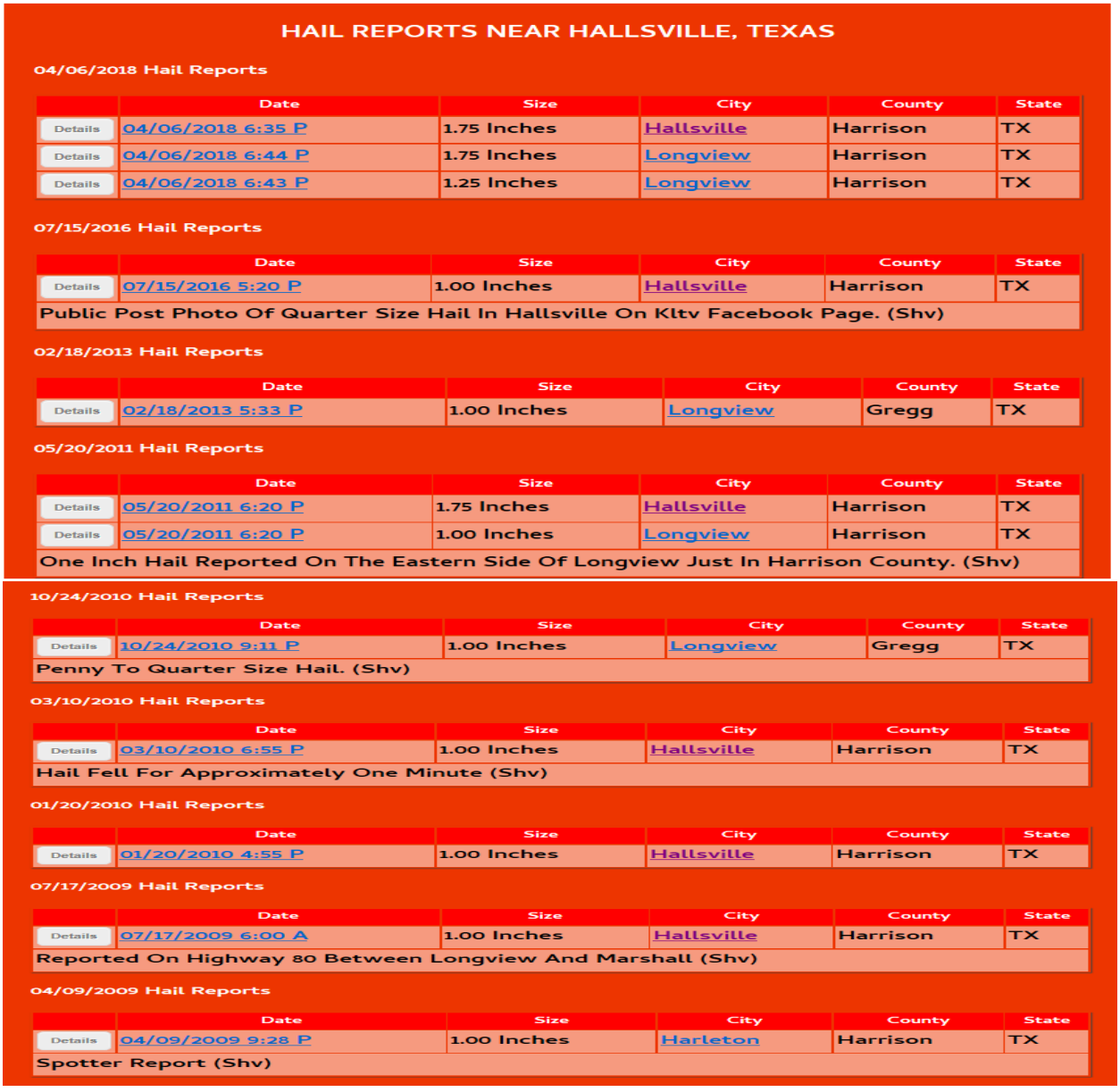
Probability of Future Events

Specific damage loss numbers as reported by NOAA Storm Events Database were used to produce the data for the estimation of future loss. It is important to understand that the true financial impact due to hailstorms is difficult to state. Property damage information for residents who make insurance claims to home insurance or vehicle insurance are typically not included in the Storm Event data. Therefore, you can make the conclusion that the property damage is probably double the reported range. Probability of a hail event occurring anywhere in the planning area is 100% probable in the next 5 years.

Occurrences

A hail storm can impact any one of the surrounding areas of Harrison County and has occurred in every jurisdiction at least each year to date. The whole area is vulnerable to hail at any time of the year. The largest hail recently reported was 2.75 inches 3/10/18 in Scottsville.

Hail Reports near Hallsville and the unincorporated surrounding areas.



HAIL REPORTS NEAR HALLSVILLE, TEXAS

04/06/2018 Hail Reports

	Date	Size	City	County	State
Details	04/06/2018 6:35 P	1.75 Inches	Hallsville	Harrison	TX
Details	04/06/2018 6:44 P	1.75 Inches	Longview	Harrison	TX
Details	04/06/2018 6:43 P	1.25 Inches	Longview	Harrison	TX

07/15/2016 Hail Reports

	Date	Size	City	County	State
Details	07/15/2016 5:20 P	1.00 Inches	Hallsville	Harrison	TX
Public Post Photo Of Quarter Size Hail In Hallsville On Kltv Facebook Page. (Shv)					

02/18/2013 Hail Reports

	Date	Size	City	County	State
Details	02/18/2013 5:33 P	1.00 Inches	Longview	Gregg	TX

05/20/2011 Hail Reports

	Date	Size	City	County	State
Details	05/20/2011 6:20 P	1.75 Inches	Hallsville	Harrison	TX
Details	05/20/2011 6:20 P	1.00 Inches	Longview	Harrison	TX
One Inch Hail Reported On The Eastern Side Of Longview Just In Harrison County. (Shv)					

10/24/2010 Hail Reports

	Date	Size	City	County	State
Details	10/24/2010 9:11 P	1.00 Inches	Longview	Gregg	TX
Penny To Quarter Size Hail. (Shv)					

03/10/2010 Hail Reports

	Date	Size	City	County	State
Details	03/10/2010 6:55 P	1.00 Inches	Hallsville	Harrison	TX
Hail Fell For Approximately One Minute (Shv)					

01/20/2010 Hail Reports

	Date	Size	City	County	State
Details	01/20/2010 4:55 P	1.00 Inches	Hallsville	Harrison	TX

07/17/2009 Hail Reports

	Date	Size	City	County	State
Details	07/17/2009 6:00 A	1.00 Inches	Hallsville	Harrison	TX
Reported On Highway 80 Between Longview And Marshall (Shv)					

04/09/2009 Hail Reports

	Date	Size	City	County	State
Details	04/09/2009 9:28 P	1.00 Inches	Harleton	Harrison	TX
Spotter Report (Shv)					

03/29/2008 Hail Reports

	Date	Size	City	County	State
Details	03/29/2008 9:45 P	1.00 Inches	Hallsville	Harrison	TX
Hail Covering Ground...Lasted 15 Mins (Shv)					
Details	03/29/2008 9:25 P	1.75 Inches	Longview	Gregg	TX

11/27/2005 Hail Reports

	Date	Size	City	County	State
Details	11/27/2005 6:55 P	1.25 Inches	Harleton	Harrison	TX
Half Dollar Size Hail. (Shv)					

04/07/2004 Hail Reports

	Date	Size	City	County	State
Details	04/07/2004 4:55 P	1.00 Inches	Hallsville	Harrison	TX

Hail reports near Waskom and the unincorporated surrounding areas.

HAIL REPORTS NEAR WASKOM, TEXAS

04/06/2018 Hail Reports

	Date	Size	City	County	State
Details	04/06/2018 6:30 P	2.75 Inches	Elysian Fields	Harrison	TX

03/11/2018 Hail Reports

	Date	Size	City	County	State
Details	03/11/2018 12:15 A	1.75 Inches	De Berry	Panola	TX
Corrects Previous Hail Report From 10 Ssw Waskom. Golfball Size Hail Fell Near The Deberry Community. (Shv)					

05/28/2017 Hail Reports

	Date	Size	City	County	State
Details	05/28/2017 5:25 P	1.00 Inches	Jonesville	Harrison	TX
Public Reports Hail Via Ksla Facebook Page. (Shv)					

03/17/2016 Hail Reports

	Date	Size	City	County	State
Details	03/17/2016 2:47 P	1.50 Inches	Jonesville	Harrison	TX
3 Miles West Of Waskom Ping Pong Size Hail. (Shv)					

06/29/2015 Hail Reports

	Date	Size	City	County	State
Details	06/29/2015 5:20 P	1.25 Inches	Blanchard	Caddo	LA
Hail On Blanchard Furrh Road Between Blanchard And Longwood. (Shv)					

03/28/2014 Hail Reports

	Date	Size	City	County	State
Details	03/28/2014 6:00 P	2.75 Inches	Jonesville	Harrison	TX
Baseballl Size Hail Was Reoprted In Waskom Tx. (Shv)					
Details	03/28/2014 6:05 P	1.75 Inches	Greenwood	Caddo	LA
Details	03/28/2014 6:26 P	1.50 Inches	Greenwood	Caddo	LA
Ping Pong Size Hail At Greenwook (Shv)					
Details	03/28/2014 6:00 P	2.75 Inches	Jonesville	Harrison	TX
Baseballl Size Hail Was Reported In Waskom Tx. (Shv)					
Details	03/28/2014 6:30 P	1.75 Inches	Greenwood	Caddo	LA
Severe Damage To Mobile Home And Vehicle Windows Cracked On Fawn Lane (Shv)					

10/24/2010 Hail Reports

	Date	Size	City	County	State
Details	10/24/2010 10:15 P	1.50 Inches	Jonesville	Harrison	TX
Hail Fell Between Strickland Springs Road Along Fm 2625 Southwest Of Waskom. (Shv)					

06/07/2010 Hail Reports

	Date	Size	City	County	State
Details	06/07/2010 5:44 P	1.00 Inches	Greenwood	Caddo	LA

05/20/2010 Hail Reports

	Date	Size	City	County	State
Details	05/20/2010 2:59 P	1.00 Inches	Waskom	Harrison	TX

02/11/2009 Hail Reports

	Date	Size	City	County	State
Details	02/11/2009 1:00 A	0.75 Inches	Bethany	Caddo	LA
Penny Sized Hail In Bethany (Shv)					

05/04/2006 Hail Reports

	Date	Size	City	County	State
Details	05/04/2006 7:25 P	0.88 Inches	Bethany	Caddo	LA
Hail Fell Approximately 5 Miles North Of Spring Ridge. (Shv)					

04/07/2006 Hail Reports

	Date	Size	City	County	State
Details	04/07/2006 7:16 P	1.00 Inches	Greenwood	Caddo	LA

08/23/2005 Hail Reports

	Date	Size	City	County	State
Details	08/23/2005 5:35 P	0.75 Inches	Jonesville	Harrison	TX

03/31/2005 Hail Reports

	Date	Size	City	County	State
Details	03/31/2005 10:00 P	0.75 Inches	Jonesville	Harrison	TX
Details	03/31/2005 8:25 P	1.75 Inches	Jonesville	Harrison	TX

03/14/2005 Hail Reports

	Date	Size	City	County	State
Details	03/14/2005 10:00 P	0.88 Inches	Greenwood	Caddo	LA
Hail The Size Of Nickels Covering The Ground (Shv)					

Hail report near Marshall, Scottsville and the unincorporated areas.

HAIL REPORTS NEAR MARSHALL, TEXAS

04/06/2018 Hail Reports

	Date	Size	City	County	State
Details	04/06/2018 6:05 P	1.25 Inches	Marshall	Harrison	TX
Details	04/06/2018 6:05 P	1.75 Inches	Marshall	Harrison	TX
Details	04/06/2018 6:30 P	1.75 Inches	Elysian Fields	Harrison	TX
Details	04/06/2018 6:50 P	1.25 Inches	Marshall	Harrison	TX

03/10/2018 Hail Reports

	Date	Size	City	County	State
Details	03/10/2018 11:38 P	1.00 Inches	Marshall	Harrison	TX
Details	03/10/2018 11:45 P	2.75 Inches	Scottsville	Harrison	TX
Baseball Size Hail Fell In Scottsville. (Shv)					
Details	03/10/2018 11:59 P	1.00 Inches	Elysian Fields	Harrison	TX
Quarter Size Hail Fell At The Ponds Estates Near The Crossroads Community. (Shv)					

01/21/2017 Hail Reports

	Date	Size	City	County	State
Details	01/21/2017 4:20 P	1.00 Inches	Scottsville	Harrison	TX

04/11/2016 Hail Reports

	Date	Size	City	County	State
Details	04/11/2016 7:30 P	1.00 Inches	Scottsville	Harrison	TX

03/28/2014 Hail Reports

	Date	Size	City	County	State
Details	03/28/2014 5:45 P	1.25 Inches	Marshall	Harrison	TX
Details	03/28/2014 5:49 P	1.25 Inches	Elysian Fields	Harrison	TX
Near Intersection Of Fm31 And Fm2625 (Shv)					

03/31/2013 Hail Reports

	Date	Size	City	County	State
Details	03/31/2013 10:15 A	1.00 Inches	Marshall	Harrison	TX

06/15/2012 Hail Reports

	Date	Size	City	County	State
Details	06/15/2012 5:30 P	1.00 Inches	Marshall	Harrison	TX

10/24/2010 Hail Reports

	Date	Size	City	County	State
Details	10/24/2010 10:00 P	1.00 Inches	Elysian Fields	Harrison	TX
Quarter Size Hail Fell About 2 Miles North Of Elysian Fields. Report From A Cocorahs Observer. (Shv)					

04/09/2009 Hail Reports

	Date	Size	City	County	State
Details	04/09/2009 9:28 P	1.00 Inches	Harleton	Harrison	TX
Spotter Report (Shv)					

05/22/2008 Hail Reports

	Date	Size	City	County	State
Details	05/22/2008 3:45 P	0.75 Inches	Marshall	Harrison	TX
Penny Sized Hail Along I-20...Cars Forced To Leave The Road Due To Visibility Issues (Shv)					

	Date	Size	City	County	State
Details	02/12/2008 7:22 A	1.00 Inches	Marshall	Harrison	TX
Hail Fell Just South Of The Harrison County Airport Along Hwy 31 Just North Of Interstate 20. (Shv)					

11/27/2005 Hail Reports

	Date	Size	City	County	State
Details	11/27/2005 6:55 P	1.25 Inches	Harleton	Harrison	TX
Half Dollar Size Hail. (Shv)					
Details	11/27/2005 7:25 P	0.75 Inches	Marshall	Harrison	TX

04/07/2004 Hail Reports

	Date	Size	City	County	State
Details	04/07/2004 5:05 P	1.75 Inches	Marshall	Harrison	TX
Hail Reported On The North Side Of Marshall On Hwy 43. (Shv)					

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
MARSHALL BEERS ARPT	HARRISON CO.	TX	04/20/2012	06:10	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	06/15/2012	16:30	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	03/31/2013	09:15	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	03/28/2014	16:45	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
CROSSROADS	HARRISON CO.	TX	03/28/2014	16:49	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
WASKOM	HARRISON CO.	TX	03/28/2014	17:00	CST-6	Hail	2.75 in.	0	0	0.00K	0.00K
HARLETON	HARRISON CO.	TX	05/09/2014	14:04	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
KARNACK	HARRISON CO.	TX	05/09/2014	15:45	CST-6	Hail	1.50 in.	0	0	0.00K	0.00K
UNCERTAIN	HARRISON CO.	TX	05/09/2014	15:46	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
GILL	HARRISON CO.	TX	04/19/2015	16:35	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
JONESVILLE	HARRISON CO.	TX	03/17/2016	13:47	CST-6	Hail	1.50 in.	0	0	0.00K	0.00K
MARSHALL NORTHEAST	HARRISON CO.	TX	04/11/2016	18:30	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
HALLSVILLE	HARRISON CO.	TX	07/15/2016	16:20	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
SCOTTSVILLE	HARRISON CO.	TX	01/21/2017	16:20	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
GILL	HARRISON CO.	TX	04/26/2017	14:40	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
WASKOM	HARRISON CO.	TX	05/28/2017	16:25	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
WALKERS MILL	HARRISON CO.	TX	03/11/2018	00:30	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
MARSHALL ARPT	HARRISON CO.	TX	03/11/2018	00:38	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
SCOTTSVILLE	HARRISON CO.	TX	03/11/2018	00:45	CST-6	Hail	2.75 in.	0	0	0.00K	0.00K
CROSSROADS	HARRISON CO.	TX	03/11/2018	00:59	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
CROSSROADS	HARRISON CO.	TX	03/11/2018	00:59	CST-6	Hail	1.00 in.	0	0	0.00K	0.00K
ELYSIAN FLDS	HARRISON CO.	TX	03/11/2018	01:07	CST-6	Hail	0.75 in.	0	0	0.00K	0.00K
MARSHALL ARPT	HARRISON CO.	TX	04/06/2018	17:05	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	04/06/2018	17:05	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
CROSSROADS	HARRISON CO.	TX	04/06/2018	17:30	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K

CROSSROADS	HARRISON CO.	TX	04/06/2018	17:30	CST-6	Hail	2.75 in.	0	0	0.00K	0.00K
WALKERS MILL	HARRISON CO.	TX	04/06/2018	17:40	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
LONGVIEW HGTS	HARRISON CO.	TX	04/06/2018	17:50	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
LONGVIEW HGTS	HARRISON CO.	TX	04/06/2018	17:50	CST-6	Hail	1.75 in.	0	0	0.00K	0.00K
MARSHALL	HARRISON CO.	TX	04/06/2018	17:50	CST-6	Hail	1.25 in.	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

https://www.ncdc.noaa.gov/stormevents/listevents

Jurisdiction	Vulnerabilities
Unincorporated Area Of Harrison County	• The communication tower and /or county communications system not covered or shielded, impact could be loss/interruption of communications • Damage to the County Courthouse and county barns. • Windshield and body damage to school buses and vehicles on school property. Impacts of damaged windshields could cause accidents and put the driver and passenger lives at risk. • Damage to buildings and homes include roof windows and HVAC systems. • Crop damage. Impact would be economic loss to farmers. • Possible damage to show stock.
Cities of Marshal, Hallsville, Waskom and Scottsville	• Critical Facility – roof and glass windows for City hall, library, community building, fire and EMS buildings and designated emergency shelters. HVAC units. Impact from shattered glass could lead to injuries and/or work stoppage. • Vehicle body and glass Windows: Specifically damage to emergency response vehicles and public works vehicles and machinery required to respond to calls during hailstorm events. • Economic impact.

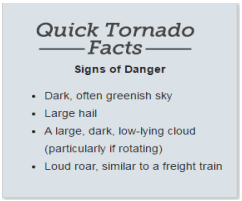
Probability of Future Events

Specific damage loss numbers as reported by NOAA Storm Events Database were used to produce the data for the estimation of future loss. It is important to understand that the true financial impact due to hailstorms is difficult to state. Property damage information for residents who make insurance claims to home insurance or vehicle insurance are typically not included in the Storm Event data. Therefore, you can make the conclusion that the property damage is probably double the reported range.

Tornado

Description

A **tornado** appears as a rotating, funnel-shaped cloud that extends from a thunderstorm to the ground with whirling winds that can reach 300 miles per hour. Damage paths can be in excess of one mile wide and 50 miles long. Some tornadoes are clearly visible, while rain or nearby low-hanging clouds obscure others. Occasionally, tornadoes develop so rapidly that little, if any, advance warning is possible.



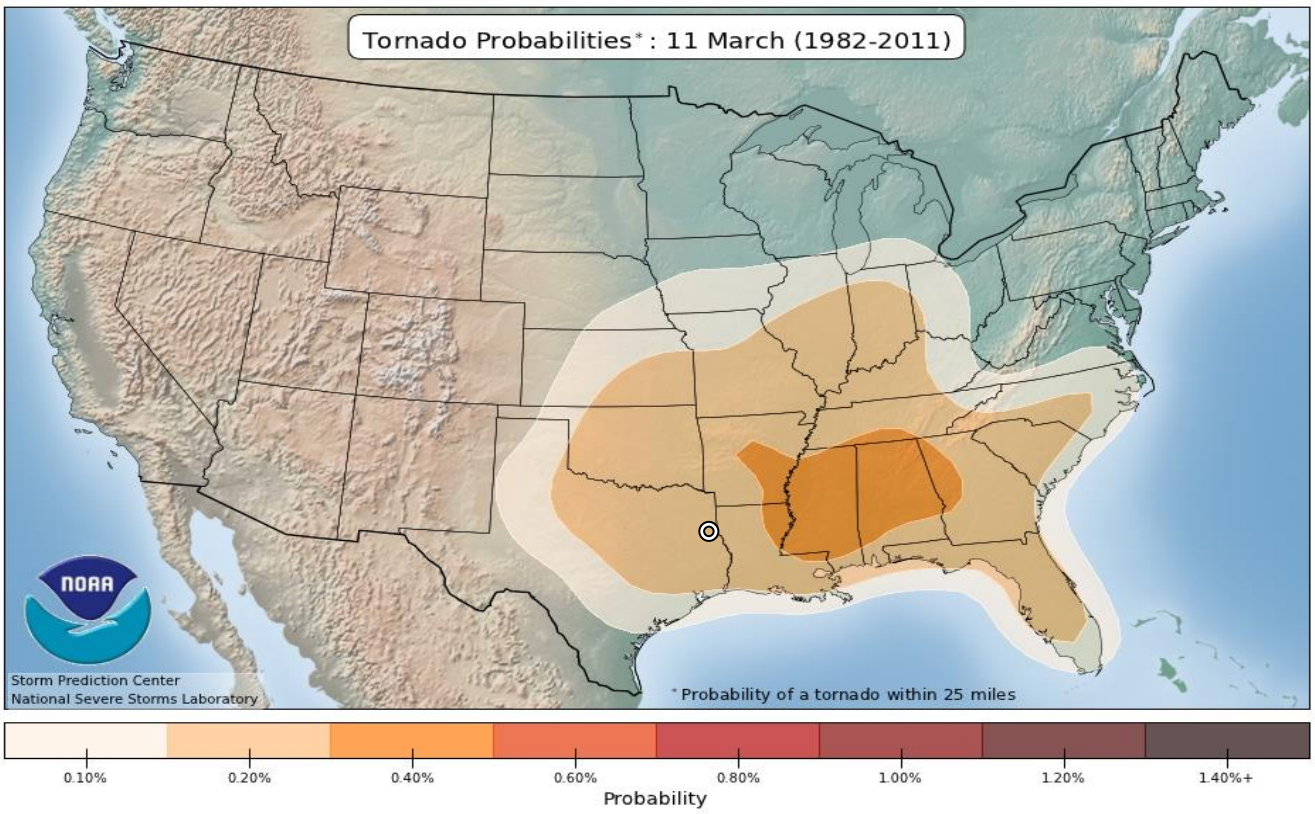
Each year, an average of over 1,000 tornadoes is reported nationwide, resulting in an average of 80 deaths and 1,500 injuries. They are more likely to occur during the spring and early summer months of March through June and can occur at any time of day, but are likely to form in the late afternoon and early evening.

The Enhanced Fujita (EF) Scale for tornadoes was developed to measure tornado strength and associated damages; it is divided into six categories from zero to five representing increasing degrees of damage. Overall, most tornadoes (around 77 percent) in the U.S. are considered weak (EF0 or EF1) and about 95 percent of all U.S. tornadoes are below EF3 intensity. The remaining small percentage of tornadoes are categorized as violent (EF3 and above).

Enhanced Fujita (EF) Scale

Enhanced Fujita (EF) Scale		
Enhanced Fujita Category	**Wind Speed (mph)**	**Potential Damage**
EF0	65-85	**Light damage** Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110	**Moderate damage** Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	**Considerable damage** Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light- object missiles generated; cars lifted off ground.

EF3	136-165	**Severe damage** Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	**Devastating damage** Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	**Incredible damage** Strong frame houses leveled off foundations and swept away; automobile- sized missiles fly through the air in excess of 100 m (109 yd.); high-rise buildings have significant structural deformation; incredible phenomena will occur.



*These probability values were estimated from a 30-year period of severe weather reports from 1982-2011. The procedure to create the maps is as follows:

1. Reports for each day are put onto a grid 80 km x 80 km.
2. If one or more reports occur in a grid box, that box is assigned the value "1" for the day. If no reports occur, it's a zero.
3. The raw frequency for each day at each grid location is found for the period (number of "1" values divided by number of years) to get a raw annual cycle.
4. The raw annual cycle at each point is smoothed in time, using a Gaussian filter with a standard deviation of 15 days.
5. The smoothed time series are then smoothed in space with a 2-D Gaussian filter (SD = 120 km in each direction).

Location

The entire planning area of Harrison County and the Cities are similarly vulnerable to the threat of tornadoes and experiences one F0-F1 tornado nearly every year.

Extent

Although the unincorporated area has only experienced F0-F1 tornados, neighboring jurisdictions have experienced F3-F4 tornados. The entire planning area may experience up to an EF5.

Impact

Recorded EF1 tornados in surrounding counties have destroyed mobile homes, heavily damaged vehicles, fences and power poles; while the EF2 tornados have snapped power poles, lifted vehicles, moved large fuel tanks and stripped trees.

Tornado impacts on basic services can be devastating. Damage to businesses and residents can be immense, but a significant vulnerability can be the loss of basic services and a safe environment following a tornado.
Examples of potential losses are:

- Damage to infrastructure (e.g., storage tanks, hydrants, residential plumbing fixtures, distribution system) from a tornadic event can result in loss of service and/or reduced pressure throughout the system
- Restricted access to the facility due to debris and damaged roads
- Loss of power and communication lines
- Potential contamination due to chemical leaks from ruptured containers
- Severe water and pressure loss due to ruptured service lines in damaged buildings and broken fire hydrants from airborne debris

Jurisdiction	Vulnerabilities
Unincorporated Harrison County	• Critical city facilities to include Courthouse, Jail, Sheriff's Office and Precinct barns. Precinct and other county owned vehicles. • The communication tower located at the County road and /or county communications system not covered or shielded, impact could be loss/interruption of communications • Power lines, transformers, transformer banks, substations and power stations. • Damage to (3) homes located on the school grounds include roof windows. • Windshield and body damage to school buses and vehicles on school property. Impacts of damaged windshields could cause accidents and put the driver and passenger lives at risk. • Possible damage to show stock. • Crop damage. Impact would be economic loss to farmers.
Cities of Hallsville, Scottsville, Marshall and Waskom	• City owned above ground water wells, water towers and HVAC units. • Critical city hall, library, community building, city barn, fire department and EMS building and designated shelters. • City Vehicles to include: responder services and public works vehicles and machinery. • Power lines, transmission lines, transformers, transformer bank

Probability of Future Events

Historical patterns are assumed to be a dominate factor in determining future tornado events. Based upon the historical instances of tornado events that have occurred with the planning area during the last 62 years, the annual probability of occurrence for these events and vulnerability are depicted below. The entire planning area lies in a low risk zone for tornados.

Probability of Future Events	Years in Record Span 1954-2016	No. of Events in the Span	Computation	Future Probability of 1 or more events year
Harrison County Unincorporated Area	62	41	(41/62) * 100=	66.00%
Cities of Hallsville, Scottsville, Marshall and Waskom	All other jurisdictions within the planning area can be equally affected as tornadoes can go anywhere. The probability of future occurrence can be anticipated to impact all jurisdictions significantly.			

Previous Occurrences

Date(s) (2012 - 2016)	Tornadoes	Fatalities	Highest Fatalities	Injuries	Highest Injuries	Longest Path	Widest Path
2012 - 2018	9	0 people	0 people	1	1	6.93 miles	234 yards

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	1	2.300M	0.00K
JONESVILLE	HARRISON CO.	TX	05/16/2013	13:20	CST-6	Tornado	EF1	0	1	100.00K	0.00K
WASKOM	HARRISON CO.	TX	05/16/2013	13:34	CST-6	Tornado	EF1	0	0	50.00K	0.00K
LONGVIEW HGTS	HARRISON CO.	TX	04/09/2015	18:20	CST-6	Tornado	EF1	0	0	300.00K	0.00K
GILL	HARRISON CO.	TX	05/24/2015	10:34	CST-6	Tornado	EF1	0	0	75.00K	0.00K
MARSHALL ARPT	HARRISON CO.	TX	05/25/2015	10:46	CST-6	Tornado	EF1	0	0	300.00K	0.00K
MARSHALL NORTHEAST	HARRISON CO.	TX	12/27/2015	16:39	CST-6	Tornado	EF2	0	0	300.00K	0.00K
ELYSIAN FLDS	HARRISON CO.	TX	04/29/2016	21:21	CST-6	Tornado	EF1	0	0	0.00K	0.00K
JONESVILLE	HARRISON CO.	TX	04/29/2016	21:46	CST-6	Tornado	EF1	0	0	50.00K	0.00K
WOODLAWN	HARRISON CO.	TX	04/29/2016	23:34	CST-6	Tornado	EF1	0	0	30.00K	0.00K
SCOTTSVILLE	HARRISON CO.	TX	01/21/2017	16:18	CST-6	Tornado	EF2	0	0	1.000M	0.00K
DARCO	HARRISON CO.	TX	03/24/2017	19:31	CST-6	Tornado	EF2	0	0	90.00K	0.00K
HARLETON	HARRISON CO.	TX	04/13/2018	22:08	CST-6	Tornado	EF1	0	0	5.00K	0.00K
ELYSIAN FLDS	HARRISON CO.	TX	04/13/2018	22:50	CST-6	Tornado	EF0	0	0	0.50K	0.00K

https://www.ncdc.noaa.gov/stormevents/listevents

Wildfire
Description

A **Wildfire** is "*An uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or wood lands. Heavy fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work together to increase risk of loss*."

Wildfires are part of the natural management of the Earth's ecosystems, but may also be caused by human factors. Wildfires may be described as follows:

- Wildfire - A fire occurring in a wildland area (e.g., grasslands, forests, brush lands). An exception to this definition is a prescribed burn.
- Prescription Burning ("Controlled Burning") – The process of igniting fires under selected conditions, in accordance with strict parameters. For example, this fire may be undertaken by land management agencies is.

Fire probability depends on local weather conditions, outdoor activities such as camping, debris burning, and construction, and the degree of public cooperation with fire prevention measures. Drought conditions and other natural disasters (e.g., tornadoes, hurricanes, etc.) increase the probability of wildfires by producing fuel in both urban and rural settings. Fire probability may be determined by using the Keetch-Byram Drought Index (KBDI)

The result of this system is a drought index number ranging from 0 to 800 that accurately describes the amount of moisture that is missing. A rating of zero defines the point where there is no moisture deficiency and 800 is the maximum drought possible.

Keetch-Byram Drought Index

Keetch-Byram Drought Index	
Drought Index #	**Potential Fire Behavior**
0 - 200	Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
200 - 400	Fires more readily burn and will carry across an area with no gaps. Heavier fuels will still not readily ignite and burn. Also, expect smoldering and the resulting smoke to carry into and possibly through the night.
400 - 600	Fire intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
600 - 800	Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn thorough the night and heavier fuels will actively burn and contribute to fire intensity.

Source: https://www.drought.gov/drought/states/texas

Location

The Wildfire Threat for Harrison County and the participants within is significant. The entire planning area can be affected by wildfires.

As with Tornadoes, borders do not stop fires and many fires begin in the open areas of the counties to the west, where the wind quickly blows them into the planning area. .

In addition to the Threat Map the Wildland Urban Interface Map shown below, indicates in yellow the vulnerability for the entire planning area and its neighbors. The maps below show the wildfire risk (yellow).

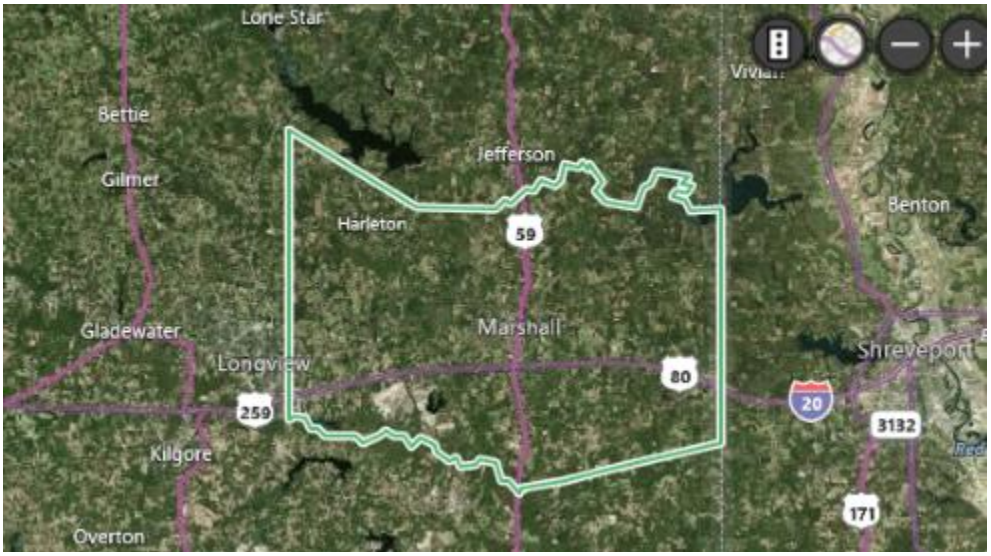
Characteristic Fire Intensity Scale

Extent

Previous wildfires in the county have ranged from small 1 acre fires to over 100 acres. Due to the high winds and dense vegetation, these fires can swiftly grow to sizes that make it very difficult to control even with air support. The Fire Intensity Chart below provides the extent of fire risk. The following pages provide risk details for the both the county and cities.

	1	Lowest Intensity	Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
	1.5		
	2	Lowest Intensity	Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
	2.5		
	3	Moderate	Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
	3.5		
	4	High	Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.
	4.5		
	5	Highest	Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

Populated areas in Harrison County are at extreme risk due to the fire spread with Wildland/Urban interface.



Heavy fuels in the neighboring counties and hazardous terrain which limit the ability to stop forward movement also put the cities at risk. Seasonal strong winds traditionally blow from the west or southwest.

All participants can experience wildfires that could possible exceed 100 acres before being contained.

Vulnerability and Impact

The impact of a wildfire is typically in direct relationship to weather conditions. Extreme winds that tend to be prevalent in the planning area plus dry fire fuels can escalate the size of a wildfire in minutes. Even with well-trained firefighters and mutual aid – winds can move the fire at over 30 MPH. The damage caused by these fires is typically in open range lands, but can easily consume cattle, fencing and rural homesteads.

Due to the similar characteristics of each participating jurisdiction, the entire planning are can be impacted in the following ways:

- Loss of power and communication lines
- Severe water and pressure loss due to high use of water resources.
- Loss of cattle and miles of fencing.
- Highway dangers due to blowing smoke
- Death and injuries to responder due to fast moving fire or changing winds.

Jurisdiction	Vulnerabilities
Harrison County Unincorporated Areas	• Critical city facilities to include Courthouse, Jail, Sheriff's Office and Precinct barns. Precinct and other county owned vehicles. • Critical school buildings HVAC units, small backup generators and other vehicles on the property. • Power lines, transformers, transformer banks and power stations have the ability to spark with high winds – thus being the igniter of grass fires. • Wildfire event could cause emergency evacuations of students/faculty and in the process possible injury/panic.
Cites of Marshall, Hallsville, Waskom and Scottsville	• Water towers, water wells, controls for wells. • Critical city hall, library, community building, city barn, fire hall, ambulance bay. • City vehicles, HVAC units and emergency vehicles could obtain severe damage and lead to loss of documents/ damaged equipment in the event of sprinkler system being triggered. • Power lines, transmission lines, transformers, transformer bank

Probability of Future Events

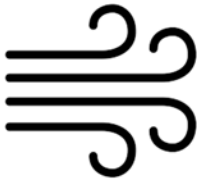
Wildfires occur with high frequency in the planning area. This vulnerability and the annual probability of occurrence for these events are estimated as follows.

Probability of Future Events	Years in Record Span 2010-2017	No. of Events in the Span	Computation	Future Probability of 1 or more events year
Harrison County Unincorporated Areas	7	40	(40/7) * 100=	571.00%
Cites of Marshall, Hallsville, Waskom and Scottsville	A wildfire event threatening any of the incorporated cities is probable to occur once on any given year.			

Previous Occurrences

Incorporated cities within the planning area are at risk for fast moving wildfires, but in the last 7 years have had a zero history of occurrence. However, the unincorporated area of Harrison County has since 2010 experienced over 40 wildfires. Property damage was localized to grasses and fences, but could easily have spread to the incorporated areas.

Windstorms
Description

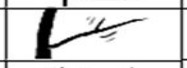


Winds begin with differences in air pressures. Pressure that is higher at one place than another sets up a force, pushing from high pressure towards low pressure. The greater the difference in pressures, the stronger the force. Wind is used to describe the prevailing direction from which the wind is

blowing with the speed given usually in miles per hour or knots. A Wind Advisory is issued when winds are forecast to be sustained at 25 to 39 mph and/or gusts to 57 mph.

Windstorms may present themselves in many forms such as high winds or downbursts. A major concern of a wind storm is wind speed and duration. It may be a 2 minute average speed or an instantaneous speed. The problems that windstorms create can be damaged roof top equipment, broken windows, and down power lines.

The **Beaufort Scale** is a system for estimating wind strengths based on the effects wind has on the physical environment. This scale is provided below.

Beaufort number	Wind Speed (mph)	Seaman's term		Effects on Land
0	Under 1	Calm		Calm; smoke rises vertically.
1	1-3	Light Air		Smoke drift indicates wind direction; vanes do not move.
2	4-7	Light Breeze		Wind felt on face; leaves rustle; vanes begin to move.
3	8-12	Gentle Breeze		Leaves, small twigs in constant motion; light flags extended.
4	13-18	Moderate Breeze		Dust, leaves and loose paper raised up; small branches move.
5	19-24	Fresh Breeze		Small trees begin to sway.
6	25-31	Strong Breeze		Large branches of trees in motion; whistling heard in wires.
7	32-38	Moderate Gale		Whole trees in motion; resistance felt in walking against the wind.
8	39-46	Fresh Gale		Twigs and small branches broken off trees.
9	47-54	Strong Gale		Slight structural damage occurs; slate blown from roofs.
10	55-63	Whole Gale		Seldom experienced on land; trees broken; structural damage occurs.
11	64-72	Storm		Very rarely experienced on land; usually with widespread damage.
12	73 or higher	Hurricane Force		Violence and destruction.

In addition to the windstorms derived from thunderstorms or sustained high winds due to other conditions, the following specific wind activities could also occur.

Macroburst is a convections downdraft with an affected outflow area of at least 2.5 miles wide and peak winds lasting between 5 to 20 minutes. Macro burst may cause tornado-force damage of up to EF3 intensity.

Microburst is a convective downdraft with an affected outflow are of less than 2.5 miles wide and peak winds lasting less than 5 minutes. Microbursts may induce dangerous horizontal/vertical wind shears, which can adversely affect aircraft performance and cause property damage.

Burst Swaths can range from about 50 to 150 yards in length. The damage they produce may resemble that caused by a tornado.

Red Flag Warnings are frequently issued in the planning area when the conditions are ideal for wildland fire combustion, and rapid spread. These warnings are typically sent out when the conditions stated are coupled with high or erratic winds. The Red Flag Warning becomes a critical statement for firefighting agencies.

Location

Harrison County's proximity to mountainous areas to the west, contribute to development of low pressure systems near the area in fall, winter and spring months. This leads to very windy periods during this time frame, and it is not uncommon to have wind gusts of 45 to 55 mph associated with low pressure systems in advance of and/or behind cold fronts. In most extreme cases, winds have gusted to 60-70 mph. These windy conditions combined with dry conditions in the area can help spark rapidly moving wild fires in the region especially during dry and drought years.

It cannot be predicted when or where a windstorm will occur, but the entire planning area can be impacted.

Extent

All participating jurisdictions in the planning area can anticipate winds in excess of 50 mph several times during the year which is an ten or higher on the Beaufort scale.

Impact

Wind can cause considerable damage to property. Injuries and deaths can occur as direct result both to people due to flying debris. High Winds can cause severe visibility issues on highways, contributing to deadly vehicle accidents. Damage to roof mounted equipment including communications equipment can put the jurisdiction at risk due to inability to reach public services.

With the type of force that can be applied, as described from the Beaufort Scale, homes and the mobile homes will always be the first to sustain damage, and possible injury from loose debris such as sheet metal or fallen trees. Since critical facilities are constructed to withstand at least medium forces, damage would be to roof mounted equipment, roof and landscaping to some degree.

Since the intensity of the various types of windstorms can generate the damage force of a F3 tornado, this would cause considerable damage. Roofs would be torn off well-constructed houses; older foundations of frame homes would shift; mobile homes would be completely destroyed; large trees would be snapped or uprooted; light object missiles would be generated; and cars lifted off the ground.

Jurisdiction	Vulnerabilities
Harrison County Unincorporated Areas	• Critical city facilities to include Courthouse, Jail, Sheriff's Office. Damage could include roof, siding and HVAC. • Power lines, transformers, transformer banks and power stations. • County Radio tower, communications system tower. • Critical school facilities to include main buildings, auxiliary buildings and homes roof, siding and HVAC. • Bus barns and buses, vans and vehicles roof and siding damage
Cites of Marshall, Hallsville, Waskom and Scottsville	• Above ground water wells, Above ground storage tank and water towers • Critical city hall, other facilities, primarily roof, siding and HVAC damage/removal leaving staff exposed to the elements • Power lines, transmission lines, transformers, transformer bank • Radio towers and communications system at the fire department.

Probability of Future Events

Since 2007, the planning area has experienced at several significant wind events every year. As significant winds impact the entire county the probability is over 100% that the entire planning area will experience a wind event exceeding 50 MPH.

Probability of Future Events	Years in Record Span 2007-2017	No. of Events in the Span	Computation	Future Probability of 1 or more events year
Entire Planning Area	10	44	(44/10) * 100=	440.00%

Previous Occurrences

In the past 10 years the planning area has had 6 extremely significant high wind events with property damage over $114K. Those events are included in the 44 referenced above.

Winter Storm

Description

A **Winter Storm** is, "…*an event in which the varieties of precipitation are formed that only occur at low temperatures, such as snow or sleet, or a rainstorm where ground temperatures are low enough to allow ice to form (i.e. freezing rain). In temperate continental climates, these storms are not necessarily restricted to the winter season, but may occur in the late autumn and early spring as well*." The difference between a blizzard and winter storms lies in the presence and strength of winds. Blizzards are massive snow storms with strong winds.

The chart below distinguishes a number of the chief characteristics of both types of storms.

Comparison of Blizzard to a Winter Storm

	BLIZZARD	WINTER STORM
Occurrence:	Winter	Winter, spring, autumn
Characteristics:	Severe storm with strong winds and heavy snow.	Cold storm with low temperature, sleet, snow, rain and ice formations can be seen throughout the planning area
Economic impact:	Blizzards harm local economies and cause paralysis of normal life for days.	Infections due to frostbites, death from hypothermia, power outage, car accidents on slippery roads, fires, carbon monoxide poisoning etc. lead to disruption of life until conditions improve.
Effect:	Blizzard gives rise to a white out with minimum visibility.	Avalanches, cornices and spring flooding are common in winter storms.
Types:	Traditional and ground blizzards	Snow storm, Freezing rain storm or wintry mixes.
Forms of precipitation:	Snow	Snow, rime, ice pellets, rain, grapple (snow pellets)

Source: http://www.diffen.com/difference/Blizzard_vs_Winter_Storm

Winter storms that impact the planning area can include:

Freezing Rain - Rain that falls on a surface with a temperature below freezing, forming a glaze of ice. Even small accumulations of ice can cause a significant hazard, especially on power lines and trees.
Heavy Snow Snowfall accumulating to 4" or more in depth in 12 hours or less; or snowfall accumulating to 6" or more in depth in 24 hours or less
Blizzard Conditions- Considerable falling or blowing snow with winds in excess of 25 mph and visibilities of less than ¼ for at least 3 hours.

The SPIA index chart allow for a community to prepare for a winter or an ice storm event. These events are infrequent but can cause damage. The primary areas of concern are on bridges, roadways and utility infrastructure including electric and natural gas supply lines.

Sperry-Piltz Ice Accumulation Index

Location
Winter storms can affect the entire planning area often and with enough severity to be a threat to people and property.
Generally, the winter storm season runs from late November to mid- March, although severe winter weather has occurred as early as October and as late as May in some locations.

Extent
The entire planning area can be impacted by extreme icing and snow. Ice accumulations on power lines and trees can exceed 1” and result in millions of dollars to the electrical coops. Snow accumulations can reach 1 feet overall.

Impact

Due to high winds that frequently blow over 30 MPH with gusts exceeding 50 MPH, residents are a risk for frequent electrical outages due to lines down or transformer damage – roads are greatly impacted with freezing ice and blowing snow.

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

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

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

Jurisdiction	Vulnerabilities
Harrison County Unincorporated Areas	• Critical county facilities to include County Courthouse, Sheriff's Office, County Jail. Roof loss due to heavy snow, electrical outage. • Power lines, transformers, transformer banks and power stations damage due to ice. • County Radio tower, communications system damage due to ice. • Impassable county roads due to snow or ice. • Stranded motorists. • Critical school facilities buildings. Roof damage, bus accidents. School closures due to electrical outages.
Cites of Marshall, Hallsville, Waskom and Scottsville	• Critical facilities; city hall, library, fire department, ambulance bay city barn roof damage, designated shelter facilities, electrical outages. • Power lines, transmission lines, transformers, transformer bank

Probability of Future Events

Historical patterns are assumed to be a dominant factor in determining future winter storm events. Based upon the historical instances of winter storm events that have occurred in the area during the last 10 years, the annual probability of occurrence for these events was estimated as follows.

Since 2007, only four winter storms occurred in the planning area in the 10 years. Based on this data, the MAT estimates the probability for multiple winter storms in any given year to be .40%.

Probability of Future Events	**Years in Record Span 2007-2017**	**No. of Events in the Span**	**Computation**	**Future Probability of 1 or more events year**
Planning Area	10	4	(4/10) * 100=	40.00%
All other jurisdictions within the planning area can be equally affected. The probability of future occurrence can be anticipated to impact all jurisdictions.				

Previous Occurrences

The table below summarizes the winter storm events recorded for the planning area between the years 2012 and 2018. During that 10-year span, the planning area witnessed more than 4 separate severe winter storm events. Only county level information is available however, winter storms do not consider boundary lines therefore the entire planning area is equally susceptible and county data can be used to reflect city and ISD possible impacts.

Severe Winter Storm Highlights for the Planning Area: 2012 – 2018

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	02/23/2015	08:00	CST-6	Winter Storm		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	02/25/2015	01:00	CST-6	Winter Storm		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	03/04/2015	22:00	CST-6	Winter Storm		0	0	0.00K	0.00K
HARRISON (ZONE)	HARRISON (ZONE)	TX	01/15/2018	23:00	CST-6	Winter Storm		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

https://www.ncdc.noaa.gov/stormevents/listevents

Element C – Mitigation Strategy

Existing Authorities, Policies, Programs and Resources (C1):

Existing Plans and Ordinances

Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance or regulation	Special purpose ordinances (floodplain management, storm water management, drainage, wildfire	Site Plan review requirements	A capital improvements plan	An economic development plan	An emergency response plan	A post-disaster recovery plan	A post-disaster recovery ordinance	Other: Annual Budget Review
Harrison County	N	N	N	Y	N	N	N	Y	Y	N	Y
City of Marshall	Y	Y	N	NA	N	N	Y	Y	Y	N	Y
City of Hallsville	N	N	N	NA	N	N	Y	Y	Y	N	Y
City of Waskom	N	N	N	Y	N	Y	Y	Y	Y	N	Y
City of Scottsville	N	N	N	Y	Y	Y	Y	Y	Y	N	Y

This table summarizes the current authorities and capabilities that could support each jurisdiction's efforts to implement the mitigation actions they've identified in this document. The matrix lists common planning tools/mechanisms which FEMA suggests as being contributive to local mitigation activities.

The most powerful mechanism available to them is motivating the public by improving their understanding of the natural hazards they face and by providing them with practical, cost-effective, actions that can be self-implemented to reduce their risks to those hazards should be one of the most effective tools each can use in achieving their mitigation goals in their jurisdiction.

Although funding to create or expand code and zoning enforcement positions may be limited, each jurisdiction can still utilize the table above to discuss methods on implementing no or low cost strategies for planning mechanisms such as formal capital improvement or comprehensive plans.

The ability for each jurisdiction to **expand** on the capabilities they currently have will be addressed in the Commission and commissioners court.

The **unincorporated area (County)** will continue to develop strong programs to mitigate wildfires and to educate the public on wildfire dangers. With the cooperation of area fire departments, the county will continue to control fuels to prevent fires. County Commissioners will discuss the development of a formal capital improvement plan.

The **City of Marshall** the city Commission will review existing ordinances and make changes based on hazard identification and new development. City will consider the addition of post-disaster recovery ordinances to aid in the recovery process. The City will also reevaluate their NFIP participation and consider future participation. The City Commission will discuss the development of a formal capital improvement plan.

The **City of Hallsville** will discuss the development of a formal capital improvement plan. The City of Hallsville will also reevaluate their NFIP participation and consider future participation. This document will aid in establishing improvements that will promote mitigation strategies to minimize loss of life of property.

The **City of Waskom** will discuss the development of a post disaster recovery ordinance. This document will aid in establishing improvements that will promote mitigation strategies to minimize loss of life of property.

The **City of Scottsville** will discuss the development of a special purpose ordinance. This document will aid in establishing improvements that will promote mitigation strategies to minimize loss of life of property.

National Flood Insurance Program (NFIP) (C2)

Not all of the jurisdictions within the planning area participate in the NFIP, although the cities of Hallsville and Scottsville are mapped they are not participating at this time because there has not been any flooding in these areas. The Texas Water Development Board (TWDB) maintains a current list of County Flood Plain Administrators (FPA). The FPA list below is current as of February of 2018.

County Flood Plan Administrators

CID	Community	Status	Firm Status	Map Date	Flood Plain Amin. (FPA) & Title
480847	Harrison County	Participating	Mapped	09/03/14	FPA John Paul Jones Lisa Benson: Assistant to the FPA & Floodplain Coordinator
480319	City of Marshall	Participating	Mapped	09/03/14	John Clark – Mapping & Permitting Tech.
480848	City of Hallsville	Not Participating	Mapped	09/03/14	N/A
480850A	City of Waskom	Participating	Mapped	09/03/14	Darrell Robins
481161	City of Scottsville	Not Participating	Mapped	09/03/14	N/A

According to the Assistant to the Flood Plain Administrator and Floodplain Coordinator for the Harrison County Road and Bridge Department Lisa Benson, CFM:

Harrison County participates in the NFIP by exercising regulation of the floodplains in the unincorporated areas of Harrison County. The county initially joined the program 9/29/1987. Since then the regulations have evolved to include at least the minimum requirements and enforcement standards. New FIRMs were adopted by the Harrison County Commissioner's Court in September 2014. At this time there are no pending requests for map updates originating from this agency. Floodplain permits are required for any construction that is performed in areas identified as Zone A in Harrison County by the FEMA flood maps and are issued by the Road and Bridge Department. The major area of floodplain concern in Harrison County is the area in and around Caddo Lake in the far northeastern portion of the county. Regular patrols and cooperation with the On-Site Sewage Facility Department help to monitor any development that is being done in a floodplain that has not been permitted.

City of Marshall's Floodplain Management Program – Ordnances

- **Sec. 25A-7. - Special flood plain provisions.**

Purpose. The purpose of these special provisions is:

(1)

To regulate the subdivision and/or development of flood prone land areas within the corporate limits of the city in order to promote the general health, welfare and safety of the community;

(2)

To require that each subdivision lot in flood prone areas be provided with a safe building site with adequate access; and that public facilities which serve such uses be designed and installed to preclude flood damage at the time of initial construction;

(3)

To protect individuals from buying lands which are unsuitable for use because of flood hazards by prohibiting the subdivision and/or development of unprotected flood prone lands.

(b)

Municipal Liability. The grant of a permit or approval of a subdivision and/or land development plan in the identified flood prone areas shall not constitute a representation, guarantee or warranty of any kind by the municipality or by any official or employee thereof of the practicability or safety of the proposed use, and shall create no liability upon the municipality, its officials or employees.

(c)

Preliminary Plan Requirements. The following information shall be additionally required as part of the preliminary plat and shall be prepared by a registered engineer or surveyor:

(1)

Name of engineer, surveyor or other qualified person responsible for providing the information required in this section.

(2)

A map showing the location of the proposed subdivision and/or land development with respect to the municipality's flood prone areas, including information on, but not limited to, the regulatory flood elevations, boundaries of flood prone areas, proposed lots and sites, fills, flood or erosion protective facilities, and areas subject to special deed restrictions.

(3)

Where the subdivision and/or land development lies partially or completely in the flood prone area, or where the subdivision and/or land development borders on the flood prone area, the preliminary plat map shall include detailed information giving the location and elevation of proposed roads, public utilities and building sites.

(d)

Final Plat Requirements. The following information shall be additionally required as part of the final plat and shall be prepared by a registered engineer or surveyor:

(1)

All information required for the submission of the preliminary plat incorporating any changes requested by the city engineer.

(2)

A map showing the exact location and elevation of all proposed buildings, structures, roads and public utilities to be constructed in flood prone areas. All such maps shall show contours at intervals of two (2) feet and identify accurately the boundaries of the flood prone areas.

(e)

Design Standards and Improvements.

(1)

Where not prohibited by this chapter or any other laws or ordinances, land located in flood prone areas may be platted for development with the provision that the developer construct all buildings and structures to preclude flood in accordance with this chapter and other laws and ordinances regulating such development.

(2)

No subdivision and/or land development, or part thereof, shall be approved if the proposed development and/or improvements will, individually or collectively, increase the regulatory flood elevation more than one (1) foot at any point.

(3)

Building sites for residences or any other type of dwelling or accommodation shall not be permitted in any floodway area. Sites for these uses may be permitted outside the floodway area if the sites or dwelling units are elevated to a height at least two (2) feet above the elevation of the hundred-year flood. The fill area shall extend out laterally for a distance of at least fifteen (15) feet beyond the limits of the proposed structures.

(4)

Building sites for structures or buildings other than for residential uses shall also not be permitted in any floodway area. Also such sites for structures or buildings outside the floodway shall be protected as provided for in paragraph (3) above. However, the governing body may allow the subdivision and/or development of areas or sites for commercial and industrial uses at an elevation less than one (1) foot above the regulatory flood if the developer otherwise protects the area to that height or assures that the buildings or structures will be floodproofed at least up to that height.

(5)

If the city engineer determines that only a part of a proposed plat can be safely developed, it shall limit development to that part and shall require that development proceed consistent with this determination.

(6)

When a developer does not intend to develop the plat himself and the city engineer determines that additional controls are required to ensure safe development, it may require the developer to impose appropriate deed restrictions on the land. Such deed restrictions shall be inserted in every deed and noted on every recorded plat.

(f)

Streets. The finished elevation of proposed streets shall be no more than two (2) feet below the regulatory flood elevation. The city engineer may require, where necessary, profiles and elevations of streets to determine compliance with this requirement. Drainage openings shall be sufficient to discharge flood flows without unduly increasing flood heights.

(g)

Sewer Facilities. All sanitary sewer systems located in flood prone areas, whether public or private, shall be floodproofed up to a point of one (1) foot above the regulatory flood elevation.

(1)

The city engineer may prohibit installation of disposal facilities requiring soil absorption systems where such systems will not function due to high groundwater, flooding or unsuitable soil characteristics. The city engineer may require that the developer note on the face of the plat and in any deed of conveyance that soil absorption fields are prohibited in designated areas.

(2)

The city engineer may prescribe adequate methods for waste disposal. If a sanitary sewer system is located on or near the proposed subdivision and/or land development, the city engineer shall require the developer to provide sewage facilities to connect to this system where practical and shall prescribe the procedures to be followed by the developer in connecting to the system.

(h)

Water Facilities. All water systems located in flood prone areas, whether public or private, shall be floodproofed to a point one (1) foot above the regulatory flood elevation. If there is an existing public water supply system on or near the subdivision, the city engineer shall require the developer to connect to this system where practical and shall prescribe the procedures to be followed by the developer in connecting to the system.

(i)

Special Definitions.

(1)

Flood prone area: A relatively flat or low land area adjoining a stream, river or watercourse, which is subject to partial or complete inundation; or any area subject to the unusual rapid accumulation or runoff of surface waters from any source.

(2)

Floodway: The channel of a river or other watercourse and the adjacent land areas required to carry and discharge a flood of a given magnitude.

(3)

Regulatory flood: A flood having an average frequency of occurrence on the order of once in one hundred (100) years, although the flood may occur in any year.

(4)

Regulatory flood elevation: The hundred year flood elevation based upon the information contained in the official flood insurance study.

(Ord. No. O-78-24, § 7, 10-4-78)

https://library.municode.com/tx/marshall/codes/code_of_ordinances

City of Waskom's Flood Damage Prevention Ordinance Attached Below:

AMENDMENTS TO ORDINACE NO. 270

FLOOD DAMAGE PREVENTION ORDINANCE

Page 1 Set a fee for Floodplain Permit of $ 50.00 .

Page 11, Article 4, Section A.

Insert " or his designee," after Mayor, to read

" The Mayor, or his designee, is herby appointed " etc. etc..

Page 12 Article 4 Section B (8)

Add the wording "or Article 5, Section A" to follow the wording " Article 3, Section B,", to read,

"When base flood elevation data has not been provided in accordance with Article 3, Section B, or Article 5, Section A, the Floodplain Administrator shall obtain, review, and reasonably utilize any base flood elevation data and floodway data available from a Federal, State, or other source, in order to administer the provisions of Article 5."

Page 16, Article 5, Section A

Add (8) "When a residential or non-residential structure is intended to be constructed in an Approximate A Zone, a BFE must be determined by using the same engineering standards and methods that are used to develop BFEs in a Flood Insurance Study (FIS)."

Add (9) "All residential and non-residential structures will require two elevation certificates, one elevation certificate for the grade to be constructed or placed

onto, and one elevation certificate for the top of the finished lowest floor or the bottom of the lowest horizontal support."

Add (10) " All engineering and surveying data, federal, state, or local permit(s), or any other documents and/or expenses to fulfill the requirements of this ordinance, shall be assumed by the permittee."

Add (11) "All encroachments, including fill, new construction, substantial improvements, and other development within the SFHA is prohibited, unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge."

Add (12) " All elevation requirements noted in this ordinance shall be documented using the Elevation Certificate, FEMA 81-34, and shall be certified by a registered professional engineer, surveyor, or architect, and shall be submitted to the Floodplain Administrator."

Add (13) " Small, detached accessory structures of 400 sq. feet or less and valued at $3,000 or less are exempt from the requirements to elevate or dry flood proof non-residential structures. They may be used only for limited parking of light vehicles and storage of low cost items."

Page 19 Article 5 Section C

(3) Remove the wording "which is greater than 50 lots or 5 acres, whichever is lesser, if not otherwise provided pursuant to Article 3, Section B or Article 4, Section B(8) of this ordinance." and replace with " pursuant to Article 5, Section A", to read

"Base flood elevation data shall be generated for subdivision proposals and other proposed development including the placement of manufactured home parks and subdivisions pursuant to Article 5, Section A."

City of Waskom
P.O. Box 730
Waskom, Texas 75692

FLOODPLAIN DEVELOPMENT PERMIT APPLICATION
$_____PERMIT FEE

FLOOD PLAIN ADMINISTRATOR
Waskom, Texas 75692
STATE OF TEXAS $
COUNTY OF HARRISON $
APPLICATION NUMBER _____ $

1. NAME OF APPLICANT:_____
MAILING ADDRESS:_____

2. LOCATION OF PROPERTY (complete as appropriate)
If located in a subdivision:

_____
Name of Subdivision Section No. Block No. Lot No.

If NOT located in subdivision:

_____
Name and No. of Survey/Abstract Acreage
Location Description (Attach a vicinity map)

3. NATURE OF PROPOSED DEVELOPMENT (check and complete all that apply)

( ) Residential ( ) Placement of Fill ( ) Other

( ) Alteration of a Natural Waterway or Drainage Course

( ) Non-Residential Name and Type of Business _____

( ) New Construction ( ) Substantial Improvement to Existing Structure

WARNING Please read and acknowledge

I affirm that I have read and understand Ordinance #270 Flood Damage and Prevention Ordinance. The flood hazard boundary maps and other flood data used by the City of Waskom's Floodplain Administrator in evaluating flood hazards to proposed developments are considered reasonable and accurate for regulatory purposes and are based on the best available scientific and engineering data. On rare occasions greater floods can and will occur and flood heights may be increased by man-made or natural causes. Issuance of an development permit or exemption certificate does not imply that developments inside or outside the identified areas of special flood hazard will be free from flooding or flood damage. Issuance of an development permit or exemption certificate shall not create Liability on the part of the City of Waskom, the City of Waskom's Floodplain administrator, or any officer or employee of the City of Waskom in the event flooding or flood damage does occur.

Additional federal, state or local, permits may be required.

Signature_____ Date:_____

4. APPLICANT WILL PROVIDE ONE COPY OF PLANS AND SPECIFICATIONS OF THE PROPOSED CONSTRUCTION, IF IN A FLOOD PLAIN.

FOR USE BY FLOODPLAIN ADMINISTRATOR

Is the property located in an identified flood hazard area? ( ) Yes ( ) No
Is the property located in the floodway? ( ) Yes ( ) No
FIRM ZONE Designation is:_____ FIRM Panel No. _____ Dated _____
Base Flood Elevation at the site is _____ft. NGVD (MSL) or is unavailable _____
Is additional information required (including Letter of Map change)? ( ) Yes ( ) No
Ensure that applicant is receiving the necessary federal, state, or local permits. ( ) Yes ( ) No

( ) Variance Issued
( ) Permit Application Approved
( ) Permit application Denied

Floodplain Administrator _____ Date: _____

CITY OF WASKOM

PRE-PERMIT FLOODPLAIN INSPECTION

PROPERTY OWNER: _____ PROPERTY ADDRESS: _____

Inspected By: _____ CFM # _____ Date: _____

I. MAIN STRUCTURE			
IS THE MAIN STURTURE IN A FLOOD HAZARD AREA?			
TYPE OF STRUCTURE? HOUSE ☐ MOBILE HOME ☐ TRAVEL TRAILER ☐ OFFICE ☐ OTHER ☐			
ARE ADEQUATE TIEDOWNS IN PLACE FOR MOBILE HOMES & TRAVEL TRAILERS?			
WHAT IS THE BFE FOR THE LOCATION? _____ FT. MSL			
DOES THE OWNER POSSESS A FLOOD ELEVATION CERTIFICATE?			
WHAT IS THE ELEVATION OF THE MAIN STRUCTURE? _____ FT. MSL			
IS THE STRUCTURE ELEVATED ABOVE THE GROUND LEVEL WITH NO BASEMENT?			
FOUNDATION WALLS ☐ SHEAR WALLS ☐ POSTS ☐ PIERS ☐ PILINGS ☐ COLUMNS ☐			
II. ADDITIONAL STRUCTURES			
ARE THE ADDED STRUCTURES CONNECTED TO MAIN STRUCTURE?			
ARE THE ADDED STRUCTURES ELEVATED TO THE SAME HIGHT AS MAIN STRUCTURE?			
WHAT IS THE ELEVATION OF THE ADDITIONAL STRUCTURE? _____ FT. MSL			
ELEVATED STRUCTURES – ARE WALLS BETWEEN THE BOTTOM FLOOR & GROUND?			
ARE THERE ADEQUATE OPENINGS IN THE WALLS BELOW BFE OF MAIN STRUCTURE?			
III. TYPE OF SEWAGE DISPOSAL			
CITY SEWER SYSTEM			
OSSF: AEROBIC ☐ SURFACE ☐ LPD ☐ CONVENTIONAL ☐ DRIP ☐ HOLDING TANK ☐			
OTHER ☐ _____			
IV. MAIN STRUCTURE			
DATE BUILT: _____			
DATE OF SUBSTANTIAL IMPROVEMENT: _____			
DATE OF INITIAL FIRM: _____ DATE OF LATEST FIRM: _____			

Deficiencies / Comments: _____

Re-inspection? Y / N **Re-inspected By:** _____ CFM#: _____ Date: _____

Deficiencies / Comments: _____

No. 270

FLOOD DAMAGE PREVENTION ORDINANCE

ARTICLE I

STATUTORY AUTHORIZATION, FINDINGS OF FACT, PURPOSE AND METHODS

SECTION A. STATUTORY AUTHORIZATION

The Legislature of the State of Texas has in the Flood Control Insurance Act, Texas Water Code, Section 16.315, delegated the responsibility of local governmental units to adopt regulations designed to minimize flood losses. Therefore, the City of Waskom, Texas, does ordain as follows:

SECTION B. FINDINGS OF FACT

(1) The flood hazard areas of Waskom are subject to periodic inundation, which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, and extraordinary public expenditures for flood protection and relief, all of which adversely affect the public health, safety and general welfare.

(2) These flood losses are created by the cumulative effect of obstructions in floodplains which cause an increase in flood heights and velocities, and by the occupancy of flood hazard areas by uses vulnerable to floods and hazardous to other lands because they are inadequately elevated, floodproofed or otherwise protected from flood damage.

SECTION C. STATEMENT OF PURPOSE

It is the purpose of this ordinance to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

(1) Protect human life and health;

(2) Minimize expenditure of public money for costly flood control projects;

(3) Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

(4) Minimize prolonged business interruptions;

(5) Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in floodplains;

(6) Help maintain a stable tax base by providing for the sound use and development of flood-prone areas in such a manner as to minimize future flood blight areas; and

(7) Insure that potential buyers are notified that property is in a flood area.

SECTION D. METHODS OF REDUCING FLOOD LOSSES

In order to accomplish its purposes, this ordinance uses the following methods:

(1) Restrict or prohibit uses that are dangerous to health, safety or property in times of flood, or cause excessive increases in flood heights or velocities;

(2) Require that uses vulnerable to floods, including facilities, which serve such uses, be protected against flood damage at the time of initial construction;

(3) Control the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of flood waters;

(4) Control filling, grading, dredging and other development, which may increase flood damage;

(5) Prevent or regulate the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards to other lands.

ARTICLE 2

DEFINITIONS

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted to give them the meaning they have in common usage and to give this ordinance its most reasonable application.

ALLUVIAL FAN FLOODING - means flooding occurring on the surface of an alluvial fan or similar landform which originates at the apex and is characterized by high-velocity flows; active processes of erosion, sediment transport, and deposition; and unpredictable flow paths.

APEX - means a point on an alluvial fan or similar landform below which the flow path of the major stream that formed the fan becomes unpredictable and alluvial fan flooding can occur.

APPURTENANT STRUCTURE – means a structure which is on the same parcel of property as the principal structure to be insured and the use of which is incidental to the use of the principal structure

AREA OF FUTURE CONDITIONS FLOOD HAZARD – means the land area that would be inundated by the 1-percent-annual chance (100 year) flood based on future conditions hydrology.

AREA OF SHALLOW FLOODING - means a designated AO, AH, AR/AO, AR/AH, or VO zone on a community's Flood Insurance Rate Map (FIRM) with a 1 percent or greater annual chance of flooding to an average depth of 1 to 3 feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

AREA OF SPECIAL FLOOD HAZARD - is the land in the floodplain within a community subject to a 1 percent or greater chance of flooding in any given year. The area may be designated as Zone A on the Flood Hazard Boundary Map (FHBM). After detailed rate-making has been completed in preparation for publication of the FIRM, Zone A usually is refined into Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE or V.

BASE FLOOD - means the flood having a 1 percent chance of being equaled or exceeded in any given year.

BASE FLOOD ELEVATION (BFE) – The elevation shown on the Flood Insurance Rate Map (FIRM) and found in the accompanying Flood Insurance Study (FIS) for Zones A, AE, AH, A1-A30, AR, V1-V30, or VE that indicates the water surface elevation resulting from the flood that has a 1% chance of equaling or exceeding that level in any given year - also called the Base Flood.

BASEMENT - means any area of the building having its floor subgrade (below ground level) on all sides.

BREAKAWAY WALL – means a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

CRITICAL FEATURE - means an integral and readily identifiable part of a flood protection system, without which the flood protection provided by the entire system would be compromised.

DEVELOPMENT - means any man-made change to improved and unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.

ELEVATED BUILDING – means, for insurance purposes, a non-basement building, which has its lowest elevated floor, raised above ground level by foundation walls, shear walls, posts, piers, pilings, or columns.

EXISTING CONSTRUCTION - means for the purposes of determining rates, structures for which the "start of construction" commenced before the effective date of the FIRM or before January 1, 1975, for FIRMs effective before that date. "Existing construction" may also be referred to as "existing structures."

EXISTING MANUFACTURED HOME PARK OR SUBDIVISION - means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the floodplain management regulations adopted by a community.

EXPANSION TO AN EXISTING MANUFACTURED HOME PARK OR SUBDIVISION - means the preparation of additional sites by the construction

of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

FLOOD OR FLOODING - means a general and temporary condition of partial or complete inundation of normally dry land areas from:

(1) the overflow of inland or tidal waters.
(2) the unusual and rapid accumulation or runoff of surface waters from any source.

FLOOD ELEVATION STUDY – means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards.

FLOOD HAZARD BOUNDARY MAP (FHBM) - means an official map of a community, issued by the Administrator, where the boundaries of the flood, mudslide (i.e., mudflow) related erosion areas having special hazards have been designated as Zones A, M, and/or E.

FLOOD INSURANCE RATE MAP (FIRM) - means an official map of a community, on which the Federal Emergency Management Agency has delineated both the special flood hazard areas and the risk premium zones applicable to the community.

FLOOD INSURANCE STUDY (FIS) – see *Flood Elevation Study*

FLOODPLAIN OR FLOOD-PRONE AREA - means any land area susceptible to being inundated by water from any source (see definition of flooding).

FLOODPLAIN MANAGEMENT - means the operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to emergency preparedness plans, flood control works and floodplain management regulations.

FLOODPLAIN MANAGEMENT REGULATIONS - means zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as a floodplain ordinance, grading ordinance and erosion control ordinance) and other applications of police power. The term describes such state or local regulations, in any combination thereof, which provide standards for the purpose of flood damage prevention and reduction.

FLOOD PROTECTION SYSTEM - means those physical structural works for which funds have been authorized, appropriated, and expended and which have been constructed specifically to modify flooding in order to reduce the extent of the area within a community subject to a "special flood hazard" and the extent of the depths of associated flooding. Such a system typically includes hurricane tidal barriers, dams, reservoirs, levees or dikes. These specialized flood modifying works are those constructed in conformance with sound engineering standards.

FLOOD PROOFING - means any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

FLOODWAY – see *Regulatory Floodway*

FUNCTIONALLY DEPENDENT USE - means a use, which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, but does not include long-term storage or related manufacturing facilities.

HIGHEST ADJACENT GRADE - means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

HISTORIC STRUCTURE - means any structure that is:

(1) Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;

(2) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;

(3) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of Interior; or

(4) Individually listed on a local inventory or historic places in communities with historic preservation programs that have been certified either:

(a) By an approved state program as determined by the Secretary of the Interior or;

(b) Directly by the Secretary of the Interior in states without approved programs.

LEVEE - means a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

LEVEE SYSTEM - means a flood protection system which consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices.

LOWEST FLOOR - means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking or vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; **provided** that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirement of Section 60.3 of the National Flood Insurance Program regulations.

MANUFACTURED HOME - means a structure transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. The term "manufactured home" does not include a "recreational vehicle".

MANUFACTURED HOME PARK OR SUBDIVISION - means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

MEAN SEA LEVEL - means, for purposes of the National Flood Insurance Program, the North American Vertical Datum (NAVD) of 1988 or other datum, to which base flood elevations shown on a community's Flood Insurance Rate Map are referenced.

NEW CONSTRUCTION - means, for the purpose of determining insurance rates, structures for which the "start of construction" commenced on or after the effective date of an initial FIRM or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For floodplain management purposes, "new construction" means structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.

NEW MANUFACTURED HOME PARK OR SUBDIVISION - means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of floodplain management regulations adopted by a community.

RECREATIONAL VEHICLE - means a vehicle which is (i) built on a single chassis; (ii) 400 square feet or less when measured at the largest horizontal projections; (iii) designed to be self-propelled or permanently towable by a light duty truck; and (iv) designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

RIVERINE – means relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

SPECIAL FLOOD HAZARD AREA – see *Area of Special Flood Hazard*

START OF CONSTRUCTION - (for other than new construction or substantial improvements under the Coastal Barrier Resources Act (Pub. L. 97-348)), includes substantial improvement and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition placement, or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for basement, footings, piers or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a

substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

STRUCTURE – means, for floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home.

SUBSTANTIAL DAMAGE - means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

SUBSTANTIAL IMPROVEMENT - means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before "start of construction" of the improvement. This term includes structures, which have incurred "substantial damage", regardless of the actual repair work performed. The term does not, however, include either: (1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions or (2) Any alteration of a "historic structure", provided that the alteration will not preclude the structure's continued designation as a "historic structure."

VARIANCE – means a grant of relief by a community from the terms of a floodplain management regulation. (For full requirements see Section 60.6 of the National Flood Insurance Program regulations.)

VIOLATION - means the failure of a structure or other development to be fully compliant with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in Section 60.3(b)(5), (c)(4), (c)(10), (d)(3), (e)(2), (e)(4), or (e)(5) is presumed to be in violation until such time as that documentation is provided.

WATER SURFACE ELEVATION - means the height, in relation to the North American Vertical Datum (NAVD) of 1988 (or other datum, where specified), of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas.

ARTICLE 3

GENERAL PROVISIONS

SECTION A. LANDS TO WHICH THIS ORDINANCE APPLIES

The ordinance shall apply to all areas of special flood hazard with the jurisdiction of Waskom.

SECTION B. BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD

The areas of special flood hazard identified by the Federal Emergency Management Agency in the Flood Insurance Rate Map (FIRM), dated October 29, 1976, Community Number, 480850, City of Waskom, Harrison County, Texas and any revisions thereto are hereby adopted by reference and declared to be a part of this ordinance.

SECTION C. ESTABLISHMENT OF DEVELOPMENT PERMIT

A Floodplain Development Permit shall be required to ensure conformance with the provisions of this ordinance.

SECTION D. COMPLIANCE

No structure or land shall hereafter be located, altered, or have its use changed without full compliance with the terms of this ordinance and other applicable regulations.

SECTION E. ABROGATION AND GREATER RESTRICTIONS

This ordinance is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this ordinance and another ordinance, easement, covenant, or deed restriction conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

SECTION F. INTERPRETATION

In the interpretation and application of this ordinance, all provisions shall be: (1) considered as minimum requirements; (2) liberally construed in favor of the governing body; and (3) deemed neither to limit nor repeal any other powers granted under State statutes.

SECTION G. WARNING AND DISCLAIMER OR LIABILITY

The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. On rare occasions greater floods can and will occur and flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This ordinance shall not create liability on the part of the community or any official or employee thereof for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

ARTICLE 4

ADMINISTRATION

SECTION A. DESIGNATION OF THE FLOODPLAIN ADMINISTRATOR

The Mayor is hereby appointed the Floodplain Administrator to administer and implement the provisions of this ordinance and other appropriate sections of 44 CFR (Emergency Management and Assistance - National Flood Insurance Program Regulations) pertaining to floodplain management.

SECTION B. DUTIES & RESPONSIBILITIES OF THE FLOODPLAIN ADMINISTRATOR

Duties and responsibilities of the Floodplain Administrator shall include, but not be limited to, the following:

(1) Maintain and hold open for public inspection all records pertaining to the provisions of this ordinance.

(2) Review permit application to determine whether to ensure that the proposed building site project, including the placement of manufactured homes, will be reasonably safe from flooding.

(3) Review, approve or deny all applications for development permits required by adoption of this ordinance.

(4) Review permits for proposed development to assure that all necessary permits have been obtained from those Federal, State or local governmental agencies (including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334) from which prior approval is required.

(5) Where interpretation is needed as to the exact location of the boundaries of the areas of special flood hazards (for example, where there appears to be a conflict between a mapped boundary and actual field conditions) the Floodplain Administrator shall make the necessary interpretation.

(6) Notify, in riverine situations, adjacent communities and the State Coordinating Agency which is the Texas Water Development Board (TWDB) and also the Texas Commission on Environmental Quality (TCEQ), prior to any alteration or relocation of a watercourse, and submit evidence of such notification to the Federal Emergency Management Agency.

(7) Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained.

(8) When base flood elevation data has not been provided in accordance with Article 3, Section B, the Floodplain Administrator shall obtain, review and reasonably utilize any base flood elevation data and floodway data available from a Federal, State or other source, in order to administer the provisions of Article 5.

SECTION C. PERMIT PROCEDURES

(1) Application for a Floodplain Development Permit shall be presented to the Floodplain Administrator on forms furnished by him/her and may include, but not be limited to, plans in duplicate drawn to scale showing the location, dimensions, and elevation of proposed landscape alterations, existing and

proposed structures, including the placement of manufactured homes, and the location of the foregoing in relation to areas of special flood hazard. Additionally, the following information is required:

(a) Elevation (in relation to mean sea level), of the lowest floor (including basement) of all new and substantially improved structures;

(b) Elevation in relation to mean sea level to which any nonresidential structure shall be floodproofed;

(c) A certificate from a registered professional engineer or architect that the nonresidential floodproofed structure shall meet the floodproofing criteria of Article 5, Section B (2);

(d) Description of the extent to which any watercourse or natural drainage will be altered or relocated as a result of proposed development.

(e) Maintain a record of all such information in accordance with Article 4, Section (B) (1).

(2) Approval or denial of a Floodplain Development Permit by the Floodplain Administrator shall be based on all of the provisions of this ordinance and the following relevant factors:

(a) The danger to life and property due to flooding or erosion damage;

(b) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;

(c) The danger that materials may be swept onto other lands to the injury of others;

(d) The compatibility of the proposed use with existing and anticipated development;

(e) The safety of access to the property in times of flood for ordinary and emergency vehicles;

(f) The costs of providing governmental services during and after flood conditions including maintenance and repair of streets and bridges, and public utilities and facilities such as sewer, gas, electrical and water systems;

(g) The expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters and the effects of wave action, if applicable, expected at the site;

(h) The necessity to the facility of a waterfront location, where applicable;

(i) The availability of alternative locations, not subject to flooding or erosion damage, for the proposed use.

SECTION D. VARIANCE PROCEDURES

(1) The Appeal Board, as established by the community, shall hear and render judgment on requests for variances from the requirements of this ordinance.

(2) The Appeal Board shall hear and render judgment on an appeal only when it is alleged there is an error in any requirement, decision, or determination made by the Floodplain Administrator in the enforcement or administration of this ordinance.

(3) Any person or persons aggrieved by the decision of the Appeal Board may appeal such decision in the courts of competent jurisdiction.

(4) The Floodplain Administrator shall maintain a record of all actions involving an appeal and shall report variances to the Federal Emergency Management Agency upon request.

(5) Variances may be issued for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or the State Inventory of Historic Places, without regard to the procedures set forth in the remainder of this ordinance.

(6) Variances may be issued for new construction and substantial improvements to be erected on a lot of 1/2 acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing the relevant factors in Section C (2) of this Article have been fully considered. As the lot size increases beyond the 1/2 acre, the technical justification required for issuing the variance increases.

(7) Upon consideration of the factors noted above and the intent of this ordinance, the Appeal Board may attach such conditions to the granting of variances as it deems necessary to further the purpose and objectives of this ordinance (Article 1, Section C).

(8) Variances shall not be issued within any designated floodway if any increase in flood levels during the base flood discharge would result.

(9) Variances may be issued for the repair or rehabilitation of historic structures upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.

(10) Prerequisites for granting variances:

(a) Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

(b) Variances shall only be issued upon: (i) showing a good and sufficient cause; (ii) a determination that failure to grant the variance would result in exceptional hardship to the applicant, and (iii) a determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.

(c) Any application to which a variance is granted shall be given written notice that the structure will be permitted to be built with the lowest floor elevation below the base flood elevation, and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

(11) Variances may be issued by a community for new construction and substantial improvements and for other development necessary for the conduct of a functionally dependent use provided that (i) the criteria outlined in Article 4, Section D (1)-(9) are met, and (ii) the structure or other development is protected by methods that minimize flood damages during the base flood and create no additional threats to public safety.

ARTICLE 5

PROVISIONS FOR FLOOD HAZARD REDUCTION

SECTION A. GENERAL STANDARDS

In all areas of special flood hazards the following provisions are required for all new construction and substantial improvements:

(1) All new construction or substantial improvements shall be designed (or modified) and adequately anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;

(2) All new construction or substantial improvements shall be constructed by methods and practices that minimize flood damage;

(3) All new construction or substantial improvements shall be constructed with materials resistant to flood damage;

(4) All new construction or substantial improvements shall be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

(5) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system;

(6) New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the system and discharge from the systems into flood waters; and,

(7) On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

SECTION B. SPECIFIC STANDARDS

In all areas of special flood hazards where base flood elevation data has been provided as set forth in (i) Article 3, Section B, (ii) Article 4, Section B (8), or (iii) Article 5, Section C (3), the following provisions are required:

(1) **Residential Construction** - new construction and substantial improvement of any residential structure shall have the lowest floor (including basement), elevated to 2 feet above the base flood elevation. A registered professional engineer, architect, or land surveyor shall submit a certification to the Floodplain Administrator that the standard of this subsection as proposed in Article 4, Section C (1) a., is satisfied.

(2) **Nonresidential Construction** - new construction and substantial improvements of any commercial, industrial or other nonresidential structure shall either have the lowest floor (including basement) elevated to 2 feet above the base flood level or together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A registered professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction are in accordance with accepted standards of practice as outlined in this subsection. A record of such certification which includes the specific elevation (in relation to mean sea level) to which such structures are floodproofed shall be maintained by the Floodplain Administrator.

(3) **Enclosures** - new construction and substantial improvements, with fully enclosed areas below the lowest floor that are usable solely for parking of vehicles, building access or storage in an area other than a basement and which are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria:

(a) A minimum of two openings on separate walls having a total net area of not less than 1 square inch for every square foot of enclosed area subject to flooding shall be provided.

(b) The bottom of all openings shall be no higher than 1 foot above grade.

(c) Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

(4) **Manufactured Homes -**

(a) Require that all manufactured homes to be placed within Zone A on a community's FIRM shall be installed using methods and practices that minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable State and local anchoring requirements for resisting wind forces.

(b) Require that manufactured homes that are placed or substantially improved within Zones A1-30, AH, and AE on the community's FIRM on sites (i) outside of a manufactured home park or subdivision, (ii) in a new manufactured home park or subdivision, (iii) in an expansion to an existing manufactured home park or subdivision, or (iv) in an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as a result of a flood, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to 2 feet above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.

(c) Require that manufactured homes be placed or substantially improved on sites in an existing manufactured home park or subdivision with Zones A1-30, AH and AE on the community's FIRM that are not subject to the provisions of paragraph (4) of this section be elevated so that either:

(i) the lowest floor of the manufactured home is at 2 feet above the base flood elevation, or

(ii) the manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.

SECTION C. STANDARDS FOR SUBDIVISION PROPOSALS

(1) All subdivision proposals including the placement of manufactured home parks and subdivisions shall be consistent with Article 1, Sections B, C, and D of this ordinance.

(2) All proposals for the development of subdivisions including the placement of manufactured home parks and subdivisions shall meet Floodplain Development Permit requirements of Article 3, Section C; Article 4, Section C; and the provisions of Article 5 of this ordinance.

(3) Base flood elevation data shall be generated for subdivision proposals and other proposed development including the placement of manufactured home parks and subdivisions which is greater than 50 lots or 5 acres, whichever is lesser, if not otherwise provided pursuant to Article 3, Section B or Article 4, Section B (8) of this ordinance.

(4) Base flood elevation data shall be generated by a detailed engineering study for all Zone A areas, within 100 feet of the contour lines of Zone A areas, and other streams not mapped by FEMA, as indicated on the community's FIRM.

(5) All subdivision proposals including the placement of manufactured home parks and subdivisions shall have adequate drainage provided to reduce exposure to flood hazards.

(6) All subdivision proposals including the placement of manufactured home parks and subdivisions shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize or eliminate flood damage.

SECTION D. SEVERABILITY

If any section, clause, sentence, or phrase of this Ordinance is held to be invalid or unconstitutional by any court of competent jurisdiction, then said holding shall in no way affect the validity of the remaining portions of this Ordinance.

SECTION E. PENALTIES FOR NON COMPLIANCE

No structure or land shall hereafter be constructed, located, extended, converted, or altered without full compliance with the terms of this court order and other applicable regulations. Violation of the provisions of this court order by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a misdemeanor. Any person who violates this court order or fails to comply with any of its requirements shall upon conviction thereof be fined not more than $2000.00 for each violation, and in addition shall pay all costs and expenses involved in the case. Each day a violation occurs is a separate

offense. Nothing herein contained shall prevent City of Waskom from taking such other lawful action as is necessary to prevent or remedy any violation.

SECTION F. CERTIFICATION OF ADOPTION

APPROVED: Jesse Moore
(community official)

PASSED: March 16, 2010
(adoption date)

ORDINANCE BECOMES EFFECTIVE: March 16, 2010
(effective date)

I, the undersigned, Marlene Solomon, do hereby certify that the above is a true and correct copy of an ordinance duly adopted by the City of Waskom at a regular meeting duly convened on March 16, 2010.

Marlene Solomon
City Secretary

{SEAL}

Harrison County
Harrison County currently participates in the NFIP program. Over the life of this plan they will review participation of the additional plan participants and assist with their future participation.

City of Scottsville & Hallsville
Neither of these cities participates in the NFIP program. Harrison County will assist in determining if future participation is needed. The City of Hallsville and Scottsville shows as “not participating.” Harrison County will also evaluate their specific needs and determine if participation is in the jurisdiction’s best interest.

Goals to Reduce/Avoid Long –Term Vulnerabilities (C3)

The goals and objectives of this MAP reflect goals similar to those found in the State of Texas Mitigation Plan and the National Flood Insurance Program.

The planning team began the development of the updated MAP by agreeing to a common set of goals and objectives, flexible enough they could be used to formulate customized mitigation actions for local implementation. The goals and objectives of the planning area are provided below.

Goal 1: Protect public health and safety

Objective 1.1: Advise the public about health and safety precautions to guard against injury and loss of life from hazards.

Objective 1.2: Maximize the use of modern technology to provide adequate warning, communication, and mitigation of hazards events.

Objective 1.3: Reduce the danger to, and enhance protection of, dangerous areas during hazard events.

Objective 1.4: Protect critical infrastructure facilities and critical services.

Goal 2: Protect existing and new properties

Objective 2.1: Use the most cost-effective approaches to protect existing and new building and public infrastructure from hazards.

Objective 2.2: Work to develop local guidance to ensure that development will not inadvertently endanger the public or increase threats to existing and new properties.

Goal 3*:* Increase public understanding, support, and demand for hazard mitigation

Objective 3.1: Increase public awareness of the full range of natural and man-made hazards they face.

Objective 3.2: Educate the public on actions they can take to prevent or reduce the loss of life or property from all hazards.

Objective 3.3: Publicize and encourage the adoption of appropriate hazard mitigation measures.

Objective 3.4: Encourage public policy to promote mitigation activities among the local jurisdictions.

Goal 4: Promote growth in a sustainable manner.

Objective 4.1: Incorporate hazard mitigation into the long-range planning and development activities

Objective 4.2: Encourage developers to voluntarily use codes and standards that will help to prevent the creation of future hazards to life and property

Goal 5: Maximize the use of outside sources of funding

Objective 5.1: Maximize the use of outside sources of funding

Objective 5.2: Maximize participation of residents in protecting their welfare and their properties

Objective 5.3: Maximize insurance coverage to provide financial protection against hazard events

The plan was revised and updated to meet the standards and goals for 2019. The goals and prioritizing criteria has not changed since the 2013 plan, the main goal to save lives, property and to protect against hazard events is still the same.

Criteria for Prioritizing Actions

Considering detailed benefit/cost or cost-effectiveness analysis for every possible mitigation activity can be time consuming, the cost-effectiveness was considered during the analysis evaluation and may not always be practical. In using the criteria and scoring below, the planning team was able to consistently score each action as High, Medium or Low.

Evaluation Worksheet		
Rank each of the criteria with a -1, 0, or 1 using the following scale: • 1 = Highly effective or feasible • 0 = Neutral • -1 = Ineffective or not feasible		
Score	**Criteria**	**Description**
	Life Safety	How effective will the action be at protecting lives and preventing injuries?
	Property Protection	How significant will the action be at eliminating or reducing damage to structures and infrastructure?
	Technical	Is the mitigation action technical feasible? Is it a long-term solution?
	Political	Is there overall public support for the mitigation action? Is there the political will to support it?
	Legal	Does the community have the authority to implement the action?
	Environmental	What are the potential environmental impacts of the action? Will it comply with environmental regulations
	Social	Will the proposed action adversely affect one segment of the population?
	Administrative	Does the community have the personnel and administrative capabilities to implement the action and maintain it?
	Local Champion	Is there a strong advocate for the action or project among local departments and agencies that will support the action's implementation?
	Other Community Objectives	Does the action advance other community objectives, such as capital improvements, economic development, environmental quality, or open space preservation?
	Total Score	
Score Key High = 6-10 Medium = 3-5 Low = <3		

Hazards Assessed and two Action Items per Jurisdiction

Hazards Addressed	**Floods, Wildfire, Tornado, Drought, Thunderstorms, Severe Winter Storms, Windstorms**
Educate the public on mitigation strategies for all hazards.	
Participating Jurisdiction/s	*Harrison County, City of Marshall, City of Hallsville, City of Waskom, City of Scottsville*
Priority (High, Medium, Low):	High
Estimated Cost:	$3,100
Potential Funding Source(s):	Local budget, Grant funds, Volunteer Hours, Business Donations
Lead Agency/Department Responsible:	County EMC, City EMC's
Implementation Schedule:	Throughout the 5-year update period
Cost Effectiveness: Outreach activities are very cost effective; they can be used to engage the public at-large by educating them on the risks associated with the hazards and the actions they can take to reduce/avoid those risks.	
Discussion: Safety brochures, signs at parks, and educating school children can all help increase public knowledge of mitigation strategies.	

Hazards Addressed	**Thunderstorms/Lightning**
Purchase and install lightning protection equipment in critical facilities and infrastructure to prevent lighting damage	
Participating Jurisdiction	*Harrison County, City of Marshall, City of Hallsville, City of Waskom, City of Scottsville*
Priority (High, Medium, Low):	Medium
Estimated Cost:	$35,000
Potential Funding Source(s):	Grant fund, Local budget, Volunteer Hours, Business Donations
Lead Agency/Department Responsible:	County EMC, City Managers
Implementation Schedule:	Within 24months of securing the necessary funding
Cost Effectiveness: *Cost is low compared to the purchase of equipment*	
Discussion: *Installing lightning protection devices such as lightning rods and grounding as well as surge protection on all city/county equipment and infrastructure is one of the best ways to protect against lightning*	

Hazard/s Addressed	**Tornados**
Adopt building codes that require construction of safe rooms in new buildings; and assist where possible, with retrofitting new/existing buildings with shelters	
Participating Jurisdiction/s	*Harrison County, City of Marshall, City of Hallsville, City of Waskom, City of Scottsville*
Priority (High, Medium, Low):	Medium
Estimated Cost:	$750,000 per building
Potential Funding Source(s):	Grant fund, Local budget, Volunteer Hours, Business Donations
Lead Agency/Department Responsible:	County EMC, City Managers
Implementation Schedule:	Upon approval of funds
Cost Effectiveness: Cities and County can incorporate multi-purpose safe rooms into new/retrofit projects so that they can be used to provide shelter as needed but also support everyday activities; in effect, the investment will return daily benefits.	
Discussion: *Installing multi-purpose safe rooms will protect life in the event of an emergency.*	

Hazards Addressed	**Floods**
Acquisition and management strategies of land to preserve open space for flood mitigation and water quality in the floodplain.	
Participating Jurisdiction	*Harrison County, City of Marshall, City of Hallsville, City of Waskom, City of Scottsville*
Priority (High, Medium, Low):	Medium
Estimated Cost:	Fair land value
Potential Funding Source(s):	Grant fund, Local budget, Volunteer Hours, Business Donations
Lead Agency/Department Responsible:	County EMC, City Managers
Implementation Schedule:	Within 24months of securing the necessary funding
Cost Effectiveness: *Cost is low compared to insurance claims*	
Discussion: Purchasing land will enable homes to not be flooded in case of flooding.	

Hazards Addressed	**Drought**
Install landscaping with drought resistant plants and trees for shading around County and City facilities to reduce exposure from extreme drought.	
Participating Jurisdiction	*Harrison County, City of Marshall, City of Hallsville, City of Waskom, City of Scottsville*
Priority (High, Medium, Low):	Low
Estimated Cost:	$1,000
Potential Funding Source(s):	Grant fund, Local budget, Volunteer Hours, Business Donations
Lead Agency/Department Responsible:	County EMC, City Managers
Implementation Schedule:	Within 6 months of securing the necessary funding
Cost Effectiveness: *Cost is low compared to having to purchase new equipment.*	
Discussion: Reducing energy cost due to natural shading will lower our need to consume more resources when times call for cutbacks.	

Hazard/s Addressed	**Thunderstorms, Tornados, Windstorms, Wildfire, Severe Winter Storm**
Install emergency generators at critical county and city facilities	
Participating Jurisdiction	*Harrison County, City of Marshall, City of Hallsville, City of Waskom, City of Scottsville*
Priority (High, Medium, Low):	High
Estimated Cost:	$250,000
Potential Funding Source(s):	Grant fund, Local budget, Volunteer Hours, Business Donations
Lead Agency/Department Responsible:	County EMC, City Managers
Implementation Schedule:	Within 6 months of securing the necessary funding
Cost Effectiveness: Ensuring that critical infrastructure is available to the County and cities and its citizens makes the cost irrelevant.	
Discussion: Installation of emergency generators at the County and city's critical infrastructures will ensure that water can still be treated and delivered without power, heat can be provided, along with keeping critical facilities open during recovery.	

Hazard/s Addressed	Windstorm, Tornado
Expand the outdoor warning system for new development.	
Participating Jurisdiction	*Harrison County, City of Marshall, City of Hallsville, City of Waskom, City of Scottsville*
Priority (High, Medium, Low):	High
Estimated Cost:	$27,500 per siren
Potential Funding Source(s):	Grant fund, Local budget, Volunteer Hours, Business Donations
Agency/Department Responsible:	County EMC, City Managers
Implementation Schedule:	Within 6 months of securing the necessary funding
Cost Effectiveness: Although costly, outdoor warning systems are an essential part of the City's public alerting/warning system and are effective in warning the public. For the most part, residents in this part of the State associate a siren tone with a tornado so sirens are particularly effective with tornado events.	
Discussion: During one of the public meetings a concerned citizen asked about adding more sirens in areas where coverage is currently lean and improving and updating aging warning sirens would save lives/reduce injuries in a hazard event by providing proper and easily recognizable warning to residents.	

Hazard/s Addressed	Wildfire, Windstorms
Establish & maintain a fire-safe defensible space around critical facilities	
Participating Jurisdiction/s	*Harrison County, City of Marshall, City of Hallsville, City of Waskom, City of Scottsville*
Priority (High, Medium, Low):	Medium
Estimated Cost:	$5,000 in annual costs
Potential Funding Source(s):	Local budget
Lead Agency/Department Responsible:	County Facilities Maintenance /County EMC, City EMC, VFD, FD
Implementation Schedule:	Within 12 months
Cost Effectiveness: Establishing and maintaining a fire-safe defensible space around critical facilities is an easy, low-cost way to create a buffer zone and limit the potential for wildfire damages.	
Discussion: Establishing and maintaining fire-safe defensible space will reduce the likelihood that a critical facility, such as a fire station, will be affected by this type of hazard event. This will also reduce the potential threat of this type of hazard on people inside the facility and increase the jurisdiction's ability to adequately respond event during this type of hazard.	

Integrating Mitigation Plan In To Other Planning Mechanisms (C6)

When integrating change Harrison County and all plan participants will follow the steps outlined below:

1. Change is proposed by an elected official or other interested party.

2. Proposal is placed on the local agenda of the governing body.

3. Agenda is published at least 3 days in advance of the meeting at which it will be discussed, so members of the public have an opportunity to attend the discussion meeting. Publication is made by posting the agenda on a public bulletin board in the respective City Hall or Harrison County Courthouse and by posting on the agency's website. Notice may also be printed in the local newspaper.

4. Proposal is discussed at the public meeting, including any comments by members of the public in attendance.

5. Proposal is voted on by the governing body.

6. If the proposal is passed, the change is implemented by the appropriate local authority.

Harrison County and Participating Cities

All of the 2013 mitigation action items were either completed or incorporated as ongoing projects. By utilizing the 2013 Hazard Mitigation Plan; the County Judge, EMC, Commissioners and City Leadership were able to prioritize mitigation projects within the county by referring to historical weather data and county vulnerabilities. These actions were assigned to the EMC to coordinate.

The new mitigation action items that were developed for Harrison County and all participating jurisdictions within this plan will be used in long term development of county and city improvement projects. While the County does not have a formal comprehensive plan or capital improvement plan – the County Commissioners can integrate this plan and the hazard assessments to provide the necessary data for future development planning whether it be in an unincorporated community or new/expanded industry. In addition, the Hazard Mitigation Plan will be cited as a technical reference and data source for any updates or future planning processes.

The Hazard Mitigation plan and its actions have been integrated into the EOP. The county has appointed a full-time County EMC to assist in emergency preparedness and response within the unincorporated area. It is their job to maintain the Interjurisdictional Emergency Operation Plan and implement mitigation strategies that have already been identified and seek out new strategies as they present themselves.

Element D – Plan Review, Evaluation and Implementation

Development Trends (D1/3)

Harrison County
Harrison County still remains primarily rural farm land. While the county has seen little growth, they are still more vulnerable to hazards due to current dry conditions and an aging volunteer fire response.

City of Marshall
A population increase in the community has been seen over the years. New businesses have opened to including several restaurants and various others.
The population and business increase has made the city more vulnerable to identified hazards.

City of Hallsville
Hallsville has seen a 40% increase in population since 2000 according to the city data website. http://www.city-data.com/city/Hallsville-Texas.html
New businesses have opened to include: a several restaurants, grocery stores, and gas stations. The population and business increase has made the city more vulnerable to identified hazards.

City of Waskom
Waskom has seen continued growth of Spring Grocery Store and a gym. The growth of businesses makes the City more vulnerable to identified hazards.

City of Scottsville
Scottsville has seen a slight increase in population over the last several years. The population moving in makes the City more vulnerable to identified hazards.

Participating Jurisdictions
During the life of this MAP update, the participating jurisdictions will work to ensure that as new developments occur, it meets the appropriate standards in existence at the time of construction, that the development will not aggravate or contribute to hazard conditions in the area and that to extent possible, the new development will support the goals and objectives of this update. The goals and objectives from the previous plan have changed slightly to ensure better mitigation action coverage's for the participating jurisdictions.

Mitigation Strategy Implementation

Through the involvement of this planning process, each jurisdiction was able to review existing mechanisms for identifying their existing status and hopes for the future. Although each jurisdiction has an informal process that can be related to a comprehensive plan or a capital improvement plan – through this planning process, they have become more focused on developing more formal plans. This document and the mitigation strategies that were conceived in this plan will be a guiding factor for the jurisdiction's improvement.

The following pages show the mitigation actions that were generated in 2001. This was the planning area's first hazard mitigation plan. The jurisdictions were able to identify which strategies were actually implemented over the last 17 years. While many of the strategies were prudent; through the plan review and a better understanding of this plans goals – jurisdictions were able to prioritize incomplete actions and move in the 2013 plan and eliminated those that did not have high value for mitigation

2019 Mitigation Actions (D2)
Mitigation Actions for the Harrison County

Hazard	Action	Completed, Deleted or Deferred
Thunderstorm	Enhance strategies for debris management by establishing specific locations throughout the county and city which can house debris until it can be disposed of properly	Deleted, considered recovery
Thunderstorm	Map and publicize locations around the County that have the highest incidence of extreme thunderstorm and windstorm events.	Deleted, not considered mitigation efforts
Lightning	Stress the importance of NOAA Weather Radios that automatically alert the public when a watch or warning is issued for an area as well as train people to serve as weather spotters. Public Service Announcements could be used for this type of information dissemination.	Completed, code red weather warning system implemented
Lightning	Encourage cities to pass ordinances requiring buried power lines. This offers the security of uninterrupted power during and after storms. Utility companies should be encouraged to bury lines where appropriate.	Deleted, change of priority
Hail	Educate the public on strengthening roofs through the use of specific building materials, such as concrete tiles. This can lessen the long-term damage from hailstorms and protect private property utilizing informational pamphlets.	Deleted, change of priority
Hail	Stress the importance of purchasing NOAA Weather Radios for homes and businesses which automatically alert the public when a watch or warning is issued for an area.	Completed, code red weather warning system implemented
Tornados	Incorporate the design of shelters in the construction of new critical facilities.	Deleted, change of priority
Tornados	Retrofit or add shelters to existing facilities that offer adequate protection.	Deleted, change of priority
Wildfire	Increase training opportunities, dispatching capabilities, communication capabilities, and necessary equipment in order to reduce damage that could occur as a result of inadequate resources.	Deleted, change of priority

Wildfire	Enhance response capabilities in the County by working with local fire departments by assisting with funding to increase training and upgrade equipment. (Evaluate whether additional resources are needed for particular types of fires, structural, forestry, grass fires, petroleum, etc.)	Deleted, duplication of efforts
Drought	Distribute public awareness information regarding droughts to encourage citizens to lower their water use during drought periods.	Deleted, change of priorities
Drought	Distribute public awareness information regarding crop insurance which includes importance of insurance and how to go about purchasing insurance.	Deleted, change of priorities
Flood	Evaluate the location of existing lift stations to determine if mitigation measures to a higher elevation are in order to prevent storm water runoff from overflowing the WWTP, where appropriate.	Deleted, change of priority
Flood	Take action to flood-proof public buildings, where appropriate.	Deleted, change of priority
Winter Storm	Enhance strategies for debris management after storms.	Deleted, considered recovery
Winter Storm	Enhance weather monitoring to attain earlier severe storm warning.	Completed, code red weather warning system implemented
Hazardous Materials	As development occurs, evaluate and implement more logical alternative hazardous material (HAZMAT) routes, especially for areas, in which hazardous materials are passing by high or critical populations.	Deleted, change in priorities
Hazardous Materials	Develop a plan to handle evacuated residents from surrounding areas.	Deleted, change in priorities
Disease	Increase ability to vaccinate and spay/neuter animals.	Deleted, change in priorities
Disease	Create a County Emergency Action Plan for mass public vaccination.	Deleted, change in priorities

Dam Failure	Create a county wide mapping system that includes: Locate all dams on a map. Survey areas located below these dams that contain homes or business that would be impacted by a dam breach. Establish an inventory of these structures.	Deleted, change of priority
Dam Failure	Work with land/property owners that would be impacted by a dam breach to inform them of the risk of the hazard and options for prevention.	Deleted, change of priority

Mitigation Actions for the City of Marshall

Hazard	Action	Completed, Deleted or Deferred
Thunderstorm	Increase public awareness of thunderstorm and windstorm mitigation activities, such as to secure loose objects, trimming tree limbs near power lines, etc.	Deleted, change of priority
Thunderstorm	Evaluate the need for early storm warning notification systems for those communities that currently have none or need upgrades.	Deleted, change of priority
Lightning	Pass ordinance requiring buried power lines. This offers the security of uninterrupted power during and after storms. Utility companies should be encouraged to bury lines where appropriate.	Deleted, change of priority
Lightning	Pass ordinances to require public and private buildings to be designed with lightning rods, structural bracing, shutters, laminated glass in window panes, and hail resistant roof shingles or flashing to minimize damage.	Deleted, change of priority
Hail	Stress the importance of purchasing NOAA Weather Radios for homes and businesses which automatically alerts the public when a watch or warning is issued for an area. These notices will be distributed in water bills.	Deleted, change of priority
Hail	Educate the public on strengthening roofs through the use of specific building materials, such as concrete tiles, this can lessen the long-term	Deleted, change of priority

	damage from hailstorms and protect private property.	
Tornados	Encourage the adoption of the most current edition of a model building codes and engineering standards that provide greater protection against high winds.	Deleted, change of priority
Tornados	Obtain a current inventory of all buildings and their wind ratings, and recommend any necessary modifications.	Deleted, change of priority
Wildfire	Continue efforts to reduce fire fuel load on developed and undeveloped lots by removing debris.	Deleted, change of priority
Wildfire	Enhance response capabilities by the volunteer fire department by increasing training and upgrading equipment. (Evaluate whether additional resources are needed for particular types of fires, structural, forestry, grass fires, petroleum, etc.).	Deleted, change of priority
Drought	Distribute public awareness information regarding droughts to encourage citizens to lower their water use during drought periods.	Deleted, change of priority
Drought	Implement phased water rationing when necessary to ensure efficient water usage.	Deleted, change of priority
Flood	Encourage development of acquisition and management strategies to preserve open space for flood mitigation and water quality in the floodplain.	Deferred
Flood	Improve maintenance of storm gutters and storm sewers.	Deleted, change of priority
Winter Storm	Enhance strategies for debris management.	Deleted, change of priority
Winter Storm	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure.	Deleted, change of priority

Hazardous Materials	Continue efforts to collect information regarding the location of hazardous materials and distribute information to emergency response crews.	Deleted, change of priority
Hazardous Materials	As development occurs, evaluate and implement more logical alternative hazardous material (HAZMAT) routes, especially for areas, in which hazardous materials are passing by high or critical populations.	Deleted, change of priority
Disease	Increase ability to vaccinate and spay/neuter animals.	Deleted, change of priority
Disease	Take measures to reduce fear associated with bio-terrorist threats by distributing accurate, non-biased information.	Deleted, change of priority
Dam Failure	Work with County to create a mapping system that includes: Locate all dams on a map. Survey areas located below these dams that contain homes or business that would be impacted by a dam breach. Establish an inventory of these structures.	Deleted, change of priority
Dam Failure	Work with land/property owners that would be impacted by a dam breach to inform them of the risk of the hazard and options for prevention.	Deleted, change of priority

Mitigation Actions for the City of Hallsville

Hazard	Action	Completed, Deleted or Deferred
Thunderstorm	Encourage electrical utilities to use underground construction methods where possible to reduce power outages from thunderstorms and windstorms.	Deleted, change of priority
Thunderstorm	Increase public awareness of thunderstorm and windstorm mitigation activities, such as to secure loose objects, trimming tree limbs near power lines, etc.	Deleted, change of priority
Lightning	Pass ordinance requiring buried power lines. This offer the security of uninterrupted power during and after storms. Utility companies should be encouraged to bury lines where appropriate.	Deleted, change of priority
Lightning	Require public and private buildings to be designed with lightning rods, structural bracing, shutters, laminated glass in window panes, and hail resistant roof shingles or flashing to minimize damage.	Deleted, change of priority
Hail	Reduce the adverse impacts by preparing individuals and buildings with materials that will withstand hail storms. Encourage citizens to purchase storm windows and doors to protect private property and provide adequate shelter within the home or business.	Deleted, change of priority
Hail	Produce pamphlets describing to the general public the actions necessary to protect life and property *prior* to a hail storm. These actions would include bringing property such as cars and pets into a sheltered area, seeking adequate shelter if humans are outside, when a hailstorm is imminent.	Deleted, change of priority
Tornados	Ensure that all public building have a designated "safe haven."	Deleted, change of priority
Tornados	Require critical facilities, such as schools and daycare centers, to determine the best location for occupants during a storm, and provide directions to the designated "safe haven."	Deleted, change of priority
Wildfire	Identify alternative methods of water supply to fight fires.	Deleted, change of priority
Wildfire	Continue efforts to reduce fire fuel load on developed and undeveloped lots by removing debris.	Deleted, change of priority

Drought	Distribute public awareness information regarding droughts to encourage citizens to lower their water use during drought periods.	Deleted, change of priority
Drought	Implement phased water rationing when necessary to ensure efficient water usage.	Deleted, change of priority
Flood	Develop and/or obtain data necessary to develop floodplain regulations.	Deleted, change of priority
Flood	Adopt measures to control runoff from developing areas outside the floodplain	Deleted, change of priority
Winter Storm	Enhance weather monitoring to attain earlier severe storm warning.	Deleted, change of priority
Winter Storm	Enhance strategies for debris management.	Deleted, change of priority
Hazardous Materials	Develop a plan to handle evacuated residents from surrounding areas.	Deleted, change of priority
Hazardous Materials	Continue efforts to collect information regarding the location of hazardous materials and distribute information to emergency response crews.	Deleted, change of priority
Disease	Encourage hospital/clinics to increase oxygen stock in order to have an adequate quantity to refill tanks for citizens that are dependent on power to run breathing machines. (tank capacity –four hour limit).	Deleted, change of priority
Disease	Designate a climate-controlled area for Disease-related supplies.	Deleted, change of priority
Dam Failure	Create a county wide mapping system that includes: Locate all dams on a map. Survey areas located below these dams that contain homes or business that would be impacted by a dam breach. Establish an inventory of these structures.	Deleted, change of priority
Dam Failure	Work with land/property owners that would be impacted by a dam breach to inform them of the risk of the hazard and options for prevention.	Deleted, change of priority

Mitigation Actions for the City of Waskom

Hazard	Action	Completed, Deleted or Deferred
Thunderstorm	Increase public awareness of thunderstorm and windstorm mitigation activities, such as to secure loose objects, trimming tree limbs near power lines, etc.	Deleted, change of priority
Thunderstorm	Evaluate the need for early storm warning notification systems for those communities that currently have none or need upgrades.	Deleted, change of priority
Lightning	Pass ordinance requiring buried power lines. This offers the security of uninterrupted power during and after storms. Utility companies should be encouraged to bury lines where appropriate.	Deleted, change of priority
Lightning	Pass ordinances to require public and private buildings to be designed with lightning rods, structural bracing, shutters, laminated glass in window panes, and hail resistant roof shingles or flashing to minimize damage.	Deleted, change of priority
Hail	Stress the importance of purchasing NOAA Weather Radios for homes and businesses which automatically alerts the public when a watch or warning is issued for an area. These notices will be distributed in water bills.	Deleted, change of priority
Hail	Educate the public on strengthening roofs through the use of specific building materials, such as concrete tiles, this can lessen the long-term damage from hailstorms and protect private property.	Deleted, change of priority
Tornados	Encourage the adoption of the most current edition of a model building codes and engineering standards that provide greater protection against high winds.	Deleted, change of priority
Tornados	Obtain a current inventory of all buildings and their wind ratings, and recommend any necessary modifications.	Deleted, change of priority
Wildfire	Continue efforts to reduce fire fuel load on developed and undeveloped lots by removing debris.	Deleted, change of priority
Wildfire	Enhance response capabilities by the volunteer fire department by increasing training and upgrading equipment. (Evaluate whether additional resources are needed for particular types of fires, structural, forestry, grass fires, petroleum, etc.).	Deleted, change of priority

Drought	Distribute public awareness information regarding droughts to encourage citizens to lower their water use during drought periods.	Deleted, change of priority
Drought	Implement phased water rationing when necessary to ensure efficient water usage.	Deleted, change of priority
Flood	Encourage development of acquisition and management strategies to preserve open space for flood mitigation and water quality in the floodplain.	Deleted, change of priority
Flood	Improve maintenance of storm gutters and storm sewers.	Deleted, change of priority
Winter Storm	Enhance strategies for debris management.	Deleted, change of priority
Winter Storm	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure.	Deleted, change of priority
Hazardous Materials	Continue efforts to collect information regarding the location of hazardous materials and distribute information to emergency response crews.	Deleted, change of priority
Hazardous Materials	As development occurs, evaluate and implement more logical alternative hazardous material (HAZMAT) routes, especially for areas, in which hazardous materials are passing by high or critical populations.	Deleted, change of priority
Disease	Increase ability to vaccinate and spay/neuter animals.	Deleted, change of priority
Disease	Take measures to reduce fear associated with bio-terrorist threats by distributing accurate, nonbiased information.	Deleted, change of priority
Dam Failure	Work with County to create a mapping system that includes: Locate all dams on a map. Survey areas located below these dams that contain homes or business that would be impacted by a dam breach. Establish an inventory of these structures.	Deleted, change of priority
Dam Failure	Work with land/property owners that would be impacted by a dam breach to inform them of the risk of the hazard and options for prevention.	Deleted, change of priority

Mitigation Actions for the City of Scottsville

Hazard	Action	Completed, Deleted or Deferred
Thunderstorm	Enhance strategies for debris management by establishing specific locations throughout the city which can house debris until it can be deposed of properly.	Deleted, change of priority
Thunderstorm	Map and publicize locations around the City that have the highest incidence of extreme thunderstorm and windstorm events.	Deleted, change of priority
Lightning	Require Public and private buildings to be designed with lightning rods, structural bracing, shutters, laminated glass in window panes, and hail resistant roof shingles or flashing to minimize damage.	Deleted, change of priority
Lightning	Stress the importance of NOAA Weather Radios that automatically alert the public when a watch or warning is issued for an area as well as train people to serve as weather spotters.	Deleted, change of priority
Hail	Stress the importance of purchasing NOAA Weather Radios for homes and businesses which automatically alerts the public when a watch or warning is issued for an area.	Deleted, change of priority
Hail	Educate the public on strengthening roofs through the use of specific building materials, such as concrete tiles, this can lessen the long-term damage from hailstorms and protect private property.	Deleted, change of priority
Tornados	Encourage critical facilities, such as schools and daycare centers, to determine the best location for occupants during a storm, and provide directions to the designated "safe haven."	Deleted, change of priority
Tornados	Continue efforts to keep up-to-date list of addresses of shelters, to assist non-local emergency response agencies in checking after a tornado to see if people are trapped inside.	Deleted, change of priority
Wildfire	Utilize resources of the Texas Forest Service for fire prevention and suppression.	Deleted, change of priority
Wildfire	Continue efforts to develop maps to assist emergency services during response.	Deleted, change of priority
Drought	Distribute public awareness information regarding droughts to encourage citizens to lower their water use during drought periods.	Deleted, change of priority

Drought	Distribute public awareness information regarding crop insurance which includes importance of insurance and how to go about purchasing insurance.	Deleted, change of priority
Flood	Conduct hydrology studies and surveys of flood-prone areas and identify feasible mitigation options.	Deleted, change of priority
Flood	Take action to flood-proof public buildings, where appropriate.	Deleted, change of priority
Winter Storm	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure.	Deleted, change of priority
Winter Storm	Increase public awareness of severe winter storm mitigation activities.	Deleted, change of priority
Hazardous Materials	As development occurs, evaluate and implement more logical alternative hazardous material {HAZMAT) routes, especially for areas, in which hazardous materials are passing by high or critical populations.	Deleted, change of priority
Hazardous Materials	Increase response capabilities by review HAZMAT evacuation plans and develop mitigation measures to increase capabilities-possibly forming a HAZMAT team, obtaining specialized training and equipment to meet HAZMAT needs.	Deleted, change of priority
Disease	Continue to pursue state and federal funding for health department to treat citizens of the community who may not have the opportunity to seek healthcare in a hospital due to insurance restrictions.	Deleted, change of priority
Disease	Continue to identify individuals with special needs and publicize existing programs to improve the County's inventory of any medical needs that might need to be addressed prior to, during, or after a hazard event, especially in the event of a power outage.	Deleted, change of priority
Dam Failure	Create a county wide mapping system that includes: Locate all dams on a map. Survey areas located below these dams that contain homes or business that would be impacted by a dam breach. Establish an inventory of these structures.	Deleted, change of priority
Dam Failure	Work with land/property owners that would be impacted by a dam breach to inform them of the risk of the hazard and options for prevention.	Deleted, change of priority

Plan Adoption Summary

RESOLUTION NO. 2019-171

A RESOLUTION OF HARRISON COUNTY, TEXAS, ADOPTING THE

Plan Adoption

This plan was formally adopted by Harrison County and the plan participants, after the document had been reviewed by both the Texas Division of Emergency Management (TDEM) and the Federal Emergency Management Agency (FEMA) to ensure it met current state and federal guidelines governing local MAPs.

The evidence of local adoption was sent to both agencies; essentially marking the conclusion of the planning process and the start of the plan's implementation phase. The plan was finally adopted as of the dates shown below.

FEMA Approval	**Resolution Number**	**Adoption Date**
Harrison County	2019-171	May 17, 2019
City of Marshall	R-19-11	May 9, 2019
City of Hallsville	2019-02	May 21, 2019
City of Waskom	337	June 11 2019
City of Scottsville	N/A	June 14, 2019

REVISED 2019 HARRISON COUNTY HAZARD MITIGATION ACTION PLAN

WHEREAS, certain areas of Harrison County, Texas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people and property within the area; and

WHEREAS, Harrison County desires to be prepared for and to mitigate losses caused by such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) requires that local jurisdictions have in place a FEMA-Approved Hazard Mitigation Action Plan as a condition of receipt of certain Federal mitigation funding; and

WHEREAS, all such approved plans must be revised at least once every five (5) years; and

WHEREAS, the Harrison County Hazard Mitigation Action Plan was previously adopted by Harrison County on January 16, 2012;

WHEREAS, the 2012 Harrison County Hazard Mitigation Action Plan has now been revised and updated for 2018, in accordance with FEMA guidelines;

NOW, THEREFORE, BE IT RESOLVED that the Harrison County Commissioners Court hereby:

Section 1. Adopts the revised 2019 Harrison County Hazard Mitigation Action Plan.

Section 2. Vests the County Judge of Harrison County with the responsibility, authority, and the means to:

- **(a)** Inform all concerned parties of this action.
- **(b)** Develop an Addendum to this Hazard Mitigation Action Plan if such addendum is warranted.

Section 3. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Action Plan.

RESOLUTION NO. 2019-171

A RESOLUTION OF HARRISON COUNTY, TEXAS, ADOPTING THE REVISED 2019 HARRISON COUNTY HAZARD MITIGATION ACTION PLAN

Passed, approved and adopted this 17 day of May, 2019.

Harrison County Judge

Chad Sims

Commissioner, Precinct #1

William Hatfield

Commissioner, Precinct #3

Phillip Mauldin

Commissioner, Precinct #2

Zephaniah Timmins

Commissioner, Precinct #4

Jay Ebarb

ATTEST:
County Clerk

Liz Whipkey

RESOLUTION NO 2019-02

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF HALLSVILLE ADOPTING THE REVISED 2019 HARRISON COUNTY HAZARD MITIGATION ACTION PLAN.

WHEREAS, the City Council of the City of Hallsville, Texas, a Type A General Law municipality, may adopt an ordinance, act, law, or regulation, not inconsistent with state law, that is necessary for the government, interest, welfare, or good order of the municipality as a body politic pursuant to §51.012 of the *Texas Local Government Code*; and

WHEREAS, certain areas of the City of Hallsville, Texas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people and property within the area; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) requires that local jurisdictions have in place a FEMA-Approved Hazard Mitigation Action Plan as a condition of receipt of certain Federal mitigation funding; and

WHEREAS, all such approved plans must be revised at least once every five (5) years; and

WHEREAS, the 2012 Harrison County Hazard Mitigation Action Plan has now been revised and updated for 2018, in accordance with FEMA guidelines.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF HALLSVILLE THAT:

Section 1. Adopts the revised 2019 Harrison County Hazard Mitigation Action Plan.

Section 2. Vest the Mayor of the City of Hallsville with the responsibility, authority, and the means to:

a. Inform all concerned parties of this action
b. Develop an Addendum to this Hazard Mitigation Action Plan if such addendum is warranted.

Section 3. Agrees to take suck other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Action Plan.

PASSED AND APPROVED by an affirmative vote of the members of the City Council is the 21st day of May 2019.

Jesse Casey

Jesse Casey, Mayor

ATTEST:

Kimberly Smith

Kimberly Smith TRMC, City Secretary

PAGE 2 of 2

R-19-11

CITY OF MARSHALL, TEXAS

A RESOLUTION OF THE MARSHALL CITY COMMISSION, ADOPTING THE REVISED 2019 HARRISON COUNTY HAZARD MITIGATION ACTION PLAN

WHEREAS, certain areas of the City of Marshall, Texas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people and property within the area; and

WHEREAS, the City of Marshall desires to be prepared for and to mitigate losses caused by such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) requires that local jurisdictions have in place a FEMA-Approved Hazard Mitigation Action Plan as a condition of receipt of certain Federal mitigation funding; and

WHEREAS, all such approved plans must be revised at least once every five (5) years; and

WHEREAS, the 2012 Harrison County Hazard Mitigation Action Plan has now been revised and updated for 2018, in accordance with FEMA guidelines;

NOW, THEREFORE, BE IT RESOLVED that the Marshall City Commission hereby:

Section 1. Adopts the revised 2019 Harrison County Hazard Mitigation Action Plan.

Section 2. Vests the Mayor of the City of Marshall with the responsibility, authority, and the means to:

(a) Inform all concerned parties of this action.
(b) Develop an Addendum to this Hazard Mitigation Action Plan if such addendum is warranted.

Section 3. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Action Plan.

Passed, approved and adopted this 9th **day of** May **, 2019.**

City of Marshall, Texas

BY: _____
Mayor Larry Hurta

ATTEST:

_____
City Secretary Elaine Altman

RESOLUTION NO. 337

CITY OF WASKOM, TEXAS

A RESOLUTION OF THE WASKOM CITY COUNCIL, ADOPTING THE REVISED 2019 HARRISON COUNTY HAZARD MITIGATION ACTION PLAN

WHEREAS, certain areas of the City of Waskom, Texas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people and property within the area; and

WHEREAS, the City of Waskom desires to be prepared for and to mitigate losses caused by such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) requires that local jurisdictions have in place a FEMA-Approved Hazard Mitigation Action Plan as a condition of receipt of certain Federal mitigation funding; and

WHEREAS, all such approved plans must be revised at least once every five (5) years; and

WHEREAS, the 2012 Harrison County Hazard Mitigation Action Plan has now been revised and updated for 2018, in accordance with FEMA guidelines;

NOW, THEREFORE, BE IT RESOLVED that the Waskom City Council hereby:

Section 1. Adopts the revised 2019 Harrison County Hazard Mitigation Action Plan.

Section 2. Vests the Mayor of the City of Waskom with the responsibility, authority, and the means to:

(a) Inform all concerned parties of this action.
(b) Develop an Addendum to this Hazard Mitigation Action Plan if such addendum is warranted.

Section 3. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Action Plan.

Passed, approved and adopted this 11th **day of** JUNE**, 2019.**

City of Waskom, Texas

BY: Jesse Moore
Mayor Jesse Moore

ATTEST:
Tammy Sefton
City Administrator / Secretary

CITY OF SCOTTSVILLE, TEXAS

A RESOLUTION OF THE SCOTTSVILLE CITY COMMISSION, ADOPTING THE REVISED 2019 HARRISON COUNTY HAZARD MITIGATION ACTION PLAN

WHEREAS, certain areas of the City of Scottsville, Texas, are subject to periodic flooding and other natural and man-caused hazards with the potential to cause damages to people and property within the area; and

WHEREAS, the City of Scottsville desires to be prepared for and to mitigate losses caused by such circumstances; and

WHEREAS, under the Disaster Mitigation Act of 2000, the United States Federal Emergency Management Agency (FEMA) requires that local jurisdictions have in place a FEMA-Approved Hazard Mitigation Action Plan as a condition of receipt of certain Federal mitigation funding; and

WHEREAS, all such approved plans must be revised at least once every five (5) years; and

WHEREAS, the 2012 Harrison County Hazard Mitigation Action Plan has now been revised and updated for 2018, in accordance with FEMA guidelines;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF SCOTTSVILLE, TEXAS, that:

Section 1. The revised 2019 Harrison County Hazard Mitigation Action Plan is hereby adopted.

Section 2. The Mayor of the City of Scottsville is hereby vested with the responsibility, authority, and the means to:

(a) Inform all concerned parties of this action.
(b) Develop an Addendum to this Hazard Mitigation Action Plan if such addendum is warranted.

Section 3. The Mayor of the City of Scottsville is appointed to assure that the Hazard Mitigation Action Plan be reviewed at least annually, and that any needed adjustment to the City of Scottsville's Addendum to the Plan be developed and presented to the Scottsville City Commission for consideration.

Section 4. The City of Scottsville hereby agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Action Plan.

Passed, approved and adopted this 14th **day of** June **, 2019.**

City of Scottsville, Texas

BY: Dennis N. Engdahl
Mayor Pro Tem Dennis N. Engdahl


Harrison County
State of Texas