

*Henderson County, TX*

*Office of Emergency Management*

# Henderson County 2020 Hazard Mitigation Plan



Henderson County Fire Marshal's Office  
125 N. Prairieville Street  
Athens, TX 75751

**DRAFT**

# **HENDERSON COUNTY HAZARD MITIGATION ACTION PLAN UPDATE**

## **TABLE OF CONTENTS**

### Executive Summary

Plan Update

Mitigation Guiding Principles and Goals

Identified Hazards of Concern

Mitigation Actions

## **PART 1 PLAN ELEMENTS AND PARTICIPATING COMMUNITIES**

Chapter 1.	Introduction
1.1	Purpose for Planning
Chapter 2.	Plan Update
2.1	Previous Plan
2.2	The Update
2.3	Local Mitigation Plan Review Tool
Chapter 3.	Plan Methodology
3.1	Establishment of Planning Partnership
3.2	Planning Committee
3.3	Defining the Planning Area
3.4	The Planning Committee
3.5	Coordinations with Other Agencies
3.6	Review of Existing Programs
3.7	Public Involvement
3.7.1	Stakeholders and planning committee
3.7.2	Survey/Questionnaire
3.7.3	Meetings
3.7.4	Press Releases
3.7.5	Internet
3.8	Plan Development, Chronology/Milestones
Chapter 4.	Henderson County Profile
4.1	Geographic Overview
4.2	Historical Overview
4.3	Major Past Hazard Events
4.4	Climate
4.5	Geology and Soils
4.6	Critical Facilities and Infrastructure
4.7	Demographics
4.7.1	Population
4.7.2	Age Distribution
4.7.3	Disabled Populations
4.7.4	Ethnic Populations
4.8	Economy



- 4.8.1 Income
  - 4.8.2 Employment Trends
  - 4.8.3 Occupations and Industries
- 4.9 Land Use and Development Trends
  - 4.9.1 Henderson County
  - 4.9.2 Athens
  - 4.9.3 Berryville
  - 4.9.4 Brownsboro
  - 4.9.5 Caney City
  - 4.9.6 Chandler
  - 4.9.7 Coffee City
  - 4.9.8 Enchanted Oaks
  - 4.9.9 Eustace
  - 4.9.10 Gun Barrel City
  - 4.9.11 Log Cabin
  - 4.9.12 Malakoff
  - 4.9.13 Moore Station
  - 4.9.14 Murchison
  - 4.9.15 Payne Springs
  - 4.9.16 Poynor
  - 4.9.17 Seven Points
  - 4.9.18 Star Harbor
  - 4.9.19 Tool
  - 4.9.20 Trinidad
- 4.10 Laws and Ordinances
  - 4.10.1 Federal
  - 4.10.2 State and Regional
  - 4.10.3 Henderson County
  - 4.10.4 Athens
  - 4.10.5 Berryville
  - 4.10.6 Brownsboro
  - 4.10.7 Caney City
  - 4.10.8 Chandler
  - 4.10.9 Coffee City
  - 4.10.10 Enchanted Oaks
  - 4.10.11 Eustace
  - 4.10.12 Gun Barrel City
  - 4.10.13 Log Cabin
  - 4.10.14 Malakoff
  - 4.10.15 Moore Station
  - 4.10.16 Murchison
  - 4.10.17 Payne Springs
  - 4.10.18 Poynor
  - 4.10.19 Seven Points
  - 4.10.20 Star Harbor
  - 4.10.21 Tool
  - 4.10.22 Trinidad

Chapter 5.	Hazard Mitigation Capabilities Assessment
5.1	Henderson County
5.1.1	Legal and Regulatory Capabilities
5.1.2	Administrative and Technical Capabilities
5.1.3	Financial Capabilities
5.2	Athens
5.2.1	Legal and Regulatory Capabilities
5.2.2	Administrative and Technical Capabilities
5.2.3	Financial Capabilities
5.3	Berryville
5.3.1	Legal and Regulatory Capabilities
5.3.2	Administrative and Technical Capabilities
5.3.3	Financial Capabilities
5.4	Brownsboro
5.4.1	Legal and Regulatory Capabilities
5.4.2	Administrative and Technical Capabilities
5.4.3	Financial Capabilities
5.5	Caney City
5.5.1	Legal and Regulatory Capabilities
5.5.2	Administrative and Technical Capabilities
5.5.3	Financial Capabilities
5.6	Chandler
5.6.1	Legal and Regulatory Capabilities
5.6.2	Administrative and Technical Capabilities
5.6.3	Financial Capabilities
5.7	Coffee City
5.7.1	Legal and Regulatory Capabilities
5.7.2	Administrative and Technical Capabilities
5.7.3	Financial Capabilities
5.8	Enchanted Oaks
5.8.1	Legal and Regulatory Capabilities
5.8.2	Administrative and Technical Capabilities
5.8.3	Financial Capabilities
5.9	Eustace
5.9.1	Legal and Regulatory Capabilities
5.9.2	Administrative and Technical Capabilities
5.9.3	Financial Capabilities
5.10	Gun Barrel City
5.10.1	Legal and Regulatory Capabilities
5.10.2	Administrative and Technical Capabilities
5.10.3	Financial Capabilities
5.11	Log Cabin
5.11.1	Legal and Regulatory Capabilities
5.11.2	Administrative and Technical Capabilities
5.11.3	Financial Capabilities
5.12	Malakoff
5.12.1	Legal and Regulatory Capabilities
5.12.2	Administrative and Technical Capabilities

- 5.12.3 Financial Capabilities
- 5.13 Moore Station
  - 5.13.1 Legal and Regulatory Capabilities
  - 5.13.2 Administrative and Technical Capabilities
  - 5.13.3 Financial Capabilities
- 5.14 Murchison
  - 5.14.1 Legal and Regulatory Capabilities
  - 5.14.2 Administrative and Technical Capabilities
  - 5.14.3 Financial Capabilities
- 5.15 Payne Springs
  - 5.15.1 Legal and Regulatory Capabilities
  - 5.15.2 Administrative and Technical Capabilities
  - 5.15.3 Financial Capabilities
- 5.16 Poynor
  - 5.16.1 Legal and Regulatory Capabilities
  - 5.16.2 Administrative and Technical Capabilities
  - 5.16.3 Financial Capabilities
- 5.17 Seven Points
  - 5.17.1 Legal and Regulatory Capabilities
  - 5.17.2 Administrative and Technical Capabilities
  - 5.17.3 Financial Capabilities
- 5.18 Star Harbor
  - 5.18.1 Legal and Regulatory Capabilities
  - 5.18.2 Administrative and Technical Capabilities
  - 5.18.3 Financial Capabilities
- 5.19 Tool
  - 5.19.1 Legal and Regulatory Capabilities
  - 5.19.2 Administrative and Technical Capabilities
  - 5.19.3 Financial Capabilities
- 5.20 Trinidad
  - 5.20.1 Legal and Regulatory Capabilities
  - 5.20.2 Administrative and Technical Capabilities
  - 5.20.3 Financial Capabilities

## **PART 2 RISK ASSESSMENTS**

- Chapter 6. Identified Hazards of Concern and Risk Assessment Methodology
  - 6.1 Identified Hazards of Concern
  - 6.2 Climate Change
  - 6.3 Methodology
  - 6.4 Risk Assessment Tools
    - 6.4.1 FEMA Resilience Analysis and Planning Tool
      - Overview
      - Application for this plan
    - 6.4.2 Other Hazards of Concern
- Chapter 7. Dam Failure

7.1	Hazard Profile
7.1.1	Location
7.1.2	Extent
7.1.3	Past Events
7.1.4	Warning Time
7.2	Vulnerability and Impact
7.3	Probability of Future Events
7.4	Climate Change Impacts
7.5	Issues
Chapter 8.	Drought
8.1	Hazard Profile
8.1.1	Location
8.1.2	Extent
8.1.3	Past Events
8.1.4	Warning Time
8.2	Vulnerability and Impacts
8.3	Probability of Future Events
8.4	Climate Change Impacts
8.5	Issues
Chapter 9.	Flood
9.1	Hazard Profile
9.1.1	Location
9.1.2	Extent
9.1.3	Past Events
9.1.4	Warning time
9.2	Vulnerability and Impacts
9.2.1	Exposure
9.2.2	Impacts
9.3	Probability of Future Events
9.4	Climate Change Impacts
9.5	Issues
Chapter 10.	Severe Storms (Hail, Lightning and Wind)
10.1	Hazard Profile
10.1.1	Location
10.1.2	Extent
10.1.3	Past Events
10.1.4	Warning Time
10.2	Vulnerability and Impact
10.2.1	Exposure
10.2.2	Impacts
10.3	Probability of Future Events
10.4	Climate Change Impacts
10.5	Issues
Chapter 11.	Tornado
11.1	Hazard Profile
11.1.1	Location
11.1.2	Extent

	11.1.3	Past Events
	11.1.4	Warning Time
11.2		Vulnerability and Impact
	11.2.1	Exposure
	11.2.2	Impacts
	11.2.3	Probability of Future Events
11.3		Climate Change Impacts
11.4		Issues
Chapter 12.		Wildfire
12.1		Hazard Profile
	12.1.1	Location
	12.1.2	Extent
	12.1.3	Past Events
	12.1.4	Warning Time
12.2		Vulnerability and Impacts
	12.2.1	Exposure
	12.2.2	Impacts
12.3		Probability of Future Events
12.4		Climate Change Impacts
12.5		Issues
Chapter 13.		Winter Weather
13.1		Hazard Profile
	13.1.1	Location
	13.1.2	Extent
	13.1.3	Past Events
	13.1.4	Warning Time
13.2		Vulnerability and Impacts
	13.2.1	Exposure
	13.2.2	Impact
13.3		Probability of Future Events
13.4		Climate Change Impacts
13.5		Issues
Chapter 14.		Planning Area Risk Ranking
14.1		Probability of Occurrence
14.2		Impact
14.3		Risk Rating and Ranking

### **PART 3 MITIGATION STRATEGIES AND PLAN MAINTENANCE**

Chapter 15.		Mitigation Strategy
15.1		Guiding Principles and Goals
15.2		Area-wide Mitigation Actions and Implementation
	15.2.1	Recommended Mitigation Actions
	15.2.2	Benefit/Cost Review and Prioritization
Chapter 16.		Plan Adoption and Maintenance
16.1		Plan Adoption
16.2		Plan Maintenance

- 16.2.1 Monitoring and Evaluating
  - 16.2.2 Plan Maintenance Schedule
  - 16.2.3 Plan Maintenance Process
  - 16.2.4 Continuing Public Involvement
- 16.3 Incorporation into Existing Planning Mechanisms



## LIST OF TABLES

0-1	Recommended Mitigation Actions
2-1	Hazards Evaluated in Henderson County HMAP 2011
3-1	County and City Planning Partners
3-2	Planning committee Members Participation in Planning Process
3-3	Plan Development Chronology/Milestones
4-1	Presidential Disaster Declarations
4-2	Temperature Summaries for Planning Area
4-3	Precipitation Summaries for Planning Area
4-4	Planning Area Critical Facilities and Infrastructure
4-5	Henderson County Demographic and Social Characteristics
4-6	Population Data
4-7	Economic Characteristics
4-8	Present Land Use in Planning Area
4-9	Henderson County Population Projection 2020-2050
4-10	City of Athens Building Permits
4-11	City of Berryville Building Permits
4-12	City of Brownsboro Building Permits
4-13	City of Caney City Building Permits
4-14	City of Chandler Building Permits
4-15	City of Enchanted Oaks Building Permits
4-16	City of Gun Barrel City Building Permits
4-17	City of Log Cabin Building Permits
4-18	City of Malakoff Building Permits
4-19	City of Murchison Building Permits
4-20	City of Payne Springs Building Permits
4-21	City of Seven Points Building Permits
4-22	City of Star Harbor Building Permits
4-23	City of Tool Building Permits
4-24	City of Trinidad Building Permits
5-1	Henderson County Regulatory Capabilities
5-2	Henderson County Administrative and Technical Capabilities
5-3	Henderson County Financial Capabilities
5-4	City of Athens Regulatory Capabilities
5-5	City of Athens Administrative and Technical Capabilities
5-6	City of Athens Financial Capabilities
5-7	City of Berryville Regulatory Capabilities
5-8	City of Berryville Administrative and Technical Capabilities
5-9	City of Berryville Financial Capabilities
5-10	City of Brownsboro Regulatory Capabilities
5-11	City of Brownsboro Administrative and Technical Capabilities
5-12	City of Brownsboro Financial Capabilities
5-13	City of Caney City Regulatory Capabilities
5-14	City of Caney City Administrative and Technical Capabilities
5-15	City of Caney City Financial Capabilities
5-16	City of Chandler Regulatory Capabilities

5-17 City of Chandler Administrative and Technical Capabilities  
5-18 City of Chandler Financial Capabilities  
5-19 City of Coffee City Regulatory Capabilities  
5-20 City of Coffee City Administrative and Technical Capabilities  
5-21 City of Coffee City Financial Capabilities  
5-22 City of Enchanted Oaks Regulatory Capabilities  
5-23 City of Enchanted Oaks Administrative and Technical Capabilities  
5-24 City of Enchanted Oaks Financial Capabilities  
5-25 City of Eustace Regulatory Capabilities  
5-26 City of Eustace Administrative and Technical Capabilities  
5-27 City of Eustace Financial Capabilities  
5-28 City of Gun Barrel City Regulatory Capabilities  
5-29 City of Gun Barrel City Administrative and Technical Capabilities  
5-30 City of Gun Barrel City Financial Capabilities  
5-31 City of Log Cabin Regulatory Capabilities  
5-32 City of Log Cabin Administrative and Technical Capabilities  
5-33 City of Log Cabin Financial Capabilities  
5-34 City of Malakoff Regulatory Capabilities  
5-35 City of Malakoff Administrative and Technical Capabilities  
5-36 City of Malakoff Financial Capabilities  
5-37 City of Moore Station Regulatory Capabilities  
5-38 City of Moore Station Administrative and Technical Capabilities  
5-39 City of Moore Station Financial Capabilities  
5-40 City of Murchison Regulatory Capabilities  
5-41 City of Murchison Administrative and Technical Capabilities  
5-42 City of Murchison Financial Capabilities  
5-43 City of Payne Springs Regulatory Capabilities  
5-44 City of Payne Springs Administrative and Technical Capabilities  
5-45 City of Payne Springs Financial Capabilities  
5-46 City of Poynor Regulatory Capabilities  
5-47 City of Poynor Administrative and Technical Capabilities  
5-48 City of Poynor Financial Capabilities  
5-49 City of Seven Points Regulatory Capabilities  
5-50 City of Seven Points Administrative and Technical Capabilities  
5-51 City of Seven Points Financial Capabilities  
5-52 City of Star Harbor Regulatory Capabilities  
5-53 City of Star Harbor Administrative and Technical Capabilities  
5-54 City of Star Harbor Financial Capabilities  
5-55 City of Tool Regulatory Capabilities  
5-56 City of Tool Administrative and Technical Capabilities  
5-57 City of Tool Financial Capabilities  
5-58 City of Trinidad Regulatory Capabilities  
5-59 City of Trinidad Administrative and Technical Capabilities  
5-60 City of Trinidad Financial Capabilities  
6-1 Hazards Not Profiled in Plan  
7-1 Dams in Henderson County  
7-2 Dams Upstream of Henderson County  
7-3 TCEQ Dam Hazard Extent Classification

7-4	Dams Impacts in Henderson County
8-1	Palmer Drought Classifications
8-2	Palmer Drought Category Description
8-3	USDA Secretarial Disasters
8-4	Monthly Highest Temperature Extremes for Planning Area (1908-2019)
8-5	Populations at Greater Risk by Jurisdictions
8-6	Estimated Insurable Annual Crops Lost Resulting from Extreme Heat
9-1	Flood Zones
9-2	National Weather Service Flash Flood Products
9-3	Historical Flood Events in Henderson County
9-4	Highest 24 Hour Rain Events at Tyler Climate Station by Month (1984-2019)
9-5	Exposure within 1-Percent-Annual Chance Flood Area
9-6	Critical Facilities in 1-Percent-Annual Chance Flood Area
9-7	Estimated Flood Impact on Persons
9-8	Loss Estimates for 1-Percent-Annual Chance Flood
9-9	Estimated Damage to Critical Facilities and Infrastructure from 1-Percent-Annual Chance Flood
9-10	Estimated Insurable Annual Crops Lost Resulting from Excessive Moisture
9-11	National Flood Insurance Program Statistics
10-1	Hail Intensity and Magnitude Scale
10-2	NOAA Lightning Activity Levels
10-3	Beaufort Wind Scale
10-4	Thunderstorm Summary for Henderson County
10-5	Hail Historical Events Summary 2006-2020
10-6	Lightning Historical Events Summary 2006-2020
10-7	Wind Historical Events Summary 2006-2020
10-8	Wind Power Class and Speed
10-9	Loss Estimate for Hail, Lightning and Wind Events
11-1	Enhanced Fujita Scale
11-2	Tornado Historical Events Summary 2006-2020
11-3	Loss Estimates for Tornado Events
11-4	Manufactured Homes by Jurisdiction
12-1	Vegetation Classes in Henderson County
12-2	Texas Forest Service Fire Intensity Rating
12-3	Comparison of Building Related Exposure in Hazard Area
12-4	Loss Estimates for Wildfire Events
13-1	Winter Weather Historical Events Summary 2006-2020
13-2	Loss of Used Estimates for Power Failure (1 Day)
13-3	Estimated Insurable Annual Crops Lost Resulting from Freeze Conditions
14-1	Probability of Hazards
14-2	Impact of People from Hazard
14-3	Impact of Property from Hazard
14-4	Impact of Economy from Hazard
14-5	Total Hazard Risk Rating Calculations
15-1	Recommended Mitigation Actions by Jurisdiction
16-1	Integration of Previous Plan and Strategies to Integrate Plan Update

## LIST OF FIGURES

- 3-1 Henderson County Planning Area
- 3-2 Sample from survey distributed to the public
- 3-3 planning committee meeting November 04,2020
- 3-4 Press release issued by November 18,2020
- 3-5 Soliciting participation from public, La Poynor School handout, City of Poynor
- 3-6 Henderson County Fire Marshal facebook post, October 08,2020
- 3-7 Henderson County draft plan availability (date) (TO BE ADDED)**
- 3-8 Soliciting public participation Gun Barrel City
- 3-9 Soliciting public participation City of Berryville
- 3-10 Soliciting public participation, Facebook, City of Berryville
- 3-11 Soliciting public participation, City of Payne Springs
- 4-1 Location of Henderson County Planning area within State of Texas
- 4-2 Critical facilities and infrastructure in Henderson County
- 4-3 State of Texas and Henderson County Population Growth
- 4-4 Henderson County Age Distribution
- 4-5 Henderson County Ethnic Distribution
- 4-6 Henderson County Unemployment Rate
- 4-7 Percent of Total Employment by Industry in Henderson County
- 4-8 Henderson County Floodplain Map
- 7-1 Dam Locations in Henderson County
- 8-1 U.S. Drought Monitor Texas October, 2020
- 8-2 Keetch-Byram Drought Index October, 2020
- 8-3 Heat Index Table, NOAA's National Weather Service
- 9-1 Texas River Basins
- 9-2 Henderson County DFIRM
- 9-3 City of Athens
- 9-4 City of Berryville
- 9-5 City of Brownsboro
- 9-6 City of Caney City
- 9-7 City of Chandler
- 9-8 City of Enchanted Oaks
- 9-9 City of Eustace
- 9-10 City of Gun Barrel City
- 9-11 City of Log Cabin
- 9-12 City of Malakoff
- 9-13 City of Moore Station
- 9-14 City of Murchison
- 9-15 City of Payne Springs
- 9-16 City of Poynor
- 9-17 City of Seven Points
- 9-18 City of Star Harbor
- 9-19 City of Tool
- 9-20 City of Trinidad
- 9-21 USGS Reading Gauge, Lake Palestine 2020
- 9-22 USGS Reading Gauge, Cedar Creek Lake 2020

- 10-1 Thunderstorm life cycle
- 10-2 Lightning Density Scale
- 10-3 Wind zones in the US
- 10-4 Texas Wind Power
- 11-1 Photo of tornado damage, Highway 175 Eustace, TX
- 11-2 Tornado Events in Henderson County 1950-2020
- 12-1 Henderson County Wildland Urban Interface
- 12-2 Henderson County Wildfire Intensity
- 12-3 City of Athens
- 12-4 City of Berryville
- 12-5 City of Brownsboro
- 12-6 City of Caney City
- 12-7 City of Chandler
- 12-8 City of Coffee City
- 12-9 City of Enchanted Oaks
- 12-10 City of Eustace
- 12-11 City of Gun Barrel City
- 12-12 City of Log Cabin
- 12-13 City of Malakoff
- 12-14 City of Moore Station
- 12-15 City of Murchison
- 12-16 City of Payne Springs
- 12-17 City of Poynor
- 12-18 City of Seven Points
- 12-19 City of Star Harbor
- 12-20 City of Tool
- 12-21 City of Trinidad
- 13-1 National Weather Service Windchill
- 13-2 Sperry-Piltz Ice accumulation index or SPIA Index
- 15-1 Sample Mitigation Action Worksheet
- 15-2 Example benefit/cost review and prioritization worksheet

## **LIST OF APPENDICES**

- |          |    |   |
|----------|----|---|
| Appendix | A. | Acronyms and Definitions                        |
| Appendix | B. | Maps of Dams Located in Henderson County        |
| Appendix | C. | Jurisdictional Critical Facility Maps           |
| Appendix | D. | Planning Process Documentation                  |
| Appendix | E. | Status of Previous Actions                      |
| Appendix | F. | Local Mitigation Plan Review Tool               |
| Appendix | G. | Plan Adoption Resolution from Planning Partners |
| Appendix | H. | Example Progress Report                         |

## REFERENCES

<https://nid.sec.usace.army.mil/>

<https://www.tylertexasweather.com/noaareports.htm>

<https://www.tylertexasweather.com/noaareports.htm>

<https://www.census.gov/quickfacts/fact/table/hendersoncountytexas/PST045219>

<https://txcip.org/tac/census/profile.php?FIPS=48213>

<https://www.census.gov/quickfacts/fact/table/hendersoncountytexas/PST045219>

<https://www.tshaonline.org/handbook/entries/henderson-county>

[https://wrcc.dri.edu/Climate/comp\\_tables.php](https://wrcc.dri.edu/Climate/comp_tables.php)

<https://www.tylertexasweather.com/noaareports.htm>

<https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/disaster-designation-information/index>

[https://www.fema.gov/disasters/disaster-declarations?field\\_dv2\\_state\\_territory\\_tribal\\_value=TX&field\\_year\\_value=All&field\\_dv2\\_declaration\\_type\\_value=All&field\\_dv2\\_incident\\_type\\_target\\_id=All](https://www.fema.gov/disasters/disaster-declarations?field_dv2_state_territory_tribal_value=TX&field_year_value=All&field_dv2_declaration_type_value=All&field_dv2_incident_type_target_id=All)

[https://irp-cdn.multiscreensite.com/e5de3edb/files/uploaded/HENDERSON%20COUNTY\\_Updated%20May%202019.pdf](https://irp-cdn.multiscreensite.com/e5de3edb/files/uploaded/HENDERSON%20COUNTY_Updated%20May%202019.pdf)

<https://www.tylertexasweather.com/noaareports.htm>

[https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=ALL&beginDate\\_mm=06&beginDate\\_dd=01&beginDate\\_yyyy=1980&endDate\\_mm=06&endDate\\_dd=30&endDate\\_yyyy=2020&county=HENDERSON%3A213&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitButton=Search&statefips=48%20CTEXAS](https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=ALL&beginDate_mm=06&beginDate_dd=01&beginDate_yyyy=1980&endDate_mm=06&endDate_dd=30&endDate_yyyy=2020&county=HENDERSON%3A213&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitButton=Search&statefips=48%20CTEXAS)

[https://irp-cdn.multiscreensite.com/e5de3edb/files/uploaded/HENDERSON%20COUNTY\\_Updated%20May%202019.pdf](https://irp-cdn.multiscreensite.com/e5de3edb/files/uploaded/HENDERSON%20COUNTY_Updated%20May%202019.pdf)

<https://www.tshaonline.org/handbook/entries/henderson-county>

[https://www.vaisala.com/sites/default/files/documents/2018%20Annual%20Lightning%20Report\\_1.pdf](https://www.vaisala.com/sites/default/files/documents/2018%20Annual%20Lightning%20Report_1.pdf)

<https://fred.stlouisfed.org/series/TXHEND3URN#0>

<https://worldpopulationreview.com/us-cities/star-harbor-tx-population>

<https://city-data.com/city/star-harbor-texas.html>



<https://www.bestplaces.net>

#### Star Harbor City Records

<https://txcip.org/tac/census/profile.php?FIPS=48213>

<https://www.weather.gov/media/hazstat/80years.pdf>

<https://www.weather.gov/hazstat/>

<https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?TX>

<https://twc.tamu.edu/kbdi>

[https://irp-cdn.multiscreensite.com/e5de3edb/files/uploaded/HENDERSON%20COUNTY\\_Updated%20May%202019.pdf](https://irp-cdn.multiscreensite.com/e5de3edb/files/uploaded/HENDERSON%20COUNTY_Updated%20May%202019.pdf)

[https://www.fema.gov/pdf/library/ism2\\_s1.pdf](https://www.fema.gov/pdf/library/ism2_s1.pdf)

<https://maps.nrel.gov/wind-prospector/?aL=OELMSC%255Bv%255D%3Dt%26MIB4Hk%255Bv%255D%3Dt%26MIB4Hk%255Bd%255D%3D1%26fAG2I8%255Bv%255D%3Dt%26fAG2I8%255Bd%255D%3D2&bL=clight&cE=0&IR=0&mC=33.916013113401696%2C-97.294921875&zL=6>

#### Floodplain Map

<https://www.propertyshark.com/mason/tx/Henderson-County/Maps/Fema-Flood-Hazard-Areas>

<https://www.bestplaces.net/climate/county/texas/henderson>

#### Berryville City Records

[www.worldpopulationreview.com](http://www.worldpopulationreview.com)

[www.twbd.texas.gov/flood/insurance/index.asp](http://www.twbd.texas.gov/flood/insurance/index.asp)

[hazards-fema.maps.arcgis.com/apps/webappviewer](http://hazards-fema.maps.arcgis.com/apps/webappviewer)

[www.fema.gov/emergency-managers/practitioners/resilience-analysis-and-planning-tool](http://www.fema.gov/emergency-managers/practitioners/resilience-analysis-and-planning-tool)

<https://www.iii.org/fact-statistic/facts-statistics-flood-insurance>

<https://www.esri.com/arcgis-blog/products/arcgis-online/analytics/wildfire-hazard-potential-demographics/>

<https://www.texaswildfirerisk.com/Map/Public/#whats-your-risk>

<https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd>

[https://www.nass.usda.gov/Publications/AgCensus/2017/Online\\_Resources/County\\_Profiles/Texas/cp48213.pdf](https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Texas/cp48213.pdf)

[opScape/https://nassgeodata.gmu.edu/Cr](https://nassgeodata.gmu.edu/CropScape/)

<https://www.arcgis.com/>

Henderson County Appraisal District

Enchanted Oaks City Records

Murchison City Records

FEMA website

Coffee City City Records

US Department of Labor

Coffee City City Ordinances

Texas Water Development Board

Gun Barrel City Code of Ordinances

Gunbarrelcity.net

Oncor

Centurylink

Sudden Link

East Cedar Creek Fresh Water

Henderson County CAD

Log Cabin City Ordinances

Log Cabin City Records

Trinidad City Records

Chandler City Records

Chandler's Comprehensive Plan

Seven Points NFIP

Star Harbor City Records

# ACKNOWLEDGEMENTS AND CONTACTS

## Henderson County

### Fire Marshal

Shane Renberg

Henderson County Fire Marshal's Office

Fire Marshal/Emergency Management Coordinator

Phone: 903-675-6157

Email: firemarshal@henderson-county.com

### Staff

Sherry Powers - Assistant Fire Marshal

Meghan Burger - Deputy Fire Marshal - Assistant EM Coordinator

Jacqui Callaway - Deputy Fire Marshal

## **EXECUTIVE SUMMARY**

The Disaster Act of 2000 (DMA; Public Law 106-390) is federal legislation that requires proactive, pre-disaster planning as a prerequisite for some funding available under the Robert T. Stafford Act. The DMA encourages state and local authorities to work together on pre-disaster planning. The planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk reduction projects. Regulations developed to fulfill the DMA's requirements are included in Title 44 of the Code of Federal Regulations (44 CFR).

Hazard mitigation is the use of long-term and short-term strategies to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster. It involves strategies such as planning policy changes, programs, projects, and other activities that can mitigate the impacts of hazards. It is impossible to predict exactly when and where disasters will occur or the extent to which they will impact an area. However, with careful planning and collaboration among public agencies, stakeholders, and citizens, it is possible to minimize losses that disasters can cause. The responsibility for hazard mitigation lies with many, including private property owners; business and industry; and local, state, and federal government.

Henderson County and the participating municipalities have developed and maintained a hazard mitigation plan to reduce risks from natural disasters and to comply with the DMA.

## **PLAN UPDATE**

Federal regulations require monitoring, evaluation, and updating of hazard mitigation plans. An update provides opportunity to reevaluate recommendations, monitor the impacts of implemented actions, and evaluate whether there is a need to change the focus of mitigation strategies. A jurisdiction covered by a hazard mitigation plan that has expired is no longer in compliance with the DMA.

The Henderson County Hazard Mitigation Action Plan was formally approved by the Federal Emergency Management Agency (FEMA) Region VI on September 16, 2011. Henderson County and the planning partners adopted the previous hazard mitigation plan. All other records or further work related to the Henderson County Hazard Mitigation Plan have been reviewed and considered during the updating process. It is for that reason that the Henderson County Office of Emergency Management elected to develop and update a plan specifically for Henderson County and its participating municipalities.

The development of this hazard mitigation plan update consisted of the following phases:

**Phase 1: Organize and Review-** A steering committee was assembled to provide technical support for the plan update, consisting of county emergency management representatives, and key county staff. The first step in developing a plan update was to re-establish a planning partnership with the unincorporated areas of Henderson County, and the Cities of Athens, Berryville, Brownsboro, Candy, Chandler, Coffee City, Enchanted Oaks, Eustace, Gun Barrel City, Log Cabin, Malakoff, Moore Station, Murchison, Payne Springs, Poynor, Seven Points, Star Harbor, Tool, and Trinidad. A planning committee was assembled to oversee the plan update, consisting of Emergency management staff, community representatives and city staff from the planning areas. Coordination with our county, state, and federal agencies involved in hazard mitigation occurred throughout the plan update process. This phase included a broad review of the previous Henderson County Hazard Mitigation Action Plan 2011 and existing programs that may support or enhance hazard mitigation actions.

**Phase 2: Update the Risk Assessment-** Risk assessment is the process of measuring the potential loss of life, personal injury, economic impact, and property damage resulting from natural hazards. This process assesses the vulnerability of people, buildings, and infrastructure to natural hazards. All angles of the risk assessment included in the plan were re-visited by the planning team and updated with the best available data and technology. The work included:

- Hazard identification and profiling
- Assessment of the impact of hazards on physical, social, and economic assets
- Vulnerability identification
- Estimation of the cost of potential damage

**Phase 3: Engage the Public-** A public involvement strategy agreed upon by the steering committee was implemented by the planning committee. The planning committee meetings were open to the public and participation in the hazard mitigation survey occurred across Henderson County.

**Phase 4: Assemble the Updated Plan-** The steering committee and planning committee assembled key information into a document to meet the DMA requirements for all planning partners.

**Phase 5: Adopt/Implementation of Plan-** Once pre-adoption approval has been granted by the Texas Division of Emergency Management (TDEM) and FEMA Region VI, the final adoption phase begins. Each planning partner individually adopts the updated plan. The plan maintenance process includes a schedule for monitoring and evaluating the plan's progress annually and producing a plan revision every five (5) years. Throughout the life of this plan, a representative of the original planning committee will be available to provide consistent guidance and oversight.

## **MITIGATION GUIDING PRINCIPLE AND GOALS**

The guiding principle for the Henderson County Hazard Mitigation Action Plan Update is:

To reduce or eliminate the long-term risks to loss of life and property damage in Henderson County from natural disasters.

The following plan goals were determined by the planning committee:

- Goal 1: Minimize loss of life, damage to property, economy and natural resources from natural hazards
- Goal 2: Increase public understanding, support and demand for hazard mitigation
- Goal 3: Build and integrate local mitigation capabilities to encourage individual safety, reduce damage to public buildings and facilities continuity of emergency services
- Goal 4: Maintain the natural and man-made systems in the county to protect our communities from natural hazards.



## **IDENTIFIED HAZARDS OF CONCERN**





For this plan, the planning committee considered the full range of natural hazards that could impact the planning area and listed hazards the greatest concern to the county. The process incorporated review of the state and local hazard mitigation and planning documents, as well as information on the frequency, magnitude and cost associated with hazards that have impacted or could impact the planning area. Anecdotal information regarding natural hazards and the perceived vulnerability of the planning area's assets to hazards were also included. Based on the review, this plan addresses the following natural hazards of concern listed below:





- Dam Failure
- Drought/Extreme Heat
- Flood/Flash Flooding
- Severe Storms (Hail, Lightning, and Wind)
- Tornado
- Wildfire
- Winter Storms (Ice Storms)

## **MITIGATION ACTIONS**








Mitigation actions presented in this plan update are activities designed to reduce or eliminate losses resulting from natural hazards. The update process in the identification of 7 mitigation actions targeted form implementation by individual planning partners as listed in TABLE 0-1 . The planning committee ranked the mitigation actions in order of priority with one (1) being the highest priority. Low priority mitigation actions are shown in yellow, medium priority are shown in orange, and highest priority actions are shown in red.









## 0-1 RECOMMENDED MITIGATION ACTIONS

ACTION NO.	TITLE	DESCRIPTION	ACTION RANKING	HAZARDS MITIGATED	ACTION TYPE	GOALS	RESPONSIBLE DEPARTMENT/ AGENCY	ESTIMATED COST	POTENTIAL FUNDING SOURCES	TIMELINE IN MONTHS	PRIORITY LEVEL
HENDERSON COUNTY											
1	Interlocal/Multi jurisdiction Coordination	Partner with other local and regional jurisdictions in projects such as the Regional MultiAgency Coordination Group; make sure local officials and EMCs know how to contact the MAC-G if needed.	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Office of Emergency Management	N/A	No cost associated	12	Low
2	Local/State/Federal training for Emergency situations	Increase training opportunities for citizens, to encourage their involvement in mitigation efforts. Partner with ETCOG, TDEM, TFS, TEEX, FEMA, and others, to bring free and low cost mitigation training to the people of our local jurisdictions, county, and region.	2	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Office of Emergency Management	50,000	County Budget, Grants	24	Medium







3	Early Warning & Public Notification	Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and email blasts; automated emergency calling systems; emergency warning sirens; and any other available method.	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Office of Emergency Management	100,000	Grants	24	High
4	Critical Facility Retrofitting	Harden public structures to protect the building and its contents, and to provide a safe place for humans during a storm.	4	Tornado, Severe Storms- Lightning/Hail/High Winds, Winter Storm			Office of Emergency Management	100,000	County Budget, Grants	36	High
5	Wildfire Prevention and education	Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.	3	Wildfire, Drought/Extreme Heat			Office of Emergency Management/Fire Marshal	10,000	County Budget	12	Medium
6	Expansion of Code Red for Early warning notification	Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms	1	Tornado, Severe Storms- Lightning/Hail/High Winds, Winter Storm			Office of Emergency Management	N/A	Cost provided by ETCOG	24	High
ATHENS											
1	Early Warning & Public Notification	Incorporate the use of the City's automated emergency calling system, Rave Alert, into local emergency management procedures.	1	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme			City of Athens Emergency Management	Other/ Cost provided by ETCOG	N/A	C	High

				Heat, Flood/Flash Flooding							
2	Early Warning & Public Notification	Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	◆	●	City of Athens Emergency Management	\$5000 bi-annually	City Budget	C	High
3	Dam Failure	Improve existing public-owned dams to reduce threats posed by potential failure.	2	Dam Failure	◆	●●	City of Athens Emergency Management	TBD	City Budget, Grants	24	Low
4	Emergency personnel response to Wildfire	Enhance emergency services to increase the efficiency of wildfire response and recovery activities	3	Wildfire	◆	●●●○	City of Athens Emergency Management	TBD	City Budget, Grants	12	High
5	Community awareness and education-Wil dfire	Develop public information programs to create a greater awareness of the risk of wildfire and to encourage individuals to implement mitigation strategies on their own property.	1	Wildfire	□	●●●○	City of Athens Emergency Management	TBD	City Budget, Grants	12	Medium
6	Storm Shelters	Seek grant funding to build needed storm shelters	3	Severe Storms/ Lightning/ Hail/ High Winds, Tornado	◆	●●●○	City of Athens Emergency Management	TBD	Grant Funding	12	Medium






















7	Community awareness and education-Drought/Extreme Heat	Increase public awareness of ways to conserve water, prevent loss of valuable topsoil and reduce the effects of drought	2	Drought/ Extreme Heat	<input type="checkbox"/>		City of Athens Emergency Management	TBD	City Budget, Grants	12	Low
8	Public education-Winter Storm	Increase public awareness of the dangers of walking on icy sidewalks and driving icy roads	3	Winter Storms	<input type="checkbox"/>		City of Athens Emergency Management	TBD	City Budget, Grants	12	Low
BERRYVILLE											
1	Implementati on of Code Red or Advanced Warning and Public Notification System	Obtain access and/or incorporate the use of the automated emergency calling system, Code Red, into local emergency management plan	1	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Fire Chief	\$5,000	City Budget/Grant s	24	High
2	Storm Shelter	Build community storm shelter(s)	3	Tornado, Severe Storms-Lightning/Hail /High Winds			Mayor/City Council	\$50,000	City Budget/Grant s	60	Medium
3	Public Education and Awareness	Provide materials and data sources to educate citizens of all potential hazards in the planning area and methods to mitigate hazards and increase awareness.	2	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	<input type="checkbox"/>		Mayor/City Council	\$3,000	City Budget/Grant s	24	Low

4	Public Warning System	Develop/improve	4	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Fire Chief	\$3,000	City Budget/FEMA Grant	6	High
BROWNSBORO											
1	Implementati on of Code Red or Advanced Warning and Public Notification System	Obtain access and/or incorporate the use of the automated emergency calling system, Code Red, into local emergency management plan	1	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Police Chief	\$100,000	Grant	24	High
2	Flood mitigation education for city officials and citizens	Seek FEMA and State training in flood mitigation to assist with NFIP and encourage awareness of flood hazard and National Flood Insurance Program assistance to citizens	2	Dam Failure, Flood/Flash Flooding			City Administration	\$5,000	City Budget	12	Medium
3	Public Education	Provide materials and data sources to educate citizens of all potential hazards in the planning area and methods to mitigate hazards and increase awareness.	2	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			City Administration	\$5,000	City Budget	12	Low


























4	Mitigation Planning Organization	Train local EMC and officials on chosen Mitigation action items including record keeping or reports and data. Provide information during Hazard Mitigation Planning Committee Meeting update	3	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			City Administration	\$10,000	City Budget/Grant	48	Low
CANEY CITY											
1	Implementati on of Code Red or Advanced Warning and Public Notification System	Obtain access and/or incorporate the use of the automated emergency calling system, Code Red, into local emergency management plan	1	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			City Council	\$50,000	Grant	12	High
2	Ordinances and retrofitting of current structures and new development s for hazards	Implement ordinances to ensure new housing developments meeet current floodproofing, as well as ensure that critical facilities owned by jurisdiction are protected from flood. Consulat FEMA publications, and ask an expert for additional suggestions if required. To be incorporated in the permitting process.	3	Dam Failure, Storms-Lightning/Hail /High Winds, Winter Storm, Flood/Flash Flooding			City Council	\$10,000	City Budget/Grant	60	Medium

3	Public Education on Hazards	Provide materials and data sources to educate/train citizens of all potential hazards in the planning area and methods to mitigate hazards and increase awareness.	2	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	<input type="checkbox"/>		City Council	\$10,000	City Budget/Grant	12	Medium
CHANDLER											
1	Early warning siren maintenance	check the location and condition of warning sirens; determine if repairs are needed	4	Tornado, Severe Storms-Lightning/Hail/High Winds, Wildfire, Drought/Extreme Heat, Flood/Flash Flooding			EOC and Administrative	\$100,000	HMGP Grant	60	High
2	Update emergency response equipment	assist local fire department in applying for grant funding to purchase needed equipment and PPE; assist in qualification and grant writing	2	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			City Staff	\$100,000	Grant	48	Low
3	Public Education on Code Red	provide public training and education materials about the Code Red system and how to register for the warning system notifications	1	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	<input type="checkbox"/>		City Staff	\$10,000	City Budget	12	Medium























4	City wide citizen/business/city mitigation strategy planning	Encourage the development of public and private partnership with businesses, service organizations and other community groups to work together on mitigation	2	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding		 	Emergency Management	No funding needed	N/A	60	Low
COFFEE CITY											
1	Roadway and Infrastructure maintenance	Locate roadways and properties prone to flooding due to heavy rainfall	1	Flood		 	Fire Department/Police Department	\$10,000	Grant	12	Medium
2	Public notification during Hazard incidents	Work to educate the public on information dealing with severe storms	1	Severe Storms		  	Fire Department/Police Department	\$10,000	City Budget	12	Medium
3	Emergency Notification Siren	Maintain and update siren and notification systems	4	Tornado	 	 	Fire Department/Police Department	\$100,000	Grant	24	High
4	Community notification and awareness of Fire hazards	Work to mitigate brush and fuel load in city right of ways and easements	4	Wildfire	 	  	Fire Department/Police Department	\$10,000	City Budget	12	Low
ENCHANTED OAKS											
1	Create/implement new building codes	mitigate water runoff from severe rain downfall to assist in preventing flooding	1	Storms-Lightning/Hail/High Winds, Flood/Flash Flooding		  	Building Officials	\$5,000	City Budget	12	Low

2	Infrastructure Improvement	Seek improvements for city streets and drainage through cleaning roadside ditches and replacement or implementation of infrastructure	3	Storms-Lightning/Hail /High Winds, Dam, Failure, Winter Storm, Flood/Flash Flooding	■	●○	Mayor/City Council	\$8,000	City Budget	24	Low
3	Early warning Siren maintenance	check the location and condition of warning sirens; determine if repairs are needed	4	Tornado, Severe Storms-Lightning/Hail/High Winds, Wildfire, Flood/Flash Flooding	◆	●●	Mayor/City Council	\$2,000	City Budget	24	High
EUSTACE											
1	Financial audit for Mitigation grants	Seek financial audit for grant eligibility to obtain mitigation grants	4	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	◆	●●	Mayor/Administrative	\$100,000	Grant/City Budget	36	Medium
2	Implementation of Code Red or Advanced Warning and Public Notification System	Obtain access and/or incorporate the use of the automated emergency calling system, Code Red, into local emergency management plan	4	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	◆	●●●	Mayor	\$50,000	Grant	24	High
3	Ordinance(s)/Evacuation Plan(s)	Identify areas and produce evacuation plans for citizens and businesses	3	Tornado, Severe Storms-Lightning/Hail /High Winds, Wildfire, Flood/Flash Flooding	■	●●	Mayor/Administrative	\$20,000	City Budget/Fundraiser	24	Medium












4	Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event	Inventory kept at city hall of capabilities for Search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications; location, size and condition of shelter facilities; first aid supplies, sheltering items and locations.	1	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Administrative	\$2,000	City Budget	12	Low
GUN BARREL CITY											
1	Implementati on of Code Red or Advanced Warning and Public Notification System	Incorporate the use of the automated emergency calling system, Code Red, into local emergency hazard plans. Provide training to selected parties on when and how to use it.	1	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding		 	Fire Chief	\$3,000	City Budget	12	High
2	Emergency Alert Siren System	Update current storm sirens and add one outdoor warning siren to Tom Finley boat ramp parking lot to supplement the existing 6 sirens due to west winds.	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Fire Chief	#30,000	City Budget	12	High
3	Public Education and Information	Post water restrictions to city website when local water purveyor requests	1	Wildfire, Drought/Extreme Heat		 	Fire Chief	\$1,500	City Budget	24	Low

4	Communications Capabilities	installation of HAM club antennas and radio system into Central Station for early warning and/or post warning on multi hazards	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Fire Chief	\$3,500	City Budget	C	Low
5	Ordinance/Code Update	Adopt 2015 complete code set 2014 NEC. 2015 Urban/Wildland added for new subdivisions require two ways out	3	Wildfire, Drought/Extreme Heat			City Council	\$4,200	City Budget/Grant	60	Medium
LOG CABIN											
1	Emergency Alert Siren System	obtain system that allows the city to rapidly notify residents and businesses of hazards	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	 		Mayor/City Council	\$100,000	City Budget/FEMA Grant	12	High
2	Infrastructure and Utility Improvements	replacement of water lines with better quality materials and relocated if needed to prevent further damage or underlying hazards	3	Dam Failure, Severe Storms- Lightning/Hail/High Winds, Winter Storm, Flood/Flash Flooding		 	Mayor/City Council/Water Department	\$100,000	City Budget/Grants	60	Medium
3	Critical facility and Infrastructure retrofitting	replacement of anchors on the water tower to add more stability during storms or hazard weather	3	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Winter Storm, Flood/Flash Flooding		 	Mayor/City Council	\$10,000	City Budget	12	High

4	Boat Dock Replacement	replacement of dock at boat ramps including all materials and stability	1	Severe Storm-Lightning/Hail/High Winds, Flood/Flash Flooding	◆	●●○	Mayor/City Council/City Maintenance Department	\$100,000	City Budget/Grants	48	Low
MALAKOFF											
1	Water Shortages	Educate citizens about the potential for water shortages and limit water usage	1	Drought/Extreme Heat	□	●●	City Water/Fire Department	\$100,000	TWDB Grants	12	Low
2	Potential wildfires in the event of drought and extreme heat	Educate citizens about the potential for wildfires	1	Wildfire	□	●●	Fire Department/Code Enforcement	\$10,000	City Budget / Forestry Service	12	Low
3	Damages and loss of life from the threat of severe storms	Educate citizens about the potential for severe storms and install early warning systems	2	Severe Storms/Lightning/Hail/High Winds	□	●●●	Administration/Fire Department/Police Department	\$100,000	Fema Grants/ City Budget	12	Low
4	Localized flooding in and around the vicinity of CR 1400	Cleaning debris, widening and installing box drains where necessary.	4	Flood	◆■	●●○	Street Department	\$500,000	Fema Grants/ TWDB Grants	24	High
5	Damages and loss of life from the threat of tornadoes	Educate citizens about the potential for tornadoes and install additional early warning sirens and systems	2	Tornado	□	●●●	Fire Department/Code Enforcement	\$250,000	Fema Grants	36	Medium
MOORE STATION											
1	Roadway and Infrastructure maintenance	Locate roadways and properties prone to flooding due to heavy rainfall	3	Flood	◆	●○	EMC/ Fire Department	\$10,000	City Budget	12	Medium










2	Public notification during Hazard incidents	Locate roadways and potential icing areas and notify public of potential hazards due severe storms	3	Sever Storms		  	EMC/ Fire Department	\$10, 000	City Budget	12	Medium
3	Emergency Notification Siren	Look into sirens and possible warning systems for tornadoes and bad weather	4	Severe Storms/Lightning/Hail /High Winds/Tornados	 	  	Fire Department	10,000	Grants	36	High
4	Community notification and awareness of Fire hazards	Enhance ways of notifying the public of potential fire conditions which could lead to wildfires	1	Wildfire	 	  	Fire Department	\$10,000	City Budget	12	Low
MURCHISON											
1	Protection and Maintenance of Roadway and Infrastructure	Perform maintenance of culverts and ditches throughout the city and sewer plant location	2	Flood/Flash Flooding		 	City of Murchison/Contractor	\$100,000	City Budget	12	High
2	Early warning Siren for public notification	Obtain early warning siren system installment inside jurisdiction to assist in public notification of hazard prior to hazard occurrence	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	 	  	City of Murchison	\$100,000	City Budget/Grants	12	High



3	First Responders Assistance by City	Assist local VFD with grant opportunities for needed resources	3	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			City of Murchison	\$100,000	Grants	60	Medium
4	Public Education/Notice and awareness of Hazards	Post on social media, websites and purchase large signs at City Hall regarding burn ban hazards	1	Drought/Extreme Heat, Wildfire			City of Murchison	\$10,000	City Budget	60	Medium
PAYNE SPRINGS											
1	Flood Prevention	Flood waters covering roads in the city causing traffic problems, road damage and debris	2	Flood, Tornado			City Road and Bridge	\$100,000	City Funds, Grants	36	High
2	Minimize Risk of Wildfires	Minimize risk to homes, businesses, agriculture and nature due to wildfire, potential for fire due to brush, compact spaces	3	Wildfire	 		City Mayor and Road and Bridge	\$100,000	City Budget	12	High
3	Tornado Safety	Safety tips on tornadoes, what is safer, what to do before, during and after a tornado. Public awareness and citizen safety	1	Tornado			Mayor and Council	\$10,000	City Budget	12	Low
POYNOR											





1	Road and Infrastructure Improvements	2 Step process of surveying and repaving city roadways through contracting company	3	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	■	●○	City Administration/Contractor	\$350,000	City Budget/FEMA Grant	24	High
2	Community Education on prevention of Hazard	Contact electrical company for class education and material on how to handle electricity during a storm	1	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Winter Storm, Flood/Flash Flooding	□	●●	City Administration	\$3,000	City Budget/Grant	24	Medium
SEVEN POINTS											
1	Maintenance/update Tornado Siren	perform maintenance/replace siren system to ensure the alert is loud enough to be heard throughout the city	4	Tornado, Severe Storms- Lightning/Hail/High Winds, Wildfire, Flood/Flash Flooding	◆◆	●●●	EMC/Mayor/City Council	\$100,000	FEMA Grant	24	Medium
STAR HARBOR											
1	Early Hazard warning system	Install a city-wide all-hazard warning system to implement early notification	4	Tornado, Severe Storms- Lightning/Hail/High Winds, Wildfire, Flood/Flash Flooding	◆◆	●●●	Mayor/City Council	\$100,000	Grant	48	High
TOOL											
1	Hazard Response by emergency personnel	Coordinate with Texas Forest Service to obtain educational resources with public information programs to seek manpower to control fires and protect life and property	1	Drought/Extreme Heat, Wildfire	□	●●	City of Tool	>\$ 10,000	City Budget/Grants	24	High

2	City Infrastructure Improvements	Poor Culvert Integrity and lack of drainage infrastructure; encourage retrofitting of existing structures	2	Flood, Dam Failure, Severe Storms, Winter Storm	■	●●○	City of Tool	>\$ 10,000	City Budget/Grants	24	Medium
3	Hazard Preparation Ordinances/Programs	Locate affordable options of materials and resources. Implement pre-storm meetings and create feasible response plans for loss of power and inability to power O2 devices, loss of HVAC functionality.	1	Severe Storms, Lightning, Hail, High Winds, Tornado, Winter Storm	◆	●●	City of Tool	>\$ 10,000	City Budget	24	Medium
4	Public Education of Hazards	Provide materials and data sources to educate/train citizens of all potential hazards in the planning area and methods to mitigate hazards and increase awareness.	1	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	□	●●	City of Tool	\$10,000	City Budget/Grants	24	Low
TRINIDAD											
1	Improvement /creation for long range management operation and evacuation plans for natural and manmade hazards	Develop a long term plan to create evacuation routes/plans for citizens to be implemented during hazard situations.	5	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	□◆	●●●	City of Trinidad	50 Million	Grant Funding	60	High

2	Early warning Siren for public notification	Obtain early warning system installment inside jurisdiction to assist in public notification of hazard prior to hazard occurrence	4	Tornado, Severe Storms- Lightning/Hail/High Winds, Wildfire, Drought/Extreme Heat, Flood/Flash Flooding	 	  	City of Trinidad	\$100,000	City Budget/Grant	48	Medium
3	Infrastructure Improvement	Seek improvements for city streets and drainage through cleaning roadside ditches and replacement or implementation of infrastructure	2	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	 	 	City of Trinidad	\$500,000	City Budget/Grant	48	Low

#### LEGEND

ACTION TYPE:  LPR  SIP  NSP  EAP

APPLICABLE GOALS: G1  G2  G3  G4 

EAP	Emergency Action Plan
EOC	Emergency Operations Center
FEMA	Federal Emergency Management Agency
GIS	Geography Information System
HMGP	Hazard Mitigation Grant Program
IBC	International Building Code
IRC	International Residential Code
NFPA-70	National Fire Protection Association 70 (National Electrical Code)
NOAA	National Oceanic and Atmospheric Administration
OEM	Office of Emergency Management
STEAR	State of Texas Emergency Assistance Registry
TCEQ	Texas Commission on Environmental Quality



## **CHAPTER 1. INTRODUCTION**

### **1.1 PURPOSE FOR THE PLAN**

The responsibility for hazard mitigation lies with many, including private property owners, commercial interests, and local, state and federal governments. The DMA encourages cooperation among state and local authorities in pre-disaster planning. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk-reduction projects.

For many years, federal disaster funding focused on relief and recovery after disasters occurred, with limited funding for hazard mitigation planning in advance.

Henderson County prepared a hazard mitigation plan in compliance with the DMA that was adopted and approved in October 2011. That plan identifies resources, information, and strategies for reducing risk from natural hazards and to be revised on a five (5) year cycle. That requirement will be fulfilled with this update.

The county prepared this plan update in partnership with local municipalities. Elements and strategies in the plan were selected because they meet a program requirement and because they best meet the needs of the planning partners and their citizens. One of the benefits of multi-jurisdictional planning is the ability to pool resources and eliminate redundant activities within a planning area that has uniform risk exposure and vulnerabilities. The Federal Emergency Management Agency (FEMA) encourages multi-jurisdictional planning under its guidance for the DMA. This plan will help guide and coordinate mitigation activities throughout the planning area.

The following objectives were developed during this plan update:

- Meet or exceed requirements of the DMA
- Enable all planning partners to continue use of federal grant funding to reduce risk through mitigation
- Meet the needs of each planning partners as well as state and federal requirements
- Create a risk assessment that focuses on Henderson County hazards
- Create a single planning document that integrates all planning partners into a framework that supports partnerships within the county, and puts all partners on the same planning cycle for future updates
- Coordinate existing plans and programs so that high-priority actions and projects to mitigate possible disaster impacts are funded and implemented

All residents, businesses and visitors of and to Henderson County are the ultimate beneficiaries of this hazard mitigation plan update. The plan reduces risk of those who live in, work in, and visit the county. It provides a viable planning framework for all foreseeable natural hazards that may impact the county. Participation in development of the plan by key stakeholders helped ensure that outcomes will be mutually beneficial. The resources and background information in the plan are applicable countywide. The plan's goals and recommendations lay groundwork for the development and implementation of local mitigation activities and partnerships.

## CHAPTER 2. PLAN UPDATE

### 2.1 PREVIOUS PLAN

Henderson County Hazard Mitigation Action Plan, 2011 included the following municipalities:

- Henderson County
- Athens
- Berryville
- Brownsboro
- Candy City
- Chandler
- Coffee City
- Enchanted Oaks
- Eustace
- Gun Barrel City
- Log Cabin
- Mabank (Did not participate)
- Malakoff
- Moore Station
- Murchison
- Payne Springs
- Poynor (Did not participate)
- Seven Points
- Star Harbor
- Tool
- Trinidad

These are the same planning partners for the Henderson County Hazard Mitigation Action Plan update in 2020 with the city of Poynor added as a participating jurisdiction.

The Henderson County Hazard Mitigation Action Plan 2011 ranked 7 hazards from highly likely (HL) to unlikely (U) for Henderson County and all the planning partners. TABLE 2-1 shows the hazards and their ranking. These hazards include one human-caused hazard disease.

**TABLE 2.1 HAZARDS EVALUATED IN HENDERSON COUNTY HAZARD MITIGATION ACTION PLAN 2011**

	DISEASE	DROUGHT/ EXTREME HEAT	FLOODING/ FLASH FLOODING	THUNDE RSTORM/ LIGHTNIN G/HAIL	TORNADO	WINTER STORMS/ICE STORMS	WILDFIRE
<b>HENDERSON COUNTY</b>	H	H	VH	H	H	H	H
<b>ATHENS</b>	H	H	L	H	H	H	H
<b>BERRYVILLE</b>	H	H	H	H	H	H	H
<b>BROWNSBORO</b>	H	H	L	H	H	H	H
<b>CANEY CITY</b>	H	H	L	H	H	H	H
<b>CHANDLER</b>	H	H	VH	H	H	H	H
<b>COFFEE CITY</b>	H	H	H	H	H	H	H
<b>ENCHANTED OAKS</b>	H	H	L	H	H	H	H
<b>EUSTACE</b>	H	H	VH	H	H	H	H
<b>GUN BARREL CITY</b>	H	H	L	H	H	H	H
<b>LOG CABIN</b>	H	H	L	H	H	H	H

<b>MALAKOFF</b>	H	H	L	H	H	H	H
<b>MOORE STATION</b>	H	H	L	H	H	H	H
<b>MURCHISON</b>	H	H	VH	H	H	H	H
<b>PAYNE SPRINGS</b>	H	H	L	H	H	H	H
<b>SEVEN POINTS</b>	H	H	L	H	H	H	H
<b>STAR HARBOR</b>	H	H	L	H	H	H	H
<b>TOOL</b>	H	H	VH	H	H	H	H
<b>TRINIDAD</b>	H	H	VH	H	H	H	H

## 2.2 THE UPDATE

Title 44 of the Code of Federal Regulations (44 CFR) stipulates that hazard mitigation plan must present a schedule for monitoring, evaluating, and updating the plan. As mentioned previously, Henderson County participated in a Mitigation planning process 2013-2015. The plan was not approved by FEMA Region VI, and has since expired. This update process provides an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and evaluate whether there is a need to change the focus of mitigation strategies. A jurisdiction covered by the plan that has expired is not able to pursue elements of federal funding under the Robert T. Stafford Act for which a current hazard mitigation plan is prerequisite.

The County and the planning partners were fully involved in the preparation of this plan update. The plan update includes a more robust hazard analysis. Mitigation actions were reviewed and ended to include only those that would move the jurisdiction toward a higher degree of resiliency while being feasible, practical, and implementable given current finances. Federal and state funds for projects have become difficult to obtain. Actions from the previous plan were carried forward into the mitigation actions if they were identified as delayed or in progress and still applicable or beneficial. These actions were indicated on TABLE 15-1.

## 2.3 LOCAL MITIGATION PLAN REVIEW TOOL

The Local Mitigation Plan Review Tool demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR 201.6 and offers states and FEMA Mitigation Planners an opportunity to provide feedback to the community.

The Regulation Checklist provides a summary of FEMA's evaluation of whether the plan has addressed all the requirements.

The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.

The Multi-Jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of each element of the plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference the Local Mitigation Plan Review Guide when completing the Local Mitigation Plan Review Tool.

## CHAPTER 3.



## PLAN METHODOLOGY

### 3.1 ESTABLISHMENT OF PLANNING PARTNERSHIP

Henderson County opened this planning efforts to all eligible local governments in the county. The planning partners' responsible leaders (point of contacts) are shown in TABLE 3-1. These responsible leaders were asked to join the planning committee and its process.

**TABLE 3-1 COUNTY AND CITY PLANNING PARTNERS**

JURISDICTION	POINT OF CONTACT	AGENCY	TITLE	ADDRESS	PHONE
ATHENS	Russell Marshall	City of Athens	Fire Chief	508 E Tyler St, Athens, TX	903-677-6610
BERRYVILLE	Ron Hewlett	City of Berryville	Mayor	23170 CR 4117 Frankston, TX	214-802-4834
BROWNSBORO	David Smith	City of Brownsboro	Building Inspector	11351 Willow Brownsboro, TX	903-852-2401
CANEY CITY	Lamar Matthews	City of Caney City	Mayor	15241 Barron Caney City, TX	903-288-1891
CHANDLER	Stephen Kidd	City of Chandler	Fire Marshal	811 SH 31 E Chandler, TX	903-849-6853
COFFEE CITY	Chris Moore	City of Coffee City	Fire Chief	7019 Pleasant Ridge Rd, Frankston, TX	903-876-3414
ENCHANTED OAKS	Natalie Onate	City of Enchanted Oaks	Mayor	PO Box 5019 Mabank, TX	903-603-3303
EUSTACE	Dustin Shelton	City of Eustace	Mayor	107 Edge St. Eustace, TX	903-275-1024
GUN BARREL CITY	Joseph Lindaman	City of Gun Barrel City	Fire Chief	1716 W. Main St. Gun Barrel City, TX	903-887-1087
LOG CABIN	Nancy Ruckstaetter	City of Log Cabin	Mayor	14387 Alamo Rd, Malakoff, TX	903-489-2195
MALAKOFF	Ann Barker	City of Malakoff	City Administrator	109 S. Melton Malakoff, TX	903-489-0699
MOORE STATION	Chris Moore	City of Moore Station	Fire Chief	4720 CR 4319 Larue, TX	903-681-2767
MURCHISON	John Placyk	City of Murchison	Mayor	9540 FM 773 Murchison, TX	903-469-3710
PAYNE SPRINGS	Andrea Miller	City of Payne Springs	Mayor Pro-tem	109601 CR 2529 Payne Springs, TX	903-451-9229
POYNOR	George Thaw	City of Poynor	City Council	PO Box 228 Poynor,	903-876-2436

			Member	TX	
SEVEN POINTS	Raymond Wennerstorm	City of Seven Points	Police Chief	423 E. Cedar Creek Pkwy Kemp, TX	903-432-4610
STAR HARBOR	Richard Haley	City of Star Harbor	City Council Member	99 Sunset Blvd Malakoff, TX	903-489-0091
TOOL	Makenzie Lyons	City of Tool	City Manager	701 N. Tool Drive Tool, TX	903-432-3522
TRINIDAD	Bryan Miers	City of Trinidad	Police Chief	PN Box 345 Trinidad, TX	903-778-2525
HENDERSON COUNTY	Shane Renberg	Fire Marshal	Fire Marshal	125 N. Prairieville St. Athens, TX	903-677-7252

### 3.2 PLANNING COMMITTEE

A planning committee was established consisting of representatives from Henderson County as well as each of the planning partners' responsible leaders and stakeholders throughout the communities. Each planning partner and stakeholder wishing to join the planning committee was asked to commit to the process and have a clear understanding of expectations as listed below:

- Support and participate in the planning committee meetings overseeing the development of the plan update. Support includes making decisions regarding plan development and scope on behalf of the partnership.
- Each partner will provide support as needed for public involvement strategy development by the planning committee in the form of mailing lists, possible meeting space, and media outreach such as newsletters, newspapers or direct-mail brochures.
- Each partner will participate in plan update development activities such as:
  - Planning committee meetings
  - Public Meetings
  - Workshops and planning partners training sessions
  - Public review and comment period prior to adoption

Attendance was tracked at these activities, and attendance records documenting participation for each planning partner are included in the plan. All participating committees were expected to attend and actively participate in meetings and activities.

- Each partner within the planning committee is expected to review the risk assessment and identify hazards and vulnerabilities specific to its jurisdiction. County resources will provide jurisdiction specific mapping to aid in this task, but the determination of risk and vulnerability ranking will be up to each partner.
- Each partner will be expected to review the mitigation recommendations chosen for the overall county and evaluate whether they will meet the needs of its jurisdiction within each jurisdiction consistent with the overall plan recommendations will need to be identified, prioritized and reviewed to identify their benefits and costs.
- Each partner will be required to sponsor at least one public meeting to present the draft plan at least two (2) weeks prior to adoption.
- Each partner will be required to formally adopt the plan.
- Each partner will agree to the plan implementation and maintenance protocol.

Failure to meet these criteria may result in a partner being dropped from the partnership by the planning committee, and thus losing eligibility under the scope of this plan.

### 3.3 DEFINING THE PLANNING AREA

The planning area was defined to consist of all of Henderson County FIGURE 3-1. It should be noted that the Cities of Coffee City, Berryville, are split between Henderson County and Smith County. Mabank is split between Henderson County, Kaufman County and Ellis County. Relevant planning area characteristics are described. In Chapter 4. all partners to this plan have jurisdictional authority within this planning area.

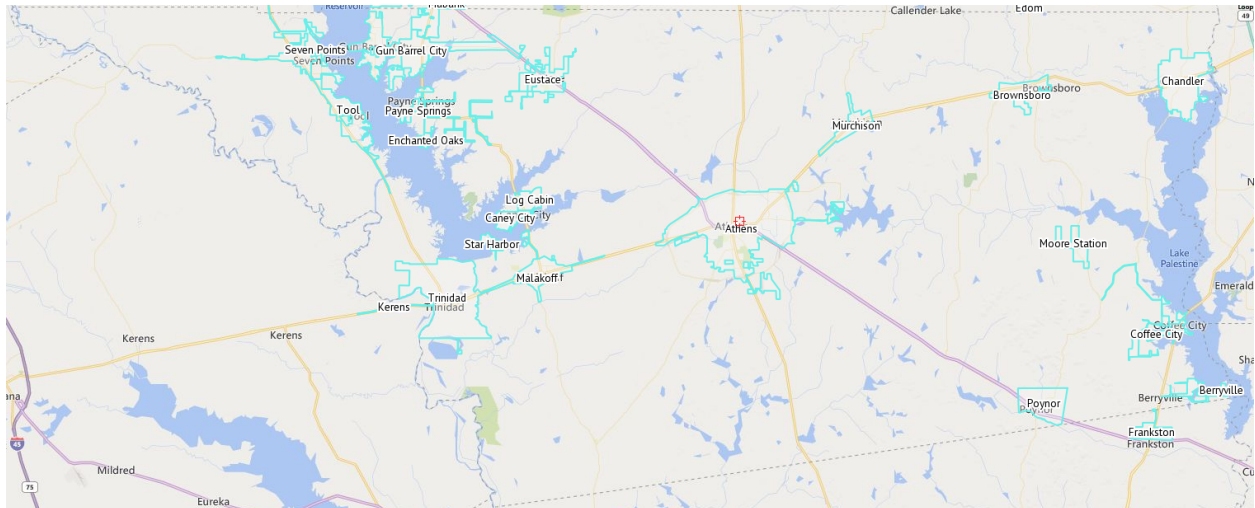


Figure 3-1 Henderson County Planning Area

### 3.4 THE PLANNING COMMITTEE

Hazard mitigation planning enhances collaboration and support among diverse parties whose interests can be affected by hazard losses. A planning committee was formed to oversee all phases of the plan update. The members of this committee included key planning partners, staff, citizens and other stakeholders from the planning area. TABLE 3-2 shows the representation of each participating jurisdiction at the planning meetings and update/development of mitigation actions. Sign-in sheets are included in Appendix D:Planning Process Documentation. All of the jurisdictions listed as official participants in this plan met all of these participation requirements.

TABLE 3-2 PLANNING COMMITTEE MEMBERS PARTICIPATION IN PLANNING PROCESS

JURISDICTION	PLANNING MTG. #1	PLANNING MTG. #2	PLANNING MTG. #3	PLANNING MTG. #4	STATUS OF PREVIOUS ACTION	MITIGATION ACTIONS RECEIVED
HENDERSON COUNTY	X	X	X		X	X
Athens	X		X		X	X
Berryville	X		X		X	X

<b>Brownsboro</b>	X		X		X	X
<b>Caney City</b>	X	X			X	X
<b>Chandler</b>		X	X		X	X
<b>Coffee City</b>		X	X		X	X
<b>Enchanted Oaks</b>		X	X		X	X
<b>Eustace</b>		X	X		X	X
<b>Gun Barrel City</b>	X	X			X	X
<b>Log Cabin</b>		X	X		X	X
<b>Malakoff</b>		X	X		X	X
<b>Moore Station</b>			X		X	X
<b>Murchison</b>	X		X		X	X
<b>Payne Springs</b>	X	X			X	X
<b>Poynor</b>	X		X		X	X
<b>Seven Points</b>		X	X		X	X
<b>Star Harbor</b>		X	X		X	X
<b>Tool</b>	X				X	X
<b>Trinidad</b>					X	X

The planning committee agreed to meet a minimum of three times or as needed throughout the course of the plan's development. An MOA, (Memorandum of Agreement), was developed describing each planning partner's roles and responsibilities in the hazard mitigation updating process. Each jurisdiction within Henderson County signed the MOA and received a copy of the agreement. The Henderson County Emergency Management Coordinator facilitated each planning committee meeting, which addressed a set of objectives based on the timeline established for the plan update. The planning committee met four times from October 2020 through December 2020. Meeting agendas, notes, and attendance logs can be found in Appendix D of this document.

The planning team introduced the mitigation planning process on October 08, 2020. The planning committee, planning partners, and the public were encouraged to participate in the plan update process. Key meeting objectives at the October meeting were as listed below:

- Planning committee purposes and responsibilities
- Plan partners and signatories responsibilities
- Purpose and goals of the update process
- Public outreach strategies

The planning committee met on October 21 2020, to review the MOA Agreement, discuss the plan tables and review and amend mitigation goals. The planning committee also discussed critical facilities, received

an update of the community survey while reviewing county hazard risk assessments and the previous mitigation actions from the 2011 plan. The results of the hazard ranking is discussed in Chapter 14.

The second planning committee meeting was held on November 4, 2020. The main objective of the meeting was to review completed items and goals, discuss any questions about data tables and collect all remaining data from the cities. There was an update on the survey results, reviewed the mitigation action table and worksheet. The mitigation actions are discussed in Chapter 15.

The third planning Committee meeting was held on November 18, 2020. During the meeting the Henderson County Hazard Mitigation Action Plan draft document was reviewed by the planning committee, it was encouraged that each jurisdiction publicize the draft document to the citizens in their cities. The meeting provided for an exchange of information on how the plan would be submitted and adopted by each jurisdiction.

### **3.5 COORDINATION WITH OTHER AGENCIES**

Opportunities for involvement in the planning process must be provided to neighboring communities, local and regional agencies involved in hazard mitigation, agencies with authority to regulate development, businesses, academia, and other private and non-profit interests (44 CFR, Section 201.6(b)(2)). This task was accomplished by the planning team as follows:

- **Planning committee Involvement-** Agency representatives were invited to participate on the planning committee.
- **Agency Notification-** The Texas Division of Emergency Management (TDEM) was invited to participate in the plan development process from the beginning and was kept apprised of plan development milestones.
- **Review-** Agency representatives listed above were provided an opportunity to review and comment on this plan, primarily during the planning committee meetings or through coordination with county emergency management personnel. Each agency was sent an email message informing them that draft portions of the plan were available for review. In addition, the complete draft plan was sent to TDEM for a pre-adoption review to ensure program compliance.

### **3.6 REVIEW OF EXISTING PROGRAMS**

Hazard mitigation planning must include reviewing and incorporation, if appropriate, of existing plans, studies, reports and technical information (44 CFR, Section 201.6(b)(3)). Chapter 4 of this plan provides a review of laws and ordinances in effect within the planning area that can affect hazard mitigation actions. The following programs can affect mitigation within the planning area:

- Henderson County
  - Subdivision Regulations
  - Flood Damage Prevention Order
  - Floodplain Map
  - Basic Emergency Operations Plan

An assessment of all planning partners' regulatory, technical and financial capabilities to implement hazard mitigation actions is presented in Chapter 4 and Chapter 5. Many relevant plans, studies and regulation are cited in the capability assessment.

### **3.7 PUBLIC INVOLVEMENT**

Broad public participation in the planning process helps ensure that diverse points of view about the planning area's needs are considered and addressed. The public must have the opportunities to comment on disaster mitigation plans during the drafting stages and prior to plan approval (44 CFR, Sections 201.6(b)(1)). The strategy for involving the public in this plan emphasized the following elements:

- Include members of the public on the planning committee
- Use a community survey/questionnaire to evaluate whether the public's perception of risk and support of hazard mitigation has changed since the initial planning process.
- Attempt to reach as many planning area citizens as possible using multiple media
- Identify and involve planning area stakeholders
- Solicit public feedback at each stage of plan implementation, monitoring and evaluation.

### **3.7.1 STAKEHOLDERS AND PLANNING COMMITTEE**

Stakeholders are the individuals, agencies and jurisdictions that have a vested interest in the recommendations of the hazard Mitigation plan and may be affected by a Mitigation action or policy. Examples of Stakeholders encouraged to participate in the plan update process include business owners, chamber of commerce, neighborhood associations, Red Cross, hospital districts, and private organizations. The effort to include stakeholders in this process included stakeholder participation on the Planning Committee and encouraged to attend and participate in all jurisdictional committee meetings. Stakeholders were notified by various methods including email, Community News webpages, and face-to-face invites.

Additionally, representatives from the planning committee were encouraged to give plan progress updates at their various organizations public and private committee meetings. Plan and planning committee updates were also included on the community and/or department website encouraging interested stakeholders to either reach out to Planning Committee leaders one on one to provide comments or ask questions.

### **3.7.2 SURVEY/QUESTIONNAIRE**

A hazard mitigation plan questionnaire FIGURE 3-2 was developed to gauge household preparedness for natural hazards; the level of knowledge of tools and techniques that assist in reducing risk and loss from natural hazards; and the perceived impact of natural hazards on Henderson County residents and businesses. This on-line questionnaire was designed to help identify areas vulnerable to one or more natural hazards. The answers to these 11 questions helped guide the planning committee in prioritizing hazards of impact and in selecting goals, objectives, and mitigation strategies. A total of 325 questionnaires were completed during the course of this planning process.

# Hazard Mitigation Plan Citizen Survey

Font Size: [+](#) [-](#)

[+](#) Share & Bookmark

[Feedback](#)

[Print](#)

1. How long have you lived in Henderson County Texas? \*

- ☐ Less than one Year
- ☐ 1 to 4 Years
- ☐ more than 5 Years

2. Do you rent or own the place where you live? \*

- ☐ Own
- ☐ Rent
- ☐ Neither (please specify)

3. Which of the following types of Hazard Events have you or someone in your household experienced while living where you live now? (Check all that apply)

\*

- |  |   |
|--|---|
| <input type="checkbox"/> Tornado                     | <input type="checkbox"/> Flooding       |
| <input type="checkbox"/> Dam Failure                 | <input type="checkbox"/> Flash Flooding |
| <input type="checkbox"/> Drought                     | <input type="checkbox"/> High Winds     |
| <input type="checkbox"/> Earthquake                  | <input type="checkbox"/> Levee Failure  |
| <input type="checkbox"/> Extreme Temperature Heat    | <input type="checkbox"/> Wildfire       |
| <input type="checkbox"/> Severe Weather Winter Storm | <input type="checkbox"/> Hail Storm     |
| <input type="checkbox"/> Other (please specify)      |   |

4. What actions have you taken to reduce risk for your home/apartment/property for potential disaster? (Check all that apply)

\*

- |   |   |
|---|---|
| <input type="checkbox"/> Purchase homeowners/renter insurance   | <input type="checkbox"/> Purchase and placement of easily accessible fire extinguishers |
| <input type="checkbox"/> Purchase Flood insurance   | <input type="checkbox"/> Alternative power source                                       |
| <input type="checkbox"/> Flood proofing (elevated furnace, water heaters, electric panels)  | <input type="checkbox"/> Alternative water supply                                       |
| <input type="checkbox"/> Install retrofits such as high impact windows or doors to withstand high winds; fire resistant siding, roofing or window screens, etc. | <input type="checkbox"/> Storm shelter  |
| <input type="checkbox"/> Install fire breaks around structure   | <input type="checkbox"/> None   |
| <input type="checkbox"/> Remove dead/dying trees vegetation   | <input type="checkbox"/> Other (please specify)   |

5. To the best of your knowledge, is your property located in a designated floodplain? If no, skip to question 8.

Figure 3-2 Sample from Survey Distributed to the Public

### 3.7.3 MEETINGS

Four planning committee meetings, as well as one meeting before the Henderson County Commissioners' Court were held during the planning process. Meetings were held in the City of Athens on October 8, 2020, October 21, 2020, November 4, 2020, November 18, 2020 and December 3, 2020.(See FIGURE 3-3). The meeting format allowed attendees to access handouts, maps, and other resources and ask questions during the meetings in person and by google meeting. Additionally, project staff and county personnel remained after the meeting to have direct conversations with interested attendees.

Details regarding the planning and information generated the risk assessment were shared with attendees via overhead screen projection.

Henderson County and the planning partners held public meetings to present the draft plan, discuss the benefits of the plans and solicit public comments. Unless otherwise noted below, the public meetings were held as part of a regularly scheduled public meeting and the plan was discussed as an item on the meeting agenda. Notice of the public meeting was provided in compliance with the communities' individual requirements. A member of the planning team was available during all meetings to answer questions from the public on the development of the Hazard Mitigation Action Plan.

The 1st public comment period was from 11/24/2020-12/15/2020. Henderson County issued a Press Release FIGURE 3-4 to solicit public comments on the draft plan. The draft plan was available for review in hard copy at the Fire Marshal's Office starting November 18, 2020 for review by the interested parties and posted on the Henderson County website FIGURE 3-7. The participating jurisdictions also solicited public comments on the draft. A sample of participant's jurisdictions websites of the draft plan availability can be viewed at FIGURE 3-8, FIGURE 3-9 and FIGURE 3-10 for the cities of.... And ..... No comments that resulted in change to the plan were received for the public electronically or in person at the Henderson County Fire Marshal's Office.

Once the draft plan became approved pending adoption by FEMA, a second Public outreach occurred. The plan was available to the public and was presented and reviewed in a public meeting before the Henderson County Commissioners County on December 15, 2020.

Each city was encouraged to hold a public meeting between November and December to present the draft plan and solicit public comments. The draft plan was made available for review in hard copy in the City Halls, city websites and on the County website for review by interested parties. No comments that resulted in changes to the plan were received for the public electronically or in person at the city hall or during the public meeting.





Figure 3-3 Planning Committee Meeting, November 4, 2020

---

### **3.7.4 PRESS RELEASES**

Henderson County issued a Press Release to solicit public comments on the draft plan . FIGURE 3-4



Angie Ewaskiw  
Court Coordinator  
903-675-6120

Angela Wilson  
Indigent Health Coordinator  
903-677-6372

**Henderson County Judge's Office  
Judge Wade McKinney**

**PUBLIC NOTICE-  
HENDERSON COUNTY HAZARD MITIGATION PLAN**

**UPDATE OF THE HENDERSON COUNTY HAZARD MITIGATION PLAN**

Henderson County, TX, the incorporated municipalities of Henderson County including Athens, Berryville, Brownsboro, Caney City, Chandler, Coffee City, Enchanted Oaks, Eustace, Gun Barrel City, Log Cabin, Malakoff, Moore Station, Murchison, Payne Springs, Poynor, Seven Points, Star Harbor, Tool and Trinidad have updated the 2011 Hazard Mitigation Action Plan. The new 2020 plan focuses on reducing the risk of loss of life, injury and property damage due to hazards such as drought, floods, severe storms, wildfires and tornadoes.

This plan also identifies specific actions that can be undertaken to minimize or eliminate these vulnerabilities. These projects can be implemented as funding becomes available. This plan is a requirement for eligibility for federal mitigation grant programs, including the Hazard Mitigation Grant Program (HMGP).

There are millions of federal hazard mitigation grant dollars made available to eligible applicants through programs such as the Hazard Mitigation Grant Program. With an approved hazard mitigation plan, the participating jurisdictions are eligible to apply for competitive grant funds.

As part of the development process, and in compliance with 44 CFR, part 201, we are requesting that the public review this plan, and submit any comments or suggestions on the document. The plan may be viewed at the location listed below:

Henderson County Fire Marshal's Office  
125 N. Prairieville St.  
Athens, TX 75751  
Office Hours: 7:00 AM- 5:00 PM  
Monday- Friday

Please download a draft of the document using this link:

[www.henderson-county.com](http://www.henderson-county.com)

Should you wish to comment on the draft, please send it in writing to the address listed above or by email to [firemarshal@henderson-county.com](mailto:firemarshal@henderson-county.com) noting the section and page number relevant to your comment. All comments must be received no later than December 15, 2020.

125 N. Prairieville Street Room 100 ~ Athens, Texas 75751 ~ (903) 675-6120 office  
[countyjudgesoffice@henderson-county.com](mailto:countyjudgesoffice@henderson-county.com)

Figure 3-4 Press Release Issued November 18, 2020

---

Hello my name is George E. Thaw (Skip) and I'm one of your city councilman for Poynor. This letter is to advise the residents in the area that we need your assistance in helping our county obtain information by filling out the Hazard Mitigation Plan Citizen Survey. This survey will assist the county in locating problem areas and to be prepared in case of Hazard Events.

Now if you have a computer go to the site titled

**[www.henderson-county.com](http://www.henderson-county.com)**

Go to the right side of the screen and tap the Scroll arrow, then tap HAZARD MITIGATION PLAN CITIZEN SURVEY, this should bring up the survey to be completed, complete the survey and place your zip code in the box. In order to send you'll have to fill in the I'm not a robot box then hit send

For those who do not have a computer the survey should be attached this letter,

Once completed return it to the school.

Thank each of you for your time and effort and have a blessed day.

Figure 3-5 Soliciting Participation from Public, LaPoynor School handout, City of Poynor

### 3.7.5 INTERNET

At the beginning of the plan development process, Henderson County posted information regarding the update process, a link to the community survey, and link to the mitigation plan on its website and on Facebook FIGURE 3-6. The website keeps the public informed on plan development milestones and to solicit relevant input. Information on the plan development process, the planning committee, the questionnaire, and phased drafts of the plan were available to the public on the site throughout the process. After the plans's completion, the Henderson County website will keep the public informed about successful mitigation projects and future plan updates.

Sample internet posting from the Henderson County website and Henderson County Fire Marshal's Office Facebook page on October 8, 2020 FIGURE 3-7. City of Gun Barrel City website FIGURE 3-8 and City of Berryville Website FIGURE 3-9 and facebook page FIGURE 3-10. As well as City of Payne Springs website FIGURE 3- 11 as described in Chapter 3.7.3.



Figure 3-6 Henderson County Fire Marshal Facebook Page Post, October 8, 2020



FIGURE 3-7 HENDERSON COUNTY DRAFT PLAN AVAILABILITY (DATE)

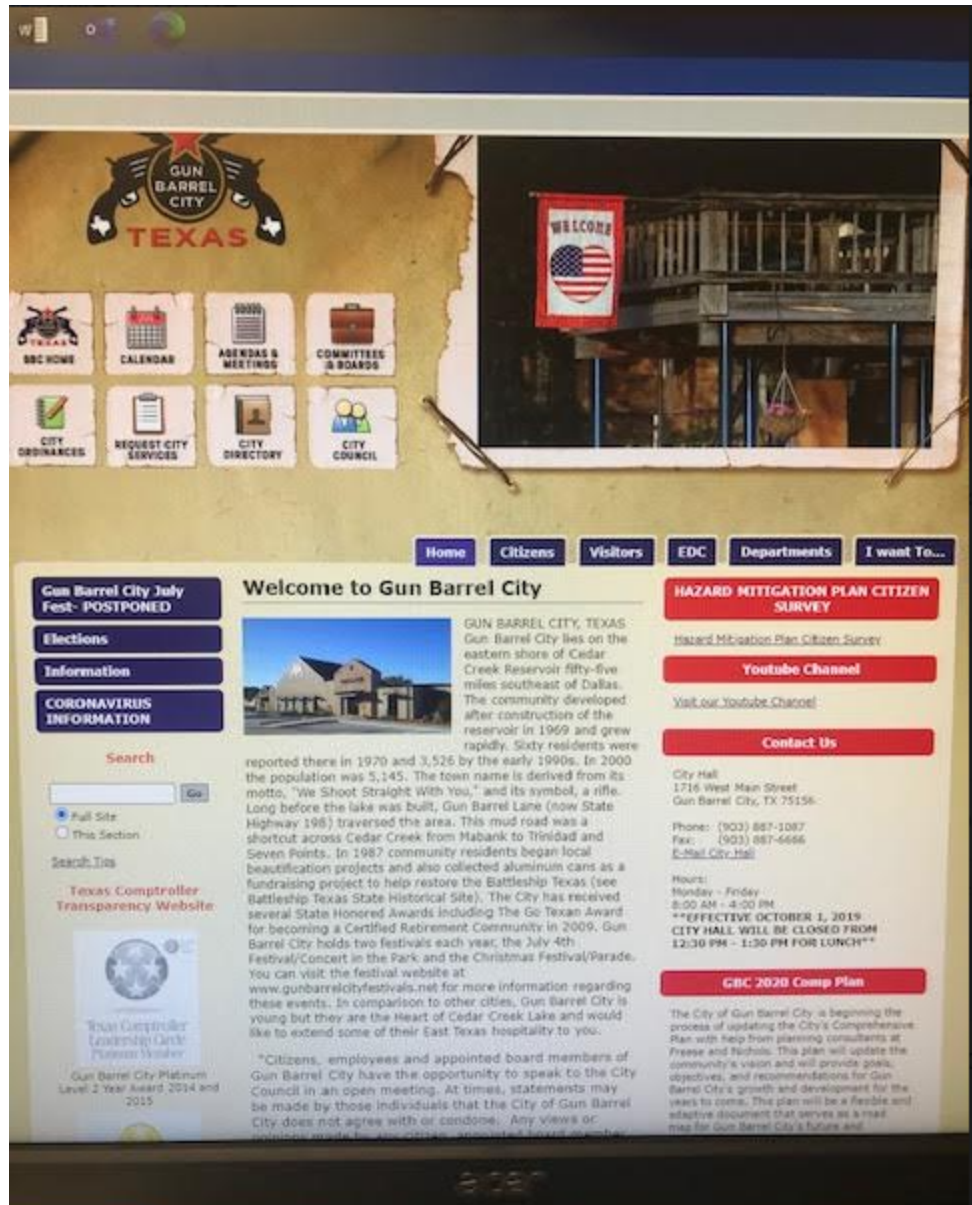


FIGURE 3-8 Soliciting Public Participation, City of Gun Barrel City

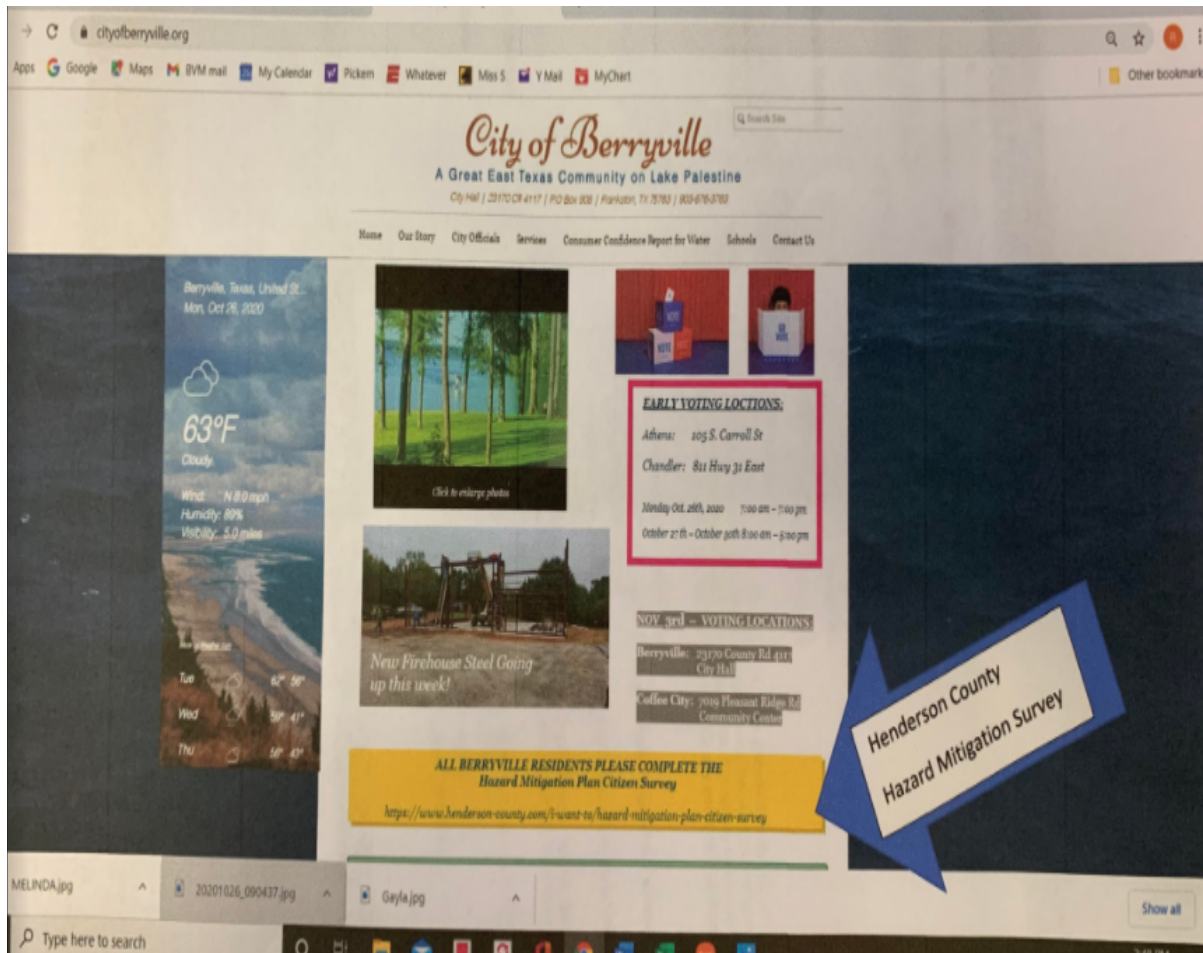


Figure 3-9 Soliciting Public Participation ,City of Berryville

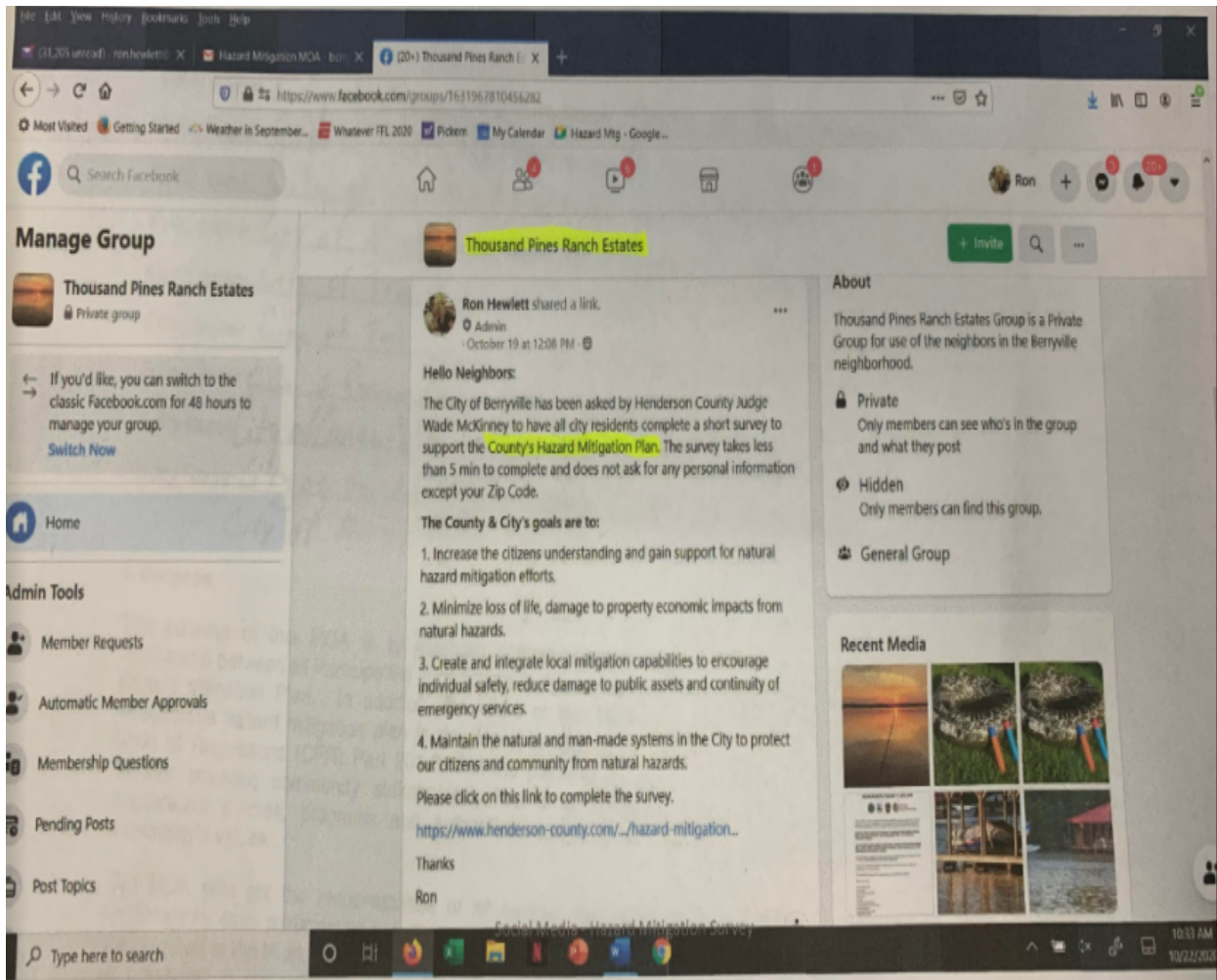


Figure 3-10 Soliciting Public Participation, Facebook, City of Berryville



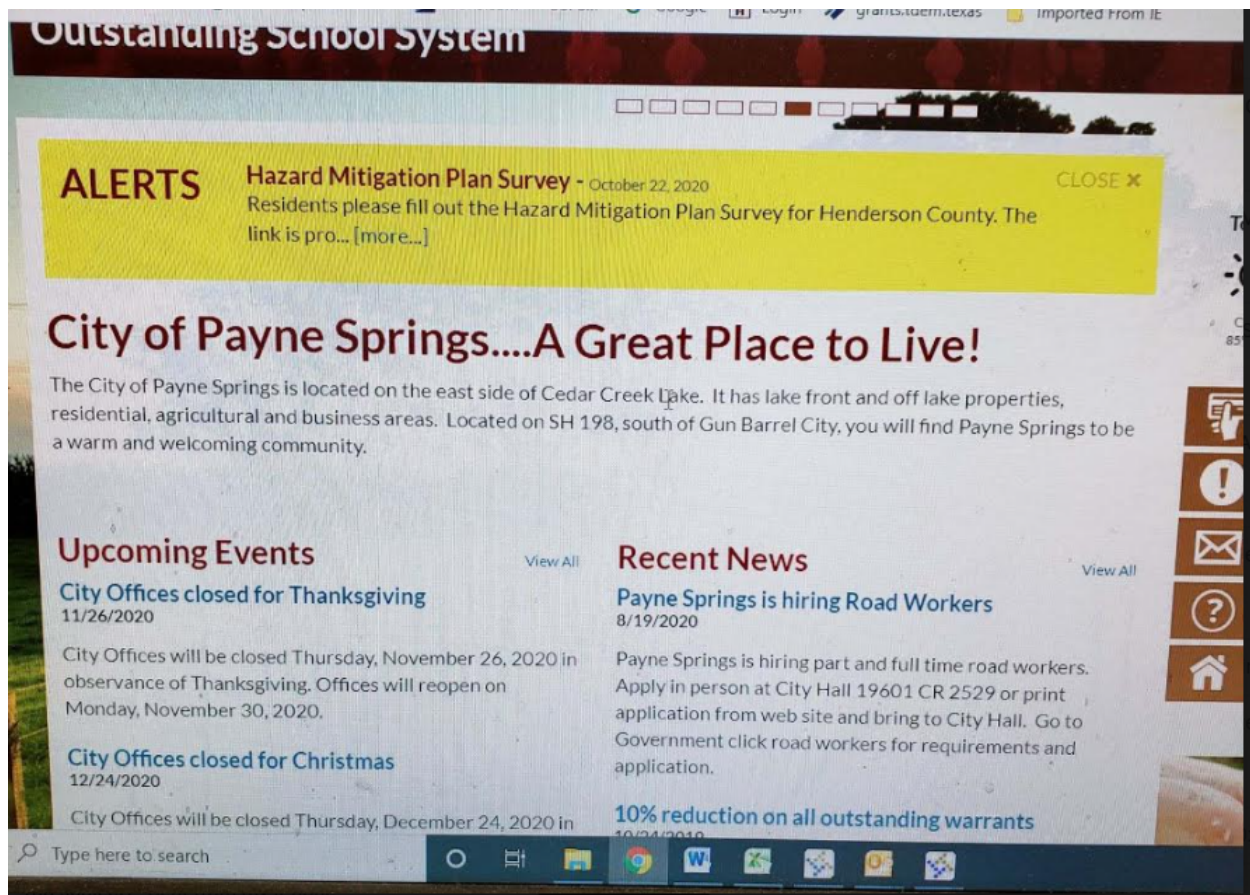


Figure 3-11 Soliciting Public Participation, City of Paynes Springs



### 3.8 PLAN DEVELOPMENT, CHRONOLOGY, MILESTONES

TABLE 3-3 summaries important milestones in the development of the plan update.

TABLE 3-3 PLAN DEVELOPMENT CHRONOLOGY/MILESTONES			
DATE	EVENT	DESCRIPTION	ATTENDANCE
10/08/2020	Organize Resources	County OEM holds kickoff meeting for potential planning partners to inform them of the next steps in the plan update process, solicit commitment to participate, explain expectations and organize resources.	18 In Person 20+ Google Meets
09/24/2020	Steering Committee		10
10/21/2020	Planning Committee Meeting #1	Introduction to Hazard Mitigation Planning Process; Steering Committee purpose and responsibilities; Plan Goals update; Discuss options for public outreach strategy and survey; MOA; Plan table discussion; previous mitigation actions update/amend	8 In Person 15 Google Meets
10/07/2020	Ongoing Public Outreach	Website and social media posting; Survey	N/A
11/4/2020	Planning Committee Meeting #2	Introduction to Hazard Mitigation Planning Process; Review of past mitigation actions; critical facilities; capabilities assessment; discuss options public outreach; Establish Plan goals	8 In Person 25 Google Meets
11/18/2020	Planning Committee Meeting #3	Reminder Hazard mitigation planning process; Review completed items-goals, capabilities assessment; hazards of concern presentation; survey results to date; hazard ranking exercise; mitigation action worksheet	
11/18/2020	Press Release	Citie(s) issue a press release for public participation in HMP update and survey	N/A
12/3/2020	Planning Committee Meeting #4	Mitigation actions prioritization; Project development update	
11/24/2020-12/15/2020	1st Public Comment Period	Public comment period of the draft plan opens for Henderson County and the planning partners. Press release of draft plan availability to public issues. Draft Plan available on Henderson County website, planning partners websites and in hard copy at Henderson County Fire Marshal's Office	
12/18/2020	Plan Review	Final draft submitted to Texas Division of Emergency Management for review	N/A
	-	Plan approval pending adoption by FEMA	N/A
	2nd Public Comment Period	Final public meeting on draft plan	N/A
	Adoption	Adoption window of final plan opens	N/A
		Final plan approved by FEMA	N/A

## CHAPTER 4

### HENDERSON COUNTY PROFILE

#### 4.1 GEOGRAPHIC OVERVIEW

Henderson County covers 948 square miles of which all is land except for 75 square miles of water. It is located in the East Texas Timberlands region of Texas, 121 miles from the eastern state boundary and approximately 73 miles east of Dallas FIGURE 4-1. It is bordered by Smith County, and Cherokee County to the East, Anderson County and Freestone County to the south, Navarro County, Ellis County to the West, and Kaufman County and Van Zandt County to the North.

Athens, the largest township inn and county seat, is at the intersection of U.S. Highway 175 and Texas State highway 19 with State highways 31, 198, 334, 259 near the center of the county. The County's 2010 population was 78,532, an increase of 34% since 1990. As of the 2019 U.S. Census; Henderson County had a population estimate of 82,737 (Census, 2019).



Figure 4-1 Location of the Henderson County Planning area within the State of Texas

---

The major livestock is cattle. The main crop is peaches and pears; as well as cotton, little and big bluestem, Indian grass, switchgrass, grama and Virginia wild rye, fruit, tree nuts, and berries. Soil is an important natural resource in the county as many people depend on the soil to produce forage for livestock, timber and cultivated crops.

Natural resources from water, fish and wildlife play an important role at the locations such as Cedar Creek Lake, Lake Palestine, and many smaller private lakes and ponds. These natural resources provide recreational activities and for domestic, industrial and agricultural resources.

Mineral resources include oil and gas reserves, sulfur, lignite coal, sand and gravel, and clay used for making bricks and pottery. Municipalities located in Henderson County:

- Athens
- Berryville
- Brownsboro
- Caney City
- Chandler
- Coffee City
- Enchanted Oaks
- Eustace
- Frankston
- Gun Barrel City
- Log Cabin
- Mabank
- Malakoff
- Moore Station
- Murchison
- Payne Springs
- Poynor
- Seven Points
- Star Harbor
- Tool
- Trinidad

## **4.2 HISTORICAL OVERVIEW**

The Texas legislature established Henderson County on April 27, 1846, and named it in honor of James Pinckney Henderson, first governor of the state of Texas. Henderson County was organized on August 4, 1846, and comprised 3,500 square miles at the time. Buffalo was the county seat until March 1848. Bennett H. Martin presided over the first district court in Buffalo in 1847.

Indians inhabited the area in prehistoric times. Pottery found buried amid fossil remains of extinct horses and camels in the 1920s and 1930s indicated that an aboriginal culture existed along the Trinity River thousands of years ago. One particular artifact, Malakoff Man, is a sandstone mask weighing ninety-eight pounds. When the first Europeans entered the area in the sixteenth century, they found the Hasinai, a Caddoan group, living along the upper Neches River. The Caddoes had the highest cultural development of any Texas Indians. They were agriculturalists and raised corn, beans, squash, sunflowers, and tobacco. Men and women shared garden work, used dogs for hunting bears, consumed small mammals, fish, and birds, ran trot lines baited with dough bait, and gathered nuts, berries, and wild fruits. The Spanish and French explorers described these people, who called themselves the Tejas, as friendly.

People of European origin did not settle in the area until after the Texas Revolution in 1836, though the future Henderson County was part of the Nacogdoches District in Spanish and Mexican Texas. In 1848 the legislature formed Van Zandt and Kaufman counties out of Henderson County and reduced it to its present size. The center of the county again moved. J. B. Luker became chief justice, James Boggs sheriff, and E. J. Thompson county clerk. Court was held under a grove of red oak trees where the present courthouse stands. The name of the new county seat, Athens, was suggested by Dulcina A. Holland (later Mrs. Dull Avriett), who hoped the town would be a center of learning. The first courthouse, built in 1850, cost the county fifty dollars. That year the population of Henderson County consisted of 1,155 white persons, eighty-one slaves, and one free Black. Farming was the chief source of income.

Several Henderson County communities developed not long after county organization. Normandy, established in 1845, was the first Norwegian settlement in Texas. Science Hill, established in 1848, had the first school of higher learning and Masonic lodge in the county. Brownsboro, three miles from Normandy at a ferry crossing on Kickapoo Creek, is the oldest existing town in the county; it was established in 1849 by John (Red) Brown. In the late 1840s Buffalo had 100 residents and a debating society presided over by John H. Reagan. Fincastle had the first public school and got the first post office

in 1852; residents had previously traveled to Palestine for their mail. Stillwater, later renamed for A. H. Chandler, was established in 1859. Citizens read the Palestine *Trinity Advocate* for news; no newspaper was printed in Henderson County until the 1880s. Other communities that no longer exist were New York, Goshen, Wild Cat, Carroll Springs, and CatFish.

By 1860 the county more resembled the Deep South. Roads, ferries, and bridges replaced buffalo trails. Cotton had increased in importance. Lumber, leather work, and clay products were manufactured. Levi Cogburn established a pottery company in 1857 to manufacture cups and saucers. Two other manufacturing firms, a lumber mill and a gristmill, helped boost the number of persons employed in manufacturing to thirty-nine.

Henderson County did not escape the trials of Southern life during the Civil War and Reconstruction era. In all about 1,500 Henderson County men served in the war, while the home front provided leather goods, crocks, food, and clothing to the army. One-tenth of the farm products was taxed to cover war expenses, and a county tax helped care for indigent wives, widows, and orphans.

In an attempt to recoup their previous financial status, citizens pooled their resources beginning in 1875, donated the right-of-way, and built the bed of the St. Louis Southwestern Railway. In 1880 the first railroad came to the county. The first county newspaper, the Athens *Bulletin*, began in 1873; it later became the Athens *Courier*, then the *Athenian*, and in 1885 the Athens *Review*. Murchison, founded in 1877, shipped watermelons out of its depot. Part of Brownsboro moved a short distance, to form new Brownsboro, while Trinidad was founded by the railroad as a water and refueling stop. The census of 1880 reflected growth in every area. Population increased to 9,735 (7,641 Whites and 2,094 Blacks), and agricultural production increased during the decade. The clay subsoils of the county provided a new manufacturing base when Miller Pottery began to produce flower pots in 1882, Gus Hill began producing building and fire brick in 1885, and Athens Tile and Pottery Company was formed in 1885. The courthouse burned in 1885, killing the original red oak trees under which the first court met. In 1902, J. J. Faulk helped pass the first good-road law, and roads were improved with sand and clay. W. D. Dodd developed the county's lignite deposits for the railroads; migrant Mexican workers first worked the mines. The first automobile in the county appeared in Athens in 1910. The first county school board formed to provide public education for the first time since before the Civil War.

By 1926, Texas Power and Light began to build the power plant at Trinidad to utilize the lignite deposits for power generation. Oil was discovered at Pine Grove in 1934, at the Cayuga field in 1937, at the Flag Lake field in 1940, and afterward at Tri-City; the Opelika gas works of Lone Star Gas Company helped boost the country's economy. The 1920s and 1930s saw a drop in manufacturing.

The young men of the county responded to the call for volunteers and registered for the draft in World War II, which claimed the lives of 108 of them. In the 1970s fifty manufacturing firms hired 1,800 employees and paid wages of more than \$14 million. Workers made products valued at more than \$48 million—processed food, lumber, clay products, furniture, chemical and medical instruments, ladies' intimate apparel, machinery, and electrical equipment. In 1990 most county residents were employed in manufacturing. Retail trade had doubled since 1956, service jobs had quadrupled, and agricultural jobs had remained stable. Mining, oil, and gas had declined, while transportation and public utilities had grown slightly. Wholesale trade had declined and finance had risen. Recreation and entertainment, hunting, and fishing, bring people to the county along the Texas Forest Trail and the Texas Lakes Trail. The Old Fiddlers Reunion is held in May, and the Black-Eyed Pea Jamboree in July, both in Athens.

#### **4.3 MAJOR PAST HAZARD EVENTS**

Federal disaster declarations are typically issued for hazard events that cause more damage than state and local governments can handle without assistance from the federal government. However, no specific dollar loss threshold has been established for these declarations. A federal disaster declaration puts

federal recovery programs into motion to help disaster victims, businesses, and public entities. Some of the programs are matched by state programs. The planning area has experienced 14 events since the first was issued in 1989 for Henderson County. These events are listed in TABLE 4-1.

Review of these events help identify targets for risk reduction and ways to increase a community's capability to avoid large-scale events in the future. Still, many natural hazard events do not trigger federal disaster declaration protocol but have significant impact on their communities. These events are also important to consider in establishing recurrence intervals for hazards of concern. More detailed event tables can be found in the individual hazard sections.

**TABLE 4-1 PRESIDENTIAL DISASTER DECLARATIONS**

TYPE OF EVENT	FEMA DISASTER #	DECLARATION DATE
Texas COVID-19 Pandemic	DR-4485	03/25/2020
Texas COVID-19	EM-3458	03/13/2020
Severe Storms, Tornadoes, Straight-line Winds and Flooding	DR-4255	02/09/2016
Severe Storms, Tornadoes and Flooding	DR-4266	03/19/2016
Severe Storms, Tornadoes, Straight-line Winds and Flooding	DR-4223	05/29/2015
Hurricane Ike	EM-3294	09/10/2008
Severe Storms, Tornadoes and Flooding	DR-1709	06/29/2007
Extreme Wildfire Threat	DR-1624	01/11/2006
Hurricane Rita	EM-3261	09/21/2005
Hurricane Katrina	EM-3216	09/02/2005
Loss of Space Shuttle Columbia	EM-3171	02/01/2003
Extreme Fire Hazard	EM-3113	09/10/1993
Severe Thunderstorms	DR-930	12/26/1991
Severe Storms, Tornadoes and Flooding	DR-828	05/19/1989

#### 4.4 CLIMATE

In Henderson County, climate is considered subtropical. Temperatures range from an average range in July and August of 72° F to 96° and in January of 34° to 56° , for an average annual temperature of 65°. The average annual rainfall is forty inches, and the growing season extends to 260 days. The western Regional Climate Center (WRCC) reports data from the City of Tyler weather station. TABLE 4-2 contains temperature summaries for the station.

**TABLE 4-2 TEMPERATURE SUMMARIES FOR PLANNING AREA**

	<b>TYLER WEATHER STATION</b>
<b>PERIOD OF RECORD</b>	2006 to 2019
<b>WINTER AVERAGE MINIMUM TEMPERATURE</b>	39.4
<b>WINTER AVERAGE MAXIMUM TEMPERATURE</b>	59.1
<b>WINTER MEAN TEMPERATURE</b>	48.9
<b>SPRING AVERAGE MINIMUM TEMPERATURE</b>	56
<b>SPRING AVERAGE MAXIMUM TEMPERATURE</b>	76.7
<b>SPRING MEAN TEMPERATURE</b>	65.7
<b>SUMMER AVERAGE MAXIMUM TEMPERATURE</b>	92.6
<b>SUMMER AVERAGE MINIMUM TEMPERATURE</b>	73
<b>SUMMER MEAN TEMPERATURE</b>	81.5
<b>FALL AVERAGE MINIMUM TEMPERATURE</b>	56.9
<b>FALL AVERAGE MAXIMUM TEMPERATURE</b>	77
<b>FALL MEAN TEMPERATURE</b>	66
<b>MAXIMUM TEMPERATURE</b>	108.2 August 2011
<b>MINIMUM TEMPERATURE</b>	10.0 January 2018
<b>AVERAGE ANNUAL # DAYS &gt;90F</b>	92.6
<b>AVERAGE ANNUAL # DAYS &lt;32F</b>	30.8

a. Winter: December, January and February; Spring: March, April and May; Summer: June, July and August; Fall: September, October and November

b. Temperatures are in degrees Fahrenheit

**SOURCE: Tyler Texas Weather**

Rainfall is uniformly distributed throughout the year, reaching a slight peak in winter. Snowfalls are infrequent. Precipitation is highest in the months of April through June. The average precipitation yearly is 44 inches. Severe thunderstorms occur mostly in the spring. Based on information measured by the National Lightning Detection Network, Henderson County received 4 to 8 cloud-to-ground lightning flashes pers square mile from 2009 to 2018 (Vaisala 2018 Annual Lightning Report).

**TABLE 4-3 PRECIPITATION SUMMARIES FOR PLANNING AREA**

	<b>TYLER WEATHER STATION</b>
<b>PERIOD OF RECORD</b>	2006 to 2019
<b>WINTER MEAN PRECIPITATION</b>	11.56 Inches
<b>SPRING MEAN PRECIPITATION</b>	13.62 Inches
<b>SUMMER MEAN PRECIPITATION</b>	10.45 Inches

<b>FALL MEAN PRECIPITATION</b>	11.06 Inches
<b>ONE DATA MAXIMUM PRECIPITATION</b>	12.30 Inches, October 2009
<b>ANNUAL PRECIPITATION</b>	47.88 Inches
<b>SOURCE: Tyler Texas Weather</b>	

#### 4.5 GEOLOGY AND SOILS

Texas is broadly divided into four regions by physical geography features such as landform and vegetation. Henderson County is in East Texas and it lies within the Coastal Region Natural Resource area. The western half of Henderson County is Post Oak/Claypan area and the eastern half of the county is East Texas Timberland. The main crop is peaches and pears; as well as cotton, little and big bluestem, Indian grass, switchgrass, grama and Virginia wild rye, fruit, tree nuts, and berries. The soil varies from sandy loams in the west portion of Henderson County and east to loam-covered clay through the remainder of the county. The elevation ranges from 300 to 600 feet above mean sea level. Mineral resources include petroleum, gas, iron ore, clay, limestone, lignite, and salt.

#### 4.6 CRITICAL FACILITIES AND INFRASTRUCTURE

Critical facilities and infrastructure are assets, systems and networks, whether physical or virtual, whose incapacity or destruction would have a debilitating impact on security, public health or safety or any combination. Risk assessment of hazards considers the potential impact of a hazard on the function of critical facilities and infrastructure. All critical facilities and infrastructure were analyzed in FEMA's Resilience Analysis and Planning tool to help rank risk and identify mitigation actions. The risk assessment for each hazard discusses critical facilities with regard to that hazard.

Typically critical facilities include hospitals, fire stations, police stations, storage of critical records and similar facilities. These facilities should be given special consideration when formulating regulatory alternatives and emergency management plans. A critical facility should not be located in high hazard areas if at all possible. If a critical facility must be located in a high hazard area, it should be provided a higher level of protection so that it can continue to function and provide services after the hazard event. Communities should develop emergency plans to continue to provide these services during the hazard event.

The Resilience Analysis and Planning tool used for risk assessment in this plan defines specific types of critical facilities and infrastructure as well as broader categories that include multiple types. TABLE 4-4 summarizes the critical facilities and infrastructure within each category for each municipality and unincorporated county area. This information was obtained from FEMA's Resilience Analysis and Planning tool and county emergency management personnel.

**TABLE 4-4 PLANNING AREA CRITICAL FACILITIES AND INFRASTRUCTURE**

<b>JURISDICTION</b>	<b>MEDICAL AND HEALTH SERVICE</b>	<b>EMERGENCY SERVICE</b>	<b>EDUCATION FACILITIES</b>	<b>OTHER CRITICAL FACILITIES</b>	<b>UTILITIES AND COMMUNICATION</b>	<b>TRANSPORTATION INFRASTRUCTURE</b>	<b>TOTAL</b>
<b>Henderson County</b>	0	14	5	0	1	0	20
<b>Athens</b>	14	12	16	10	19	4	75

<b>Berryville</b>	0	1	0	3	4	1	8
<b>Brownsboro</b>	1	2	4	2	1	0	10
<b>Caney City</b>	0	2	0	0	0	0	2
<b>Chandler</b>	2	3	2	15	0	0	22
<b>Coffee City</b>	0	0	0	0	2	0	2
<b>Enchanted Oaks</b>	0	0	0	0	0	0	0
<b>Eustace</b>	0	2	6	0	2	0	10
<b>Gun Barrel City</b>	2	3	3	4	5	3	20
<b>Log Cabin</b>	0	1	0	0	2	1	4
<b>Malakoff</b>	4	3	4	14	23	10	58
<b>Moore Station</b>	0	0	0	0	2	0	2
<b>Murchison</b>	0	1	1	0	0	0	2
<b>Payne Springs</b>	0	2	0	0	0	0	2
<b>Poynor</b>	0	1	0	0	1	0	2
<b>Seven Points</b>	3	2	0	7	2	0	14
<b>Star Harbor</b>	0	0	0	0	4	0	4
<b>Tool</b>	0	1	1	0	2	0	4
<b>Trinidad</b>	1	2	3	0	11	0	17
<b>TOTAL</b>	27	52	45	55	81	19	278

**SOURCE: FEMA RAPT Tool**

FIGURE 4-2 shows the location of critical facilities and infrastructure in the county with symbols showing each specific type of facility. The figure legend identifies the broader category that encompasses each type. All the planning partner's critical facilities and infrastructure maps are located in Appendix C. Because of the sensitivity of this information, a detailed list of facilities is not provided. The list is on file with each planning partner. The risk assessment for each hazard discusses critical facilities and infrastructure with regard to that hazard.



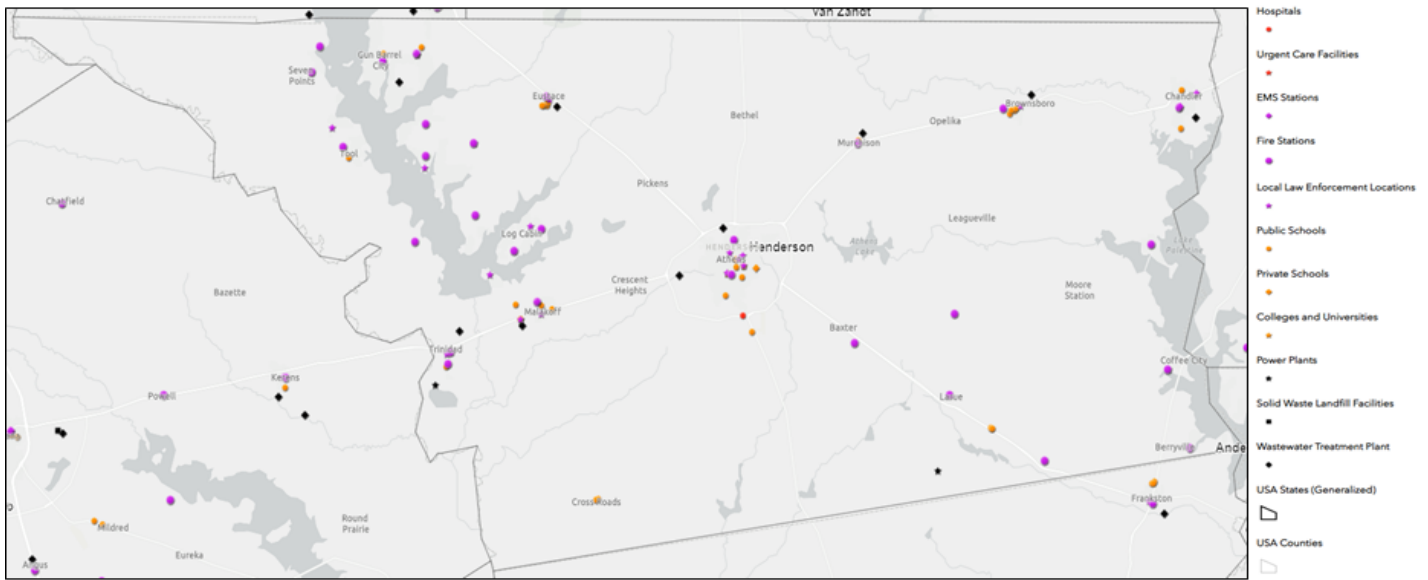


Figure 4-2 Critical Facilities and Infrastructure in Henderson County

#### 4.7 DEMOGRAPHICS

Some populations are at great risk from hazard events because of decreased resources or physical abilities. Elderly people, for example, may be more likely to require additional assistance. Research has shown that people living near or below the poverty line, the elderly, women, children, ethnic minorities, renters, individuals with disabilities and others with access and functional needs all experience more severe effects from disasters than the general population. These vulnerable populations may vary from the general population in risk perception, living conditions, access to information before, during and after a hazard event, capabilities during an event and access to resources for post-disaster recovery. Indicators of vulnerability- such as disability, age, poverty and minority race and ethnicity-often overlap spatially and often in the geographically more vulnerable locations. Detailed spatial analysis to locate areas where there are higher concentrations of vulnerable community members would help to extend focused public outreach and education to these most vulnerable citizens. Select U.S. Census demographic and social characteristics for Henderson County are shown in TABLE 4-5.

TABLE 4-5 HENDERSON COUNTY DEMOGRAPHIC AND SOCIAL CHARACTERISTICS	
	HENDERSON COUNTY
<b>GENDER/AGE (% OF TOTAL POPULATION)</b>	
<b>MALE</b>	49%
<b>FEMALE</b>	51%
<b>UNDER 5 YEARS</b>	5.40%
<b>65 YEARS AND OVER</b>	22.40%
<b>RACE/ETHNICITY (% OF TOTAL POPULATION)</b>	

<b>WHITE</b>	89.80%
<b>AMERICAN INDIAN/ALASKA NATIVE</b>	0.90%
<b>ASIAN</b>	0.70%
<b>BLACK OR AFRICAN AMERICAN</b>	6.40%
<b>OTHER RACE</b>	0.10%
<b>TWO OR MORE RACES</b>	2.00%
<b>HISPANIC OR LATINO</b>	13.60%
<b>EDUCATION</b>	
<b>HIGH SCHOOL GRADUATE OR HIGHER</b>	83.50%
<b>SOURCE: US Census</b>	

#### 4.7.1 POPULATION

The Texas Association of Counties estimates a population of 82,737 for Henderson County as of July 1, 2019. TABLE 4-6 shows planning area population data from 1990 through 2019. The Henderson County population has increased 25% from 1990 to 2000, and increased another 5% from 2010 to 2019. The City of Athens is the county's principal population center. The population in all the jurisdictions has grown since 1990.

**TABLE 4-6 POPULATION DATA**

<b>POPULATION</b>				
	<b>1990</b>	<b>2000</b>	<b>2010</b>	<b>2019</b>
<b>Henderson County</b>	58543	73277	78532	82,737
<b>Athens</b>	10967	11297	12710	12,753
<b>Berryville</b>	749	891	975	1064
<b>Brownsboro</b>	545	796	1039	1279
<b>Caney City</b>	170	236	217	220
<b>Chandler</b>	1630	2099	2734	3180
<b>Coffee City</b>	216	193	278	293
<b>Enchanted Oaks</b>	290	357	326	341
<b>Eustace</b>	662	798	991	1006
<b>Gun Barrel City</b>	3526	5145	5672	6208
<b>Log Cabin</b>	487	733	714	772
<b>Malakoff</b>	2038	2257	2324	2301
<b>Moore Station</b>	256	184	201	220
<b>Murchison</b>	510	592	594	599

<b>Payne Springs</b>	606	683	767	769
<b>Poynor</b>	237	314	305	306
<b>Seven Points</b>	723	1145	1455	1469
<b>Star Harbor</b>	368	416	444	477
<b>Tool</b>	1712	2275	2240	2302
<b>Trinidad</b>	1056	1091	886	870
<b>TOTAL</b>	85291	104779	113404	119,166

**SOURCE: TXCIP; US Census**

FIGURE 4-3 shows 10-year population changes in Henderson County and the State of Texas from 1990 to 2010, and the 9-year change from 2010 to 2019. Between 1990 and 2019, the State of Texas' population grew by 64% (about 2.4% per year) while Henderson County's population increased by 41.32% (2.17% per year).

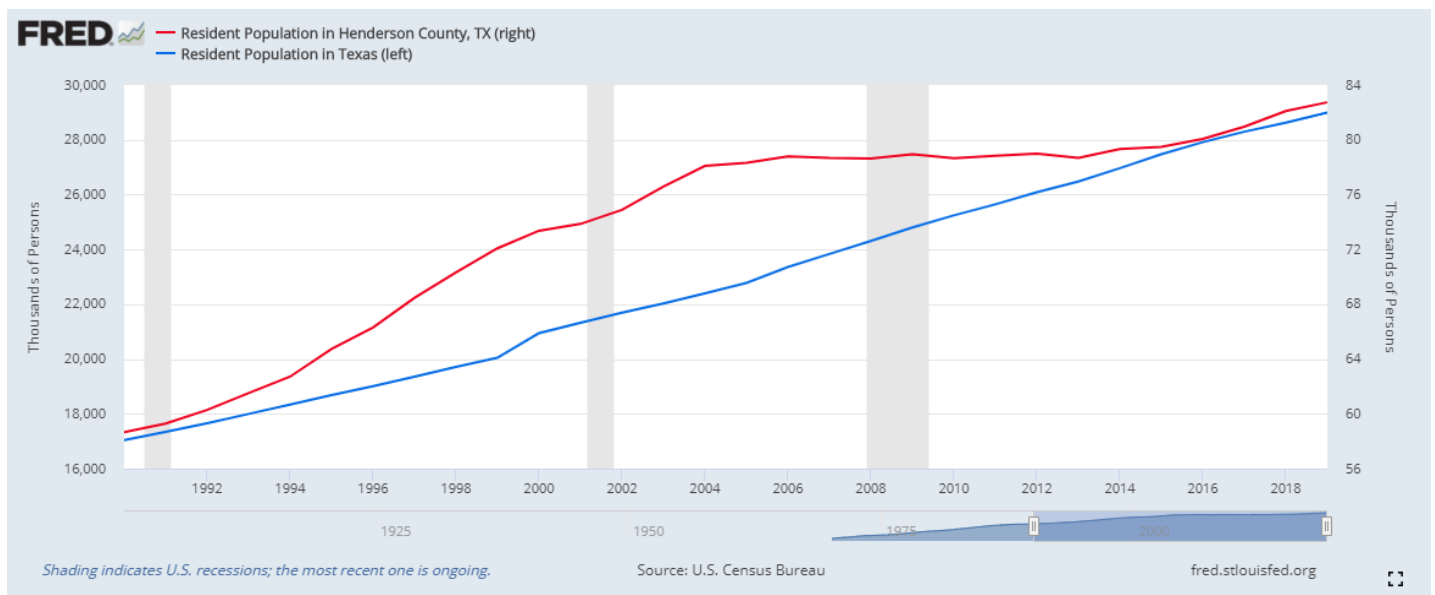


Figure 4-3 State of Texas and Henderson County Population Growth

#### 4.7.2 AGE DISTRIBUTION

As a group, the elderly are more apt to lack the physical and economic resources necessary for response to hazard events and are more likely to suffer health-related consequences making recovery slower. They are more likely to be vision, hearing or mobility impaired and more likely to experience mental impairment or dementia. Additionally, the elderly are more likely to live in assisted-living facilities where emergency preparedness occurs at the discretion of facility operators. These facilities are typically identified as “critical facilities” by emergency managers because they require extra notice to implement evacuation. Elderly residents living in their own homes may have more difficulty evacuating their homes and could be stranded in dangerous situations. This population group is more likely to need special medical attention, which may not be readily available during natural disasters because of isolation caused by the event.

Specific planning attention for the elderly is an important consideration given the current aging of the national population.

Children under 14 are particularly vulnerable to disaster events because of their young age and dependence on others for basic necessities. Very young children may additionally be vulnerable to injury or sickness; this vulnerability can be worsened during a natural disaster because they may not understand the measures that need to be taken to protect themselves from hazards.

The overall age distribution for the planning area is illustrated in FIGURE 4-4. Based on the U.S. Census, 2011-2019 American Community Survey 8-year estimates, 22% of the planning area's population is 65 or older. American Community Survey data does not provide information regarding disabilities in the planning area's over-65 population.

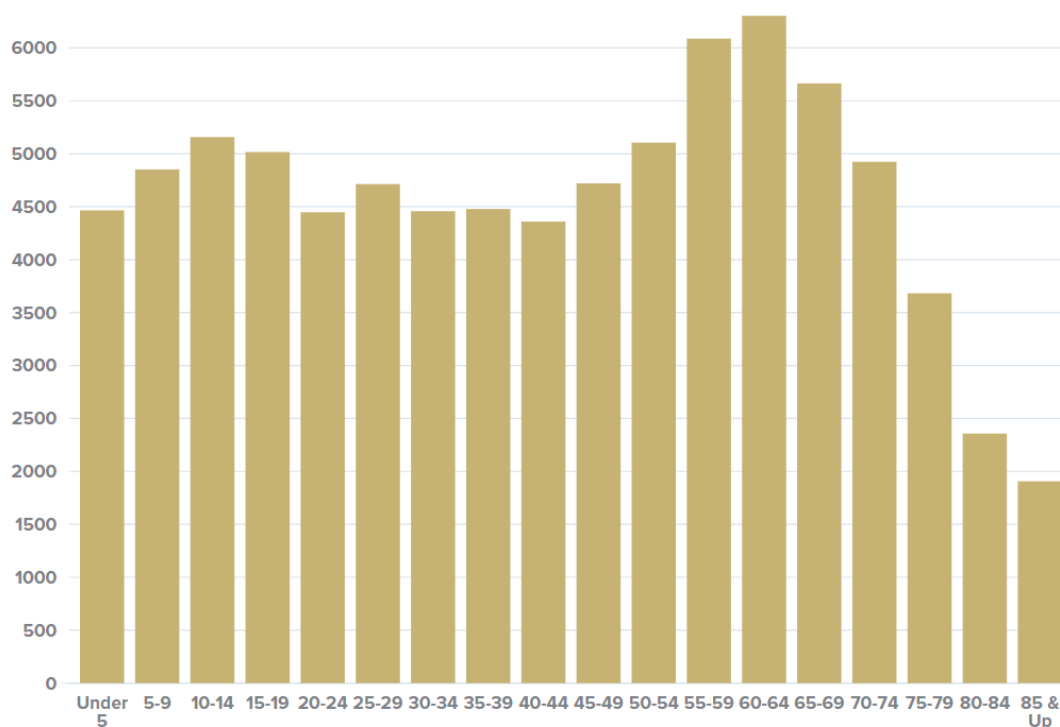


Figure 4-4 Henderson County Age Distribution

#### 4.7.3 DISABLED POPULATIONS

The 2010 U.S. Census estimated that 57 million non-institutionalized Americans with disabilities live in the U.S. This equates to about one-in-five persons. People with disabilities are more likely to have difficulty responding to a hazard event than the general population. Local government is the first level of response to assist these individuals, and coordination of efforts to meet their access and functional needs is paramount to life safety efforts. It is important for emergency managers to distinguish between functional and medical needs to plan for incidents that require evacuation and sheltering. Knowing the percentage of the population with a disability will allow emergency management personnel and first responders to have personnel available who can provide services needed by those with access and functional needs.

According to the U.S. Census, 2014-2018 American Community Survey 5-year estimates, 11.3% of the population in the planning area lives with some form of disability.

#### 4.7.4 ETHNIC POPULATIONS

Research shows that minorities are less likely to be involved in pre-disaster planning and experience higher mortality rates during a disaster event. Post-disaster recovery can be less effective for ethnic populations and is often characterized by cultural insensitivity. Since higher proportions of ethnic minorities live below the poverty line than the majority white population, poverty can compound vulnerability. According to 2011-2015 American Community Survey 5-year estimates, the ethnic composition of Henderson County is predominantly white, at about 77.4%. The largest minority population is Hispanic or Latino at 13.6%. FIGURE 4-6 shows the population distribution by race and ethnicity in Henderson County. The values shown on FIGURE 4-5 exceed 100% because according to the U.S. Census, Hispanic or Latino is listed as an ethnicity, not a race. Therefore, the Hispanic or Latino designation encompasses several races.

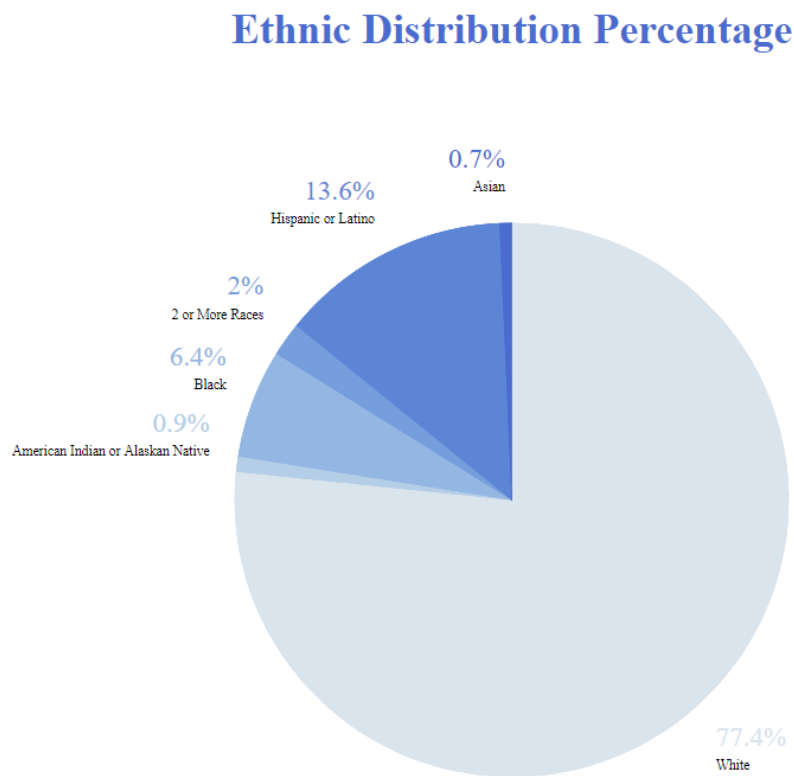


Figure 4-5 Henderson County Ethnic Distribution Percentage

---

#### 4.8 ECONOMY

The U.S. Census, 2011-2019 American Community Survey 5-year economic characteristics estimates are shown in TABLE 4-7.

**TABLE 4-7 ECONOMIC CHARACTERISTICS**

	<b>FAMILIES BELOW POVERTY LEVEL</b>	<b>INDIVIDUALS BELOW POVERTY LEVEL</b>	<b>MEDIAN HOME VALUE</b>	<b>MEDIAN HOUSEHOLD INCOME</b>	<b>PER CAPITA INCOME</b>	<b>POPULATION &gt;16 YEARS OLD IN LABOR FORCE</b>	<b>POPULATION EMPLOYED</b>
<b>Athens</b>	27.3	27.30%	87600	37445	20699	52.90%	6746
<b>Berryville</b>	13.7	16.40%	83500	31618	24871	55%	508
<b>Brownsboro</b>	6.1	8.50%	105660	39454	20726	61.90%	510
<b>Caney City</b>	0	26.70%	27955	9,079	7,980	96.50%	213
<b>Chandler</b>	8.2	9.80%	197000	38641	19075	54.80%	1743
<b>Coffee City</b>	26.6	8.3	51,979	34,792	19,789	24.3%	71
<b>Enchanted Oaks</b>	2	3	285000	60000	20000	25%	200
<b>Eustace</b>	18.9	10.4	85,800	47,856	17,419	54.9%	399
<b>Gun Barrel City</b>	13.1	18.30%	106300	41911	28193	45.8%	2312
<b>Log Cabin</b>	22.96	40.3	36500	36129	14364	42.8%	420
<b>Malakoff</b>	39.53	42.9	70,000	36,465	12,109	52.8%	1127
<b>Moore Station</b>	16.9	18.1	97,222	28,393	9,378	55.8%	149
<b>Murchison</b>	6.6	15.7	87,200	55,338	14,986	60.4%	226
<b>Payne Springs</b>	12.8	15.1	164700	43281	15,451	46.2%	312
<b>Poynor</b>	13.6	10.1	54,375	39,375	14,829	60.5%	127
<b>Seven Points</b>	17.5	14.99	70300	38580	34821	32%	700
<b>Star Harbor</b>	6.2	3.4	338641	69889	41142	42.1%	206
<b>Tool</b>	19.2	15.1	99,100	43,750	19,507	44.8%	863
<b>Trinidad</b>	15.5	1	56,600	31,042	114,270	47.5%	350
<b>Henderson County</b>	19.4	19.40%	102500	45798	25280	51.10%	51.1

SOURCE: US Census 2020

### 4.8.1 INCOME

In the United States, individual households are expected to use private resources to some extent to prepare for, respond to, and recover from disasters. This means that households living in poverty are automatically disadvantaged when confronting hazards. Additionally, the poor typically occupy more poorly built and inadequately maintained housing. Mobile or modular homes, for example, are more susceptible to damage in earthquakes and floods than other types of housing. In urban areas, the poor often live in older houses and apartment complexes, which are more likely to be made of unreinforced masonry, a building type that is particularly susceptible to damage during earthquakes. Furthermore, residents below the poverty level are less likely to have insurance to compensate for losses incurred from natural disasters. This means that residents below the poverty level have a great deal to lose during an event and are the least prepared to deal with potential losses. The events following Hurricane Katrina in 2005 illustrated that personal household economics significantly impact people's decisions on evacuation. Individuals who cannot afford gas for their cars will likely decide not to evacuate.

### 4.8.2 EMPLOYMENT TRENDS

According to the Federal Reserve Economic Data, Henderson County's unemployment rate as of January 2019 was 4%, compared to a statewide rate of 3.7%. FIGURE 4-6 shows Henderson County's unemployment trends from 2010 through September 2020. Henderson County's unemployment rate was lowest in 2019 at 3% and peaked in 2020 at 10%. According to 2010-2020 American Community Survey 5-year estimates, 51.1% of Henderson County's population 16 years and older is in the labor force, including 45.8% of women and 5.3% of men.



Figure 4-6 Henderson County Unemployment Rate

### 4.8.3 OCCUPATIONS AND INDUSTRIES

According to the East Texas Council of Governments GIS Services Program, the planning area's economy is strongly based in the retail industries (20.9% of total employment), followed by food services and accommodation 17%, and health care and social assistance 16.3%. FIGURE 4-7 shows the distribution of industry types in Henderson County, based on share of total employment.

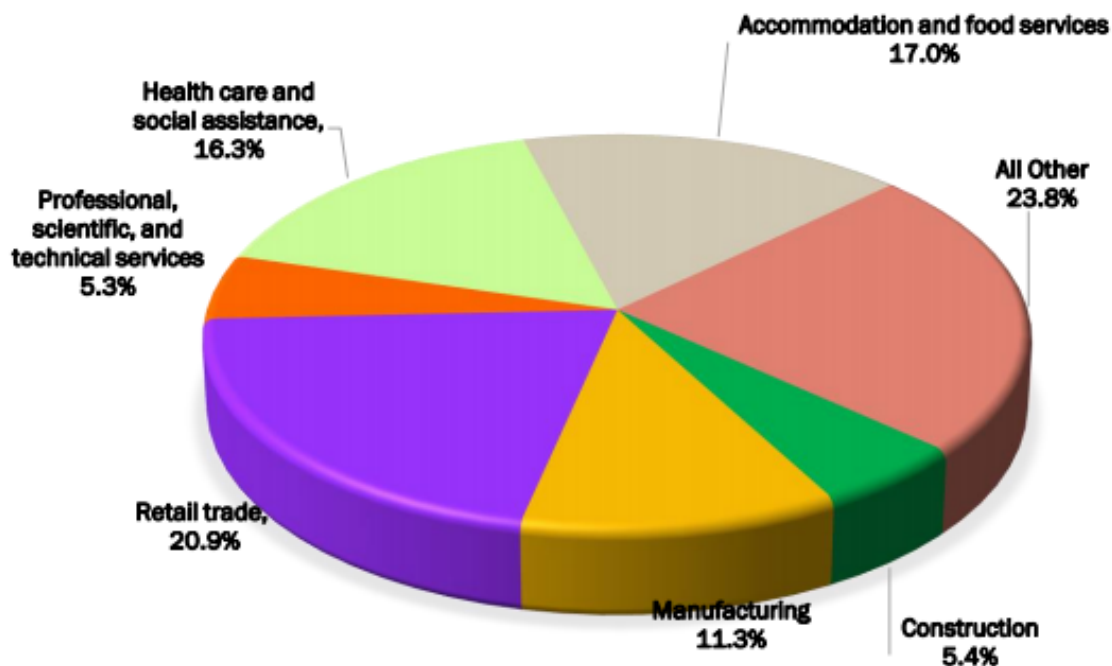


Figure 4-7 Percent of Total Employment by Industry in Henderson County

### 4.9 LAND USE AND DEVELOPMENT TRENDS

The municipal planning partners have adopted plans that govern land use decision and policy making in their jurisdictions. Decisions on land use will be governed by these programs. This plan will work together with these programs to support wise land use in the future by providing vital information on the risk associated with natural hazards in the planning area.

It is the goal that all municipal planning partners will incorporate this hazard mitigation plan update in their comprehensive plans (if applicable) by reference. This will help ensure that future development trends can be established with the benefits of the information on risk and vulnerability to natural hazards identified in this plan. TABLE 4-8 lists the present land use in Henderson County. Henderson County consists primarily of forest land, agricultural land and water. The county and the city partners have not formally tracked the impacts of changes in development over the last 5 years and how these changes in development were influenced by the risk associated with natural hazards in the county or the city.



partners. As part of this hazard mitigation plan update, Henderson County and the cities are now equipped with the knowledge and the tools to track and implement changes to the plan during their annual reviews and 5-year updates to reflect development changes. However, it should be noted that the mitigation actions developed and prioritized through the mitigation action ranking process reflect the current development conditions and applicable policies.

#### 4.9.1 HENDERSON COUNTY

Henderson County consists primarily of grassland. Developed land accounts for 8.32% of the county, thus there is space for developed growth. TABLE 4-8 lists the present land use in Henderson County.

TABLE 4-8 PRESENT LAND USE IN PLANNING AREA		
PRESENT USE CLASSIFICATION	AREA (ACRES)	% OF TOTAL
AGRICULTURE	14555.9	2.4
DEVELOPED, OPEN SPACE	23,918.10	3.9
DEVELOPED, HIGH INTENSITY	1422	0.23
DEVELOPED, MEDIUM INTENSITY	3758	0.7
DEVELOPED, LOW INTENSITY	21927.4	3.57
FOREST LAND	109732	17.9
GRASSLAND/PRAIRIE	285232.9	46.5
WATER/WETLAND	152425.7	24.8
<b>TOTAL</b>	<b>612972</b>	<b>100</b>
SOURCE: NRCS		

As described in Chapter 4.7.1, the population of Henderson County increased 25% from 1990 to 2000, and another increase of 5% from 2010 to 2016. The population in 2019 was 82,737. TABLE 4-9 shows a projection scenario, created by the Texas Demographic Center, based on migration to and from the county. Zero Scenario assumes that in-migration and out-migration are equal resulting in growth only through natural increase as shown in TABLE 4-9.

TABLE 4-9 HENDERSON COUNTY POPULATION PROJECTIONS, 2020-2050				
SCENARIO	2020 POPULATION PROJECTION	2030 POPULATION PROJECTION	2040 POPULATION PROJECTION	2050 POPULATION PROJECTION
<b>ZERO SCENARIO</b>	81179	82001	80697	78763
Source: Texas Demographic Center				

Housing units in Henderson County are mainly single-family manufactured homes. The highest number of permits was in 2019 with 491 creases experienced during this timeframe and the trend is expected to continue. With this new homes surge and population increase, the vulnerability of hazard prone areas has increased since the plan was last approved.

#### 4.9.2 CITY OF ATHENS

The City of Athens has experienced about a 21.5% population increase between 2000 and 2019. The city averages about 20 building permits per year with an average permit cost of \$428. The vulnerability of hazard prone areas in the City of Athens has stayed similar since the plan was last approved and a minimal amount of building permits issued each year.

**TABLE 4-10 CITY OF ATHENS BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2020	27	10,825
2019	12	5,875

#### 4.9.3 CITY OF BERRYVILLE

The City of Berryville has experienced about a 16.3% population increase between 2000 and 2019. The city averages about 9.4 building permits per year with an average permit cost of \$21,543. The vulnerability of hazard prone areas in the City of Berryville has stayed similar since the plan was last approved and a minimal amount of building permits issued each year.

**TABLE 4-11 CITY OF BERRYVILLE BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2020	20	215000
2019	9	211000
2018	8	210100
2017	3	201100
2016	8	199500
2015	6	190200
2014	12	195000

#### 4.9.4 CITY OF BROWNSBORO

The City of Brownsboro has experienced about a 37.8% population increase between 2000 and 2019. The city averages about 6.3 building permits per year with an average permit cost of \$500. The vulnerability of hazard prone areas in the City of Brownsboro has stayed similar since the plan was last approved and a minimal amount of building permits issued each year.

**TABLE 4-12 CITY OF BROWNSBORO BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2020	4	2000
2019	8	4000
2018	7	3500

#### 4.9.5 CITY OF CANEY CITY

The City of Caney City has experienced about a 6.8% population decrease between 2000 and 2019. The city averages about 3 building permits per year with an average permit cost of \$339. The vulnerability of hazard prone areas in the City of Caney City has stayed similar since the plan was last approved and a minimal amount of building permits issued each year.

**TABLE 4-13 CITY OF CANEY CITY BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2020	2	829.68
2019	3	886
2018	5	406
2017	3	440
2016	2	2530

#### 4.9.6 CITY OF CHANDLER

The City of Chandler has experienced about a 44% population increase between 2000 and 2019. The city averages about 15.4 building permits per year with an average permit cost of \$229,492. The vulnerability of hazard prone areas in the City of Chandler has stayed similar since the plan was last approved as the amount of building permits issued each year continues to grow with the population growth.

**TABLE 4-14 CITY OF CHANDLER BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2016	14	2,040,000
2017	15	4,787,803
2018	20	4168127
2019	11	2556623
2020	17	4118354

#### 4.9.7 CITY OF COFFEE CITY

The City of Coffee City has experienced about a 34.2% population increase between 2000 and 2019. The city does not issue or require building permits. The vulnerability of hazard prone areas in the City of Coffee City has stayed similar since the plan was last approved.

#### 4.9.8 ENCHANTED OAKS

The City of Enchanted Oaks has experienced about a 4.5% population decrease between 2000 and 2019. The city averages about 47 building permits per year with an average permit cost of

\$271. The vulnerability of hazard prone areas in the City of Enchanted Oaks has stayed similar since the plan was last approved and a minimal amount of building permits issued each year.

**TABLE 4-15 CITY OF ENCHANTED OAKS BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2020	47	12770

#### **4.9.9 CITY OF EUSTACE**

The City of Eustace has experienced about a 20.7% population increase between 2000 and 2019. The city does not issue or require building permits. The vulnerability of hazard prone areas in the City of Eustace has stayed similar since the plan was last approved.

#### **4.9.10 CITY OF GUN BARREL CITY**

The City of Gun Barrel City has experienced about a 17.2% population increase between 2000 and 2019. The city averages about 153.7 building permits per year with an average permit cost of \$304. The vulnerability of hazard prone areas in the City of Gun Barrel City has stayed similar since the plan was last approved and a medium amount of building permits issued each year.

**TABLE 4-16 CITY OF GUN BARREL CITY BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2020	117	60.471.20
2019	136	40411.9
2018	135	36155.4
2017	227	50055.22

#### **4.9.11 CITY OF LOG CABIN**

The City of Log Cabin has experienced about a 5.1% population increase between 2000 and 2019. The city averages about 16.5 building permits per year with an average permit cost of \$341.9. The vulnerability of hazard prone areas in the City of Log Cabin has stayed similar since the plan was last approved and a minimal amount of building permits issued each year.

**TABLE 4-17 CITY OF LOG CABIN BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2020	16	9866.2
2019	26	6836.48
2018	11	3043.5
2017	13	2820

#### 4.9.12 CITY OF MALAKOFF

The City of Malakoff has experienced about a 2% population increase between 2000 and 2019. The city averages about 76.6 building permits per year with an average permit cost of \$173. The vulnerability of hazard prone areas in the City of Malakoff has stayed similar since the plan was last approved and a medium amount of building permits issued each year.

**TABLE 4-18 CITY OF MALAKOFF BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2020	85	16,107.74
2019	86	14,840.47
2018	92	16,791.86
2017	58	6,893.86
2016	62	11,318.09

#### 4.9.13 CITY OF MOORE STATION

The City of Moore Station has experienced about a 16.4% population increase between 2000 and 2019. The city does not issue or require building permits. The vulnerability of hazard prone areas in the City of Moore Station has stayed similar since the plan was last approved.

#### 4.9.14 CITY OF MURCHISON

The City of Murchison has experienced about a 1.2% population increase between 2000 and 2019. The city averages about 2 building permits per year with an average permit cost of \$901.66. The vulnerability of hazard prone areas in the City of Murchison has stayed similar since the plan was last approved and a minimal amount of building permits issued each year.

**TABLE 4-19 CITY OF MURCHISON BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2020	1	16000
2019	4	450000
2018	1	75000

#### 4.9.15 CITY OF PAYNE SPRINGS

The City of Payne Springs has experienced about a 21.2% population increase between 2000 and 2019. The city averages about 4.25 building permits per year with an average permit cost of \$175. The vulnerability of hazard prone areas in the City of Payne Springs has stayed similar since the plan was last approved and a minimal amount of building permits issued each year.

**TABLE 4-20 CITY OF PAYNE SPRINGS BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2020	11	2000
2019	2	300
2018	1	170
2017	3	510

**4.9.16 CITY POYNOR**

The City of Poynor has experienced about a 2.6% population decrease between 2000 and 2019. The city does not issue or require building permits. The vulnerability of hazard prone areas in the City of Poynor has stayed similar since the plan was last approved.

**4.9.17 CITY OF SEVEN POINTS**

The City of Seven Points has experienced about a 32.1% population increase between 2000 and 2019. The city was unable to obtain the number of permits issued each year but were able to provide the type of permits issued. The city permit fees average \$451 annually. The vulnerability of hazard prone areas in the City of Seven Points has stayed similar since the plan was last approved and a minimal amount of building permits issued each year.

**TABLE 4-21 CITY OF SEVEN POINTS BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2017	NEW CONSTRUCTION	800
2019	MANUFACTURED HOMES	430
2019	REMODELS	125

**4.9.18 CITY OF STAR HARBOR**

The City of Star Harbor has experienced about a 22.8% population increase between 2000 and 2019. The city averages about 5 building permits per year with an average permit cost of \$217,290. The vulnerability of hazard prone areas in the City of Star Harbor has stayed similar since the plan was last approved and a minimal amount of building permits issued each year.

**TABLE 4-22 CITY OF STAR HARBOR RESIDENTIAL BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2016	4	948,800
2017	9	1,687,020
2018	1	1708080
2019	6	1900.34

#### 4.9.19 CITY OF TOOL

The City of Tool has experienced about a 1.2% population increase between 2000 and 2019. The city averages about 169 building permits per year with an average permit cost of \$153.50. The vulnerability of hazard prone areas in the City of Tool has stayed similar since the plan was last approved and a medium amount of building permits issued each year.

**TABLE 4-23 CITY OF TOOL BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2019	196	56,032
2018	157	22,745
2017	168	13,097
2016	155	11,925

#### 4.9.20 CITY OF TRINIDAD

The City of Trinidad has experienced about a 20.3% population decrease between 2000 and 2019. The city averages about 5 building permits per year with an average permit cost of \$450. The vulnerability of hazard prone areas in the City of Trinidad has stayed similar since the plan was last approved and a minimal amount of building permits issued each year.

**TABLE 4-24 CITY OF TRINIDAD BUILDING PERMITS**

YEAR	BUILDING PERMITS ISSUED	ESTIMATED TOTAL
2019	5	2250
2018	5	2250
2017	4	1800
2016	6	2700
2015	5	2250

#### 4.10 LAW AND ORDINANCES

Existing laws, ordinances, and plans at the federal, state, and local level can support or impact hazard mitigation actions identified in this plan. Hazard mitigation plans are required to include review and incorporation, if appropriate, of existing plans, studies, reports, and technical information as part of the planning process (44 CFR, Section 201.6(b)(3)). Pertinent federal, state, and local laws are described below. These laws, programs, documents, and departments were reviewed to identify the plans, regulations, personnel, and funding mechanisms available to the county and planning partners to impact and mitigate the effects of natural hazards. The county and municipals partners have the capacity to expand their hazard mitigation capabilities through the training of existing staff, cross-training staff across program areas, and hiring of additional staff, as well as acquiring additional funding through the attainment of grant funds, raising of taxes, and levying of new taxes

#### **4.10.1 FEDERAL**

##### **DISASTER MITIGATION ACT**

The DMA is the current federal legislation addressing hazard mitigation planning. It emphasizes planning for disasters before they occur. It specifically addresses planning at the local level, requiring plans to be in place before Hazard Mitigation Assistance grant funds are available to communities. This plan is designed to meet the requirements of DMA, improving the planning partners' eligibility for future hazard mitigation funds.

##### **COMMUNITY DEVELOPMENT BLOCK GRANT DISASTER RESILIENCE PROGRAM**

In response to disasters, Congress may appropriate additional funding for the U.S. Department of Housing and Urban Development Community Development Block Grant programs to be distributed as Disaster Recovery grants (CDBG-DR). These grants can be used to rebuild affected areas and provide seed money to start the recovery process. CDBG-DR assistance may fund a broad range of recovery activities, helping communities and neighborhoods that otherwise might not recover due to limited resources. CDBG-DR grants often supplement disaster programs of the Federal Emergency Management Agency, the Small Business Administration, and the U.S. Army Corps of Engineers. Housing and Urban Development generally awards noncompetitive, nonrecurring CDBG-DR grants by a formula that considers disaster recovery needs unmet by other federal disaster assistance programs. To be eligible for CDBG-DR funds, projects must meet the following criteria:

- Address a disaster-related impact (direct or indirect) in a presidentially declared county for the covered disaster
- Be a CDBG-eligible activity (according to regulations and waivers)
- Meet a national objective.

Incorporating preparedness and mitigation into these actions is encouraged, as the goal is to rebuild in ways that are safer and stronger.

##### **CLEAN WATER ACT**

The federal Clean Water Act (CWA) employs regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's surface waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."

Evolution of CWA programs over the last decade has included a shift from a program-by-program, source by-source, and pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach, equal emphasis is placed on protecting healthy waters and restoring impaired ones. A full array of issues are addressed, not just those subject to CWA regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining water quality and other environmental goals is a hallmark of this approach.

##### **NATIONAL DAM SAFETY ACT**

The potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect the lives and property of the public. To help the State Dam Safety Program achieve its goal, the state's dam safety regulations now include the requirement for emergency action plans on all non-exempt Significant-Hazard and High-Hazard Potential dams (Title 30, Texas Administrative Code, Ch. 299, 299.61b).



## **NATIONAL FLOOD INSURANCE PROGRAM**

The National Flood Insurance Program (NFIP) provides federally backed flood insurance in exchange for communities enacting floodplain regulations. Participation and good standing under NFIP are prerequisites to grant funding eligibility under the Robert T. Stafford Act.

### **4.10.2 STATE AND REGIONAL**

#### **TEXAS DIVISION OF EMERGENCY MANAGEMENT**

The TDEM is a division within the Texas Department of Public Safety and has its roots in the civil defense programs established during World War II. It became a separate organization through the Texas Civil Protection Act of 1951, which established the Division of Defense and Disaster Relief in the Governor's Office to handle civil defense and disaster response programs. The division was co-located with the Department of Public Safety (DPS) in 1963. The division was renamed the Division of Disaster Emergency Services in 1973. After several more name changes, it was designated an operating division of the Texas Department of Public Safety in 2005. Legislation passed during the 81st session of the Texas Legislature in 2009 formally changed the name to TDEM. TDEM operates according to the Texas Disaster Act of 1975 (Chapter 418 of the Texas Government Code).

TDEM's is charged with carrying out a comprehensive all-hazard emergency management program for the state and for assisting cities, counties, and state agencies in planning and implementing their emergency management programs. A comprehensive emergency management program includes pre- and post-disaster mitigation of known hazards to reduce their impact; preparedness activities, such as emergency planning, training, and exercises; provisions for effective response to emergency situations; and recovery programs for major disasters."

#### **TEXAS COMMISSION ON ENVIRONMENTAL QUALITY**

The TCEQ has jurisdiction over rule changes to dams as 99% of dams are under state regulatory authority. Those regulations are implemented by the TCEQ Dam Safety Program, which monitors and regulates both private and public dams in Texas. The program periodically inspects dams that pose a high or significant hazard and makes recommendations and reports to dam owners to help them maintain safe facilities. The primary goal of the state's Dam Safety Program is to reduce the risk to lives and property from the consequences of dam failure.

In 2008, TCEQ proposed several rule changes including the definition of dams and dam classifications. According to the new definition, a dam in Texas is a barrier with a "height greater than or equal to 25 feet and a maximum storage (top of dam) capacity of 15 acre-feet; a height greater than 6 feet and a maximum storage capacity greater than or equal to 50 acre-feet; or one that poses a threat to human life or property in the event of failure, regardless of height or maximum storage capacity."

#### **TEXAS WATER DEVELOPMENT BOARD**

The Texas Water Development Board (TWDB) was created in 1957 but its history dates back to a 1904 constitutional amendment authorizing the first public development of water resources. The TWDB mission is "to provide leadership, information, education, and support for planning, financial assistance, and outreach for the conservation and responsible development of water for Texas." TWDB provides water planning, data collection and dissemination, financial assistance, and technical assistance services.

TWDB financial assistance programs are funded through state-backed bonds, a combination of state bond proceeds and federal grant funds, or limited appropriated funds. Since 1957, the Texas State Legislature and voters approved constitutional amendments authorizing TWDB to issue up to \$10.93 billion in Texas Water Development Bonds. In 1987, TWDB added the Clean Water State Revolving Fund

(CWSRF) to its portfolio of financial assistance programs. Low-interest loans from the CWSRF finance costs associated with the planning, design, construction, expansion, or improvement of wastewater treatment facilities, wastewater recycling and reuse facilities, collection systems, stormwater pollution control projects, and nonpoint source pollution control projects. Funded in part by federal grant money, CWSRF provides loans at interest rates lower than the market can offer to any eligible applicant. CWSRF offers 20-year loans using either a traditional long-term, fixed-rate or a short-term, variable-rate construction period loan that converts to a long-term, fixed-rate loan on project completion.

## TEXAS STATE SOIL AND WATER CONSERVATION BOARD

The Texas State Soil and Water Conservation Board (TSSWCB) is the state agency that administers Texas' soil and water conservation law and coordinates conservation and nonpoint source water pollution abatement programs. The TSSWCB was created in 1939 by the Texas Legislature to organize the state into 216 soil and water conservation districts (SWCD) and to serve as a centralized agency for communicating with the Texas Legislature as well as other state and federal entities. The TSSWCB is the lead state agency for the planning, management, and abatement of agricultural and silvicultural (forestry) nonpoint source water pollution, and administers the Water Supply Enhancement Program. Each SWCD is an independent political subdivision of state government. Local SWCDs are actively involved throughout the state in soil and water conservation activities such as operation and maintenance of flood control structures.

## TEXAS BUREAU OF ECONOMIC GEOLOGY

The University of Texas at Austin, Bureau of Economic Geology serves as the State Geological Survey of Texas. The bureau conducts research focusing on the intersection of energy, environment, and economy. The bureau partners with federal, state, and local agencies, academic institutions, industry, nonprofit organizations, and foundations to conduct high-quality research and to disseminate the results to the scientific and engineering communities as well as to the broad public. The Geophysical Log Facility (GLF) is the official well log repository for the Railroad Commission of Texas, which by law receives a copy of geophysical logs from every new, deepened, or plugged well drilled in Texas since September 1985.

## TEXAS FOREST SERVICE

The Texas Forest Service (TFS) was created in 1915 by the 34th Legislature as an integral part of the Texas A&M University System. It is mandated by law to assume direction of all forest interests and all matters pertaining to forestry within the jurisdiction of the state. TFS administers the Community Wildfire Protection Plan (CWPP) to reduce related risks to life, property, and the environment. Its Fire Control Department provides leadership in wildland fire protection for state and private lands in Texas and reduces wildfire-related loss of life, property, and critical resources.

The intention of the TFS CWPP is to reduce the risk of wildfire and promote ecosystem health. The plan also is intended to reduce home losses and provide for the safety of residents and firefighters during wildfires. It has the following goals.

Goals:

- Provide for the safety of residents and emergency personnel
- Limit the number of homes destroyed by wildfire
- Promote and maintain healthy ecosystems
- Educate citizens about wildfire prevention

CWPPs are developed to mitigate losses from wildfires. By developing a CWPP, a community is outlining a strategic plan to mitigate, prepare, respond, and recover. Texas Department of State Health Services

The mission of the Department of State Health Services is to protect and preserve the health of the citizens of Texas. Public health nurses provide a variety of services including immunizations, preventive assessments of children and the elderly, and a full range of services designed to assist individuals and groups to attain and maintain good health and to cope with illnesses.

#### **EAST TEXAS COUNCIL OF GOVERNMENTS**

ETCOG helps local communities work cooperatively to improve the conditions and well-being of East Texans. The ETCOG includes the following counties: Anderson, Camp, Cherokee, Gregg, Harrison, Henderson, Marion, Panola, Rains, Rusk, Smith, Upshur, Van Zandt, and Wood. ETCOG provides services and programs including 911 emergency communications, air quality, homeland security, resource conservation, transportation planning, and criminal justice training.

#### **4.10.3 HENDERSON COUNTY**

The Henderson County government is made up of the following offices and departments (Henderson County of Texas, 2020):

- Commissioner's Court
- County Attorney
- County Clerk
- Treasurer
- District Attorney
- Court Collections
- Fire Marshal/Office of Emergency Management
- Sheriff's Office
- Human Resources
- Information Technology
- Indigent Health Care
- Extension Office (Texas AgriLife)
- Elections
- Juvenile Services
- Purchasing
- Records Services
- Road and Bridge
- Veteran Services
- FloodPlain Management

Excerpts from applicable policies, regulations and plans and program descriptions follow to provide more details on existing mitigation capabilities to expand on and improve upon integration with this plan update.

#### **HENDERSON COUNTY SUBDIVISION REGULATIONS, 2018 (as amended)**

The purpose of the Henderson County Subdivision Regulations are to provide for the safety, health and well-being of the general public by requiring that adequate streets, storm drainage, water and sewage facilities be installed in all residential subdivisions and to provide guidelines for the construction and installation of such streets and facilities in a manner that will allow for efficient maintenance and upkeep without imposing an extraordinary monetary burden on the taxpayers of Henderson County, Texas.

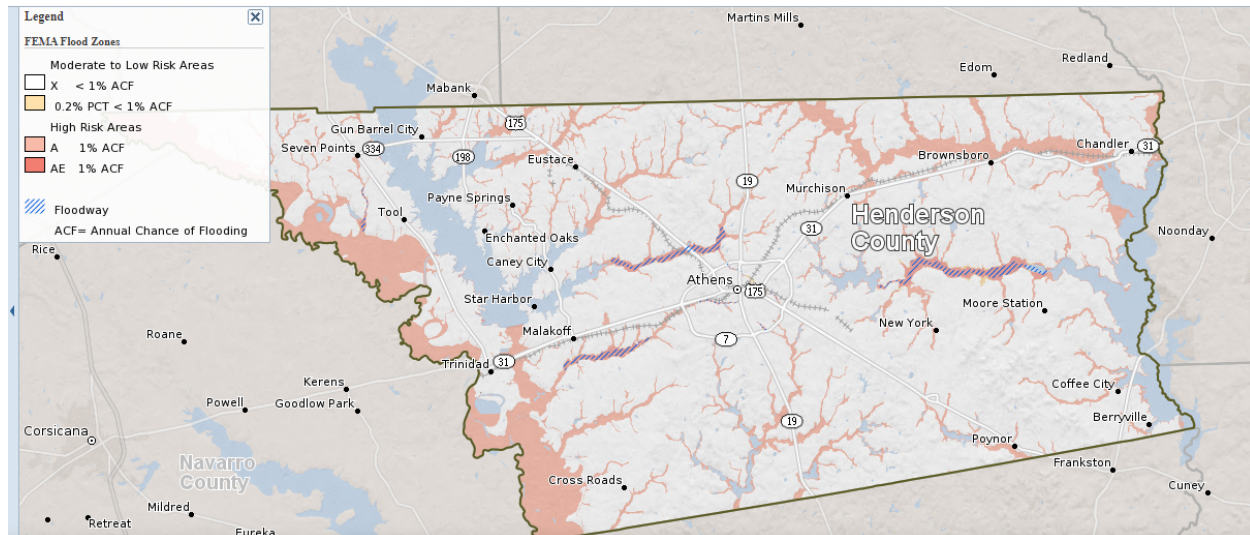
#### **HENDERSON COUNTY'S FLOOD DAMAGE PREVENTION ORDER, 2010**

The State of Texas Flood Control Insurance Act under Texas Water Code, Section 16.315, delegated the responsibility of local governmental units to adopt regulation designed to minimize flood losses. Therefore, the County of Henderson adopted the Henderson County Flood

Damage Prevention Order, 2010. The purpose of the Henderson County Flood Damage Prevention Order is to promote 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.

## HENDERSON COUNTY FLOODPLAIN MAP

The Henderson County Floodplain Map for issuing permits went into effect April 05, 2010.



4-8 Henderson County Floodplain Map

## HENDERSON COUNTY BASIC EMERGENCY OPERATIONS PLAN, 2010

The purpose of the Henderson County Basic Emergency Operations Plan is to:

- Identify the roles, responsibilities and actions required of county departments and other agencies in preparing for and responding to major emergencies and disasters
- Provide a framework for coordinating, integrating, and administering the EOPs and related programs of local, state, and federal governments
- Provide for the integration and coordination of volunteer agencies and private organizations involved in emergency response and relief efforts
- The EOP covers the county and the cities of Berryville, Brownsboro, Caney City, Chandler, Coffee City, Enchanted Oaks, Eustace, Gun Barrel City, Log Cabin, Malakoff, Moore Station, Murchison, Payne Springs, Poynor, Star Harbor, Tool and Trinidad.

## HENDERSON COUNTY FIRE MARSHAL/OFFICE OF EMERGENCY MANAGEMENT

The Henderson County Fire Marshal's Office mission is to ensure all state and county regulations related to fire, explosions or damages of any kind caused by fire or explosion are enforced. The office has the capability to investigate the cause, origin and circumstances of each fire that occurs within the county that destroys or damages property. The Fire Marshal's Office coordinates with the following fire departments with jurisdictions within Henderson County. All are volunteer fire departments except the City of Athens and the City of Gun Barrel who have paid staff.

- Athens Fire Department
- Baxter Volunteer Fire Department
- Berryville Volunteer Fire Department
- Brownsboro Volunteer Fire Department
- Caney City Volunteer Fire Department
- Chandler Volunteer Fire Department
- Coffee City Volunteer Fire Department
- Eustace Volunteer Fire Department
- Gun Barrel City Fire Department
- Larue-New York Volunteer Fire Department
- Log Cabin Volunteer Fire Department
- Malakoff Volunteer Fire Department
- Moore Station Volunteer Fire Department
- Murchison Volunteer Fire Department
- North 19 Volunteer Fire Department
- Payne Springs Volunteer Fire Department
- Poynor Volunteer Fire Department
- Seven Points Volunteer Fire Department
- Southside Volunteer Fire Department
- Tool ESD Volunteer Fire Department
- Trinidad Volunteer Fire Department
- Westside Volunteer Fire Department

The Office of Emergency Management (OEM) assists Henderson County in preparing for, responding to and recovering from disasters. The OEM works year-round with city departments, regional emergency management, public safety officials and elected officials to develop a plan to lessen the impact of disasters on county residents. In addition, communication is maintained with state and federal agencies for coordination in the event of large disasters, natural or manmade.

## HENDERSON COUNTY EMERGENCY MEDICAL SERVICES

The entire Henderson County planning area and the majority of East Texas counties are covered by the UHealth East Texas system for emergency medical services. In addition to a fleet of ambulances, the system operates three helicopters and one is stationed in Athens.

#### **4.10.4 CITY OF ATHENS**

The City of Athens delivers a full spectrum of municipal services to its residents, businesses and visitors.

- City Manager's Office
- City Secretary's Office
- Police Department
- Fire Department
- Public Works
- Development Services
- Finance
- Human Resources
- Utilities

The City of Athens, Code of Ordinances have provisions related directly or indirectly to hazard mitigation. These provisions are discussed below.

##### **Chapter 5- Building and Structures**

- Provisions under this chapter include:
  - ❖ Building permit requirements
  - ❖ Residential codes
  - ❖ Fire limits
  - ❖ Plumbing codes
  - ❖ Electrical codes
  - ❖ Flood damage prevention

##### **Chapter 7- Fire Protection and Prevention**

- Provisions under this chapter include:
  - ❖ Fire and hazardous conditions investigations, record, reports and abatement
  - ❖ International Fire Code adoption
  - ❖ Outdoor burning policy

##### **Chapter 21- Water and Sewers**

- Provisions under this chapter include:
  - ❖ Industrial wastes
  - ❖ On-site sewage facilities
  - ❖ Drought contingency
  - ❖ Zoning

#### **4.10.5 CITY OF BERRYVILLE**

The city of Berryville offers city offices and city services to its citizens which include:

- City Mayor's Office
- City Secretary's Office
- City Administration Office
- Municipal Water Department
- Berryville Volunteer Fire Department

The city of Berryville does not have ordinances in place related directly or indirectly to Hazard Mitigation. The city will examine their existing mitigation capabilities to expand on and improve upon integration with this plan update.

#### **4.10.6 CITY OF BROWNSBORO**

The city of Brownsboro offers city offices and city services to its citizens which include:

- City Mayor's Office
- City Secretary's Office
- City Administration Office
- Chamber of Commerce
- City Courts
- Police Department
- Brownsboro Volunteer Fire Department
- Brownsboro Water and Sewer Department
- Economic Development Corporation

The city of Brownsboro does not have ordinances in place related directly or indirectly to Hazard Mitigation. The city will examine their existing mitigation capabilities to expand on and improve upon integration with this plan update.

#### **4.10.7 CITY OF CANEY CITY**

The city of Caney City offers city offices to its citizens which include:

- City Mayor's Office
- City Secretary's Office
- City Administration Office
- Police Department
- Caney City Volunteer Fire Department

The city of Cane City does not have ordinances in place related directly or indirectly to Hazard Mitigation. The city will examine their existing mitigation capabilities to expand on and improve upon integration with this plan update.

#### **4.10.8 CITY OF CHANDLER**

The City of Chandler delivers a full spectrum of municipal services to its residents, businesses and visitors.

- |                              |                                      |
|------------------------------|--------------------------------------|
| • City Mayor's Office        | • Chandler Volunteer Fire Department |
| • City Secretary's Office    | • Economic Development Corporation   |
| • City Administration Office | • Code Compliance Office             |
| • Police Department          |                                      |

- Development Services
- Municipal Courts
- Museum and Visitors Center
- Parks and Recreation
- Public Works
- Planning and Zoning

The City of Chandler, Code of Ordinances have provisions related directly or indirectly to hazard mitigation. These provisions are discussed below.

#### Chapter 3- Building Regulations

- Provisions of this chapter include:
  - ❖ Dangerous or substandard buildings
  - ❖ Flood damage prevention
  - ❖ Streets and sidewalks

#### Chapter 5- Fire Prevention and Protection

- Provisions of this chapter include:
  - ❖ Fire Code
  - ❖ Outdoor Burning

#### Chapter 6- Health and Sanitation

- Provisions of this chapter include:
  - ❖ Unsanitary or objectionable conditions
  - ❖ Pollution control near public waterways

#### Chapter 10- Subdivision Regulation

- Provisions of this chapter include:
  - ❖ Subdivision Ordinance
  - ❖ Street and utility installation

#### Chapter 14- Zoning Ordinance

- Provisions of this chapter include:
  - ❖ Zoning Ordinances
  - ❖ Fee Schedules

### **4.10.9 CITY OF COFFEE CITY**

The city of Enchanted Oaks offers city offices and city services to its citizens which include:

- City Mayor's Office
- City Secretary's Office
- City Administration
- Police Department
- Coffee City Volunteer Fire Department
- Municipal Court System



The city of Eustace does not have ordinances in place related directly or indirectly to Hazard Mitigation. The city will examine their existing mitigation capabilities to expand on and improve upon integration with this plan update.

#### **4.10.10 ENCHANTED OAKS**

The city of Enchanted Oaks offers city offices and city services to its citizens which include:

- City Mayor's Office
- City Secretary's Office
- City Administration
- Police Department
- Enchanted Oaks Volunteer Fire Department

The City of Enchanted Oaks, Code of Ordinances have provisions related directly or indirectly to hazard mitigation. These provisions are discussed below.

- Ord# 187- Outdoor Burning
- Ord# 60c- Building SF Zoning
- Ord# 212c- Building Codes
- Ord#60a,b,D- Zoning

#### **4.10.11 CITY OF EUSTACE**

The city of Eustace offers city offices and city services to its citizens which include:

- City Mayor's Office
- City Secretary's Office
- City Administration
- Municipal Court System
- Police Department
- Eustace Volunteer Fire Department
- Water/Wastewater services

The city of Eustace does not have ordinances in place related directly or indirectly to Hazard Mitigation. The city will examine their existing mitigation capabilities to expand on and improve upon integration with this plan update.

#### **4.10.12 CITY OF GUN BARREL CITY**

The City of Gun Barrel City delivers a full spectrum of municipal services to its residents, businesses and visitors including:

- City Mayor's Office
- City Secretary's Office
- City Administration Office
- Building Official Department
- City Manager's Office
- City Treasurer's Office

- City Code Enforcement
- Municipal Court System
- City of Gun Barrel Fire Department
- Police Department
- City Street Department
- Economic Development Corp

The City of Gun Barrel City, Code of Ordinances have provisions related directly or indirectly to hazard mitigation. These provisions are discussed below.

#### Title V: Public Works

- Provisions of this chapter include:
  - ❖ Utilities Regulations
  - ❖ Solid Waste Management
  - ❖ Sewers

#### Title IX: General Regulations

- Provisions of this chapter include:
  - ❖ Fire Prevention, Fireworks
  - ❖ Health and Sanitation
  - ❖ Nuisances

#### Title XI: Business Regulations

- Provisions of this chapter include:
  - ❖ Oil and Gas Wells; Mineral Exploration
  - ❖ Environmental, Health and safety inspections

#### Title XV: Land Usage

- Provisions of this chapter include:
  - ❖ Building Regulations
  - ❖ Flood Damage Prevention
  - ❖ Subdivision Regulations
  - ❖ Zoning Code
  - ❖ Small wind energy system standards

### **4.10.13 CITY OF LOG CABIN**

The city of Log Cabin offers city offices and city services to its citizens which include:

- City Mayor's Office
- City Secretary's Office
- City Administration Office
- Police Department
- Log Cabin Volunteer Fire Department
- Municipal Court System
- Public Works Department
- Water/Sewer Services

- Maintenance/Streets Department

The City of Log Cabin, Code of Ordinances have provisions related directly or indirectly to hazard mitigation. These provisions are discussed below.

- Ordinance 5- Electrical
- Ordinance 10- Emergency Management
- Ordinance 11- Oil and Gas
- Ordinance 12- Streets
- Ordinance 31- Zoning and Building Standards
- Ordinance 35- Emergency Management
- Ordinance 77- Sewer System
- Ordinance 79- Emergency Water Demand Management Plan
- Ordinance 108- Sanitation and Pollution Control
- Ordinance 117- Building Regulations
- Ordinance 124- Flood Control
- Ordinance 128- Outdoor Burning

#### **4.10.14 CITY OF MALAKOFF**

The City of Malakoff delivers a full spectrum of municipal services to its residents, businesses and visitors including:

- |                              |                                      |
|------------------------------|--------------------------------------|
| • City Mayor's Office        | • Parks Department                   |
| • City Secretary's Office    | • Code Enforcement                   |
| • City Administration Office | • Police Department                  |
| • Animal Control Office      | • Malakoff Volunteer Fire Department |
| • Municipal Court System     | • Utility Department                 |
| • Public Works Department    | • Water Department                   |

The City of Malakoff has provisions related directly or indirectly to hazard mitigation. These provisions are discussed below.

- Building Permits
- Environment Protection Agency Permit
- Local and State Building Fire Code Enforcement Including:
  - ❖ Compliance inspection
  - ❖ Ordinance updates
  - ❖ Code Violations

#### **4.10.15 CITY OF MOORE STATION**

The city of Moore Station offers city offices to its citizens which include:

- City Mayor's Office

- City Secretary's Office
- Moore Station Volunteer Fire Department
- Utilities Department

The city of Moore Station does not have ordinances in place related directly or indirectly to Hazard Mitigation. The city will examine their existing mitigation capabilities to expand on and improve upon integration with this plan update.

#### **4.10.16 CITY OF MURCHISON**

The city of Murchison offers city offices to its citizens which include:

- City Mayor's Office
- City Secretary's Office
- City Administration Office
- Utilities Department
- Murchison Volunteer Fire Department

The city of Murchison does not have ordinances in place related directly or indirectly to Hazard Mitigation. The city will examine their existing mitigation capabilities to expand on and improve upon integration with this plan update.

#### **4.10.17 CITY OF PAYNE SPRINGS**

The City of Payne Springs delivers a full spectrum of municipal services to its residents, businesses and visitors including:

- City Mayor's Office
- City Secretary's Office
- City Administration Office
- Utilities Department
- Police Department
- Payne Springs Volunteer Fire Department
- Street Department
- Municipal Court System

The City of Payne Springs has provisions related directly or indirectly to hazard mitigation. These provisions are discussed below.

- Code Compliance Ordinances
- Code Enforcement
- Building Inspections
- Business Permitting Process

#### **4.10.18 CITY OF POYNOR**

The city of Poynor offers city offices to its citizens which include:

- City Mayor's Office
- City Secretary's Office
- City Administration Office
- Utility Services
- Poynor Volunteer Fire Department

The city of Poynor does not have ordinances in place related directly or indirectly to Hazard Mitigation. The city will examine their existing mitigation capabilities to expand on and improve upon integration with this plan update.

#### **4.10.19 CITY SEVEN POINTS**

The City of Seven Points delivers a full spectrum of municipal services to its residents, businesses and visitors including:

- City Mayor's Office
- City Secretary's Office
- City Administration Office
- Economic Development Corporation
- Municipal Court System
- Police Department
- Seven Points Volunteer Fire Department
- Utilities Department
- Street Department

The city of Seven Points does not have ordinances in place related directly or indirectly to Hazard Mitigation. The city will examine their existing mitigation capabilities to expand on and improve upon integration with this plan update.

#### **4.10.20 CITY OF STAR HARBOR**

The city of Star Harbor offers city offices to its citizens which include:

- City Mayor's Office
- City Secretary's Office
- City Administration Office
- Municipal Court System
- Police Department
- Water Treatment/Distribution System
- Sewage Collection System

The city of Star Harbor does not have ordinances in place related directly or indirectly to Hazard Mitigation. The city will examine their existing mitigation capabilities to expand on and improve upon integration with this plan update.

#### **4.10.21 CITY OF TOOL**

The City of Tool delivers a full spectrum of municipal services to its residents, businesses and visitors including:

- City Mayor's Office
- City Secretary's Office
- City Administration Office
- Animal Control
- Code Enforcement Office
- Municipal Court System
- Police Department
- Tool ESD Volunteer Fire Department
- Emergency Management Services

The City of Tool, Code of Ordinances have provisions related directly or indirectly to hazard mitigation. These provisions are discussed below.

#### **Title III: Administration**

- Provisions of this chapter include:
  - ❖ Emergency Management
  - ❖ City Policies

#### **Title V: Public Works**

- Provisions of this chapter include:
  - ❖ Solid Waste
  - ❖ Public Utility Commission

#### **Title IX: General Regulations**

- Provisions of this chapter include:
  - ❖ Animal Control
  - ❖ Fire Protection
  - ❖ Streets and sidewalks

#### **Title XV: Land Usage**

- Provisions of this chapter include:
  - ❖ Planning and zoning commission
  - ❖ Building Regulations
  - ❖ Floodplain Regulations
  - ❖ Zoning

#### **4.10.22 CITY OF TRINIDAD**

The City of Trinidad delivers a full spectrum of municipal services to its residents, businesses and visitors including:

- City Mayor's Office
- City Secretary's Office
- City Administration Office
- Municipal Court System
- Human Resources
- Public Works Department
- Utility Department
- Police Department
- Trinidad Volunteer Fire Department

The City of Trinidad, Code of Ordinances have provisions related directly or indirectly to hazard mitigation. These provisions are discussed below.

##### **Title V: Public Works**

- Provisions of this chapter include:
  - ❖ Public Utilities Generally
  - ❖ Sewers and sanitation
  - ❖ Water; Wastewater; Solid Waste Collection
  - ❖ Drought contingency plan

##### **Title IX: General Regulations**

- Provisions of this chapter include:
  - ❖ Public Safety
  - ❖ Streets, Rights-of-way

##### **Title XV: Land Usage**

- Provisions of this chapter include:
  - ❖ Building Regulations; Construction
  - ❖ Zoning
  - ❖ Flood Damage Prevention

## CHAPTER 5

### HAZARD MITIGATION CAPABILITIES ASSESSMENT

The planning team performed an inventory and analysis of existing authorities and capabilities called a “capability assessment.” A capability assessment creates an inventory of an agency’s mission, programs and policies, and evaluates its capacity to carry them out. The county and cities used this capabilities assessment to identify mitigation actions to strengthen their ability to mitigate the effects of a natural hazard.

#### 5.1 HENDERSON COUNTY

##### 5.1.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-1 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Henderson County.

TABLE 5-1 HENDERSON COUNTY REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	YES	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	YES	
GROWTH MANAGEMENT	YES	
FLOODPLAIN ORDINANCE	YES	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	YES	
BUILDING CODE	NO	
EROSION OR SEDIMENT CONTROL PROGRAM	NO	
STORMWATER MANAGEMENT	YES	
SITE PLAN REVIEW REQUIREMENTS	YES	
CAPITAL IMPROVEMENT PLAN	NO	
ECONOMIC DEVELOPMENT PLAN	YES	
LOCAL EMERGENCY OPERATIONS PLAN	YES	
OTHER SPECIAL PLANS	YES	
FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS	YES	
ELEVATION CERTIFICATES	NO	



### 5.1.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-2 identifies the county personnel responsible for activities related to mitigation and loss prevention in Henderson County.

TABLE 5-2 HENDERSON COUNTY ADMINISTRATIVE AND TECHNICAL CAPABILITIES		
PERSONNEL RESOURCES	YES/NO	DEPARTMENT/POSITION
Planner/Engineer with knowledge of land development/land management practices	NO	
Engineer/professional trained in construction practices related to buildings or infrastructure	NO	
Planner/engineer/scientists with an understanding of natural hazards	NO	
Personnel skilled in GIS	NO	
Full-time building official	NO	
Floodplain manager	YES	Flood Plain Manager
Emergency Manager	YES	Fire Marshal/Office of Emergency Management
Grant Writer	YES	Audit Department
Other Personnel	NO	
GIS data: Hazard Areas	YES	Appraisal District
GIS data: Critical facilities	YES	Appraisal District
GIS data: Building footprints	YES	Appraisal District
GIS data: Land use	YES	Appraisal District
GIS data: Links to assessor's Data	YES	Appraisal District
Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	YES	Code Red/ Sheriff Office
Other	NO	

### 5.1.3 FINANCIAL CAPABILITIES

Table 5-3 identifies financial tools or resources that Henderson County could use to help fund mitigation activities.

TABLE 5-3 HENDERSON COUNTY FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES

Authority to levy taxes for specific purposes	YES
Fees for water, sewer, gas or electric services	YES
Impact fees for new development	NO
Incur debt through general obligations bonds	YES
Incur debt through special tax bonds	YES
Incur debt through private activities	YES

## 5.2 CITY OF ATHENS

### 5.2.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-4 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Athens.

TABLE 5-4 CITY OF ATHENS REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	YES	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	YES	
GROWTH MANAGEMENT	N/A	
FLOODPLAIN ORDINANCE	YES	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	YES	
BUILDING CODE	YES	2015
EROSION OR SEDIMENT CONTROL PROGRAM	N/A	
STORMWATER MANAGEMENT	N/A	
SITE PLAN REVIEW REQUIREMENTS	YES	
CAPITAL IMPROVEMENT PLAN	YES	
ECONOMIC DEVELOPMENT PLAN	YES	
LOCAL EMERGENCY OPERATIONS PLAN	YES	
OTHER SPECIAL PLANS	N/A	
FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS	YES	
ELEVATION CERTIFICATES	YES	

### 5.2.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-5 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Athens.

TABLE 5-5 CITY OF ATHENS ADMINISTRATIVE AND TECHNICAL CAPABILITIES		
PERSONNEL RESOURCES	YES/NO	DEPARTMENT/POSITION
Planner/Engineer with knowledge of land development/land management practices	YES	
Engineer/professional trained in construction practices related to buildings or infrastructure	YES	
Planner/engineer/scientists with an understanding of natural hazards	YES	
Personnel skilled in GIS	NO	WE USE CONSULTANT SERVICES
Full-time building official	YES	
Floodplain manager	YES	
Emergency Manager	YES	
Grant Writer	NO	WE USE CONSULTANT SERVICES
Other Personnel	YES	
GIS data: Hazard Areas	YES	
GIS data: Critical facilities	YES	
GIS data: Building footprints	YES	
GIS data: Land use	YES	
GIS data: Links to assessor's Data	YES	
Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	YES	
Other	N/A	

### 5.2.3 FINANCIAL CAPABILITIES

Table 5-6 identifies financial tools or resources that the City of Athens could use to help fund mitigation activities.

TABLE 5-6 CITY OF ATHENS FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES

Authority to levy taxes for specific purposes	YES
Fees for water, sewer, gas or electric services	YES
Impact fees for new development	NO
Incur debt through general obligations bonds	YES
Incur debt through special tax bonds	NO
Incur debt through private activities	YES

### 5.3 CITY OF BERRYVILLE

#### 5.3.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-7 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Berryville.

TABLE 5-7 CITY OF BERRYVILLE REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	NO	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	YES	SOME SUBDIVISIONS
GROWTH MANAGEMENT	NO	
FLOODPLAIN ORDINANCE	NO	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	NO	
BUILDING CODE	YES	
EROSION OR SEDIMENT CONTROL PROGRAM	NO	
STORMWATER MANAGEMENT	YES	
SITE PLAN REVIEW REQUIREMENTS	YES	
CAPITAL IMPROVEMENT PLAN	NO	
ECONOMIC DEVELOPMENT PLAN	NO	
LOCAL EMERGENCY OPERATIONS PLAN	NO	
OTHER SPECIAL PLANS	NO	
FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS	NO	
ELEVATION CERTIFICATES	NO	

### 5.3.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-8 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Berryville.

TABLE 5-8 CITY OF BERRYVILLE ADMINISTRATIVE AND TECHNICAL CAPABILITIES		
PERSONNEL RESOURCES	YES/NO	DEPARTMENT/POSITION
Planner/Engineer with knowledge of land development/land management practices	NO	
Engineer/professional trained in construction practices related to buildings or infrastructure	NO	
Planner/engineer/scientists with an understanding of natural hazards	NO	
Personnel skilled in GIS	NO	
Full-time building official	NO	
Floodplain manager	NO	
Emergency Manager	NO	
Grant Writer	NO	
Other Personnel	NO	
GIS data: Hazard Areas	NO	
GIS data: Critical facilities	NO	
GIS data: Building footprints	NO	
GIS data: Land use	NO	
GIS data: Links to assessor's Data	NO	
Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	YES	WARNING SIREN
Other	NO	

### 5.3.3 FINANCIAL CAPABILITIES

Table 5-9 identifies financial tools or resources that the City of Berryville could use to help fund mitigation activities.

TABLE 5-9 CITY OF BERRYVILLE FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES

Authority to levy taxes for specific purposes	YES
Fees for water, sewer, gas or electric services	YES
Impact fees for new development	NO
Incur debt through general obligations bonds	NO
Incur debt through special tax bonds	NO
Incur debt through private activities	NO

## 5.4 CITY OF BROWNSBORO

### 5.4.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-10 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Brownsboro.

TABLE 5-10 CITY OF BROWNSBORO REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	NO	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	YES	
GROWTH MANAGEMENT	NO	
FLOODPLAIN ORDINANCE	NO	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	NO	
BUILDING CODE	YES	
EROSION OR SEDIMENT CONTROL PROGRAM	NO	
STORMWATER MANAGEMENT	NO	
SITE PLAN REVIEW REQUIREMENTS	NO	
CAPITAL IMPROVEMENT PLAN	NO	
ECONOMIC DEVELOPMENT PLAN	YES	
LOCAL EMERGENCY OPERATIONS PLAN	YES	
OTHER SPECIAL PLANS	NO	
FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS	NO	
ELEVATION CERTIFICATES	NO	

### 5.4.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-11 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Brownsboro.

TABLE 5-11 CITY OF BROWNSBORO ADMINISTRATIVE AND TECHNICAL CAPABILITIES		
PERSONNEL RESOURCES	YES/NO	DEPARTMENT/POSITION
Planner/Engineer with knowledge of land development/land management practices	YES	CONTRACTED
Engineer/professional trained in construction practices related to buildings or infrastructure	NO	
Planner/engineer/scientists with an understanding of natural hazards	NO	
Personnel skilled in GIS	NO	
Full-time building official	NO	
Floodplain manager	NO	
Emergency Manager	YES	EMC
Grant Writer	YES	CONTRACTED
Other Personnel	NO	
GIS data: Hazard Areas	NO	
GIS data: Critical facilities	NO	
GIS data: Building footprints	NO	
GIS data: Land use	NO	
GIS data: Links to assessor's Data	NO	
Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	YES	SIRENS
Other	NO	

### 5.4.3 FINANCIAL CAPABILITIES

Table 5-12 identifies financial tools or resources that the City of Brownsboro could use to help fund mitigation activities.

TABLE 5-12 CITY OF BROWNSBORO FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES
Authority to levy taxes for specific purposes	YES

<b>Fees for water, sewer, gas or electric services</b>	YES
<b>Impact fees for new development</b>	NO
<b>Incur debt through general obligations bonds</b>	YES
<b>Incur debt through special tax bonds</b>	YES
<b>Incur debt through private activities</b>	NO

## **5.5 CITY OF CANEY CITY**

### **5.5.1 LEGAL AND REGULATORY CAPABILITIES**

Table 5-13 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Caney City.

<b>TABLE 5-13 CITY OF CANEY CITY REGULATORY CAPABILITIES</b>		
<b>REGULATORY TOOLS (ORDINANCES, CODES, PLANS)</b>	<b>YES/NO</b>	<b>COMMENTS</b>
<b>GENERAL PLAN</b>	YES	
<b>ZONING ORDINANCES</b>	YES	
<b>SUBDIVISION ORDINANCE</b>	YES	
<b>GROWTH MANAGEMENT</b>	YES	EDC
<b>FLOODPLAIN ORDINANCE</b>	NO	
<b>OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)</b>	NO	
<b>BUILDING CODE</b>	NO	
<b>EROSION OR SEDIMENT CONTROL PROGRAM</b>	NO	
<b>STORMWATER MANAGEMENT</b>	NO	
<b>SITE PLAN REVIEW REQUIREMENTS</b>	NO	
<b>CAPITAL IMPROVEMENT PLAN</b>	NO	
<b>ECONOMIC DEVELOPMENT PLAN</b>	YES	
<b>LOCAL EMERGENCY OPERATIONS PLAN</b>	NO	
<b>OTHER SPECIAL PLANS</b>	NO	
<b>FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS</b>	NO	
<b>ELEVATION CERTIFICATES</b>	NO	



### 5.5.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-14 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Caney City.

TABLE 5-14 CITY OF CANEY CITY ADMINISTRATIVE AND TECHNICAL CAPABILITIES		
PERSONNEL RESOURCES	YES/NO	DEPARTMENT/POSITION
Planner/Engineer with knowledge of land development/land management practices	NO	
Engineer/professional trained in construction practices related to buildings or infrastructure	NO	
Planner/engineer/scientists with an understanding of natural hazards	NO	
Personnel skilled in GIS	NO	
Full-time building official	NO	
Floodplain manager	NO	
Emergency Manager	NO	
Grant Writer	NO	
Other Personnel	NO	
GIS data: Hazard Areas	NO	
GIS data: Critical facilities	NO	
GIS data: Building footprints	NO	
GIS data: Land use	NO	
GIS data: Links to assessor's Data	NO	
Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	NO	
Other	NO	

### 5.5.3 FINANCIAL CAPABILITIES

Table 5-15 identifies financial tools or resources that the City of Caney City could use to help fund mitigation activities.

TABLE 5-15 CITY OF CANEY CITY FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	NO
Authority to levy taxes for specific purposes	NO

<b>Fees for water, sewer, gas or electric services</b>	NO
<b>Impact fees for new development</b>	NO
<b>Incur debt through general obligations bonds</b>	YES
<b>Incur debt through special tax bonds</b>	NO
<b>Incur debt through private activities</b>	NO

## 5.6 CITY OF CHANDLER

### 5.6.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-16 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Chandler.

<b>TABLE 5-16 CITY OF CHANDLER REGULATORY CAPABILITIES</b>		
<b>REGULATORY TOOLS (ORDINANCES, CODES, PLANS)</b>	<b>YES/NO</b>	<b>COMMENTS</b>
<b>GENERAL PLAN</b>	YES	
<b>ZONING ORDINANCES</b>	YES	
<b>SUBDIVISION ORDINANCE</b>	YES	
<b>GROWTH MANAGEMENT</b>	YES	
<b>FLOODPLAIN ORDINANCE</b>	YES	
<b>OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)</b>	YES	
<b>BUILDING CODE</b>	YES	
<b>EROSION OR SEDIMENT CONTROL PROGRAM</b>	YES	
<b>STORMWATER MANAGEMENT</b>	YES	
<b>SITE PLAN REVIEW REQUIREMENTS</b>	YES	
<b>CAPITAL IMPROVEMENT PLAN</b>	YES	
<b>ECONOMIC DEVELOPMENT PLAN</b>	YES	
<b>LOCAL EMERGENCY OPERATIONS PLAN</b>	YES	
<b>OTHER SPECIAL PLANS</b>	NO	
<b>FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS</b>	NO	
<b>ELEVATION CERTIFICATES</b>	NO	

### 5.6.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-17 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Chandler.

TABLE 5-17 CITY OF CHANDLER ADMINISTRATIVE AND TECHNICAL CAPABILITIES		
PERSONNEL RESOURCES	YES/NO	DEPARTMENT/POSITION
Planner/Engineer with knowledge of land development/land management practices	YES	CABS/THIRD PARTY
Engineer/professional trained in construction practices related to buildings or infrastructure	YES	CABS/THIRD PARTY
Planner/engineer/scientists with an understanding of natural hazards	NO	
Personnel skilled in GIS	NO	
Full-time building official	NO	
Floodplain manager	YES	John Whitsell
Emergency Manager	YES	Stephen Kidd
Grant Writer	YES	Nancy Beftholf
Other Personnel	N/A	
GIS data: Hazard Areas	YES	ETCOG
GIS data: Critical facilities	YES	ETCOG
GIS data: Building footprints	YES	ETCOG
GIS data: Land use	YES	ETCOG
GIS data: Links to assessor's Data	YES	ETCOG
Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	YES	Kalon Rollins
Other	N/A	

### 5.6.3 FINANCIAL CAPABILITIES

Table 5-18 identifies financial tools or resources that the City of Chandler could use to help fund mitigation activities.

TABLE 5-18 CITY OF CHANDLER FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	NO
Authority to levy taxes for specific	NO

purposes	
Fees for water, sewer, gas or electric services	YES
Impact fees for new development	NO
Incur debt through general obligations bonds	YES
Incur debt through special tax bonds	NO
Incur debt through private activities	NO

## 5.7 CITY OF COFFEE CITY

### 5.7.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-19 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Coffee City.

TABLE 5-19 CITY OF COFFEE CITY REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	YES	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	NO	
GROWTH MANAGEMENT	NO	
FLOODPLAIN ORDINANCE	YES	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	NO	
BUILDING CODE	NO	
EROSION OR SEDIMENT CONTROL PROGRAM	NO	
STORMWATER MANAGEMENT	NO	
SITE PLAN REVIEW REQUIREMENTS	YES	
CAPITAL IMPROVEMENT PLAN	YES	
ECONOMIC DEVELOPMENT PLAN	YES	
LOCAL EMERGENCY OPERATIONS PLAN	YES	
OTHER SPECIAL PLANS	NO	
FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS	YES	
ELEVATION CERTIFICATES	YES	

### 5.7.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-20 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Coffee City.

TABLE 5-20 CITY OF COFFEE CITY ADMINISTRATIVE AND TECHNICAL CAPABILITIES		
PERSONNEL RESOURCES	YES/NO	DEPARTMENT/POSITION
Planner/Engineer with knowledge of land development/land management practices	NO	
Engineer/professional trained in construction practices related to buildings or infrastructure	NO	
Planner/engineer/scientists with an understanding of natural hazards	NO	
Personnel skilled in GIS	NO	
Full-time building official	NO	
Floodplain manager	NO	
Emergency Manager	YES	
Grant Writer	YES	
Other Personnel	NO	
GIS data: Hazard Areas	NO	
GIS data: Critical facilities	NO	
GIS data: Building footprints	NO	
GIS data: Land use	YES	
GIS data: Links to assessor's Data	NO	
Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	YES	
Other	NO	

### 5.7.3 FINANCIAL CAPABILITIES

Table 5-21 identifies financial tools or resources that the City of Coffee City could use to help fund mitigation activities.

TABLE 5-21 CITY OF COFFEE CITY FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES
Authority to levy taxes for specific purposes	YES

<b>Fees for water, sewer, gas or electric services</b>	NO
<b>Impact fees for new development</b>	NO
<b>Incur debt through general obligations bonds</b>	NO
<b>Incur debt through special tax bonds</b>	NO
<b>Incur debt through private activities</b>	NO

## **5.8 ENCHANTED OAKS**

### **5.8.1 LEGAL AND REGULATORY CAPABILITIES**

Table 5-22 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Enchanted Oaks.

<b>TABLE 5-22 CITY OF ENCHANTED OAKS REGULATORY CAPABILITIES</b>		
<b>REGULATORY TOOLS (ORDINANCES, CODES, PLANS)</b>	<b>YES/NO</b>	<b>COMMENTS</b>
<b>GENERAL PLAN</b>	YES	
<b>ZONING ORDINANCES</b>	YES	
<b>SUBDIVISION ORDINANCE</b>	NO	
<b>GROWTH MANAGEMENT</b>	NO	
<b>FLOODPLAIN ORDINANCE</b>	YES	
<b>OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)</b>	NO	
<b>BUILDING CODE</b>	YES	
<b>EROSION OR SEDIMENT CONTROL PROGRAM</b>	YES	
<b>STORMWATER MANAGEMENT</b>	YES	
<b>SITE PLAN REVIEW REQUIREMENTS</b>	YES	
<b>CAPITAL IMPROVEMENT PLAN</b>	YES	
<b>ECONOMIC DEVELOPMENT PLAN</b>	NO	
<b>LOCAL EMERGENCY OPERATIONS PLAN</b>	YES	
<b>OTHER SPECIAL PLANS</b>	NO	
<b>FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS</b>	NO	
<b>ELEVATION CERTIFICATES</b>	NO	

### 5.8.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-23 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Enchanted Oaks.

TABLE 5-23 CITY OF ENCHANTED OAKS ADMINISTRATIVE AND TECHNICAL CAPABILITIES		
PERSONNEL RESOURCES	YES/NO	DEPARTMENT/POSITION
Planner/Engineer with knowledge of land development/land management practices	NO	
Engineer/professional trained in construction practices related to buildings or infrastructure	NO	
Planner/engineer/scientists with an understanding of natural hazards	NO	
Personnel skilled in GIS	NO	
Full-time building official	NO	
Floodplain manager	NO	
Emergency Manager	NO	
Grant Writer	NO	
Other Personnel	NO	
GIS data: Hazard Areas	NO	
GIS data: Critical facilities	NO	
GIS data: Building footprints	NO	
GIS data: Land use	NO	
GIS data: Links to assessor's Data	NO	
Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	YES	TORNADO SIREN, SUPPORTED BY COUNCIL & OTHER VOLUNTEERS
Other	NO	

### 5.8.3 FINANCIAL CAPABILITIES

Table 5-24 identifies financial tools or resources that the City of Enchanted Oaks could use to help fund mitigation activities.

TABLE 5-24 CITY OF ENCHANTED OAKS FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	NO
Capital Improvements project funding	NO

Authority to levy taxes for specific purposes	NO
Fees for water, sewer, gas or electric services	NO
Impact fees for new development	YES
Incur debt through general obligations bonds	NO
Incur debt through special tax bonds	NO
Incur debt through private activities	NO

## 5.9 CITY OF EUSTACE

### 5.9.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-25 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Eustace.

TABLE 5-25 CITY OF EUSTACE REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	NO	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	NO	
GROWTH MANAGEMENT	NO	
FLOODPLAIN ORDINANCE	NO	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	NO	
BUILDING CODE	NO	
EROSION OR SEDIMENT CONTROL PROGRAM	NO	
STORMWATER MANAGEMENT	NO	
SITE PLAN REVIEW REQUIREMENTS	NO	
CAPITAL IMPROVEMENT PLAN	NO	
ECONOMIC DEVELOPMENT PLAN	NO	
LOCAL EMERGENCY OPERATIONS PLAN	NO	
OTHER SPECIAL PLANS	NO	
FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS	NO	
ELEVATION CERTIFICATES	NO	



### 5.9.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-26 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Eustace.

TABLE 5-26 CITY OF EUSTACE ADMINISTRATIVE AND TECHNICAL CAPABILITIES		
PERSONNEL RESOURCES	YES/NO	DEPARTMENT/POSITION
Planner/Engineer with knowledge of land development/land management practices	NO	
Engineer/professional trained in construction practices related to buildings or infrastructure	NO	
Planner/engineer/scientists with an understanding of natural hazards	NO	
Personnel skilled in GIS	NO	
Full-time building official	NO	
Floodplain manager	NO	
Emergency Manager	YES	MAYOR
Grant Writer	NO	
Other Personnel	YES	SECRETARY/ POLICE CHIEF
GIS data: Hazard Areas	NO	
GIS data: Critical facilities	NO	
GIS data: Building footprints	NO	
GIS data: Land use	NO	
GIS data: Links to assessor's Data	NO	
Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	YES	SIRENS
Other	NO	

### 5.9.3 FINANCIAL CAPABILITIES

Table 5-27 identifies financial tools or resources that the City of Eustace could use to help fund mitigation activities.

TABLE 5-27 CITY OF EUSTACE FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES

Authority to levy taxes for specific purposes	YES
Fees for water, sewer, gas or electric services	YES
Impact fees for new development	NO
Incur debt through general obligations bonds	NO
Incur debt through special tax bonds	NO
Incur debt through private activities	NO

## 5.10 CITY OF GUN BARREL CITY

### 5.10.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-28 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Gun Barrel.

TABLE 5-28 CITY OF GUN BARREL CITY REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	YES	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	YES	
GROWTH MANAGEMENT	YES	
FLOODPLAIN ORDINANCE	YES	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	YES	2015 WILDLAND-URBAN INTERFACE
BUILDING CODE	YES	2015 IBC
EROSION OR SEDIMENT CONTROL PROGRAM	NO	
STORMWATER MANAGEMENT	YES	
SITE PLAN REVIEW REQUIREMENTS	YES	
CAPITAL IMPROVEMENT PLAN	YES	
ECONOMIC DEVELOPMENT PLAN	YES	
LOCAL EMERGENCY OPERATIONS PLAN	YES	HENDERSON COUNTY PLAN
OTHER SPECIAL PLANS	YES	COMPREHENSIVE/STRATEGIC PLAN
FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS	YES	YI.LAING CHAN TEXAS WATER DEVELOPMENT BOARD
ELEVATION CERTIFICATES	NO	

### 5.10.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-29 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Gun Barrel City.

TABLE 5-29 CITY OF GUN BARREL CITY ADMINISTRATIVE AND TECHNICAL CAPABILITIES		
PERSONNEL RESOURCES	YES/NO	DEPARTMENT/POSITION
Planner/Engineer with knowledge of land development/land management practices	NO	
Engineer/professional trained in construction practices related to buildings or infrastructure	NO	
Planner/engineer/scientists with an understanding of natural hazards	NO	
Personnel skilled in GIS	NO	ETCOG/HCAD
Full-time building official	YES	LOCATED @ CITY HALL SERVES AS INSPECTOR
Floodplain manager	YES	CITY MANAGER OR THIER DELEGATE
Emergency Manager	YES	MAYOR/FIRE MARSHAL/POLICE CHIEF
Grant Writer	NO	CONTRACTED OR DEPARTMENT HEAD INITIATED
Other Personnel	YES	COMMUNITY RESOURCE/SOCIAL MEDIA
GIS data: Hazard Areas	NO	
GIS data: Critical facilities	NO	HENDERSON CO. CADD
GIS data: Building footprints	NO	
GIS data: Land use	NO	
GIS data: Links to assessor's Data	YES	hcad@hcadtx.org
Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	YES	6 OUTDOOR WARNING SIREN, CITY
Other	YES	PLAN REVIEW, COMMERCIAL INSPECTIONS

### 5.10.3 FINANCIAL CAPABILITIES

Table 5-30 identifies financial tools or resources that the City of Gun Barrel City could use to help fund mitigation activities.

TABLE 5-30 CITY OF GUN BARREL CITY FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES
Authority to levy taxes for specific purposes	NO
Fees for water, sewer, gas or electric services	NO
Impact fees for new development	YES
Incur debt through general obligations bonds	NO
Incur debt through special tax bonds	NO
Incur debt through private activities	NO

## 5.11 CITY OF LOG CABIN

### 5.11.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-31 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Log Cabin.

TABLE 5-31 CITY OF LOG CABIN REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	NO	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	NO	
GROWTH MANAGEMENT	NO	
FLOODPLAIN ORDINANCE	NO	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	NO	
BUILDING CODE	YES	
EROSION OR SEDIMENT CONTROL PROGRAM	NO	
STORMWATER MANAGEMENT	NO	
SITE PLAN REVIEW REQUIREMENTS	NO	
CAPITAL IMPROVEMENT PLAN	NO	

<b>ECONOMIC DEVELOPMENT PLAN</b>	NO	
<b>LOCAL EMERGENCY OPERATIONS PLAN</b>	NO	
<b>OTHER SPECIAL PLANS</b>	NO	
<b>FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS</b>	NO	
<b>ELEVATION CERTIFICATES</b>	NO	

### 5.11.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-32 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Log Cabin.

<b>TABLE 5-32 CITY OF LOG CABIN ADMINISTRATIVE AND TECHNICAL CAPABILITIES</b>		
<b>PERSONNEL RESOURCES</b>	<b>YES/NO</b>	<b>DEPARTMENT/POSITION</b>
<b>Planner/Engineer with knowledge of land development/land management practices</b>	NO	
<b>Engineer/professional trained in construction practices related to buildings or infrastructure</b>	NO	
<b>Planner/engineer/scientists with an understanding of natural hazards</b>	NO	
<b>Personnel skilled in GIS</b>	NO	
<b>Full-time building official</b>	NO	
<b>Floodplain manager</b>	NO	
<b>Emergency Manager</b>	NO	
<b>Grant Writer</b>	NO	
<b>Other Personnel</b>	NO	
<b>GIS data: Hazard Areas</b>	NO	
<b>GIS data: Critical facilities</b>	NO	
<b>GIS data: Building footprints</b>	NO	
<b>GIS data: Land use</b>	NO	
<b>GIS data: Links to assessor's Data</b>	NO	
<b>Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)</b>	NO	
<b>Other</b>	NO	

### 5.11.3 FINANCIAL CAPABILITIES

Table 5-33 identifies financial tools or resources that the City of Log Cabin could use to help fund mitigation activities.

TABLE 5-33 CITY OF LOG CABIN FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	NO
Capital Improvements project funding	NO
Authority to levy taxes for specific purposes	NO
Fees for water, sewer, gas or electric services	YES
Impact fees for new development	NO
Incur debt through general obligations bonds	NO
Incur debt through special tax bonds	NO
Incur debt through private activities	NO

### 5.12 CITY OF MALAKOFF

#### 5.12.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-34 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Malakoff.

TABLE 5-34 CITY OF MALAKOFF REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	YES	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	YES	
GROWTH MANAGEMENT	YES	
FLOODPLAIN ORDINANCE	YES	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	YES	
BUILDING CODE	YES	
EROSION OR SEDIMENT CONTROL PROGRAM	YES	
STORMWATER MANAGEMENT	YES	
SITE PLAN REVIEW REQUIREMENTS	YES	

<b>CAPITAL IMPROVEMENT PLAN</b>	YES	
<b>ECONOMIC DEVELOPMENT PLAN</b>	YES	
<b>LOCAL EMERGENCY OPERATIONS PLAN</b>	YES	
<b>OTHER SPECIAL PLANS</b>	YES	
<b>FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS</b>	YES	
<b>ELEVATION CERTIFICATES</b>	NO	

### 5.12.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-35 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Malakoff.

<b>TABLE 5-35 CITY OF MALAKOFF ADMINISTRATIVE AND TECHNICAL CAPABILITIES</b>		
<b>PERSONNEL RESOURCES</b>	<b>YES/NO</b>	<b>DEPARTMENT/POSITION</b>
<b>Planner/Engineer with knowledge of land development/land management practices</b>	YES	KSA ENGINEERS
<b>Engineer/professional trained in construction practices related to buildings or infrastructure</b>	YES	KSA ENGINEERS
<b>Planner/engineer/scientists with an understanding of natural hazards</b>	YES	KSA ENGINEERS
<b>Personnel skilled in GIS</b>	YES	KSA ENGINEERS
<b>Full-time building official</b>	YES	CODE ENFORCEMENT
<b>Floodplain manager</b>	YES	PUBLIC WORKS DIRECTOR
<b>Emergency Manager</b>	YES	CITY ADMINISTRATOR/ PUBLIC WORKS DIRECTOR/ POLICE CHIEF/ MAYOR PRO-TEM
<b>Grant Writer</b>	YES	
<b>Other Personnel</b>	YES	
<b>GIS data: Hazard Areas</b>	YES	TWDB
<b>GIS data: Critical facilities</b>	YES	CAPITAL IMPROVEMENT PLAN
<b>GIS data: Building footprints</b>	YES	HENDERSON COUNTY CAD
<b>GIS data: Land use</b>	YES	CAPITAL IMPROVEMENT PLAN
<b>GIS data: Links to assessor's Data</b>	YES	HENDERSON COUNTY

		CAD
Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	YES	SENTRY SIRENS
Other	NO	

### 5.12.3 FINANCIAL CAPABILITIES

Table 5-36 identifies financial tools or resources that the City of Malakoff could use to help fund mitigation activities.

TABLE 5-36 CITY OF MALAKOFF FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES
Authority to levy taxes for specific purposes	YES
Fees for water, sewer, gas or electric services	YES
Impact fees for new development	NO
Incur debt through general obligations bonds	YES
Incur debt through special tax bonds	YES
Incur debt through private activities	YES

### 5.13 CITY OF MOORE STATION

#### 5.13.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-37 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Moore Station.

TABLE 5-37 CITY OF MOORE STATION REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	NO	
ZONING ORDINANCES	NO	
SUBDIVISION ORDINANCE	NO	
GROWTH MANAGEMENT	NO	
FLOODPLAIN ORDINANCE	NO	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	NO	



BUILDING CODE	NO	
EROSION OR SEDIMENT CONTROL PROGRAM	NO	
STORMWATER MANAGEMENT	NO	
SITE PLAN REVIEW REQUIREMENTS	NO	
CAPITAL IMPROVEMENT PLAN	NO	
ECONOMIC DEVELOPMENT PLAN	NO	FOLLOW COUNTY PLAN
LOCAL EMERGENCY OPERATIONS PLAN	NO	
OTHER SPECIAL PLANS	NO	
FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS	NO	
ELEVATION CERTIFICATES	NO	

### 5.13.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-38 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Moore Station.

TABLE 5-38 CITY OF MOORE STATION ADMINISTRATIVE AND TECHNICAL CAPABILITIES		
PERSONNEL RESOURCES	YES/NO	DEPARTMENT/POSITION
Planner/Engineer with knowledge of land development/land management practices	NO	
Engineer/professional trained in construction practices related to buildings or infrastructure	NO	
Planner/engineer/scientists with an understanding of natural hazards	NO	
Personnel skilled in GIS	NO	
Full-time building official	NO	
Floodplain manager	NO	
Emergency Manager	YES	FIRE CHIEF
Grant Writer	NO	
Other Personnel	NO	
GIS data: Hazard Areas	NO	
GIS data: Critical facilities	NO	
GIS data: Building footprints	NO	
GIS data: Land use	NO	
GIS data: Links to assessor's Data	NO	

Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	NO	REVERSE 911
Other	NO	

### 5.13.3 FINANCIAL CAPABILITIES

Table 5-39 identifies financial tools or resources that the City of Moore Station could use to help fund mitigation activities.

TABLE 5-39 CITY OF MOORE STATION FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES
Authority to levy taxes for specific purposes	YES
Fees for water, sewer, gas or electric services	NO
Impact fees for new development	NO
Incur debt through general obligations bonds	NO
Incur debt through special tax bonds	NO
Incur debt through private activities	NO

## 5.14 CITY OF MURCHISON

### 5.14.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-40 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Murchison.

TABLE 5-40 CITY OF MURCHISON REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	YES	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	NO	
GROWTH MANAGEMENT	NO	
FLOODPLAIN ORDINANCE	YES	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	NO	

<b>BUILDING CODE</b>	YES	
<b>EROSION OR SEDIMENT CONTROL PROGRAM</b>	NO	
<b>STORMWATER MANAGEMENT</b>	NO	
<b>SITE PLAN REVIEW REQUIREMENTS</b>	NO	
<b>CAPITAL IMPROVEMENT PLAN</b>	NO	
<b>ECONOMIC DEVELOPMENT PLAN</b>	NO	
<b>LOCAL EMERGENCY OPERATIONS PLAN</b>	NO	
<b>OTHER SPECIAL PLANS</b>	NO	
<b>FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS</b>	NO	
<b>ELEVATION CERTIFICATES</b>	NO	

#### 5.14.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-41 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Murchison.

**TABLE 5-41 CITY OF MURCHISON ADMINISTRATIVE AND TECHNICAL CAPABILITIES**

<b>PERSONNEL RESOURCES</b>	<b>YES/NO</b>	<b>DEPARTMENT/POSITION</b>
<b>Planner/Engineer with knowledge of land development/land management practices</b>	NO	
<b>Engineer/professional trained in construction practices related to buildings or infrastructure</b>	NO	
<b>Planner/engineer/scientists with an understanding of natural hazards</b>	NO	
<b>Personnel skilled in GIS</b>	NO	
<b>Full-time building official</b>	NO	
<b>Floodplain manager</b>	NO	
<b>Emergency Manager</b>	YES	MURCHISON FIRE CHIEF
<b>Grant Writer</b>	YES	GRANT WORKS
<b>Other Personnel</b>	YES	CITY SECRETARY
<b>GIS data: Hazard Areas</b>	NO	
<b>GIS data: Critical facilities</b>	NO	
<b>GIS data: Building footprints</b>	NO	
<b>GIS data: Land use</b>	NO	
<b>GIS data: Links to assessor's Data</b>	NO	

Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	NO	
Other	NO	

### 5.14.3 FINANCIAL CAPABILITIES

Table 5-42 identifies financial tools or resources that the City of Murchison could use to help fund mitigation activities.

TABLE 5-42CITY OF MURCHISON FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES
Authority to levy taxes for specific purposes	YES
Fees for water, sewer, gas or electric services	YES
Impact fees for new development	NO
Incur debt through general obligations bonds	NO
Incur debt through special tax bonds	NO
Incur debt through private activities	NO

### 5.15 CITY OF PAYNE SPRINGS

#### 5.15.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-43 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Payne Springs.

TABLE 5-43 CITY OF PAYNE SPRINGS REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	NO	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	NO	
GROWTH MANAGEMENT	NO	
FLOODPLAIN ORDINANCE	NO	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	NO	
BUILDING CODE	YES	
EROSION OR SEDIMENT CONTROL PROGRAM	NO	

<b>STORMWATER MANAGEMENT</b>	NO	
<b>SITE PLAN REVIEW REQUIREMENTS</b>	NO	
<b>CAPITAL IMPROVEMENT PLAN</b>	NO	
<b>ECONOMIC DEVELOPMENT PLAN</b>	NO	
<b>LOCAL EMERGENCY OPERATIONS PLAN</b>	NO	
<b>OTHER SPECIAL PLANS</b>	NO	
<b>FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS</b>	NO	
<b>ELEVATION CERTIFICATES</b>	NO	

### 5.15.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-44 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Payne Springs.

<b>TABLE 5-44 CITY OF PAYNE SPRINGS ADMINISTRATIVE AND TECHNICAL CAPABILITIES</b>		
<b>PERSONNEL RESOURCES</b>	<b>YES/NO</b>	<b>DEPARTMENT/POSITION</b>
<b>Planner/Engineer with knowledge of land development/land management practices</b>	NO	
<b>Engineer/professional trained in construction practices related to buildings or infrastructure</b>	NO	
<b>Planner/engineer/scientists with an understanding of natural hazards</b>	NO	
<b>Personnel skilled in GIS</b>	NO	
<b>Full-time building official</b>	NO	
<b>Floodplain manager</b>	NO	
<b>Emergency Manager</b>	NO	
<b>Grant Writer</b>	NO	
<b>Other Personnel</b>	NO	
<b>GIS data: Hazard Areas</b>	NO	
<b>GIS data: Critical facilities</b>	NO	
<b>GIS data: Building footprints</b>	NO	
<b>GIS data: Land use</b>	NO	
<b>GIS data: Links to assessor's Data</b>	NO	
<b>Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)</b>	NO	
<b>Other</b>	NO	

### 5.15.3 FINANCIAL CAPABILITIES

Table 5-45 identifies financial tools or resources that the City of Payne Springs could use to help fund mitigation activities.

TABLE 5-45 CITY OF PAYNE SPRINGS FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	NO
Capital Improvements project funding	NO
Authority to levy taxes for specific purposes	NO
Fees for water, sewer, gas or electric services	NO
Impact fees for new development	NO
Incur debt through general obligations bonds	NO
Incur debt through special tax bonds	NO
Incur debt through private activities	NO

### 5.16 CITY POYNOR

#### 5.16.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-46 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Poynor.

TABLE 5-46 CITY OF POYNOR REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	YES	
ZONING ORDINANCES	NO	
SUBDIVISION ORDINANCE	NO	
GROWTH MANAGEMENT	NO	
FLOODPLAIN ORDINANCE	NO	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	NO	
BUILDING CODE	NO	
EROSION OR SEDIMENT CONTROL PROGRAM	NO	
STORMWATER MANAGEMENT	NO	
SITE PLAN REVIEW REQUIREMENTS	NO	
CAPITAL IMPROVEMENT PLAN	YES	

<b>ECONOMIC DEVELOPMENT PLAN</b>	YES	
<b>LOCAL EMERGENCY OPERATIONS PLAN</b>	NO	
<b>OTHER SPECIAL PLANS</b>	NO	
<b>FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS</b>	NO	
<b>ELEVATION CERTIFICATES</b>	NO	

### 5.16.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-47 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Poynor.

**TABLE 5-47 CITY OF POYNOR ADMINISTRATIVE AND TECHNICAL CAPABILITIES**

<b>PERSONNEL RESOURCES</b>	<b>YES/NO</b>	<b>DEPARTMENT/POSITION</b>
<b>Planner/Engineer with knowledge of land development/land management practices</b>	NO	
<b>Engineer/professional trained in construction practices related to buildings or infrastructure</b>	NO	
<b>Planner/engineer/scientists with an understanding of natural hazards</b>	NO	
<b>Personnel skilled in GIS</b>	NO	
<b>Full-time building official</b>	NO	
<b>Floodplain manager</b>	NO	
<b>Emergency Manager</b>	NO	
<b>Grant Writer</b>	YES	CONTRACTOR
<b>Other Personnel</b>	NO	
<b>GIS data: Hazard Areas</b>	NO	
<b>GIS data: Critical facilities</b>	NO	
<b>GIS data: Building footprints</b>	NO	
<b>GIS data: Land use</b>	NO	
<b>GIS data: Links to assessor's Data</b>	NO	
<b>Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)</b>	YES	SIREN WARNING SYSTEM
<b>Other</b>	NO	

### 5.16.3 FINANCIAL CAPABILITIES

Table 5-48 identifies financial tools or resources that the City of Poynor could use to help fund mitigation activities.

TABLE 5-48 CITY OF POYNOR FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES
Authority to levy taxes for specific purposes	YES
Fees for water, sewer, gas or electric services	YES
Impact fees for new development	NO
Incur debt through general obligations bonds	YES
Incur debt through special tax bonds	YES
Incur debt through private activities	NO

### 5.17 CITY OF SEVEN POINTS

#### 5.17.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-49 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Seven Points.

TABLE 5-49 CITY OF SEVEN POINTS REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	Yes	CITY ORDINANCE CHAPTER 234
ZONING ORDINANCES	Yes	CITY ORDINANCE CHAPTER 272
SUBDIVISION ORDINANCE	Yes	CITY ORDINANCE CHAPTER 270
GROWTH MANAGEMENT	No	N/A
FLOODPLAIN ORDINANCE	Yes	CITY ORDINANCE CHAPTER 341
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	Yes	FIRE PROTECTION ORDINANCE CHAPTER 304
BUILDING CODE	Yes	2012 BUILDING CODE/ CITY ORDINANCE CHAPTER 343 & 351
EROSION OR SEDIMENT CONTROL PROGRAM	No	N/A
STORMWATER MANAGEMENT	Yes	CITY ORDINANCE CHAPTER 341



<b>SITE PLAN REVIEW REQUIREMENTS</b>	Yes	CITY ORDINANCE CHAPTER 272
<b>CAPITAL IMPROVEMENT PLAN</b>	NO	N/A
<b>ECONOMIC DEVELOPMENT PLAN</b>	YES	EDC BOARD HOLDS
<b>LOCAL EMERGENCY OPERATIONS PLAN</b>	YES	
<b>OTHER SPECIAL PLANS</b>	NO	N/A
<b>FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS</b>	YES	
<b>ELEVATION CERTIFICATES</b>	N/A	

### 5.17.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-50 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Seven Points.

<b>TABLE 5-50 CITY OF SEVEN POINTS ADMINISTRATIVE AND TECHNICAL CAPABILITIES</b>		
<b>PERSONNEL RESOURCES</b>	<b>YES/NO</b>	<b>DEPARTMENT/POSITION</b>
<b>Planner/Engineer with knowledge of land development/land management practices</b>	NO	
<b>Engineer/professional trained in construction practices related to buildings or infrastructure</b>	NO	
<b>Planner/engineer/scientists with an understanding of natural hazards</b>	NO	
<b>Personnel skilled in GIS</b>	NO	
<b>Full-time building official</b>	NO	CONTRACT EXPIRED
<b>Floodplain manager</b>	NO	
<b>Emergency Manager</b>	YES	POLICE DEPARTMENT/CHIEF
<b>Grant Writer</b>	NO	CONTRACT EXPIRED
<b>Other Personnel</b>	NO	
<b>GIS data: Hazard Areas</b>	NO	
<b>GIS data: Critical facilities</b>	NO	
<b>GIS data: Building footprints</b>	NO	
<b>GIS data: Land use</b>	NO	
<b>GIS data: Links to assessor's Data</b>	NO	
<b>Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)</b>	YES	TORNADO SIREN
<b>Other</b>	N/A	

### 5.17.3 FINANCIAL CAPABILITIES

Table 5-51 identifies financial tools or resources that the City of Seven Points could use to help fund mitigation activities.

TABLE 5-51 CITY OF SEVEN POINT FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES
Authority to levy taxes for specific purposes	NO
Fees for water, sewer, gas or electric services	NO
Impact fees for new development	NO
Incur debt through general obligations bonds	NO
Incur debt through special tax bonds	NO
Incur debt through private activities	NO

### 5.18 CITY OF STAR HARBOR

#### 5.18.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-52 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Star Harbor.

TABLE 5-52 CITY OF STAR HARBOR REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	YES	MAYOR
ZONING ORDINANCES	YES	BUILDING & ZONING COMMITTEE
SUBDIVISION ORDINANCE	NO	
GROWTH MANAGEMENT	NO	
FLOODPLAIN ORDINANCE	NO	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	YES	OPERATIONS MANAGER
BUILDING CODE	YES	BUILDING & ZONING COMMITTEE
EROSION OR SEDIMENT CONTROL PROGRAM	YES	OPERATIONS MANAGER

<b>STORMWATER MANAGEMENT</b>	YES	OPERATIONS MANAGER
<b>SITE PLAN REVIEW REQUIREMENTS</b>	YES	BUILDING & ZONING COMMITTEE
<b>CAPITAL IMPROVEMENT PLAN</b>	NO	
<b>ECONOMIC DEVELOPMENT PLAN</b>	NO	
<b>LOCAL EMERGENCY OPERATIONS PLAN</b>	YES	MAYOR
<b>OTHER SPECIAL PLANS</b>	NO	
<b>FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS</b>	NO	
<b>ELEVATION CERTIFICATES</b>	NO	

### 5.18.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-53 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Star Harbor.

<b>TABLE 5-53 CITY OF STAR HARBOR ADMINISTRATIVE AND TECHNICAL CAPABILITIES</b>		
<b>PERSONNEL RESOURCES</b>	<b>YES/NO</b>	<b>DEPARTMENT/POSITION</b>
Planner/Engineer with knowledge of land development/land management practices	NO	
Engineer/professional trained in construction practices related to buildings or infrastructure	NO	
Planner/engineer/scientists with an understanding of natural hazards	NO	
Personnel skilled in GIS	NO	
Full-time building official	NO	
Floodplain manager	NO	
Emergency Manager	NO	
Grant Writer	NO	
Other Personnel	NO	
GIS data: Hazard Areas	NO	
GIS data: Critical facilities	NO	
GIS data: Building footprints	NO	
GIS data: Land use	NO	
GIS data: Links to assessor's Data	NO	
Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)	NO	
Other	NO	

### 5.18.3 FINANCIAL CAPABILITIES

Table 5-54 identifies financial tools or resources that the City of Seven Points could use to help fund mitigation activities.

TABLE 5-54 CITY OF STAR HARBOR FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	NO
Capital Improvements project funding	NO
Authority to levy taxes for specific purposes	NO
Fees for water, sewer, gas or electric services	YES, MAYOR
Impact fees for new development	YES, BUILDING & ZONING COMMITTEE
Incur debt through general obligations bonds	NO
Incur debt through special tax bonds	NO
Incur debt through private activities	NO

### 5.19 CITY OF TOOL

#### 5.19.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-55 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Tool.

TABLE 5-55 CITY OF TOOL REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	YES	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	YES	
GROWTH MANAGEMENT	NO	
FLOODPLAIN ORDINANCE	YES	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	YES	
BUILDING CODE	YES	
EROSION OR SEDIMENT CONTROL PROGRAM	NO	
STORMWATER MANAGEMENT	YES	

<b>SITE PLAN REVIEW REQUIREMENTS</b>	YES	
<b>CAPITAL IMPROVEMENT PLAN</b>	NO	
<b>ECONOMIC DEVELOPMENT PLAN</b>	NO	
<b>LOCAL EMERGENCY OPERATIONS PLAN</b>	YES	
<b>OTHER SPECIAL PLANS</b>	NO	
<b>FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS</b>	NO	
<b>ELEVATION CERTIFICATES</b>	YES	

### 5.19.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-56 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Tool.

<b>TABLE 5-56 CITY OF TOOL ADMINISTRATIVE AND TECHNICAL CAPABILITIES</b>		
<b>PERSONNEL RESOURCES</b>	<b>YES/NO</b>	<b>DEPARTMENT/POSITION</b>
<b>Planner/Engineer with knowledge of land development/land management practices</b>	NO	
<b>Engineer/professional trained in construction practices related to buildings or infrastructure</b>	NO	
<b>Planner/engineer/scientists with an understanding of natural hazards</b>	NO	
<b>Personnel skilled in GIS</b>	NO	
<b>Full-time building official</b>	NO	Code/ Building Part Time
<b>Floodplain manager</b>	YES	Building
<b>Emergency Manager</b>	YES	Administration
<b>Grant Writer</b>	NO	Contract out
<b>Other Personnel</b>	YES	City Administrator
<b>GIS data: Hazard Areas</b>	NO	
<b>GIS data: Critical facilities</b>	NO	
<b>GIS data: Building footprints</b>	NO	
<b>GIS data: Land use</b>	NO	
<b>GIS data: Links to assessor's Data</b>	NO	
<b>Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)</b>	YES	Comcate/ Code Red
<b>Other</b>	NO	

### 5.19.3 FINANCIAL CAPABILITIES

Table 5-57 identifies financial tools or resources that the City of Tool could use to help fund mitigation activities.

TABLE 5-57 CITY OF TOOL FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	YES
Capital Improvements project funding	YES
Authority to levy taxes for specific purposes	YES
Fees for water, sewer, gas or electric services	NO
Impact fees for new development	NO
Incur debt through general obligations bonds	YES
Incur debt through special tax bonds	YES
Incur debt through private activities	NO

### 5.20 CITY OF TRINIDAD

#### 5.20.1 LEGAL AND REGULATORY CAPABILITIES

Table 5-58 lists regulatory and planning tools typically used by local jurisdiction to implement hazard mitigation activities and indicates those that are in place in the City of Trinidad.

TABLE 5-58 CITY OF TRINIDAD REGULATORY CAPABILITIES		
REGULATORY TOOLS (ORDINANCES, CODES, PLANS)	YES/NO	COMMENTS
GENERAL PLAN	YES	
ZONING ORDINANCES	YES	
SUBDIVISION ORDINANCE	YES	
GROWTH MANAGEMENT	YES	
FLOODPLAIN ORDINANCE	YES	
OTHER SPECIAL PURPOSE ORDINANCE (STORMWATER, STEEP SLOPE, WILDFIRE)	NO	
BUILDING CODE	YES	
EROSION OR SEDIMENT CONTROL PROGRAM	YES	
STORMWATER MANAGEMENT	YES	
SITE PLAN REVIEW REQUIREMENTS	YES	
CAPITAL IMPROVEMENT PLAN	YES	
ECONOMIC DEVELOPMENT PLAN	YES	

<b>LOCAL EMERGENCY OPERATIONS PLAN</b>	YES	
<b>OTHER SPECIAL PLANS</b>	NO	
<b>FLOOD INSURANCE STUDY OR OTHER ENGINEERING STUDY FOR STREAMS</b>	YES	
<b>ELEVATION CERTIFICATES</b>	NO	

### 5.20.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

Table 5-59 identifies the county personnel responsible for activities related to mitigation and loss prevention in the City of Trinidad.

<b>TABLE 5-59 CITY OF TRINIDAD ADMINISTRATIVE AND TECHNICAL CAPABILITIES</b>		
<b>PERSONNEL RESOURCES</b>	<b>YES/NO</b>	<b>DEPARTMENT/POSITION</b>
<b>Planner/Engineer with knowledge of land development/land management practices</b>	YES	Contractor
<b>Engineer/professional trained in construction practices related to buildings or infrastructure</b>	YES	Contractor
<b>Planner/engineer/scientists with an understanding of natural hazards</b>	YES	
<b>Personnel skilled in GIS</b>	NO	
<b>Full-time building official</b>	YES	
<b>Floodplain manager</b>	NO	
<b>Emergency Manager</b>	YES	
<b>Grant Writer</b>	NO	
<b>Other Personnel</b>	NO	
<b>GIS data: Hazard Areas</b>	NO	
<b>GIS data: Critical facilities</b>	NO	
<b>GIS data: Building footprints</b>	NO	
<b>GIS data: Land use</b>	NO	
<b>GIS data: Links to assessor's Data</b>	NO	
<b>Warning systems/services (Reverse 911 callback, cable override, outdoor warning signals)</b>	YES	
<b>Other</b>	NO	

### 5.20.3 FINANCIAL CAPABILITIES

Table 5-60 identifies financial tools or resources that the City of Trinidad could use to help fund mitigation activities.

TABLE 5-60 CITY OF TRINIDAD FINANCIAL CAPABILITIES	
FINANCIAL RESOURCES	ACCESSIBLE/ELIGIBLE TO USE (YES/NO)
Community Development Block Grants	NO
Capital Improvements project funding	YES
Authority to levy taxes for specific purposes	YES
Fees for water, sewer, gas or electric services	YES
Impact fees for new development	YES
Incur debt through general obligations bonds	YES
Incur debt through special tax bonds	YES
Incur debt through private activities	YES



## **PART 2 RISK ASSESSMENT**

### **CHAPTER 6**

#### **IDENTIFIED HAZARDS OF CONCERN AND RISK ASSESSMENT METHODOLOGY**

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards. It allows emergency management personnel to establish early response priorities by identifying potential hazards and vulnerable assets. The process focuses on the following elements:

- **HAZARD IDENTIFICATION-** Use all available information to determine what types of disasters may affect a jurisdiction, how often they can occur, and their potential severity.
- **VULNERABILITY IDENTIFICATION-** Determine the impact of natural hazard events on the people, property, environment, economy, and lands of the region.
- **COST EVALUATION-** Estimate the cost of potential damage or cost that can be avoided by mitigation.

The risk assessment for this hazard mitigation plan update evaluates the risk of natural hazards prevalent in the planning area and meets requirements of the DMA (44 CFR, Section 201.6(c)(2)).

#### **6.1 IDENTIFIED HAZARDS OF CONCERN**

For this plan, the planning committee considered the full range of natural hazards that could impact the planning area and then listed hazards that present the greatest concern. The process incorporated review of state and local hazard planning documents, as well as information on the frequency, magnitude, and costs associated with hazards that have impacted or could impact the planning area. Anecdotal information regarding natural hazards and the perceived vulnerability of the planning area's assets to them was also used. TABLE 2-1 lists the hazards identified in the previous Henderson County Hazard Mitigation Action Plan 2011 and the hazard ranking. Based on the review, this plan addresses the following hazards of concern:

- Disease
- Drought/ Extreme Heat
- Flooding/Flash Flooding
- Severe Storm (Hail, Lightning and Wind)
- Tornado
- Wildfire
- Winter storms (Ice Storm)

Several of these hazards were profiled together because of their common occurrence or damage assessments, such as drought and extreme heat and severe storms with thunderstorms, lightning, hail and high winds.

The following hazards are profiled in the State of Texas Hazard Mitigation Plan; however, the planning committee decided not to profile hazards listed in TABLE 6-1 for the stated reasons. Hazards not identified for inclusion at this time may be addressed during future evaluations and updates.

TABLE 6-1 HAZARDS NOT PROFILED IN PLAN	
HAZARD	REASON FOR OMISSION
COASTAL EROSION	Geographic location. Henderson County is an inland location and negligible potential for occurrence
DISEASE	Probability and potential impacts are negligible risk
EARTHQUAKE	Lack of risk of occurrence Henderson County; low to moderate vulnerability to earthquake damage
EXPANSIVE SOIL	Lack of risk to the Henderson County planning are and participating jurisdictions
HURRICANE/TROPICAL STORM	No direct impact on Henderson County, potential hazards would be mitigated under other mitigation hazards listed in the plan
LAND SUBSIDENCE	Probability and potential impacts are negligible risk
LEVEES	There are no levees in Henderson County nor neighboring counties that are acknowledged by the USACE National Levee Database System.

## 6.2 CLIMATE CHANGE

Climate includes patterns of temperature, precipitation, humidity, wind, and seasons. Climate plays a fundamental role in shaping natural ecosystems, and the human economies and cultures that depend on them. The term “climate change” refers to changes over a long period of time. It is generally perceived that climate change will have a measurable impact on the occurrence and severity of natural hazards around the world. Impacts include the following:

- Stronger and more frequent severe / intense thunderstorms and tornadoes
- The risk of drought and the frequency, intensity, and duration of heat waves are expected to increase.
- More extreme precipitation is likely, increasing the risk of flooding.
- The world’s average temperature is expected to increase.

Climate change will affect communities in a variety of ways. Impacts could include an increased risk for extreme events such as drought, storms, flooding, and wildfires; more heat-related stress; and the spread of existing or new vector-borne disease into a community. In many cases, communities are already facing these problems to some degree. Climate change influences the frequency, intensity, extent, or magnitude of the problems.

Each chapter addressing one of the hazards of concern includes a section with a qualitative discussion on the probable impacts of climate change for that hazard. While many models are being developed to assess the potential impacts of climate change, none are currently available to support hazard mitigation planning. As these models are developed in the future, this risk assessment may be enhanced to better measure these impacts.

## 6.3 METHODOLOGY

The risk assessments in Chapter 7 through Chapter 15 describe the risks associated with each identified hazard of concern. Each chapter describes the hazard, the planning area’s vulnerabilities, and probable event scenarios. The following steps were used to define the risk of each hazard:

- **Identify and profile each hazard-** The following information is given for each hazard:
  - Geographic areas most affected by the hazard
  - Extent used to measure the hazards

- Past events in planning area
- Warning time likely to be available for response

- **Determine exposure to each hazard** - Exposure was evaluated by overlaying hazard maps, when available, with an inventory of structures, facilities, and systems to identify which of them would be exposed to each hazard. When hazard mapping is not available, a more qualitative discussion of exposure is presented.
- **Assess the vulnerability of exposed facilities** - Vulnerability of exposed structures and infrastructure was evaluated by interpreting the probability of occurrence of each event and assessing structures, facilities, and systems that are exposed to each hazard. Tools such as the geographic information system (GIS) and FEMA's Flood Mapping Program, were used to perform this assessment for the flood hazards.

## **6.4 RISK ASSESSMENT TOOLS**

### **6.4.1 FEMA RESILIENCE ANALYSIS AND PLANNING TOOL**

#### **OVERVIEW**

The Federal Emergency Management Agency (FEMA) created the Resilience Analysis and Planning Tool (RAPT) to support state, local, tribal, territorial analysis in identifying focus areas for building resilience, response, and recovery capabilities. RAPT is a geographic information system (GIS) webmap tool with clickable layers of community resilience indicators, infrastructure locations, and hazard data, and widgets to help with analysis, including a population counter. The RAPT is available at: <https://bit.ly/ResilienceAnalysisandPlanningTool>.

#### **Population-Focused**

Educational Attainment, Unemployment Rate, Disability, English Proficiency, Home Ownership, Mobility, Age, Household Income, Income Inequality, Health Insurance and Single-parent Household.

#### **Community-Focused**

Hospital Capacity, Medical Professionals, Affiliation with a Religion, Presence of Mobile Homes, Public School Capacity, Population Change, Hotel/Motel Capacity, Rental Property Capacity and Connection to Civic/Social Org.

The RAPT webmap site includes an overview of the Community Resilience Indicator Analysis, a summary of how the researchers connected each indicator to resilience, a correlation analysis of each indicator to the other 19 indicators, and a link to the full report: Community Resilience Indicator Analysis: CountyLevel Analysis of Commonly Used Indicators from Peer-Reviewed Research: 2019 Update.

#### **Infrastructure Layers**

The infrastructure layers in RAPT are drawn from the Homeland Infrastructure Foundation-Level Data (HIFLD) Subcommittee Online Community and include community lifelines datapoints. Infrastructure layers include hospitals, fire stations, mobile home parks, and school locations.

## **Hazard Layers**

RAPT includes GIS layers of historic hazard data for tornados, tropical storms, and wildfire; risk assessments for seismic and flooding events; and real-time watch and warning notifications from the National Weather Service. Jurisdictions can click on multiple hazard layers at a time to see a more comprehensive view of hazard risk.

## **Using RAPT**

RAPT is not a scorecard of resilience but is a tool to help jurisdictions better understand the interplay of factors that may be important for resilience, response, and recovery. Users can select multiple layers to better understand local challenges to resilience, such as population with a disability combined with location of mobile home parks, and historic tropical storm/cyclone activity.

## ***APPLICATION FOR THIS PLAN***

This risk assessment was conducted using the FEMA Resilience Analysis and Planning Tool and GIS-based methodology. The FEMA Resilience Analysis and Planning Tool database for Henderson County contains U.S. Census data.

### **6.4.2 OTHER HAZARDS OF CONCERN**

For hazards of concern that are not directly modeled in the Resilience Analysis and Planning Tool, future losses could not be estimated. For other hazards, a qualitative analysis was conducted using the best available data. Locally relevant information was gathered from a variety of sources. Frequency and severity indicators include past events and the expert opinions of geologists, emergency management specialists, and others. The primary data sources were the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information, augmented with state and federal data sets. Additional data sources for specific hazards were as follows:

- **Dams** – U.S. Army Corps of Engineers Dam Inventory Database
- **Drought** - National Drought Mitigation Center
- **Extreme Heat** - Western Regional Climate Center, Census of Agriculture, U.S. Department of Agriculture (USDA) Risk Management Agency
- **Hail, Lightning, Tornado, Wind, and Winter Weather** - Data provided by NOAA National Climatic Data Center storm events database.
- **Wildfire** - Information on wildfire hazards areas was provided by the Texas A&M Forest Service Wildfire Risk Assessment Portal (TxWRAP), USGS Federal Wildfire History, Fire Program AnalysisFire Occurrence Database (FPA-FOD), and USDA Wildfire Hazard Potential (WHP) data.

## **CHAPTER 7 DAM FAILURE**

## **7.1 HAZARD PROFILE**

Water is an essential natural resource and one of the most efficient ways to manage and control water resources is through dam construction. A dam in Texas is a water storage, control or diversion structure that impounds water upstream with a “height greater than or equal to 25 feet and a maximum storage (top of dam) capacity of 15 acre-feet; a height greater than 6 feet and a maximum storage capacity greater than or equal to 50 acre-feet; or one that poses a threat to human life or property in the event of failure, regardless of height or maximum storage capacity” as defined by Texas Commission on Environmental Quality (TCEQ). The majority of dams and lakes in Texas benefit users for water supplies for drinking, irrigation, and industrial uses; flood control; hydroelectric power; recreation; and navigation. However, despite the benefits and importance of dams to our public works infrastructure, many safety issues exist for dams as with any complex infrastructure; the most serious threat is dam failure. Approximately 92% of the dams in Henderson County are privately owned.

### **CAUSE OF DAM FAILURE**

Dam failure is a collapse or breach in a dam. While most dams have storage volumes small enough that failures have little or no repercussions, dams with large storage amounts can cause significant downstream flooding. Dam failures typically occur from any one or combination of the following:

- Prolonged periods of rainfall and flooding, which cause most failures
- Overtopping of the primary dam structure, which can occur due to inadequate spillway design, settlement of the dam crest, blockage of spillways, and other factors.
- Foundation defects due to differential settlement, slides, slope instability, uplift pressures, and foundation seepage can also cause dam failure.
- Improper maintenance, including failure to remove trees, repair internal seepage problems, or maintain gates, valves, and other operational components.
- Failure of upstream dams in the same drainage basin
- Secondary results from earthquakes, landslides, extreme storms, massive snowmelt, equipment malfunction, structural damage, foundation failures, and sabotage.

#### **7.1.1 LOCATION**

According to the U.S. Army Corps of Engineers National Inventory of Dams, there are 113 dams in Henderson County; 15 are classified as high-hazard, 23 as significant-hazard and 77 low-hazard. TABLE 7-1 lists all 115 dams in Henderson County by hazard class (high, significant, and low) potential to affect downstream areas. FIGURE 7-1 shows locations of all dams in Henderson County sorted by their hazard class. Appendix B has map locations and flood risk areas near all the high- and significant-hazard dams in the county.

**TABLE 7-1 DAMS IN HENDERSON COUNTY**

<b>NAME</b>	<b>NATIONAL ID #</b>	<b>HAZARD CLASS</b>	<b>OWNER</b>	<b>DAM TYPE</b>	<b>PURPOSE</b>	<b>WATER COURSE</b>	<b>HEIGHT (FEET)</b>	<b>NID STORAGE (ACRE-FEET)</b>	<b>Latitude</b>	<b>Longitude</b>
<b>ABERNATHY LAKE</b>	TX05217	Significant	Private	Earth	Water Supply	TR-North Twin Creek	38	150	-96.050	32.347
<b>ADAMS LAKE DAM</b>	TX00208	Low	Private	Earth	Recreation	TR-Coon Creek	21	69	-95.794	32.140
<b>ADAMS DAM</b>	TX06261	Low	Private	Earth	Fire Protection, Stock or Small Fish Pond	TR-Coon Creek	25	150	-95.791	32.131
<b>ALDER LAKE DAM</b>	TX00196	High	Private	Earth	Recreation	Alder Creek	17	869	95.734	32.093
<b>ALLEN LAKE DAM</b>	TX06334	Low	Private	Earth	Recreation	Andings Branch	16	55	-95.894	32.086
<b>ATHENS FISH AND GAME</b>	TX00220	High	Private	Earth	Recreation	Flat Creek	28	1419	-95.778	32.234
<b>BAGLEY LAKE DAM</b>	TX00187	High	Private	Earth	Recreation	Delta Creek	18	95	-95.512	32.240
<b>BIG LAKE DAM</b>	TX00193	Low	Private	Earth	Recreation	Little Alder Creek	24	685	-95.734	32.075
<b>BIG ROCK RANCH LAKE</b>	TX07118	Low	Private	Rockfill	Other	Mill Creek	20.4	220	95.940	32.356
<b>BLACK LAKE DAM</b>	TX04342	Significant	Private	Earth	Recreation	TR-Coon Creek	21	65	-95.852	32.070
<b>BLUEBERRY LAKE</b>	TX04763	Low	Private	Earth	Irrigation	Little Alder Creek	14	54	-95.704	32.071
<b>BOMER LAKE DAM NO 2</b>	TX06390	Significant	Private	Earth	Recreation	TR-Flat Creek	18	530	-95.792	32.215
<b>BROWN LAKE DAN</b>	TX07449	High	Private	Earth	Other	TR-Flat Creek	25	592	-95.771	32.245

<b>CADDO CREEK LAKE DAM</b>	TX00181	Low	Private	Earth	Recreation	Caddo Creek	31	9342	-95.634	32.078
<b>CALLENDER LAKE</b>	TX02800	Significant	Private	Earth	Recreation	Slater Creek	35	5316	-95.698	32.356
<b>CARTWRIGHT LAKE DAM</b>	TX04341	Low	Private	Earth	Recreation	TR-Andin g Branch	21	82	-95.868	32.046
<b>CATES POND NO 3</b>	TX07208	Significant	Private	Earth	Other	TR-South Twin Creek	25	103	-96.033	32.317
<b>CATFISH CREEK RANCH LAKE DAM</b>	TX00218	Significant	Private	Earth	Irrigation	Catfish Creek	20	4308	-95.800	32.054
<b>CEDAR CREEK WS SCS SITE 143A DAM</b>	TX05948	High	Trinity Neches SWCD, TPWD	Earth	UKN	Purtis Creek	45	8408	-95.999	32.356
<b>CITY LAKE DAM</b>	TX00238	Low	City of Trinidad	Earth	Other	Off CH-Cedar Creek	20	755	-96.080	32.160
<b>COFFMAN LAKE DAM</b>	TX06395	Low	Private	Earth	Fire Protection, Stock or Small Fish Pond	Catfish Creek	52	3430	-95.716	32.112
<b>COON CREEK LAKE DAM</b>	TX00204	Low	Private	Earth	Recreation	Coon Creek	34	21366	-95.860	32.038
<b>CONCORD RANCH LAKE</b>	TX06344	Low	Private	Earth	Flood Control	TR-Battle Creek	37	636	-95.507	32.341
<b>CRESLENN RANCH DAM</b>	TX00235	Low	Private	Gravity	Irrigation	Old Channel Trinity River	7	735	96.066	32.039
<b>DARBY FARMS LAKE DAM</b>	TX00211	Low	Private	Earth	Recreation	TR-Coon Creek	22	72	-95.795	32.152
<b>DECRAENE DAM</b>	TX07345	Low	Private	Earth	Other	-	13	91	-95.672	32.060

<b>DILLARD LAKE DAM</b>	TX00228	Low	Private	Earth	Recreation	TR-Flat Creek	14	118	-95.766	32.249
<b>DOGWOOD ACRES DAM</b>	TX00185	Low	Private	Earth	Recreation	TR-Adams Creek	24	100	-95.699	32.186
<b>DRAGERT LAKE DAM</b>	TX00227	Low	Private	Earth	Irrigation	TR-Daniel Creek	38.4	916	-95.794	32.290
<b>EAST LATERALS TRINITY WS SCS SITE 1 DAM</b>	TX00234	Low	Local Government	Earth	Flood Control	Tr-Turkey Creek	31	1700	-96.014	32.101
<b>EAST LATERALS TRINITY WS SCS SITE 2 DAM</b>	TX00207	Low	Local Government	Earth	Flood Control	Turkey Creek	44	10500	-95.994	32.101
<b>EAST LATERALS TRINITY WS SCS SITE 3 DAM</b>	TX00233	Low	Local Government	Earth	Flood Control	TR-Prairie Creek	27	600	-96.012	32.073
<b>EAST LATERALS TRINITY WS SCS SITE 4 DAM</b>	TX00121	Low	Local Government	Earth	Flood Control	Prairie Creek	36	3000	-96.002	32.053
<b>ECHO LAKE</b>	TX00180	Significant	Local Government	Earth	Recreation	TR-Flat Creek	36	2775	-95.652	32.247
<b>ECHOLS LAKE</b>	TX00231	High	Private	Earth	Other	Duncan Branch	15	75	-95.739	32.257
<b>FLY-IN LAKE DAM</b>	TX00221	Low	Private	Earth	Recreation	Pottawatomie Creek	17	360	-95.880	32.343
<b>FOREST GROVE LAKE DAM</b>	TX04395	High	Private	Earth	Other	Caney Creek	54	54300	-95.963	32.227
<b>FRONTIER CITY LAKE</b>	TX00190	Low	Private	Earth	Recreation	TR-Flat Creek	22	419	-95.554	32.222
<b>GATOR LAKE DAM</b>	TX07129	Low	Private	Earth	Recreation	Alder Creek	45	865	-95.705	32.093



<b>GRASS LAKE DAM</b>	TX04339	Low	Private	Earth	Recreation	Little Alder Creek	13	98	-95.721	32.071
<b>GREENBRIER LAKE DAM</b>	TX00194	Significant	Private	Earth	Irrigation	Little Palmer Branch	27	698	-95.742	32.084
<b>HALLMARK LAKE DAM</b>	TX00186	Significant	Private	Earth	Recreation	TR-Caddo Creek	12	130	-95.682	32.103
<b>HAYNIE</b>	TX07277	Low	Private	Earth	Other	Triv. Of Persimmon Branch	9	36	-96.227	32.346
<b>HENSARLING LAKE</b>	TX07318	High	Private	Earth	Other	UNK	13.3	90	-95.760	32.279
<b>HIGHWAY 175 EAST DAM</b>	TX07332	Significant	Private	Earth	Other	UNK	18.6	242	-95.703	32.129
<b>HOWETH DAM NO 2</b>	TX07467	Low	Private	Earth	Other	Boggy Ranch	18	127	-95.647	32.201
<b>HUME LAKE DAM</b>	TX07330	Low	Private	Earth	Other	Unnamed Tributary of Catfish Creek	15	261	-95.697	32.132
<b>JOE B HOGSETT</b>	TX00237	High	TRWD	Earth	Irrigation	Cedar Creek	91	1,460,000	-96.068	32.181
<b>JOHN SENTERRE LAKE</b>	TX00239	High	Private	Earth	Recreation	TR-South Twin Creek	19	95	-96.083	32.322
<b>JONSSON LAKE DAM</b>	TX00200	Low	Private	Earth	Recreation	Anding Branch	29	2560	-95.896	32.068
<b>KIDD LAKE</b>	TX00183	Low	Private	Earth	Recreation	Tanyard Creek	22	175	-95.580	32.233
<b>KLINE LAKE DAM</b>	TX0214	Low	Private	Earth	Recreation	TR-Turkey Creek	17	70	-95.956	32.107
<b>LANDBURGER LOWER LAKE NO 1</b>	TX05981	Low	Private	Earth	Fire Protection, Stock or Small Fish Pond	Shelton Mill Branch	16	128	-95.857	32.165
<b>LANDBURGER LOWER LAKE NO 2</b>	TX05982	Low	Private	Earth	Fire Protection, Stock or	Shelton Mill Branch	14	100	-95.860	32.162

					Small Fish Pond					
<b>LAKE ATHENS</b>	TX00182	Low	Local Govern ment	Earth	Recreation	Flat Creek	59	56816	-95.725	32.204
<b>LEO A. SMITH LAKE DAM</b>	TX00191	Low	Private	Earth	Recreation	TR-Cadd o Creek	15	90	-95.631	32.089
<b>LITTLE CADDO CREEK LAKE DAM</b>	TX06421	Low	Private	Earth	Fire Protection, Stock or Small Fish Pond	Caddo Creek	37	1132	-95.625	32.075
<b>MABANK CITY LAKE</b>	TX00240	Low	Private	Earth	Water Supply	TR- North Twin Creek	24	265	-96.086	32.344
<b>MCCLAIN LAKE</b>	TX07479	Low	Private	Earth	Other	UNK	42.5	443	-95.897	32.226
<b>MCELVANEY LAKE DAM</b>	TX06335	Low	Private	Earth	Recreation	Andings Branch	14	75	-95.894	32.088
<b>MC GEE DAM NO 1</b>	TX09617	Significant	Private	Earth	Other	Tributary of Coon Creek	14.5	46	-95.795	32.183
<b>MC GEE DAM NO 2</b>	TX07326	Significant	Private	Earth	Other	Tributary of Coon Creek	18.5	67	-95.792	32.181
<b>MC GEE DAM NO 3</b>	TX07327	Significant	Private	Earth	Other	Tributary of Coon Creek	18	96	-95.786	32.178
<b>MAWSY LAKE DAM</b>	TX04396	Low	Private	Earth	Recreation	Little Alder Creek	30	473	-95.717	32.072
<b>MIDDLE LAKE DAM</b>	TX07331	Low	Private	Earth	Other	UNK	10	101	-95.703	32.131
<b>MINE CREEK RESERVOIR DAM</b>	TX06324	Low	Private	Earth	Recreation	Mine Creek	42	5650	-95.830	32.083
<b>MIXON LAKE DAM</b>	TX00192	Low	Private	Earth	Fire Protection, Stock or Small Fish Pond	Mill Branch	22	104	-95.596	32.103

<b>MONROE DAM</b>	TX06407	Low	Private	Earth	Fire Protection, Stock or Small Fish Pond	TR-Flat Creek	30	268	-95.800	32.205
<b>MOONSHINE CREEK #1</b>	TX04345	Low	Private	Earth	Recreation	TR-Coon Creek	25	57	-95.786	32.16
<b>MOONSHINE CREEK #2</b>	TX04344	Significant	Private	Earth	Recreation	TR-Coon Creek	21	58	-95.785	32.163
<b>MO MARY LAKE DAM</b>	TX7132	Low	Private	Earth	Other	Alder Creek	29.1	365	-95.707	32.095
<b>MURCHISON LAKE DAM</b>	TX00198	Low	Private	Earth	Recreation	Shelton Mill Branch	25	3440	-95.858	32.105
<b>NICHOLS LAKE DAM</b>	TX0213	Low	Private	Earth	Recreation	Anding Branch	20	240	-95.911	32.085
<b>NICHOLS SOUTH LAKE DAM</b>	TX00210	Low	Private	Earth	Recreation	Gum Creek	19	137	-95.802	32.163
<b>NICHOLS NORTH LAKE DAM</b>	TX00209	Low	Private	Earth	Recreation	Gum Creek	21	210	-95.799	32.169
<b>NM JACKSON</b>	TX00222	Low	Private	Earth	Fire Protection, Stock, or Small Fish Pond	Little Duncan BR of Kickapoo	13	198	-95.768	32.279
<b>NORTH LAKE DAM</b>	TX0188	Significant	Private	Earth	Recreation	TR-Cadd o Creek	17	75	-95.633	32.095
<b>OLD LAKE DAM</b>	TX00205	Low	Private	Earth	Recreation	Shelton Mill Branch	17	2300	-95.843	32.078
<b>PERRYMAN LAKE DAM</b>	TX00199	Low	Private	Earth	Recreation	TR-Andin g Branch	20	500	-95.898	32.079
<b>PRATT LAKE DAM</b>	TX07128	Significant	Private	Earth	Recreation	Mine Creek	65	8219	-95.802	32.084
<b>PRIMACY DAM NO 2</b>	TX07252	Significant	Private	Earth	Other	Sels Creek	14.3	66	-95.879	32.161
<b>RAINBO LAKE DAM</b>	TX00195	Significant	Private	Earth	Irrigation	Catfish Creek	20	2692	-95.745	32.091

<b>ROBERSON LAKE</b>	TX00230	Low	Private	Earth	Recreation	TR-Duncan Branch	21	110	-95.732	32.276
<b>ROBERTS DAM</b>	TX07329	Low	Private	Earth	Other	Pierce Creek	21.8	384	-95.660	32.108
<b>RODGERS LAKE DAM</b>	TX00184	Low	Private	Earth	Recreation	Tindel Creek	25	180	-95.599	32.174
<b>SAFARI LAKE DAM</b>	TX00179	High	Private	Earth	Irrigation	Kile Branch	27	1172	-95.740	32.120
<b>SHELTON LAKE DAM</b>	TX00206	Low	Private	Earth	Recreation	Shelton Mill Branch	22	1941	-95.850	32.091
<b>SITE C LAKE DAM</b>	TX04340	Low	Private	Earth	Fire Protection, Stock or Small Fish Pond	TR-Little Alder Creek	25	141	-95.706	32.067
<b>SLAUGHTER LAKE DAM 1</b>	TX04343	Low	Private	Earth	Recreation	TR-Selfs Branch	21	84	-95.862	32.095
<b>SMITH LAKE (CR 3901)</b>	TX07107	Low	Private	Earth	Other	UKN	0	183	-95.883	32.347
<b>SMITH LAKE (FM 2495)</b>	TX00217	Low	Private	Earth	Recreation	Coppers Creek	20	87	-95.795	32.207
<b>SOUTTER LAKE DAM</b>	TX0212	Low	Private	Earth	Recreation	TR-Catfish Creek	22	112	-95.773	32.063
<b>SPORTSMAN S LAKE DAM</b>	TX00202	Low	Private	Earth	Recreation	Shelton Mill Creek	24	913	-95.873	32.144
<b>STAR RANCH LAKE DAM</b>	TX07333	Low	Private	Earth	Other	Catfish Creek	14	124	-95.714	32.136
<b>STAWAY RANCH LAKE</b>	TX00229	Significant	Private	Earth	Irrigation	Bailey Branch	32	2000	-95.681	32.288
<b>STROUBE DAM NO 1</b>	TX04245	Low	Private	Earth	Recreation	TR-Mill Run Creek	27	270	-95.857	32.122
<b>STROUBE DAM NO 2</b>	TX04279	Low	Private	Earth	Recreation	TR-Mill Run Creek	10	70	-95.852	32.138

<b>TARR POND DAM</b>	TX00201	Low	Private	Earth	Recreation	Anding Branch	12	263	-95.891	32.063
<b>TERRA VERDE LAKE DAM</b>	TX00216	Low	Private	Earth	Recreation	TR-Mine Creek	18	94	-95.825	32.074
<b>TEXAS IRON #1</b>	TX06333	Low	Private	Earth	Fire Protection, Stock or Small Fish Pond	Tr-Ledbetter Creek	36	70	-95.603	32.133
<b>THOMAS LAKE DAM</b>	TX00223	Significant	Private	Earth	Recreation	TR-Clear Creek	37	1900	95.903	32.311
<b>TINDEL LAKE DAM</b>	TX00189	High	Private	Earth	Recreation	TR-New York Creek	19	80	-95.667	32.168
<b>TINER LAKE</b>	TX00225	Low	Private	Earth	Recreation	TR-Pottawatomie Creek	13	225	-95.863	32.327
<b>TOLER LAKE DAM</b>	TX07438	High	Private	Earth	Other	Kile Branch	25	260	-95.736	32.13
<b>TONY PRICE DAM</b>	TX09564	Low	Private	Earth	Other	TR-Slater Creek	20.4	46	-95.711	32.355
<b>TIRIDAD DAM</b>	TX00236	Low	Private	Earth	Other	Off Ch-Trinity River	18	10768	-96.105	32.114
<b>TRIPLE S RANCH LAKE DAM</b>	TX00219	Significant	Private	Earth	Fire Protection, Stock, or Small Fish Pond	Sells Branch	21	1989	-95.876	32.122
<b>TROPHY LAKE DAM</b>	TX06160	High	Private	Earth	Debris Control	Kile Branch	28	585	-95.739	32.128
<b>TRUST NO 12</b>	TX07319	Significant	Private	Earth	Other	UNK	19	224	-95.760	32.284
<b>VALLEY VIEW LAKE</b>	TX06396	High	Private	Earth	Fire Protection, Stock, or Small Fish Pond	Caney Creek	42	8200	-95.880	32.238
<b>WHITE LAKE DAM</b>	TX00215	Low	Private	Earth	Fire Protection, Stock, or	TR-Mill Creek	18	330	-95.895	32.111

					Small Fish Pond					
<b>WILLIAMS LAKE DAM</b>	TX09090	Low	Private	Earth	Fire Protection, Stock, or Small Fish Pond	Trib. Of Persimmon Branch	10	39	-96.221	32.349
<b>WILSON LAKE DAM</b>	TX00203	Low	Private	Earth	Recreation	Anding Branch	31	3260	-95.871	32.053
<b>LEE LAKE DAM</b>	TX00226	Low	Private	Earth	Recreation	TR-Seco nd Caney Creek	23	110	-95.848	32.251
<b>COX LAKE DAM</b>	TX00224	Significant	Private	Earth	Recreation	TR-Seco nd Caney Creek	25	130	-95.861	32.256

Source: National Inventory of Dams

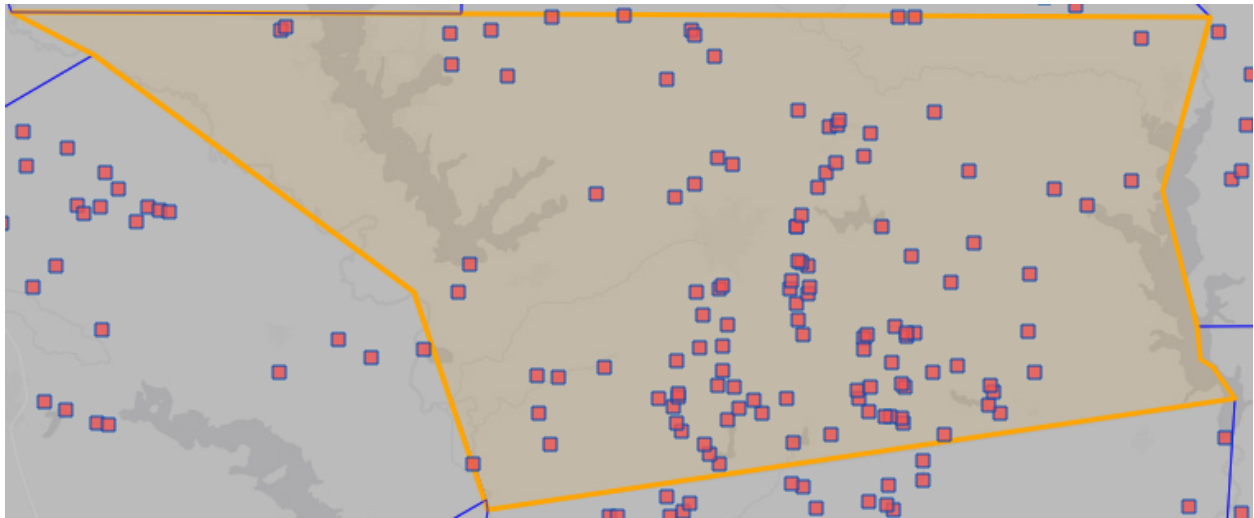


Figure 7-1 Dam Locations in Henderson County

#### DAMS UPSTREAM OF PLANNING AREA

Emergency Action Plans for two upstream dams area on file with the Henderson County Emergency Manager Coordinator. One is Hickory Hills Lake Dam and the other is Wise Lake Dam, both located in Van Zandt County.

## 7-2 DAMS UPSTREAM OF HENDERSON COUNTY

NAME	NATIONAL ID #	HAZARD CLASS	OWNER	DAM TYPE	PURPOSE	WATER COURSE	HEIGHT (FEET)	NID STORAGE (ACRE-FEET)	Latitude	Longitude
Hickory Hills Lake Dam	TX06869	Unknown	Private	Earth	Recreation	TR-Slater Creek	27	197	-95.703	32.371
Wise Lake Dam	TX06486	Unknown	Private	Earth	Fire Protection, Stock, Small Fish Pond	TR-Neches River	24	420	-95.706	32.378

SOURCE: National Inventory of Dams

### 7.1.2 EXTENT

TCEQ has developed the extent or magnitude of a dam failure event described in terms of the classification of damages that could result from a dam's failure as shown in TABLE 7-3. The hazard classification system is based only on the potential consequences of a dam failure; not the probability of such failures or the condition of the dam.

The worst-case scenario for the Henderson County planning area would be to see up to a high hazard dam failure; this could cause loss of life and excessive economic losses in the inundation area. The extent of the flood waters can vary based on dam size capacity, topography, weather and soil conditions, and the cause of the dam failure. The communities of Gun Barrel City, Athens, Moore Station and Eustace, and the unincorporated county can expect to have up to 3 to 5 feet of flood waters inundate their floodplain areas from a dam failure (see TABLE 7-4 for dam impacts)

### 7-3 TCEQ DAM HAZARD EXTENT CLASSIFICATION

HAZARD CATEGORY	HUMAN IMPACT	ECONOMIC IMPACT
<b>LOW</b>	No loss of life expected (no lives or permanent habitable structures in the inundation area)	Minimal economic loss (failure may cause damage to occasional farms, agricultural improvements, and minor highways)
<b>SIGNIFICANT</b>	Loss of life is possible (1 to 6 lives or 1 to 2 permanent habitable structures in the inundation area)	Appreciable economic loss (failure may cause damage to isolated homes, secondary highways, minor railroads or cause interruption of public service)
<b>HIGH</b>	Loss of life is expected (7 or more lives or 3 or more permanent habitable structures in the inundation area)	Excessive economic losses (failure may cause damage to public, agricultural, industrial or commercial facilities or utilities, and main highways or railroads)

### **7.1.3 PAST EVENTS**

There have been no previous major dam failure occurrences in Henderson County.

An extreme precipitation event occurred April 17-30, 2016 and the county is included in FEMA-DR-4269-TX for flooding (this event is further outlined in Chapter 10, Flood) that caused a rise in rivers and lakes in the county where 1 dam failure occurred.

### **7.1.4 WARNING TIME**

Warning time for dam failure varies depending on the cause of the failure and if the dam owner has an up-to-date Dam Emergency Actions Plan (EAP) with specific actions and call notification procedures in place. In events of extreme precipitation, evacuations can be planned with sufficient time. In the event of a structural failure due to an earthquake, there may be no warning time. A dam's structural type also affects warning time. Earthen dams do not tend to fail completely or instantaneously. Once a breach is initiated, discharging water erodes the breach until either the reservoir water is depleted or the breach resists further erosion. Concrete gravity dams also tend to have a partial breach as one or more monolith sections are forced apart by escaping water. The time of breach formation ranges from a few minutes to a few hours (USACE 1997).

EAPs for all high-hazard dams that would affect Henderson County are on file with TCEQ and the county emergency coordinator has copies of five EAPs on file. Additionally, possible evacuation routes in the event of a failure have been identified.

## **7.2 VULNERABILITY AND IMPACTS**

Overall, dam failure impacts would likely be rare and limited in the Henderson County planning area, with 10 to 25% of the planning area affected during a failure event. Roads closed from flood waters out of their banks could result in transportation disruptions. After the consultant team presented the dam information profile and analyses (including general background, historical occurrences, extent, and vulnerability), to the planning committee, the risk analysis was discussed among the participating members. Through these discussions and analysis, the committee decided that Henderson County and the Cities of Athens, Brownsboro, Caney City, Chandler, Coffee City, Log Cabin, Malakoff, Moore Station, Murchison, Poynor and Star Harbor have a low vulnerability rating, and that the Cities of Eustace, Gun Barrel City and Seven Points have "no exposure" to impacts. The city of Payne Springs feel it could have high impacts, and the Cities of Berryville, Enchanted Oaks, Tool and Trinidad feel it could have medium levels of impacts from a dam failure.

There are 114 dams in the Henderson County planning area; 15 are classified as high-hazard, 23 as significant hazard and 76 low-hazard dams. While low-hazard dams are those at which failure or mis-operation are not anticipated to result in loss of human life, they are projected to cause limited or no economic or environmental losses, but damage to agriculture is possible due to the number of low hazard dams in the planning area. Because of this situation, low-hazard dams are not evaluated in the vulnerability section.

Flooding from intense rain events is the most prominent cause of dam failure. If the dam failure is extensive, a large amount of water would enter the downstream waterway forcing the water out of its banks. There may be significant environmental effects from flood waters carrying and dispersing debris and hazardous materials downstream that can contaminate the ecosystem. If the event is severe, debris carried downstream can block traffic flow, cause power outages, and disrupt local utilities, such as water and wastewater.



Dam failure inundation mapping for the planning area was not available digitally, thus annualized losses were not estimated. Neither is a breakdown of potential dollar losses for critical facilities or critical infrastructure provided. If a high-hazard dam should fail, however, the severity of impact could result in fatalities, and damage to homes and infrastructure.

Table 7-4 provides the water course, jurisdiction and assets that would be impacted in the event of failure of the high- and significant-hazard dams. This information was obtained from EAP documents, USACE National Inventory of Dams, local knowledge, and Google Earth software.

#### 7-4 DAMS IMPACTS IN HENDERSON COUNTY

NAME	NATIONAL ID #	HAZARD CLASS	WATER COURSE	NEAREST DOWNSTREAM CITY	DISTANCE TO NEAREST CITY (MILES)	ASSETS DOWNSTREAM
<b>ABERNATHY LAKE</b>	TX05217	Significant	TR-North Twin Creek	Gun Barrel City	3.79	Rural Housing; Possible flooding St. Hwy 175
<b>ADAMS LAKE DAM</b>	TX00208	Low	TR-Coon Creek	None	N/A	1 Residence; Possible flooding FM 1615
<b>ADAMS DAM</b>	TX06261	Low	TR-Coon Creek	None	N/A	1 Residence; Possible flooding FM 1615
<b>ALDER LAKE DAM</b>	TX00196	High	Alder Creek	None	N/A	Rural Housing, CR 4520, CR 4521, CR 4516
<b>ALLEN LAKE DAM</b>	TX06334	Low	Andings Branch	None	N/A	1 Residence
<b>ATHENS FISH AND GAME</b>	TX00220	High	Flat Creek	Athens	4.8	FM 317; CR 4910; Rose Point Ln; Multiple Residences
<b>BAGLEY LAKE DAM</b>	TX00187	High	Delta Creek	Moore Station	4.49	Pecan Ridge; Pecan Tree; Multiple Residences
<b>BIG LAKE DAM</b>	TX00193	Low	Little Alder Creek	None	N/A	1 Residence
<b>BIG ROCK RANCH LAKE</b>	TX07118	Low	Mill Creek	Eustace	5.11	CR 2804
<b>BLACK LAKE DAM</b>	TX04342	Significant	TR-Coon Creek	None	N/A	CR 1106; 7 Residences
<b>BLUEBERRY LAKE</b>	TX04763	Low	Little Alder Creek	None	N/A	None
<b>BOMER LAKE DAM NO 2</b>	TX06390	Significant	TR-Flat Creek	None	N/A	3 Residences; Possible flooding Deer Run Rd
<b>BROWN LAKE DAN</b>	TX07449	High	TR-Flat Creek	Athens	5.53	Multiple Residences
<b>CADDO CREEK LAKE DAM</b>	TX00181	Low	Caddo Creek	Poynor	2.09	None

<b>CALLENDER LAKE DAM</b>	TX02800	Significant	Slater Creek	Murchison; Brownsboro	6.18 6.37	FM 2339; CR 3502; 1 Residence
<b>CARTWRIGHT LAKE DAM</b>	TX04341	Low	TR-Anding Branch	None	N/A	None
<b>CATES POND NO 3</b>	TX07208	Significant	TR-South Twin Creek	Eustace	1.73	Possible flooding St. Hwy 175; 3 Residences
<b>CATFISH CREEK RANCH LAKE DAM</b>	TX00218	Significant	Catfish Creek	None	N/A	St. Hwy 19; CR 1100; 2 Residences
<b>CEDAR CREEK WS SCS SITE 143A DAM</b>	TX05948	High	Purtis Creek	Eustace	3.29	Purtis Creek Rd; CR 2938; FM 316; CR 2915; Multiple Residences and Structures
<b>CITY LAKE DAM</b>	TX00238	Low	Off CH-Cedar Creek	Trinidad	0.88	Possible flooding St. Hwy 31
<b>COFFMAN LAKE DAM</b>	TX06395	Low	Catfish Creek	None	N/A	CR 4516
<b>COON CREEK LAKE DAM</b>	TX00204	Low	Coon Creek	None	N/A	None
<b>CONCORD RANCH LAKE</b>	TX06344	Low	TR-Battle Creek	Chandler	2.74	CR 3309
<b>CRESLENN RANCH DAM</b>	TX00235	Low	Old Channel Trinity River	None	N/A	1 Residence
<b>DARBY FARMS LAKE DAM</b>	TX00211	Low	TR-Coon Creek	None	N/A	None
<b>DECRAENE DAM</b>	TX07345	Low	-	None	N/A	2 Residences
<b>DILLARD LAKE DAM</b>	TX00228	Low	TR-Flat Creek	None	N/A	None
<b>DOGWOOD ACRES DAM</b>	TX00185	Low	TR-Adams Creek	None	N/A	2 Residences
<b>DRAGERT LAKE DAM</b>	TX00227	Low	TR-Daniel Creek	None	N/A	None
<b>EAST LATERALS TRINITY WS SCS SITE 1 DAM</b>	TX00234	Low	Tr-Turkey Creek	None	N/A	1 Residence
<b>EAST LATERALS TRINITY WS SCS STIE 2 DAM</b>	TX00207	Low	Turkey Creek	None	N/A	None
<b>EAST LATERALS TRINITY WS SCS SITE 3 DAM</b>	TX00233	Low	TR-Prairie Creek	None	N/A	None

<b>EAST LATERALS TRINITY WS SCS SITE 4 DAM</b>	TX00121	Low	Prairie Creek	None	N/A	None
<b>ECHO LAKE</b>	TX00180	Significant	TR-Flat Creek	None	N/A	West Lake Dr; E Lake Dr; Lee Rd; 3 Residences
<b>ECHOLS LAKE</b>	TX00231	High	Duncan Branch	None	N/A	PR 7702; CR 3700; Multiple Residences
<b>FLY-IN LAKE DAM</b>	TX00221	Low	Pottawatomie Creek	Athens	9.43	S. Fly in Lake Rd
<b>FOREST GROVE LAKE DAM</b>	TX04395	High	Caney Creek	Log Cabin	2.93	CR 1403; Multiple Residences
<b>FRONTIER CITY LAKE</b>	TX00190	Low	TR-Flat Creek	Moore Station	2.41	None
<b>GATOR LAKE DAM</b>	TX07129	Low	Alder Creek	None	N/A	None
<b>GRASS LAKE DAM</b>	TX04339	Low	Little Alder Creek	None	N/A	1 Residence
<b>GREENBRIER LAKE DAM</b>	TX00194	Significant	Little Palmer Branch	None	N/A	CR 4521; CR 4520; 4 Residences
<b>HALLMARK LAKE DAM</b>	TX00186	Significant	TR-Caddo Creek	None	N/A	CR 4530; FM 2588; 1 Residence
<b>HAYNIE</b>	TX07277	Low	Triv. Of Persimmon Branch	Seven Points	1.89	W. Jess Hinton Rd; 1 Residence
<b>HENSARLING LAKE</b>	TX07318	High	UNK	Murchison	0.55	Mockingbird Ln; Multiple Residences
<b>HIGHWAY 175 EAST DAM</b>	TX07332	Significant	UNK	None	N/A	St. Hwy 175; 1 Residence
<b>HOWETH DAM NO 2</b>	TX07467	Low	Boggy Ranch	None	N/A	CR 4331
<b>HUME LAKE DAM</b>	TX07330	Low	Unnamed Tributary of Catfish Creek	None	N/A	St. Hwy 175
<b>JOE B HOGSETT</b>	TX00237	High	Cedar Creek	Trinidad	2.5	St. Hwy 31; Railroad Tracks; Multiple Residences
<b>JOHN SENTERRE LAKE</b>	TX00239	High	TR-South Twin Creek	Gun Barrel City	0.1	Levee Dr; Tarpon Dr; Sunfish Dr; Bonita Point Dr; Multiple Residences

<b>JONSSON LAKE DAM</b>	TX00200	Low	Anding Branch	None	N/A	None
<b>KIDD LAKE</b>	TX00183	Low	Tonyard Creek	None	N/A	FM 317
<b>KLINE LAKE DAM</b>	TX0214	Low	TR-Turkey Creek	None	N/A	2 Residences
<b>LANDBURGER LOWER LAKE NO 1</b>	TX05981	Low	Shelton Mill Branch	None	N/A	Lake Estates Dr; 1 Residence
<b>LANDBURGER LOWER LAKE NO 2</b>	TX05982	Low	Shelton Mill Branch	None	N/A	Stone Bridge Rd; 1 Residence
<b>LAKE ATHENS</b>	TX00182	Low	Flat Creek	None	N/A	CR 4828
<b>LEO A. SMITH LAKE DAM</b>	TX00191	Low	TR-Caddo Creek	Poynor	2.15	CR 4403; 1 Residence
<b>LITTLE CADDO CREEK LAKE DAM</b>	TX06421	Low	Caddo Creek	Poynor	1.49	None
<b>MABANK CITY LAKE</b>	TX00240	Low	TR- North Twin Creek	Gun Barrel City	1.81	1 Residence
<b>MCCLAIN LAKE</b>	TX07479	Low	UNK	Athens	2.9	Patterson Rd; 2 Residences
<b>MCELVANEY LAKE DAM</b>	TX06335	Low	Andings Branch	None	N/A	None
<b>MC GEE DAM NO 1</b>	TX09617	Significant	Tributary of Coon Creek	None	N/A	Possible flooding St. Hwy 175; 2 Residences
<b>MC GEE DAM NO 2</b>	TX07326	Significant	Tributary of Coon Creek	None	N/A	Possible flooding St. Hwy 175; 2 Residences
<b>MC GEE DAM NO 3</b>	TX07327	Significant	Tributary of Coon Creek	None	N/A	Possible flooding St. Hwy 175; 4 Residences
<b>MAWSY LAKE DAM</b>	TX04396	Low	Little Alder Creek	None	N/A	None
<b>MIDDLE LAKE DAM</b>	TX07331	Low	UNK	None	N/A	St. Hwy 175
<b>MINE CREEK RESERVOIR DAM</b>	TX06324	Low	Mine Creek	None	N/A	None
<b>MIXON LAKE DAM</b>	TX00192	Low	Mill Branch	Poynor	1.95	CR 4343; 1 Residence
<b>MONROE DAM</b>	TX06407	Low	TR-Flat Creek	None	N/A	None
<b>MOONSHINE CREEK #1</b>	TX04345	Low	TR-Coon Creek	None	N/A	None

<b>MOONSHINE CREEK #2</b>	TX04344	Significant	TR-Coon Creek	None	N/A	CR 4507; CR 4508; 4 Residences
<b>MO MARY LAKE DAM</b>	TX7132	Low	Alder Creek	None	N/A	CR 4530
<b>MURCHISON LAKE DAM</b>	TX00198	Low	Shelton Mill Branch	None	N/A	Pace Ranch Rd
<b>NICHOLS LAKE DAM</b>	TX0213	Low	Anding Branch	None	N/A	CR 1113; 2 Residences
<b>NICHOLS SOUTH LAKE DAM</b>	TX00210	Low	Gum Creek	None	N/A	None
<b>NICHOLS NORTH LAKE DAM</b>	TX00209	Low	Gum Creek	None	N/A	CR 4506; 2 Residences
<b>NM JACKSON</b>	TX00222	Low	Little Duncan BR of Kickapoo	Murchison	1.03	1 Residence
<b>NORTH LAKE DAM</b>	TX0188	Significant	TR-Caddo Creek	Poynor	2.34	St. Hwy 175
<b>OLD LAKE DAM</b>	TX00205	Low	Shelton Mill Branch	None	N/A	CR 1106
<b>PERRYMAN LAKE DAM</b>	TX00199	Low	TR-Anding Branch	None	N/A	None
<b>PRATT LAKE DAM</b>	TX07128	Significant	Mine Creek	None	N/A	St. Hwy 19; 3 Residences
<b>PRIMACY DAM NO 2</b>	TX07252	Significant	Selfs Creek	None	N/A	3 Residences
<b>RAINBO LAKE DAM</b>	TX00195	Significant	Catfish Creek	None	N/A	CR 4520; CR 4521; 5 Residences
<b>ROBERSON LAKE</b>	TX00230	Low	TR-Duncan Branch	None	N/A	None
<b>ROBERTS DAM</b>	TX07329	Low	Pierce Creek	Poynor	4.18	St. Hwy 175
<b>RODGERS LAKE DAM</b>	TX00184	Low	Tindel Creek	None	N/A	None
<b>SAFARI LAKE DAM</b>	TX00179	High	Kile Branch	None	N/A	CR 4516; Safari Bluff; Catfish Creek; Multiple Residences
<b>SHELTON LAKE DAM</b>	TX00206	Low	Shelton Mill Branch	None	N/A	Pace Ranch Rd
<b>SITE C LAKE DAM</b>	TX04340	Low	TR-Little Alder Creek	None	N/A	None
<b>SLAUGHTER LAKE DAM 1</b>	TX04343	Low	TR-Selfs Branch	None	N/A	None

<b>SMITH LAKE (CR 3901)</b>	TX07107	Low	UKN	Athens	9.85	N Fly In Lake Rd; S Fly In Lake Rd.
<b>SMITH LAKE (FM 2495)</b>	TX00217	Low	Coppers Creek	None	N/A	Possible flooding FM 2495
<b>SOUTTER LAKE DAM</b>	TX0212	Low	TR-Catfish Creek	None	N/A	CR 4604; 1 Residence
<b>SPORTSMANS LAKE DAM</b>	TX00202	Low	Shelton Mill Creek	None	N/A	None
<b>STAR RANCH LAKE DAM</b>	TX07333	Low	Catfish Creek	None	N/A	St. Hwy 175
<b>STAWAY RANCH LAKE</b>	TX00229	Significant	Bailey Branch	None	N/A	CR 3619; St. Hwy 31; 1 Residence
<b>STROUBE DAM NO 1</b>	TX04245	Low	TR-Mill Run Creek	None	N/A	None
<b>STROUBE DAM NO 2</b>	TX04279	Low	TR-Mill Run Creek	None	N/A	Possible flooding FM 753
<b>TARR POND DAM</b>	TX00201	Low	Anding Branch	None	N/A	None
<b>TERRA VERDE LAKE DAM</b>	TX00216	Low	TR-Mine Creek	None	N/A	None
<b>TEXAS IRON #1</b>	TX06333	Low	Tr-Ledbetter Creek	None	N/A	1 Residence
<b>THOMAS LAKE DAM</b>	TX00223	Significant	TR-Clear Creek	Athens	7.56	FM 2709; CR 2804; 3 Residences
<b>TINDEL LAKE DAM</b>	TX00189	High	TR-New York Creek	None	N/A	FM 607; FM 804; Fertilizer Facility
<b>TINER LAKE</b>	TX00225	Low	TR-Pottawatomie Creek	Athens	8.01	CR 3900; 2 Residences
<b>TOLER LAKE DAM</b>	TX07438	High	Kile Branch	None	N/A	Pine Grove Ct; Sniper Rd; Multiple Residences
<b>TONY PRICE DAM</b>	TX09564	Low	TR-Slater Creek	Murchison	5.8	FM 2339
<b>TIRIDAD DAM</b>	TX00236	Low	Off Ch-Trinity River	None	N/A	FM 1667; 1 Residence
<b>TRIPLE S RANCH LAKE DAM</b>	TX00219	Significant	Selfs Branch	None	N/A	FM 753; FM 2970; 4 Residences
<b>TROPHY LAKE DAM</b>	TX06160	High	Kile Branch	None	N/A	Waters Edge; Safari Shores; Multiple Residences
<b>TRUST NO 12</b>	TX07319	Significant	UNK	Murchison	0.61	FM 773; Multiple Residences

<b>VALLEY VIEW LAKE</b>	TX06396	High	Caney Creek	Athens	2.57	St. Hwy 175; WildLife Way; Overlook Rd; High Point Rd; Multiple Residences
<b>WHITE LAKE DAM</b>	TX00215	Low	TR-Mill Creek	None	N/A	CR 1109; 1 Residence
<b>WILLIAMS LAKE DAM</b>	TX09090	Low	Trib. Of Persimmon Branch	Seven Points	2.04	None
<b>WILSON LAKE DAM</b>	TX00203	Low	Anding Branch	None	N/A	None
<b>LEE LAKE DAM</b>	TX00226	Low	TR-Second Caney Creek	Athens	3.74	PR 7705; 2 Residences
<b>COX LAKE DAM</b>	TX00224	Significant	TR-Second Caney Creek	Athens	3.55	CR 3907; 5 Residences

Source: National Inventory of Dams

## COMMUNITY PERCEPTION OF VULNERABILITY

See front page of current chapter for a summary of hazard rankings for Henderson County and the planning partners in this plan update. Chapter 16 gives a detailed description of these rankings and 17.2 addresses mitigations actions for this hazard vulnerability.

## 7.3 PROBABILITY OF FUTURE EVENTS

The planning committee members assessed the future probability of a major occurrence of a dam failure based on their jurisdiction's proximity to high-hazard dams, their knowledge of the structural integrity of the nearby dams and that no recorded historical events have occurred in the Henderson County planning area.

Henderson County, City of Athens, Brownsboro, Caney City, Chandler, Coffee City, Log Cabin, Malakoff, Moore Station, Murchison, Poynor and Star Harbor feel the probability was low of a dam failure to occur within 100 years. The cities of Berryville, Enchanted Oaks, Tool and Trinidad rank the probability of a future event as Medium, meaning an event is possible to occur in the next 100 years. The city of Payne Springs rank the probability as high, meaning a dam failure is likely to occur within the next 25 years. The cities of Eustace, Gun Barrel City and Seven Points said they had "no exposure" to dam failure, mainly based on no high-hazard dams upstream for these jurisdictions.

## 7.4 CLIMATE CHANGE IMPACTS

Dams are designed partly based on assumptions about a river's flow behavior, expressed as hydrographs. Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. If the hydrograph changes, it is conceivable that the dam can lose some or all of its designed margin of safety, also known as freeboard. If freeboard is reduced, dam operators may be forced to release increased volumes earlier in a storm cycle to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream.

Dams are constructed with safety features known as "spillways." Spillways are put in place on dams as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events, often referred to

as “design failures,” result in increased discharges downstream and increased flooding potential. Although climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures.

## **7.5 ISSUES**

The most significant issue associated with dam failure involves the properties and populations in the inundation zones. Flooding as a result of a dam failure would significantly impact these areas. There is often limited warning time for dam failure. These events are frequently associated with other natural hazard events such as earthquakes, or severe weather, which limits their predictability and compounds the hazard. Important issues associated with dam failure hazards include the following:

- Federally regulated dams have an adequate level of oversight and sophistication in the development of emergency action plans for public notification in the unlikely event of failure. However, the protocol for notification of downstream citizens of imminent failure needs to be tied to local emergency response planning.
- Mapping for federally regulated dams is already required and available; however, mapping for non federally regulated dams that estimate inundation depths is needed to better assess the risk associated with dam failure from these facilities.
- The concept of residual risk associated with structural flood control projects should be considered in the design of capital projects and the application of land use regulations.
- Security concerns should be addressed and the need to inform the public of the risk associated with dam failure is a challenge for public officials.

## **CHAPTER 8 DROUGHT AND EXTREME HEAT**



## **8.1 HAZARD PROFILE**

### **DROUGHT**

Drought is a normal phase in the climatic cycle of most geographical areas. According to the National Drought Mitigation Center, drought originates from a deficiency of precipitation over an extended period, usually a season or more. This results in a water shortage for some activity, group, or environmental sector. Drought is the result of a significant decrease in water supply relative to what is “normal” in a given location. Unlike most disasters, droughts normally occur slowly but last a long time.

Defining when drought begins is a function of the impacts of drought on water users, and includes consideration of the supplies available to local water users as well as the stored water they may have available in surface reservoirs or groundwater basins. Different local water agencies have different criteria for defining drought conditions in their jurisdictions. Some agencies issue drought watch or drought warning announcements to their customers. Determinations of regional or statewide drought conditions are usually based on a combination of hydrologic and water supply factors.

Precipitation and runoff into the area lakes and dams is the main source of Texas’ water supply. Precipitation is the only naturally reoccurring/renewable water supply for Henderson County. Annual precipitation in the populated areas of the planning area is approximately 44 inches per year. There are various streams and tributaries contributing to water supply in the area. This supply is stored in four forms throughout the state: streamflow, reservoir water, soil moisture, and groundwater.

### **EXTREME HEAT**

Severe, excessive summer heat is characterized by a combination of exceptionally high temperatures and humidity. When these conditions persist over a period of time, it is called a heat wave. Many areas of the country are susceptible to heat waves, including Northeast Texas and Henderson County.

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

During summer months, Henderson County is frequently affected by severe heat hazards. Daily high temperatures range into the upper 90s and low 100s. Moderate to high relative humidity levels are prevalent in the county. The heat index (a measure of discomfort that combines temperature and humidity) can move into dangerous levels. Many people begin to experience extreme discomfort or physical distress when the heat index reaches 105 degrees.

Severe summer heat is an invisible killer. Although a heat wave does not happen with the spectacle of other hazards such as tornadoes and floods, the Centers for Disease Control and Weather Channel reports that from 2010 to 2018, excessive heat exposure caused 966 deaths in the United States. Heat-related deaths were reported most frequently among males (64 percent) and adults aged 65 years and older (31 percent).

#### **8.1.1 LOCATION**

##### **DROUGHT**

Due to Texas’ humid subtropical to semi-arid conditions, drought is a natural but unpredictable occurrence in the state. However, because of natural variations in climate and precipitation sources, it is rare for all of

Texas to be deficient in moisture at the same time. Single season droughts over some portion of the state are quite common.

Droughts occur regularly in Northeast Texas and are a normal condition, but can vary greatly in their intensity and duration. According to the 2012 Census of Agriculture, of the 957 square miles (612,972 acres) of land in Henderson County, almost 50 percent (345,628 acres) is used for agricultural purposes. In 2012, there were 1,961 farms with an average size of 176 acres per farm. Although the entire planning area in Henderson County is at risk for drought, the agricultural areas are more vulnerable to the immediate effects of drought.

## EXTREME HEAT

The entire planning area is at risk for extreme heat events. There is no distinct geographic boundary to excessive summer heat. Excessive heat can occur in every participating jurisdiction within Henderson County. The record highs for Texas occur during May through October. During 2011, the City of Athens experienced the hottest all-time average temperature of 89.3°F. This record implies temperature highs of 100 and lows of 80 that summer.

### 8.1.2 EXTENT

#### DROUGHT

The National Oceanic and Atmospheric Administration (NOAA) has developed Palmer Drought Indices that are used to measure the extent of drought. The Palmer Z Index measures short-term drought on a monthly basis. The Palmer Drought Severity Index attempts to measure the duration and intensity of the long-term drought-inducing circulation patterns. Long-term drought is cumulative, with the intensity of drought during the current month dependent upon the current weather patterns plus the cumulative patterns of previous months. The hydrological impacts of drought (for example, reservoir levels, groundwater levels, etc.) take longer to develop and it takes longer to recover from them. The Palmer Hydrological Drought Index, was developed to quantify the long term hydrological effects. These Palmer Drought Indices classifications are listed in Table 8-1 and Table 8-2 depicts the magnitude of drought indices.

**8-1 PALMER DROUGHT CLASSIFICATIONS**

DROUGHT INDEX	EXTREME	SEVERE	MODERATE	NORMAL	MODERATELY MOIST	VERY MOIST	EXTREMELY MOIST
<b>PALMER Z INDEX</b>	-2.75 AND BELOW	-2.0 TO -2.74	-1.25 TO -1.99	-1.24 TO 0.99	1.00 TO 2.49	2.50 TO 3.49	N/A
<b>PALMER DROUGHT SEVERITY INDEX</b>	-4.0 AND BELOW	-3.0 TO -3.99	-2.00 TO 2.99	-1.99 TO 1.99	2.00 TO 2.9	3.0 TO 3.9	4.00 AND ABOVE
<b>PALMER HYDROLOGICAL DROUGHT INDEX</b>	-4.0 AND BELOW	-3.0 TO -3.99	-2.00 TO 2.99	-1.99 TO 1.99	2.00 TO 2.9	3.0 TO 3.9	4.00 AND ABOVE

## 8-2 PALMER DROUGHT CATEGORY DESCRIPTIONS

CATEGORY	DESCRIPTION	POSSIBLE IMPACTS	PALMER DROUGHT SEVERITY INDEX
D0	ABNORMALLY DRY	Going into drought; short-term dryness slowing planting, growth of crops or pastures; fire risk above average. Coming out of drought: so lingering water deficits; pastures or crops not fully recovered	-1.0 TO -1.9
D1	MODERATE DROUGHT	Some damage to crops, pastures; fire risk high; streams, reservoirs or wells low, some water shortages developing or imminent, voluntary water use restrictions requested	-2.0 TO -2.9
D2	SEVERE DROUGHT	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed	-3.0 TO -3.9
D3	EXTREME DROUGHT	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions	-4.0 TO -4.9
D4	EXCEPTIONAL DROUGHT	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams and wells creating water emergencies	-5.0 OR LESS

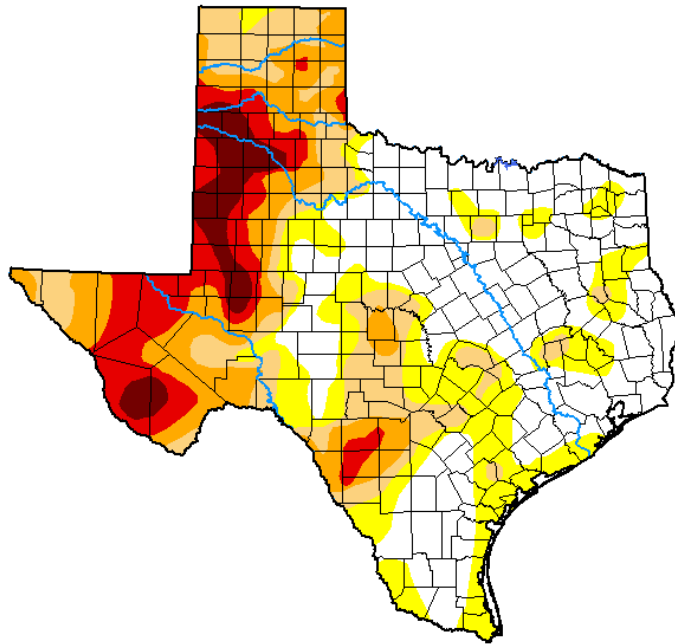
Drought is a slow-onset hazard, but over time can have damaging effects on crops, municipal water supplies, recreation, and wildlife. The worst case scenario for the Henderson County planning area is to see up to D4, Exceptional Drought conditions that extend over a number of years, the direct and indirect economic impact can be significant.

Drought warnings are issued by the State Drought Preparedness Council, as directed by H.B. 2660, based upon input from NOAA, the Office of the State Climatologist, the U.S. Geological Survey, the Texas Water Development Board, the Texas Commission on Environmental Quality, and the Texas Agricultural Statistics Service. Warnings encompass five “levels of concern” and take into account assessments of climatology, agriculture, and water availability for each of 10 climatic regions of the state.

Drought is monitored nationwide by the National Drought Mitigation Center (NDMC). Indicators are used to describe broad scale drought conditions across the U.S. Indicators correspond to the intensity of drought. FIGURE 8-1 shows the drought conditions in Texas and in particular, Henderson County, as of October 2020. The Henderson County average was a no risk in October 2020 with the entire county designated “no drought”.

# U.S. Drought Monitor Texas

**October 27, 2020**  
(Released Thursday, Oct. 29, 2020)  
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	37.98	62.02	42.98	28.28	14.42	4.72
<b>Last Week</b> 10-20-2020	46.81	53.19	39.60	25.69	14.42	4.72
<b>3 Months Ago</b> 07-28-2020	39.66	60.34	34.39	14.99	2.99	0.00
<b>Start of Calendar Year</b> 12-31-2019	44.69	55.31	36.12	9.19	0.74	0.00
<b>Start of Water Year</b> 09-29-2020	57.35	42.65	31.96	20.91	12.02	3.29
<b>One Year Ago</b> 10-29-2019	38.98	61.02	46.55	22.40	4.65	0.00

## Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

## Author:

David Miskus  
NOAA/NWS/NCEP/CPC



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

Figure 8-1 U.S. Drought Monitor Texas, October 2020

The U.S. Forest Service and the Texas Forest Service use the Keetch-Byram Drought Index to determine the fire potential based on daily water balance, precipitation and soil moisture. FIGURE 8-2 shows the Texas Drought Index according to Keetch-Byram Drought Index, which uses a color-coded rating classification with a scale of 0 to 800 (low risk to high risk). Henderson County was at a low risk in October 2020.

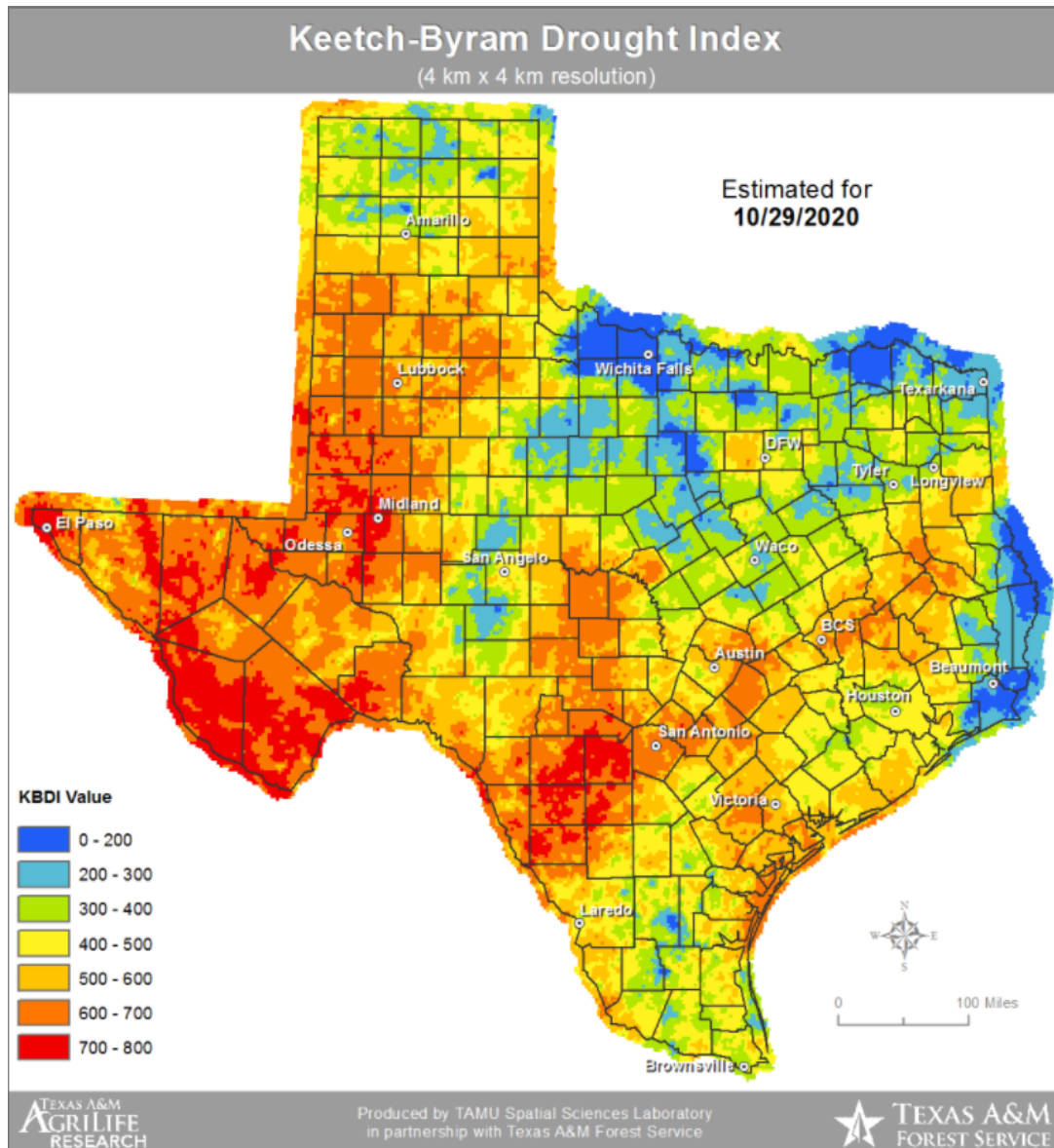


Figure 8-2 Keetch-Byram Drought Index, October 2020

## EXTREME HEAT

Heat index tables (FIGURE 8-3) are commonly used to provide information about how hot it feels, which is based on the interactions between several meteorological conditions. Since heat index values were devised for shady, light wind conditions, exposure to full sunshine can increase heat index values by up to 15 degrees Fahrenheit (°F). Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

The worst-case scenario for the Henderson County planning area would be to see up to an extreme heat wave that lasts several weeks with 100° and above during the day with high humidity and then evening lows only dropping into the 90s°. In this scenario, people and animals do not get a chance to cool off their bodies and rest from the heat.

Temperature (°F)

Relative Humidity (%)

5

10

15

20

25

30

35

40

45

50

55

60

65

70

75

80

85

90

95

100

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

77

78

78

79

79

79

80

80

80

81

81

82

82

83

84

84

85

86

86

87

87

78

79

79

79

79

80

80

81

81

82

83

84

85

86

86

87

88

88

89

90

91

91

92

93

94

95

96

96

97

97

98

98

99

100

101

102

103

104

105

106

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

166

167

168

169

170

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

187

188

189

190

191

192

193

194

195

196

197

198

199

200

Heat Index

NOAA

NATIONAL WEATHER SERVICE

Extreme Danger

Danger

Extreme Caution

Caution

Heat stroke likely.

Sunstroke, muscle cramps, and/or heat exhaustion likely. Heatstroke possible with prolonged exposure and/or physical activity.

Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.

Fatigue possible with prolonged exposure and/or physical activity.

Figure 8-3 Heat Index Table, NOAA's National Weather Service

### 8.1.3 PAST EVENTS

#### DROUGHT

According to the Texas Water Resources Institute and the NOAA National Centers for Environmental Information (NCEI) storm event database, Henderson County experienced drought conditions in 2012, 2013, 2015, 2016, 2018, 2019 and 2020 during this plan update timeframe of 2011 through 2020. No property damage amounts nor injuries/fatalities were recorded.

- 2020- The drought conditions only arose from January to early February where frequent rainfall occurred and Northeast Texas was removed from the D2 Severe drought status and remained at a low hazard condition.
- 2019- Drought conditions occurred during the months of June through parts of December and Henderson County was classified at D2- Severe Drought conditions.
- 2018- Drought conditions occurred during the month of August and Henderson County was classified at D2- Severe Drought conditions.
- 2016 Drought—Drought conditions occurred in November – December with Henderson County being classified at D2 – Severe Drought conditions.
- 2015 Drought—This year had a very wet spring but drought conditions developed in August – September and Henderson County was classified at D2 – Severe Drought conditions.
- 2013 Drought—Drought conditions occurred during the summer months with most of Northeast Texas being classified with D2 Severe or D3 Extreme Drought conditions. Then, beneficial rain fell during September and drought classifications were removed.
- 2012 Drought—The drought conditions only persisted into March of 2012 when much needed rainfall occurred and Northeast Texas was removed from the D2 Severe Drought status.

#### USDA DISASTER DECLARATIONS

Agriculture-related disasters and disaster declarations are common in the United States, and the U.S. Department of Agriculture (USDA) Farm Service Agency provides assistance for losses resulting from drought, flood, fire, freeze, tornadoes, pest infestation, and other natural disasters. Many counties have been designated disaster areas in the past several years of record crop production. The U.S. Secretary of Agriculture is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to them. Between 2011 and 2019, the period for which data were available, Henderson County was included in 17 USDA secretarial disaster declarations (related to drought) (USDA, 2020)

#### 8-3 USDA SECRETARIAL DISASTERS

YEAR	TYPE	DECLARATION NUMBER
2012	Drought, High Winds, Wildfire, Excessive Heat, Insects	S3288
2013	Drought, High Winds, Wildfire, Excessive Heat, Insects	S3465
2013	Drought, High Winds, Wildfire, Excessive Heat, Insects	S3526

2014	Drought, High Winds, Wildfire, Excessive Heat, Insects	S3661
2015	Drought, High Winds, Wildfire, Excessive Heat, Insects	S3814
2015	Drought, High Winds, Wildfire, Excessive Heat, Insects	S3791
2015	Drought, High Winds, Wildfire, Excessive Heat, Insects	S3883
2015	Drought, High Winds, Wildfire, Excessive Heat, Insects	S3890
2015	Drought, High Winds, Wildfire, Excessive Heat, Insects	S3908
2015	Drought	S3920
2016	Drought	S3974
2018	Drought	S4380
2018	Drought	S4395
2019	Flood, Flash Flooding, Excessive rain, Moisture, Humidity	S4534
2019	Drought	S4552
2020	Drought	S4654
2020	Excessive rain, Moisture, Humidity	S4720
<b>Source: USDA, 2020</b>		

## THE DROUGHT IMPACT REPORTER

The National Drought Mitigation Center developed the Drought Impact Reporter in response to the need for a national drought impact database for the United States. Information comes from a variety of sources: on-line, drought-related news stories and scientific publications, members of the public who visit the website and submit a drought-related impact for their region, members of the media, and staff of government agencies. The Drought Impact Reporter contains information of 15 impacts from droughts that specifically affected Henderson County between 2012 and 2020 and these have a high probability of continuing. The following are the categories and reported number of impacts. Note that some impacts have been assigned to more than one category.

- Agriculture
- Business and industry
- Energy
- Fire
- Plants and wildlife



- Relief, response and restrictions
- Society and public health
- Water supply and quality

## EXTREME HEAT

According to the NOAA National Centers for Environmental Information (NCEI) storm event database, No property or crop damages were recorded. Since there is no distinct geographic boundary to excessive summer heat, these historical occurrences are for all the participating jurisdictions within this plan update. TABLE 8-4 contains temperature summaries related to extreme heat for the Tyler weather station. These temperatures are experienced throughout the entire planning area. In recent history, the months of July 2011 and August 2011 recorded the highest number of days over 90°F.

<b>8-4 MONTHLY HIGHEST TEMPERATURE EXTREMES FOR PLANNING AREA 1908-2019</b>			
	<b>MONTHLY HIGHEST MEAN TEMPERATURE</b>	<b>YEAR RECORDED</b>	<b>NUMBER OF DAYS &gt; 90F</b>
<b>JANUARY</b>	52.8	2017	0
<b>FEBRUARY</b>	59.2	2017	0
<b>MARCH</b>	65.1	2012	0
<b>APRIL</b>	71	2011	0
<b>MAY</b>	76.1	2018	3
<b>JUNE</b>	85	2011	15
<b>JULY</b>	87	2011	24
<b>AUGUST</b>	89.3	2011	24
<b>SEPTEMBER</b>	80.7	2019	12
<b>OCTOBER</b>	69.6	2016	2
<b>NOVEMBER</b>	60.5	2016	0
<b>DECEMBER</b>	53.7	2015	0
<b>SOURCE: WRCC, 2020</b>			

## USDA RISK MANAGEMENT AGENCY

According to the USDA Risk Management Agency, payments for insured crop losses in Henderson County as a result of excessive heat conditions between 2011 and 2020 cause \$0 in crop losses.

### 8.1.4 WARNING TIME

#### DROUGHT

Droughts are climatic patterns that occur over long periods of time. Only generalized warnings can take place because there are numerous variables that scientists have correlated well enough to make accurate predictions. Empirical studies conducted over the past century have shown that meteorological drought is never the result of a single cause. It is the result of many causes, often synergistic in nature.

Scientists at this time do not know how to predict drought more than a month in advance for most locations. Predicting drought depends on the ability to forecast precipitation and temperature. Anomalies

of precipitation and temperature may last from several months to several decades. How long these anomalies last depends on interactions between the atmosphere and the oceans, soil moisture and land surface processes, topography, and the accumulated influence of weather systems on the global scale. Texas is semi-arid to humid subtropical, thus, drought is a regular and natural occurrence in the state. The main source of water supply in the state is precipitation and much of this occurs in the spring and fall. Some snowfall does occur in the wintertime. Although drought conditions are difficult to predict, low levels of spring precipitation may act as an indicator that drought conditions are occurring.

## **EXTREME HEAT**

NOAA issues watch, warning, and advisory information for extreme heat. Extreme heat is a regular and natural occurrence in the state.

## **8.2 VULNERABILITY AND IMPACT**

### **DROUGHT**

The impact of drought can be wide-reaching and may be economic, environmental, or societal. The most significant impacts associated with drought in Henderson County are those related to water-intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. An ongoing drought may leave this area more prone to wildfires. Drought conditions can also cause soil to compact, increasing an area's susceptibility to flooding, and reduce vegetation cover, which exposes soil to wind and erosion. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted, water wells become less productive during drought and can dry up, and water levels in streams and groundwater decline. The impact of drought can be wide-reaching and may be economic, environmental, or societal. The most significant impacts associated with drought in Henderson County are those related to water-intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. An ongoing drought may leave this area more prone to wildfires. Drought conditions can also cause soil to compact, increasing an area's susceptibility to flooding, and reduce vegetation cover, which exposes soil to wind and erosion. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted, water wells become less productive during drought and can dry up, and water levels in streams and groundwater decline.

Notable incidents that impacted Henderson County from the Drought Impact Reporter include:

- Restricted outdoor burning
- Livestock producers bought hay
- Trees stressed by drought
- Increased wildfire hazard
- Livestock were sold
- Quality of fruit declined

During this plan update planning time frame, 2011-2020 the planning area experienced 27 drought periods, but no damages were recorded in the NCEI storm event database. All the planning partners are vulnerable to drought conditions, but Chandler, Enchanted Oaks, Seven Points and Tool planning committee members feel the impacts are low in their communities. The rest of the planning partners do feel that this hazard has moderate to high impact on their population, property and economy.

Environmental impacts from drought are associated with damage to plants, animals, wildlife habitat, and air and water quality; forest and range fires; degradation of landscape quality; loss of biodiversity; and soil

erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from this temporary aberration. The degradation of landscape quality, including increased soil erosion, may lead to a more permanent loss of biological productivity. Although environmental losses are difficult to quantify, growing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects. Economic impact will be largely associated with industries that use water or depend on water for their business. For example, landscaping businesses were affected in the droughts of the past as the demand for service significantly declined because landscaping was not watered. Agricultural industries will be impacted if water usage is restricted for irrigation. The tourism sector may also be impacted.

## EXTREME HEAT

During this projected plan update time frame, 2011 – 2020, the planning area experienced 7 extreme heat periods with no fatalities, with no crop or property damage recorded in the NCEI storm event database.

All the planning partners are vulnerable to extreme heat, but Caney City, Chandler, Log Cabin, Seven Points and Tool planning committee members feel the impacts are low in their communities. The rest of the planning partners do feel that this hazard has moderate to high impacts on their population, property, and economy.

According to the U.S. Environmental Protection Agency (EPA), young children (because they are more likely to be left in cars unattended), the elderly and people with physical or mobility constraints, cognitive impairments, economic constraints, and social isolation are more susceptible to the adverse effects of excessive heat events. Actual percentages of vulnerable populations are listed in TABLE 8-5 for each planning partner. Data were not available for individuals for physical, mobility, nor economic constraints.

Overall, Texas has an estimated 19.8% of greater risk population age groups. Henderson County's greater risk population is above the state average at 26.07%. The participating jurisdictions with the highest percent of greater risk population are Enchanted Oaks, Payne Springs and Tool.

**8-5 POPULATIONS OF GREATER RISK BY JURISDICTION**

JURISDICTION	TOTAL POPULATION	POPULATION UNDER AGE 5 (%)	POPULATION 65 AND OLDER (%)	PERCENTAGE OF GREATER RISK POPULATION (%)
<b>Henderson County</b>	78532	5.60%	9.10%	14.70%
<b>Athens</b>	12753	8.10%	16.90%	25%
<b>Berryville</b>	1064	0%	22%	22%
<b>Brownsboro</b>	1279	13.60%	9.80%	23.40%
<b>Caney City</b>	220	3.70%	20.30%	24%
<b>Chandler</b>	3163	4.90%	21.40%	26.30%
<b>Coffee City</b>	293	3.90%	15.40%	19.30%
<b>Enchanted Oaks</b>	341	1.60%	53.20%	54.80%

<b>Eustace</b>	1006	8.40%	21.20%	29.60%
<b>Gun Barrel City</b>	6208	4.30%	23.40%	27.70%
<b>Log Cabin</b>	772	2.20%	19.70%	21.90%
<b>Malakoff</b>	2301	7.20%	13.40%	20.60%
<b>Moore Station</b>	220	0%	14.40%	14.40%
<b>Murchison</b>	599	5.60%	16.10%	21.70%
<b>Payne Springs</b>	769	4.90%	31.40%	36.30%
<b>Poynor</b>	306	4.60%	12.90%	17.50%
<b>Seven Points</b>	1560	8.25%	33.10%	41.35%
<b>Star Harbor</b>	492	3.40%	25.30%	28.70%
<b>Tool</b>	2302	4.90%	30.80%	35.70%
<b>Trinidad</b>	870	4.50%	18.90%	23.40%

Source: US Census 2019

## AGRICULTURE

According to the 6-year period from the USDA's Risk Management Agency, the amount of claims paid for crop damage as a result of extreme heat in Henderson County was \$0. According to the 2019 Texas Insurance Profile from the USDA's Risk Management Agency, 88 percent of the insurable crops in Texas are insured with USDA crop insurance. To estimate losses to insurable crops that are not insured, the 88 percent crop insurance coverage was factored in to provide an adjusted estimate of losses. According to this calculation, estimated annualized losses of \$0 (Table 8-6). Considering the value of crops from the 2018 Census of Agriculture as baseline crop exposure, the estimated annual losses from extreme heat were determined to be low compared to the value of the insurable crops.

**8-6 ESTIMATED INSURABLE ANNUAL CROPS LOST RESULTING FROM EXTREME HEAT**

<b>6-YEAR EXTREME HEAT INSURANCE PAID</b>	<b>ADJUSTED 6-YEAR DROUGHT LOSSES (CONSIDERING 88% INSURED)</b>	<b>ESTIMATED ANNUALIZED LOSSES</b>	<b>2018 VALUE OF CROPS</b>
0	0	0	11,645,000

Source: USDA 2016; USDA RMA 2018

## COMMUNITY PERCEPTION OF VULNERABILITY

See the first page of this chapter for a summary of hazard rankings for Henderson County and the planning partners in this plan update. Chapter 16 gives a detailed description of these rankings and 17.2 addresses mitigation actions for this hazard vulnerability.

## **8.3 PROBABILITY OF FUTURE EVENTS**

### **DROUGHT**

The probability of a future drought in Henderson County and the participating jurisdictions is “High,” with an event possible every 1 to 2 years. According to information from the NOAA National Centers for Environment Institute, the planning area had 39 documented drought periods between 2006 and 2020. Based on this historical information, the probability of a future drought occurring in any given year is over 78 percent.

The planning committee members assessed the future probability of drought based on their jurisdictional knowledge. Henderson County and the Cities of Malakoff, Moore Station and Murchison all ranked the probability of a future event as likely to occur within 25 years. The Cities of Athens, Berryville, Brownsboro, Caney City, Chandler, Coffee City, Enchanted Oaks, Eustace, Gun Barrel City, Payne Springs, Poynor, Star Harbor, Tool and Trinidad ranked the probability of a future event as likely to occur within the next 100 years and the Cities of Seven Points and Log Cabin ranked it as a low probability of future occurrence.

### **EXTREME HEAT**

On average, Henderson County and the participating jurisdictions have experienced 77 days per year where temperatures exceed 90°F so the probability of extreme heat events is expected to be very likely in any given year (based on the Tyler station for Western Regional Climate Center). When temperatures reach 90°F and above, people are vulnerable to heat cramps, heat exhaustion, and heat stroke. Pets and livestock are also vulnerable to heat-related injuries. Crops can be vulnerable as well.

Henderson County and the participating jurisdictions can expect similar numbers of hot days in the future (77 days per year are highly likely).

The planning committee members assessed the future probability on extreme heat based on their jurisdictional knowledge. The Cities of Athens, Brownsboro, Caney City, Chandler, Coffee City, Enchanted Oaks, Gun Barrel City, Malakoff, Moore Station, and Trinidad all ranked the probability of a future event as likely to occur within 25 years. Henderson County and the cities of Berryville, Eustace, Murchison, Payne Springs, Poynor and Tool ranked the probability of a future event as likely to occur within the next 100 years and the Cities of Log Cabin, Seven Points, and Star Harbor ranked it as a low probability of future occurrence.

## **8.4 CLIMATE CHANGE IMPACTS**

### **DROUGHT**

The long-term effects of climate change on regional water resources are unknown, but global water resources are already experiencing the following stresses without climate change:

- Growing populations
- Increased competition for available water
- Poor water quality
- Environmental claims
- Uncertain reserved water rights
- Groundwater overdraft
- Aging urban infrastructure

With a warmer climate, droughts could become more frequent, more severe, and longer-lasting. The 2011 drought in Texas reached a record \$7.62 billion in agriculture losses, making it the most costly drought in history. It was more than \$3.5 billion higher than the 2006 drought loss estimate, which previously was the costliest drought on record in Texas (Texas A&M, 2012). More frequent extreme events such as droughts

could be more cause for concern than the long-term change in temperature and precipitation averages. The best advice to water resource managers regarding climate change is to start addressing current stresses on water supplies and build flexibility and robustness into any system. Flexibility helps to ensure a quick response to changing conditions, and robustness helps people prepare for and survive the worst conditions. With this approach to planning, water system managers will be better able to adapt to the impacts of climate change.

## **EXTREME HEAT**

According to EPA's What Climate Change Means for Texas, Texas can expect three to four times as many days per year above 100 degrees and nighttime temperatures are rising substantially. This will cause certain populations including children, elderly, the sick, and the poor to be more vulnerable to heat stroke and dehydration and affect people's cardiovascular and nervous systems.

## **8.5 ISSUES**

The following are extreme heat and drought-related issues:

- Identification and development of alternative water supplies.
- Utilization of groundwater recharge techniques to stabilize the groundwater supply
- The probability of increased drought frequencies and durations due to climate change.
- The promotion of active water conservation even during non-drought periods.
- Increasing vulnerability to drought over time as demand for water from different sectors increases.
- The effects of climate change may result in an increase in frequency of extreme heat events.
- The effects of recent droughts have exposed the vulnerability of the planning area's economy to drought events.
- Wildlife habitat management for landowners.
- Human health impacts from droughts and extreme heat.
- Monitoring and evaluating risks to power supply and water rights.
- Development and update of mitigation- or response-based drought plans

## **CHAPTER 9**

### **FLOOD**

#### **9.1 HAZARD PROFILE**

Floods generally result from excessive precipitation, and the severity of a flooding event is typically determined by a combination of several major factors, including stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surface. Generally, floods are long-term events that may last for several days.

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

Texas has the most flash flood deaths of any state in the country. Although the Henderson County planning area lies northeast of the "Flash Flood Alley" area of Texas, it is still susceptible to flash flood events every year. Factors contributing to flash floods in the area include its location between the Rocky Mountains and the moisture-laden Gulf of Mexico. As weather systems stall and dissipate over Texas, they drop intense rains over small areas.

Flooding in the Henderson County planning area is mostly caused by slow-moving thunderstorms, thunderstorms repeatedly moving over the same area, or heavy rains from hurricanes and tropical storms. Flash floods can occur within a few minutes or after hours of excessive rainfall. These rain events are most often microbursts, which produce a large amount of rainfall in a short amount of time. Flash floods, by their nature, occur suddenly but usually dissipate within hours. According to the National Weather Service, Henderson County experienced 40 to 50 flash flood events between 1981 to 2020 (NOAA 2020). Despite their sudden nature, the NWS is usually able to issue hazardous weather outlooks, watches, and warnings in advance of a flood.

##### **9.1.1 LOCATION**

The eastern section of Henderson County lies within the Neches River Basin while the western section of the county lies within the Trinity River Basin following the Trinity River. The Neches River starts in neighboring Van Zandt County and runs along the western border of Henderson County and then continues south. The Trinity River starts in Archer County and flows southeast forming the western border of Henderson County (FIGURE 10-1).

Some local water bodies include Lake Athens and Cedar Creek Lake that are the primary water supply reservoirs.

In addition to the riverine flooding, Henderson County and the participating jurisdictions experience urban flooding caused by urbanization which can increase the runoff potential of an area.

Flash flooding occurs in those locations of the planning area that are low-lying or do not have adequate drainage to carry away the amount of water that falls during intense rainfall events. According to the NCEI and reports from the planning committee members, the following locations have a history of flash flooding events: unincorporated county, CR 2930 (Peach Tree Rd) located north of Payne Springs, CR 1500 located west of Athens, CR 2100 located north west of Seven Points, CR 3302 north of Brownsboro and Chandler, CR 3907 north of Athens and CR 2904 west of Tool.



Figure 9-1 Texas River Basins

The floodplain boundary extents for the creeks, streams, rivers, and lakes have been mapped by FEMA in the county. The resulting Digital Flood Insurance Rate Maps, or DFIRMs provide an official depiction of flood hazard risks and risk premium zones for each community and for properties located within it. The published DFIRMs within Henderson County became effective on April 5, 2010.

FEMA has identified flood zones in the unincorporated county and all the incorporated jurisdictions on the DFIRMs in FIGURE 9-2 through FIGURE 9-20. The county-level map is provided first and the remaining maps are provided in alphabetical order by city.

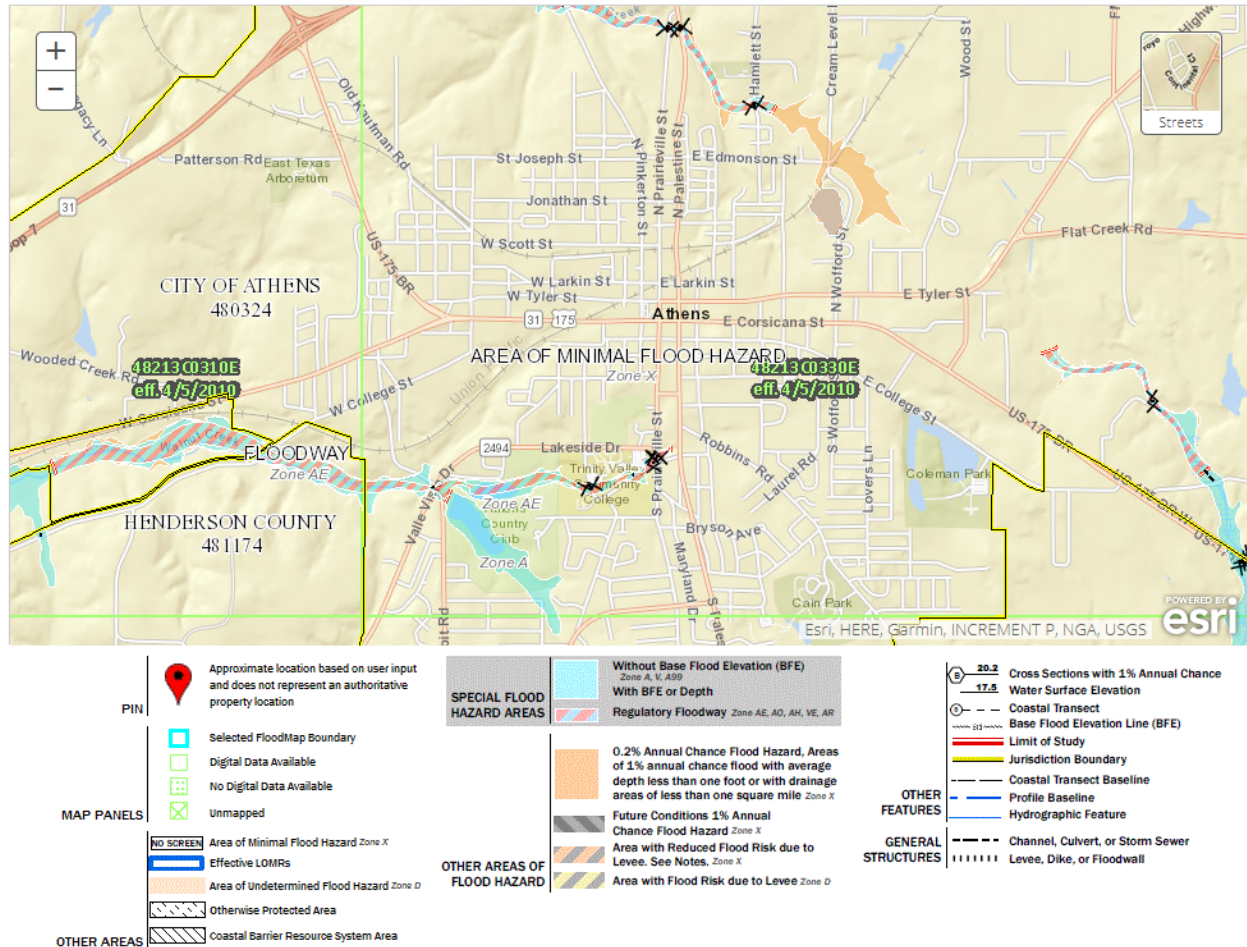


The main flooding sources in Henderson County include: Sanders Creek, Kickapoo Creek, Flat Creek, Coon Creek, Mill Run, Turkey Creek and the Trinity and Neches River.



## ATHENS

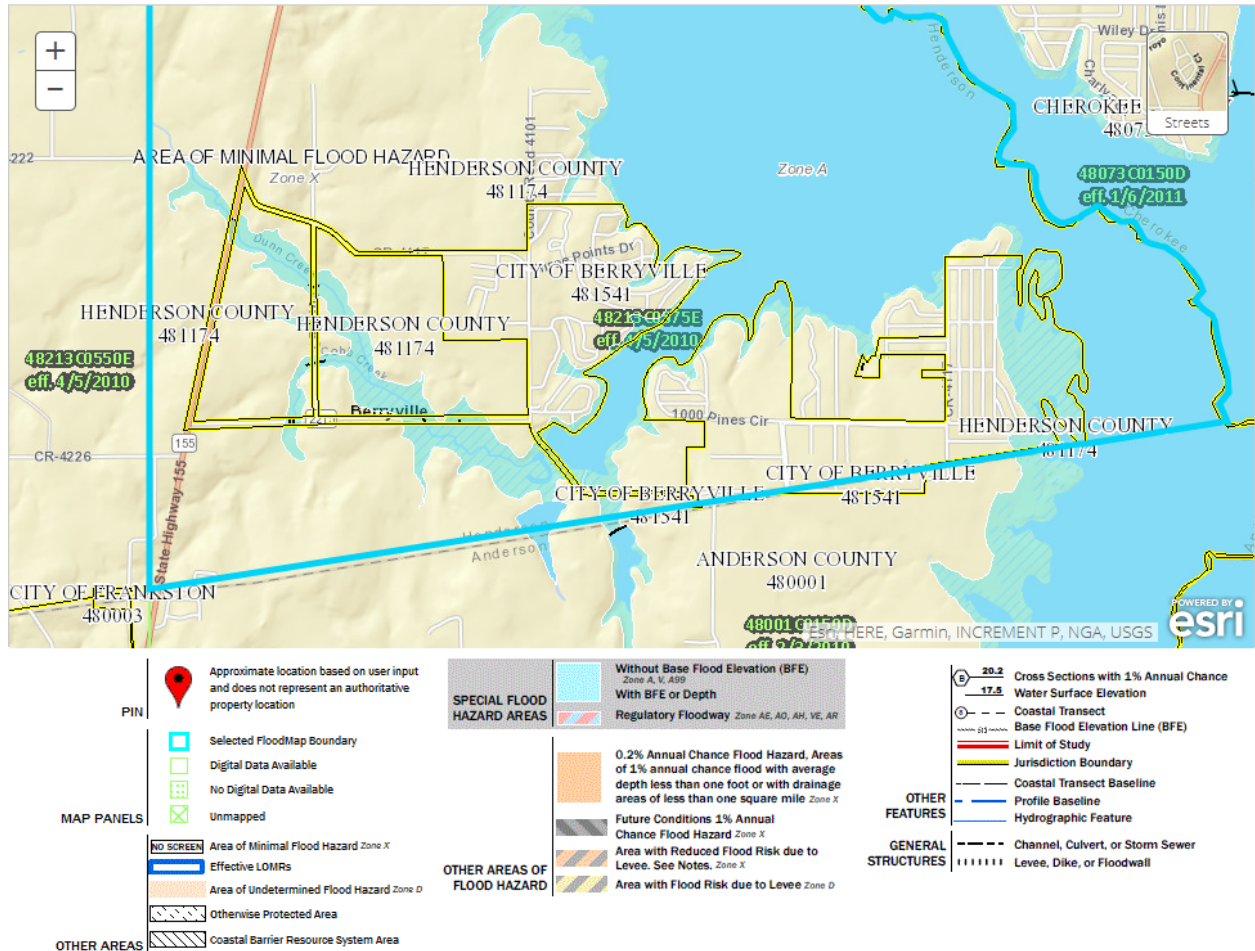
The City of Athens is centrally located within Henderson County and is the largest city in the county. There are multiple creeks and tributaries within the city that cause urbanized flooding.



### 9-3 CITY OF ATHENS

## BERRYVILLE

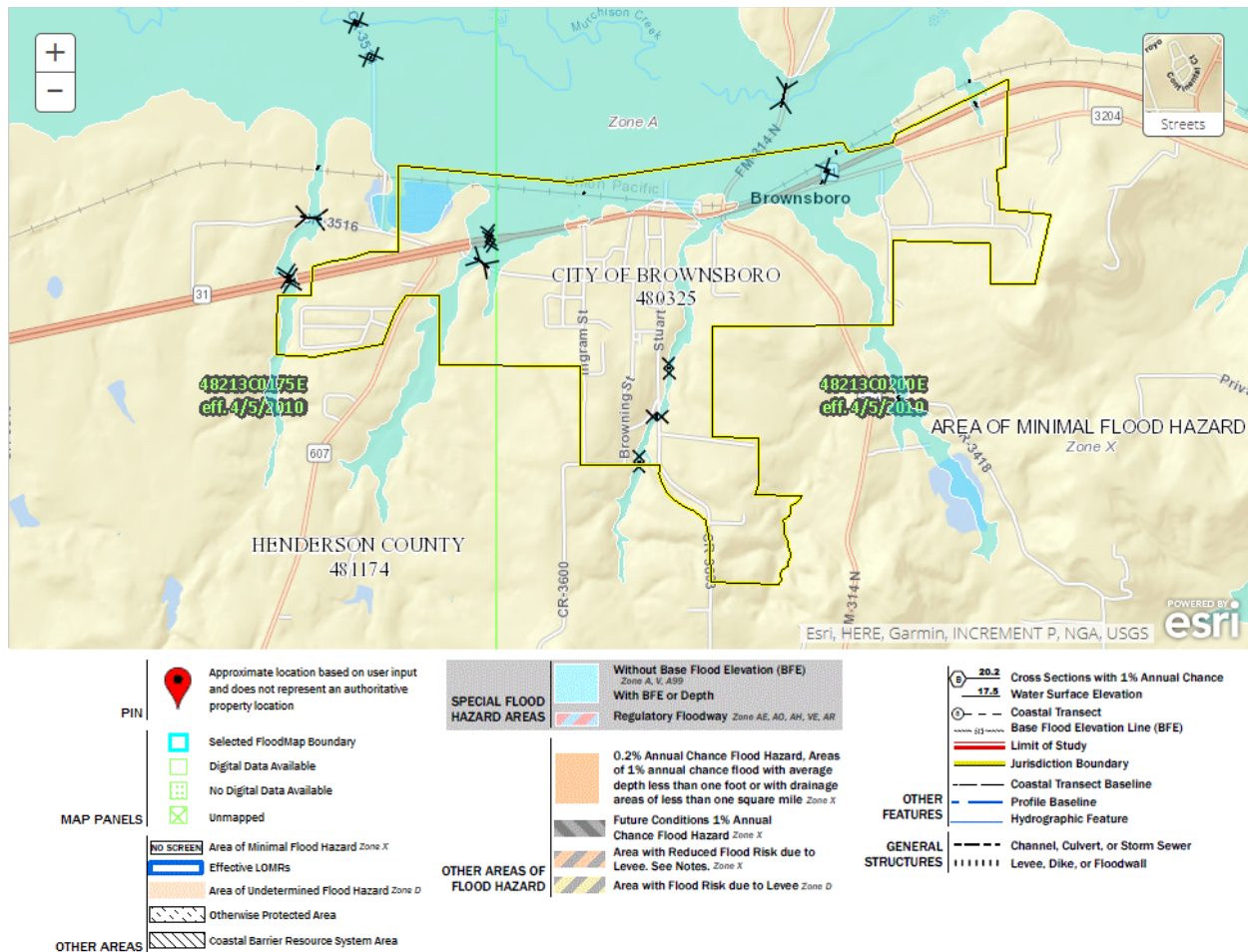
The City of Berryville is located in the southeast portion of Henderson County and has a potential flooding source from Lake Palestine.



### 9-4 CITY OF BERRYVILLE

## BROWNSBORO

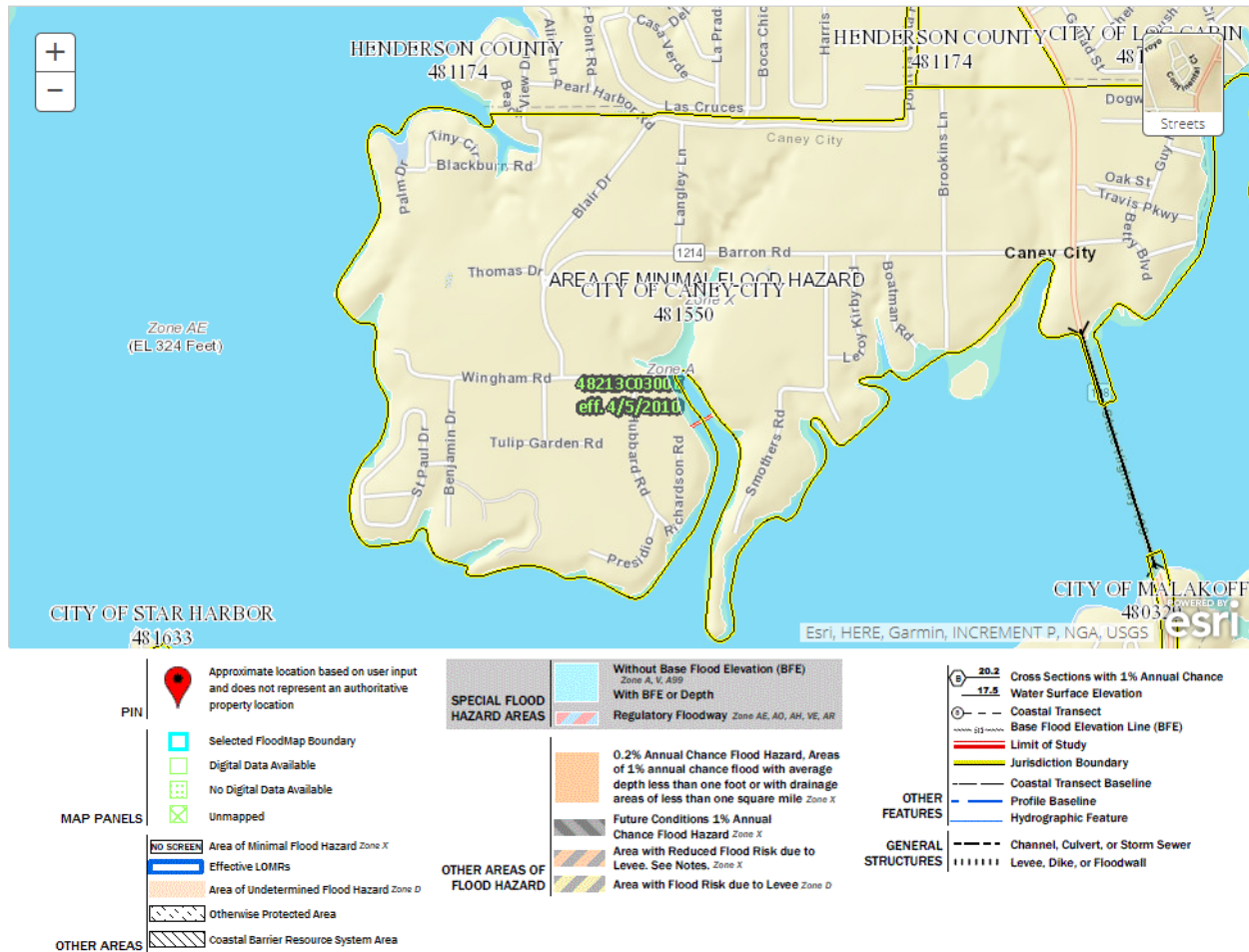
The City of Brownsboro is located in the northeast section of Henderson County and has a potential flooding source from Kickapoo Creek.



## 9-5 CITY OF BROWNSBORO

## CANEY CITY

The City of Caney City is located in the northwest section of Henderson County and has a potential flooding source from Cedar Creek Lake.

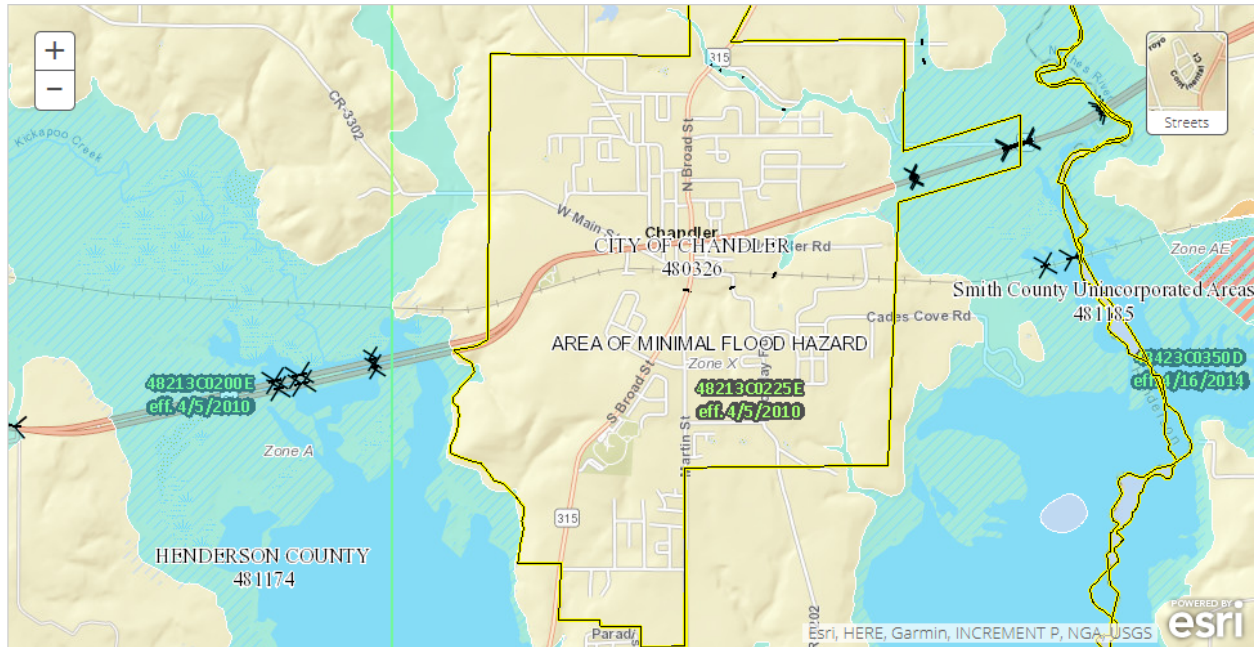


## 9-6 CITY OF CANEY CITY



## CHANDLER

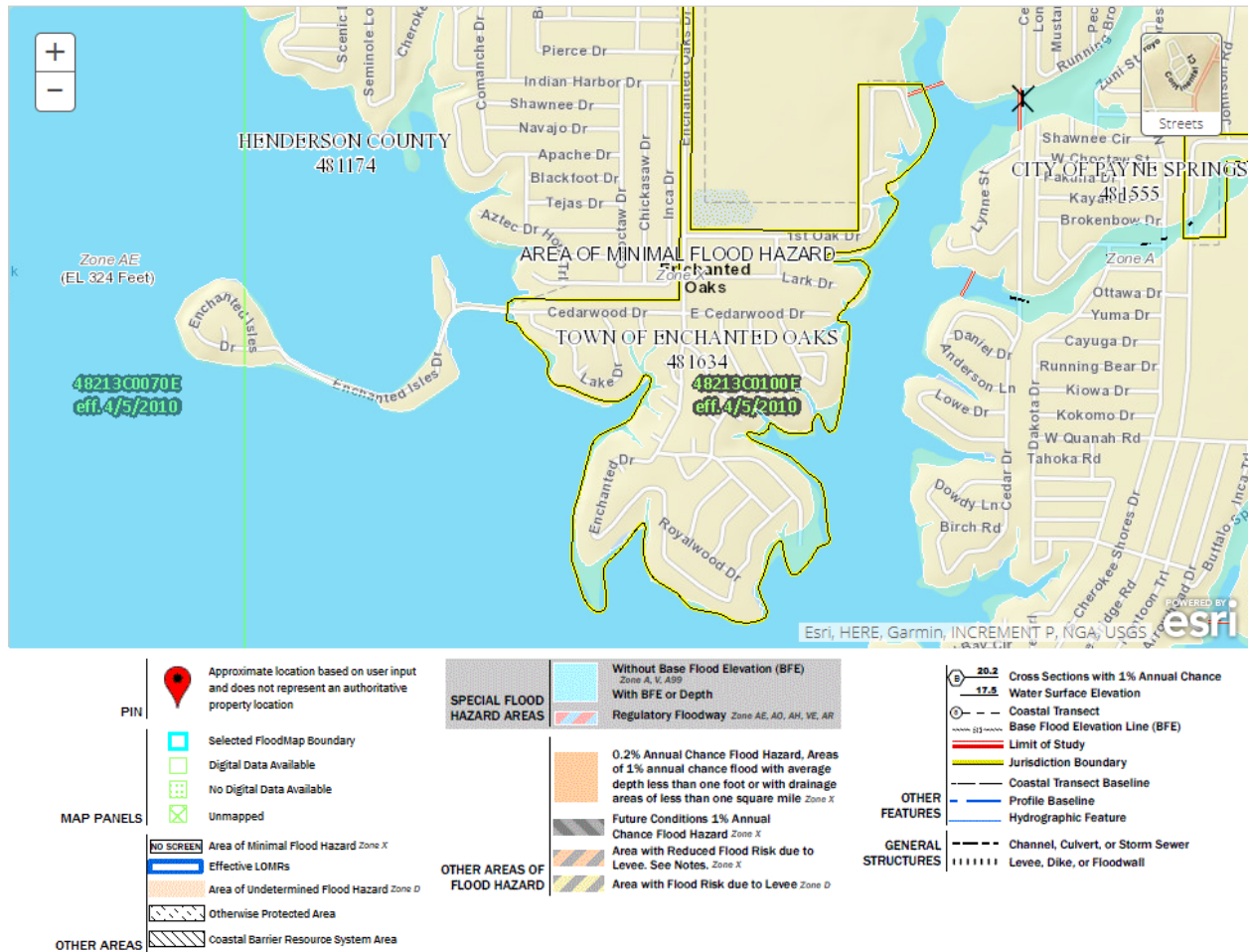
The City of Chandler is located in the northeast corner of Henderson County and has potential flooding sources from Kickapoo Creek, Lake Palestine and the Neches River.



## 9-7 CITY OF CHANDLER

## ENCHANTED OAKS

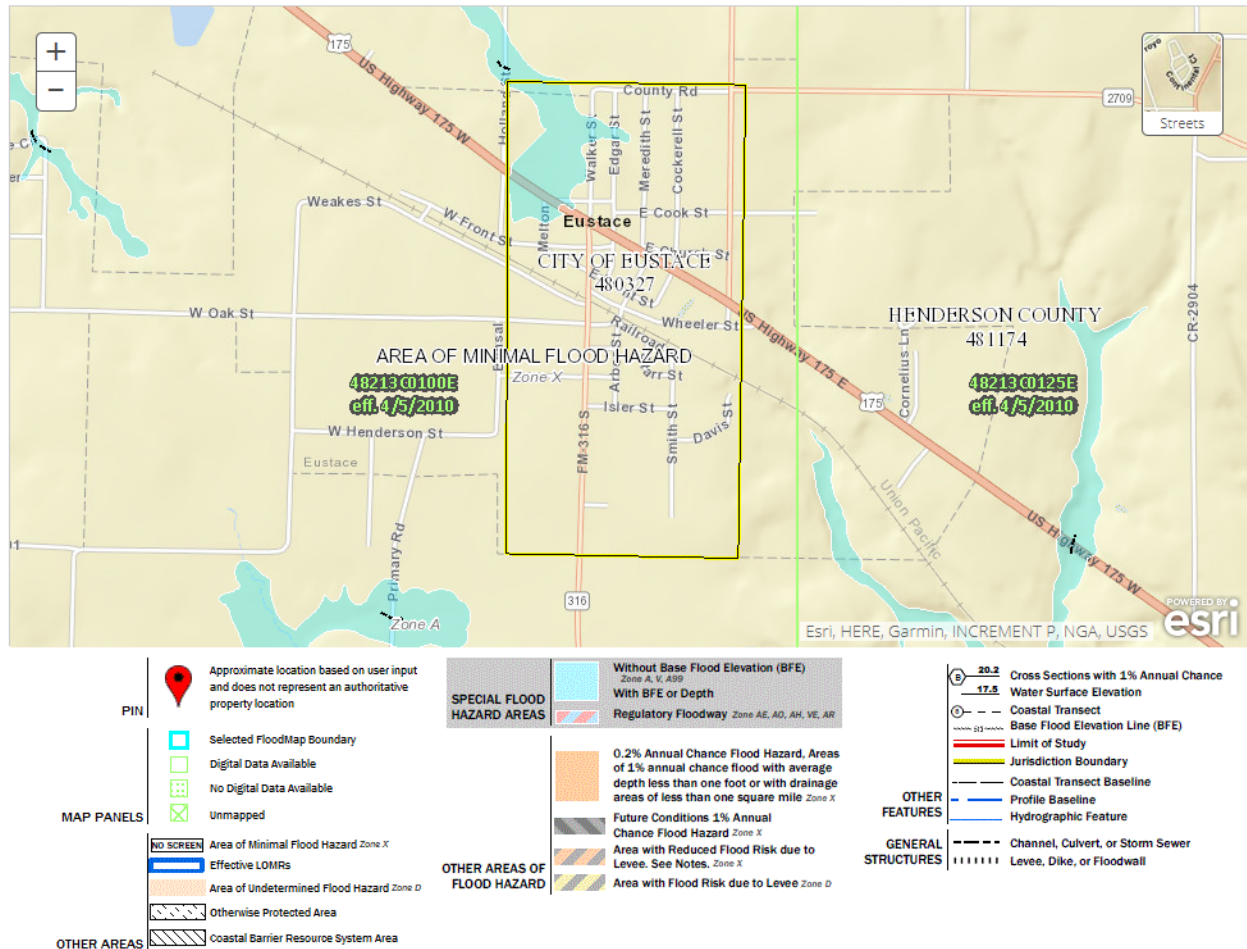
The City of Enchanted Oaks is located in the west section of Henderson County and has potential flooding from Cedar Creek Lake.



## 9-8 CITY ENCHANTED OAKS

## EUSTACE

The City of Eustace is located in the north west section of Henderson County and has potential flooding sources from private ponds and lakes.

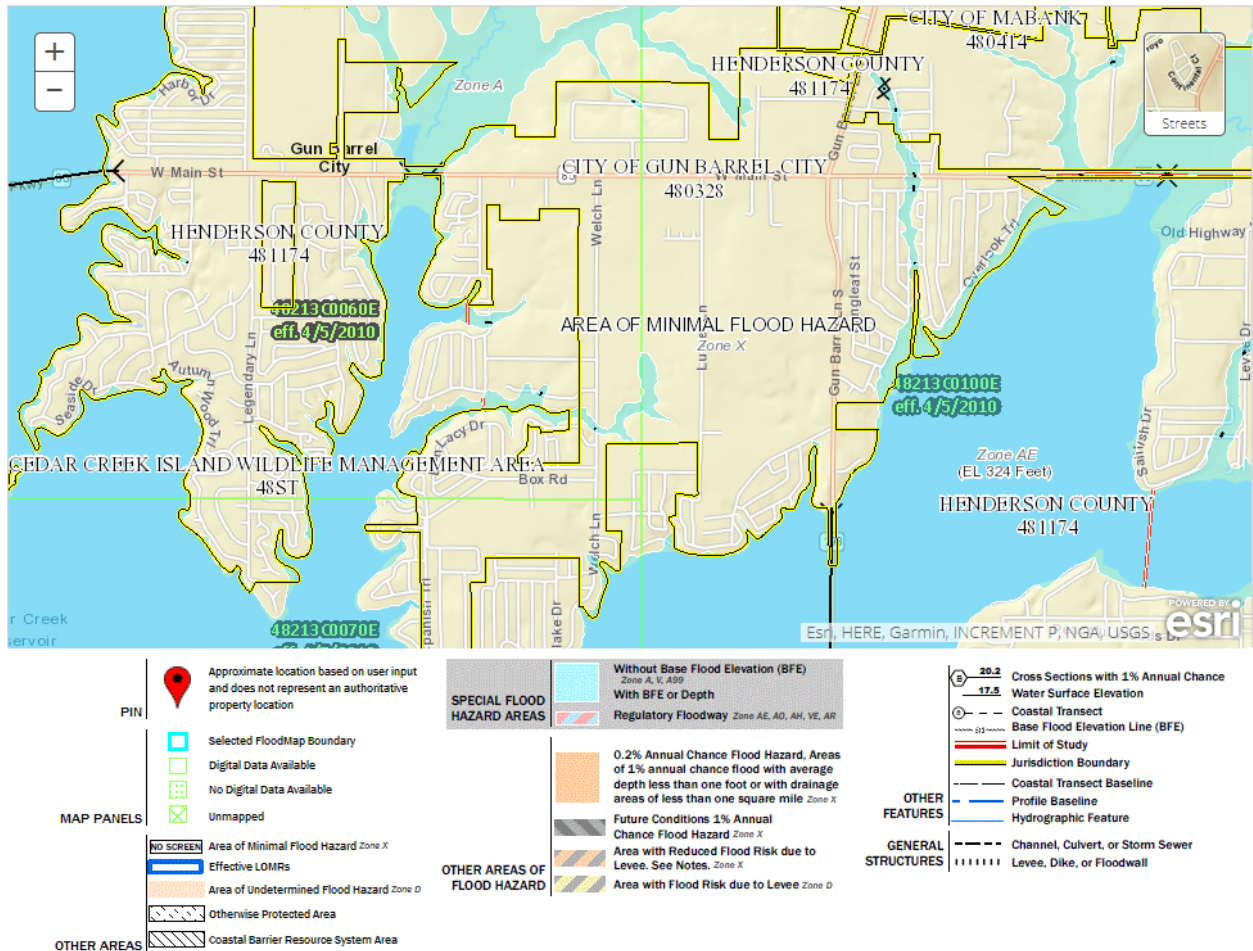


## 9-9 CITY OF EUSTACE



## GUN BARREL CITY

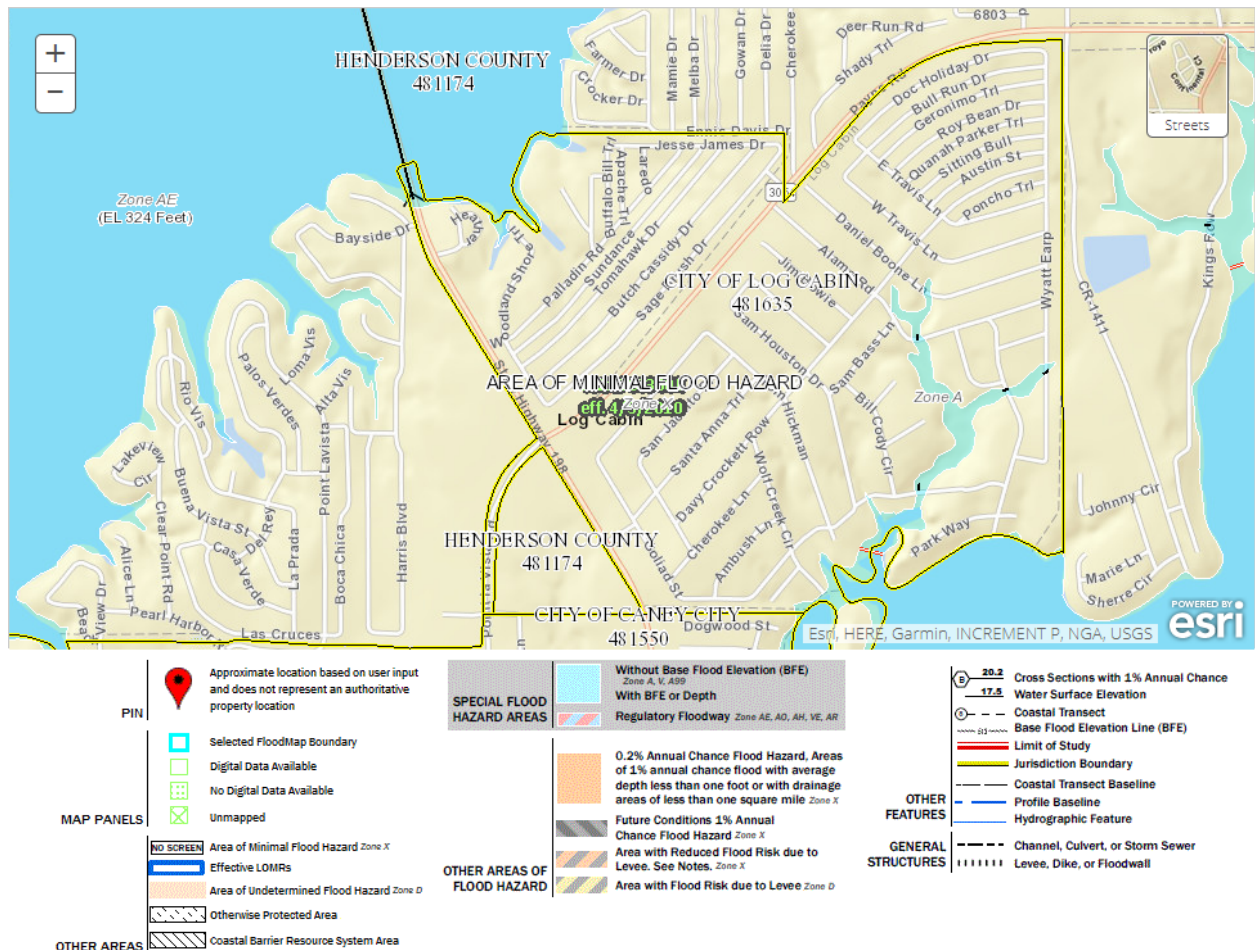
The City of Gun Barrel City is located in the west section of Henderson County and has a potential flooding source from Cedar Creek Lake..



9-10 CITY OF GUN BARREL CITY

## LOG CABIN

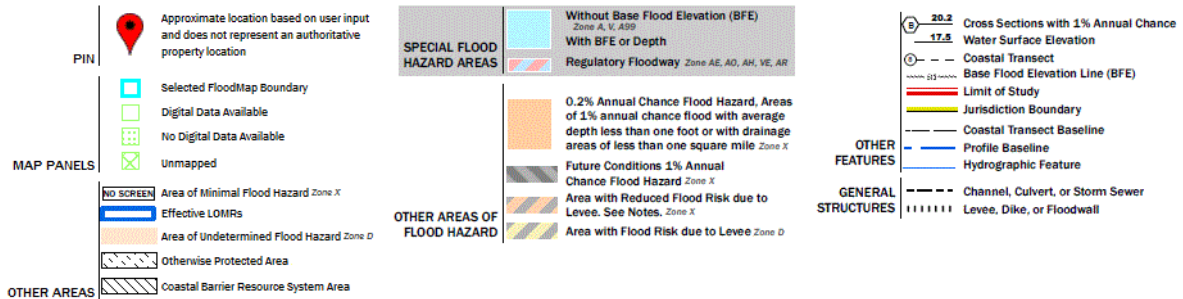
The City of Log Cabin is located in the west section of Henderson County and has a potential flooding source from Cedar Creek lake.



## 9-11 CITY OF LOG CABIN

## MALAKOFF

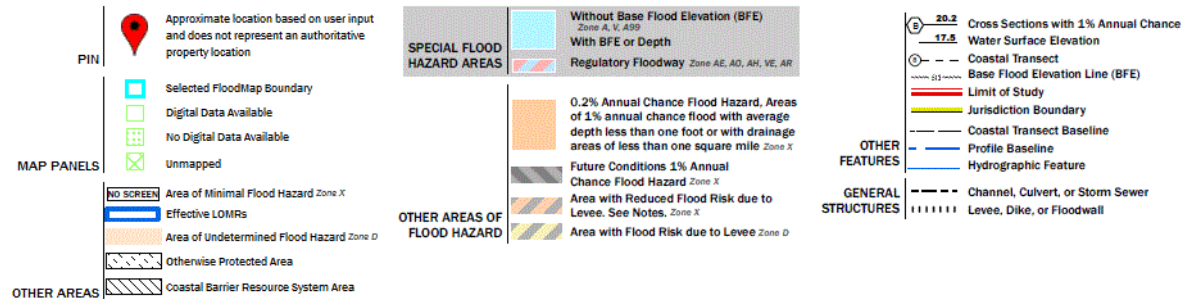
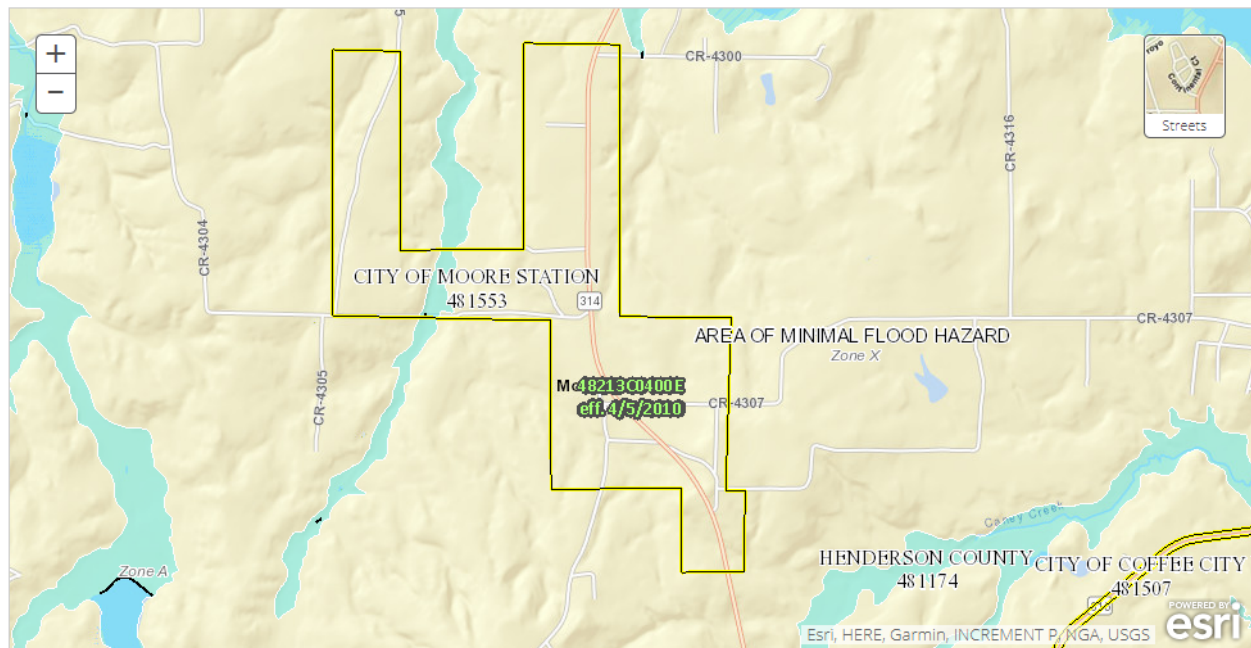
The City of Malakoff is located in the west section of Henderson County and has potential flooding sources from several private ponds and lakes.



9-12 CITY OF MALAKOFF

## MOORE STATION

The City of Moore Station is located in the south east section of Henderson County and has potential flooding sources from flat creek and Lake Palestine.

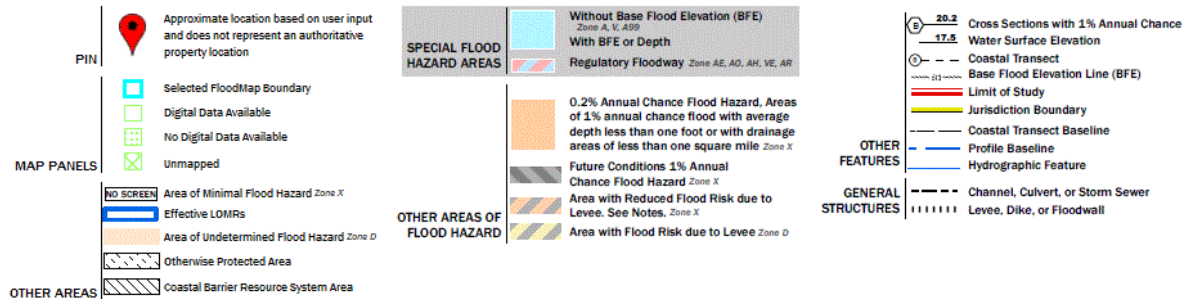
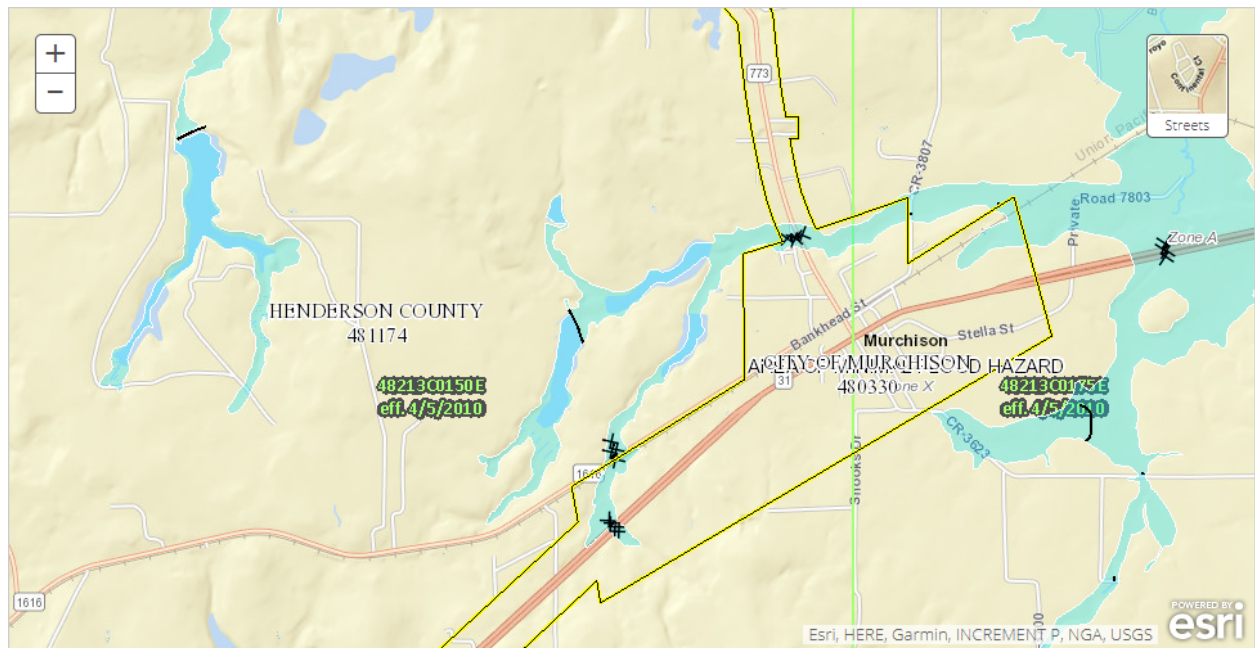


9-13 CITY OF MOORE STATION



## MURCHISON

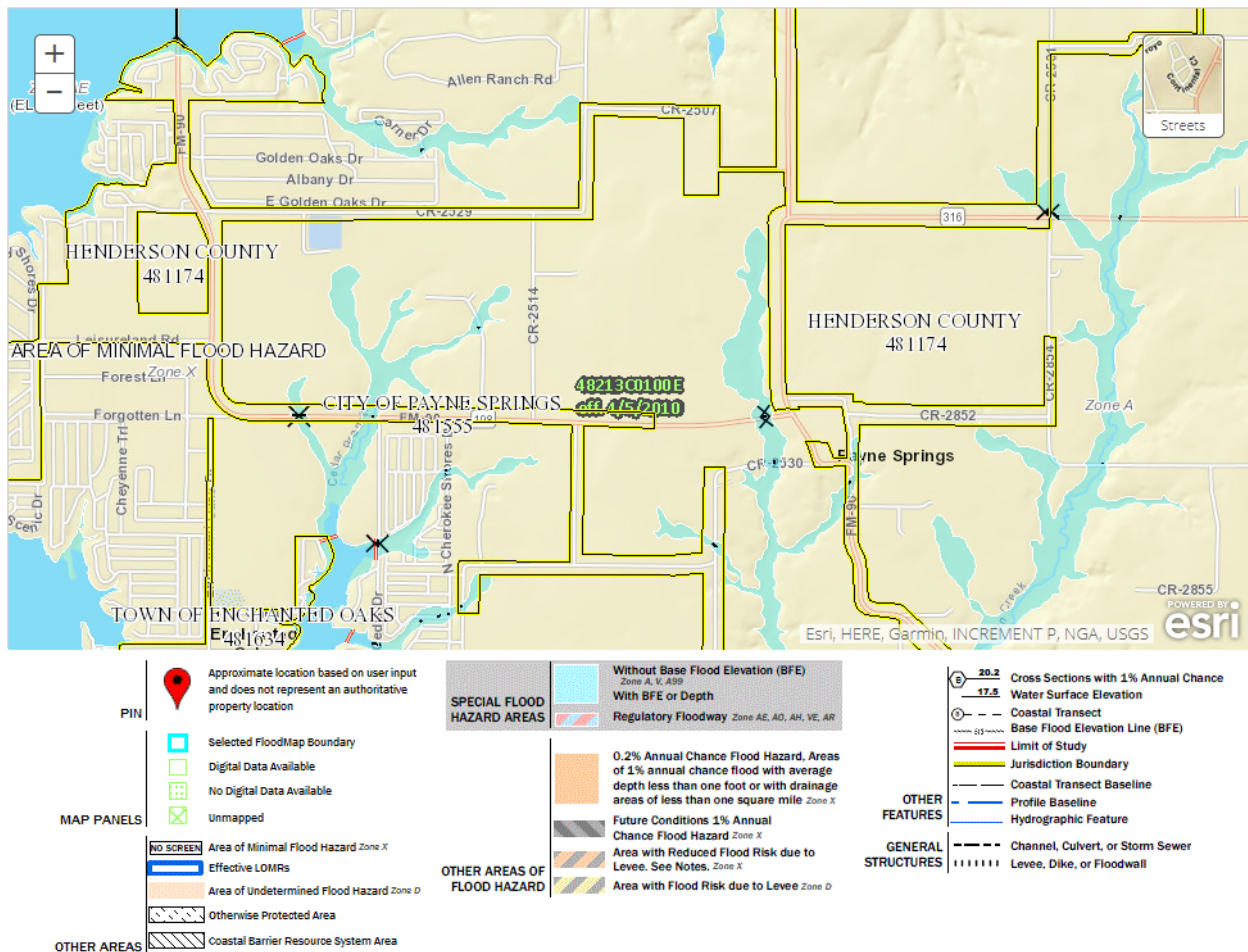
The City of Murchison is located in the east section of Henderson County and has a potential flooding source from Kippapoo Creek.



9-14 CITY OF MURCHISON

## PAYNE SPRINGS

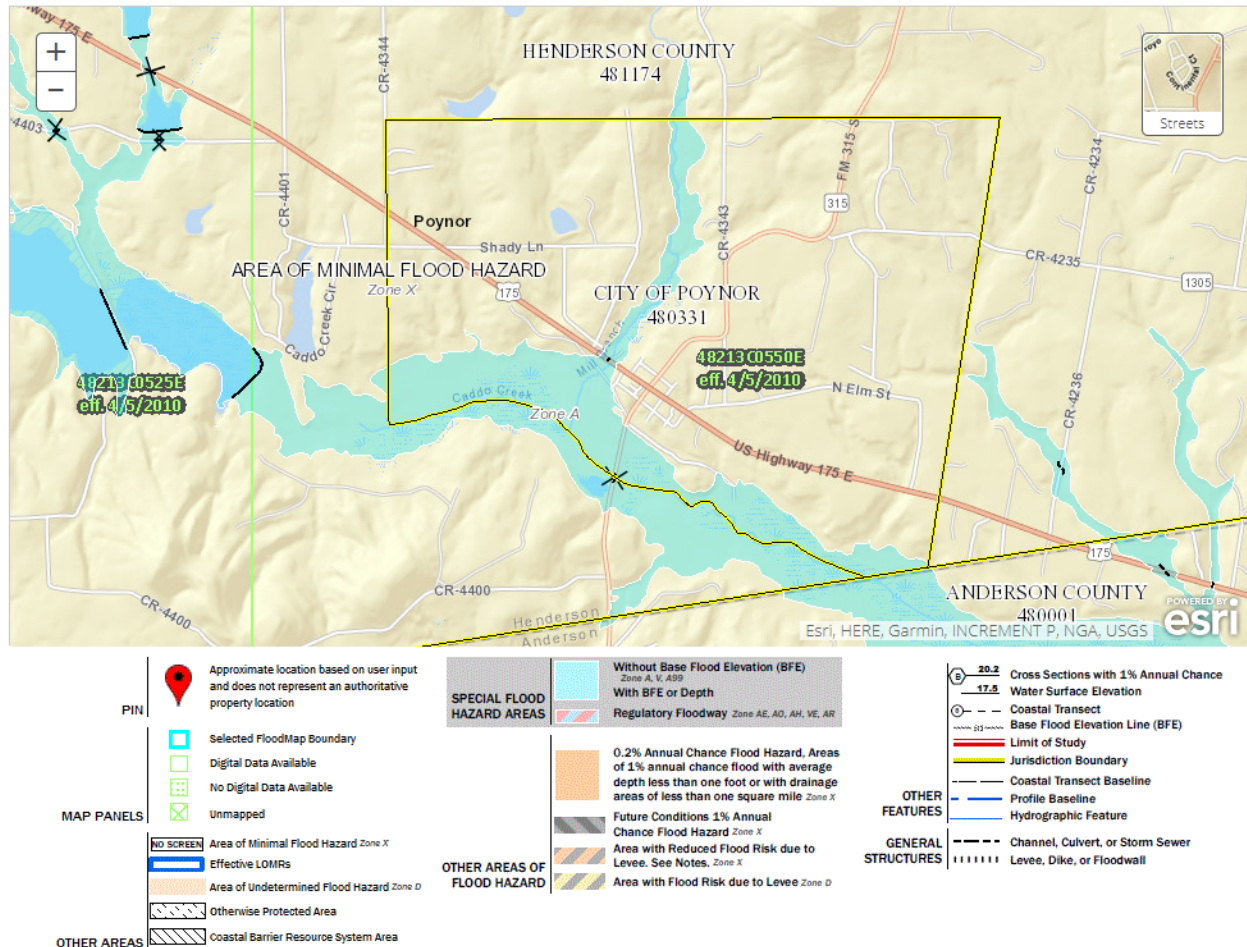
The City of Payne Springs is located in the north west section of Henderson County and has a potential flooding source from Cedar Creek lake.



9-15 CITY OF PAYNE SPRINGS

## POYNOR

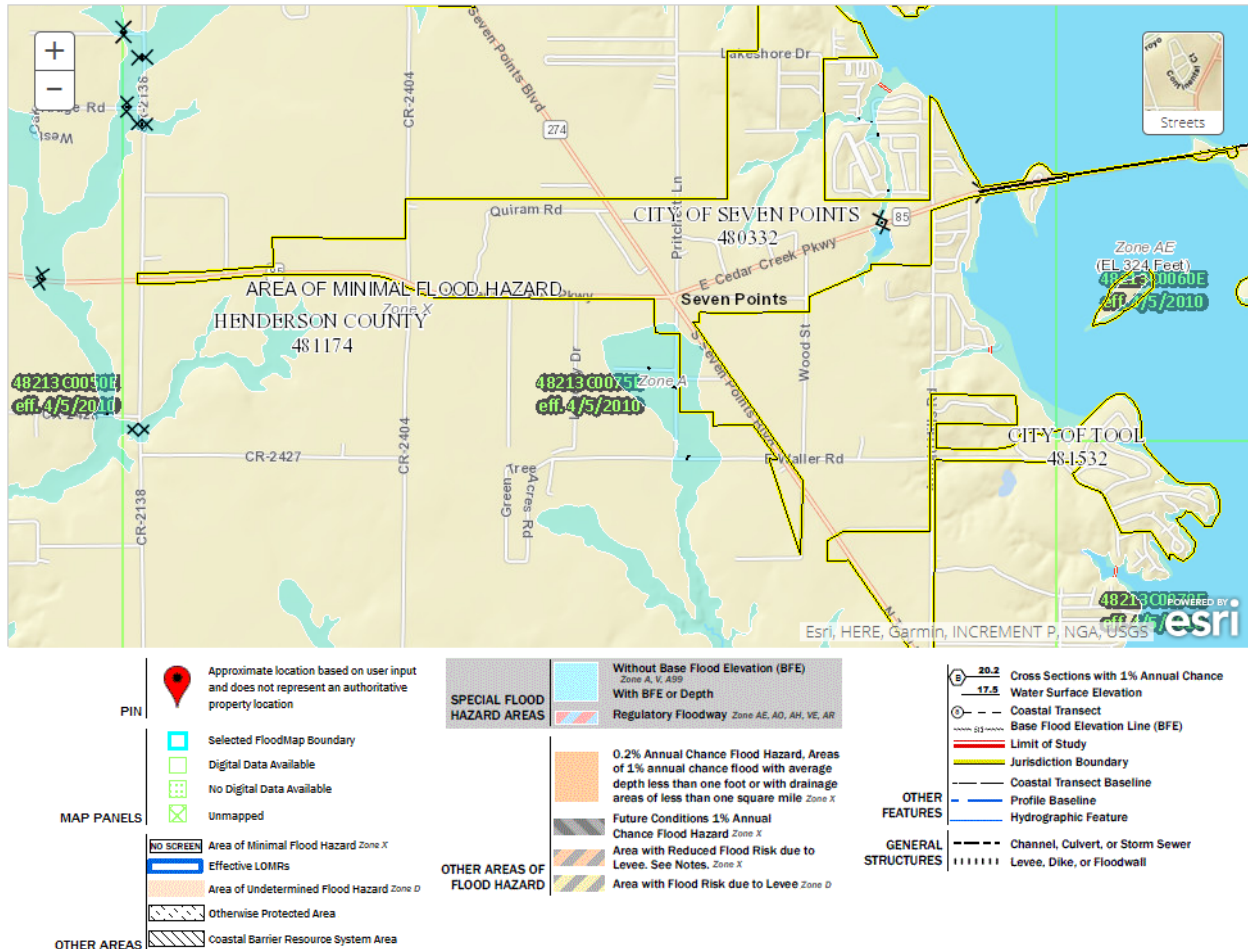
The City of Poynor is located in the south east section of Henderson County and has a potential flooding source from Caddo Creek.



9-16 CITY OF POYNOR

## SEVEN POINTS

The City of Seven Points is located in the northwest corner of Henderson County and has a potential flooding source from Cedar Creek Lake.

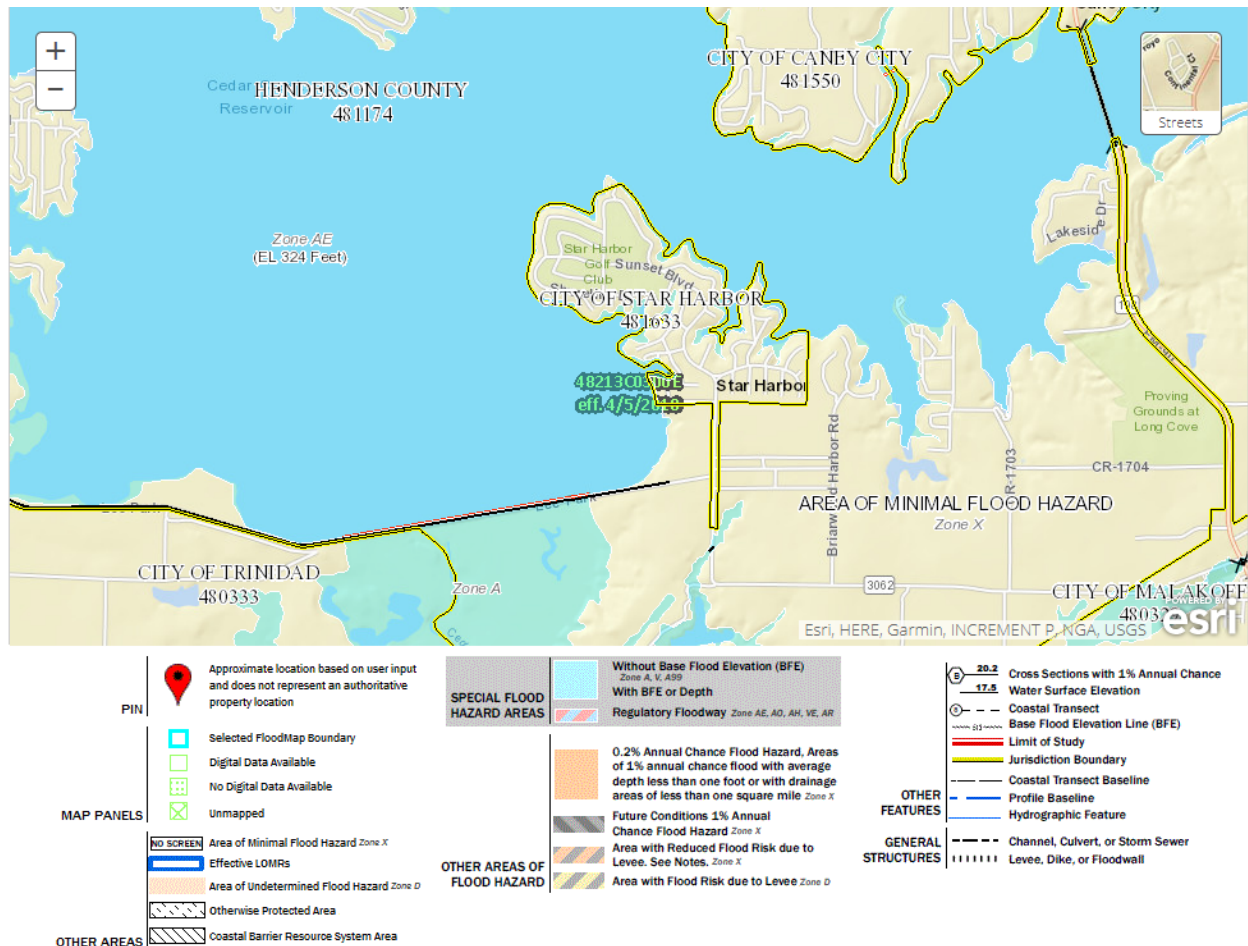


9-17 CITY OF SEVEN POINTS



## STAR HARBOR

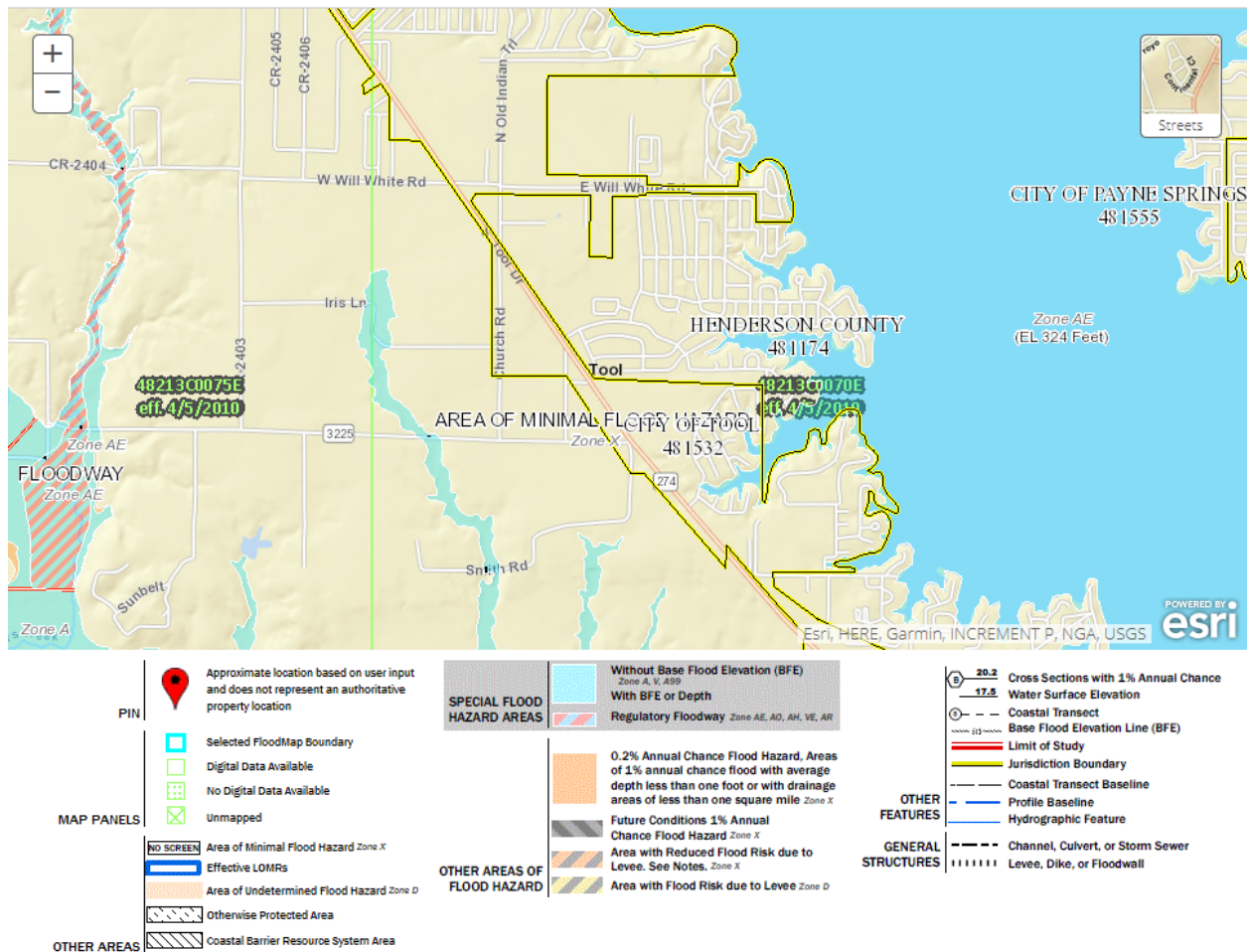
The City of Star Harbor is located in the south west section of Henderson County and has a potential flooding source from Cedar Creek lake.



9-18 CITY OF STAR HARBOR

## TOOL

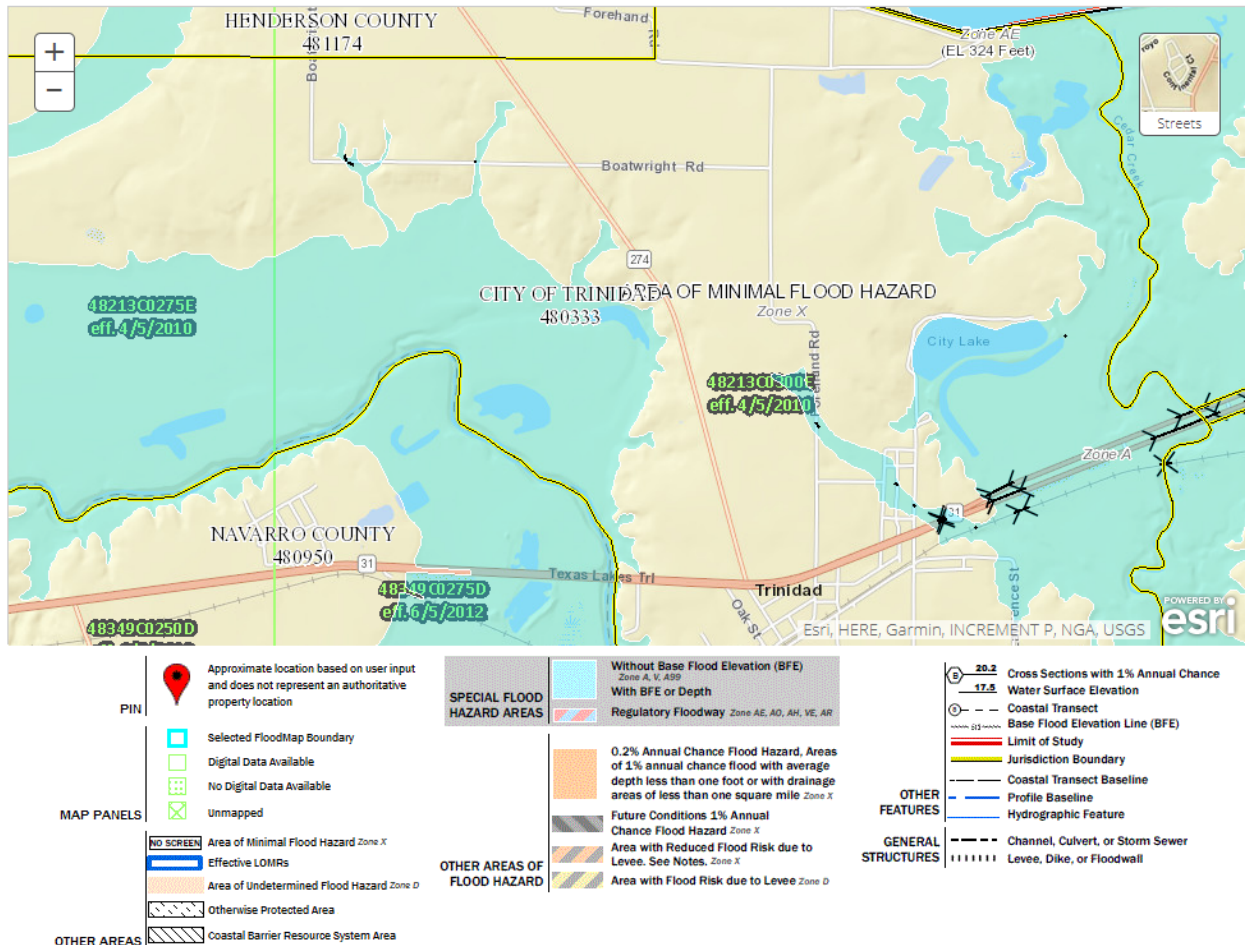
The City of Tool is located in the west section of Henderson County and has a potential flooding source from Cedar Creek lake.



9-19 CITY OF TOOL

## TRINIDAD

The City of Trinidad is located in the southwest corner of Henderson County and has potential flooding sources from Cedar Creek lake and the Trinity River.



### 9.1.2 EXTENT

The severity of a flood event is typically determined by a combination of several factors including: stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and degree of vegetative clearing and impervious surface. Generally, floods are long-term events that may last for several days.

Estimating the intensity and magnitude of a flood event is dependent upon the flood zone and location of the flood hazard area. FEMA categorizes areas on the terrain according to how the area will convey the discharge of flood water. The extent of flood damage can be expected to be greater in the areas where a base flood can occur. A base flood is defined by FEMA as a flood having a 1-percent-annual-chance of being equaled or exceeded in any given year. This is the regulatory standard also referred to as the "100year flood." The base flood is the national standard used by the National Flood Insurance Program (NFIP) and all federal agencies for the purposes of requiring the purchase of flood insurance and regulating new development. Flood zones are the categories that are mapped on Flood Insurance Rate Maps. TABLE 9-1 provides a description of FEMA flood zones and the flood impact in terms of severity or potential harm.

**TABLE 9-1 FLOOD ZONES**

INTENSITY	ZONE	DESCRIPTION
HIGH	ZONE A	Zone A interchangeably referred to as the 100-year flood, the 1-percent-annual-chance flood or the Special Flood Hazard Area (SFHA), or more commonly the base flood. Zone A is the area where the base flood will occur, and there constitutes a threat to the planning area. Areas with a 1-percent-annual-chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones.
MODERATE TO LOW	ZONE X	Area with a 0.2-percent-annual-chance (500 Year) floodplain- The area inundated by the food that has a 0.2 percent chance of being equaled or exceeded in a given year.

**SOURCE: FEMA**

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

The possible extent of flooding is also monitored by U.S. Geological Survey (USGS) river and lake gauges. There are two USGS gauges in particular that are monitored for flood depth in the Henderson County planning area.

Lake Palestine, USGS 08031400, gauge readings in Figure 9-13 show the extent of reservoir water surface elevations. Currently, the lake is at capacity and it peaked most recently in 2016 (USGS, 2018).

Cedar Creek Lake, USGS 08063010, gauge readings in Figure 10-14 show the extent of reservoir water surface elevations. Currently, the lake is at capacity and it peaked most recently in 2016 (USGS, 2018)..

The most recent peak streamflow was in 2016 (USGS, 2018a).

The worst case scenario for the Henderson County planning area is to see up to a 1-percent-annual-chance flood with 5 to 10 feet of water in each participating community.

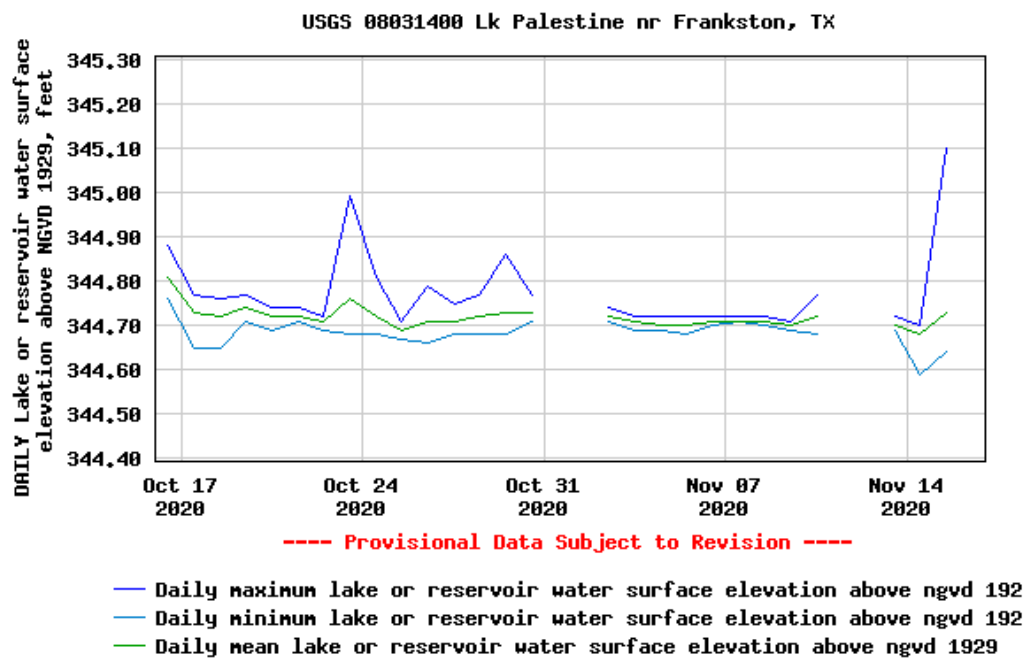


Figure 9-21 USGS Reading Gauge, Lake Palestine 2020

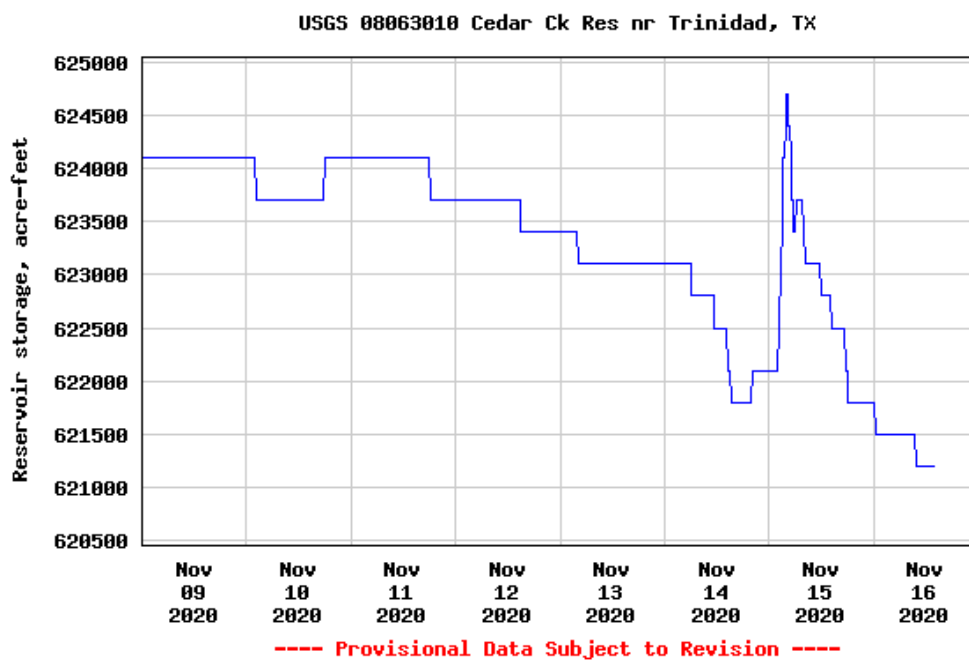


Figure 9-22 USGS Reading Gauge, Cedar Creek Lake 2020

The National Weather Service has various flash flood products that are issued to the public to provide information regarding the possible extent of upcoming and current flash food threats (TABLE 9-2).

**TABLE 9-2 NWS FLASH FLOODING PRODUCTS**

PRODUCTS	WHAT IT MEANS	YOU SHOULD....
HAZARDOUS WEATHER OUTLOOK	Will there be any threat of flash flooding in the next several days?	If there is a threat of flash flooding, check back later for updated forecasts and possible watches and warnings.
FLASH FLOOD WATCH	There is a threat of flash flooding within the next 48 hours, either as a result of heavy rain or the threat of a dam break.	Monitor weather conditions closely, especially if you live in an area prone to flash flooding
FLASH FLOOD WARNING	There is an immediate threat for flash flooding in the warned area, especially in low-lying and poor drainage areas.	If you live in an area susceptible to flash flooding, be prepared to evacuate and head to higher ground. Be very cautious when driving in the warned area, especially at night or while it is still raining. You may not be able to see a flooded road until it is too late.
AREAL FLOOD WARNING	The threat of flash flooding is over, but there is still significant standing water in the affected area.	Areal flood warning will typically list locations and roads impacted by the flooding. Try to avoid these locations until the water has receded.

### 9.1.3 PASTE EVENTS

The National Centers for Environmental Information (NCEI) storm events database includes flash flood and heavy rain events (no flood events were recorded). These occurred in the Henderson County planning area during this plan update timeframe of 2011 through 2019 and are listed in TABLE 9-3, as well as other events from local resources and experts. Forty five events were recorded, events occurring on the same day in different jurisdictions, were recorded as one event. Since 1965, there have been three Presidential Disaster Declarations that included flooding in the planning area. There is one included in this plan update timeframe, FEMA-DR-4269-DR for the April 29, 2016 event.

**TABLE 9-3 HISTORICAL FLOOD EVENTS IN HENDERSON COUNTY**

LOCATION	DATE	TYPE	DEATH	INJURY	ESTIMATED PROPERTY DAMAGE
Chandler	04/24/2019	Flash Flood	0	0	0
Malakoff	03/09/2016	Flood	0	0	0
Payne Springs	03/09/2016	Flash Flood	0	0	8000
Cross Roads	12/27/2015	Flash Flood	0	0	30000
Cross Roads	12/13/2015	Flash Flood	0	0	0

Cedar Creek Reservoir North	10/24/2015	Flash Flood	0	0	150000
Cross Roads	05/11/2015	Flood	0	0	0
Cross Roads	05/10/2015	Flash Flood	0	0	0
Loper	06/06/2013	Heavy Rain	0	0	0
Tool	06/10/2010	Flash Flood	0	0	100000
Aley	10/26/2011	Flash Flood	0	0	10000
Cedar Creek Reservoir North	10/13/2010	Flash Flood	0	0	0
Chandler	06/29/2008	Flash Flood	0	0	15000
Evelyn	05/14/2008	Flash Flood	0	0	0
Malakoff	09/05/2007	Flash Flood	0	0	0
Malakoff	07/06/2007	Flash Flood	0	0	750000
Malakoff	07/05/2007	Flash Flood	0	0	0
Chandler	07/03/2007	Flash Flood	0	0	0
Malakoff	06/26/2007	Flash Flood	0	0	50000
Payne Springs	06/26/2007	Flash Flood	0	0	0
Payne Springs	03/29/2007	Flash Flood	0	0	0
Chandler	03/12/2007	Flash Flood	0	0	0
Tool	01/15/2007	Flood	0	0	20000
Athens	01/13/2007	Flash Flood	0	0	0
Henderson County	03/19/2006	Flood	0	0	0
Athens	05/01/2004	Flash Flood	0	0	0
Payne Springs	05/01/2004	Flash Flood	0	0	0
West Central Portion	07/16/2002	Flash Flood	0	0	3000
Northwest Portion	07/16/2002	Flash Flood	0	0	0
Henderson County	12/16/2001	Flash Flood	0	0	0
Larue	06/25/1999	Flash Flood	0	0	0
Poynor	06/25/1999	Flash Flood	0	0	0
Brownsboro	05/26/1999	Flash Flood	0	0	0
County Wide	11/13/1998	Flash Flood	0	0	0
Tool	11/13/1998	Flash Flood	0	0	0
Malakoff	11/12/1998	Flash Flood	0	0	0
Aley	09/15/1998	Flash Flood	0	0	0
Athens	01/06/1998	Flash Flood	0	0	0

Chandler	01/05/1998	Flash Flood	0	0	0
Henderson County	01/05/1998	Heavy Rain	0	0	0
Henderson County	01/04/1998	Heavy Rain	0	0	0
Henderson County	12/20/1997	Heavy Rain	0	0	0
Athens	10/23/1997	Flash Flood	0	0	0
Athens	02/20/1997	Flash Flood	0	0	0
Henderson County	02/19/1997	Heavy Rain	0	0	0
<b>Total</b>		<b>45</b>	<b>0</b>	<b>0</b>	<b>1136000</b>

Source: NOAA NCEI

## TOP DAILY RAIN EVENTS

TABLE 9-4 lists the top 24 hour rain events from the Tyler Climate Station 1984 to 2019. Flash flooding can be caused by intense rainfall over a brief period.

**TABLE 9-4 HIGHEST 24-HOUR RAIN EVENTS AT TYLER CLIMATE STATION BY MONTH, 1984-2019**

MONTH	YEAR	AMOUNT (INCHES)	MONTH	YEAR	AMOUNT (INCHES)
<b>JANUARY</b>	2011	3.06	<b>JULY</b>	2009	2.77
<b>FEBRUARY</b>	2020	4.29	<b>AUGUST</b>	2008	6.41
<b>MARCH</b>	2016	3.69	<b>SEPTEMBER</b>	2013	4.27
<b>APRIL</b>	2019	4.41	<b>OCTOBER</b>	2015	6.33
<b>MAY</b>	2019	4.13	<b>NOVEMBER</b>	2008	3.28
<b>JUNE</b>	2010	4.82	<b>DECEMBER</b>	2017	4.19

Tyler Texas Weather

## USDA RISK MANAGEMENT AGENCY

According to USDA Risk Management Agency, payments for insured crop losses in Henderson County as a result of excessive moisture conditions between 2011 and 2019 caused \$0 in annualized crop losses.

### 9.1.4 WARNING TIME

Due to the sequential patterns of meteorological conditions needed to cause serious flooding, it is unusual for flood to occur without warning. Warning times for floods can be between 24 and 48 hours. Flash flooding can be less predictable, but by paying attention to NWS's Hazardous Weather Outlook, residents can be warned in advance of potential flash flooding danger.

## 9.2 VULNERABILITY AND IMPACTS

Many of the areas exposed to flooding may not experience serious flooding or flood damage. This section describes vulnerabilities in terms of population, property and critical facilities and infrastructure. The exposure and vulnerability analysis was performed at the census-block level. This methodology is likely to overestimate impacts from the modeled 1-percent-annual-chance flood event as it is assumed that both structures and the population are evenly spread throughout census blocks.



## 9.2.1 EXPOSURE

### POPULATION

Population counts of those living in the floodplain within the planning area were generated by estimating the percent of residential buildings in each jurisdiction within the 1-percent-annual-chance flood hazard areas and multiplying this by the total population within the planning area. This approach yielded an estimated population in the planning area of 0 living within the 1-percent-annual-chance flood area (4.44 percent of the total planning area population). TABLE 9-5 lists population estimates by jurisdiction living in the 1-percent-annual-chance flood hazard areas.

### PROPERTY

TABLE 9-5 summarizes the estimated value of exposed buildings in the planning area in the 1-percent annual-chance flood area. The inventory data estimated \$0 worth of building and contents exposure to the 1-percent-annual-chance flood area, representing 0% of the total replacement value of the planning area.

**TABLE 9-5 EXPOSURE WITHIN THE 1-PERCENT-ANNUAL-CHANCE FLOOD**

	VALUE EXPOSE			% OF TOTAL REPLACEMENT VALUE	POPULATION EXPOSED <sup>a</sup>	# OF 2020 TOTAL POPULATION
	STRUCTURE	CONTENT	TOTAL			
<b>Athens</b>	N/A	N/A	N/A	N/A	N/A	N/A
<b>Berryville</b>	0	0	0	0	0	0
<b>Brownsboro</b>	0	0	0	0	0	0
<b>Caney City</b>	0	0	0	0	0	0
<b>Chandler</b>	0	0	0	0	0	0
<b>Coffee City</b>	0	0	0	0	0	0
<b>Enchanted Oaks</b>	0	0	0	0	0	0
<b>Eustace</b>	0	0	0	0	0	0
<b>Gun Barrel City</b>	0	0	0	0	0	0
<b>Log Cabin</b>	0	0	0	0	0	0
<b>Malakoff</b>	0	0	0	0	0	0
<b>Moore Station</b>	0	0	0	0	0	0
<b>Murchison</b>	0	0	0	0	0	0
<b>Payne Springs</b>	0	0	0	0	0	0
<b>Poynor</b>	0	0	0	0	0	0

<b>Seven Points</b>	0	0	0	0	0	0
<b>Star Harbor</b>	0	0	0	0	0	0
<b>Tool</b>	0	0	0	0	0	0
<b>Trinidad</b>	0	0	0	0	0	0
<b>Henderson County</b>	0	0	0	0	0	0
<b>TOTAL</b>	0	0	0	0	0	0

Table 9-6 summarizes the numbers of critical facilities and infrastructure in the 1-percent-annual-chance flood area.

**TABLE 9-6 CRITICAL FACILITIES IN THE 1-PERCENT-ANNUAL-CHANCE FLOOD HAZARD AREA**

<b>JURISDICTION</b>	<b>MEDICAL AND HEALTH SERVICES</b>	<b>EMERGENCY SERVICES</b>	<b>EDUCATION FACILITIES</b>	<b>OTHER CRITICAL FACILITIES</b>	<b>UTILITIES /COMMUNICATION</b>	<b>TRANSPORTATION INFRASTRUCTURE</b>	<b>TOTAL</b>
<b>Athens</b>	0	0	0	0	0	0	0
<b>Berryville</b>	0	0	0	0	0	0	0
<b>Brownsboro</b>	0	0	0	0	0	0	0
<b>Caney City</b>	0	0	0	0	0	0	0
<b>Chandler</b>	0	0	0	0	0	0	0
<b>Coffee City</b>	0	0	0	0	0	0	0
<b>Enchanted Oaks</b>	0	0	0	0	0	0	0
<b>Eustace</b>	0	0	0	0	0	0	0
<b>Gun Barrel City</b>	0	0	0	0	0	0	0
<b>Log Cabin</b>	0	0	0	0	0	0	0
<b>Malakoff</b>	0	0	0	0	0	0	0
<b>Moore Station</b>	0	0	0	0	0	0	0
<b>Murchison</b>	0	0	0	0	0	0	0
<b>Payne Springs</b>	0	0	0	0	0	0	0
<b>Poynor</b>	0	0	0	0	0	0	0

<b>Seven Points</b>	0	0	0	0	0	0	0
<b>Star Harbor</b>	0	0	0	0	0	0	0
<b>Tool</b>	0	0	0	0	0	0	0
<b>Trinidad</b>	0	0	0	0	0	0	0
<b>Henderson County</b>	0	0	0	0	0	0	0
<b>TOTAL</b>	0	0	0	0	0	0	0

**SOURCE: FEMA, 2020**

### 9.2.2 IMPACTS

Many of the areas exposed to flooding may not experience serious flooding or flood damage. This section describes impacts in terms of population, property, infrastructure, and agriculture. The analysis was performed at the census-block level. This methodology is likely to overestimate impacts from the modeled 1-percent-annual-chance flood event as it is assumed that both structures and the population are evenly spread throughout census blocks.

Due to Henderson County planning area being an interior location (over 200 miles inland), they are not exposed directly to hurricanes. The hurricanes usually fade and downgrade to tropical storms or tropical depressions as they move away from the coast. Since 1965, Henderson County has been included in five Presidential Emergency Management (EM) Declarations and two Disaster (DR) Declarations for hurricanes in the planning area. Three are included in this plan update timeframe (FEMA-DR-1791-TX and FEMA-EM3294-TX for Hurricane Ike and FEMA-EM-3290-TX for Hurricane Gustav).

According to NCEI, Henderson County was impacted by one Gulf of Mexico hurricane-related event during this plan update timeframe – Hurricane Ike (no impacts were recorded from Hurricane Gustav). It was considered a tropical storm when it reached the planning area.

#### LISTED EVENT-

Historical events indicate that a hurricane will affect the Henderson County planning area as tropical storms, hail, lightning, or related weather events (high winds, tornado). These hazards are discussed in more detail in Chapter 12.

Property, population, and the natural environment are all exposed to hurricanes and tropical storms, however, by the time such an event reaches Henderson County it will be more closely classified as a tropical storm, depression, or related event (such as hail, high winds, or lightning). The entire population of the planning area would be affected by the tropical storm or tropical depression to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of functions of utilities could impact populations that suffered no direct damage from an event. This is the reason Hurricane/Tropical Storms were not mitigated as a hazard to the planning area.

### POPULATION

Impacts on persons in the planning area were estimated for the 1-percent-annual-chance flood event through the FEMA National Flood Hazard Layer analysis. TABLE 9-7 summarizes the results.

**TABLE 9-7 ESTIMATED FLOOD IMPACT ON PERSONS**

<b>JURISDICTION</b>	<b>ESTIMATED DISPLACED POPULATION</b>	<b>% OF 2019 TOTAL POPULATION</b>
<b>Athens</b>	N/A	N/A
<b>Berryville</b>	0	0
<b>Brownsboro</b>	0	0
<b>Caney City</b>	0	0
<b>Chandler</b>	0	0
<b>Coffee City</b>	0	0
<b>Enchanted Oaks</b>	0	0
<b>Eustace</b>	0	0
<b>Gun Barrel City</b>	0	0
<b>Log Cabin</b>	0	0
<b>Malakoff</b>	0	0
<b>Moore Station</b>	0	0
<b>Murchison</b>	0	0
<b>Payne Springs</b>	0	0
<b>Poynor</b>	0	0
<b>Seven Points</b>	0	0
<b>Star Harbor</b>	0	0
<b>Tool</b>	0	0
<b>Trinidad</b>	0	0
<b>Henderson County</b>	0	0
<b>TOTAL</b>	0	0

Floods and their aftermath present numerous threats to public health and safety:

- **Unsafe food**—Floodwaters contain disease-causing bacteria, dirt, oil, human and animal waste, and farm and industrial chemicals. Their contact with food items, including food crops in agricultural lands, can make that food unsafe to eat. Refrigerated and frozen foods are affected during power outages caused by flooding. Foods in cardboard, plastic bags, jars, bottles, and paper packaging may be unhygienic with mold contamination.
- **Contaminated drinking and washing water and poor sanitation**—Flooding impairs clean water sources with pollutants. The pollutants also infiltrate into the groundwater. Flooded wastewater treatment plants can be overloaded, resulting in backflows of raw sewage. Private wells can be contaminated by floodwaters. Private sewage disposal systems can become a cause of disease if they overflow.

- Mosquitoes and animals—Floods provide new breeding grounds for mosquitoes in wet areas and stagnant pools. The public should dispose of dead animals that can carry viruses and diseases only in accordance with guidelines issued by local animal control authorities. Leptospirosis—a bacterial disease associated predominantly with rats—often accompanies floods in developing countries, although the risk is low in industrialized regions unless cuts or wounds have direct contact with disease contaminated flood waters or animals.
- Mold and mildew—Excessive exposure to mold and mildew can cause flood victims—especially those with allergies and asthma—to contract upper respiratory diseases, triggering cold-like symptoms. Molds grow in as short a period as 24 to 48 hours in wet and damp areas of buildings and homes that have not been cleaned after flooding, such as water-infiltrated walls, floors, carpets, toilets and bathrooms. Very small mold spores can be easily inhaled by human bodies and, in large enough quantities, cause allergic reactions, asthma episodes, and other respiratory problems. Infants, children, elderly people and pregnant women are considered most vulnerable to mold-induced health problems.
- Carbon monoxide poisoning—In the event of power outages following floods, some people use alternative fuels for heating or cooking in enclosed or partly enclosed spaces, such as small gasoline engines, stoves, generators, lanterns, gas ranges, charcoal or wood. Built-up carbon monoxide from these sources can poison people and animals.
- Hazards when reentering and cleaning flooded homes and buildings—Flooded buildings can pose significant health hazards to people entering them. Electrical power systems can become hazardous. Gas leaks can trigger fire and explosion. Flood debris—such as broken bottles, wood, stones and walls—may cause injuries to those cleaning damaged buildings. Containers of hazardous chemicals may be buried under flood debris. Hazardous dust and mold can circulate through a building and be inhaled by those engaged in cleanup and restoration.
- Mental stress and fatigue—People who live through a devastating flood can experience long-term psychological impact. The expense and effort required to repair flood-damaged homes places severe financial and psychological burdens on the people affected. Post-flood recovery can cause anxiety, anger, depression, lethargy, hyperactivity, and sleeplessness. There is also a long-term concern among the affected that their homes can be flooded again in the future. Current loss estimation models are not equipped to measure public health impacts such as these. The best preparation for these effects includes awareness that they can occur, education of the public on prevention, and planning to deal with them during responses to flood events.

PROPERTY

TABLE 9-8 LOSS ESTIMATES FOR 1-PERCENT-ANNUAL-CHANCE FLOOD				
JURISDICTION	ESTIMATED LOSSES BY REPLACEMENT VALUE		TOTAL	% OF TOTAL REPLACEMENT VALUE
	STRUCTURE	CONTENT		
Athens	N/A	N/A	N/A	N/A
Berryville	0	0	0	0
Brownsboro	0	0	0	0
Caney City	0	0	0	0
Chandler	0	0	0	0
Coffee City	0	0	0	0
Enchanted Oaks	36,000,000	7,200,000	43,200,000	N/A
Eustace	0	0	0	0
Gun Barrel City	7,166,400	2,445,400	9,246,800	N/A
Log Cabin	350,000	350,000	750,000	100
Malakoff	0	0	0	0
Moore Station	0	0	0	0
Murchison	0	0	0	0
Payne Springs	0	0	0	0
Poynor	0	0	0	0
Seven Points	0	0	0	0
Star Harbor	0		0	0
Tool	0	0	0	0
Trinidad	0	0	0	0
Henderson County	0	0	0	0
<b>TOTAL</b>	43516400	9995400	53196800	100

## CRITICAL FACILITIES AND INFRASTRUCTURE

<b>9-9 ESTIMATED DAMAGE TO CRITICAL FACILITIES AND INFRASTRUCTURE FROM 1%-ANNUAL-CHANCE FLOOD</b>				
<b>TYPES OF CRITICAL FACILITIES AND INFRASTRUCTURE</b>	<b>NUMBER OF FACILITIES AFFECTED</b>	<b>AVERAGE % OF TOTAL VALUE DAMAGED</b>		<b>DAYS TO 100% FUNCTIONALLY</b>
		<b>STRUCTURE</b>	<b>CONTENT</b>	
<b>MEDICAL AND HEALTH SERVICES</b>	N/A	N/A	N/A	N/A
<b>EMERGENCY SERVICES</b>	1	N/A	N/A	N/A
<b>EDUCATIONAL FACILITIES</b>	1	26.6	10	N/A
<b>OTHER CRITICAL FACILITIES</b>	N/A	N/A	N/A	N/A
<b>UTILITIES/COMMUNICATION</b>	N/A	N/A	N/A	N/A
<b>TRANSPORTATION INFRASTRUCTURE</b>	3	N/A	N/A	N/A
<b>TOTAL</b>	5	N/A	N/A	N/A

## AGRICULTURE

<b>TABLE 9-10 ESTIMATED INSURABLE ANNUAL CROPS LOST RESULTING FROM EXCESSIVE MOISTURE</b>			
<b>6-YEAR EXCESSIVE MOISTURE INSURANCE PAID</b>	<b>ADJUSTED 6-YEAR LOSSES (CONSIDERING 88% INSURED)</b>	<b>ESTIMATED ANNUALIZED LOSSES</b>	<b>2018 VALUE OF CROPS</b>
0	0	0	11,645,000
Source: USDA-NASS			

## COMMUNITY PERCEPTION OF VULNERABILITY

The city of Chandler, Malakoff, Murchison, Payne Springs, Seven Points, Tool and Trinidad ranked flood as a “high” hazard and the jurisdictions of Enchanted Oaks, Gun Barrel City, Log Cabin and Poynor ranked flood as a “medium” hazard. The cities of Athens, Berryville, Brownsboro, Caney City, Coffee City, Eustace, Moore Station and Star Harbor ranked flood as a “low” hazard.

See the first page of this chapter for a summary of hazard ranking for Henderson County and the planning partners in this plan update. Chapter 16 gives a detailed description of these rankings and 15.2 addresses mitigation actions for this hazard vulnerability.

## NATIONAL FLOOD INSURANCE PROGRAM PARTICIPATION

Participants in the NFIP must, at a minimum, regulate development in floodplain areas in accordance with NFIP criteria. Before issuing a permit to build in a floodplain, participating jurisdictions must ensure that three criteria are met:

- New buildings and those undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood.
- New floodplain development must not aggravate existing flood problems or increase damage to other properties.
- New floodplain development must exercise a reasonable and prudent effort to reduce its adverse impacts on threatened salmonid species.

Henderson County and all incorporated cities in the county that participate in the NFIP, are currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the Texas Water Development Board under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. All planning partners that participate in the NFIP have identified initiatives to maintain and continue their compliance and good standing.

TABLE 10-11 provides details on NFIP participation for the communities in the planning area as well as the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction, where applicable. The claims information is for the period from July 1974 to December 2018. Participants in the NFIP must, at a minimum, regulate development in floodplain areas in accordance with NFIP criteria. Before issuing a permit to build in a floodplain, participating jurisdictions must ensure that three criteria are met:

- New buildings and those undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood
- New floodplain development must not aggravate existing flood problems or increase damage to other properties.
- New floodplain development must exercise a reasonable and prudent effort to reduce its adverse impacts on threatened salmonid species.

Henderson County and all incorporated cities in the county that participate in the NFIP, are currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the Texas Water Development Board under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. All planning partners that participate in the NFIP have identified initiatives to maintain and continue their compliance and good standing.

### 9-11 NATIONAL FLOOD INSURANCE PROGRAM STATISTICS

JURISDICTION	NFIP PARTICIPATION (YES/NO)	CURRENT EFFECTIVE MAP DATE	PROGRAM ENTRY DATE	POLICIES IN FORCE	INSURANCE IN FORCE	# OF CLOSED LOSSES	VALUE OF CLAIMS PAID (\$)
<b>Athens</b>	Yes	04/05/2010	08/23/1974	19	5,896,500	3	6728
<b>Berryville</b>	Yes	04/05/2010	06/26/1979	6	1,450,000	0	0
<b>Brownsboro</b>	Yes	04/05/2010	12/10/1976	2	1,250,000	0	0
<b>Caney City</b>	Yes	04/05/2010	06/17/1980	1	26,600	0	0
<b>Chandler</b>	Yes	04/05/2010	06/28/1974	8	2,460,000	2	18852



<b>Coffee City</b>	Yes	04/05/2010	07/03/1979	1	8,000	0	0
<b>Enchanted Oaks</b>	Yes	04/05/2010	1990	4	1,225,000	0	0
<b>Eustace</b>	No	04/05/2010	016/11/1976	0	0	0	0
<b>Gun Barrel City</b>	Yes	04/05/2010	11/08/1974	34	8,810,000	5	17841
<b>Log Cabin</b>	Yes	04/05/2010	N/A	1	350,000	0	0
<b>Malakoff</b>	Yes	04/05/2010	10/25/1974	3	836,800	12	1,676,119
<b>Moore Station</b>	No	N/A	N/A	0	0	0	0
<b>Murchison</b>	Yes	04/05/2010	06/11/1976	1	350,000	1	0
<b>Payne Springs</b>	Yes	04/05/2010	07/01/1980	5	1,410,000	0	0
<b>Poynor</b>	No	04/05/2010	N/A	0	0	0	0
<b>Seven Points</b>	Yes	July 2012	11/05/1976	3	796,000	0	0
<b>Star Harbor</b>	Yes	N/A	N/A	8	1,895,800	0	0
<b>Tool</b>	Yes	04/05/2010	05/29/1979	9	1,737,900	3	0
<b>Trinidad</b>	Yes	04/05/2010	10/18/1974	2	420,000	1	448
<b>Henderson County</b>	Yes	04/05/2010	11/22/1977	185	47,254,000	37	346,517

SOURCE: FEMA NFIP

## REPETITIVE LOSS

A **repetitive loss property** is defined by FEMA as an NFIP-insured property that has experienced the following since 1978, regardless of any changes in ownership:

- Two paid losses in excess of \$1,000 within any rolling 10-year period

A **severe repetitive loss property** as defined as a “single family property” (consisting of one-to-four residences) that is covered under flood insurance by the NFIP and has incurred flood-related damage for which:

- Four or more separate claim payments have been paid under flood insurance coverage with the amount of each claims payments exceeding \$5,000 and with cumulative amounts of such claims payments exceeding \$20,000; or
- At least two separate claims payments have been made with the cumulative amount of such claims exceeding the fair market value of the property on the day before each loss.

There are 2 repetitive loss properties that meet the above definitions, within unincorporated Henderson County of \$112,844 and one repetitive loss property in Malakoff of \$1,607,905 that are inside the participating jurisdictions according to the Henderson County Floodplain Administrator.

### **9.3 PROBABILITY OF FUTURE EVENTS**

With the history of flooding in the planning area, it is likely that flooding of various levels will continue to occur. According to NCEI, in the 10-year timeframe for this plan update, there were 12 events. This translates to approximately one event per year. Therefore, the probability rating is “high.”

The planning committee members assessed the future probability of flood based on their jurisdictional knowledge. Henderson County and the cities of Malakoff, Murchison, Payne Springs, Seven Points, Tool and Trinidad all ranked the probability of a future event as high to occur within the next 25 years. The cities of Berryville, Chandler, Enchanted Oaks, Gun Barrel City, Log Cabin, Poynor and Star Harbor all ranked the probability of a future event as moderate to occur within the next 100 years. The Cities of Athens, Brownsboro, Caney City, Coffee City, Eustace and Moore Station ranked it as a low probability of future occurrence.

### **9.4 CLIMATE CHANGE IMPACTS**

Use of historical hydrologic data has long been the standard of practice for designing and operating water supply and flood protection projects. For example, historical data are used for flood forecasting models. This method of forecasting assumes that the climate of the future will be similar to that of the period of historical record. However, the hydrologic record cannot be used to predict changes in frequency and severity of extreme climate events such as floods. Going forward, model calibration or statistical relation development must happen more frequently, new forecast-based tools must be developed, and a standard of practice that explicitly considers climate change must be adopted. Climate change is already impacting water resources, and resource managers have observed the following:

- Historical hydrologic patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply and quality, flood management, and ecosystem functions.
- Extreme climatic events will become more frequent, necessitating improvement in flood protection, drought preparedness, and emergency response.

High frequency flood events (for example, 10-year floods) in particular will likely increase with a changing climate. Scientists project greater storm intensity, resulting in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will likewise change runoff and recharge patterns. As stream flows and velocities change, erosion patterns will also change, altering channel shapes and depths, possibly increasing sedimentation behind dams, and affecting habitat and water quality. With potential increases in the frequency and intensity of wildfires due to climate change, there is potential for more floods following fire, which increase sediment loads and water quality impacts.

As hydrology changes, what is currently considered a 100-year flood may strike more often, leaving many communities at greater risk. Planners will need to factor a new level of safety into the design, operation, and regulation of flood protection facilities such as dams, floodways, and bypass channels, as well as the design of local sewers and storm drains.

### **9.5 ISSUES**

The major issues for flooding are the following:

- Flash flooding that occurs with little or no warning will continue to impact the planning area.
- The duration and intensity of storms contributing to flooding issues may increase due to climate change.

- Flooding may be exacerbated by other hazards, such as wildfires.
- The promotion of flood insurance as a means of protecting private property owners from the economic impacts of frequent flood events should continue.
- More information is needed on flood risk to support the concept of risk-based analysis of capital projects.
- Ongoing flood hazard mitigation will require funding from multiple sources.
- There needs to be a coordinated hazard mitigation effort between jurisdictions affected by flood hazards in the planning area.
- Floodplain residents need to continue to be educated about flood preparedness and the resources available during and after floods.
- Existing floodplain-compatible uses such as agricultural and open space need to be maintained. There is constant pressure to convert these existing uses to more intense uses within the planning area during times of moderate to high growth.
- The economy affects a jurisdiction's ability to manage its floodplains. Budget cuts and personnel losses can strain resources needed to support floodplain management.

## CHAPTER 10

### SEVERE STORM (HAIL, LIGHTNING AND WIND)

#### 10.1 HAZARD PROFILE

A thunderstorm is a rain event that contains thunder, hail, lightning and wind. A thunderstorm is classified as “severe” when it contains one or more of the following: hail with a diameter of three-quarter inch or greater, winds gusting in excess of 50 knots (kt) (58 mph), or tornadoes. For this hazard mitigation plan, each component of a thunderstorm (lightning, hail, and winds) will be profiled below. Thunderstorms or severe storms are not Texas State Hazards per the Texas State Mitigation Plan Update 2018. ‘Thunderstorm’ is used in this section as a descriptive term to qualify hail, wind, and lightning atmospheric events. Thunderstorms are described below for general reference information and not a profiled hazard.

Three factors cause thunderstorms to form: moisture, rising unstable air (air that keeps rising when disturbed), and a lifting mechanism to provide the disturbance. The sun heats the surface of the earth, which warms the air above it. If this warm surface air is forced to rise (hills or mountains can cause rising motion, as can the interaction of warm air and cold air or wet air and dry air) it will continue to rise as long as it weighs less and stays warmer than the air around it. As the air rises, it transfers heat from the surface of the earth to the upper levels of the atmosphere (the process of convection). The water vapor it contains begins to cool and it condenses into a cloud. The cloud eventually grows upward into areas where the temperature is below freezing. Some of the water vapor turns to ice and some of it turns into water droplets. Both have electrical charges. Ice particles usually have positive charges, and rain droplets usually have negative charges. When the charges build up enough, they are discharged in a bolt of lightning, which causes the sound waves we hear as thunder. Thunderstorms have three stages (FIGURE 10-1):

The **developing stage** of a thunderstorm is marked by a cumulus cloud that is being pushed upward by a rising column of air (updraft). The cumulus cloud soon looks like a tower (called towering cumulus) as the updraft continues to develop. There is little to no rain during this stage but occasional lightning. The developing stage lasts about 10 minutes.

The thunderstorm enters the **mature stage** when the updraft continues to feed the storm, but precipitation begins to fall out of the storm, and a downdraft begins (a column of air pushing downward). When the downdraft and rain-cooled air spread out along the ground, they form a gust front, or a line of gusty winds.

The **mature stage** is the most likely time for hail, heavy rain, frequent lightning, strong winds, and tornadoes. The storm occasionally has a black or dark green appearance.

Eventually, a large amount of precipitation is produced and the updraft is overcome by the downdraft beginning the dissipating stage. At the ground, the gust front moves out a long distance from the storm and cuts off the warm moist air that was feeding the thunderstorm. Rainfall decreases in intensity, but lightning remains a danger.

## The Thunderstorm Life Cycle

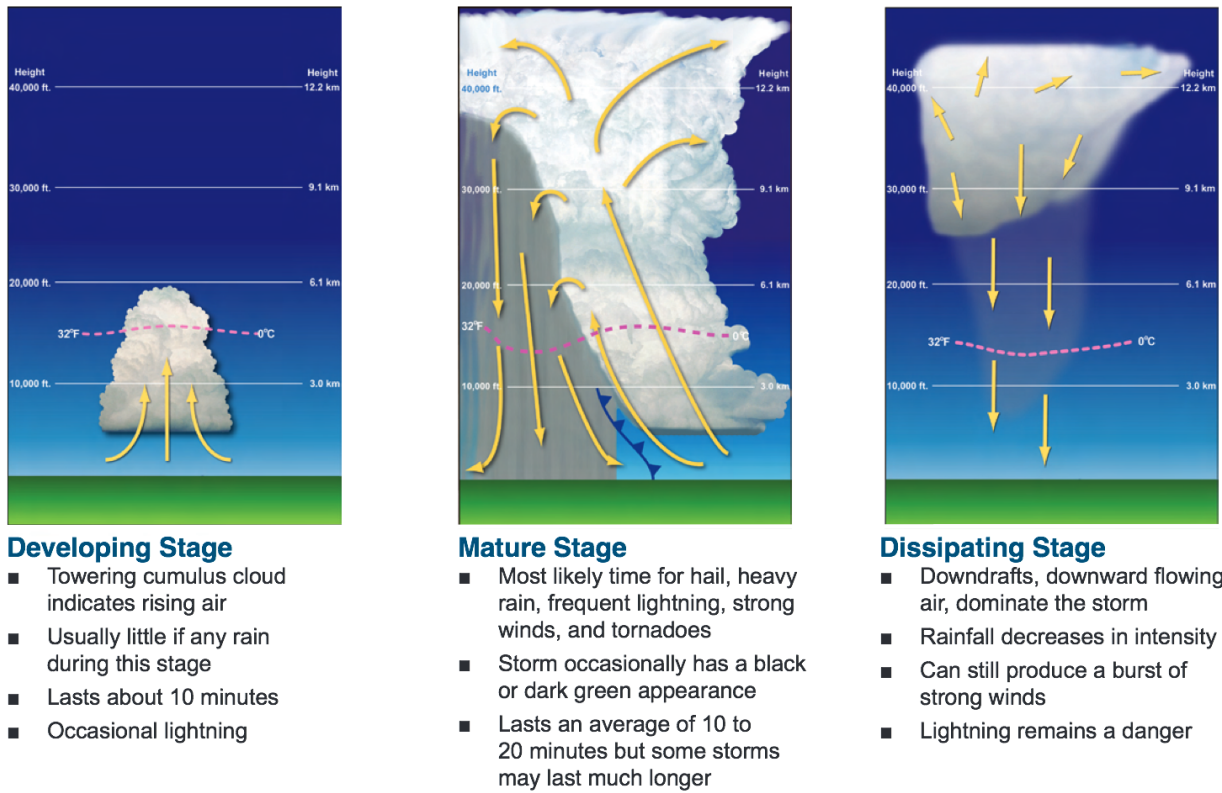


Figure 10-1 Thunderstorm Life Cycle

### HAIL

Hail occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. Recent studies suggest that super-cooled water may accumulate on frozen particles near the back-side of a storm as they are pushed forward across and above the updraft by the prevailing winds near the top of the storm. Eventually, the hailstones encounter downdraft air and fall to the ground.

At the time when the updraft can no longer support the hailstone, it will fall down to the earth. For example, a 1/4" diameter or pea-sized hail requires updrafts of 24 mph, while a 2 3/4" diameter or baseball-sized hail requires an updraft of 81 mph. The largest hailstone recorded in the United States was found in Vivian, South Dakota on July 23, 2010, measuring 8 inches in diameter, almost the size of a soccer ball. Soccer ball-sized hail is the exception, but even small pea-sized hail can do damage.

Hail storms in Texas cause damage to property, crops, and the environment, and kill and injure livestock. In the United States, hail causes more than \$1 billion in damage to property and crops each year. Much of the damage inflicted by hail is to crops. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are the other types of property most commonly damaged by hail.

The National Weather Service (NWS) classifies hail as non-severe and severe based on hail diameter size. Descriptions and diameter sizes are provided in TABLE 10-1.

## LIGHTNING

Lightning is an electrical discharge between positive and negative regions of a thunderstorm. When lightning strikes, electricity shoots through the air and causes vibrations creating the sound of thunder. Lightning is a dangerous and unpredictable weather hazard in the United States and in Texas. Each year, lightning is responsible for deaths, injuries, and millions of dollars in property damage, including damage to buildings, communications systems, power lines, and electrical systems. Lightning also causes forest and brush fires as well as deaths and injuries to livestock and other animals.

Intra-cloud lightning is the most common type of discharge. Usually, it takes place inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers.

Although not as common, cloud-to-ground lightning is the most damaging and dangerous form of lightning. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat.

## WIND

The NWS wind speed threshold for a severe thunderstorm is a surface wind speed of 58 mph or greater. There are seven types of damaging winds:

- **Straight-line winds**—Any thunderstorm wind that is not associated with rotation; this term is used mainly to differentiate from tornado winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft
- **Downdrafts**—A small-scale column of air that rapidly sinks toward the ground.
- **Downbursts**—A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst of damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.
- **Microbursts**—A small concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.
- **Gust front**—A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.
- **Derecho**—A derecho is a widespread thunderstorm wind caused when new thunderstorms form along the leading edge of an outflow boundary (the boundary formed by horizontal spreading of thunderstorm-cooled air). The word “derecho” is of Spanish origin and means “straight ahead.” Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.
- **Bow Echo**—A bow echo is a linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours, and produce extensive wind damage at the ground.

### 10.1.1 LOCATION

Severe storm events (hail, lightning and wind) have the potential to happen anywhere in the planning area.

#### HAIL

Hailstorms vary tremendously in terms of size, location, intensity, and duration but are considered frequent occurrences throughout the Henderson County planning area. It is assumed that all of the jurisdictions are uniformly exposed to hail events just as they are exposed to the thunderstorms that produce the hail events.

#### LIGHTNING

Lightning strikes in association with thunderstorms vary in terms of size, intensity, duration, and impacts, but are considered frequent occurrences throughout the Henderson County planning area. It is assumed that all of the jurisdictions are uniformly exposed to thunderstorm events and the associated impact lightning. According to information calculated from Vaisala's National Lightning Detection Network, the planning area can experience 4 to 8 lightning strikes per square kilometer per year within an orange shaded area (FIGURE 10-2). The dispersion of lightning strikes in Henderson County is assumed to be uniform across the planning area although elevation and local topography may play a role.

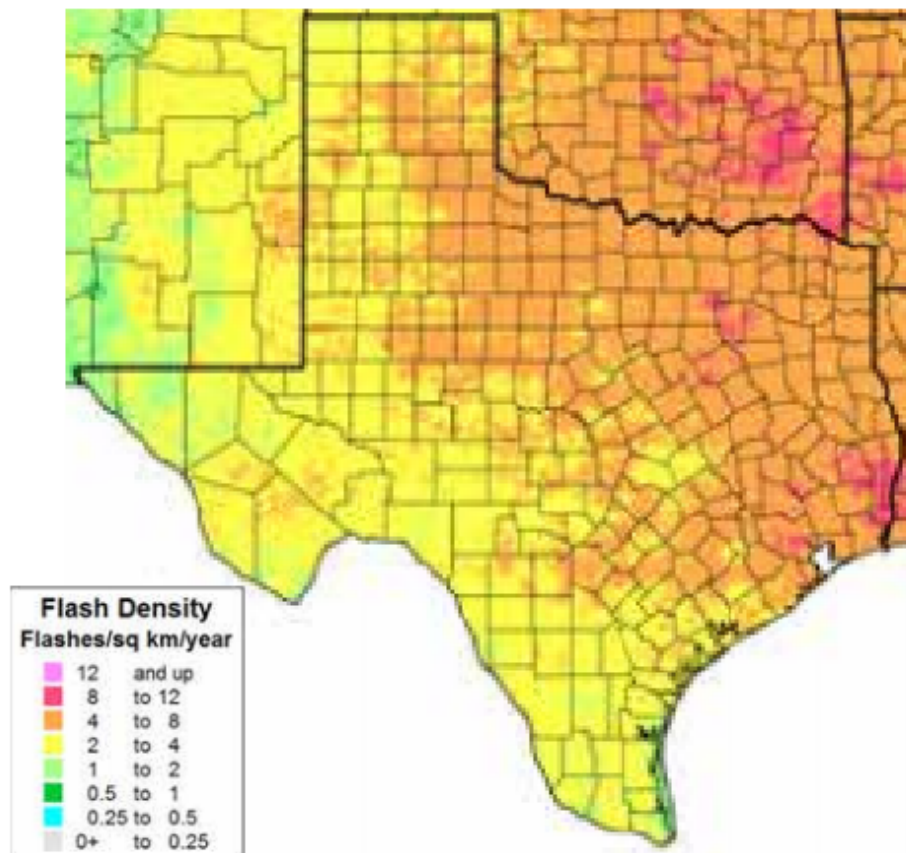


Figure 10-2 Lightning Density Scale

## WIND

The entire Henderson County planning area is exposed to high winds. Windstorms vary in terms of size, intensity, duration, and impact. High winds associated with thunderstorms are frequent occurrences throughout the planning area. They have the ability to cause damage over 100 miles from the center of storm activity. Winds impacting walls, doors, windows, and roofs, may cause structural components to fail. FIGURE 10-3 shows the U.S. wind zones and that Henderson County is located in Zone III which can have winds up to 200 mph.

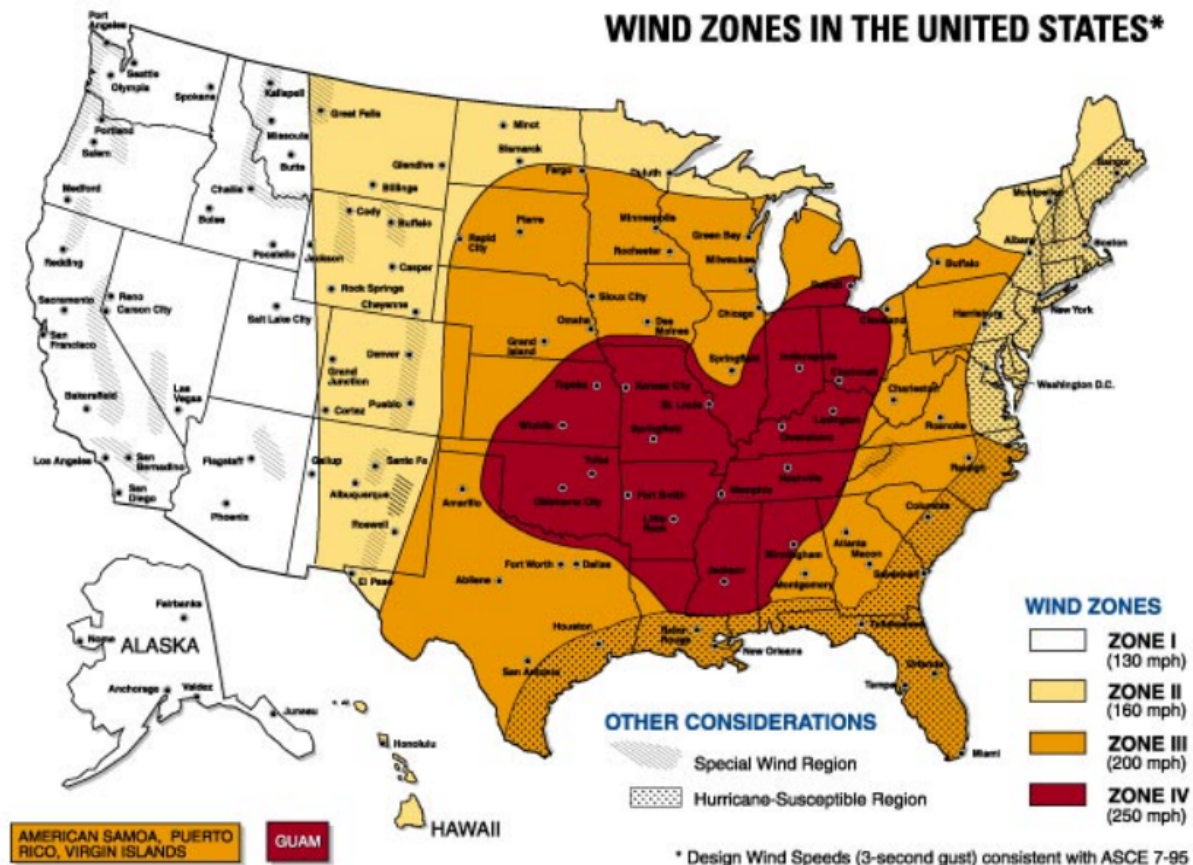


Figure I.2 Wind zones in the United States

Figure 10-3 Wind Zones in the U.S.



## 12.1.2 EXTENT

### HAIL

The NWS classifies a storm as “severe” if there is hail three-quarters of an inch in diameter (approximate size of a penny) or greater, based on radar intensity or as seen by observers. The intensity category of a hailstorm depends on hail size and the potential damage it could cause, as depicted in the Hail Intensity and Magnitude Scale in TABLE 10-1.

**TABLE 10-1 HAIL INTENSITY AND MAGNITUDE SCALE**

SIZE CODE	INTENSITY CATEGORY	DIAMETER (MM)	DIAMETER (INCHES)	SIZE DESCRIPTION	TYPICAL DAMAGE IMPACTS
H0	Hard Hail	5-9	0.2-0.4	Pea	No Damage
H1	Potentially Damaging	10-15	0.4-0.6	Mothball	Slight general damage to plants, crops
H2	Significant	16-20	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
H3	Severe	21-30	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	31-40	1.2-1.6	Pigeon's egg	Widespread glass damage, vehicle bodywork damage
H5	Destructive	41-50	1.6-2.0	Golf ball> Pullet's egg	Wholesale destruction of glass, damage to tiled roofs, significant risk of energy
H6	Destructive	51-60	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	61-75	2.4-3.0	Tennis ball> cricket ball	Severe roof damage, risk of serious injuries
H8	Destructive	76-90	3.0-3.5	Large Orange> Soft ball	Severe damage to aircraft bodywork
H9	Super Hail Storm	91-100	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hail Storm	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Note: mm Millimeters

**Source: NOAA**

## LIGHTNING

The extent for lightning can be expressed in terms of the number of strikes in an interval. NOAA categorizes lightning activity levels (LAL) on a scale from 1 to 6. LAL rankings reflect the frequency of cloud-to-ground lightning either forecast or observed as defined in TABLE 10-2.

<b>TABLE 10-2 NOAA LIGHTNING ACTIVITY LEVELS</b>		
<b>LAL</b>	<b>CLOUD AND STORM DEVELOPMENT</b>	<b>LIGHTNING STRIKES/15 MINUTES</b>
1	No thunderstorm	0
2	Cumulus clouds are common but only a few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. The clouds produce mainly virga, but light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than three must occur within the observation area. Moderate rain is common and lighting is frequent.	16-25
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense.	>25
6	Dry lightning, similar to LAL 3 except thunderstorms are dry	
<b>Source: NOAA</b>		

The NCEI does not include the LAL for the historical lightning events included in TABLE10-2. According to the National Lightning Detection Network, Henderson County can experience an average of 32 lighting strikes per day which equates to 1.36 strikes per hour or 0.02 strikes per minute. This would put Henderson County in the LAL 2 range.

## WIND

The strength of thunderstorm winds can vary from a light breeze to over 100 mph. Windstorms produced by cold fronts and gravity waves have been known to produce winds over 60 mph. The Beaufort wind scale exhibits the range in impacts of wind speeds as shown in TABLE 10-3. Thunderstorm winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. Wind storms in the Henderson County planning area are rarely

life threatening, but do disrupt daily activities, cause damage to buildings, and structures, and increase the potential for other hazards, such as wildfires. Winds can also cause trees to fall, particularly those killed by insects or wildfire, creating a hazard to property or those outdoors.

**TABLE 10-3 BEAUFORT WIND SCALE**

FORCE	WIND (KNOTS)	WMO CLASSIFICATION	APPEARANCE OF WIND EFFECTS	
			ON THE WATER	ON LAND
0	Less than 1	Clam	Sea surface smooth and mirror-like	Calm, smoke rises vertically
1	1-3	Light Air	Scaly ripped, no foam crests	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Small wavelets, crests begin to break, scattered whitecaps	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Large wavelets, crests begin to break, scattered whitecaps	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Small waves 1-4 ft. becoming longer, numerous whitecaps	Dust, leaves, and loose paper lifted, small tree branches move
5	17-21	Fresh Breeze	Moderate waves 4-8 ft. taking longer to form, many whitecaps, some spray	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Large waves 8-13 ft., whitecaps common, more spray	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Sea heaps up, waves 13-20 ft., white foam streaks off breakers	Whole tree moving, resistance felt walking against wind
8	34-40	Gale	Moderately high (13-20 ft.) waves of greater length, edges of crests begin to break into spindrift, foam blown in streaks	Whole tree in motion, resistance felt walking against wind
9	41-47	Strong Gale	High waves (20ft.) sea begins to roll, dense streaks of foam, heavy rolling lowered visibility	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Very high waves (20-30 ft.) with overhanging crests, sea white with densely blown foam, heavy rolling lowered visibility	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"

11	56-63	Violent Storm	Exceptionally high waves (30-45 ft.), foam patches cover sea, visibility more reduced	
12	64+	Hurricane	Air filled with foam, waves over 45 ft., sea completely white with drying spray, visibility greatly reduced	

**SOURCE: NOAA**

A worst case scenario for the Henderson County planning area is up to a severe storm event with H10 category hailstones the size of melons, with lightning activity levels >25 strikes per 15 minutes, and high winds in the 48-55 knots range causing considerable structural damage.

### 12.1.3 PAST EVENTS

Since 1965, Henderson County has been included in 6 Presidential Disaster (DR) Declarations for severe storms in the planning area (see Table 4-1). Three are included in this plan update timeframe (FEMA-DR4269-TX and FEMA-DR-4245-TX and FEMA-DR-4223-TX). Some of the damages that resulted in the declarations were from tornadoes and flooding that accompanied a severe storm. The NCEI reported 211 total thunderstorm events for the Henderson County planning area from January 2008 through December 2017. Of the reported events, there was approximately \$1,272,740 in property damage and no injuries or fatalities.

**TABLE 10-4 THUNDERSTORM SUMMARY FOR HENDERSON COUNTY (2006-2020)**

HAZARD TYPE	TOTAL EVENTS	EVENTS WITH DAMAGE	PROPERTY DAMAGE (K)	INJURIES	FATALITIES
Hail	46	17	92.5	0	0
Lightning	2	0	0	2	0
Wind	62	51	2326.6	0	0
<b>Total</b>	<b>110</b>		<b>2419.1</b>	<b>2</b>	<b>0</b>

**SOURCE: NCEI**

# HAIL

TABLE 10-5 shows the number of events and maximum size hail recorded by jurisdiction.

TABLE 10-5 HAIL HISTORICAL EVENTS SUMMARY (2006-2020)						
JURISDICTION	NUMBER OF EVENTS	MAXIMUM SIZE (INCHES)	PROPERTY DAMAGE	CROP DAMAGE	INJURIES	FATALITIES
Henderson County	19	1.75	40.5	0	0	0
Athens	2	1.25	0	0	0	0
Berryville	0	0	0	0	0	0
Brownsboro	2	1.75	1	0	0	0
Caney City	0	0	0	0	0	0
Chandler	3	1.25	3	0	0	0
Coffee City	0	0	0	0	0	0
Enchanted Oaks	0	0	0	0	0	0
Eustace	5	1.75	40	0	0	0
Gun Barrel City	0	0	0	0	0	0
Log Cabin	0	0	0	0	0	0
Malakoff	3	1	0	0	0	0
Moore Station	0	0	0	0	0	0
Murchison	1	1	0	0	0	0
Payne Springs	2	1	1	0	0	0
Poynor	2	1	0	0	0	0
Seven Points	0	0	0	0	0	0
Star Harbor	0	0	0	0	0	0
Tool	5	1	0	0	0	0
Trinidad	2	0.75	7	0	0	0
<b>TOTAL</b>	<b>46</b>	<b>13.5</b>	<b>92.5</b>	<b>0</b>	<b>0</b>	<b>0</b>

## LIGHTNING

According to National Lightning Detection Network, the Henderson County planning area experiences an average of 32 lightning strikes per day or 1.36 strikes per hour or 0.02 strikes per minute. The NCEI's storm events database as well as locally available data, indicated there were no casualty and 2 injury reports from lightning in the Henderson County planning area between 2006 and 2020. Table 10-6 shows the historical recorded lightning events by jurisdiction that caused no property damage. Lightning strikes have caused house fires, oil tanks and powerlines to explode, and trees to topple over.

**TABLE 10-6 LIGHTNING HISTORICAL EVENTS SUMMARY (2006-2020)**

JURISDICTION	NUMBER OF EVENTS	PROPERTY DAMAGE	CROP DAMAGE	INJURIES	FATALITIES
Henderson County	0	0	0	0	0
Athens	0	0	0	0	0
Berryville	0	0	0	0	0
Brownsboro	0	0	0	0	0
Caney City	0	0	0	0	0
Chandler	0	0	0	0	0
Coffee City	0	0	0	0	0
Enchanted Oaks	0	0	0	0	0
Eustace	0	0	0	0	0
Gun Barrel City	0	0	0	0	0
Log Cabin	0	0	0	0	0
Malakoff	1	0	0	1	0
Moore Station	0	0	0	0	0
Murchison	0	0	0	0	0
Payne Springs	0	0	0	0	0
Poynor	0	0	0	0	0
Seven Points	0	0	0	0	0
Star Harbor	0	0	0	0	0
Tool	1	0	0	1	0
Trinidad	0	0	0	0	0
<b>TOTAL</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>

## WINDS

High winds occur year round in the Henderson County planning area. In the spring and summer, which are generally warm and humid in Texas, high winds often accompany severe thunderstorms. The NCEI reported 62 wind events for the Henderson County planning area from January 2006 through December 2019. TABLE 10-7 shows the number of events and maximum wind speed recorded by jurisdiction. The number of events below add up to more than 62 events because each jurisdiction was included in the Henderson County (zone) for wind events in the NCEI storm database.

**TABLE 10-7 WIND HISTORICAL EVENTS SUMMARY (2006-2020)**

JURISDICTION	NUMBER OF EVENTS	MAXIMUM WIND (kt/mph)	PROPERTY DAMAGE (K)	CROP DAMAGE	INJURIES	FATALITIES
Henderson County	24	75	917.6	0	0	0
Athens	9	61	110	0	0	0
Berryville	0	0	0	0	0	0
Brownsboro	2	50	60	0	0	0
Caney City	0	0	0	0	0	0
Chandler	2	60	505	0	0	0
Coffee City	0	0	0	0	0	0
Enchanted Oaks	0	0	0	0	0	0
Eustace	1	56	5	0	0	0
Gun Barrel City	0	0	0	0	0	0
Log Cabin	0	0	0	0	0	0
Malakoff	9	61	272	0	0	0
Moore Station	0	0	0	0	0	0
Murchison	3	65	85	0	0	0
Payne Springs	6	78	365	0	0	0
Poynor	4	70	6	0	0	0
Seven Points	0	0	0	0	0	0
Star Harbor	0	0	0	0	0	0
Tool	0	0	0	0	0	0
Trinidad	2	52	1	0	0	0
<b>TOTAL</b>	<b>62</b>	<b>628</b>	<b>2326.6</b>	<b>0</b>	<b>0</b>	<b>0</b>

**SOURCE: NCEI**

Although these high winds may not be life-threatening, they can disrupt daily activities, cause damage to building and structures, and increase the potential damage of other hazards. Wind resource information is shown in FIGURE 10-4. as a proxy for typical wind speeds. Wind resource information is estimated by the National Renewable Energy Laboratory (NREL) to identify areas that are suitable for wind energy applications. The wind resource is expressed in terms of wind power classes, ranging from Class 1 (lowest) to Class 7 (highest). Each class represents a range of mean wind power density or approximate mean wind speed at specified heights above the ground (in this case, 50 meters above the ground surface). TABLE 10-8 identifies the mean wind power density and speed associated with each classification. FIGURE 10-4 shows the wind power class potential density for Henderson County classified as “Poor.”

**TABLE 10-8 WIND POWER CLASS AND SPEED**

<b>RANK</b>	<b>WIND POWER CLASS</b>	<b>WIND POWER DENSITY AT 50 METERS (W/m<sup>2</sup>)</b>	<b>WIND SPEED AT 50 METERS (mph)</b>
POOR	1	0-200	0-12.5
MARGINAL	2	200-300	12.5-14.3
FAIR	3	300-400	14.3-15.7
GOOD	4	400-500	15.7-16.8
EXCELLENT	5	500-600	16.8-17.9
OUTSTANDING	6	600-800	17.9-19.7
SUPERB	7	800-2000	19.7-26.6

**SOURCE: NCEI**



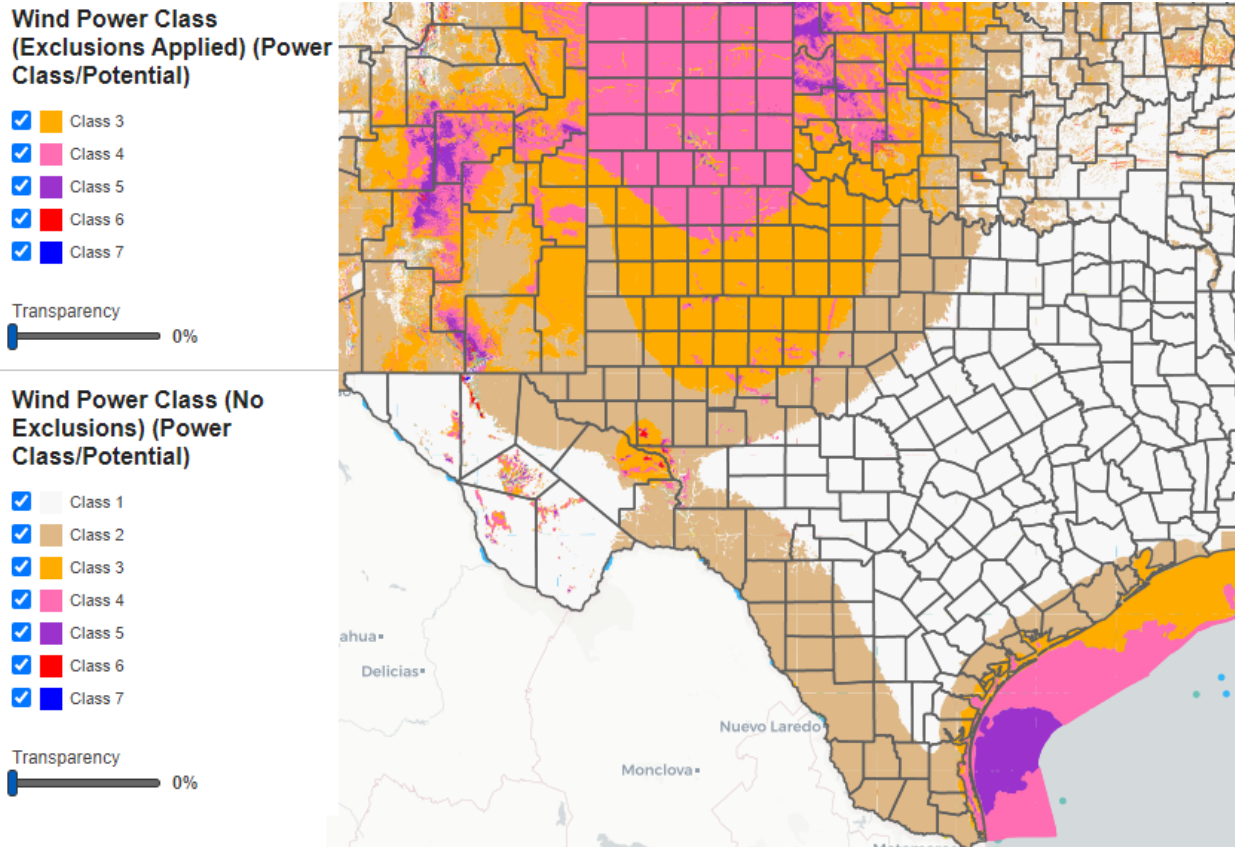


Figure 10-4 Texas Wind Power

#### 10.1.4 WARNING TIME

Meteorologists can often predict the likelihood of a severe storm. This can give several days of warning time. However, meteorologists cannot predict the exact time of onset or severity of the storm. Some storms may come on more quickly and have only a few hours of warning time. Weather forecasts for the planning area are reliable. However, at times, the warning for the onset of severe weather may be limited.

### 10.2 VULNERABILITY AND IMPACTS

#### 10.2.1 EXPOSURE

In general, assets in the entire planning area are vulnerable to thunderstorms, hail, lightning and wind including people, crops, vehicles, and built structures. Certain areas are more exposed due to geographic location and local weather patterns. Populations with large stands of trees or overhead power lines may be more susceptible to wind damage and black out, while populations in low-lying areas are at risk for possible flooding. It is not uncommon for residents living in more remote areas of the county to be isolated after such events. There is \$8,452.63 in exposed property within the county as well as the total population of 82,737.

It is estimated that most of the residential structures were built without the influence of a structure building code with provisions for wind loads. Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create lift and suction forces that act to pull building components and surfaces outward. The effects of winds are magnified in the upper levels of multi-story structures. As positive and negative forces impact the building's protective

envelope (doors, windows, and walls), the result can be roof or building component failures and considerable structural damage.

All of these buildings are considered to be exposed to the hail, lightning, and wind hazards, but structures in poor condition or in particularly vulnerable locations (located on hilltops or exposed open areas) may risk the most damage. The frequency and degree of damage will depend on specific locations.

All future development will be affected by severe storms. The ability to withstand impacts lies in sound land use practices and consistent enforcement of codes and regulations for new construction. Land use policies identified in master plans and enforced through zoning code and the permitting process also address many of the secondary impacts of the severe weather hazard. With these tools, the planning partnership can be well equipped to deal with future growth and the associated impacts of severe weather.

### 10.2.2 IMPACTS

Loss estimates for hail, lightning and wind hazards are not based on damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing projected damages (annualized loss). TABLE 10-9 lists the property loss estimates for hail, lightning and wind events. These annualized losses are less than \$50,000 annually and can be deemed “negligible.” Negligible loss hazards are still included despite minimal annualized losses because of the potential for a high value damaging event.

TABLE 10-9 LOSS ESTIMATES FOR HAIL, LIGHTNING AND WIND EVENTS			
	ANNUAL RATE OF OCCURRENCE	AVERAGE LOSS EXPECTANCY	ANNUALIZED LOSS
<b>HAIL</b>			
HENDERSON COUNTY	3.29	2010.87	515.61
<b>LIGHTNING</b>			
HENDERSON COUNTY	0.14	0	0
<b>WIND</b>			
HENDERSON COUNTY	4.43	37445.16	8,452.63

Most lightning damages occur to electronic equipment located inside buildings. But structural damage can also occur when a lightning strike causes a building fire. In addition, lightning strikes can cause damage to crops if fields burn. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes. There have not been any fatalities in Henderson County from lightning strikes.

Thunderstorm winds and hail can cause damage to property, vehicles, trees, and crops.

### 10.3 PROBABILITY OF FUTURE EVENTS

NCEI-reported damaging lightning events occurred two times from 2006 through 2019. Since lightning accompanies thunderstorms, it can be assumed that lightning occurs more often than damages are reported. These rates of occurrence are expected to continue in the future.

Based on NCEI data, there have been 46 hail events and 62 thunderstorm wind events. This translates to an annual average of 3.29 and 4.43 events per year, respectively. Based on this history, damaging hail and thunderstorm wind occur in the planning area multiple times each year making the probability for damaging events high in any given year.

The cities of Caney City, Chandler and Enchanted Oaks rank the probability factor as low. Henderson County and cities of Athens, Brownsboro, Coffee City, Eustace, Gun Barrel City, Malakoff, Moore Station, Poynor, Seven Points and Tool rank the probability factor as medium. The cities of Berryville, Log Cabin, Murchison, Payne Springs, Star Harbor and Trinidad rank the probability factor as High.

#### **10.4 CLIMATE CHANGE IMPACTS**

Climate change presents a significant challenge for risk management associated with severe weather. The frequency of severe weather events has increased steadily over the last century. NCEI states the U.S. has sustained 219 weather and climate disasters since 1980 where the damages/costs reached or exceeded \$1 billion (including consumer price index [CPI] adjustments to 2017). The total cost of these 219 events exceeds \$ (this includes the initial cost estimates for Hurricanes Harvey, Irma and Maria) (NOAA, 2018).

According to the Southern Climate Impacts Planning Program concerning Texas, growing evidence points to stronger summer storm systems. Studies have not been done to conclude that severe storms, including hail, lightning, and strong winds, are increasing. However, with summer temperatures becoming warmer and humidity levels increasing, an increase in the likelihood of these hazards is plausible (SCIPP).

#### **10.5 ISSUES**

Important issues associated with a severe weather in the planning area include the following:

- Older building stock in the planning area is built to low code standards or none at all. These structures could be highly vulnerable to severe weather events such as windstorms.
- Redundancy of power supply must be evaluated.
- The capacity for backup power generation is limited.
- The potential for isolation after a severe storm event is high
- There is limited information available for local weather forecasts
- The lack of proper management of trees may exacerbate damage from high winds.

## **CHAPTER 11**

### **TORNADO**

#### **11.1 HAZARD PROFILE**

A tornado is a narrow, violently rotating column of air that extends from the base of a cumulonimbus cloud to the ground. The visible sign of a tornado is the dust and debris that is caught in the rotating column made up of water droplets. Tornadoes are the most violent of all atmospheric storms. Tornadoes can be induced by hurricanes. The following are common ingredients for tornado formation:

- Very strong winds in the mid and upper levels of the atmosphere
- Clockwise turning of the wind with height (that is, from southeast at the surface to west aloft)
- Increasing wind speed in the lowest 10,000 feet of the atmosphere (for example, 20 mph at the surface and 50 mph at 7,000 feet)
- Very warm, moist air near the ground with unusually cooler air aloft
- A forcing mechanism such as a cold front or leftover weather boundary from previous shower or thunderstorm activity
- Tornadoes can form from individual cells within severe thunderstorm squall lines. They also can form from an isolated supercell thunderstorm. Weak tornadoes can sometimes occur from air that is converging and spinning upward, with little more than a rain shower occurring in the vicinity.
- Tornadoes are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour, and damage paths can be more than 1 mile wide and 50 miles long. Tornadoes have been known to lift and move objects weighing more than 300 tons a distance of 30 feet, toss homes more than 300 feet from their foundations, and siphon millions of tons of water from water bodies. Tornadoes also generate a tremendous amount of flying debris or “missiles,” which often become airborne shrapnel that causes additional damage. If wind speeds are high enough, missiles can be thrown at a building with enough force to penetrate windows, roofs, and walls. However, less spectacular damage is much more common.

##### **11.1.1 LOCATION**

Recorded tornadoes in the planning area are typically small to average size and short-lived. They can occur anywhere in the Henderson County planning area. FIGURE 11-1 shows tornado damage in Eustace on April 29, 2017. Figure 11-2 shows the location of previous tornado events in the Henderson County planning area.



FIGURE 11-1 Photo of Tornado Damage, Hwy 175 Eustace, TX

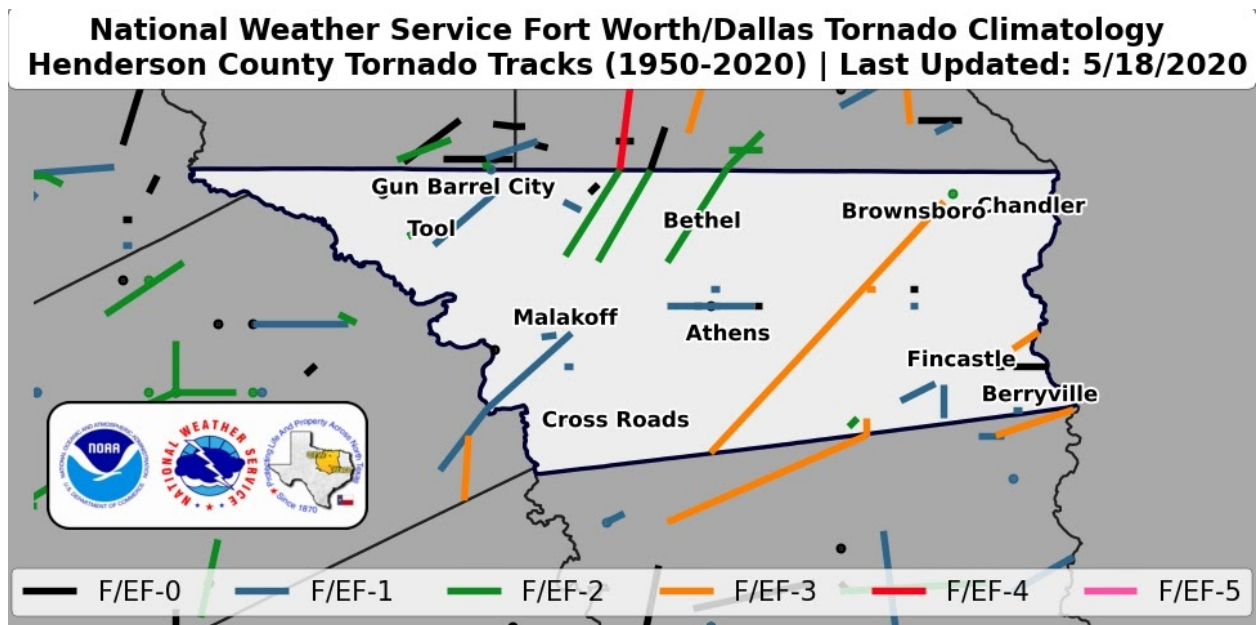


Figure 11-2 Tornado Events in Henderson County (1950-2020)

### 11.1.2 EXTENT

The Enhanced Fujita Scale, or EF Scale (Table 11-1), is the current scale for rating the strength of tornadoes in the United States; magnitude is estimated via the damage left behind. Implemented in February 2007, it replaced the Fujita Scale. The scale has the same basic design as the original Fujita Scale, six categories from zero to five, representing increasing degrees of damage. The new scale takes into account how most structures are designed, and is thought to be a more accurate representation of the surface wind speeds in the most violent tornadoes.

The worst case scenario for the Henderson County planning area is to see up to an EF5 tornado in a densely developed and populated area.

**TABLE 11-1 ENHANCED FUJITA 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 yards; high-rise buildings have significant structural deformation; incredible phenomena will occur

**SOURCE: NOAA**

### 11.1.3 PAST EVENTS

Since 1965, Henderson County has been included in three Presidential Disaster (DR) Declarations for tornadoes in the planning area (TABLE 4-1). None are included in this plan update timeframe and some of the damages that resulted in the declarations might be from accompanying flooding and severe storms. The NCEI recorded 8 tornados that touched down in the Henderson County planning area from January 2006 through December 2019. Of these events, there was \$2,705,000.00 in recorded property damage, \$130,000.00 in crop damage and 10 injuries or fatalities ( TABLE 11-2.)

**TABLE 11-2 TORNADO HISTORICAL EVENTS SUMMARY (2006-2020)**

JURISDICTION	NUMBER OF EVENTS	HIGHEST MAGNITUDE (EF)	PROPERTY DAMAGE (k)	CROP DAMAGE	INJURIES	FATALITIES
Henderson County	2	2	330000	40000	5	0
Athens	0	0	0	0	0	0
Berryville	0	0	0	0	0	0
Brownsboro	0	0	0	0	0	0
Caney City	0	0	0	0	0	0
Chandler	0	0	0	0	0	0
Coffee City	0	0	0	0	0	0
Enchanted Oaks	0	0	0	0	0	0
Eustace	1	0	0	0	0	0
Gun Barrel City	0	0	0	0	0	0
Log Cabin	0	0	0	0	0	0
Malakoff	1	0	50000	0	0	0
Moore Station	0	0	0	0	0	0
Murchison	0	0	0	0	0	0
Payne Springs	1	2	500000	90000	5	0
Poynor	1	1	2075000	0	0	0
Seven Points	0	0	0	0	0	0
Star Harbor	0	0	0	0	0	0
Tool	0	0	0	0	0	0
Trinidad	2	0	200000	0	0	0
<b>TOTAL</b>	<b>8</b>	<b>2</b>	<b>2705000</b>	<b>130000</b>	<b>10</b>	<b>0</b>

SOURCE: NOAA



#### 11.1.4 WARNING TIME

The NOAA Storm Prediction Center issues tornado watches and warnings for Henderson County. Watches and warnings are described below:

- **Tornado Watch** - Tornadoes are possible. Remain alert for approaching storms. Watch the sky and stay tuned to NOAA all hazards weather radio, commercial radio, or television for information.
- **Tornado Warning** - A tornado has been sighted or indicated by weather radar. Take shelter immediately.

Once a warning has been issued, residents may have only a matter of seconds or minutes to seek shelter.

### 11.2 VULNERABILITY AND IMPACTS

#### 11.2.1 EXPOSURE

In general, assets in the entire planning area are vulnerable to tornadoes including people, crops, vehicles, and built structures. Certain areas are more exposed due to geographic location and local weather patterns. All buildings are considered to be exposed to tornadoes, but structures in poor condition, modular homes or in particularly vulnerable locations (located on hilltops or exposed open areas) may risk the most damage. The frequency and degree of damage will depend on specific locations.

All future development will be affected by severe storms. The ability to withstand impacts lies in sound land use practices and consistent enforcement of codes and regulations for new construction. Land use policies identified in master plans and enforced through zoning codes and the permitting process also address many of the secondary impacts of the severe weather hazard. With these tools, the planning partnership can be well equipped to deal with future growth and the associated impacts of severe weather.

#### 11.2.2 IMPACTS

Loss estimation for tornadoes is not based on damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing projected damages (annualized loss). TABLE 11-9 lists the property loss estimates for tornado events, which are included with hail, lightning, and wind losses. These annualized losses are less than \$50 annually and can be deemed “negligible.” Negligible loss hazards are still included despite minimal annualized losses because of the potential for a high-value damaging event.

**TABLE 11-3 LOSS ESTIMATES FOR TORNADO EVENTS**

	ANNUAL RATE OF OCCURRENCE	AVERAGE LOSS EXPECTANCY	ANNUALIZED LOSS
HENDERSON COUNTY	0.57	631,000.00	225,357.14

The damage caused by strong tornadoes can be extensive for site-built homes as well as manufactured homes. National Weather Service research of tornado sites has shown that manufactured homes are more susceptible.

The enhanced Fujita scale identifies wind speeds that would completely destroy structures. For single family site-built homes, winds in excess of 170 miles per hour (EF4) are needed. For a single-wide



manufactured home, that drops to 127 miles per hour (EF2), and for a double-wide manufactured home, 134 miles per hour (EF2).

The highest number of manufactured homes within the planning area is in the unincorporated portion of the county, followed by the City of Gun Barrel City respectively. Table 13-4 lists the number of manufactured homes along with the ratio of manufactured homes as compared to the number of housing units in each jurisdiction.

**TABLE 11-4 MANUFACTURED HOMES BY JURISDICTION**

<b>JURISDICTION</b>	<b>TOTAL HOUSING UNITS</b>	<b>MANUFACTURED HOMES</b>	<b>MANUFACTURED HOMES TO HOUSING RATIO</b>
<b>Henderson County</b>	26,645	12530	5329/2506
<b>Athens</b>	3493	357	499/51
<b>Berryville</b>	283	123	283/123
<b>Brownsboro</b>	325	56	325/56
<b>Caney City</b>	99	47	99/47
<b>Chandler</b>	1079	31	1079/31
<b>Coffee City</b>	114	24	19/14
<b>Enchanted Oaks</b>	2886	0	1/0
<b>Eustace</b>	291	113	291/113
<b>Gun Barrel City</b>	2076	1086	519/272
<b>Log Cabin</b>	122	269	122/269
<b>Malakoff</b>	659	119	659/119
<b>Moore Station</b>	51	28	51/28
<b>Murchison</b>	168	46	84/23
<b>Payne Springs</b>	356	50	178/25
<b>Poynor</b>	120	38	60/19
<b>Seven Points</b>	139	279	139/279
<b>Star Harbor</b>	343	0	1/0
<b>Tool</b>	1238	293	1238/293
<b>Trinidad</b>	341	52	341/52

**SOURCE: Appraisal District**

## COMMUNITY PERCEPTION OF VULNERABILITY

All of the jurisdictions except Athens, Berryville, Eustace, Moore Station and Seven Points ranked the tornado as a high hazard. See the first page of this chapter for a summary of hazard rankings for Henderson County planning partners in this plan update. Chapter 14 gives a detailed description of these rankings and TABLE 15-1 addresses mitigation actions for this hazard vulnerability.

### 11.2.3 PROBABILITY OF FUTURE EVENTS

Tornadoes may occur in any month and at any hour of the day, but they occur with the greatest frequency during the late spring and early summer months, and between the hours of 4:00 pm and 8:00 pm.

TABLE 11-2 lists 8 recorded tornadoes rated EF0 to EF2. Therefore, on average, a small to medium sized tornado can occur anywhere in the county once a year. Henderson County and participating jurisdictions can expect tornadoes up to a category EF2 (as based on historical records).

All of the planning partners agreed with this high probability factor except the Cities Berryville, Brownsboro, Coffee City, Eustace, Moore Station, Poynor, Seven Points and Tool.

### 11.3 CLIMATE CHANGE IMPACTS

Climate change impacts on the frequency and severity of tornadoes are unclear. According to the Center for Climate Change and Energy Solutions, “Researchers are working to better understand how the building blocks for tornadoes – atmospheric instability and wind shear – will respond to global warming. It is likely that a warmer, moister world would allow for more frequent instability. However, it is also likely that a warmer world would lessen chances for wind shear. Recent trends for these quantities in the Midwest during the spring are inconclusive. It is also possible that these changes could shift the timing of tornadoes or regions that are most likely to be hit” (Center for Climate and Energy Solutions no date).

### 11.4 ISSUES

Important issues associated with a tornado in the planning area include the following:

- Older building stock in the planning area is built to low code standards or none at all. These structures could be highly vulnerable to tornadoes.
- Availability of tornado safe rooms in public buildings.
- Redundancy of power supply must be evaluated.
- The capacity for backup power generation is limited
- Roads and bridges blocked by debris or otherwise damaged might isolate populations.
- Warning time may not be adequate for residents to seek appropriate shelter or such shelter may not be widespread throughout the planning area
- The impacts of climate change on the frequency and severity of tornadoes are not well understood.
- Building codes may need to be updated so buildings can withstand strong wind loads or provisions may be added for tornado shelters in high risk areas.

## CHAPTER 12

### WILDFIRE

#### 12.1 HAZARD PROFILE

A wildfire event can rapidly spread out of control and occurs most often in the summer and early fall, when the brush is dry and flames can move unchecked through a highly vegetated area. Wildfires can start as a slow burning fire along the forest floor, killing and damaging trees. The fires often spread more rapidly as they reach the tops of trees, with wind carrying the flames from tree to tree. Usually, dense smoke is the first indication of a wildfire.

A wildfire is any uncontrolled fire occurring on undeveloped land that requires fire suppression. It often begins unnoticed and spreads quickly, lighting brush, trees and homes on fire. Wildfires can be ignited by lightning or by human activity such as smoking, campfires, equipment use, and arson.

Texas has seen a significant increase in the number of wildfires in the past 30 years, which included wildland and interface or intermix fires. Wildland fires are fueled almost exclusively by natural vegetation while interface or intermix fires are urban/wildland fires in which vegetation and the built-environment provide the fuel.

Fire hazards present a considerable risk to vegetation and wildlife habitats. Short-term loss caused by a wildfire can include the destruction of timber, wildlife habitat, scenic vistas, and watersheds. Long-term effects include smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural and economic resources and community infrastructure. Vulnerability to flooding increases due to the destruction of watersheds. The potential for significant damage to life and property exists in areas designated as wildland urban interface (WUI) areas, where development is adjacent to densely vegetated areas.

Texas has seen a huge increase in the number of wildfires in the past 30 years. From January 2005 through December 2014 the Texas Forest Service (TFS) has recorded 160,063 fires burning over 9.4 billion acres and 79% of those fires were within 2 miles of a community.

#### FIRE PROTECTION IN HENDERSON COUNTY

Fire protection in Henderson County is divided among the following jurisdictions. All are volunteer fire departments (VFD) except the City of Athens and the City of Gun Barrel.

- Athens Fire Department
- Baxter Volunteer Fire Department
- Berryville Volunteer Fire Department
- Brownsboro Volunteer Fire Department
- Caney City Volunteer Fire Department
- Chandler Volunteer Fire Department
- Coffee City Volunteer Fire Department
- Eustace Volunteer Fire Department
- Gun Barrel City Fire Department
- Larue-New York Volunteer Fire Department
- Log Cabin Volunteer Fire Department
- Malakoff Volunteer Fire Department
- Moore Station Volunteer Fire Department
- Murchison Volunteer Fire Department
- North 19 Volunteer Fire Department
- Payne Springs Volunteer Fire Department
- Poynor Volunteer Fire Department
- Seven Points Volunteer Fire Department

- Southside Volunteer Fire Department
- Tool ESD Volunteer Fire Department
- Trinidad Volunteer Fire Department
- Westside Volunteer Fire Department

## VEGETATION CLASSES IN HENDERSON COUNTY

General vegetation for the Henderson County planning area is described in TABLE 12-1. The most common vegetation class in the county is grass land.

TABLE 12-1 VEGETATION CLASSES IN HENDERSON COUNTY		
CLASS	ACRES	% OF AREA
BARREN LAND (ROCK/SAND/CLAY)	878.2	0.14
DEVELOPED LAND	27,107.40	4.42
DEVELOPED OPEN SPACE	23,918.10	3.9
CROPS AND PASTURE/HAY	14,556	2.40
GRASSLAND	285,232.90	46.5
MARSH	84,494.80	13.78
MIXED FOREST	109,732	17.9
SHRUB/SCRUB	5,312.80	0.86
WATER	61,740.10	10.1
TOTAL	612972.2	100
SOURCE: USDA NATIONAL AGRICULTURAL STATISTICS SCIENCE		

### 12.1.1 LOCATION

Texas is one of the fastest growing states in the nation. Much of this growth is occurring in the WUI area, where structures and other human improvements meet and mix with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfires. For Henderson County, the Texas A&M Forest Service Wildfire Risk Assessment Portal (TxWRAP) estimated that 35692 people or 40.7% of the total county population live within the WUI.

The WUI layer reflects housing density depicting where humans and their structures meet or intermix with wildland fuels. Approximately 409520.9 acres of Henderson County are located as part of the WUI. The TxWRAP report for the Henderson County planning area maps the WUI Response Index, which is a rating of the potential impact of a wildfire on people and their homes. The key input, WUI, reflects housing density (houses per acre) as seen in FIGURE 12-1. The TxWRAP report states that the location of people living in the WUI and rural areas is essential for defining potential wildfire impacts to people and homes.

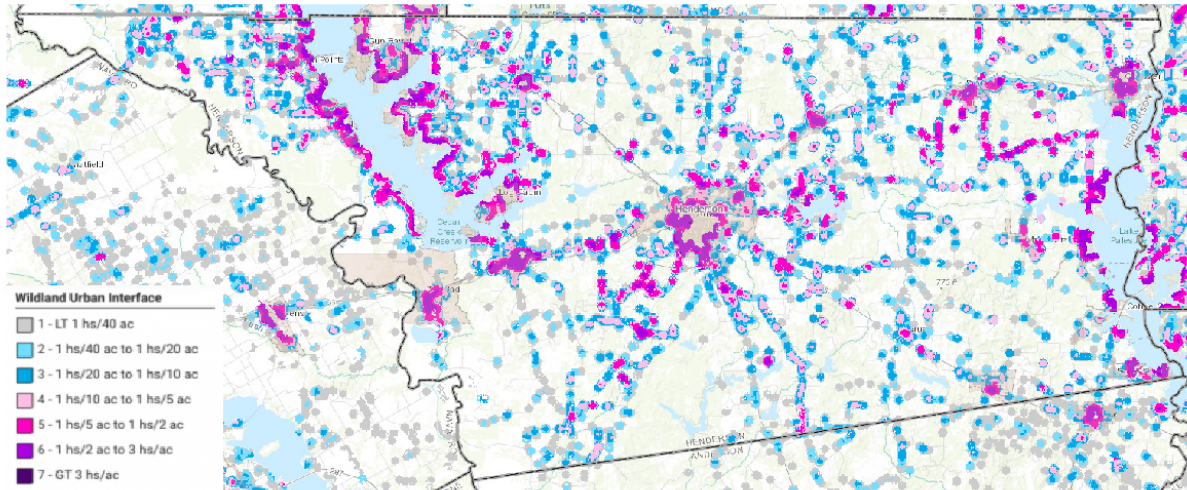


FIGURE 12-1 HENDERSON COUNTY WILDLAND URBAN INTERFACE

### 12.1.2 EXTENT

The ESRI, ArcGIS Living Atlas, report for Henderson County maps the Fire Intensity Scale (FIS) specifically identifies areas where significant fuel hazards and associated dangerous fire behavior potential exist based on a weighted average of four percentile weather categories. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities as seen in TABLE 12-2. The majority of Henderson County is identified as a very low to low on the FIS as seen in FIGURE 12-2 and all the municipal planning partners' FIS can be viewed in FIGURE 12-3 through FIGURE 12-21.

The worst case scenario for the Henderson County planning area is to see up to a Class 5 Wildfire with very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire induced winds and a great potential for harm or damage to life and property.

TABLE 12-2 TEXAS FOREST SERVICE FIRE INTENSITY RATINGS

CLASS	WILDFIRE INTENSITY RATINGS	DESCRIPTION OF FIRE
CLASS 1	Very Low	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
CLASS 2	Low	Small flames, usually less than 2 foot long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
CLASS 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 dozers and plows are generally effective. Increasing potential for harm or damage to life and

		property.
CLASS 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.
CLASS 5	Very High	Very large flames up to 150 feet in length; profused 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.

**SOURCE: TFS**

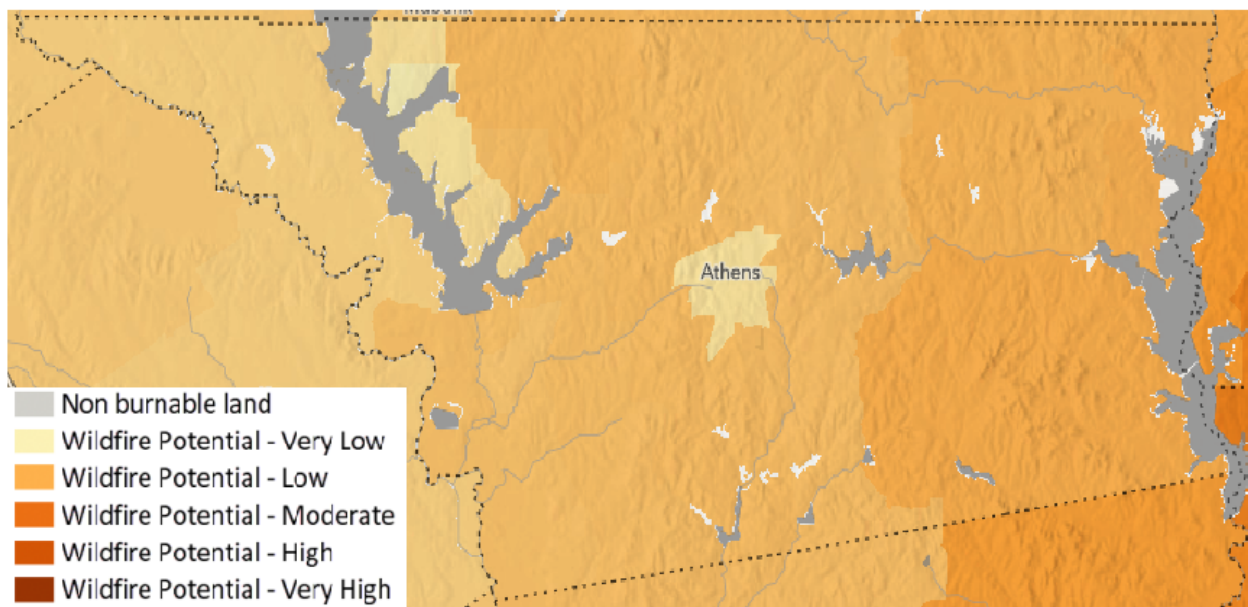


Figure 12-2 Henderson County Wildfire Intensity

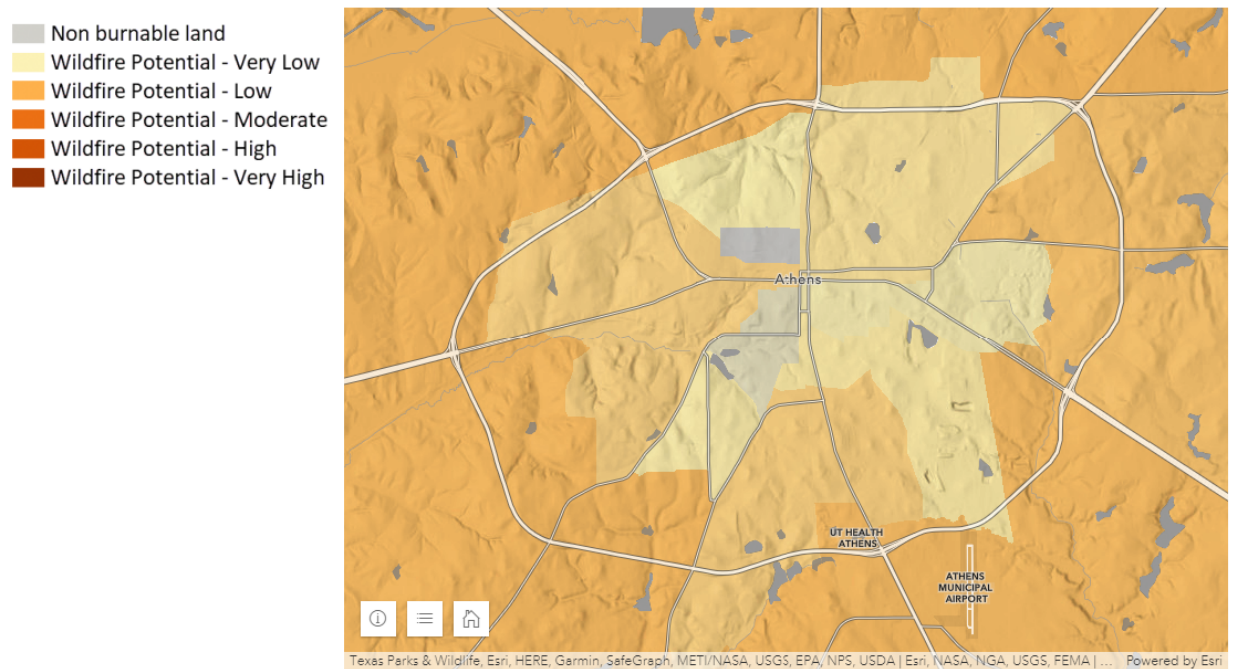


Figure 12-3 City of Athens

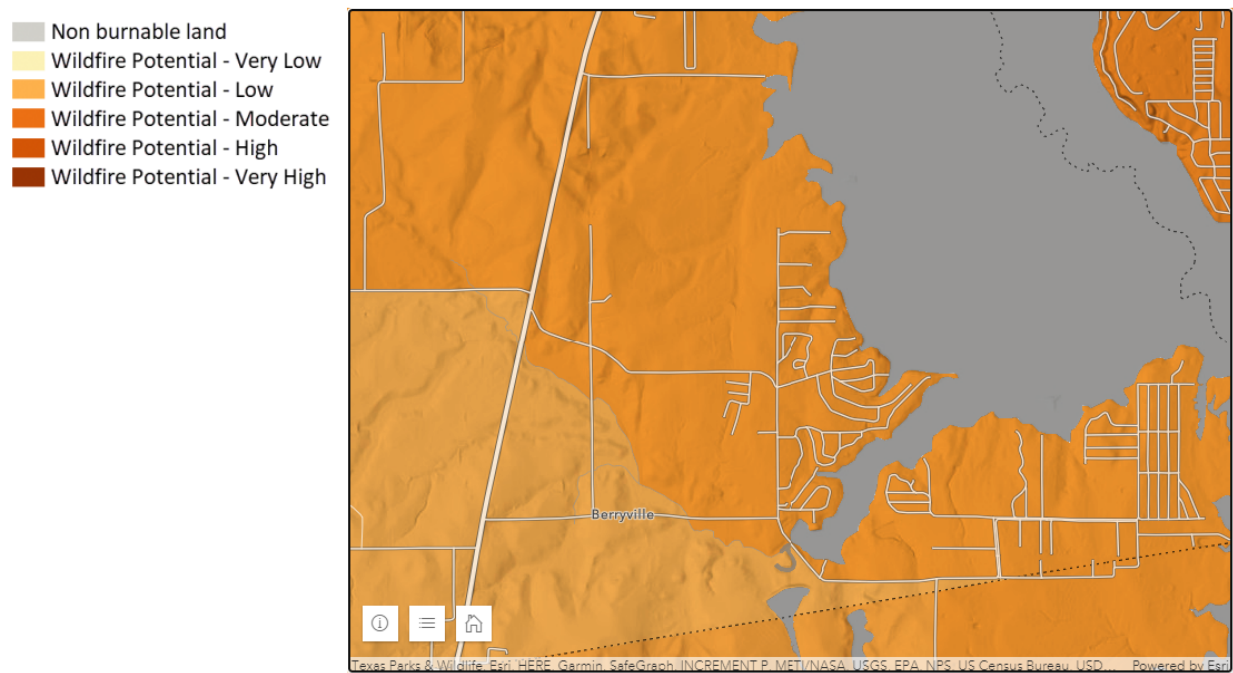


Figure 12-4 City of Berryville



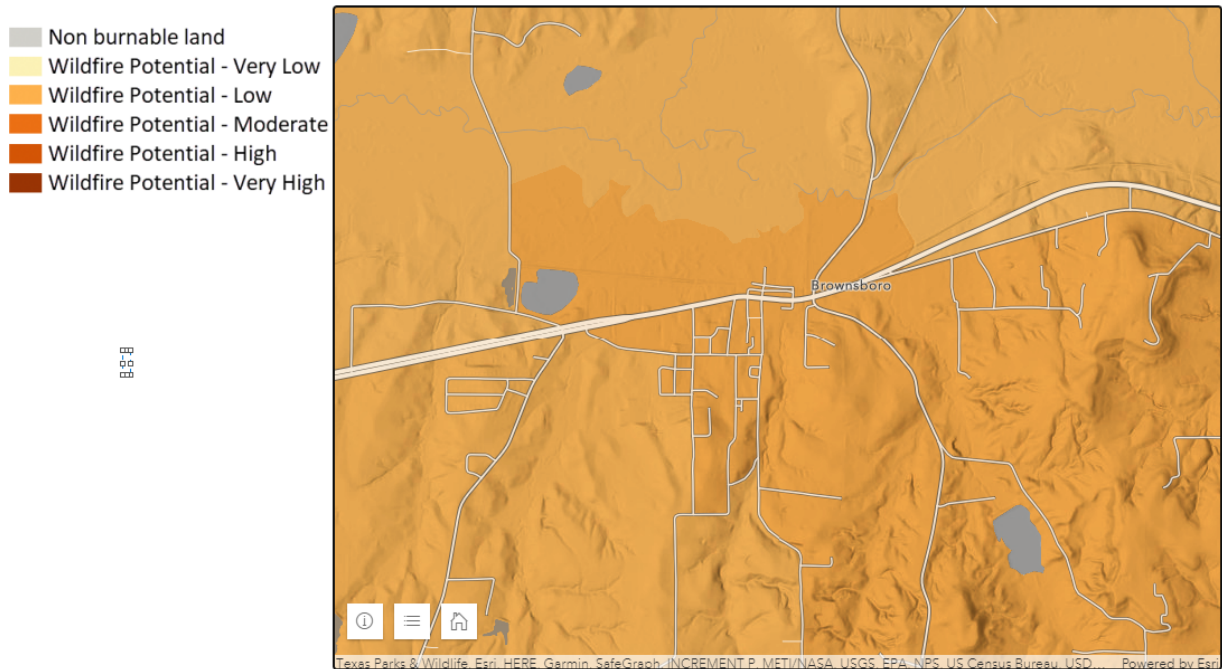


FIGURE 12-5 CITY OF BROWNSBORO

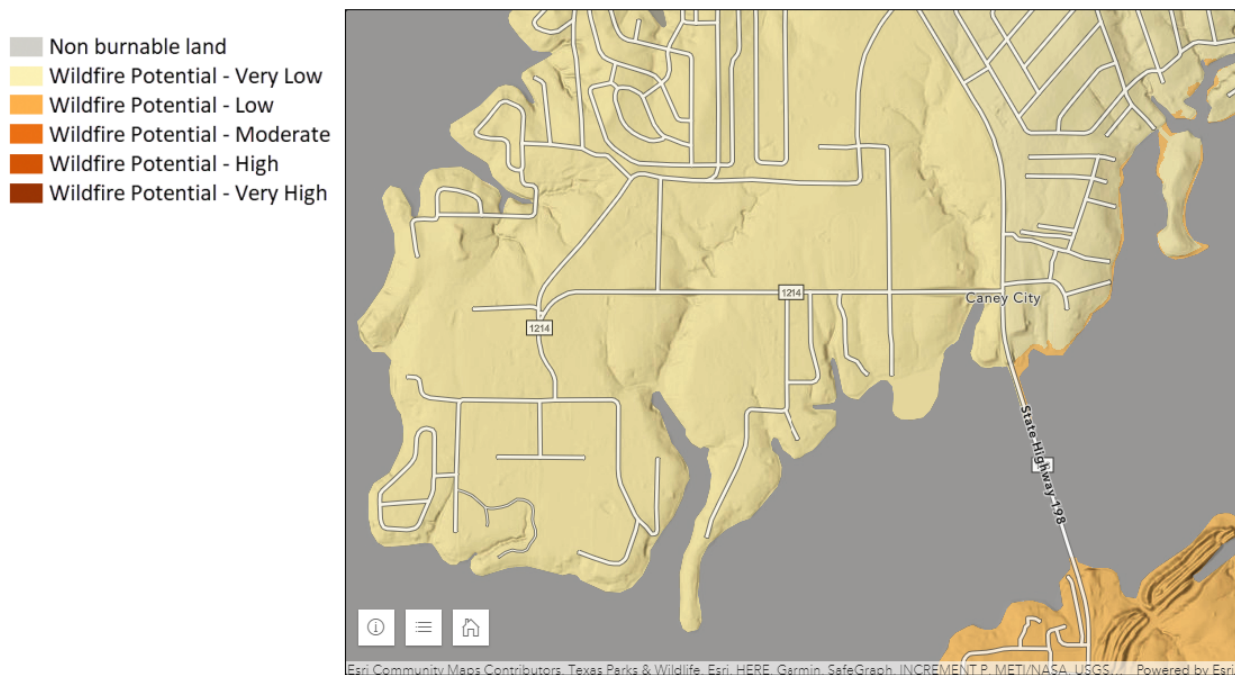


FIGURE 12-6 CITY OF CANEY CITY



- Non burnable land
- Wildfire Potential - Very Low
- Wildfire Potential - Low
- Wildfire Potential - Moderate
- Wildfire Potential - High
- Wildfire Potential - Very High

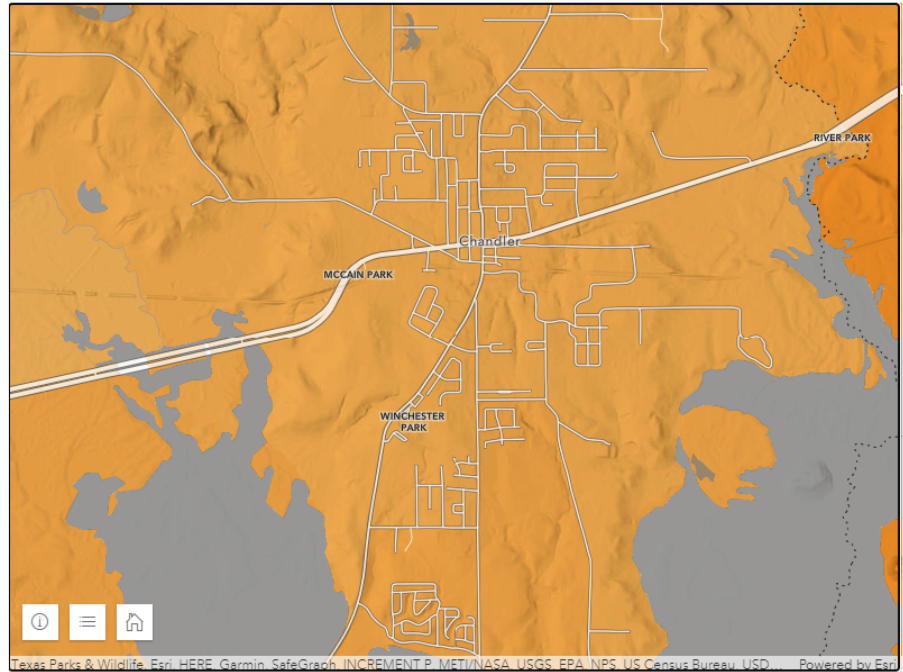


FIGURE 12-7 CITY OF CHANDLER

- Non burnable land
- Wildfire Potential - Very Low
- Wildfire Potential - Low
- Wildfire Potential - Moderate
- Wildfire Potential - High
- Wildfire Potential - Very High

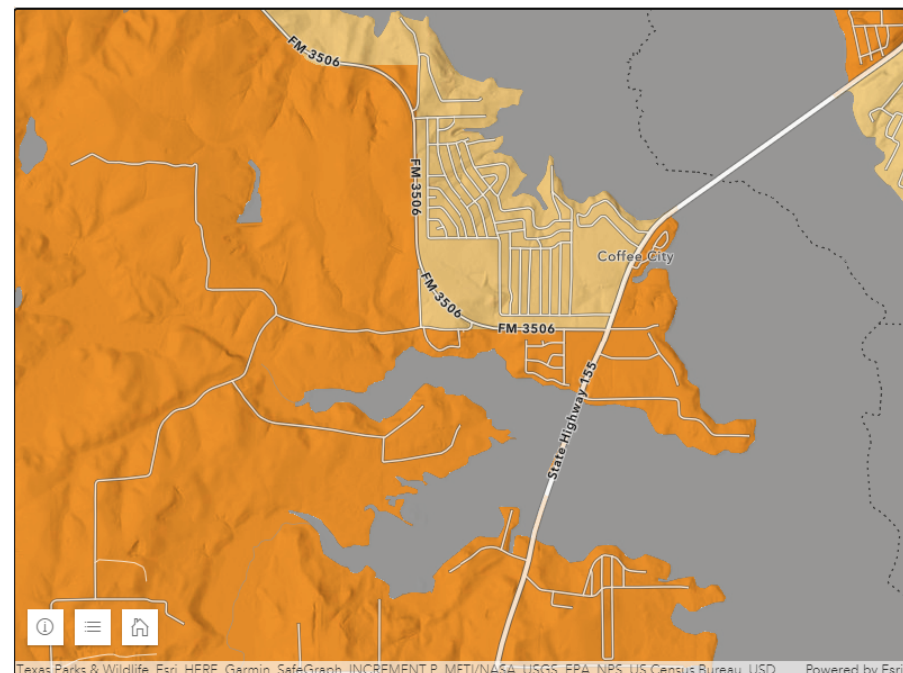


FIGURE 12-8 CITY OF COFFEE CITY

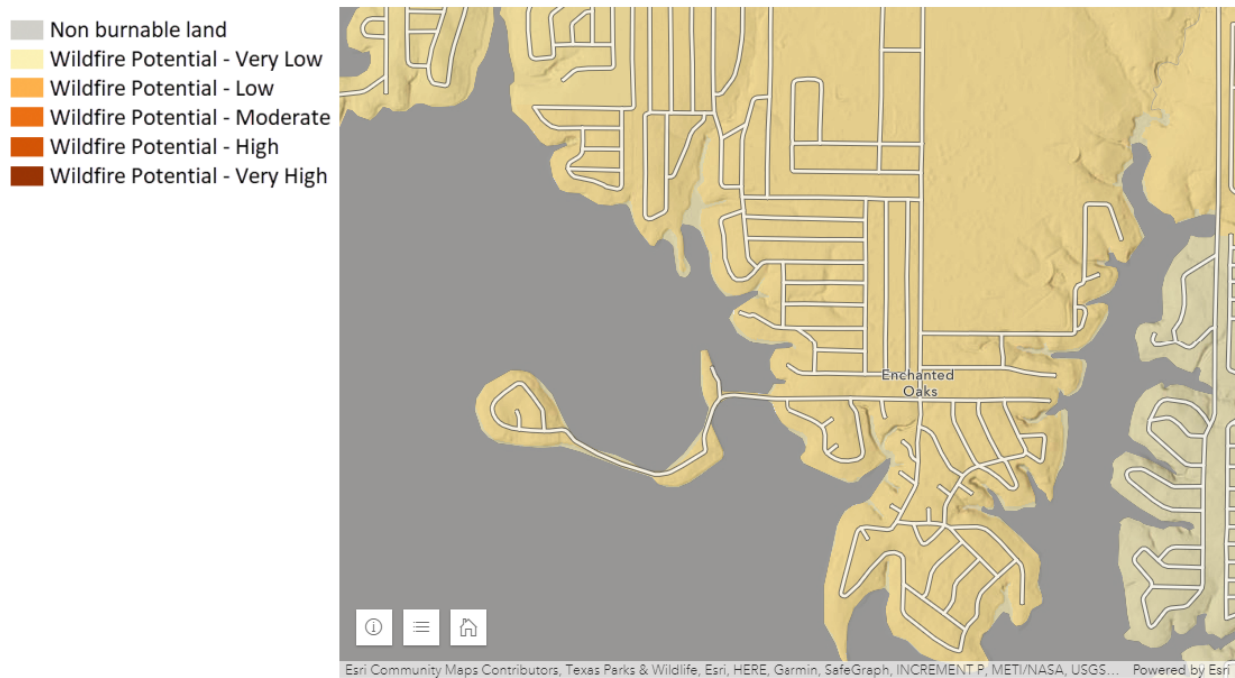


FIGURE 12-9 CITY OF ENCHANTED OAKS

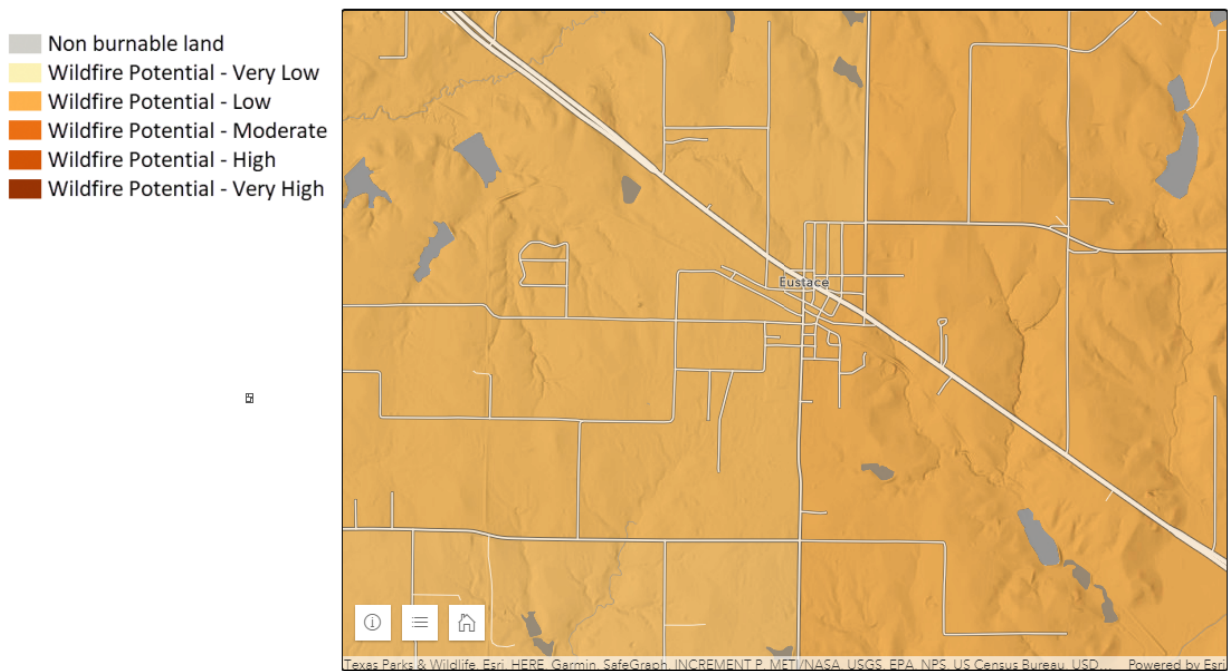


FIGURE 12-10 CITY OF EUSTACE

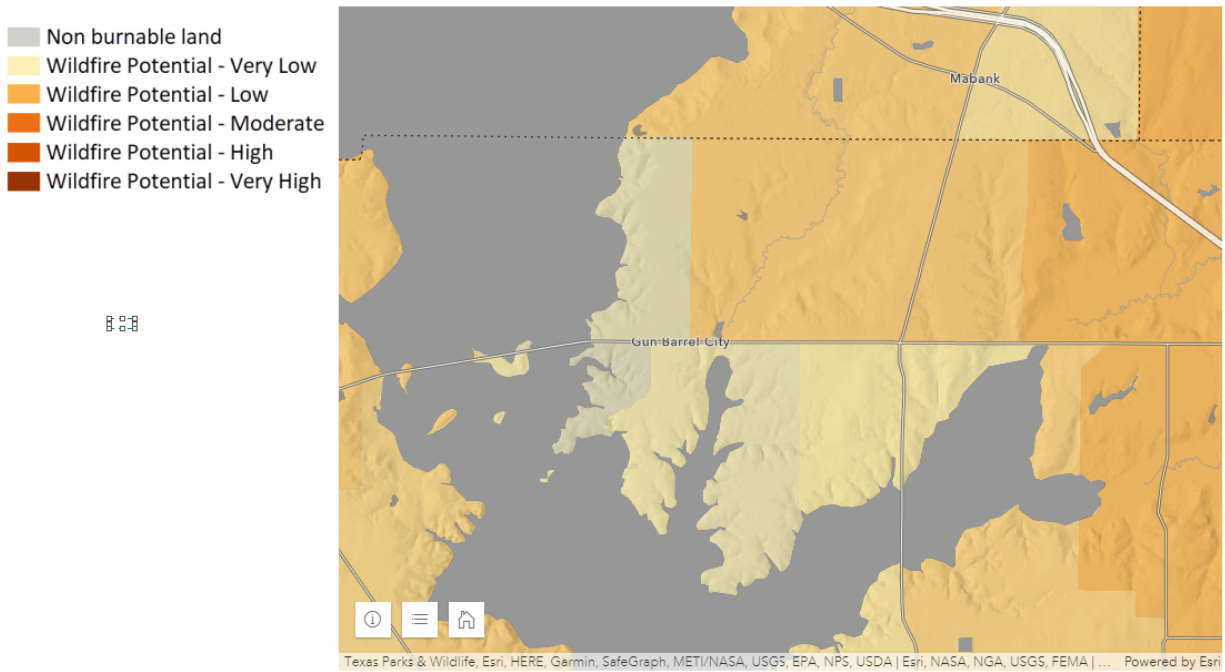


FIGURE 12-11 CITY OF GUN BARREL CITY

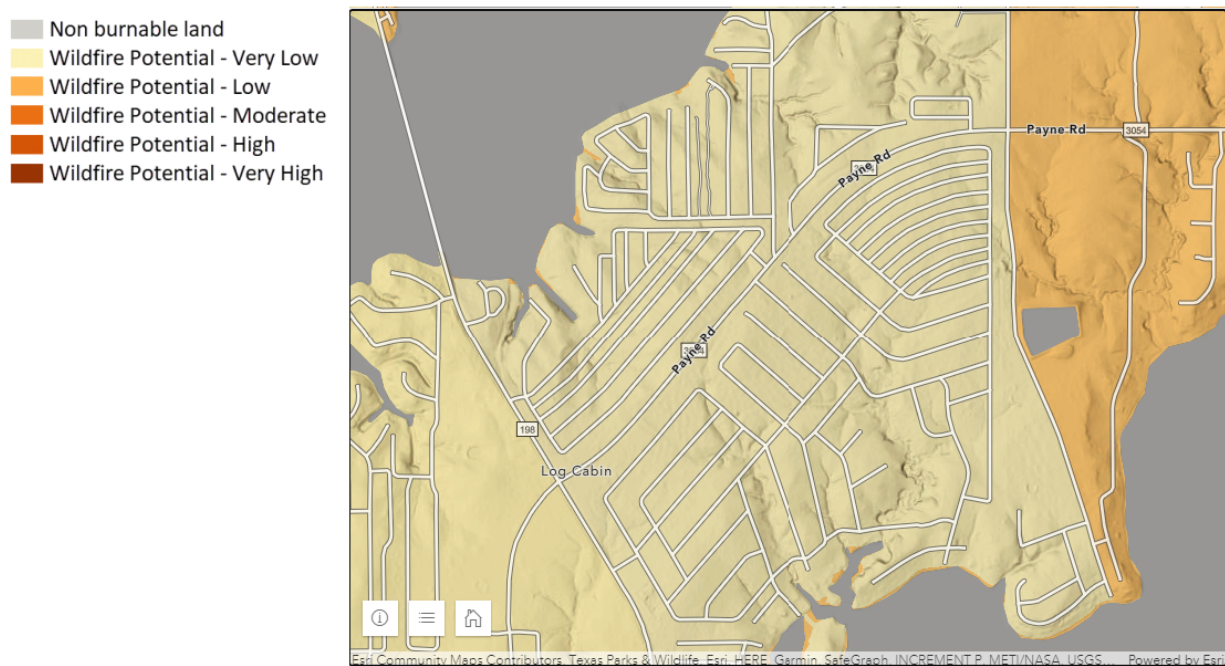


FIGURE 12-12 CITY OF LOG CABIN



- Non burnable land
- Wildfire Potential - Very Low
- Wildfire Potential - Low
- Wildfire Potential - Moderate
- Wildfire Potential - High
- Wildfire Potential - Very High

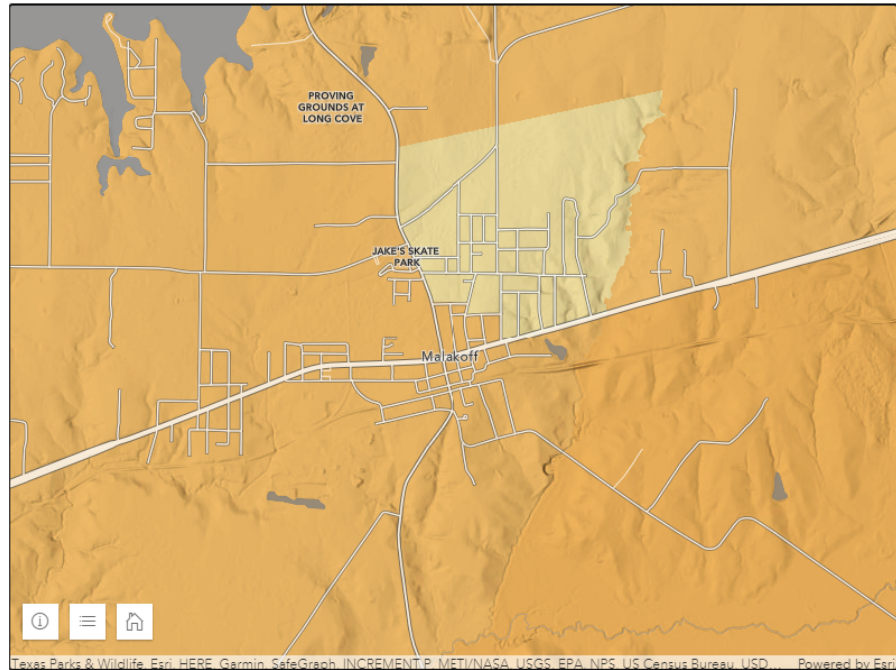


FIGURE 12-13 CITY OF MALAKOFF

- Non burnable land
- Wildfire Potential - Very Low
- Wildfire Potential - Low
- Wildfire Potential - Moderate
- Wildfire Potential - High
- Wildfire Potential - Very High

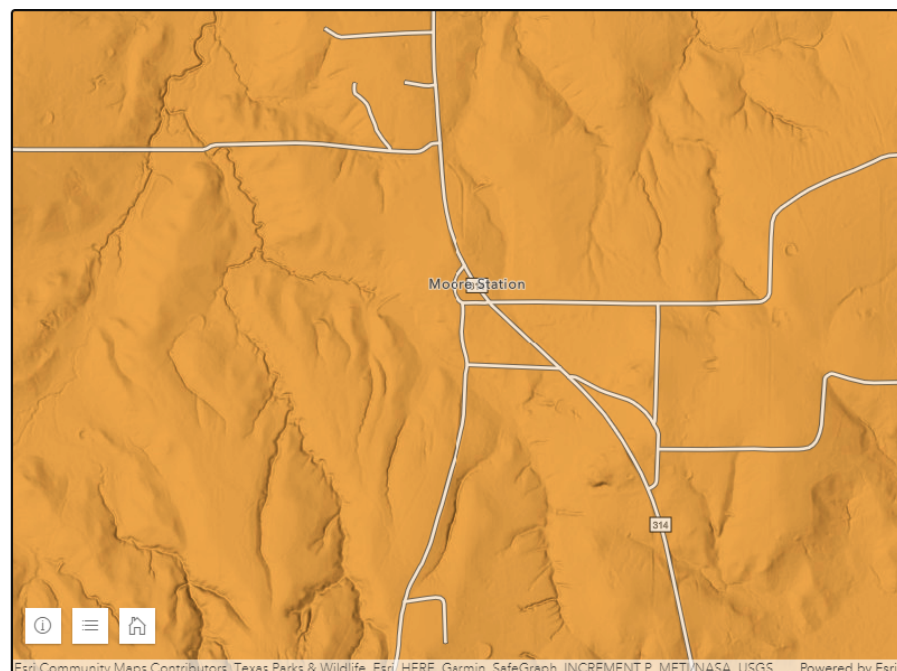


FIGURE 12-14 CITY OF MOORE STATION

- Non burnable land
- Wildfire Potential - Very Low
- Wildfire Potential - Low
- Wildfire Potential - Moderate
- Wildfire Potential - High
- Wildfire Potential - Very High

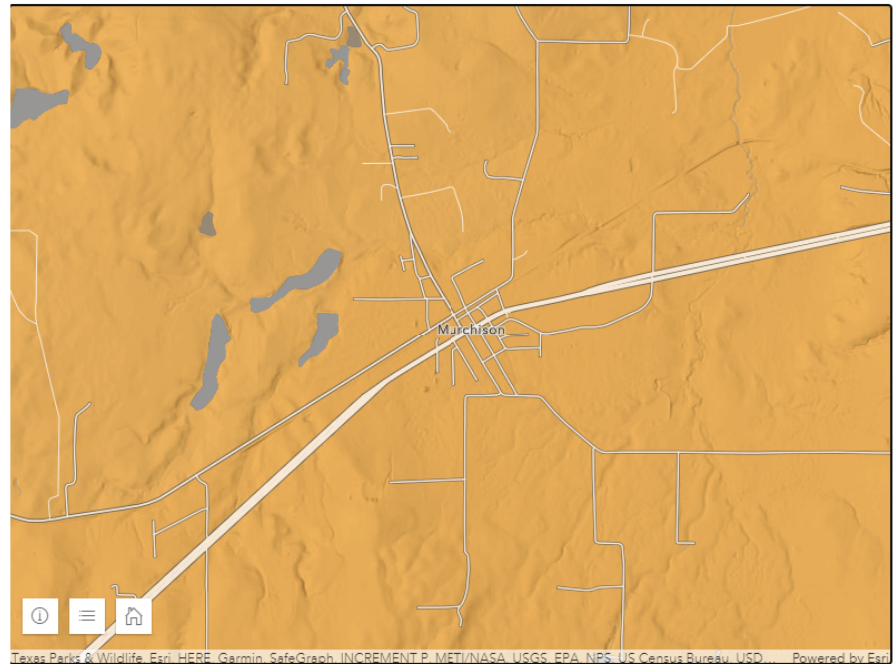


FIGURE 12-15 CITY OF MURCHISON

- Non burnable land
- Wildfire Potential - Very Low
- Wildfire Potential - Low
- Wildfire Potential - Moderate
- Wildfire Potential - High
- Wildfire Potential - Very High

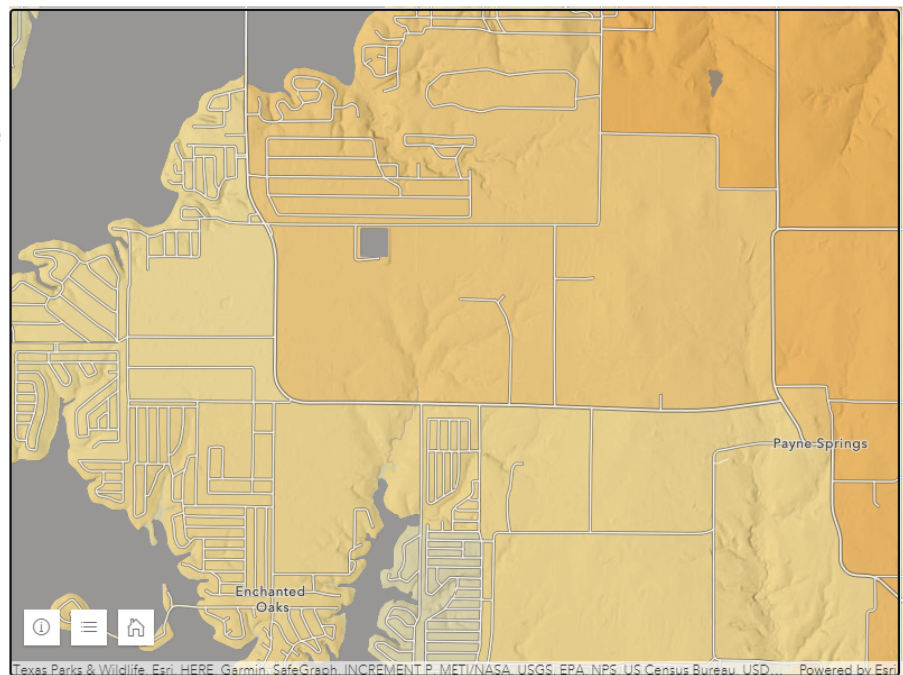


FIGURE 12-16 CITY OF PAYNE SPRINGS

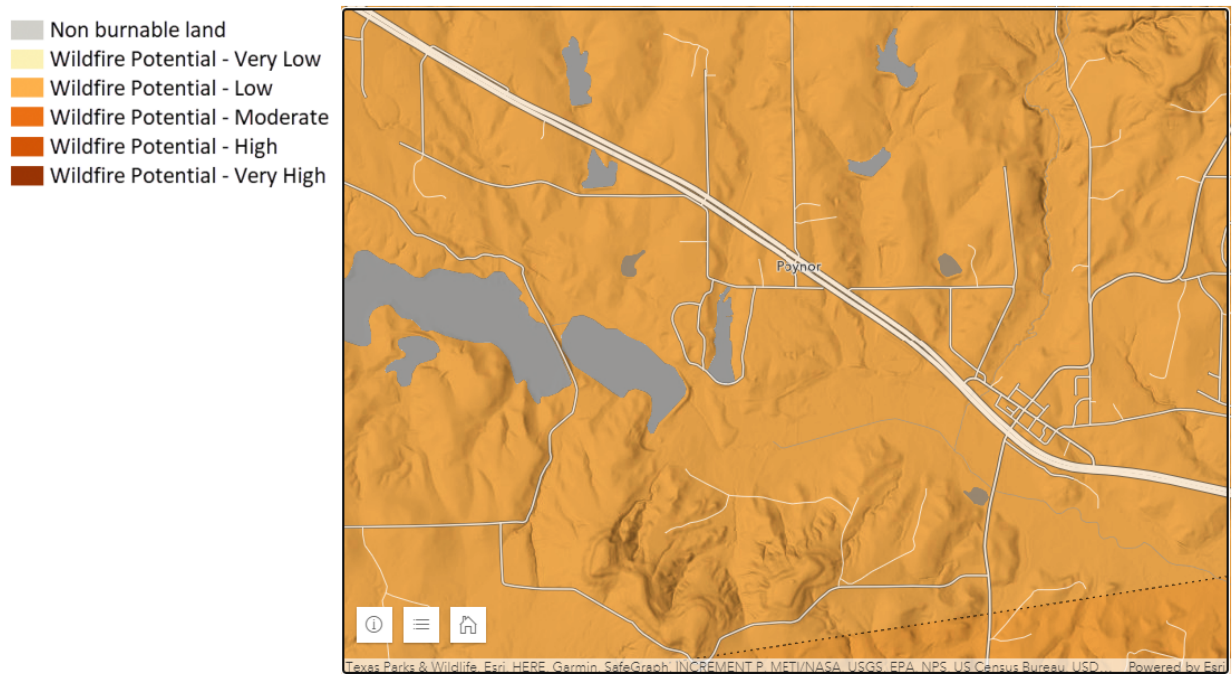


FIGURE 12-17 CITY OF POYNOR

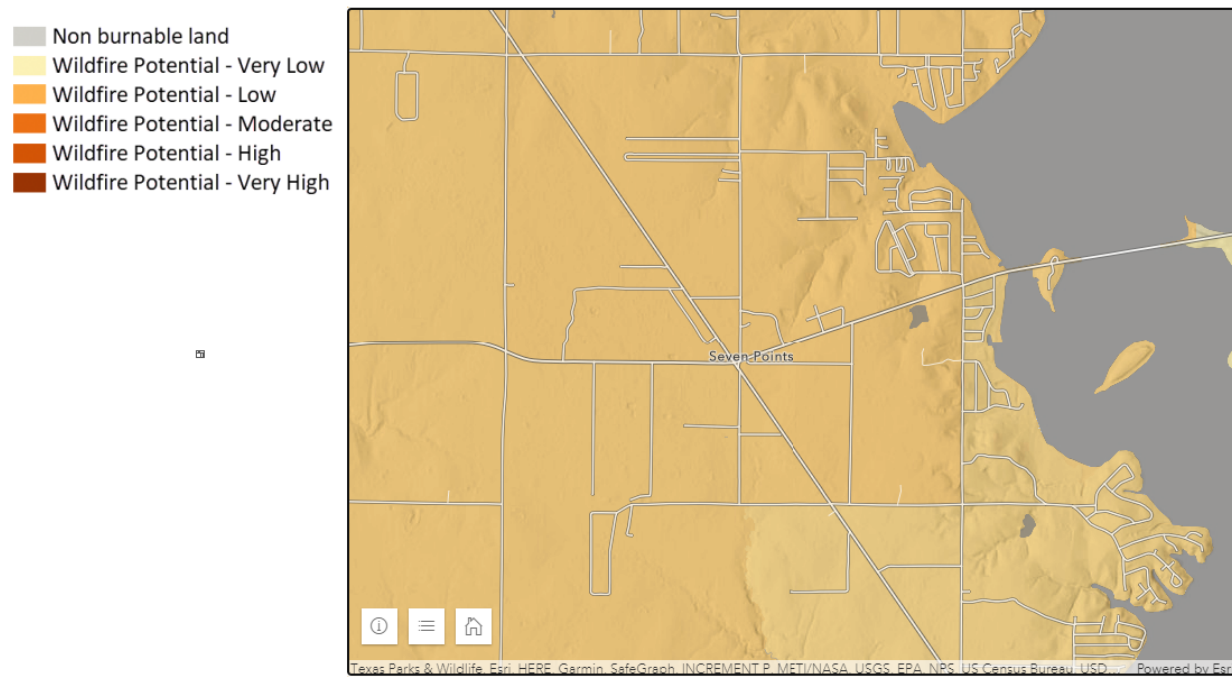


FIGURE 12-18 CITY OF SEVEN POINTS

- Non burnable land
- Wildfire Potential - Very Low
- Wildfire Potential - Low
- Wildfire Potential - Moderate
- Wildfire Potential - High
- Wildfire Potential - Very High

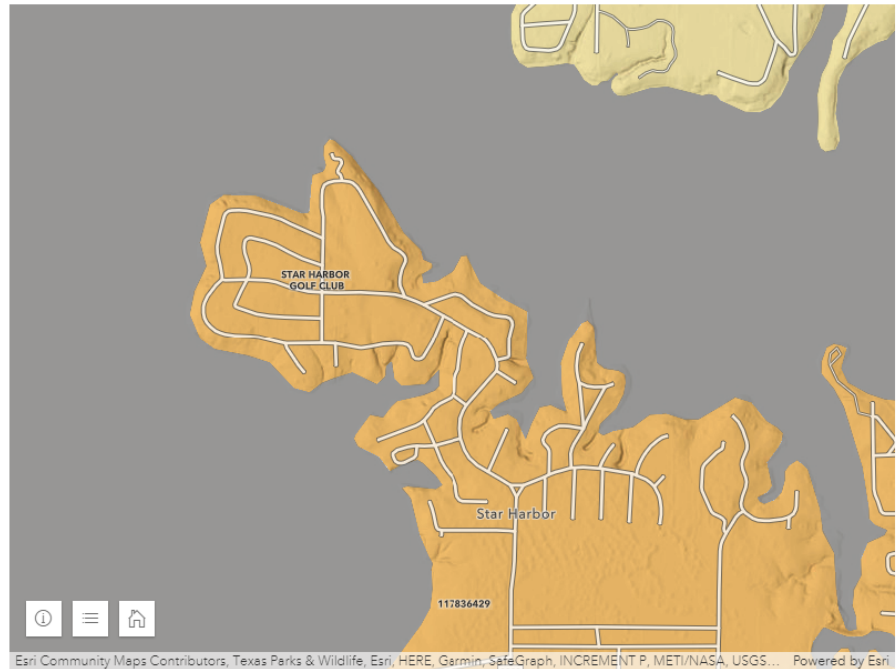


FIGURE 12-19 CITY OF STAR HARBOR

- Non burnable land
- Wildfire Potential - Very Low
- Wildfire Potential - Low
- Wildfire Potential - Moderate
- Wildfire Potential - High
- Wildfire Potential - Very High

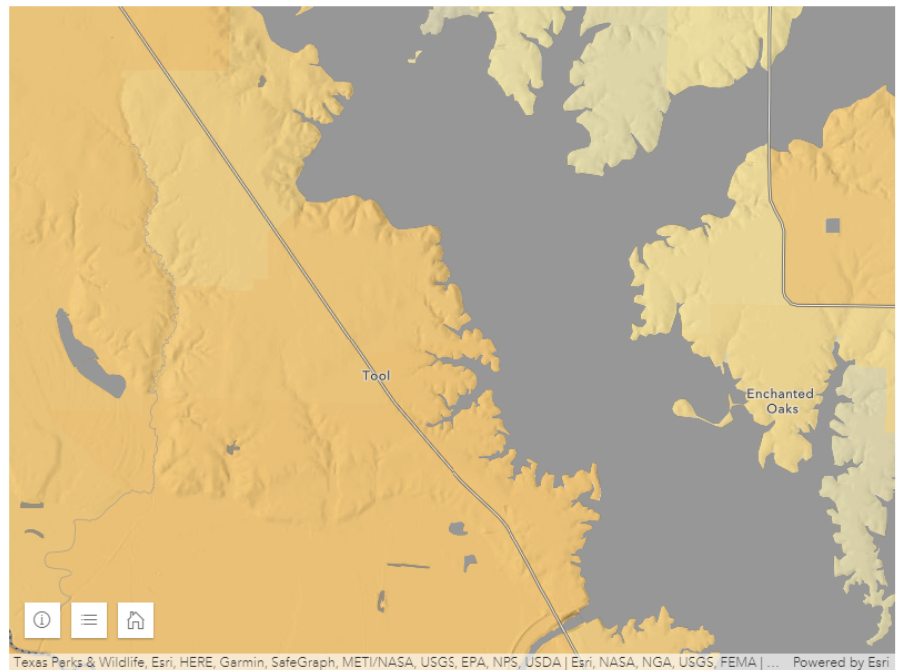


FIGURE 12-20 CITY OF TOOL



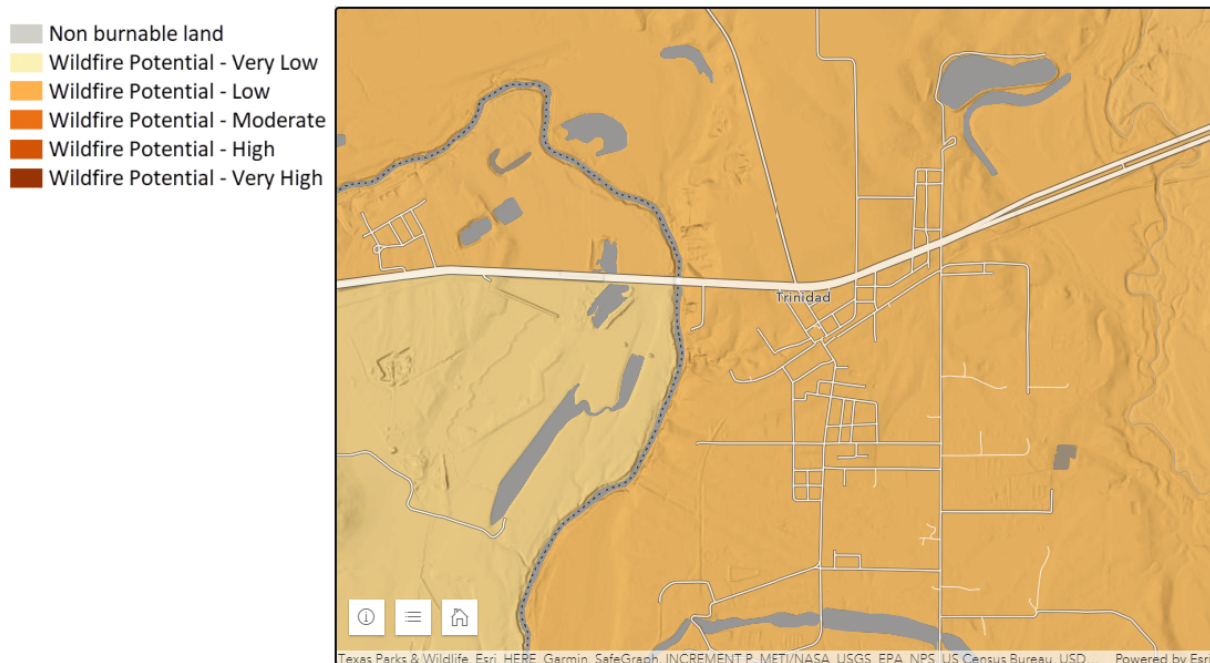


FIGURE 12-21 CITY OF TRINIDAD

### 12.1.3 PAST EVENTS

Since 1965, Henderson County has been included in 2 Presidential Declarations for wildfires in the planning area (Table 4-1). No declarations are included in this plan update timeframe.

The Texas Forest Service's Wildfire Risk Assessment Portal reports 35 wildfire events burning 4,803 acres between 2005 and 2015 (fires burning over 50 acres) mainly within unincorporated Henderson County.

### 12.1.4 WARNING TIME

Wildfires are often caused by humans, intentionally or accidentally. There is no way to predict when one might break out. Because fireworks often cause brush fires, extra diligence is warranted around the Fourth of July when the use of fireworks is highest. Dry seasons and droughts are factors that greatly increase fire likelihood. Dry lightning may trigger wildfires. Severe weather can be predicted, so special attention can be paid during weather events that may include lightning. Reliable NWS lightning warnings are available on average 24 to 48 hours before a significant electrical storm.

If a fire does break out and spreads rapidly, residents may need to evacuate within days or hours. A fire's peak burning period generally is between 1:00 p.m. and 6:00 p.m. Once a fire has started, fire alerting is reasonably rapid in most cases. The rapid spread of cellular and two-way radio communications in recent years has further contributed to a significant improvement in warning time.

## 12.2 VULNERABILITY AND IMPACTS

Structures, aboveground infrastructure, critical facilities, agricultural areas (crops and structures), and natural environments are all vulnerable to the wildfire hazard.



### 14.2.1 EXPOSURE

TABLE 12-3 lists the building-related exposure to the wildfire risk categories for the Henderson County planning area.

TABLE 12-3 COMPARISON OF BUILDING-RELATED EXPOSURE IN HAZARD AREAS				
HENDERSON COUNTY	VERY LOW POTENTIAL WILDFIRE INTENSITY	LOW POTENTIAL WILDFIRE INTENSITY	MODERATE POTENTIAL WILDFIRE INTENSITY	HIGH POTENTIAL WILDFIRE INTENSITY
TOTAL AREA (ACRES)	67187.2	274240	90035.2	0
ESTIMATED POPULATION EXPOSED	10855	44307	14546	0
VALUE OF BUILDING AND CONTENT	951,396,908	3,577,732,070	1,189,609,541	0
PERCENTAGE OF REPLACEMENT VALUE EXPOSED	16.6	62.6	20.8	0
SOURCE: ArcGIS				

### CRITICAL FACILITIES AND INFRASTRUCTURE

Critical facilities of wood frame construction are especially vulnerable during wildfire events. In the event of wildfire, there would likely be little damage to most infrastructure. Most roads and railroads would be without damage except in the worst scenarios. Power lines are the most at risk from wildfire because most poles are made of wood and susceptible to burning. Fires can create conditions that block or prevent access and can isolate residents and emergency service providers. Wildfire typically does not have a major direct impact on bridges, but it can create conditions in which bridges are obstructed.

### ENVIRONMENT

Fire is a natural and critical ecosystem process in most terrestrial ecosystems, dictating in part the types, structure, and spatial extent of native vegetation. However, wildfires can cause severe environmental impacts:

- **Soil Erosion** – The protective covering provided by foliage and dead organic matter is removed, leaving the soil fully exposed to wind and water erosion. Accelerated soil erosion occurs, causing landslides and threatening aquatic habitats.
- **Spread of Invasive Plant Species** – Non-native woody plant species frequently invade burned areas. When weeds become established, they can dominate the plant cover over broad landscapes, and become difficult and costly to control.

- **Disease and Insect Infestations** – Unless diseased or insect-infested trees are swiftly removed, infestations and disease can spread to healthy forests and private lands. Timely active management actions are needed to remove diseased or infested trees.
- **Destroyed Endangered Species Habitat** – Catastrophic fires can have devastating consequences for endangered species.
- **Soil Sterilization** – Topsoil exposed to extreme heat can become water repellant, and soil nutrients may be lost. It can take decades or even centuries for ecosystems to recover from a fire. Some fires burn so hot that they can sterilize the soil. Many ecosystems are adapted to historical patterns of fire occurrence. These patterns, called “fire regimes,” include temporal attributes (frequency and seasonality), spatial attributes (size and spatial complexity), and magnitude attributes (intensity and severity), each of which have ranges of natural variability. Ecosystem stability is threatened when any of the attributes for a given fire regime diverge from its range of natural variability.

### 12.2.2 IMPACTS

Loss estimates for wildfire hazard are not based on damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing projected damages (annualized loss) on historical events. TABLE 12-4 lists the loss estimates based on historical occurrences.

**TABLE 12-4 LOSS ESTIMATES FOR WILDFIRE EVENTS**

	ANNUAL RATE OF OCCURRENCE	ANNUALIZED ACRES BURNED	ANNUALIZED LOSS
HENDERSON COUNTY	3.5	480.3	77,000

### COMMUNITY PERCEPTION OF VULNERABILITY

The jurisdictions of Henderson County as well as the Cities of Athens, Berryville, Brownsboro, Caney City, Chandler, Enchanted Oaks, Log Cabin, Malakoff, Moore Station, Murchison, Payne Springs, Poynor, Star Harbor, Tool and Trinidad ranked wildfire as a high hazard. The Cities of Coffee City, Eustace and Gun Barrel City ranked it as a medium hazard and the city of Seven Points ranked it a low hazard impact. See the first page of this chapter for a summary of hazard rankings for Henderson County planning partners in this plan update. Chapter 16 gives a detailed description of these rankings and 17.2 addresses mitigation actions for this hazard vulnerability.

### 12.3 PROBABILITY OF FUTURE EVENTS

The threat of wildfire is a constant in Texas. From the East Texas Piney Woods to the Davis Mountains of West Texas, wildfires burn thousands, if not millions, of acres each year. Wildfires become especially dangerous when wildland vegetation begins to intermix with homes. Based on previous events and historical records, there is nearly a 100% chance of an event occurring in the unincorporated Henderson County and varying factors will determine if they burn into the interface areas of the municipalities.

The Cities of Berryville, Chandler, Coffee City, Log Cabin, Malakoff, Moore Station, Murchison, Payne Springs and Trinidad agree that there is a high probability of wildfires in the future. The jurisdiction of Henderson County and the cities of Athens, Brownsboro, Caney City, Enchanted Oaks, Eustace, Poynor, Star Harbor and Tool feel the probability is medium and wildfire is likely to occur within 100 years.

With more and more people living in the WUI, it is increasingly important for local officials to plan and prepare for wildfires. CWPPs are a proven strategy for reducing the risk of catastrophic wildfires and protecting lives and property.

TFS encourages Texas counties and communities to develop and adopt CWPPs to better prepare their region and citizens for wildfires. Planning for wildfires should take place long before a community is threatened. Once a wildfire ignites, the only option available to firefighters is to attempt to suppress the fire before it reaches a community. A CWPP is unique in that it empowers communities to share the responsibility for selecting the best strategies for protection against wildfire.

The Texas CWPP calls for communities to:

- Know their environment (WUI), assets at risk, fire occurrence and behavior, and overall wildfire risks
- Adopt mitigation strategies from wildfire preventions to fuels reduction to capacity building
- Create and adopt recovery plan strategies

## **12.4 CLIMATE CHANGE IMPACTS**

Fire in western ecosystems is affected by climate variability, local topography, and human intervention. Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot, dry spells create the highest fire risk. Increased temperatures may intensify wildfire danger by warming and drying out vegetation. When climate alters fuel loads and fuel moisture, forest susceptibility to wildfires changes. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

Historically, drought patterns in the West and Midwest are related to large-scale climate patterns in the Pacific and Atlantic Oceans. The El Niño–Southern Oscillation in the Pacific varies on a 5- to 7-year cycle, the Pacific Decadal Oscillation varies on a 20- to 30-year cycle, and the Atlantic Multidecadal Oscillation varies on a 65- to 80-year cycle. As these large-scale ocean climate patterns vary in relation to each other, drought conditions in the U.S. shift from region to region.

Climate scenarios project summer temperature increases between 2 and 5 degrees Celsius (3.6 to 9°F) and precipitation decreases of up to 15% by 2100. Such conditions would exacerbate summer drought and further promote wildfires, releasing stores of carbon and further contributing to the buildup of greenhouse gases. Forest response to increased atmospheric carbon dioxide – the so-called “fertilization effect” – could also contribute to more tree growth and thus more fuel for fires, but the effects of carbon dioxide on mature forests are still largely unknown. High carbon dioxide levels should enhance tree recovery after fire and young forest regrowth, as long as sufficient nutrients and soil moisture are available, although the latter is in question for many parts of the U.S. because of climate change.

## **12.5 ISSUES**

The major issues for wildfire are the following:

Public education and outreach to people living in or near the fire hazard zones should include information about and assistance with mitigation activities such as defensible space, and advance identification of evacuation routes and safe zones.

- Future growth into interface areas should continue to be managed.
- Area fire districts need to continue to train on WUI events.
- Vegetation management activities should be enhanced
- Regional consistency of higher building code standards should be adopted such as residential sprinkler requirements and prohibitive combustible roof standards.
- Fire department water supply in high-risk wildfire areas.

- Expand certifications and qualifications for fire department personnel. Ensure that all firefighters are trained in basic wildfire behavior, basic fire weather, and that all company officers and chief level officers are trained in the wildland command and strike team leader level.
- Both the natural and man-made conditions that contribute to the wildland fire hazard are tending to worsen through time
- Conservative forestry management practices have resulted in congested forests prone to fire and disease.
- The continued migration of inhabitants to remote areas of the county increases the probability of human-caused ignitions from vehicles, grills, campfires, and electrical devices.

## **Chapter 13**

### **WINTER WEATHER**

#### **13.1 HAZARD PROFILE**

A severe winter storm event is identified as a storm with snow, ice, or freezing rain----all of which can cause significant problems for area residents. Although rare in east Texas, winter weather does occasionally occur. January is the month when snow, sleet, or freezing rain is most likely to be observed; yet, winter weather conditions can occur at any time during the winter and early spring months. The leading cause of death during winter storms is transportation accidents. Hypothermia and frostbite are other dangers from very cold winter temperatures.

Extreme cold often accompanies a winter storm or is left in its wake. It is most likely to occur in the winter months of December, January and February. Prolonged exposure to the cold can cause frostbite or hypothermia and can become life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Extreme cold can disrupt or impair communications facilities.

##### **13.1.1 LOCATION**

Henderson County and the planning partners are susceptible to winter storms; blizzard conditions are primarily in the form of freezing rain, sleet or ice. Ice accumulation becomes a hazard by creating dangerous travel conditions especially when jurisdictions do not pre-treat the roads and people do not have all-weather tires on their vehicles.

According to the weather station in Tyler, the planning area experiences an average of 30 freezing days. TABLE 4-2 shows the annual average minimum, maximum and mean temperature distribution from Tyler Weather Station for Henderson County.

##### **13.1.2 EXTENT**

FIGURE 15-1 and FIGURE 13-2 are indices used to measure winter storms. The first is the wind chill temperature index (FIGURE 13-1). This index describes the relative discomfort or danger resulting from the combination of wind and temperature. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.

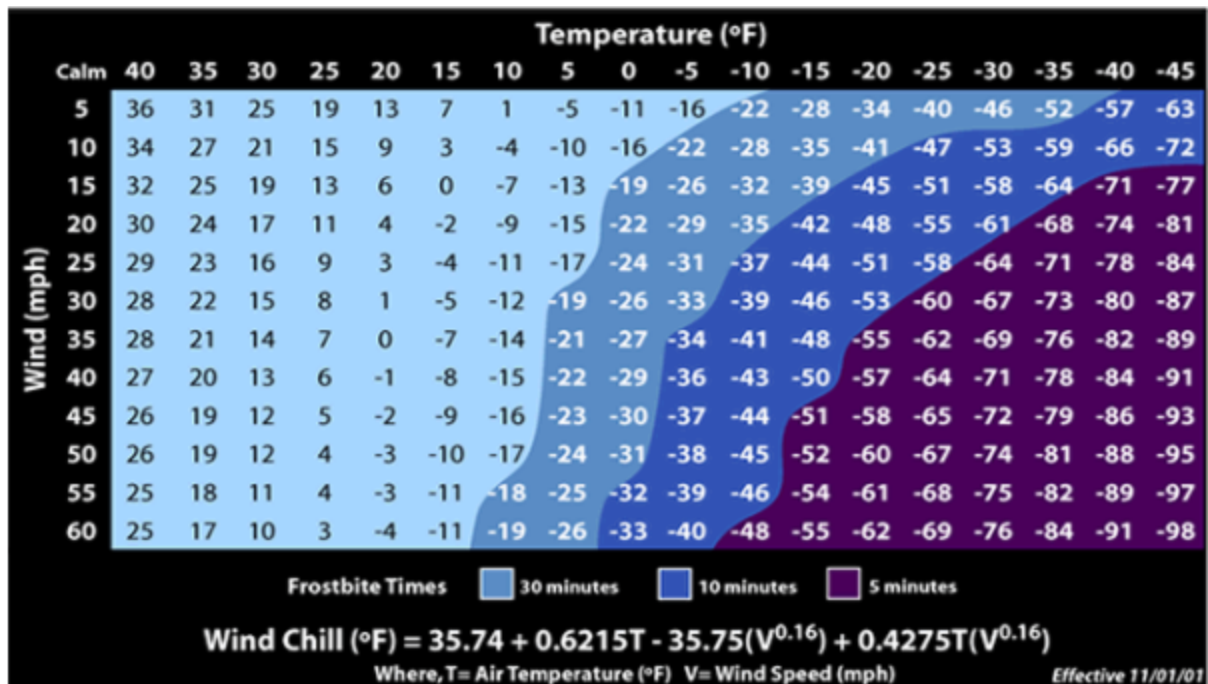


Figure 13-1. National weather Service Wind Chill

A wind chill watch is issued by the NWS when wind chill warning criteria are possible in the next 12 to 36 hours. A wind chill warning is issued for wind chills of at least -25 F in the Midwest.

The worst case scenario for the Henderson County Planning area and participating jurisdictions is the combination of -15 air temperatures and 35 mph winds that would create up to -48 wind chill. This would result in frostbite within 10 minutes of exposure and lead to hypothermia if precautions are not taken.

The second index is the Sperry-Piltz Ice Accumulation index, or SPIA Index, which is an ice accumulation and damage prediction index (FIGURE13-2). It is a tool to be used by the National Weather Service, FEMA as well as other agencies and communities for risk management and winter weather preparedness.

The second worst case scenario involves the Henderson County planning area and participating jurisdictions receiving up to one inch of ice covering everything.

**The Sperry-Piltz Ice Accumulation Index, or “SPIA Index” – Copyright, February, 2009**

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

FIGURE 13-2 Sperry-Piltz Ice Accumulation Index or SPIA Index

### 13.1.3 PAST EVENTS

Since 1965, Henderson County has been included in no Presidential Disaster (DR) Declaration for a severe winter ice storm in the planning area (TABLE 4-1)

NCEI recorded 8 winter weather events within the Henderson County area from January 2006 through December 2019 and all the planning partners are exposed to the same weather events. Of the events, there was \$228,000 recorded property damage and no injuries or fatalities (TABLE 13-1.)

**TABLE 13-1 WINTER WEATHER HISTORICAL EVENTS SUMMARY (2006-2020)**

	NUMBER OF EVENTS PER YEAR	PROPERTY DAMAGE	CROP DAMAGE	INJURIES	FATALITIES
<b>2019</b>	1	0	0	0	0
<b>2018</b>	2	0	0	0	0
<b>2015</b>	1	0	0	0	0
<b>2014</b>	1	150000	0	0	0

<b>2011</b>	1	3000	0	0	0
<b>2010</b>	1	60000	0	0	0
<b>2007</b>	1	15000	0	0	0
<b>TOTAL</b>	8	228000	0	0	0

**SOURCE: NECI**

Henderson County and the planning partners do not experience severe winter weather events consistently but winter storms can affect the plan update area. There have not been any category 5 (SPIA Index) ice events in Henderson County. Weather events for Henderson County and participation communities have been in the 0-2 Index, with an occasional 3 SPIA Index event. SPIA Index events of 0 to 2 can expect ice accumulation up to 0.75 inch and winds less than 35 mph. SPIA Index 3 events can expect ice accumulation up to 1.0 inch and winds greater than 35 mph.

For snowfall, the only historical event recorded during this plan update was on February 11<sup>th</sup>- 12<sup>th</sup>, 2010. Snow began accumulating during the morning hours of February 11<sup>th</sup> and did not end until the afternoon hours of February 12<sup>th</sup>. Snowfall totals across the county ranged from 5 to 10 inches with 4 inches measured at Chandler and 9 inches measured in Athens. Schools and some businesses were closed and the wet nature of the snow resulted in large tree branches being downed along with some smaller trees across the county.

#### USDA Risk Management Agency

According to the USDA Risk Management Agency, payments for insured crop losses in Henderson County as a result of freeze conditions between 2006 and 2019 caused \$0 in annualized crop losses that affected 0 acres.

#### 13.1.4 WARNING TIME

Meteorologists can often predict the likelihood of a severe winter storm. When forecasts are available, they can give several days of warning time. However, meteorologists cannot predict the exact time of onset or severity of the storm. Some storms may come on more quickly and have only a few hours of warning time.

#### 13.2 VULNERABILITY AND IMPACTS

The entire planning area is vulnerable to the effects of winter storms. Hazardous driving conditions caused by snow and ice on highways and bridges lead to many traffic accidents and can impact the response of emergency vehicles. The leading cause of death during winter storms is transportation accidents. About 70 percent of winter-related deaths occur in automobiles due to traffic accidents and about 25 percent are from people caught outside in a storm. Emergency services such as police, fire and ambulance are unable to respond due to road conditions. Emergency needs of remote or isolated residents for food or fuel, as well as for feed, water and shelter for livestock are unable to be met. The probability of utility and infrastructure failure increases during winter storms due to freezing rain accumulation on utility poles and power lines. People, pets and livestock are also susceptible to frostbite and hypothermia during winter storms. Those at risk are primarily either engaged in outdoor activity or the elderly. Schools often close during extreme cold or ice conditions to protect the safety of children and bus



drivers. Citizens' use of kerosene heater and other alternative forms of heating may create other hazards such as structural fires and carbon monoxide poisoning.

### 13.2.1 EXPOSURE

Vulnerable populations are the elderly, low income, linguistically isolated populations, people with life threatening illnesses and residents living in areas that are isolated from major roads. Power outages can be life threatening to those dependent on electricity for life support. Isolation of these populations is a significant concern. These populations face isolation and exposure during severe winter weather events and could suffer more secondary effects from the hazard. Commuters who are caught in storms may be particularly vulnerable. Stranded commuters may be vulnerable to carbon monoxide poisoning or hypothermia.

### 13.2.2 IMPACTS

The total property damage reported by the NCEI was \$228,000.00.

Buildings with overhanging tree limbs are more vulnerable to damage during winter storms. Businesses can experience loss of income as a result of closure during winter storms.

### LOSS OF USE

Overhead power lines and infrastructure are also vulnerable to damage from winter storms. In particular, ice accumulation during winter storm events can cause damage to power lines due to the ice weight on the lines and equipment, as well as damage caused to lines and equipment from falling trees and tree limbs weighted down by ice. Potential losses could include cost of repair or replacements of damaged facilities and lost economic opportunities for businesses. Secondary effects from loss of power could include burst water pipes in homes without electricity during winter storms. Public safety hazards include risk of electrocution from downed power lines. Specific amounts of estimated losses are not available due to the complexity and multiple variables associated with this hazard.

The electric power loss of use estimates provided below were calculated using FEMA's Standard Values for Loss of Service for Utilities published in June 2009 BCA Reference Guide. These figures are used to provide estimated costs associated with the loss of power in relation to the populations in Henderson County's jurisdictions. The loss of use estimates for power failure associated with winter storms are provided as the loss of use cost per person, per day of loss. The estimated loss of use provided for each jurisdiction represents the loss of service of the indicated utility for 1 day for 10 percent of the population. These figures do not take into account physical damages to utility equipment and infrastructure.

**TABLE 13-2 LOSS OF USE ESTIMATES FOR POWER FAILURE (ONE DAY)**

<b>JURISDICTION</b>	<b>2019 POPULATION</b>	<b>ESTIMATED AFFECTED POPULATION (10%)</b>	<b>ELECTRIC LOSS OF USE ESTIMATED (\$126 PER PERSON PER DAY)</b>
<b>Henderson County</b>	82,737	8,274	1,042,524
<b>Athens</b>	12,753	1,276	160,776
<b>Berryville</b>	1064	107	13,482
<b>Brownsboro</b>	1279	128	16,128
<b>Caney City</b>	220	22	2,772
<b>Chandler</b>	3180	318	40,068

<b>Coffee City</b>	293	30	3,780
<b>Enchanted Oaks</b>	341	35	4,410
<b>Eustace</b>	1006	101	12,726
<b>Gun Barrel City</b>	6208	621	78,246
<b>Log Cabin</b>	772	78	9,828
<b>Malakoff</b>	2301	231	29,106
<b>Moore Station</b>	220	22	2,772
<b>Murchison</b>	599	60	7,560
<b>Payne Springs</b>	769	77	9,702
<b>Poynor</b>	306	31	3,906
<b>Seven Points</b>	1469	147	18,522
<b>Star Harbor</b>	477	48	6,048
<b>Tool</b>	2302	231	29,106
<b>Trinidad</b>	870	87	10,962
<b>TOTAL</b>	119,166	11,924	1,502,424

## AGRICULTURE

According to the 6-year period from the USDA's Risk Management Agency, the amount of claims paid for crop damage as a result of freeze conditions in Henderson County was \$0. According to the 2016 Texas Insurance Profile from the USDA's Risk Management Agency, 88 percent of the insurable crops in Texas are insured with USDA crop insurance. To estimate losses to insurable crops that are insured, the 88 percent crop insurance coverage was factored in to provide an adjusted estimate of losses. According to this calculation, estimated annualized losses are \$0 (Table 13-3). Considering the value of crops from the 2012 Census of Agriculture as baseline crop exposure, the estimated annual loss was determined to be negligible compared to the value of the insurable crops.

**TABLE 13-3 ESTIMATED INSURABLE ANNUAL CROPS LOST RESULTING FROM FREEZE CONDITIONS**

<b>6-YEAR FREEZE CONDITIONS INSURANCE PAID</b>	<b>ADJUSTED 6-YEAR LOSS (CONSIDERING 88% INSURED)</b>	<b>ESTIMATED ANNUALIZED LOSSES</b>	<b>2018 VALUE OF CROPS</b>
0	0	0	11,645,000

**SOURCE: USDA**

## COMMUNITY PERCEPTION OF VULNERABILITY

See the first page of this chapter for a summary of hazard ranking for Henderson County and the planning partner in this plan update. Chapter 14 gives a detailed description of these rankings and 15.2 addresses mitigation actions for this hazard vulnerability.

### 13.3 PROBABILITY OF FUTURE EVENTS

TABLE13-1 lists 8 recorded winter weather events during this plan update timeframe. Therefore, on average, a winter weather event occurs one to two times a year and this occurrence may decrease as temperatures rise in the planning area.

The cities of Log Cabin, Chandler, Gun Barrel City, Murchison and Trinidad feel that there is a high probability of winter storms in the future. The cities of Brownsboro, Caney City, Coffee City, Enchanted Oaks, Malakoff, Moore Station, Payne Springs, Poynor and Tool feel the probability is medium and winter weather is likely to occur within 100 year. Henderson County and the cities of Athens, Berryville, Eustace, Seven Points and Star Harbor feel the probability is low and winter weather is likely to occur within 500 years.

### 13.4 CLIMATE CHANGE IMPACTS

Southern Climate Impacts Planning Program information concerning Texas points to temperatures increasing by another 3 to 9 degrees Fahrenheit by 2100 and thus less frequent cold winter temperatures. (SCIPP, 2017)

If this trend continues, future occurrences of the extreme cold/wind chill aspects of winter weather should decrease. In addition, high winter temperatures bring higher probability of rain, rather than ice or snow. As a result, the amount of precipitation falling as snow should decrease.

### 13.5 ISSUES

Important issues associated with a winter storm in the planning area include the following:

- Older building stock in the planning area is built to low code standards or none at all. These structures could be highly vulnerable to winter weather, particularly freezing temperatures, high winds and ice.
  - Redundancy of power supply must be evaluated.
  - The capacity for backup power generation is limited.
- Future efforts should be made to identify populations at risk and identify special needs during winter storm events.

## **CHAPTER 14**

### **PLANNING AREA RISK RANKING**

A risk ranking was performed for the hazards of concern described in this plan. This risk ranking assesses the probability of each hazard's occurrence as well as its likely impact on the people, property, and economy of the planning area. The risk ranking was conducted by the planning committee based on the hazard risk assessment presented during the second planning committee meeting, community survey results, and personal and professional experience with hazards in the planning area. The results are used in establishing mitigation priorities. The hazard rankings were used in establishing mitigation action priorities.

#### **14.1 PROBABILITY OF OCCURRENCE**

The probability of occurrence of a hazard is indicated by a probability factor based on likelihood of annual occurrence:

- High (Probability Factor = 3) – Hazard event is likely to occur within 25 years
- Medium (Probability Factor = 2) – Hazard event is likely to occur within 100 years
- Low (Probability Factor = 1) – Hazard event is not likely to occur within 100 years
- No exposure (Probability Factor = 0) – There is no probability of occurrence

The assessment of hazard frequency is generally based on past hazard events in the planning area. The planning committee assigned the probabilities of occurrence for each hazard, as shown on Table 14-1 located at the end of this section.

#### **14.2 IMPACT**

Hazard impacts were assessed in three categories based on impacts to: people, property, and the local economy. Numerical impact factors were assigned as follows:

- People – Values were assigned based on the percentage of the total population exposed to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for simplicity and consistency that all people who live in a hazard zone will be equally impacted when a hazard event occurs. It should be noted that planners can use an element of subjectivity when assigning values for impacts on people. Impact factors were assigned as follows:
  - High (Impact Factor = 3) – 50% or more of the population is exposed to a hazard
  - Medium (Impact Factor = 2) – 25% to 49% of the population is exposed to a hazard
  - Low (Impact Factor = 1) – 24% or less of the population is exposed to the hazard
  - No impact (Impact Factor = 0)
  - None of the population is exposed to a hazard
- Property – Values were assigned based on the percentage of the total assessed property value exposed to the hazard event:
  - High (Impact Factor = 3) – 30% or more of the total assessed property value is exposed to a hazard
  - Medium (Impact Factor = 2) – 15% to 29% of the total assessed property value is exposed to a hazard
  - Low (Impact Factor = 1) – 14% or less of the total assessed property value is exposed to the hazard

- No impact (Impact Factor = 0)
  - None of the total assessed property value is exposed to a hazard
- Economy – Values were assigned based on total impact to the economy from the hazard event and activities conducted after the event to restore the community to previous functions. Values were assigned based on the number of days the hazard impacts the community, including impacts on tourism, businesses, road closures, or government response agencies.
  - High (Impact Factor = 3) – Community impacted for more than 7 days
  - Medium (Impact Factor = 2) – Community impacted for 1 to 7 days
  - Low (Impact Factor = 1) – Community impacted for less than 1 day
  - No impact (Impact Factor = 0)
  - No community impacts estimated from the hazard event

The impacts of each hazard category were assigned a weighting factor to reflect the significance of the impact. These weighting factors are consistent with those typically used for measuring the benefits of hazard mitigation actions: impact on people was given a weighting factor of 3; impact on property was given a weighting factor of 2; and impact on the economy was given a weighting factor of 1. The impacts for each hazard are summarized in TABLE 14-2, TABLE 14-3, and TABLE 14-4 located at the end of this section. The total impact factor shown on the tables equals the impact factor multiplied by the weighting factor.

### **14.3 RISK RATING AND RANKING**

The total risk rating for each hazard was calculated by multiplying the probability factor by the sum of the weighted impact factors for people, property, and operations, as summarized in TABLE 14-5. Based on these ratings, a priority of high, medium, low, or no exposure was assigned to each hazard. The hazards ranked as being of highest concern vary by jurisdiction but generally include hail, high winds, lightning, and tornado.

Several jurisdictions ranked hazards as having “No Exposure” to the natural hazard and thus no mitigation actions were developed for those jurisdictional hazards (see TABLE 14-5).

**TABLE 14-1 PROBABILITY OF HAZARDS**

JURISDICTION	HENDERSON COUNTY	ATHENS	BERRYVILLE	BROWNSB ORO	CANEY CITY	CHANDLE R	COFFEE CITY	ENCHANTED OAKS	EUSTACE	GUN BARREL CITY
PROBABILITY FACTOR										
DAM FAILURE	Low	Low	Medium	Low	Low	Low	Low	Low	No Exposure	No Exposure
DROUGHT	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
EXTREME HEAT	Medium	High	Medium	High	High	High	High	High	Medium	High
FLOOD	High	Low	Medium	Low	Low	Medium	Low	Medium	Low	Medium
HAIL	Medium	Medium	Medium	Medium	Medium	High	Medium	Medium	Medium	Medium
HIGH WINDS	High	High	Medium	High	High	Medium	Medium	High	High	High
LIGHTNING	Low	High	High	High	High	High	Medium	Medium	Medium	High
TORNADO	High	High	Medium	Medium	High	High	Medium	High	Medium	High
WILDFIRE	Medium	Medium	High	Medium	Medium	High	Medium	Medium	Medium	High
WINTER STORM	Low	Low	Low	Medium	Medium	High	Medium	Medium	Low	High

LOG CABIN	MALAKOFF	MOORE STATION	MURCHISON	PAYNE SPRINGS	POYNOR	SEVEN POINTS	STAR HARBOR	TOOL	TRINIDAD
PROBABILITY FACTOR									
Low	Low	Low	Low	Medium	Low	No Exposure	Low	Medium	Medium
Low	High	High	High	Medium	Medium	Low	Medium	Medium	Medium
Low	High	High	Medium	Medium	Medium	Low	Low	Medium	High
Medium	High	Low	High	High	Medium	High	Medium	High	High
High	Medium	Medium	High	High	Low	Medium	Medium	High	High
High	High	Medium	High	High	Medium	High	Medium	Medium	High
High	High	Medium	High	High	Medium	Medium	High	Medium	High
High	High	Medium	High	High	Low	Medium	High	Medium	High
High	High	High	High	High	Medium	No Exposure	Medium	Medium	High
High	Medium	Medium	High	Medium	Medium	Low	Low	Medium	High

**TABLE 14-2 IMPACT ON PEOPLE FROM HAZARDS**

JURISDICTION	HENDERSON COUNTY	ATHENS	BERRYVILLE	BROWNSBORO	CANEY CITY	CHANDLER	COFFEE CITY	ENCHANTED OAKS	EUSTACE	GUN BARREL CITY
TOTAL IMPACT FACTOR										
DAM FAILURE	Medium	Low	Medium	Low	Low	Low	Low	Medium	No Exposure	No Exposure
DROUGHT	Medium	Low	Medium	Medium	High	High	Medium	Medium	Medium	Medium
EXTREME HEAT	Medium	Low	Medium	High	Low	Low	High	High	Medium	Medium
FLOOD	High	Low	Medium	Low	Low	High	Low	Medium	Low	Low
HAIL	Low	Low	Medium	Medium	Medium	Low	Medium	Low	Low	Low
HIGH WINDS	High	Low	Medium	Medium	Low	High	Medium	Medium	Medium	Medium
LIGHTNING	Low	Low	Medium	Medium	Low	Low	Medium	Medium	Low	Low
TORNADO	High	Medium	Medium	Medium	Low	Medium	High	High	Medium	High
WILDFIRE	High	Medium	High	Medium	Low	High	High	Medium	Medium	Low
WINTER STORM	Medium	Low	Medium	Medium	Low	Low	Medium	Medium	Low	Low

LOG CABIN	MALAKOFF	MOORE STATION	MURCHISON	PAYNE SPRINGS	POYNOR	SEVEN POINTS	STAR HARBOR	TOOL	TRINIDAD
TOTAL IMPACT FACTOR									
Low	Low	Low	Low	High	Low	No Exposure	Low	High	High
Low	High	High	High	Medium	Medium	Low	Medium	Low	High
No Exposure	High	High	Medium	Medium	Medium	Low	Medium	Low	High
Medium	High	Low	High	High	Medium	High	Low	High	High
Medium	Low	Medium	High	Medium	Medium	Medium	Medium	Low	High
High	Medium	Medium	High	High	High	High	Low	High	High
No Exposure	High	Medium	High	Medium	Medium	Medium	High	Low	High
High	High	Medium	High	High	High	Medium	High	Medium	High
Low	High	High	High	High	High	No Exposure	High	High	High
No Exposure	Medium	Medium	High	Medium	Medium	Low	Low	Low	High

**TABLE 14-3 IMPACT ON PROPERTY FROM HAZARDS**

JURISDICTION	HENDERSON COUNTY	ATHENS	BERRYVILLE	BROWNSBORO	CANEY CITY	CHANDLER	COFFEE CITY	ENCHANTED OAKS	EUSTACE	GUN BARREL CITY
TOTAL IMPACT FACTOR										
DAM FAILURE	Low	Low	Medium	Low	Low	Low	Low	Low	No Exposure	No Exposure
DROUGHT	High	Medium	Medium	High	High	Low	Medium	Low	Medium	Medium
EXTREME HEAT	High	High	Medium	Medium	Low	Low	High	Medium	Medium	Medium
FLOOD	High	Low	Medium	Medium	Low	Medium	Low	High	Low	Low
HAIL	High	Medium	Medium	High	Low	Low	Medium	High	Medium	Low
HIGH WINDS	High	High	Medium	High	High	High	Medium	High	Medium	Medium
LIGHTNING	Medium	Low	High	High	High	Medium	Medium	Medium	Medium	Medium
TORNADO	High	Medium	Medium	High	High	High	Medium	High	Medium	High
WILDFIRE	Medium	Medium	High	High	High	High	High	High	Medium	Medium
WINTER STORM	Low	Low	Low	Medium	Low	Low	Medium	Medium	Low	Medium

LOG CABIN	MALAKOFF	MOORE STATION	MURCHISON	PAYNE SPRINGS	POYNOR	SEVEN POINTS	STAR HARBOR	TOOL	TRINIDAD
TOTAL IMPACT FACTOR									
Low	Low	Low	Low	Medium	Low	No Exposure	Low	High	High
Low	Medium	High	High	Medium	Medium	Low	Medium	Low	Medium
Low	High	High	Medium	Medium	Medium	Low	High	Low	Medium
Medium	High	Low	High	High	Medium	High	Medium	High	High
High	Medium	Medium	High	High	Low	Medium	High	Low	High
High	High	Medium	High	High	Medium	Medium	Medium	High	High
High	High	Medium	High	High	Medium	Medium	High	Low	High
High	High	Medium	High	High	Low	Medium	High	Medium	High
High	High	High	High	High	Medium	No Exposure	High	High	High



High	Medium	Medium	High	Medium	Medium	Low	Low	Low	High
------	--------	--------	------	--------	--------	-----	-----	-----	------

**TABLE 14-4 IMPACT ON ECONOMY FORM HAZARDS**

JURISDICTION	HENDERSON COUNTY	ATHENS	BERRYVILLE	BROWNSBORO	CANEY CITY	CHANDLER	COFFEE CITY	ENCHANTED OAKS	EUSTACE	GUN BARREL CITY
TOTAL IMPACT FACTOR										
DAM FAILURE	Low	No Exposure	Medium	Low	Low	Low	Low	No Exposure	No Exposure	No Exposure
DROUGHT	Medium	Medium	Medium	Low	Low	Low	Medium	No Exposure	Medium	High
EXTREME HEAT	Medium	Low	Medium	Medium	Low	Low	High	No Exposure	Medium	High
FLOOD	Medium	Low	Medium	Low	Low	Medium	Low	No Exposure	Medium	Low
HAIL	Low	Low	Medium	Medium	Low	Low	Medium	No Exposure	Low	Low
HIGH WINDS	Medium	Medium	Medium	High	Medium	High	Medium	No Exposure	Medium	Medium
LIGHTNING	Low	Low	Medium	Medium	Low	Low	Medium	No Exposure	Low	Low
TORNADO	High	Medium	Medium	High	Medium	Medium	High	No Exposure	Medium	High
WILDFIRE	Medium	Medium	Medium	Medium	Medium	High	High	No Exposure	Medium	Low
WINTER STORM	Low	Low	Medium	Medium	Low	Low	Medium	No Exposure	Low	Medium

LOG CABIN	MALAKOFF	MOORE STATION	MURCHISON	PAYNE SPRINGS	POYNOR	SEVEN POINTS	STAR HARBOR	TOOL	TRINIDAD
TOTAL IMPACT FACTOR									
Low	Low	Low	Low	High	Low	No Exposure	Low	Medium	High
High	High	High	High	Medium	Medium	Low	Low	Low	High
Low	High	High	Medium	Medium	Medium	Low	Low	Low	Medium
Medium	High	Low	High	High	Medium	Low	Low	Low	High
High	Low	Medium	High	Medium	Medium	Low	Low	Low	Medium
High	Medium	Medium	High	High	High	Low	Low	Low	Medium
High	High	Medium	High	Medium	Medium	Low	Low	Low	Medium
High	High	Medium	High	High	High	Medium	Low	Medium	High
Low	High	High	High	High	High	No Exposure	Low	Medium	High

High	Medium	Medium	High	Medium	Medium	Low	Low	Low	Medium
------	--------	--------	------	--------	--------	-----	-----	-----	--------

**TABLE 14-5 TOTAL HAZARD RISK RATING CALCULATIONS**

JURISDICTION	HENDERSON COUNTY	ATHENS	BERRYVILLE	BROWNSBORO	CANEY CITY	CHANDLER	COFFEE CITY	ENCHANTED OAKS	EUSTACE	GUN BARREL CITY
DAM FAILURE	Low	Low	Medium	Low	Low	Low	Low	Medium	No Exposure	No Exposure
DROUGHT	Medium	Medium	Low	Medium	Low	Medium	Medium	Medium	Medium	High
EXTREME HEAT	Medium	Medium	Medium	Medium	Low	Low	High	High	Medium	High
FLOOD	High	Low	Low	Low	Low	High	Low	Medium	Low	Medium
HAIL	Medium	Medium	High	Medium	Low	Low	Medium	Low	Medium	Medium
HIGH WINDS	High	Medium	Medium	High	Low	Medium	Medium	Medium	High	High
LIGHTNING	Low	Low	High	High	Low	Medium	Medium	Medium	Low	Medium
TORNADO	High	Medium	Medium	High	High	High	High	High	Medium	High
WILDFIRE	Medium	Medium	High	Medium	Low	High	High	Medium	Medium	Medium
WINTER STORM	Low	Low	Low	Medium	Low	Medium	Medium	Medium	Low	Medium

LOG CABIN	MALAKOFF	MOORE STATION	MURCHISON	PAYNE SPRINGS	POYNOR	SEVEN POINTS	STAR HARBOR	TOOL	TRINIDAD	
Low	Low	Low	Low	High	Low	No Exposure	Low	Medium	Medium	NO EXPOSURE
Low	High	High	High	Medium	Medium	Low	Medium	High	High	LOW
Low	High	High	Medium	Medium	Medium	Low	Medium	High	High	MEDIUM
Medium	High	Low	High	High	Medium	High	Low	High	High	HIGH
High	Medium	Medium	High	High	Medium	Medium	High	Medium	High	NOTE: Total Risk Rating= Probability x Impact Weighted Sum (Total Impact factor people + total impact factor property + total impact factor economy)
High	Medium	Medium	High	High	High	Medium	Medium	High	High	
High	High	Medium	High	High	Medium	Medium	Medium	High	High	
High	High	Medium	High	High	High	Medium	High	High	High	
Low	High	High	High	High	High	No Exposure	High	High	High	

High	Medium	Medium	High	Medium	Medium	Low	Low	Medium	High	
------	--------	--------	------	--------	--------	-----	-----	--------	------	--

## **CHAPTER 15**

### **MITIGATION STRATEGY**

#### **15.1 GUIDING PRINCIPLE AND GOALS**

Hazard mitigation plans must identify goals for reducing long-term vulnerabilities to identified hazards (44 CFR Section 201.6(c)(3)(i)). The planning committee established a guiding principle, a set of goals, and measurable objectives for this plan, based on data from the preliminary risk assessment and the results of the public involvement strategy. The guiding principle, goals, and actions in this plan all support each other. Goals were selected to support the guiding principle. Actions were prioritized based on the action meeting multiple objectives.

A guiding principle focuses the range of objectives and actions to be considered. This is not a goal because it does not describe a hazard mitigation outcome, and it is broader than a hazard-specific objective. The guiding principle for the Henderson County Hazard Mitigation Plan Update is as follows: To reduce or eliminate the long-term risks to loss of life and property damage in Henderson County from natural disasters.

The following plan goals were determined by the planning committee:

- Goal 1: Minimize loss of life, and damage to property, the economy and natural resources from natural hazards.
- Goal 2: Increase public understanding, support and demand for hazard mitigation.
- Goal 3: Build and integrate local mitigation capabilities to encourage individual safety, reduce damage to public buildings and facilitate continuity of emergency services.
- Goal 4: Maintain the natural and man-made systems in the county to protect our communities from natural hazards.

#### **15.2 AREA-WIDE MITIGATION ACTIONS AND IMPLEMENTATION**

The planning committee reviewed a menu of hazard mitigation alternatives that present a broad range of alternatives to be considered for use in the planning area, in compliance with Title 44 Code of Federal Regulations (44 CFR) (Section 201.6(c)(3)(ii)). The menu provided a baseline of mitigation alternatives that are backed by a planning process, are consistent with the planning partners' goals and are within the capabilities of the partners to implement. The planning committee reviewed the full range of actions as well as the county's ability to implement the variety of mitigation actions. Hazard mitigation actions recommended in this plan were selected from among the alternatives presented in the menu as well as other projects known to be necessary.

##### **15.2.1 RECOMMENDED MITIGATION ACTIONS**

The planning committee planning partners identified actions that could be implemented to provide hazard mitigation benefits. Table 15-1 lists the recommended mitigation actions identifying the mitigation action number (including the previous action number being carried forward in this plan update), title, description, mitigation action ranking, hazards mitigated, action type, applicable goals, responsible department to administer the action, estimated cost, potential funding sources, timeline in months, and benefit to the community (high, medium or low). All of the hazards profiled in this plan are addressed by more than one mitigation action

Mitigation types used for this categorization are as follows:

- **Local Plans and Regulations (LPR)** – These actions include government authorities, policies, or codes that influence the way land and buildings are being developed and 44 cfr built.

- **Structure and Infrastructure Projects (SIP)** – These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- **Natural Systems Protection (NSP)** – These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- **Education and Awareness Programs (EAP)** – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These initiatives may also include participation in national programs, such as StormReady and FireWise Communities.

Mitigation action worksheets were developed to provide more information for each recommended mitigation action, including the specific problem being mitigated, alternative actions considered, whether the action applies to existing or future development, the benefits or losses avoided, the department, position, office or agency responsible for implementing the action, the local planning mechanism, and potential funding sources. These worksheets were developed to provide a tool for the planning partners to apply for grants or general funds to complete the mitigation action. An example worksheet for Henderson County is shown in FIGURE 15-1. These worksheets are kept on file with the county and city and can be a valuable resource for annual progress updates and reports.



## Henderson County Mitigation Action Worksheet

Please complete one worksheet per action with as much detail as possible, using the instructions provided and FEMA examples.

Name of Jurisdiction: \_\_\_\_\_ Mitigation Action # \_\_\_\_\_

Mitigation Action Title: \_\_\_\_\_

Assessing the Risk	
Hazard(s) Addressed: (check all that apply)	<input type="checkbox"/> All Hazards <input type="checkbox"/> Dam Failure <input type="checkbox"/> Drought/Extreme Heat <input type="checkbox"/> Earthquake <input type="checkbox"/> Flood <input type="checkbox"/> Hurricane <input type="checkbox"/> Severe Storms/Lightning/Hail/High Winds <input type="checkbox"/> Tornado <input type="checkbox"/> Wildfire <input type="checkbox"/> Winter Storm
Specific Problem Being Mitigated (describe why action is needed)	
Evaluation of Potential Alternatives	
Alternatives Considered (name of project and reason for not selecting)	<div style="border: 1px solid black; height: 15px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; height: 15px; margin-bottom: 2px;"></div> <div style="border: 1px solid black; height: 15px;"></div>
Action/Project Intended for Implementation	
Describe How Action Will Be Implemented (main steps involved)	
Action/Project Type	<input type="checkbox"/> Local Plans & Regulations <input type="checkbox"/> Structure & Infrastructure Project <input type="checkbox"/> Natural System Project <input type="checkbox"/> Education & Awareness Programs
Applicable Goals (Refer to list of Goals)	<input type="checkbox"/> Goal #1 <input type="checkbox"/> Goal #2 <input type="checkbox"/> Goal #3 <input type="checkbox"/> Goal #4
Applies to Existing or Future Development	<input type="checkbox"/> Existing Development <input type="checkbox"/> Both Existing & Future Development <input type="checkbox"/> Future Development <input type="checkbox"/> Not Applicable
Describe Benefits (Losses Avoided)	<input type="checkbox"/> Life Safety <input type="checkbox"/> Damage Reduction <input type="checkbox"/> Other Describe :
Estimated Cost	<input type="checkbox"/> >\$10,000 <input type="checkbox"/> \$10,000-\$100,000 <input type="checkbox"/> <\$100,000 <input type="checkbox"/> Other Amount: \$ _____
Plan For Implementation	
Responsible Department	
Local Planning Mechanism (Check all that Apply)	<input type="checkbox"/> Capital Improvement Plan <input type="checkbox"/> Comprehensive Plan <input type="checkbox"/> Building Code <input type="checkbox"/> Ordinance <input type="checkbox"/> Other:
Potential Funding Sources	
Timeline for Completion (in months)	
Plan For Implementation	
Status/Comment	<input type="checkbox"/> Not Started <input type="checkbox"/> In-Progress <input type="checkbox"/> No Longer Required <input type="checkbox"/> Completed <input type="checkbox"/> Delayed Comment:
Completed By: (Name, Title, Phone#) Date:	

Figure 15-1 Sample Mitigation Action Worksheet

### 15.2.2 BENEFIT/COST REVIEW AND PRIORITIZATION

The action plan must be prioritized according to a benefit/cost analysis of the proposed projects and their associated costs (44 CFR, Section 201.6(c)(3)(iii)). The benefits of proposed projects were weighed against estimated costs as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Assistance (HMA) Grant Program. A less formal approach was used because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. Therefore, a review of the apparent benefits versus the apparent cost of each project was performed. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects. Fourteen criteria were used to assist in evaluating and prioritizing the mitigation initiatives. For each mitigation action, a numeric rank (0, 1, 2, 3, 4) was assigned for each of the 14 evaluation criteria defined as follows:

- Definitely Yes - 4
- Maybe Yes - 3
- Unknown/Neutral - 2
- Probably No - 1
- Definitely No - 0

The 14 evaluation/prioritization criteria are:

1. **Life Safety** – How effective will the action be at protecting lives and preventing injuries? The numeric rank for this criterion is multiplied by 2 to emphasize the importance of life safety when evaluating the benefit of the action.
2. **Property Protection** – How significant will the action be at eliminating or reducing damage to structures and infrastructure? The numeric rank for this criterion is multiplied by 2 to emphasize the importance of property protection when evaluating the benefit of the action.
3. **Cost-Effectiveness** – Will the future benefits achieved by implementing the action, exceed the cost to implement the action?
4. **Technical** – Is the mitigation action technically feasible? Will it solve the problem independently and is it a long-term solution? Eliminate actions that, from a technical standpoint, will not meet the goals.
5. **Political** – Is there overall public support for the mitigation action? Is there the political will to support it?
6. **Legal** – Does the jurisdiction have the authority to implement the action?
7. **Fiscal** – Can the project be funded under existing program budgets (i.e., is this action currently budgeted for)? Or would it require a new budget authorization or funding from another source such as grants?
8. **Environmental** – What are the potential environmental impacts of the action? Will it comply with environmental regulations?
9. **Social** – Will the proposed action adversely affect one segment of the population? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?
10. **Administrative** – Does the jurisdiction have the personnel and administrative capabilities to implement the action and maintain it or will outside help be necessary?
11. **Multi-hazard** – Does the action reduce the risk to multiple hazards?
12. **Timeline** – Can the action be completed in less than 5 years (within our planning horizon)?
13. **Local Champion** – Is there a strong advocate for the action or project among the jurisdiction's staff, governing body, or committees that will support the action's implementation?

14. ***Other Local Objectives*** – Does the action advance other local objectives, such as capital improvements, economic development, environmental quality, or open space preservation? Does it support the policies of other plans and programs?

The numeric results of this exercise are shown on the mitigation action worksheets. An example worksheet for is shown in FIGURE 15-2. These results were used to identify the benefit of the action to the community as low, medium, or high priority. TABLE 15-1 shows the benefit of each mitigation action. The planning committee used the results of the benefit/cost review and prioritization exercise to rank the mitigation actions in order of priority, with 1 being the highest priority. The highest priority mitigation actions are shown in red on TABLE 15-1, medium priority actions are shown in orange and low priority actions are shown in yellow.



## Prioritization Worksheet





Mitigation Action #: \_\_\_\_\_





Mitigation Action Title: \_\_\_\_\_

Criteria	Numeric Rank: Definitely Yes = 4 Maybe Yes = 3 Unknown/Neutral = 2 Probably No = 1 Definitely No = 0		Provide brief rationale for numeric rank when appropriate
1. Will the action result in <u>Life Safety</u> ?		x 2 =	
2. Will the action result in <u>Property Protection</u> ?		x 2 =	
3. Will the action be <u>Cost-Effective</u> ? (future benefits exceed cost)			
4. Is the action <u>Technically</u> feasible			
5. Is the action <u>Politically</u> acceptable?			
6. Does the jurisdiction have the <u>Legal</u> authority to implement?			
7. Is <u>Funding</u> available for the action?			
8. Will the action have a positive impact on the natural <u>Environment</u> ?			
9. Is the action <u>Socially</u> acceptable?			
10. Does the jurisdiction have the <u>Administrative</u> capability to execute the action?			
11. Will the action reduce risk to more than one hazard ( <u>Multi-Hazard</u> )?			
12. Can the action be implemented <u>Quickly</u> ?			
13. Is there an Agency/Department <u>Champion</u> for the action?			
14. Will the action meet other <u>Community Objectives</u> ?			
Total			
Priority: Low = <35 Medium = 35-49 High = >50	<input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High		








Figure 15-2 Example Benefit/Cost Review and Prioritization Worksheet









## 15-1 RECOMMENDED MITIGATION ACTIONS







ACTION NO.	TITLE	DESCRIPTION	ACTION RANKING	HAZARDS MITIGATED	ACTION TYPE	GOALS	RESPONSIBLE DEPARTMENT/ AGENCY	ESTIMATED COST	POTENTIAL FUNDING SOURCES	TIMELINE IN MONTHS	BENEFIT
HENDERSON COUNTY											
1	Interlocal/Multi jurisdiction Coordination	Partner with other local and regional jurisdictions in projects such as the Regional MultiAgency Coordination Group; make sure local officials and EMCs know how to contact the MAC-G if needed.	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Office of Emergency Management	N/A	No cost associated	12	Low
2	Local/State/Federal training for Emergency situations	Increase training opportunities for citizens, to encourage their involvement in mitigation efforts. Partner with ETCOG, TDEM, TFS, TEEX, FEMA, and others, to bring free and low cost mitigation training to the people of our local jurisdictions, county, and region.	2	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Office of Emergency Management	50,000	County Budget, Grants	24	Medium

3	Early Warning & Public Notification	Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and email blasts; automated emergency calling systems; emergency warning sirens; and any other available method.	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Office of Emergency Management	100,000	Grants	24	High
4	Critical Facility Retrofitting	Harden public structures to protect the building and its contents, and to provide a safe place for humans during a storm.	4	Tornado, Severe Storms- Lightning/Hail/High Winds, Winter Storm			Office of Emergency Management	100,000	County Budget, Grants	36	High
5	Wildfire Prevention and education	Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.	3	Wildfire, Drought/Extreme Heat			Office of Emergency Management/Fire Marshal	10,000	County Budget	12	Medium
6	Expansion of Code Red for Early warning notification	Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms	1	Tornado, Severe Storms- Lightning/Hail/High Winds, Winter Storm			Office of Emergency Management	N/A	Cost provided by ETCOG	24	High
ATHENS											
1	Early Warning & Public Notification	Incorporate the use of the City's automated emergency calling system, Rave Alert, into local emergency management procedures.	1	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme			City of Athens Emergency Management	Other/ Cost provided by ETCOG	N/A	C	High

				Heat, Flood/Flash Flooding							
2	Early Warning & Public Notification	Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	◆	●	City of Athens Emergency Management	\$5000 bi-annually	City Budget	C	High
3	Dam Failure	Improve existing public-owned dams to reduce threats posed by potential failure.	2	Dam Failure	◆	●●	City of Athens Emergency Management	TBD	City Budget, Grants	24	Low
4	Emergency personnel response to Wildfire	Enhance emergency services to increase the efficiency of wildfire response and recovery activities	3	Wildfire	◆	●●●○	City of Athens Emergency Management	TBD	City Budget, Grants	12	High
5	Community awareness and education-Wil dfire	Develop public information programs to create a greater awareness of the risk of wildfire and to encourage individuals to implement mitigation strategies on their own property.	1	Wildfire	□	●●●○	City of Athens Emergency Management	TBD	City Budget, Grants	12	Medium
6	Storm Shelters	Seek grant funding to build needed storm shelters	3	Severe Storms/ Lightning/ Hail/ High Winds, Tornado	◆	●●●○	City of Athens Emergency Management	TBD	Grant Funding	12	Medium























7	Community awareness and education-Drought/Extreme Heat	Increase public awareness of ways to conserve water, prevent loss of valuable topsoil and reduce the effects of drought	2	Drought/ Extreme Heat	<input type="checkbox"/>		City of Athens Emergency Management	TBD	City Budget, Grants	12	Low
8	Public education-Winter Storm	Increase public awareness of the dangers of walking on icy sidewalks and driving icy roads	3	Winter Storms	<input type="checkbox"/>		City of Athens Emergency Management	TBD	City Budget, Grants	12	Low
BERRYVILLE											
1	Implementation of Code Red or Advanced Warning and Public Notification System	Obtain access and/or incorporate the use of the automated emergency calling system, Code Red, into local emergency management plan	1	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Fire Chief	\$5,000	City Budget/Grants	24	High
2	Storm Shelter	Build community storm shelter(s)	3	Tornado, Severe Storms-Lightning/Hail/High Winds			Mayor/City Council	\$50,000	City Budget/Grants	60	Medium
3	Public Education and Awareness	Provide materials and data sources to educate citizens of all potential hazards in the planning area and methods to mitigate hazards and increase awareness.	2	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	<input type="checkbox"/>		Mayor/City Council	\$3,000	City Budget/Grants	24	Low

4	Public Warning System	Develop/improve	4	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Fire Chief	\$3,000	City Budget/FEMA Grant	6	High
BROWNSBORO											
1	Implementati on of Code Red or Advanced Warning and Public Notification System	Obtain access and/or incorporate the use of the automated emergency calling system, Code Red, into local emergency management plan	1	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Police Chief	\$100,000	Grant	24	High
2	Flood mitigation education for city officials and citizens	Seek FEMA and State training in flood mitigation to assist with NFIP and encourage awareness of flood hazard and National Flood Insurance Program assistance to citizens	2	Dam Failure, Flood/Flash Flooding			City Administration	\$5,000	City Budget	12	Medium
3	Public Education	Provide materials and data sources to educate citizens of all potential hazards in the planning area and methods to mitigate hazards and increase awareness.	2	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			City Administration	\$5,000	City Budget	12	Low









4	Mitigation Planning Organization	Train local EMC and officials on chosen Mitigation action items including record keeping or reports and data. Provide information during Hazard Mitigation Planning Committee Meeting update	3	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			City Administration	\$10,000	City Budget/Grant	48	Low
CANEY CITY											
1	Implementati on of Code Red or Advanced Warning and Public Notification System	Obtain access and/or incorporate the use of the automated emergency calling system, Code Red, into local emergency management plan	1	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			City Council	\$50,000	Grant	12	High
2	Ordinances and retrofitting of current structures and new development s for hazards	Implement ordinances to ensure new housing developments meeet current floodproofing, as well as ensure that critical facilities owned by jurisdiction are protected from flood. Consulat FEMA publications, and ask an expert for additional suggestions if required. To be incorporated in the permitting process.	3	Dam Failure, Storms-Lightning/Hail /High Winds, Winter Storm, Flood/Flash Flooding			City Council	\$10,000	City Budget/Grant	60	Medium














3	Public Education on Hazards	Provide materials and data sources to educate/train citizens of all potential hazards in the planning area and methods to mitigate hazards and increase awareness.	2	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	<input type="checkbox"/>		City Council	\$10,000	City Budget/Grant	12	Medium
CHANDLER											
1	Early warning siren maintenance	check the location and condition of warning sirens; determine if repairs are needed	4	Tornado, Severe Storms- Lightning/Hail/High Winds, Wildfire, Drought/Extreme Heat, Flood/Flash Flooding			EOC and Administrative	\$100,000	HMGP Grant	60	High
2	Update emergency response equipment	assist local fire department in applying for grant funding to purchase needed equipment and PPE; assist in qualification and grant writing	2	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			City Staff	\$100,000	Grant	48	Low
3	Public Education on Code Red	provide public training and education materials about the Code Red system and how to register for the warning system notifications	1	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	<input type="checkbox"/>		City Staff	\$10,000	City Budget	12	Medium


























4	City wide citizen/business/city mitigation strategy planning	Encourage the development of public and private partnership with businesses, service organizations and other community groups to work together on mitigation	2	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding		 	Emergency Management	No funding needed	N/A	60	Low
COFFEE CITY											
1	Roadway and Infrastructure maintenance	Locate roadways and properties prone to flooding due to heavy rainfall	1	Flood		 	Fire Department/Police Department	\$10,000	Grant	12	Medium
2	Public notification during Hazard incidents	Work to educate the public on information dealing with severe storms	1	Severe Storms		  	Fire Department/Police Department	\$10,000	City Budget	12	Medium
3	Emergency Notification Siren	Maintain and update siren and notification systems	4	Tornado	 	 	Fire Department/Police Department	\$100,000	Grant	24	High
4	Community notification and awareness of Fire hazards	Work to mitigate brush and fuel load in city right of ways and easements	4	Wildfire	 	  	Fire Department/Police Department	\$10,000	City Budget	12	Low
ENCHANTED OAKS											
1	Create/implement new building codes	mitigate water runoff from severe rain downfall to assist in preventing flooding	1	Storms-Lightning/Hail/High Winds, Flood/Flash Flooding		  	Building Officials	\$5,000	City Budget	12	Low











2	Infrastructure Improvement	Seek improvements for city streets and drainage through cleaning roadside ditches and replacement or implementation of infrastructure	3	Storms-Lightning/Hail /High Winds, Dam, Failure, Winter Storm, Flood/Flash Flooding	■	●○	Mayor/City Council	\$8,000	City Budget	24	Low
3	Early warning Siren maintenance	check the location and condition of warning sirens; determine if repairs are needed	4	Tornado, Severe Storms-Lightning/Hail/High Winds, Wildfire, Flood/Flash Flooding	◆	●●	Mayor/City Council	\$2,000	City Budget	24	High
EUSTACE											
1	Financial audit for Mitigation grants	Seek financial audit for grant eligibility to obtain mitigation grants	4	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	◆	●●	Mayor/Administrative	\$100,000	Grant/City Budget	36	Medium
2	Implementation of Code Red or Advanced Warning and Public Notification System	Obtain access and/or incorporate the use of the automated emergency calling system, Code Red, into local emergency management plan	4	Tornado, Dam Failure, Severe Storms-Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	◆	●●●	Mayor	\$50,000	Grant	24	High
3	Ordinance(s)/ Evacuation Plan(s)	Identify areas and produce evacuation plans for citizens and businesses	3	Tornado, Severe Storms-Lightning/Hail /High Winds, Wildfire, Flood/Flash Flooding	■	●●	Mayor/Administrative	\$20,000	City Budget/Fundraiser	24	Medium

4	Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event	Inventory kept at city hall of capabilities for Search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications; location, size and condition of shelter facilities; first aid supplies, sheltering items and locations.	1	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Administrative	\$2,000	City Budget	12	Low
GUN BARREL CITY											
1	Implementati on of Code Red or Advanced Warning and Public Notification System	Incorporate the use of the automated emergency calling system, Code Red, into local emergency hazard plans. Provide training to selected parties on when and how to use it.	1	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Fire Chief	\$3,000	City Budget	12	High
2	Emergency Alert Siren System	Update current storm sirens and add one outdoor warning siren to Tom Finley boat ramp parking lot to supplement the existing 6 sirens due to west winds.	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Fire Chief	#30,000	City Budget	12	High
3	Public Education and Information	Post water restrictions to city website when local water purveyor requests	1	Wildfire, Drought/Extreme Heat			Fire Chief	\$1,500	City Budget	24	Low

4	Communications Capabilities	installation of HAM club antennas and radio system into Central Station for early warning and/or post warning on multi hazards	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			Fire Chief	\$3,500	City Budget	C	Low
5	Ordinance/Code Update	Adopt 2015 complete code set 2014 NEC. 2015 Urban/Wildland added for new subdivisions require two ways out	3	Wildfire, Drought/Extreme Heat			City Council	\$4,200	City Budget/Grant	60	Medium
LOG CABIN											
1	Emergency Alert Siren System	obtain system that allows the city to rapidly notify residents and businesses of hazards	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	 		Mayor/City Council	\$100,000	City Budget/FEMA Grant	12	High
2	Infrastructure and Utility Improvements	replacement of water lines with better quality materials and relocated if needed to prevent further damage or underlying hazards	3	Dam Failure, Severe Storms- Lightning/Hail/High Winds, Winter Storm, Flood/Flash Flooding		 	Mayor/City Council/Water Department	\$100,000	City Budget/Grants	60	Medium
3	Critical facility and Infrastructure retrofitting	replacement of anchors on the water tower to add more stability during storms or hazard weather	3	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Winter Storm, Flood/Flash Flooding		 	Mayor/City Council	\$10,000	City Budget	12	High

4	Boat Dock Replacement	replacement of dock at boat ramps including all materials and stability	1	Severe Storm-Lightning/Hail/High Winds, Flood/Flash Flooding	◆	●●○	Mayor/City Council/City Maintenance Department	\$100,000	City Budget/Grants	48	Low
MALAKOFF											
1	Water Shortages	Educate citizens about the potential for water shortages and limit water usage	1	Drought/Extreme Heat	□	●●	City Water/Fire Department	\$100,000	TWDB Grants	12	Low
2	Potential wildfires in the event of drought and extreme heat	Educate citizens about the potential for wildfires	1	Wildfire	□	●●	Fire Department/Code Enforcement	\$10,000	City Budget / Forestry Service	12	Low
3	Damages and loss of life from the threat of severe storms	Educate citizens about the potential for severe storms and install early warning systems	2	Severe Storms/Lightning/Hail/High Winds	□	●●●	Administration/Fire Department/Police Department	\$100,000	Fema Grants/ City Budget	12	Low
4	Localized flooding in and around the vicinity of CR 1400	Cleaning debris, widening and installing box drains where necessary.	4	Flood	◆■	●●○	Street Department	\$500,000	Fema Grants/ TWDB Grants	24	High
5	Damages and loss of life from the threat of tornadoes	Educate citizens about the potential for tornadoes and install additional early warning sirens and systems	2	Tornado	□	●●●	Fire Department/Code Enforcement	\$250,000	Fema Grants	36	Medium
MOORE STATION											
1	Roadway and Infrastructure maintenance	Locate roadways and properties prone to flooding due to heavy rainfall	3	Flood	◆	●○	EMC/ Fire Department	\$10,000	City Budget	12	Medium





2	Public notification during Hazard incidents	Locate roadways and potential icing areas and notify public of potential hazards due severe storms	3	Sever Storms		  	EMC/ Fire Department	\$10, 000	City Budget	12	Medium
3	Emergency Notification Siren	Look into sirens and possible warning systems for tornadoes and bad weather	4	Severe Storms/Lightning/Hail /High Winds/Tornados	 	  	Fire Department	10,000	Grants	36	High
4	Community notification and awareness of Fire hazards	Enhance ways of notifying the public of potential fire conditions which could lead to wildfires	1	Wildfire	 	  	Fire Department	\$10,000	City Budget	12	Low
MURCHISON											
1	Protection and Maintenance of Roadway and Infrastructure	Perform maintenance of culverts and ditches throughout the city and sewer plant location	2	Flood/Flash Flooding		  	City of Murchison/Contractor	\$100,000	City Budget	12	High
2	Early warning Siren for public notification	Obtain early warning siren system installment inside jurisdiction to assist in public notification of hazard prior to hazard occurrence	4	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	 	  	City of Murchison	\$100,000	City Budget/Grants	12	High

3	First Responders Assistance by City	Assist local VFD with grant opportunities for needed resources	3	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			City of Murchison	\$100,000	Grants	60	Medium
4	Public Education/Notice and awareness of Hazards	Post on social media, websites and purchase large signs at City Hall regarding burn ban hazards	1	Drought/Extreme Heat, Wildfire			City of Murchison	\$10,000	City Budget	60	Medium
PAYNE SPRINGS											
1	Flood Prevention	Flood waters covering roads in the city causing traffic problems, road damage and debris	2	Flood, Tornado			City Road and Bridge	\$100,000	City Funds, Grants	36	High
2	Minimize Risk of Wildfires	Minimize risk to homes, businesses, agriculture and nature due to wildfire, potential for fire due to brush, compact spaces	3	Wildfire	 		City Mayor and Road and Bridge	\$100,000	City Budget	12	High
3	Tornado Safety	Safety tips on tornadoes, what is safer, what to do before, during and after a tornado. Public awareness and citizen safety	1	Tornado			Mayor and Council	\$10,000	City Budget	12	Low
POYNOR											

1	Road and Infrastructure Improvements	2 Step process of surveying and repaving city roadways through contracting company	3	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	■	●○	City Administration/Contractor	\$350,000	City Budget/FEMA Grant	24	High
2	Community Education on prevention of Hazard	Contact electrical company for class education and material on how to handle electricity during a storm	1	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Winter Storm, Flood/Flash Flooding	□	●●	City Administration	\$3,000	City Budget/Grant	24	Medium
SEVEN POINTS											
1	Maintenance/update Tornado Siren	perform maintenance/replace siren system to ensure the alert is loud enough to be heard throughout the city	4	Tornado, Severe Storms- Lightning/Hail/High Winds, Wildfire, Flood/Flash Flooding	◆◆	●●●	EMC/Mayor/City Council	\$100,000	FEMA Grant	24	Medium
STAR HARBOR											
1	Early Hazard warning system	Install a city-wide all-hazard warning system to implement early notification	4	Tornado, Severe Storms- Lightning/Hail/High Winds, Wildfire, Flood/Flash Flooding	◆◆	●●●	Mayor/City Council	\$100,000	Grant	48	High
TOOL											
1	Hazard Response by emergency personnel	Coordinate with Texas Forest Service to obtain educational resources with public information programs to seek manpower to control fires and protect life and property	1	Drought/Extreme Heat, Wildfire	□	●●	City of Tool	>\$ 10,000	City Budget/Grants	24	High







2	City Infrastructure Improvements	Poor Culvert Integrity and lack of drainage infrastructure; encourage retrofitting of existing structures	2	Flood, Dam Failure, Severe Storms, Winter Storm	■	●●○	City of Tool	>\$ 10,000	City Budget/Grants	24	Medium
3	Hazard Preparation Ordinances/Programs	Locate affordable options of materials and resources. Implement pre-storm meetings and create feasible response plans for loss of power and inability to power O2 devices, loss of HVAC functionality.	1	Severe Storms, Lightning, Hail, High Winds, Tornado, Winter Storm	◆	●●	City of Tool	>\$ 10,000	City Budget	24	Medium
4	Public Education of Hazards	Provide materials and data sources to educate/train citizens of all potential hazards in the planning area and methods to mitigate hazards and increase awareness.	1	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	□	●●	City of Tool	\$10,000	City Budget/Grants	24	Low
TRINIDAD											
1	Improvement /creation for long range management operation and evacuation plans for natural and manmade hazards	Develop a long term plan to create evacuation routes/plans for citizens to be implemented during hazard situations.	5	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding	□◆	●●●	City of Trinidad	50 Million	Grant Funding	60	High

2	Early warning Siren for public notification	Obtain early warning system installment inside jurisdiction to assist in public notification of hazard prior to hazard occurrence	4	Tornado, Severe Storms- Lightning/Hail/High Winds, Wildfire, Drought/Extreme Heat, Flood/Flash Flooding			City of Trinidad	\$100,000	City Budget/Grant	48	Medium
3	Infrastructure Improvement	Seek improvements for city streets and drainage through cleaning roadside ditches and replacement or implementation of infrastructure	2	Tornado, Dam Failure, Severe Storms- Lightning/Hail/High Winds, Wildfire, Winter Storm, Drought/Extreme Heat, Flood/Flash Flooding			City of Trinidad	\$500,000	City Budget/Grant	48	Low

#### LEGEND

ACTION TYPE:  LPR  SIP  NSP  EAP

APPLICABLE GOALS: G1  G2  G3  G4 

EAP	Emergency Action Plan
EOC	Emergency Operations Center
FEMA	Federal Emergency Management Agency
GIS	Geography Information System
HMGP	Hazard Mitigation Grant Program
IBC	International Building Code
IRC	International Residential Code
NFPA-70	National Fire Protection Association 70 (National Electrical Code)
NOAA	National Oceanic and Atmospheric Administration
OEM	Office of Emergency Management
STEAR	State of Texas Emergency Assistance Registry
TCEQ	Texas Commission on Environmental Quality



## **CHAPTER 16**

### **PLAN ADOPTION AND MAINTENANCE**

#### **16.1 PLAN ADOPTION**

A hazard mitigation plan must document that it has been formally adopted by the governing body of the jurisdiction requesting federal approval of the plan (44 CFR Section 201.6(c)(5)). For multi-jurisdictional plans, each jurisdiction requesting approval must document that it has been formally adopted. All planning partners fully met the participation requirements specified by the planning committee and will seek Disaster Mitigation Act of 2000 (DMA) compliance under this plan. The plan will be submitted for review to the Texas Division of Emergency Management (TDEM) and then to the Federal Emergency Management Agency (FEMA) Region VI for review and pre-adoption approval. Once pre-adoption approval has been provided, all planning partners will formally adopt the plan. All partners understand that DMA compliance and its benefits cannot be achieved until the plan is adopted. Copies of the resolutions adopting this plan for all planning partners can be found in Appendix G.

#### **16.2 PLAN MAINTENANCE**

A hazard mitigation plan must present a plan maintenance process that includes the following (44 CFR Section 201.6(c)(4)): monitoring, evaluating, schedule, process, and continued public participation. This chapter details the formal process that will ensure that the Henderson County Hazard Mitigation Action Plan remains an active and relevant document and that the planning partners maintain their eligibility for applicable funding sources. The plan maintenance process includes a schedule for monitoring and evaluating the plan annually and producing an updated plan every 5 years. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

##### **16.2.1 MONITORING AND EVALUATING**

The annual plan maintenance planning committee meetings will include representation from each of the participating jurisdictions, multiple departments within Henderson County, and interested stakeholders. As with the Plan planning committee all interested and affected entities within the communities are encouraged to participate. With adoption of this plan, the designated planning committee members will be tasked with plan monitoring, evaluation and maintenance. The planning committee, led by the Henderson County Emergency Management Coordinator, agree to:

- Meet annually to monitor and evaluate the implementation of the plan
- Act as a forum for hazard mitigation issues
- Disseminate hazard mitigation ideas and activities to all participants
- Pursue the implementation of high priority, low- or no-cost recommended actions
- Maintain vigilant monitoring of multi-objective, cost-share, and other funding opportunities to help the community implement the plan's recommended actions for which no current funding exists
- Monitor and assist in implementation and update of this plan
- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters
- Report on plan progress and recommended changes to the Henderson County Commissioners Court and governing bodies of participating jurisdictions
- Inform and solicit input from the public

The planning committee is an advisory body and can only make recommendations to county and city elected officials. Its primary duty is to see the plan successfully carried out and to report to the community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, hearing stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information in areas accessible to the public.

### **16.2.2 PLAN MAINTENANCE SCHEDULE**

The planning committee will meet annually to monitor progress, discuss recent hazard events and changes in development that impact vulnerability, and update the mitigation strategy. The Henderson County Emergency Management Coordinator will be responsible for initiating the plan reviews with the planning committee and plan to integrate with other regularly scheduled emergency management meetings.

In coordination with the other participating jurisdictions, a 5-year written update of the plan will be submitted to TDEM and then to FEMA Region VI per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule.

### **16.2.3 PLAN MAINTENANCE PROCESS**

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions, and/or
- Increased vulnerability as a result of new development (and/or annexation).

The annual reviews and updates to this plan will include the following:

- Consider changes in vulnerability due to action implementation
- Summary of any natural hazard events that occurred during the performance period and the impact these events had on the planning area
- Review of mitigation success stories
- Review of continuing public involvement and feedback received from the community
- Re-evaluation of the action plan to evaluate whether the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term one because of new funding)
- Recommendations for new projects
- Changes in or potential for new funding options (grant opportunities)
- Impact of any other planning programs or initiatives that involve hazard mitigation
- Monitor the incorporation of the Mitigation Plan into planning mechanisms
- Post on the Henderson County website dedicated to the hazard mitigation plan
- Provide information for a press release that will be issued to the local media
- Inform planning partner governing bodies of the progress of actions implemented during the reporting period
- Uses of the progress report will be at the discretion of each planning partner. A template to guide the planning partners in preparing an annual progress report is available in Appendix H. Annual progress reporting is not a requirement specified under 44 CFR. However, it may enhance the planning partnership's opportunities for funding. While failure to implement this component of the

plan maintenance strategy will not jeopardize a planning partner's compliance under the DMA, it may jeopardize its opportunity to partner and leverage funding opportunities with the other partners.

In order to best evaluate the mitigation strategy during plan review and update, the participating jurisdictions will follow the following process:

- A representative from the responsible office identified in each mitigation action will be stakeholders responsible for tracking and reporting the action status on an annual basis to the jurisdictional planning committee member and providing input on any completion details or whether the action still meets the defined objectives and is likely to be successful in reducing vulnerabilities.
- If the action does not meet identified objectives, the jurisdictional planning committee member will determine what additional measures may be implemented, and an assigned individual will be responsible for defining action scope, implementing the action, monitoring success of the action, and making any required modifications to the plan.
- As part of the annual review process, the Henderson County Emergency Management Coordinator will provide the updated Mitigation Strategy with the current status of each mitigation action to the County Commissioner Court and County Department Heads as well as all Mayors and City Clerks requesting that the mitigation strategy be incorporated, where appropriate in other planning mechanisms.

Changes will be made to the plan to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, or funding resources. Actions that were not ranked high but were identified as potential mitigation activities will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation. Updating of the plan will be by written changes and submissions, as the Henderson County planning committee deems appropriate and necessary, and as approved by the Henderson County Commissioner Court and the governing boards of the other participating jurisdictions.

#### **16.2.4 CONTINUING PUBLIC INVOLVEMENT**

The public will continue to be apprised of the plan's progress through the Henderson County website and other methods as appropriate. This site will not only house the final plan, it will become the one-stop shop for information regarding the plan, the partnership and plan implementation. Copies of the plan will be maintained at the Henderson County Fire Marshal's Office. Upon initiation of future update processes, a new public involvement strategy will be initiated based on guidance from a new planning committee. This strategy will be based on the needs and capabilities of the planning partnership at the time of the update. This strategy will include the use of local media outlets within the planning area to notify the public of the implementation, monitoring, and evaluation of the plan. The public will be invited to participate in each stage by attending meetings and provide feedback to the planning team and new planning committee. The planning committee may include community stakeholders, such as prominent businesses, local action groups, etc.

#### **16.3 INCORPORATION INTO EXISTING PLANNING MECHANISMS**

The information on hazard, risk, vulnerability, and mitigation contained in this plan is based on the best science and technology available at the time this plan update was prepared. The existing Henderson County regulations, ordinances, and plans (including the Henderson County Emergency Operations

Plan), and the jurisdictional comprehensive plans are considered to be integral parts of this plan. The county and planning partners, through adoption of comprehensive plans and zoning ordinances, have planned for the impact of natural hazards. Many of the small jurisdictions in Henderson County do not have standing formal planning mechanisms such as a Comprehensive Plan or Capital Improvements Plan through which formal integration of mitigation actions can be documented. As a result activities that occur in these small communities are developed through annual budget planning, regular City Council Meetings and other community forums rather than a formal planning process. Planning mechanisms that do exist within the participating jurisdictions include:

- Comprehensive Plans;
- Various ordinances of participating jurisdictions, including floodplain management ordinances in NFIP-participating communities;
- Henderson County Emergency Operations Plan;
- Capital Improvement Plans

In particular, several affected municipalities, for example the City of Athens, have adopted updated floodplain prevention ordinances to incorporate this data. Other jurisdictions, for example unincorporated Henderson County, has a floodplain prevention ordinance that allows for FIS revisions to be adopted by reference and declared to be a part of their ordinance.

Thus no need for a revised ordinance. For a detailed summary of planning mechanisms and other mitigation-related capabilities, see Chapter 5. TABLE 15-1 provides additional details on each jurisdiction regarding how the Henderson County Hazard Mitigation Action Plan 2020 was integrated into existing planning mechanisms as well as the strategy going forward to integrate this plan update into existing planning mechanisms.

In Henderson County, the general statue process for integration is initiated via an action request by a county departmental supervisor, elected official or other interested party. Once a request is initiated the item is placed on the Commissioners Court agenda, compliant with all County required procedures which includes posting in the Courthouse kiosks in the designated windows as well as the Henderson County Commissioner website, <https://www.henderson-county.com/advanced-components/calendar-month-view>, for public access. The item is discussed as part of the Commissioners normal agenda. Discussion is then open to the public in attendance at the Commissioner's Court public meeting compliant with the provisions of the Texas Open Meeting Act, Texas Government Code, Chapter 551. The proposal is then voted on by the Commissioner's Court which may or may not be the same meeting the proposal was first introduced at.

In the participating cities of Athens, Berryville, Brownsboro, Caney City, Chandler, Coffee City, Enchanted Oaks, Eustace, Gun Barrel City, Log Cabin, Malakoff, Moore Station, Murchison, Payne Springs, Poynor, Seven Points, Star Harbor, Tool and Trinidad, the general statue process for integration is initiated via an action request by a city departmental supervisor, city manager, elected official or other interested party. The City Clerk or City Secretary coordinates action items and completes the City Council's agenda which is posted for public access per each city's statute. The item is discussed at the City Council's public meeting, including receipt of public comment per the provisions of the Texas Open Meeting Act, Texas Government Code, Chapter 551. The proposal is then voted on by the City Council which may or may not be the same meeting the proposal was first introduced at.

**APPENDIX A.**  
**ACRONYMS AND DEFINITIONS**



## **APPENDIX A.**

### **ACRONYMS AND DEFINITIONS**

Note: Acronyms are defined the first time they are used in each part of this plan.

°F	Degrees Fahrenheit
°C	Degrees Celsius
44 CFR	Title 44 Code of Federal Regulations
CWPP	Community Wildfire Protection Plan
DFIRM	Digital Flood Insurance Rate Map
DMA	Disaster Mitigation Act of 2000
DPS	Department of Public Safety
EAP	Education and Awareness Program
EF	Enhanced Fujita
EOP	Emergency Operations Plan
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
GIS	Geographic Information System
HAZMAT	Hazardous Materials
HMA	Hazard Mitigation Grant Program
HMGP	Hazard Mitigation Grant Program
KT	Knot
LPR	Local Plans and Regulations
Mph	Miles Per Hour
Mw	Moment Magnitude
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NREL	National Renewable Energy Laboratory
NSP	Natural Systems Protection
NWS	National Weather Service
OEM	Office of Emergency Management
PDI	Palmer Drought Index
PHDI	Palmer Hydrological Drought Index
SIP	Structure and Infrastructure Project
SFHA	Special Flood Hazard Area
SPI	Standardized Precipitation Index
SWCD	Soil and Water Conservation District
TCEQ	Texas Commission on Environmental Quality
TDEM	Texas Department of Emergency Management
TFS	Texas Forest Service
TSSWCB	Texas State Soil and Water Conservation Board
TWDB	Texas Water Development Board
TxWRAP	Texas A&M Forest Service Wildfire Risk Assessment Portal
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service

USGS	U.S. Geological Survey
WHP	Wildfire Hazard Potential
WUI	Wildland Urban Interface

## **DEFINITIONS**

**100-Year Flood:** The term “100-year flood” can be misleading. The 100-year flood does not necessarily occur once every 100 years. Rather, it is the flood that has a 1% chance of being equaled or exceeded in any given year. Thus, the 100-year flood could occur more than once in a relatively short period of time. The Federal Emergency Management (FEMA) defines it as the 1% annual-chance-flood, which is now the standard definition used by most federal and state agencies by the National Flood Insurance Program (NFIP).

**Acre-Foot:** An acre-foot is the amount of water it takes to cover 1 acre to a depth of 1 foot. This measure is used to describe the quantity of storage in a water reservoir. An acre-foot is a unit of volume. One acre foot equals 7,758 barrels; 325,829 gallons; or 43,560 cubic feet. An average household of four will use approximately 1 acre-foot of water per year.

**Asset:** An asset is any man-made or natural feature that has value, including but not limited to, people; buildings; infrastructure, such as bridges, road, sewers and water systems; lifelines, such as electricity and communication resources; and environmental, cultural, or recreational features such as parks, wetland and landmarks.

**Base Flood:** The flood having 1% chance of being equaled or exceeded in any given year, also known as the “100-year” or “1% chance” flood. The base flood is a statistical concept used to ensure that all properties subject to the NFIP are protected to the same degree against flooding.

**Basin:** A basin is the area within which all surface water, whether from rainfall, snowmelt, springs or other sources flow to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains and ridges. Basins are also referred to as “watersheds” and “drainage basins.”

**Benefit:** A benefit is a net project outcome and is usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of benefit-cost analysis of proposed mitigation measures, benefits are limited to specific, measurable risk reduction factors, including reduction in expected property losses (buildings, contents, and functions) and protection of human life.

**Benefit/Cost Analysis:** A benefit/cost analysis is a systematic, quantitative method of comparing projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

**Breach:** An opening through which floodwaters may pass after part of a levee has given way.

**Building:** A building is defined as a structure that is walled and roofed, principally aboveground, and permanently fixed to a site. The term includes manufactured homes on permanent foundations on which the wheels and axles carry no weight.

**Capability Assessment:** A capability assessment provides a description and analysis of a community's current capacity to address threats associated with hazards. The assessment includes two components: an inventory of an agency's mission, programs, and policies, and an analysis of its capacity to carry them out. A capability assessment is an integral part of the planning process in which a community's actions to reduce losses are identified, reviewed, and analyzed, and the framework for implementation is identified. The following capabilities were reviewed under this assessment:

- Legal and regulatory capability
- Administrative and technical capability
- Fiscal capability

**Conflagration:** A fire that grows beyond its original source area to engulf adjoining regions. Wind, extremely dry or hazardous weather conditions, excessive fuel buildup, and explosions are usually the elements behind a wildfire conflagration.

**Critical Area:** An area defined by state or local regulations as deserving special protection because of unique natural features or its value as habitat for a wide range of species of flora and fauna. A sensitive/critical area is usually subject to more restrictive development regulations.

**Critical Facility:** Facilities and infrastructure that are critical to the health and welfare of the population. These become especially important after any hazard event occurs.

**Dam:** A barrier, including one for flood detention, designed to impound liquid volumes and which has a height of dam greater than six feet (Texas Administrative Code, Ch. 299, 1986).

**Dam Failure:** Dam failure refers to a partial or complete breach in a dam (or levee) that impacts its integrity. Dam failures occur for a number of reasons, such as flash flooding, inadequate spillway size, mechanical failure of valves or other equipment, freezing and thawing cycles, earthquakes, and intentional destruction.

**Debris Flow:** Dense mixtures of water-saturated debris that move down-valley; looking and behaving much like flowing concrete. They form when loose masses of unconsolidated material are saturated, become unstable, and move down slope. The source of water varies but includes rainfall, melting snow or ice, and glacial outburst floods.

**Deposition:** Deposition is the placing of eroded material in a new location.

**Disaster Mitigation Act of 2000 (DMA):** The DMA is Public Law 106-390 and is the latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA emphasizes planning for disasters before they occur. Under the DMA, a pre-disaster hazard mitigation program and new requirements for the national post-disaster hazard mitigation grant program (HMGP) were established.

**Drainage Basin:** A basin is the area within which all surface water, whether from rainfall, snowmelt, springs or other sources, flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains and ridges. Drainage basins are also referred to as watersheds or basins.

**Drought:** Drought is a period of time without substantial rainfall or snowfall from one year to the next. Drought can also be defined as the cumulative impacts of several dry years or a deficiency of precipitation over an extended period of time, which in turn results in water shortages for some activity, group, or environmental function. A hydrological drought is caused by deficiencies in surface and subsurface water supplies. A socioeconomic drought impacts the health, well-being, and quality of life or starts to have an adverse impact on a region. Drought is a normal, recurrent feature of climate and occurs almost everywhere.

**Earthquake:** An earthquake is defined as a sudden slip on a fault, volcanic or magmatic activity, and sudden stress changes in the earth that result in ground shaking and radiated seismic energy. Earthquakes can last from a few seconds to over 5 minutes, and have been known to occur as a series of tremors over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties may result from falling objects and debris as shocks shake, damage, or demolish buildings and other structures.

**Emergency Action Plan:** A document that identifies potential emergency conditions at a dam and specifies actions to be followed to minimize property damage and loss of life. The plan specifies actions the dam owner should take to alleviate problems at a dam. It contains procedures and information to assist the dam owner in issuing early warning and notification messages to responsible downstream emergency management authorities of the emergency situation. It also contains inundation maps to show emergency management authorities the critical areas for action in case of an emergency. (FEMA 64)

**Enhanced Fujita Scale (EF-scale):** The EF-scale is a set of wind estimates (not measurements) based on damage. It uses 3-second gusts estimated at the point of damage based on a judgment of 8 levels of damage to the 28 indicators. These estimates vary with height and exposure. Standard measurements are taken by weather stations in openly exposed areas.

**Expansive Soil:** Expansive soil and rock are characterized by clayey material that shrinks as it dries or swells as it becomes wet.

**Exposure:** Exposure is defined as the number and dollar value of assets considered to be at risk during the occurrence of a specific hazard. **Extent:** The extent is the size of an area affected by a hazard.

**Extreme Heat:** Summertime weather that is substantially hotter or more humid than average for a location at that time of year.

**Fault:** A fracture in the earth's crust along which two blocks of the crust have slipped with respect to each other.

**Fire Behavior:** Fire behavior refers to the physical characteristics of a fire and is a function of the interaction between the fuel characteristics (such as type of vegetation and structures that could burn), topography, and weather. Variables that affect fire behavior include the rate of spread, intensity, fuel consumption, and fire type (such as underbrush versus crown fire).

**Fire Frequency:** Fire frequency is the broad measure of the rate of fire occurrence in a particular area. An estimate of the areas most likely to burn is based on past fire history or fire rotation in the area, fuel conditions, weather, ignition sources (such as human or lightning), fire suppression response, and other factors.

**Flash Flood:** A flash flood occurs with little or no warning when water levels rise at an extremely fast rate.

**Flood:** The inundation of normally dry land resulting from the rising and overflowing of a body of water.

**Flood Insurance Rate Map (FIRM):** FIRMs are the official maps on which the Federal Emergency Management Agency (FEMA) has delineated the Special Flood Hazard Area (SFHA).

**Flood Insurance Study:** A report published by the Federal Insurance and Mitigation Administration for a community in conjunction with the community's FIRM. The study contains such background data as the base flood discharges and water surface elevations that were used to prepare the FIRM. In most cases, a community FIRM with detailed mapping will have a corresponding flood insurance study.

**Floodplain:** Any land area susceptible to being inundated by flood waters from any source. A FIRM identifies most, but not necessarily all, of a community's floodplain as the SFHA.

**Floodway:** Floodways are areas within a floodplain that are reserved for the purpose of conveying flood discharge without increasing the base flood elevation more than one foot. Generally speaking, no development is allowed in floodways, as any structures located there would block the flow of floodwaters.

**Freeboard:** Freeboard is the margin of safety added to the base flood elevation.

**Freezing Rain:** The result of rain occurring when the temperature is below the freezing point. The rain freezes on impact, resulting in a layer of glaze ice up to an inch thick. In a severe ice storm, an evergreen tree 60 feet high and 30 feet wide can be burdened with up to 6 tons of ice, creating a threat to power and telephone lines and transportation routes.

**Fujita Scale of Tornado Intensity:** Tornado wind speeds are sometimes estimated on the basis of wind speed and damage sustained using the Fujita Scale. The scale rates the intensity or severity of tornado events using numeric values from F0 to F5 based on tornado wind speed and damage. An F0 tornado (wind speed less than 73 miles per hour [mph]) indicates minimal damage (such as broken tree limbs), and an F5 tornado (wind speeds of 261 to 318 mph) indicates severe damage.

**Goal:** A goal is a general guideline that explains what is to be achieved. Goals are usually broad-based, long-term, policy-type statements and represent global visions. Goals help define the benefits that a plan is trying to achieve. The success of a hazard mitigation plan is measured by the degree to which its goals have been met (that is, by the actual benefits in terms of actual hazard mitigation).

**Geographic Information System (GIS):** GIS is a computer software application that relates data regarding physical and other features on the earth to a database for mapping and analysis. **Ground Subsidence:** Ground subsidence is the sinking of land over human-caused or natural underground voids and the settlement of native low density soils.

**Groundwater Depletion:** Groundwater depletion occurs when groundwater is pumped from pore spaces between grains of sand and gravel. If an aquifer has beds of clay or silt within or next to it, the lowered water pressure in the sand and gravel causes slow drainage of water from the clay and silt beds. The reduced water pressure is a loss of support for the clay and silt beds. Because these beds are compressible, they compact (become thinner), and the effects are seen as a lowering of the land surface.

**Hazard:** A hazard is a source of potential danger or adverse condition that could harm people or cause property damage.

**Hazard Mitigation Grant Program (HMGP):** Authorized under Section 202 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, the HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster.

**High Hazard Dam —** Dams where failure or operational error will probably cause loss of human life.  
**(FEMA 333) Hurricane:** A tropical cyclone with maximum sustained surface winds (using the U.S. 1-minute average) of 64 knot (kt) (74 miles per hour [mph]) or more.

**Hydraulics:** Hydraulics is the branch of science or engineering that addresses fluids (especially water) in motion in rivers or canals, works and machinery for conducting or raising water, the use of water as a prime mover, and other fluid-related areas.

**Hydrology:** Hydrology is the analysis of waters of the earth. For example, a flood discharge estimate is developed by conducting a hydrologic study.

**Hypocenter:** The region underground where an earthquake's energy originates.

**Intensity:** For the purposes of this plan, intensity refers to the measure of the effects of a hazard.

**Interface Area:** An area susceptible to wildfires and where wildland vegetation and urban or suburban development occur together. An example would be smaller urban areas and dispersed rural housing in forested areas. **Inventory:** The assets identified in a study region comprise an inventory. Inventories include assets that could be lost when a disaster occurs and community resources are at risk. Assets include people, buildings, transportation, and other valued community resources.

**Lightning:** Lightning is an electrical discharge resulting from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt," usually within or between clouds and the ground. A bolt of lightning instantaneously reaches temperatures approaching 50,000°F. The rapid heating and cooling of air near lightning causes thunder. Lightning is a major threat during thunderstorms. In the United States, 75 to 100 people are struck and killed by lightning each year (see <http://www.fema.gov/hazard/thunderstorms/thunder.shtml>).

**Local Government:** Any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under state law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

**Magnitude:** Magnitude is the measure of the strength of an earthquake, and is typically measured by the Richter scale. As an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

**Mitigation:** A preventive action that can be taken in advance of an event that will reduce or eliminate the risk to life or property.

**Mitigation Actions:** Mitigation actions are specific actions to achieve goals and objectives that minimize the effects from a disaster and reduce the loss of life and property.

**National Flood Insurance Program (NFIP):** The NFIP provides federally backed flood insurance in exchange for communities enacting floodplain regulations. **Peak Ground Acceleration:** Peak Ground Acceleration is a measure of the highest amplitude of ground shaking that accompanies an earthquake, based on a percentage of the force of gravity.

**Preparedness:** Preparedness refers to actions that strengthen the capability of government, citizens, and communities to respond to disasters.

**Presidential Disaster Declaration:** These declarations are typically made for events that cause more damage than state and local governments and resources can handle without federal government assistance. Generally, no specific dollar loss threshold has been established for such declarations. A Presidential Disaster Declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, designed to help disaster victims, businesses, and public entities.

**Probability of Occurrence:** The probability of occurrence is a statistical measure or estimate of the likelihood that a hazard will occur. This probability is generally based on past hazard events in the area and a forecast of events that could occur in the future. A probability factor based on yearly values of occurrence is used to estimate probability of occurrence.

**Repetitive Loss Property:** Any NFIP-insured property that, since 1978 and regardless of any changes of ownership during that period, has experienced:

- Four or more paid flood losses in excess of \$1,000; or
- Two paid flood losses in excess of \$1,000 within any 10-year period since 1978; or
- Three or more paid losses that equal or exceed the current value of the insured property.

**Riparian Zone:** The area along the banks of a natural watercourse. **Riverine:** Of or produced by a river. Riverine floodplains have readily identifiable channels. Floodway maps can only be prepared for riverine floodplains.

**Risk:** Risk is the estimated impact that a hazard would have on people, services, facilities, and structures in a community. Risk measures the likelihood of a hazard occurring and resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to occurrence of a specific type of hazard. Risk also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

**Risk Assessment:** Risk assessment is the process of measuring potential loss of life, personal injury, economic injury, and property damage resulting from hazards. This process assesses the vulnerability of people, buildings, and infrastructure to hazards and focuses on (1) hazard identification; (2) impacts of hazards on physical, social, and economic assets; (3) vulnerability identification; and (4) estimates of the cost of damage or costs that could be avoided through mitigation.

**Risk Ranking:** This ranking serves two purposes, first to describe the probability that a hazard will occur, and second to describe the impact a hazard will have on people, property, and the economy. Risk estimates for the jurisdiction are based on the methodology that the jurisdiction used to prepare the risk assessment for this plan. The following equation shows the risk ranking calculation:

$$\text{Risk Ranking} = \text{Probability} + \text{Impact (people + property + economy)}$$

**Robert T. Stafford Act:** The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 100-107, was signed into law on November 23, 1988. This law amended the Disaster Relief Act of 1974, Public Law 93-288. The Stafford Act is the statutory authority for most federal disaster response activities, especially as they pertain to FEMA and its programs.

**Severe Local Storm:** Small-scale atmospheric systems, including tornadoes, thunderstorms, windstorms, ice storms, and snowstorms. These storms may cause a great deal of destruction and even death, but their impact is generally confined to a small area. Typical impacts are on transportation infrastructure and utilities.

**Significant Hazard Dam:** Dams where failure or operational error will result in no probable loss of human life but can cause economic loss, environmental damage, or disruption of lifeline facilities, or can impact other concerns. Significant hazard dams are often located in rural or agricultural areas but could be located in areas with population and significant infrastructure. (FEMA 333)

**Sinkhole:** A collapse depression in the ground with no visible outlet. Its drainage is subterranean. It is commonly vertical-sided or funnel-shaped.

**Special Flood Hazard Area:** The base floodplain delineated on a FIRM. The SFHA is mapped as a Zone A in riverine situations. The SFHA may or may not encompass all of a community's flood problems.

**Stakeholder:** Business leaders, civic groups, academia, non-profit organizations, major employers, managers of critical facilities, farmers, developers, special purpose districts, and others whose actions could impact hazard mitigation.

**Stream Bank Erosion:** Stream bank erosion is common along rivers, streams, and drains where banks have been eroded, sloughed, or undercut. However, it is important to remember that a stream is a dynamic and constantly changing system. It is natural for a stream to want to meander, so not all eroding banks are "bad" and in need of repair. Generally, stream bank erosion becomes a problem where development has limited the meandering nature of streams, where streams have been channelized, or where stream bank structures (like bridges, culverts, etc.) are located in places where they can actually cause damage to downstream areas. Stabilizing these areas can help protect watercourses from continued sedimentation, damage to adjacent land uses, control unwanted meander, and improvement of habitat for fish and wildlife.

**Steep Slope:** Different communities and agencies define it differently, depending on what it is being applied to, but generally a steep slope is a slope in which the percent slope equals or exceeds 25%. For this study, steep slope is defined as slopes greater than 33%.

**Sustainable Hazard Mitigation:** This concept includes the sound management of natural resources, local economic and social resilience, and the recognition that hazards and mitigation must be understood in the largest possible social and economic context.



**Thunderstorm:** A thunderstorm is a storm with lightning and thunder produced by cumulonimbus clouds. Thunderstorms usually produce gusty winds, heavy rains, and sometimes hail. Thunderstorms are usually short in duration (seldom more than 2 hours). Heavy rains associated with thunderstorms can lead to flash flooding during the wet or dry seasons.

**Tornado:** A tornado is a violently rotating column of air extending between and in contact with a cloud and the surface of the earth. Tornadoes are often (but not always) visible as funnel clouds. On a local scale, tornadoes are the most intense of all atmospheric circulations, and winds can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long.

**Tropical Storm:** A tropical cyclone with maximum sustained surface wind speed (using the U.S. 1-minute average) ranges from 34 kt (39 mph) to 63 kt (73 mph).

**Tropical Depression:** A tropical cyclone with maximum sustained surface wind speed (using the U.S. 1-minute average) ranges from 4 kt (39 mph) to 63 kt (73 mph).

**Values Response Index (VRI):** The wildfire VRI reflects a rating of the potential impact of a wildfire on values or assets. The VRI is an overall rating that combines the impact ratings for WUI (housing density) and Pine Plantations (pine age) into a single measure. VRI combines the likelihood of a fire occurring (threat) with those areas of most concern that are adversely impacted by fire to derive a single overall measure of wildfire risk.

**Vulnerability:** Vulnerability describes how exposed or susceptible an asset is to damage. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power. Flooding of an electric substation would affect not only the substation itself but businesses as well. Often, indirect effects can be much more widespread and damaging than direct effects.

**Watershed:** A watershed is an area that drains downgradient from areas of higher land to areas of lower land to the lowest point, a common drainage basin.

**Wildfire:** Wildfire refers to any uncontrolled fire occurring on undeveloped land that requires fire suppression. The potential for wildfire is influenced by three factors: the presence of fuel, topography, and air mass. Fuel can include living and dead vegetation on the ground, along the surface as brush and small trees, and in the air such as tree canopies. Topography includes both slope and elevation. Air mass includes temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount, duration, and the stability of the atmosphere at the time of the fire. Wildfires can be ignited by lightning and, most frequently, by human activity including smoking, campfires, equipment use, and arson.

**Wildfire Hazard Potential (WHP):** The wildfire threat or WHP is the likelihood of a wildfire occurring or burning into an area. Threat is calculated by combining multiple landscape characteristics including surface and canopy fuels, fire behavior, historical fire occurrences, weather observations, terrain conditions, and other factors.

**Windstorm:** Windstorms are generally short-duration events involving straight-line winds or gusts exceeding 50 mph. These gusts can produce winds of sufficient strength to cause property damage. Windstorms are especially dangerous in areas with significant tree stands, exposed property, poorly constructed buildings, mobile homes (manufactured housing units), major infrastructure, and aboveground utility lines. A windstorm can topple trees and power lines; cause damage to residential, commercial, critical facilities; and leave tons of debris in its wake.

**Winter Storm:** A storm having significant snowfall, ice, or freezing rain; the quantity of precipitation varies by elevation.

**Zoning Ordinance:** The zoning ordinance designates allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.

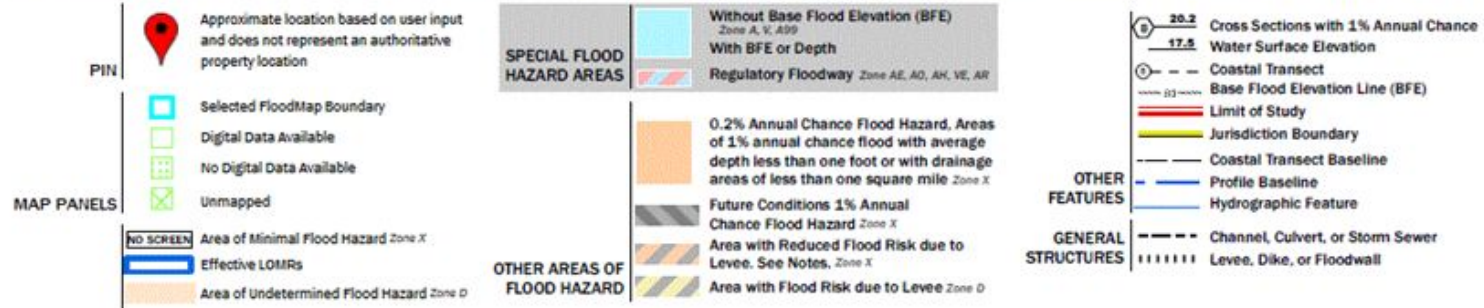
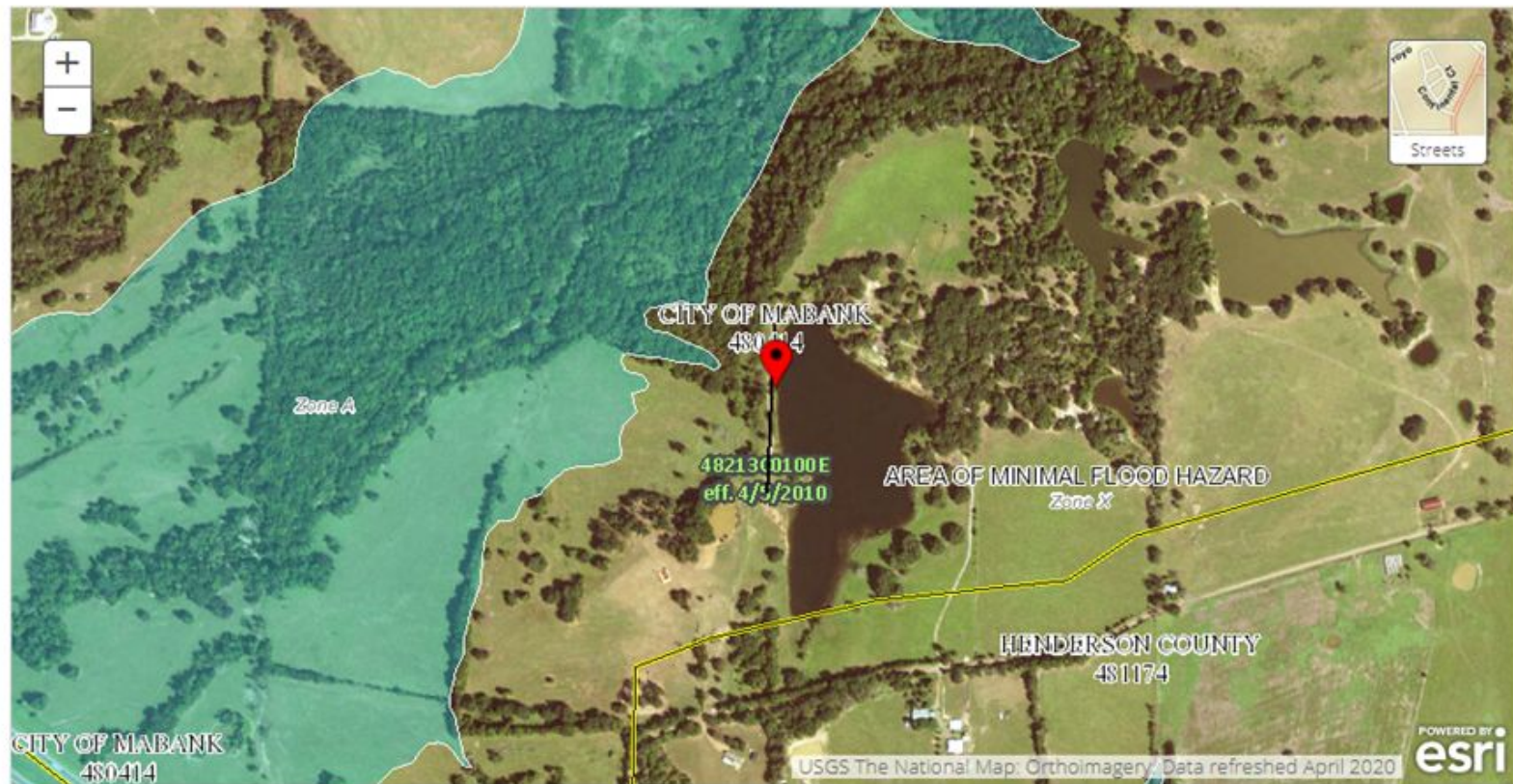
## **APPENDIX B.**

### **MAPS OF DAMS LOCATED IN HENDERSON COUNTY**

## **APPENDIX B. DAM LOCATION MAPS**

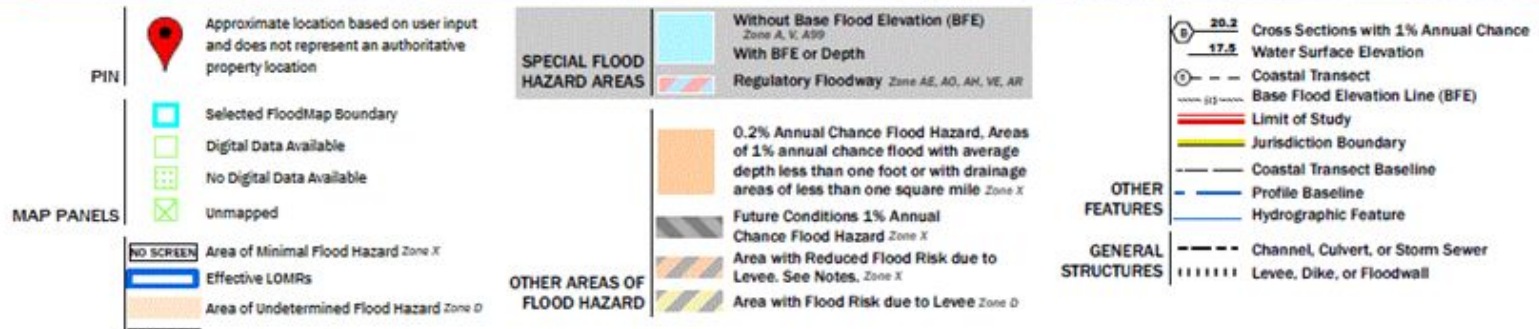
This appendix shows all the locations of all the high- , significant- and low-hazard dams in Henderson County, Texas.

# ABERNATHY LAKE



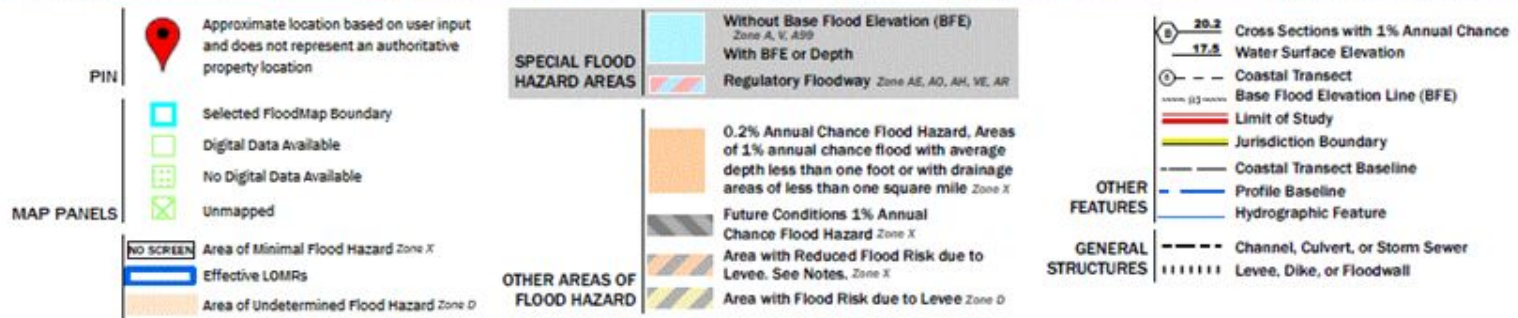
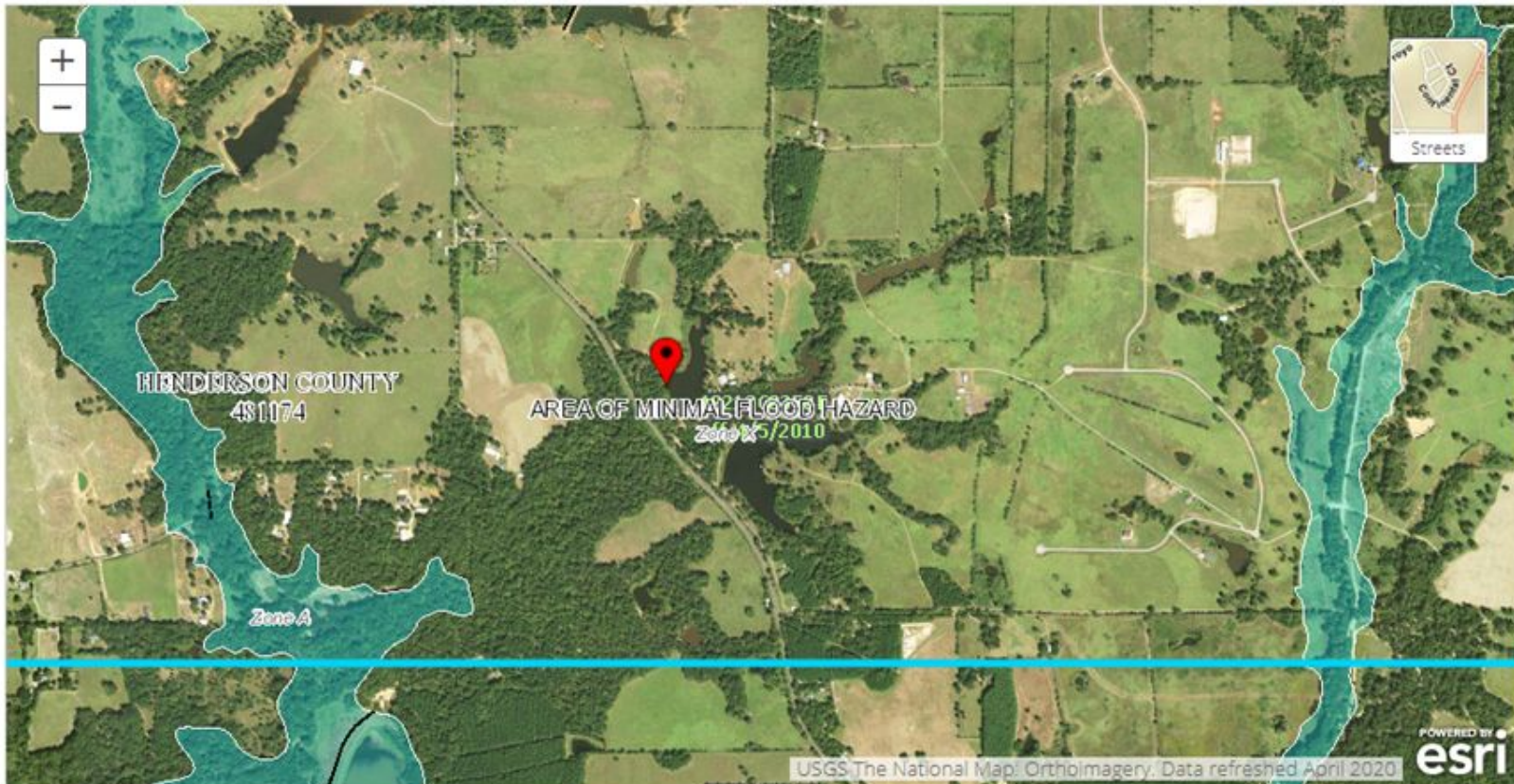


# ADAMS LAKE DAM





# ADAMS DAM



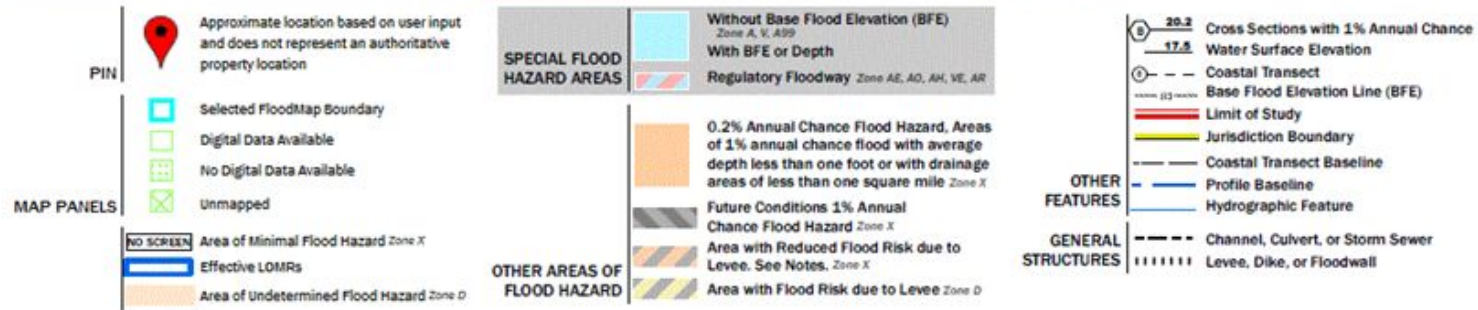


# ALDER LAKE DAM



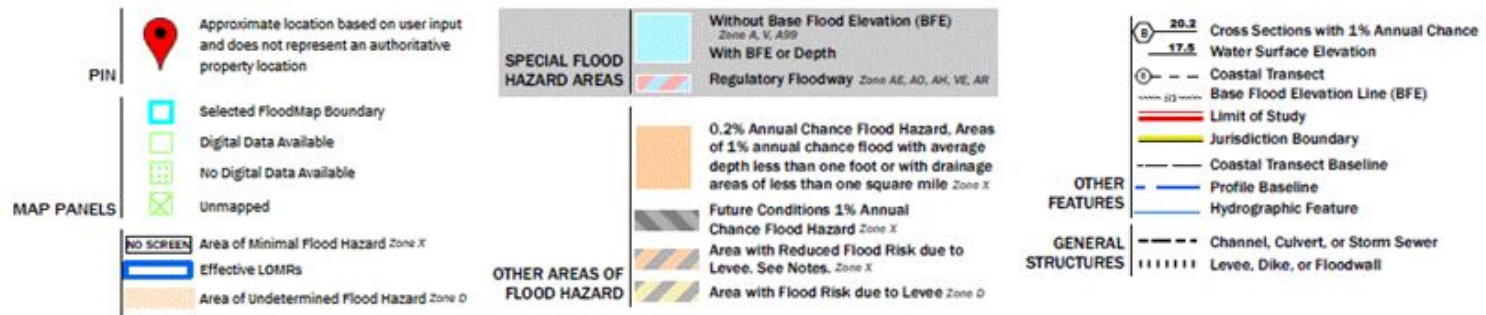
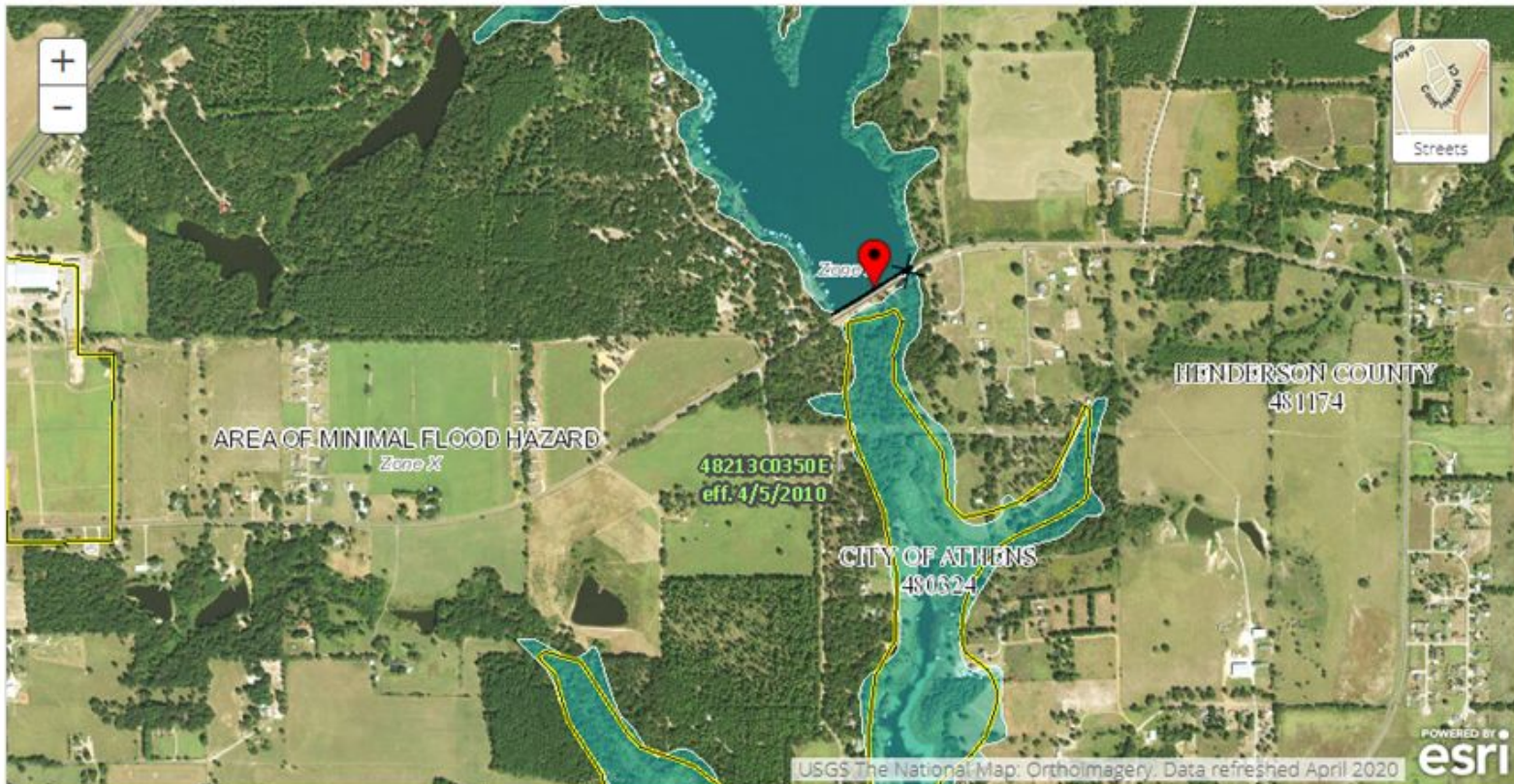


# ALLEN LAKE DAM



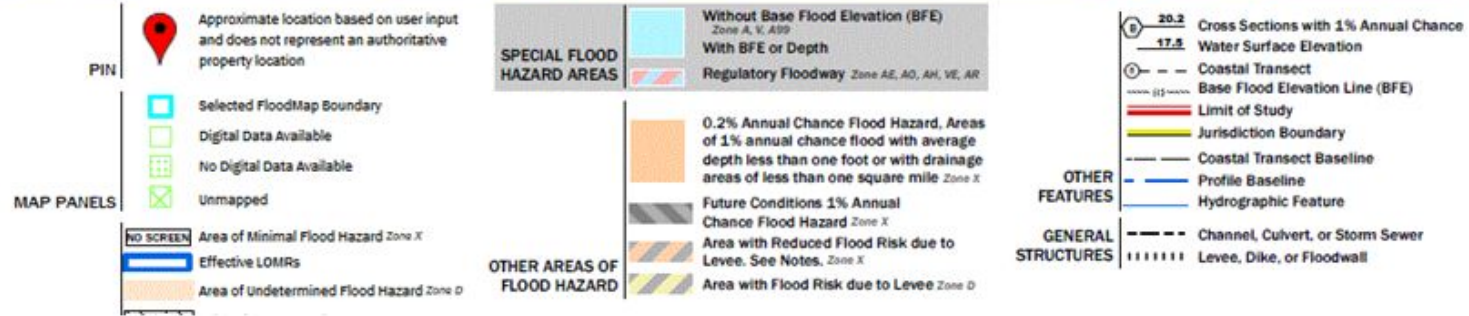
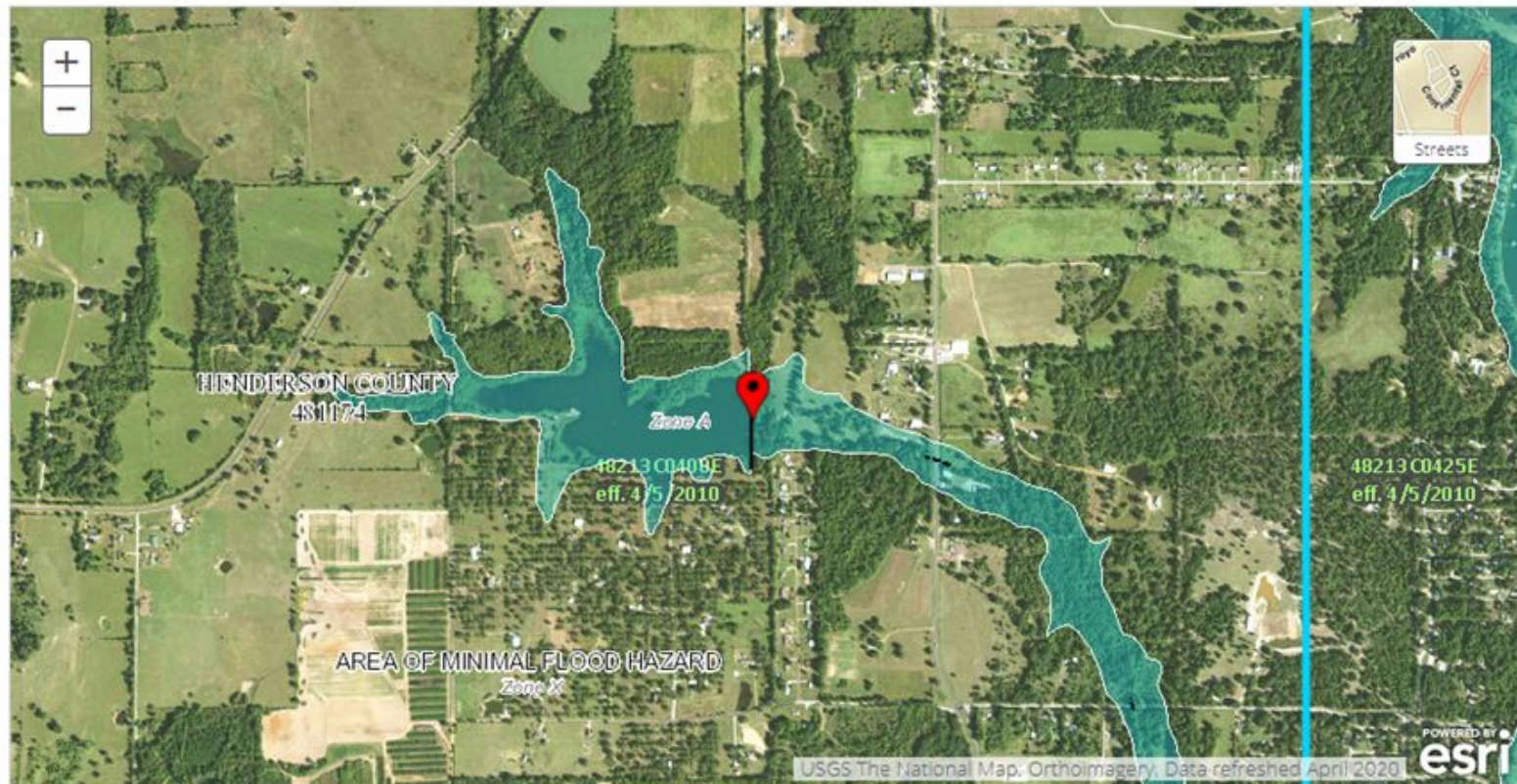


# ATHENS FISH AND GAME DAM



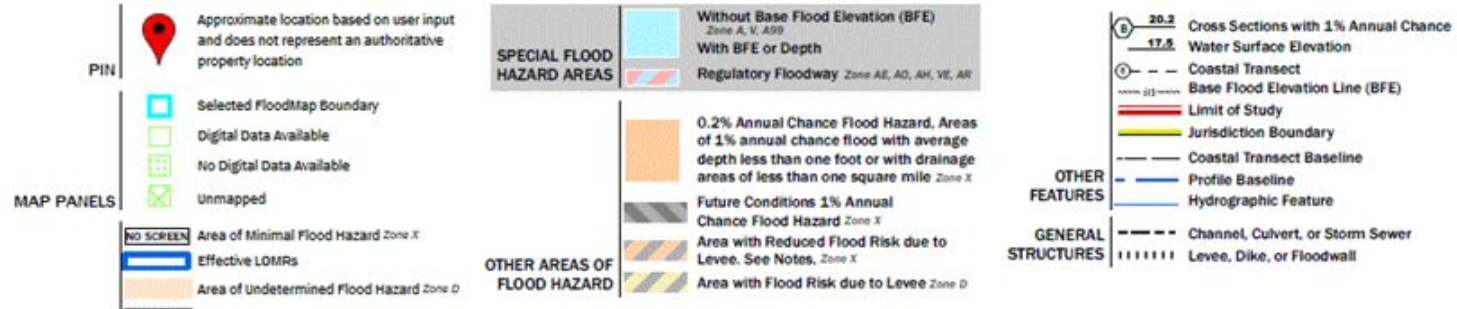
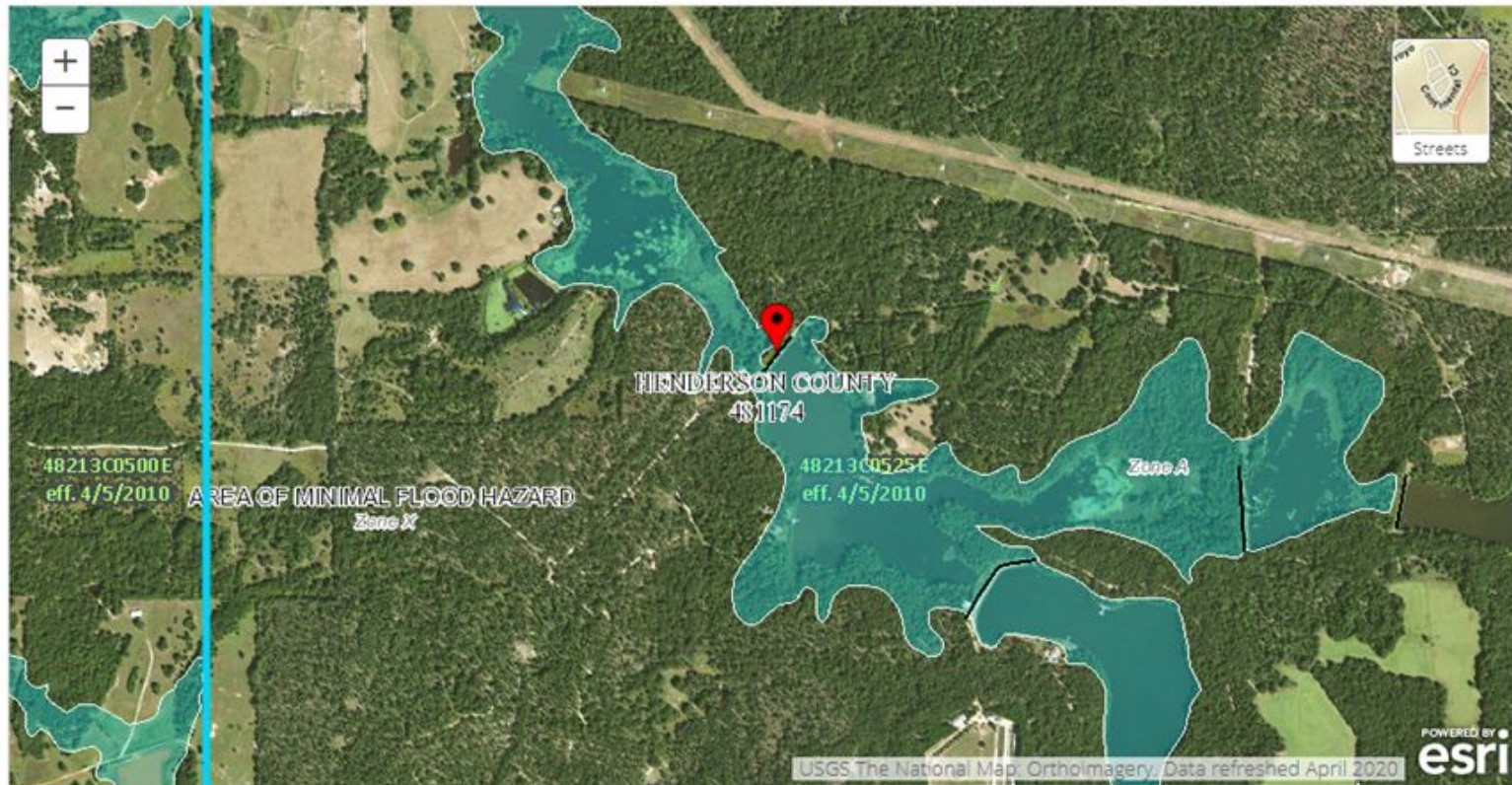


# BAGLEY LAKE DAM



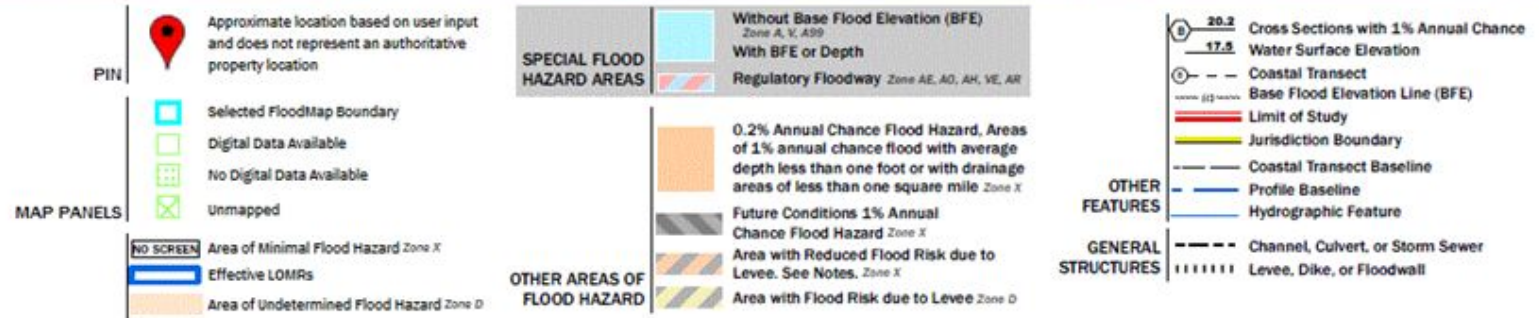


# BIG LAKE DAM



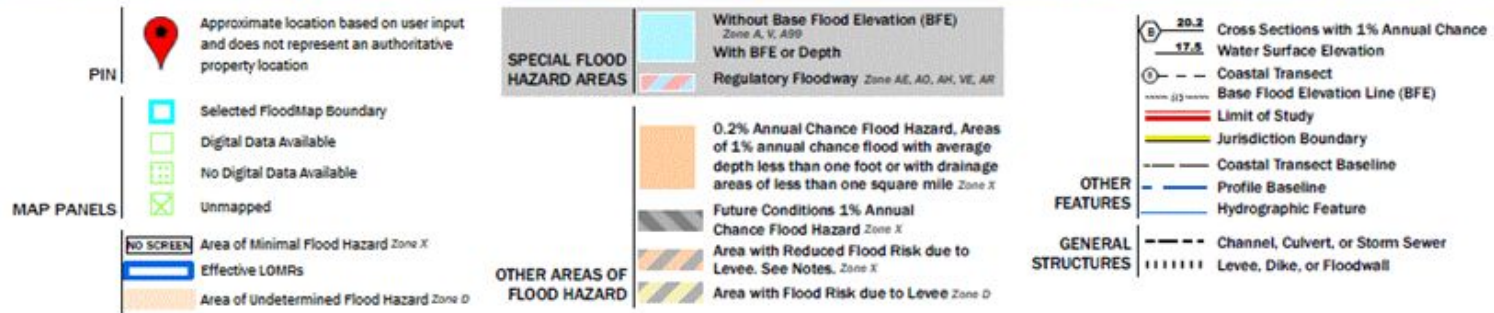
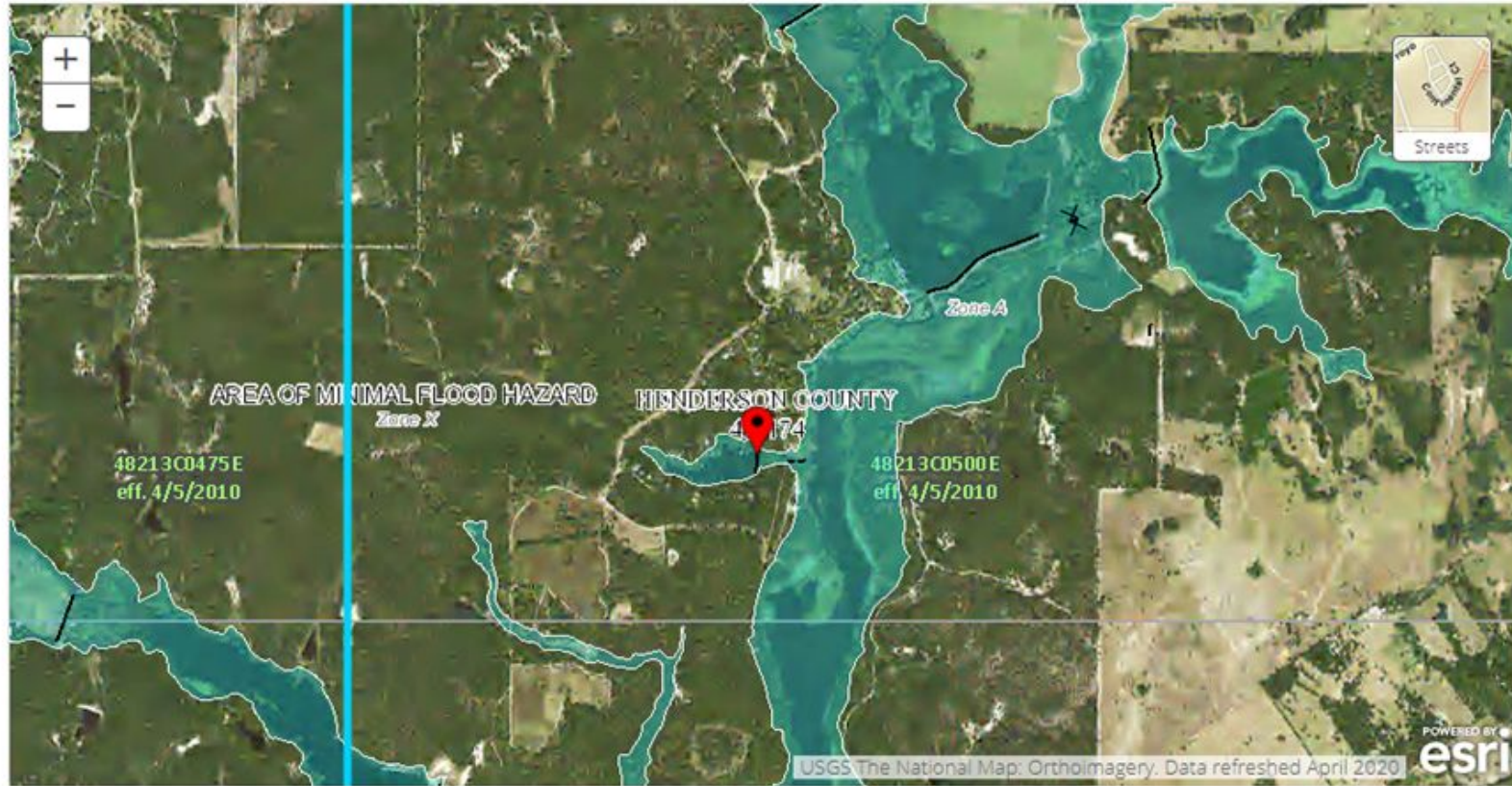


# BIG ROCK RANCH LAKE DAM



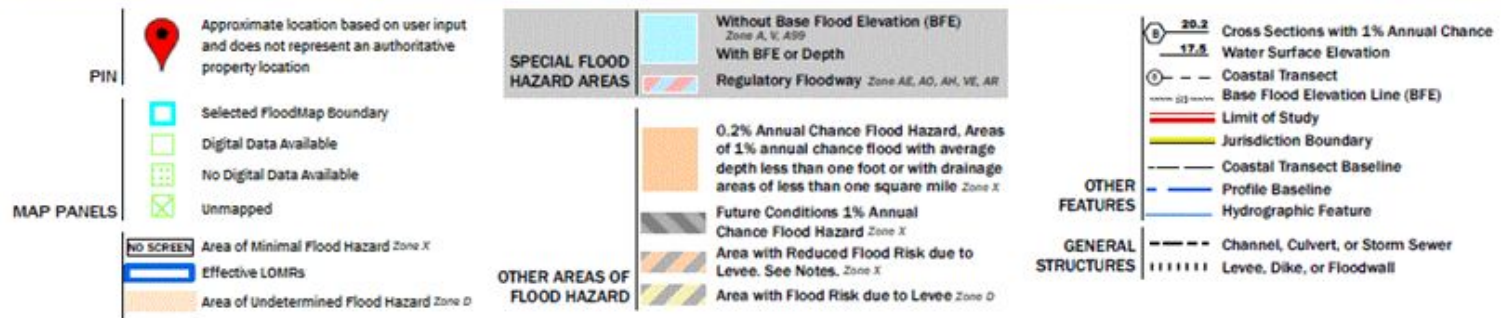
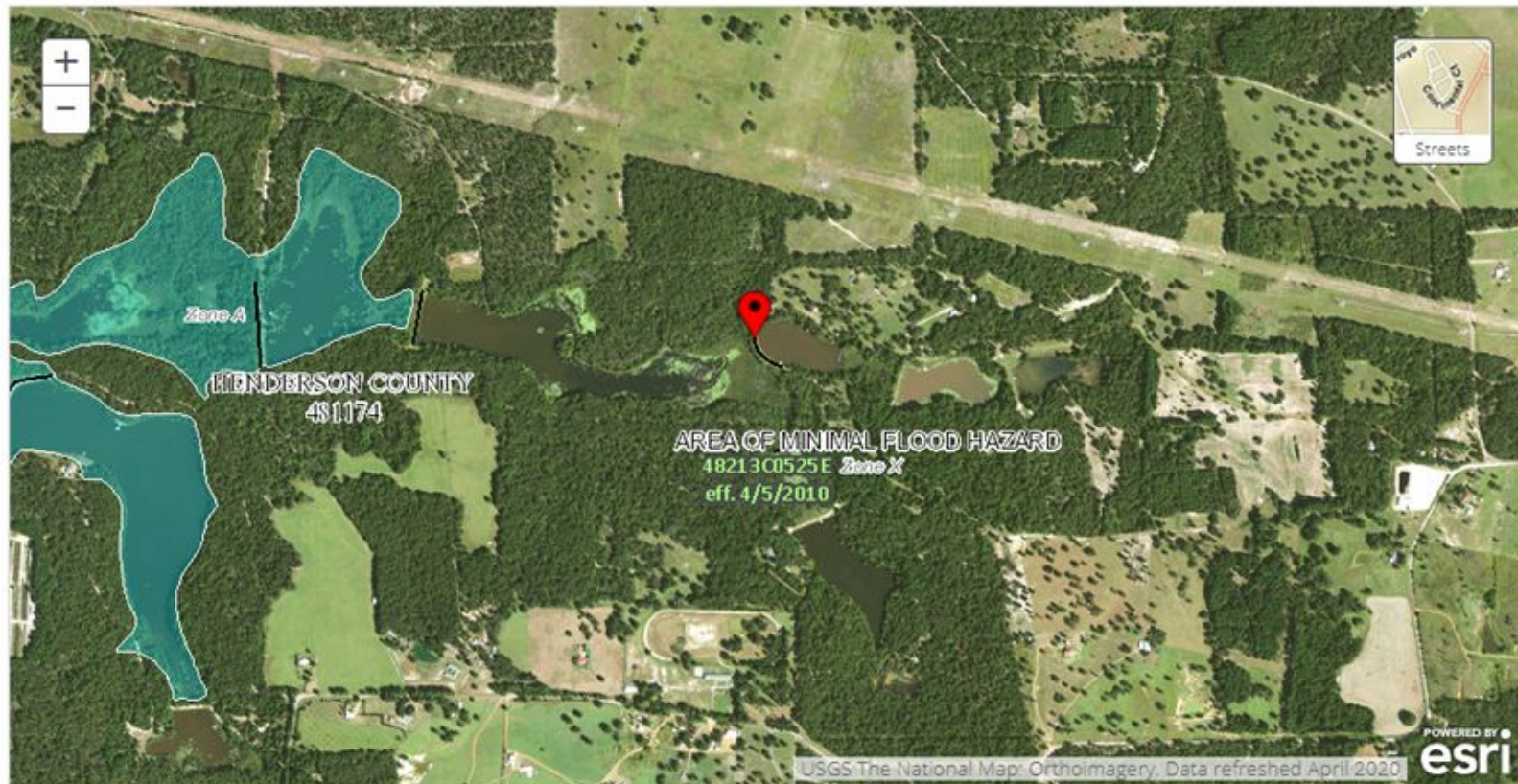


# BLACK LAKE DAM



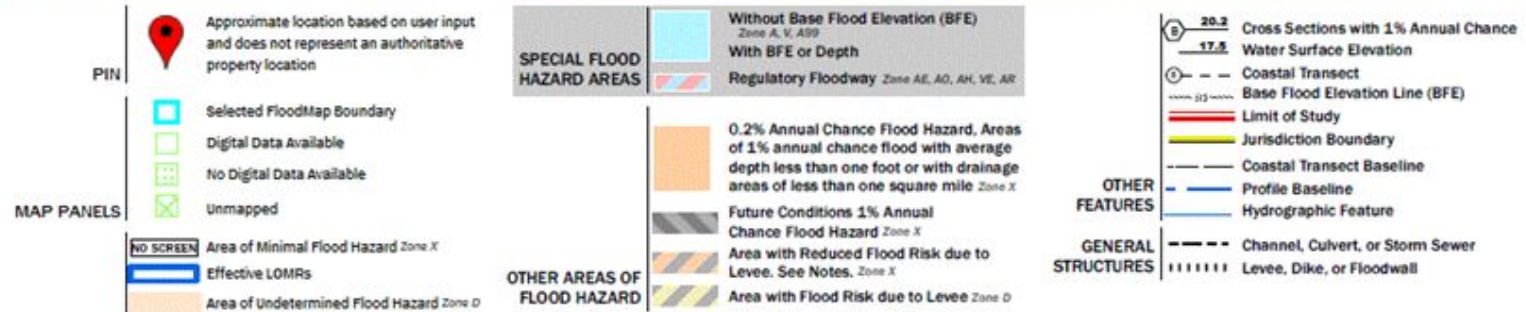
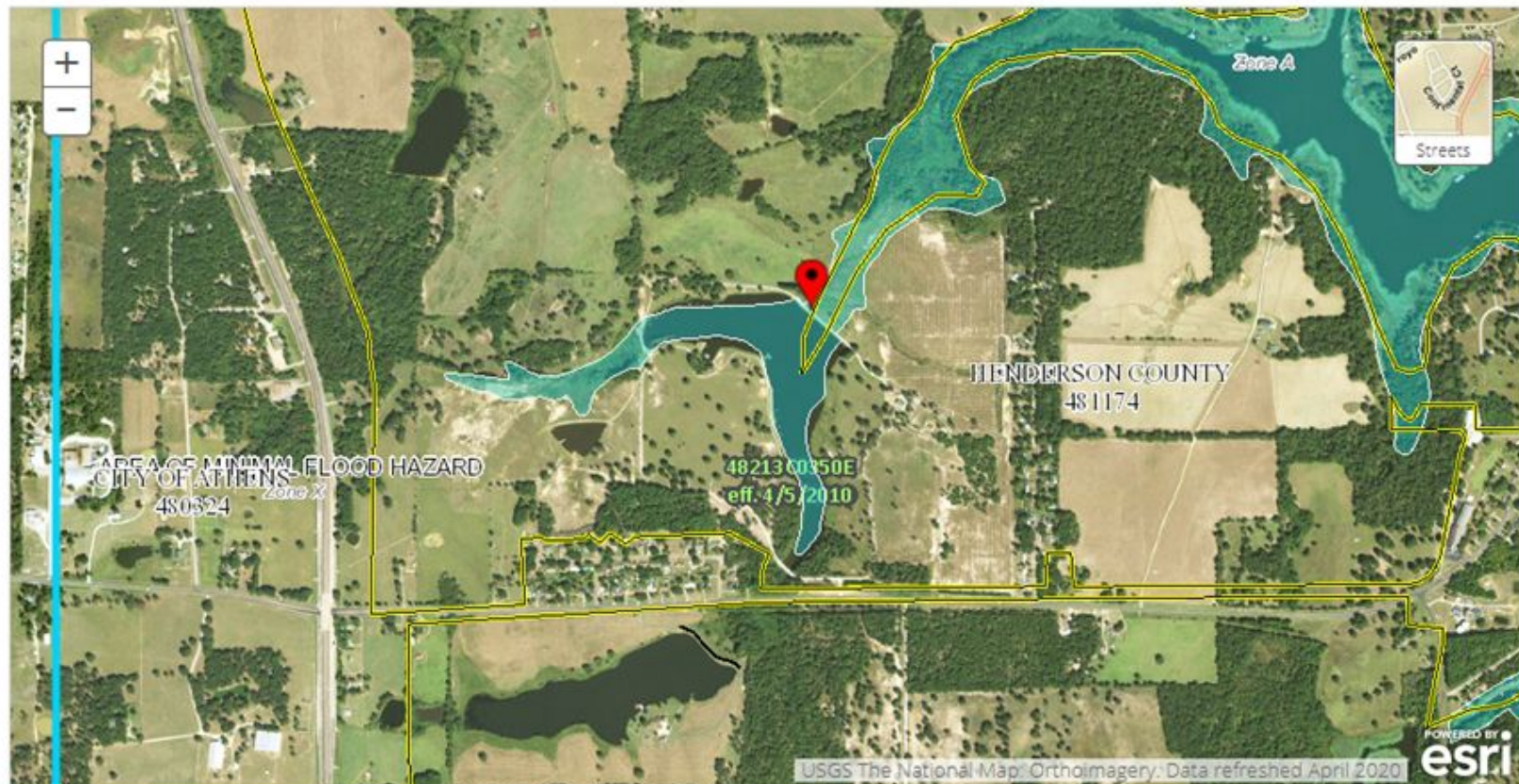


# BLUEBERRY LAKE DAM



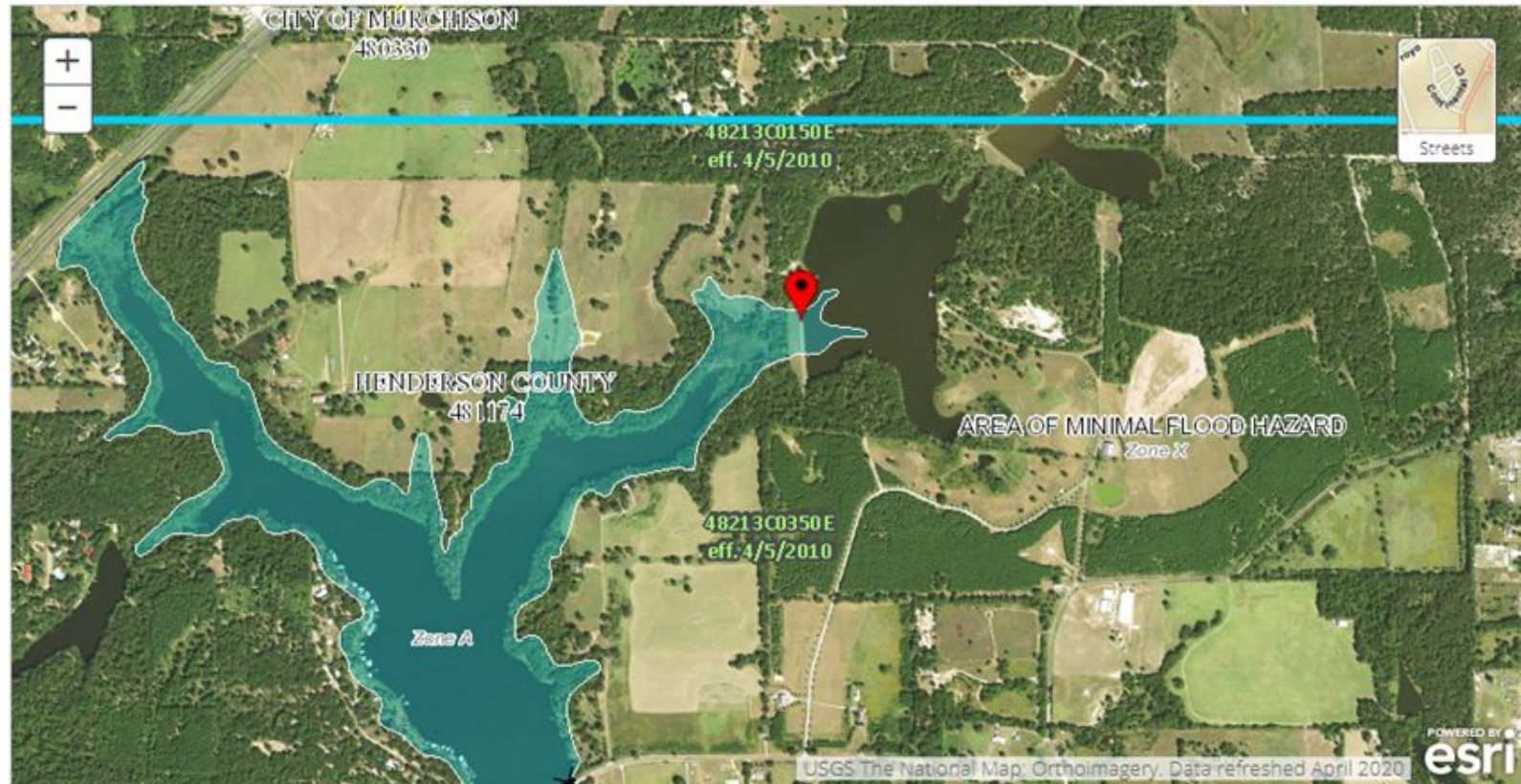


## BOOMER LAKE DAM NO. 2



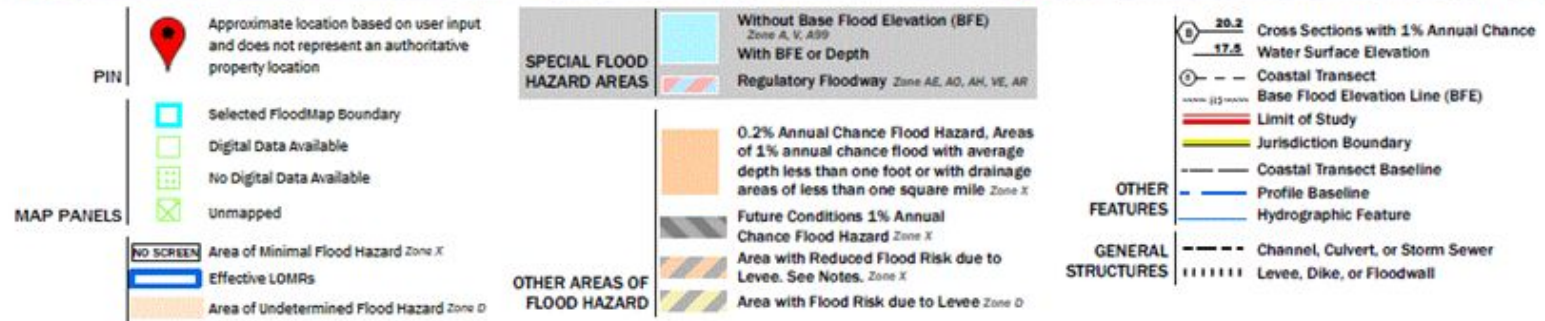
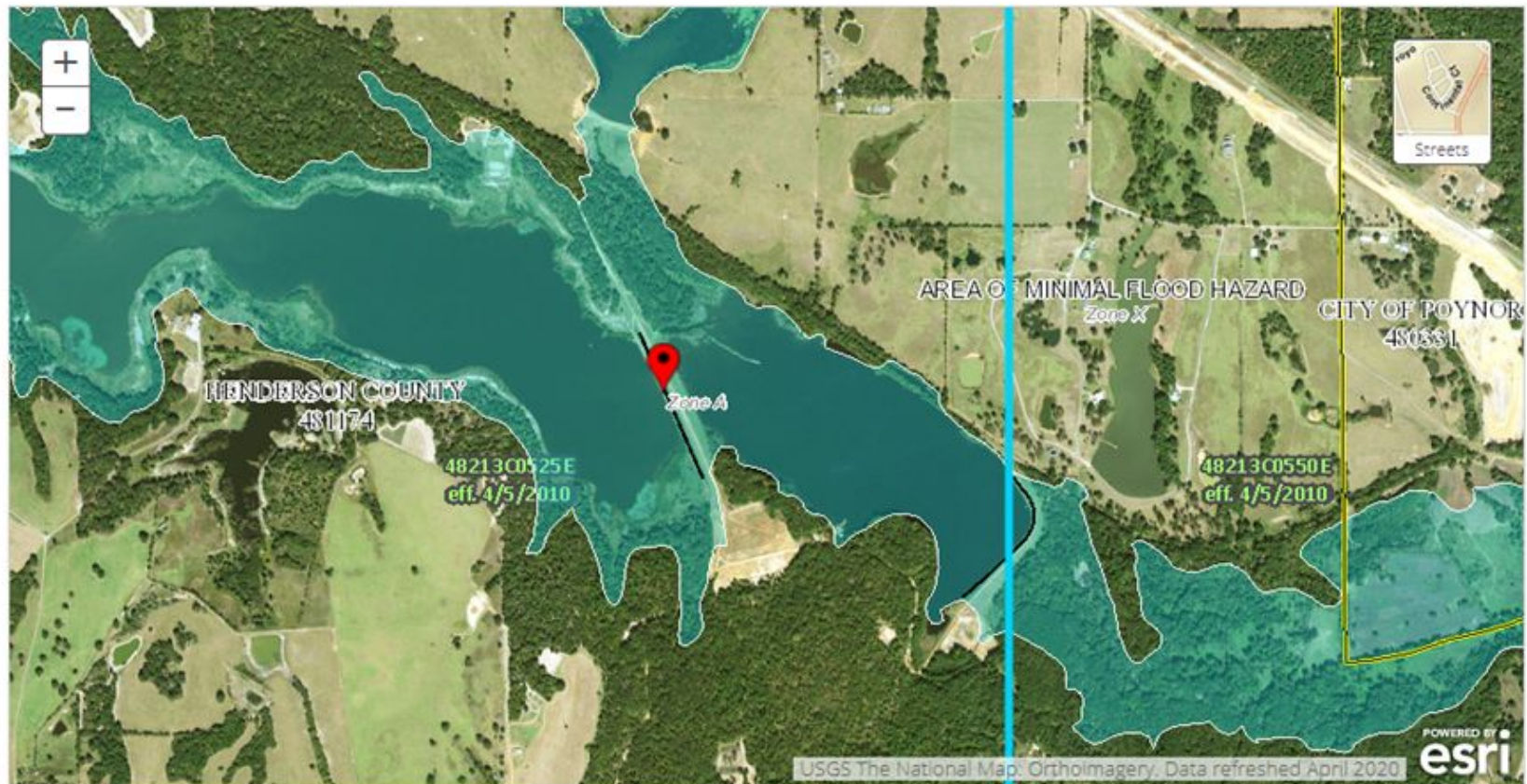


# BROWN LAKE DAM



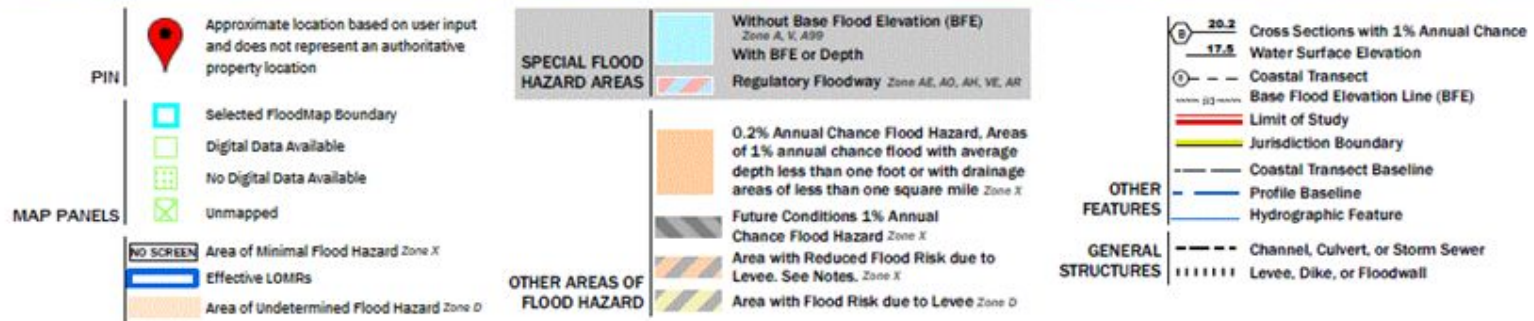
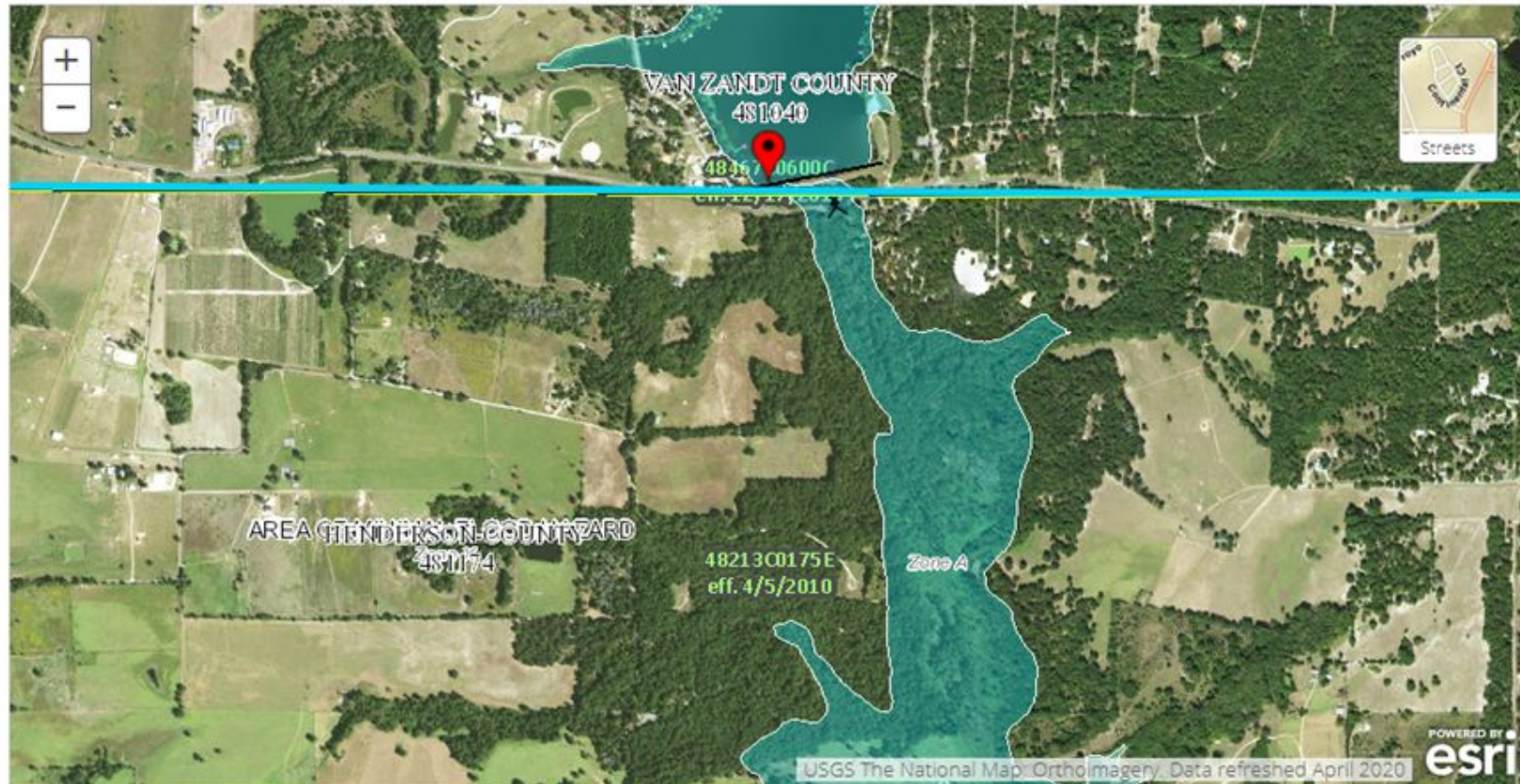


# CADDO CREEK LAKE DAM



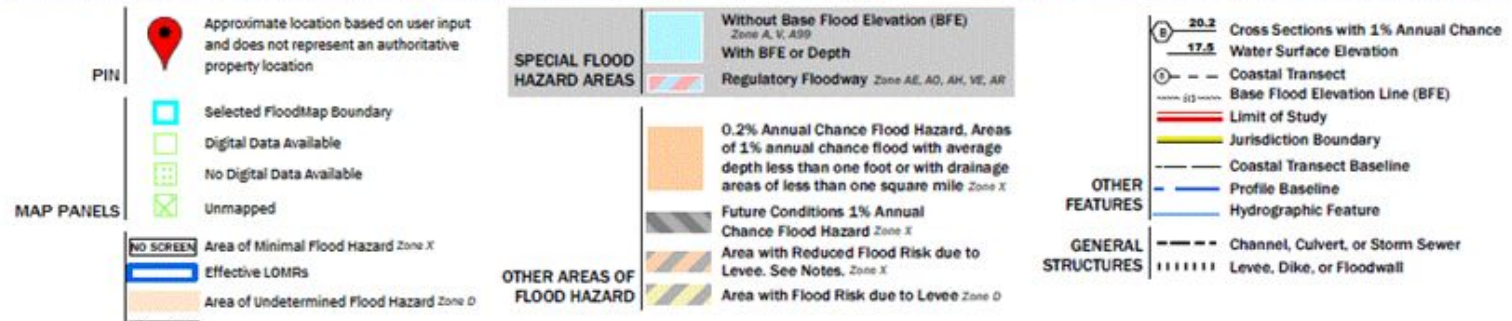
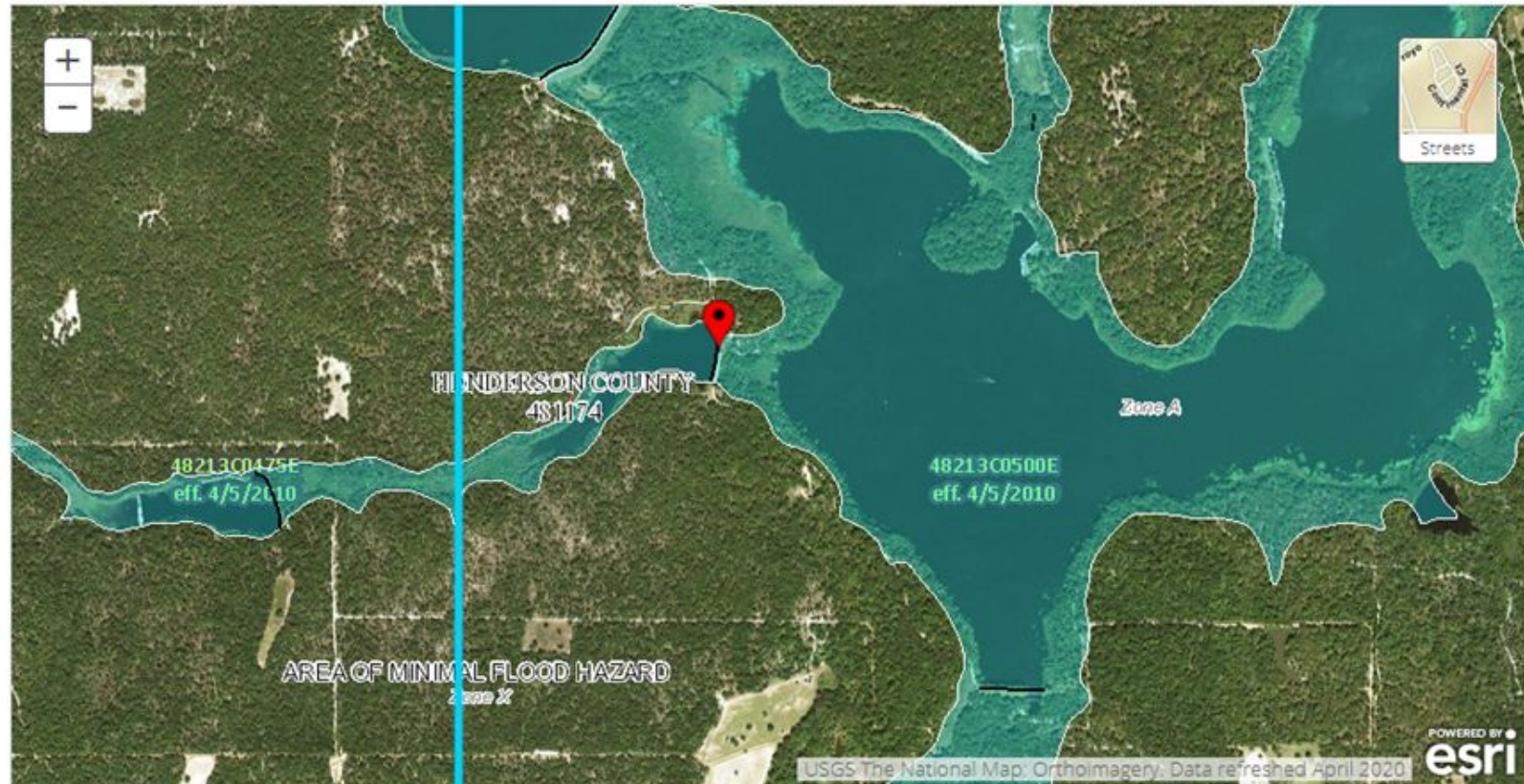


# CALLENDER LAKE DAM





# CARTWRIGHT LAKE DAM



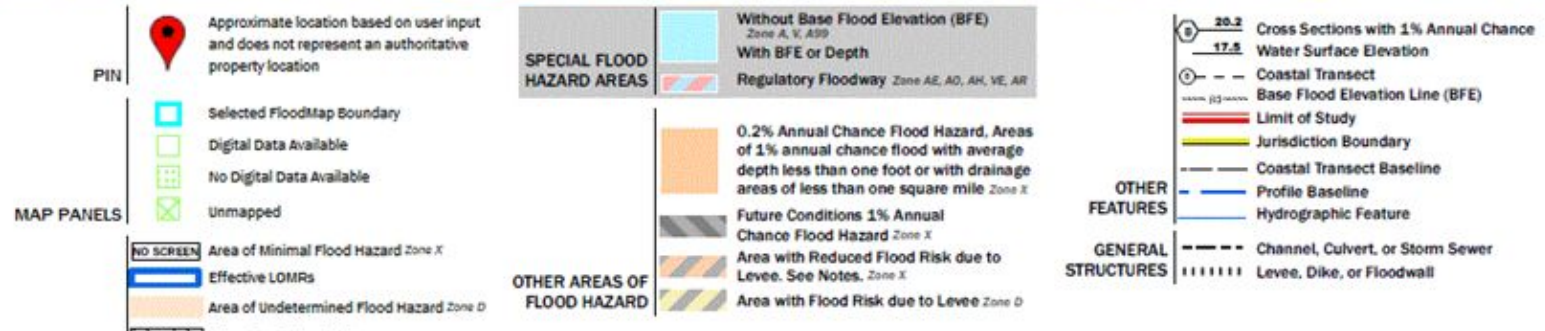
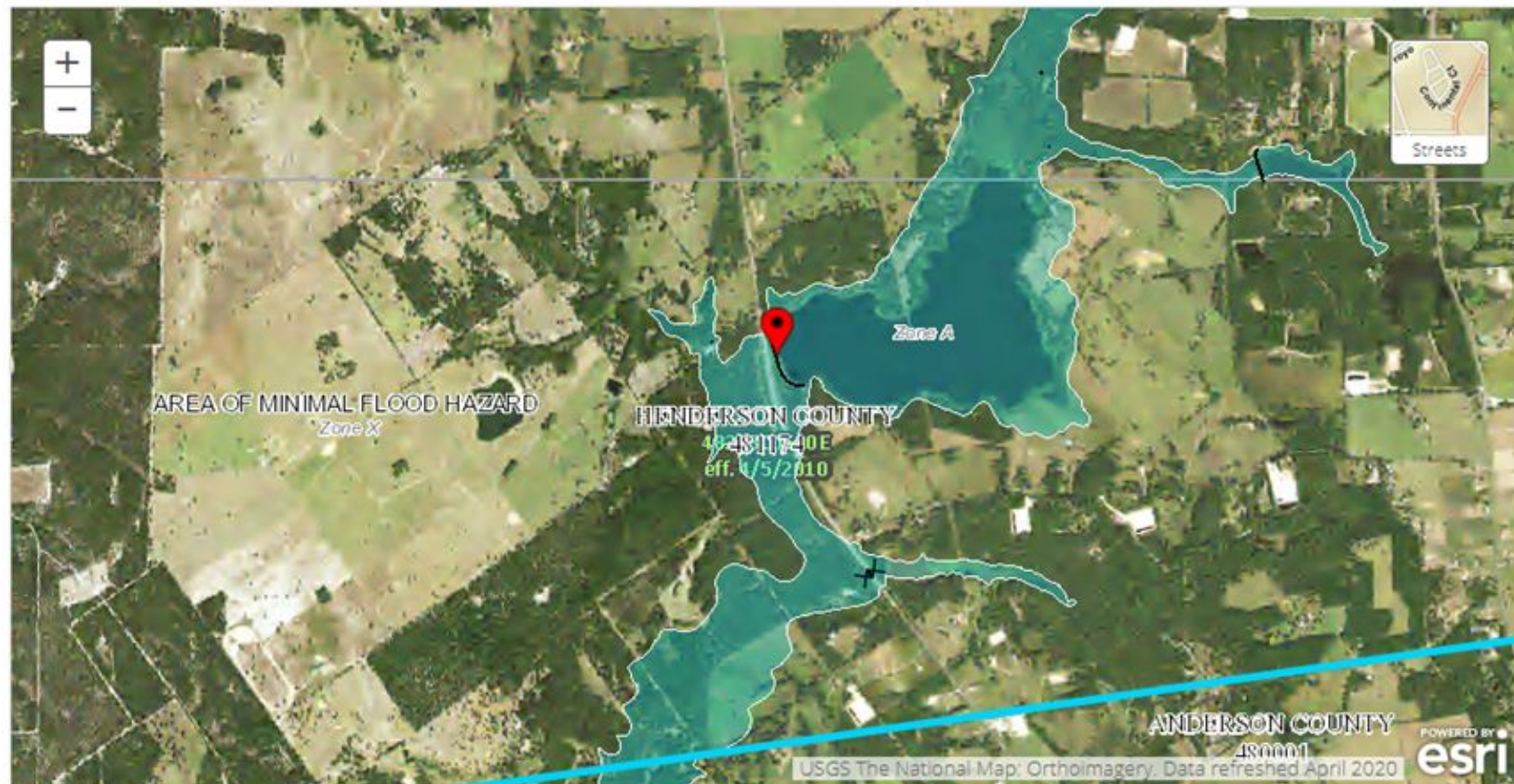


# CATES POND NO. 3



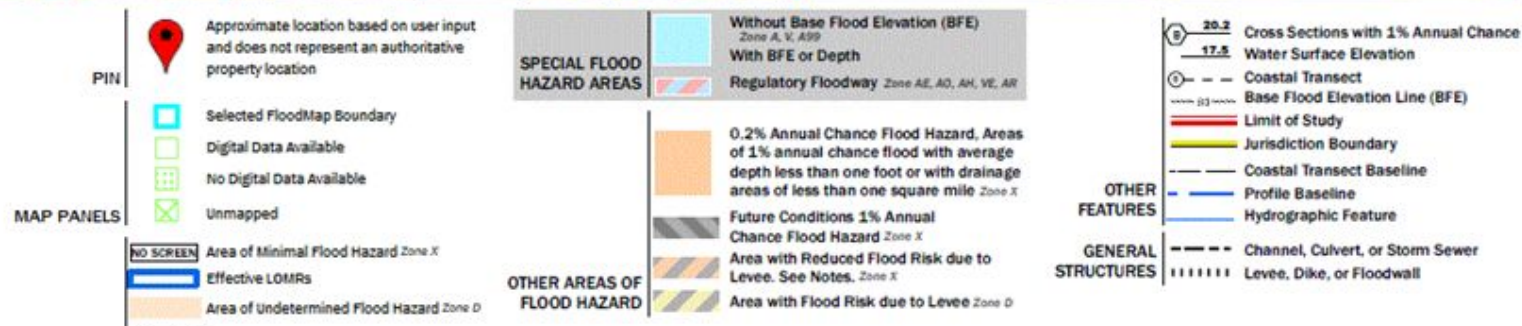
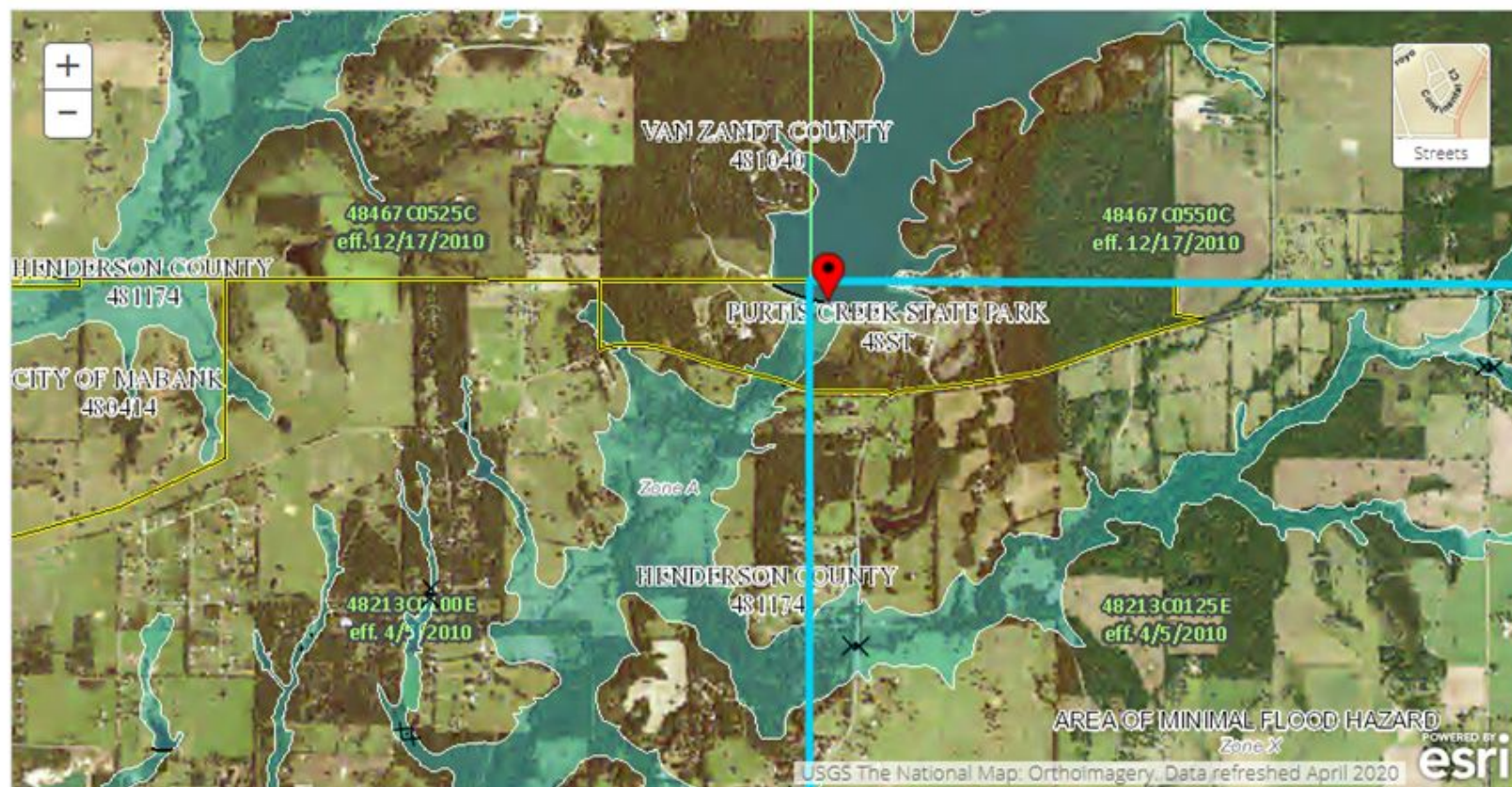


# CATFISH CREEK RANCH LAKE DAM



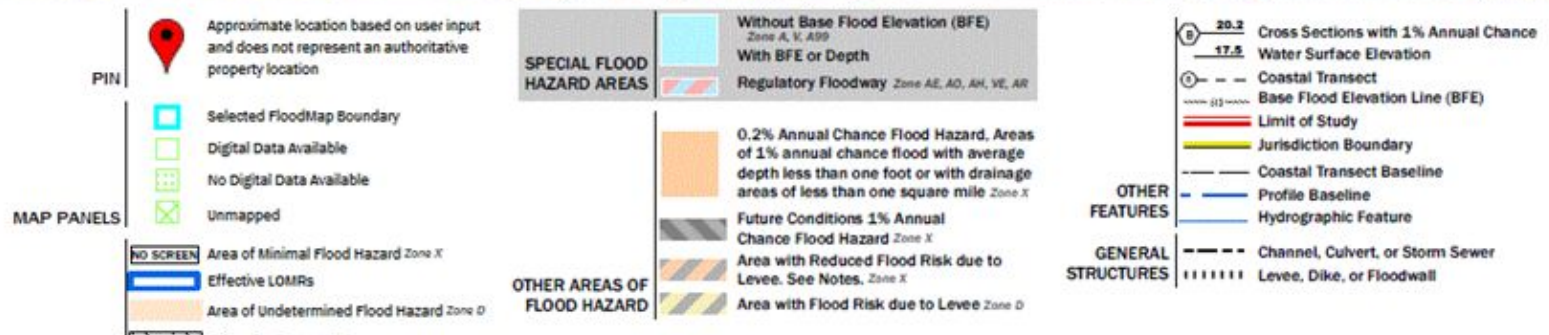


## CEDAR CREEK WS SCS SITE 143A DAM



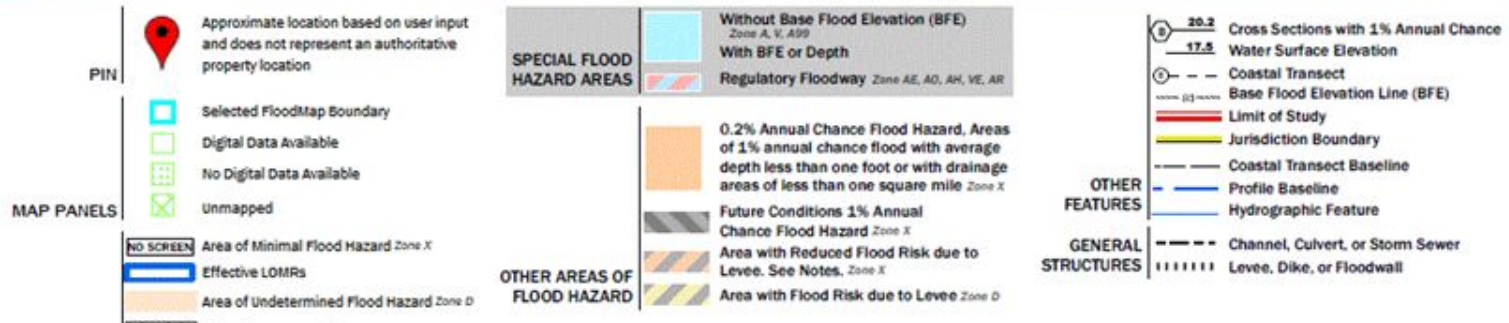
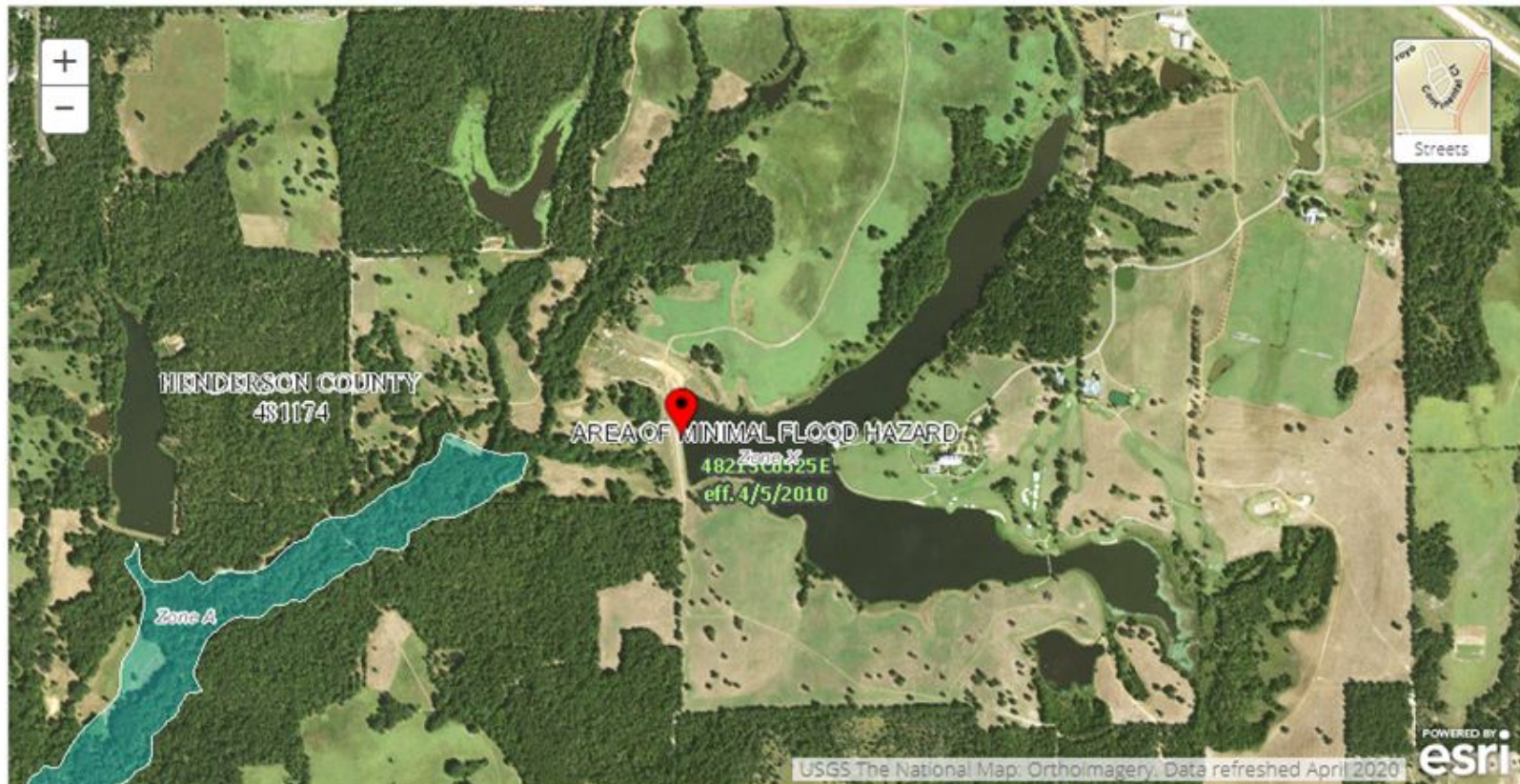


# CITY LAKE DAM



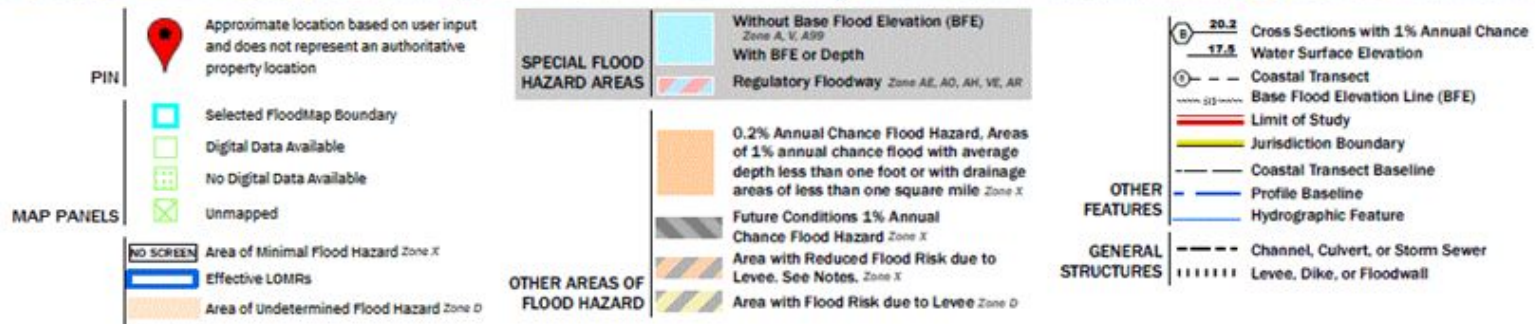


# COFFMAN LAKE DAM



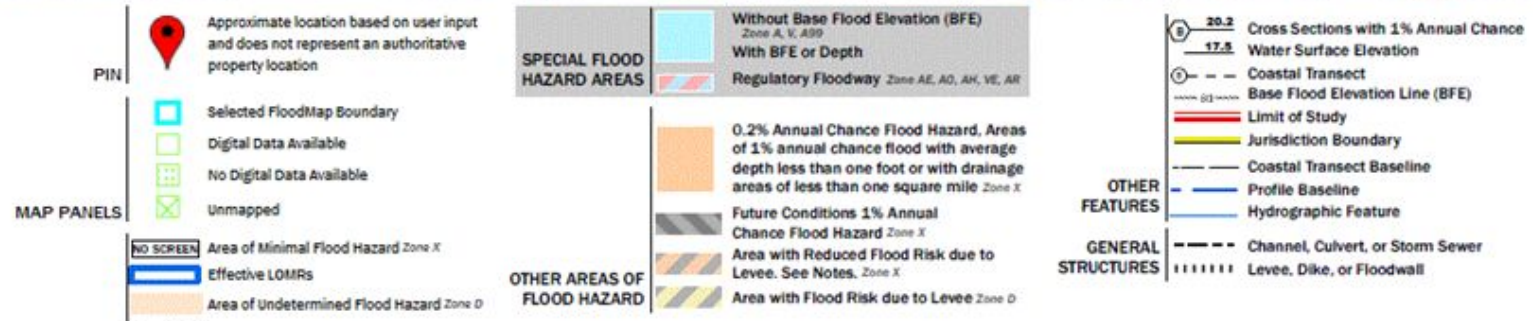
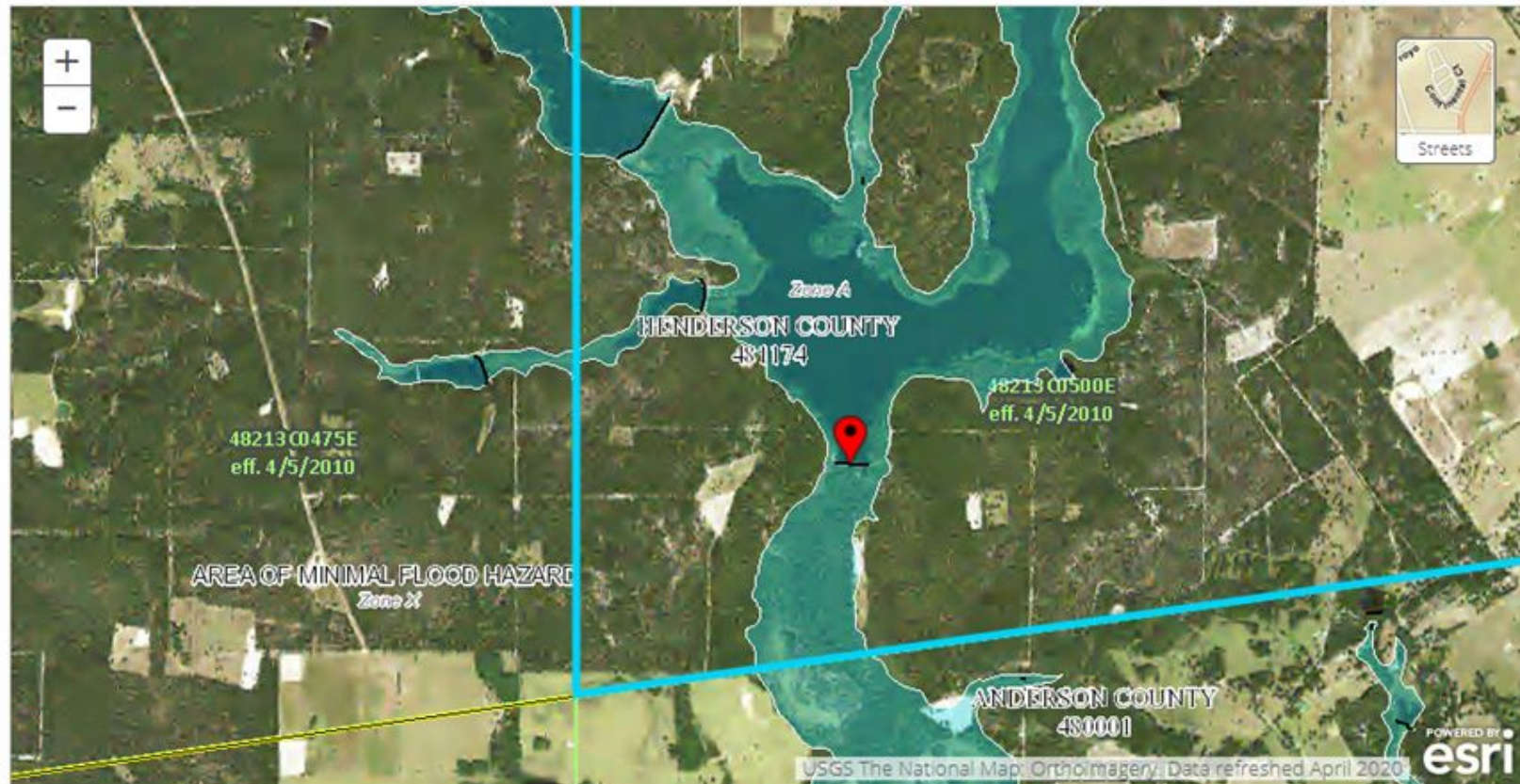


# CONCORD RANCH LAKE DAM



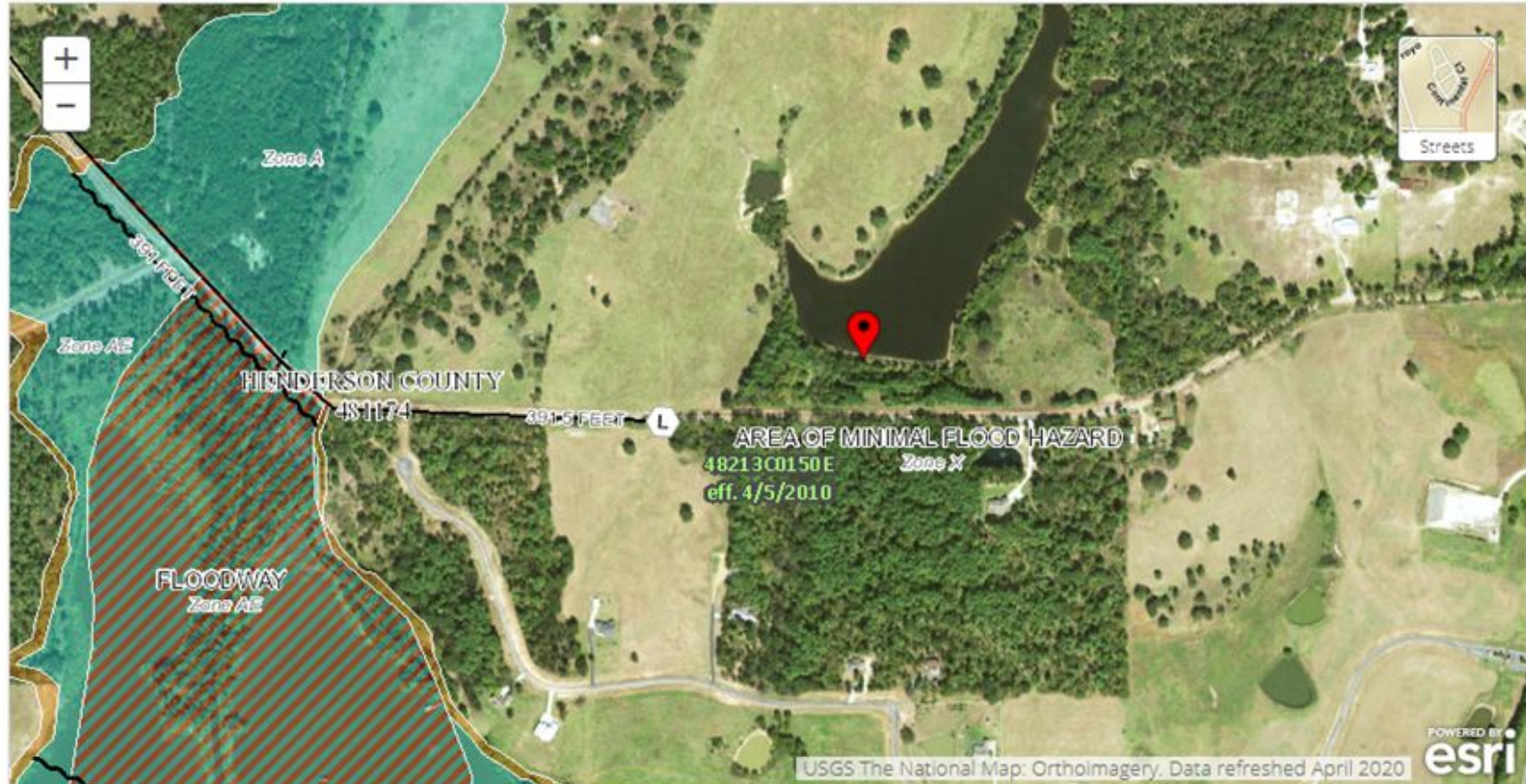


# COON CREEK LAKE DAM



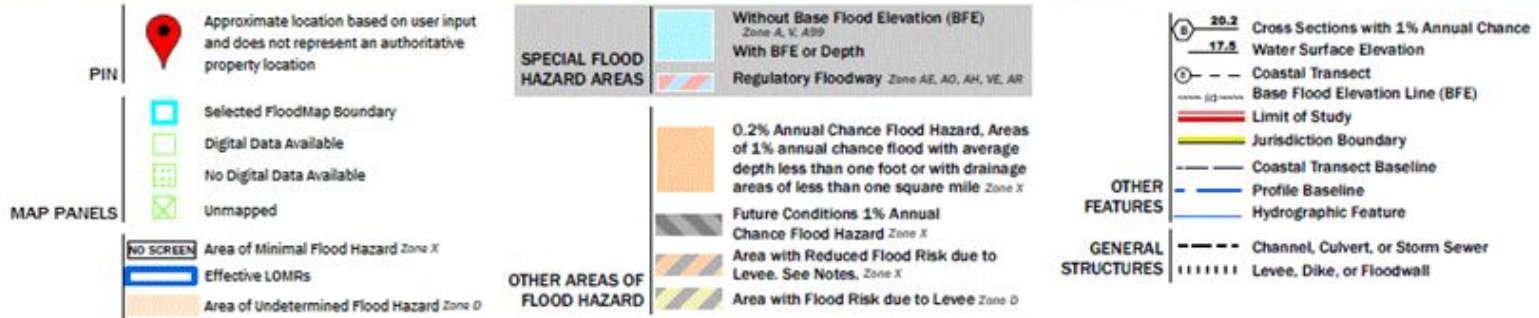
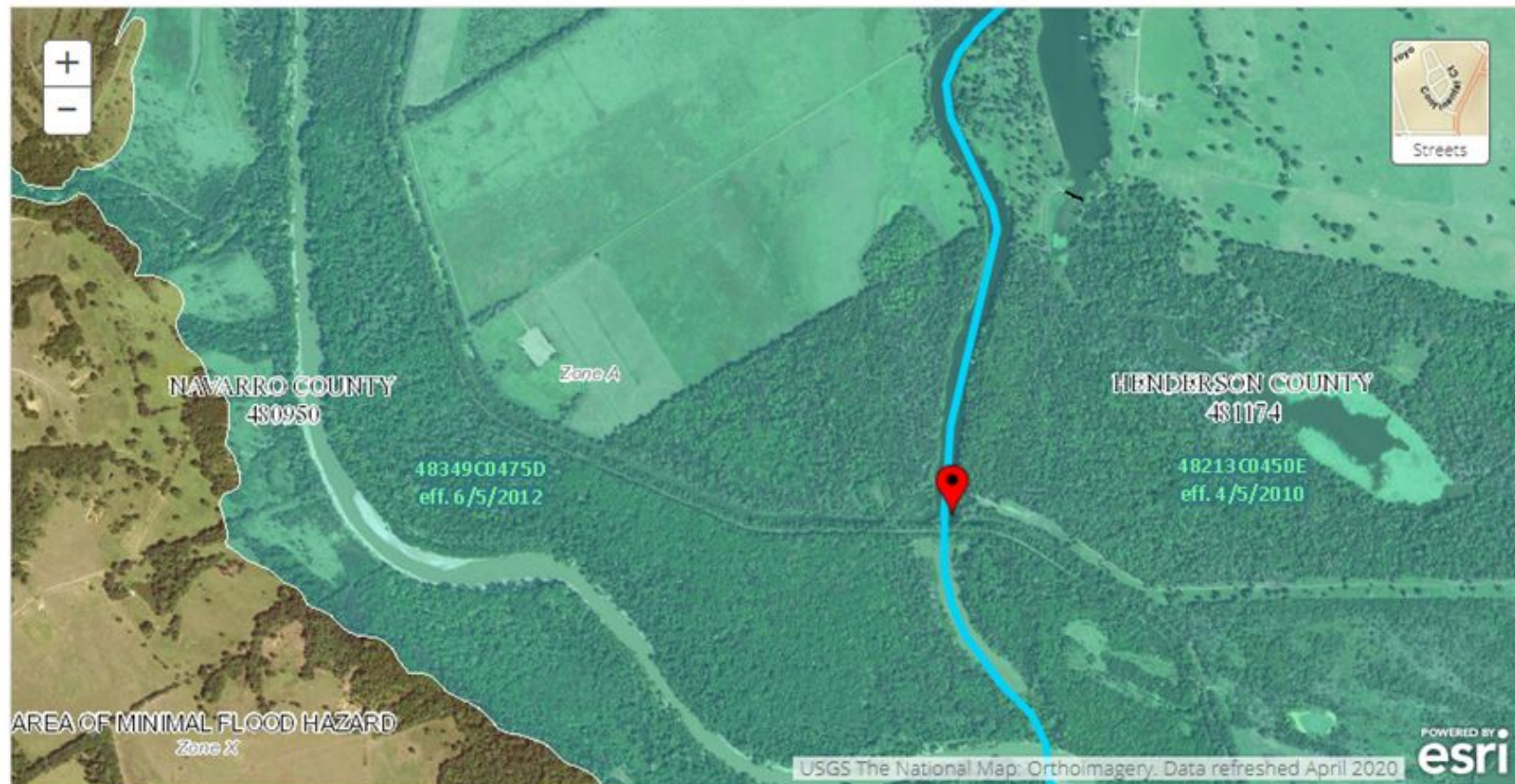


# COX LAKE DAM



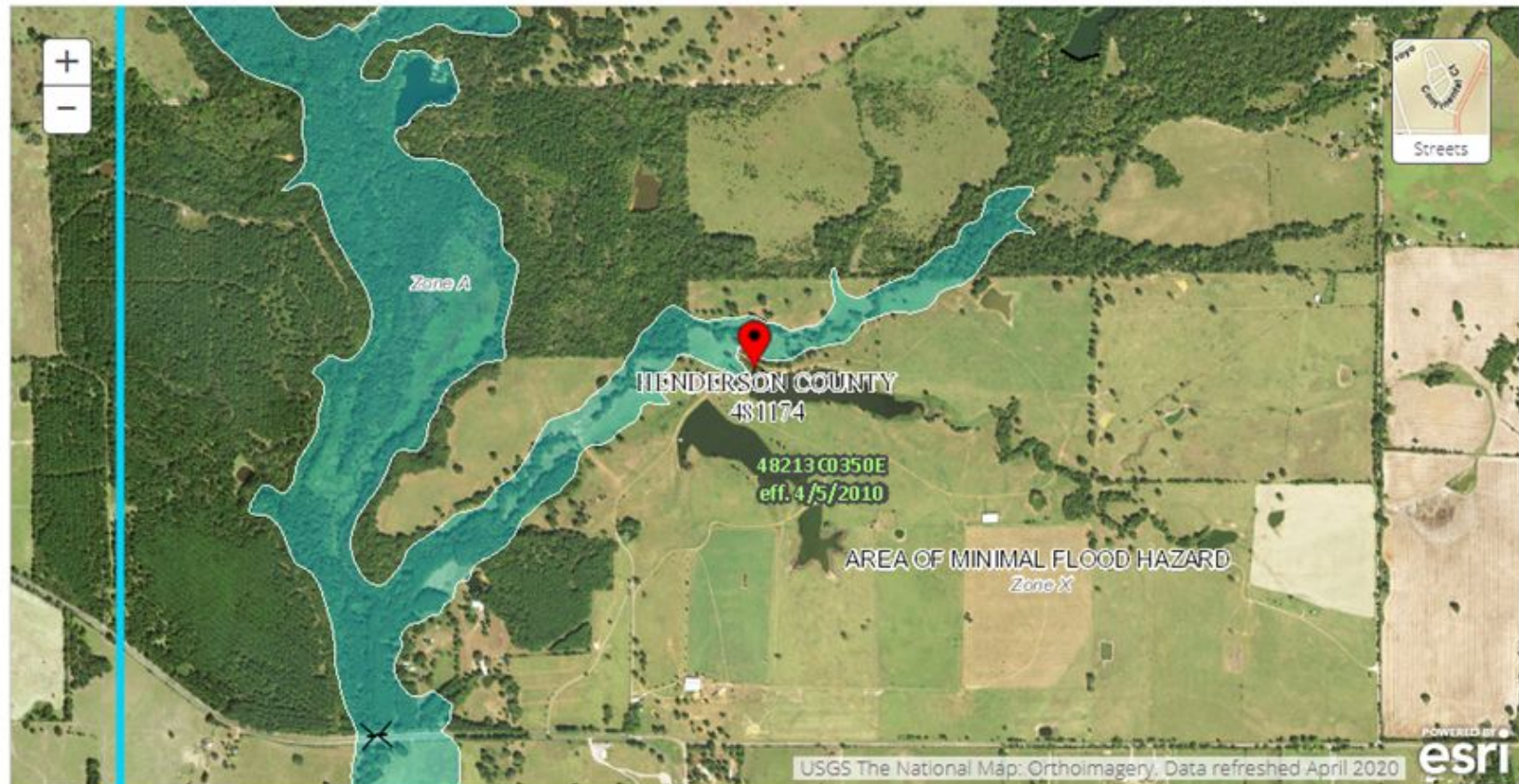


# CRESLEEN RANCH DAM



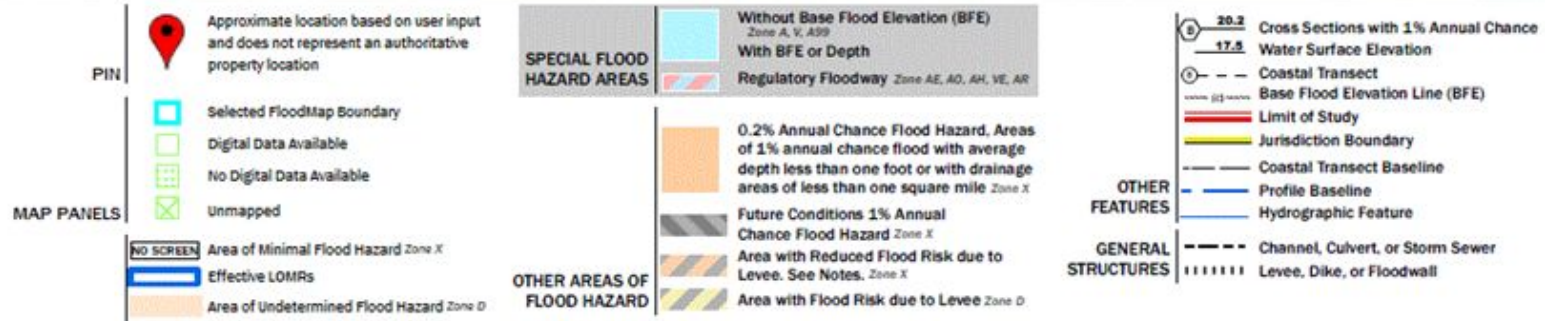
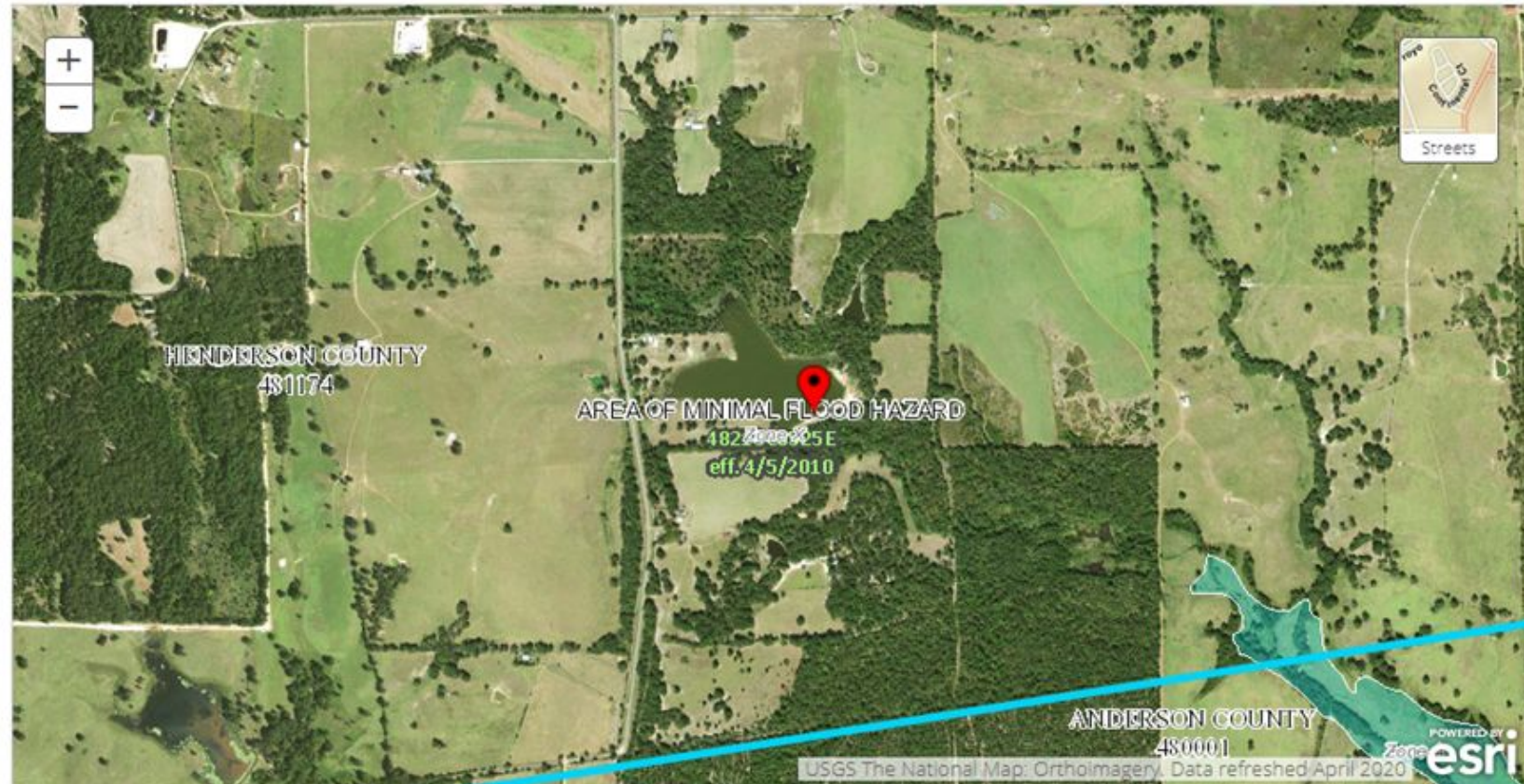


# DARBY FARMS LAKE DAM



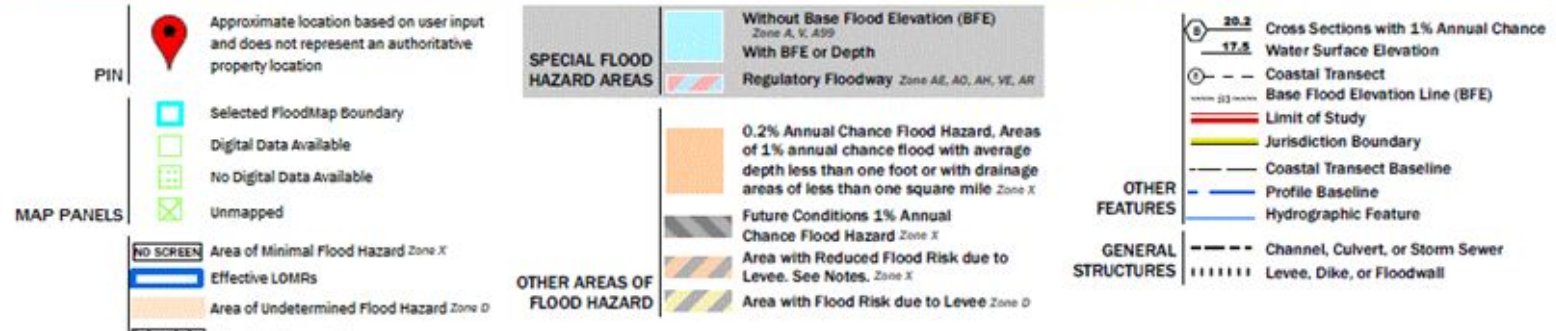
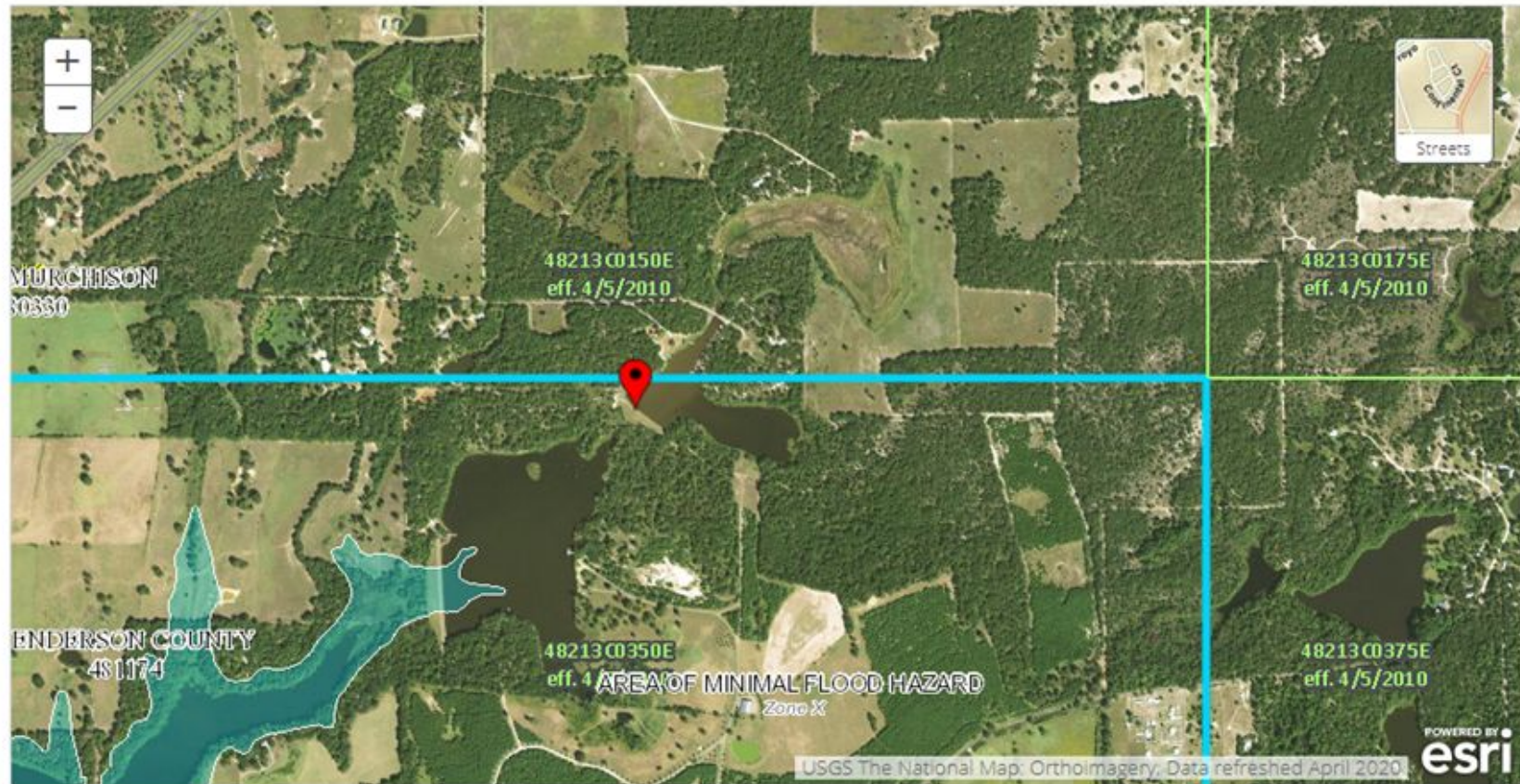


# DECRAENE DAM



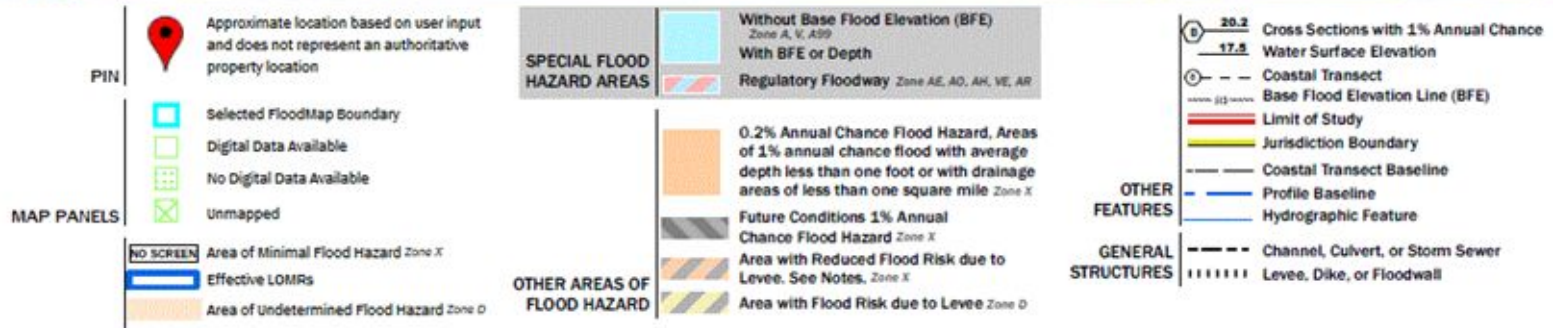
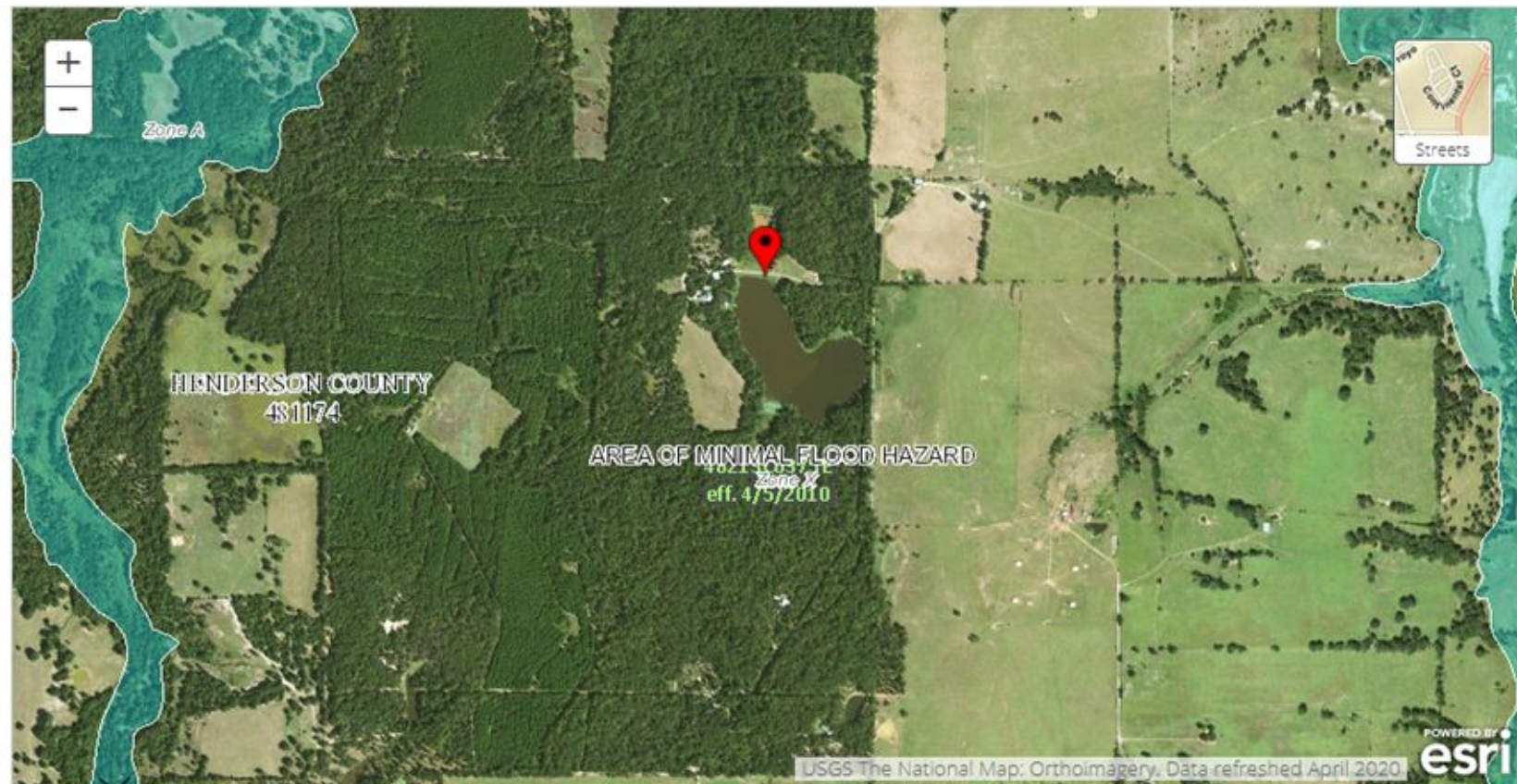


# DILLARD LAKE DAM



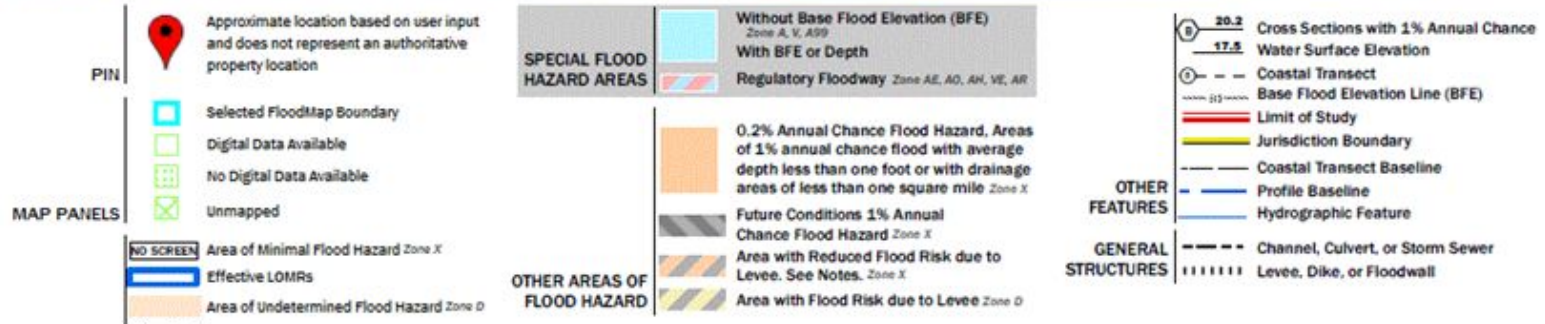
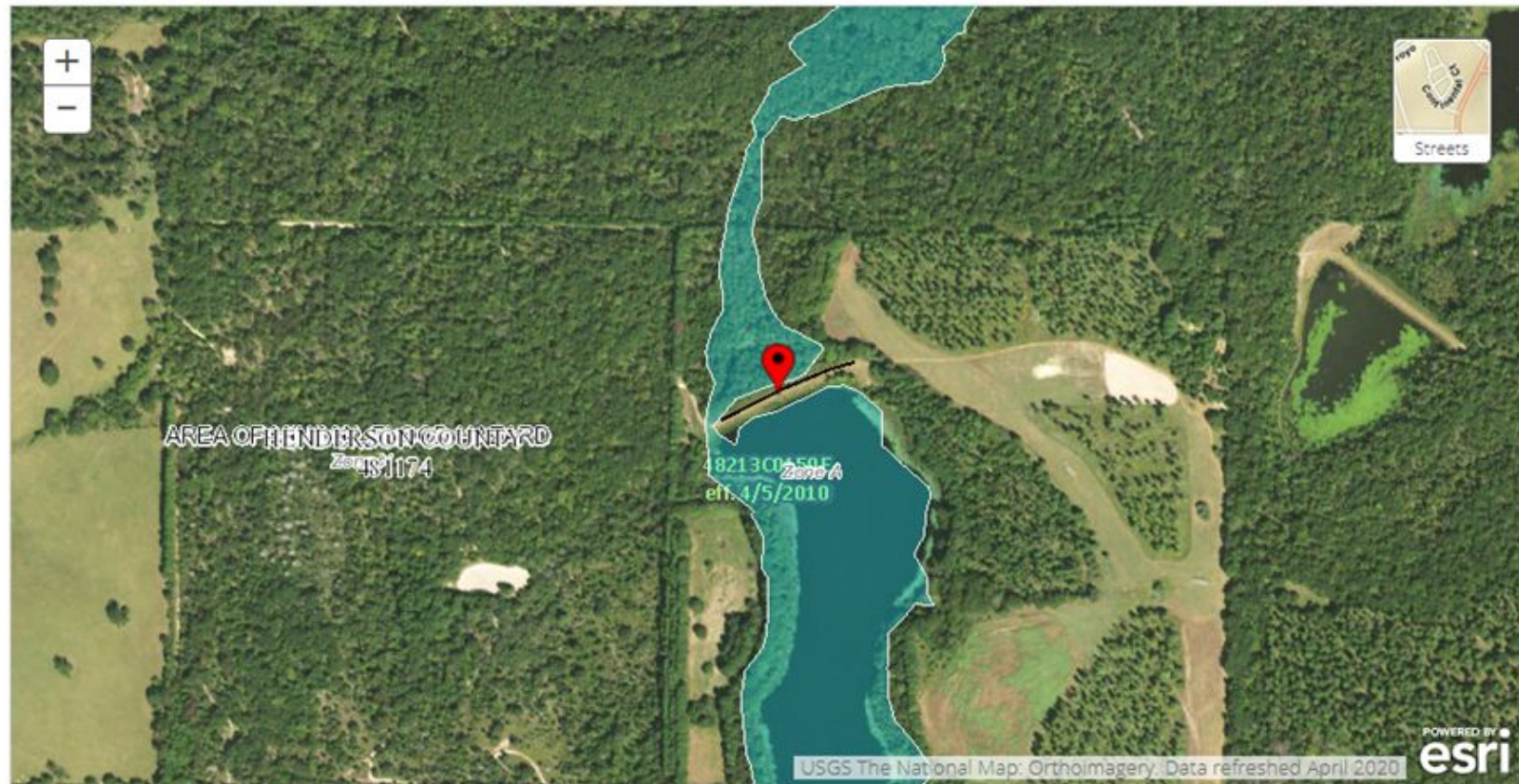


# DOGWOOD ACRES DAM



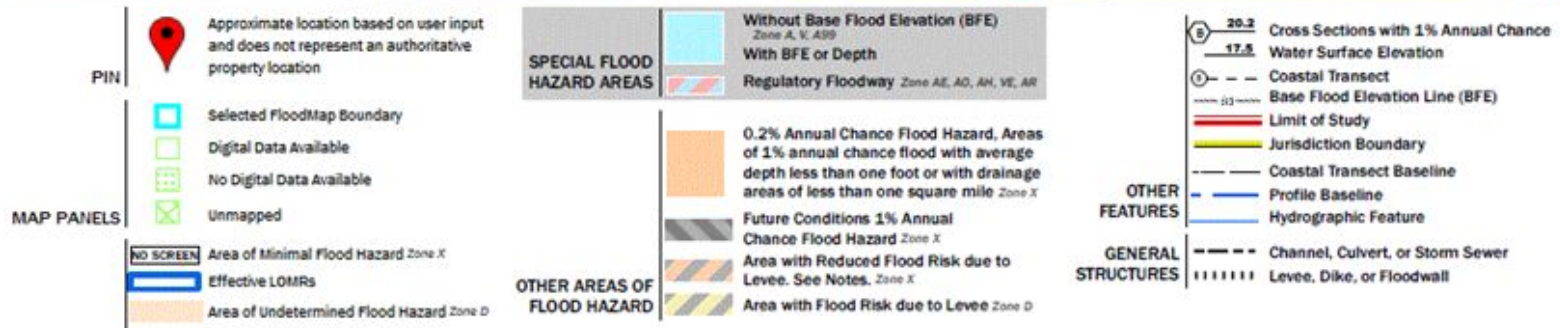


# DRAGERT LAKE DAM



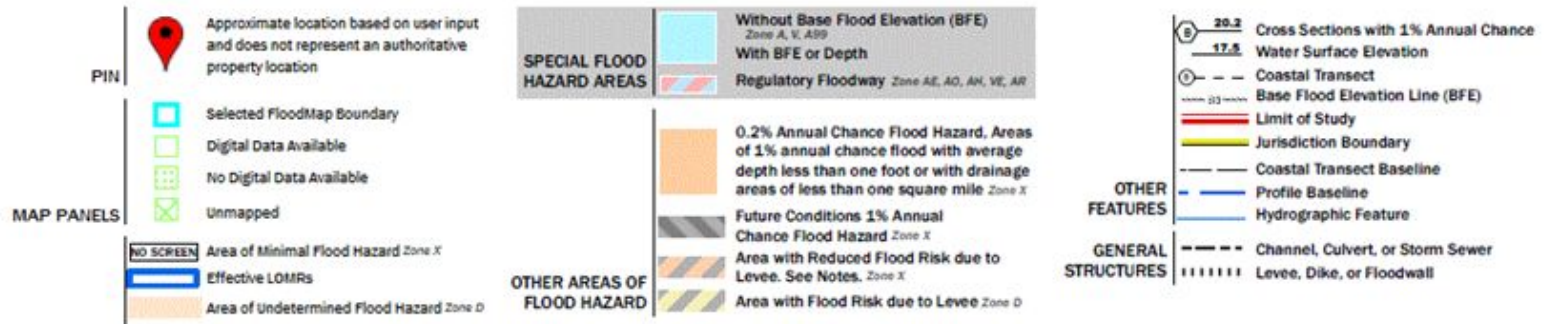


## EAST LATERALS TRINITY WS SCS SITE 3 DAM



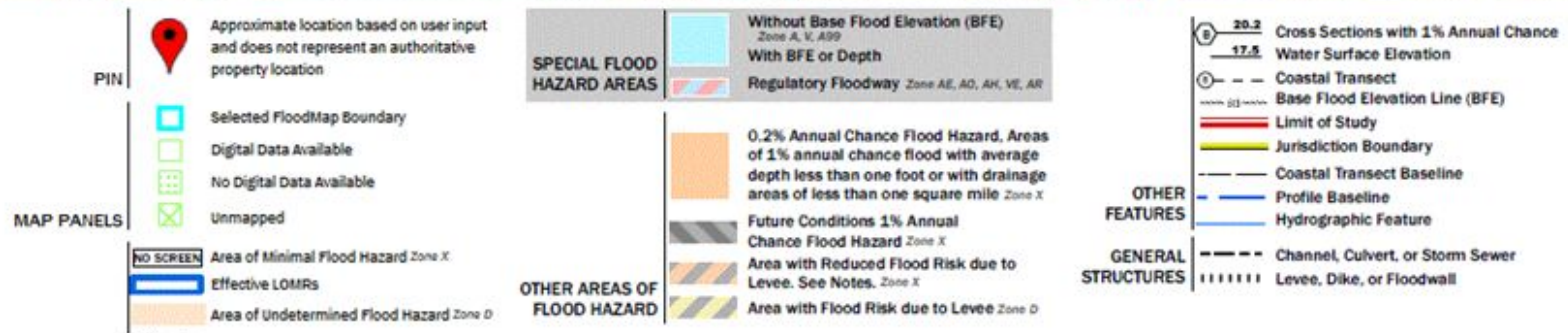
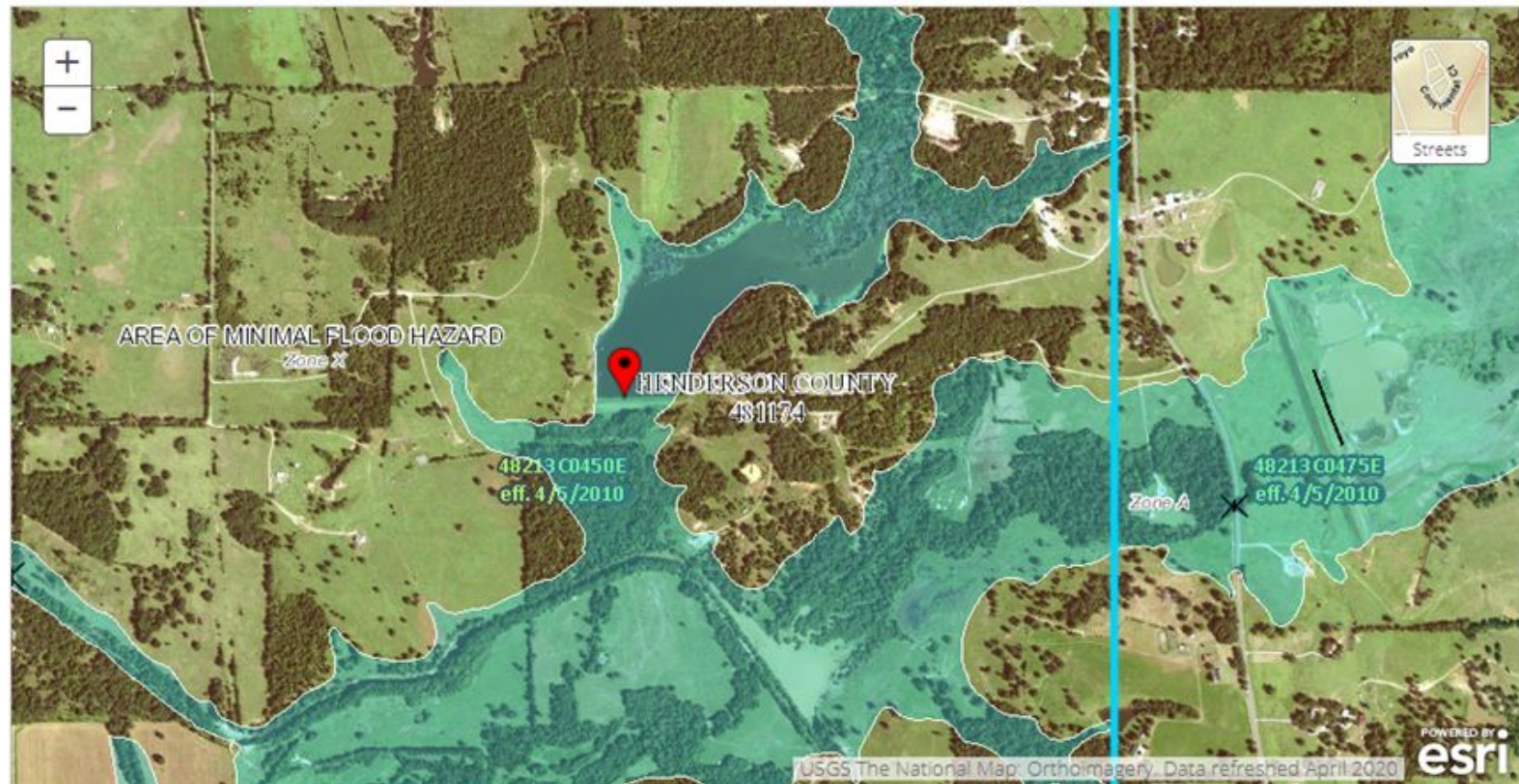


# EAST LATERALS TRINITY WS SCS SITE 4 DAM



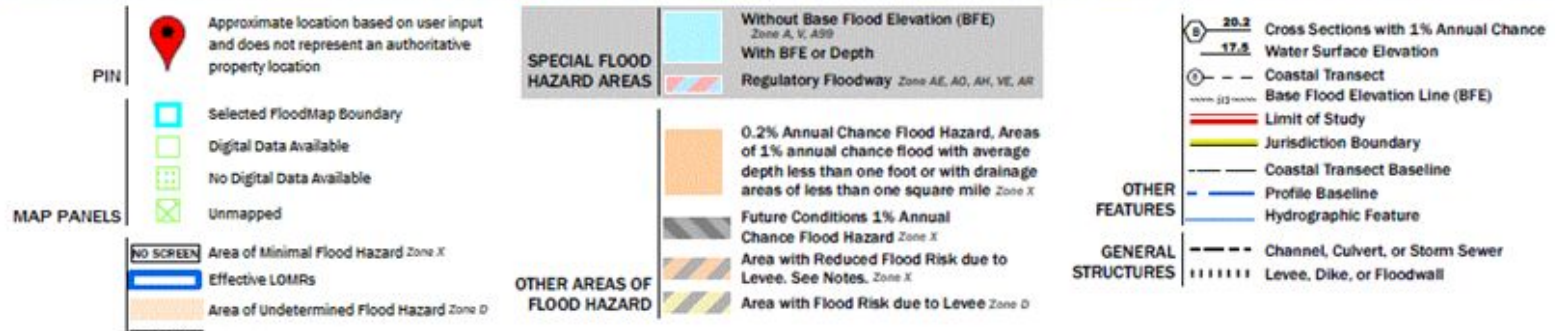
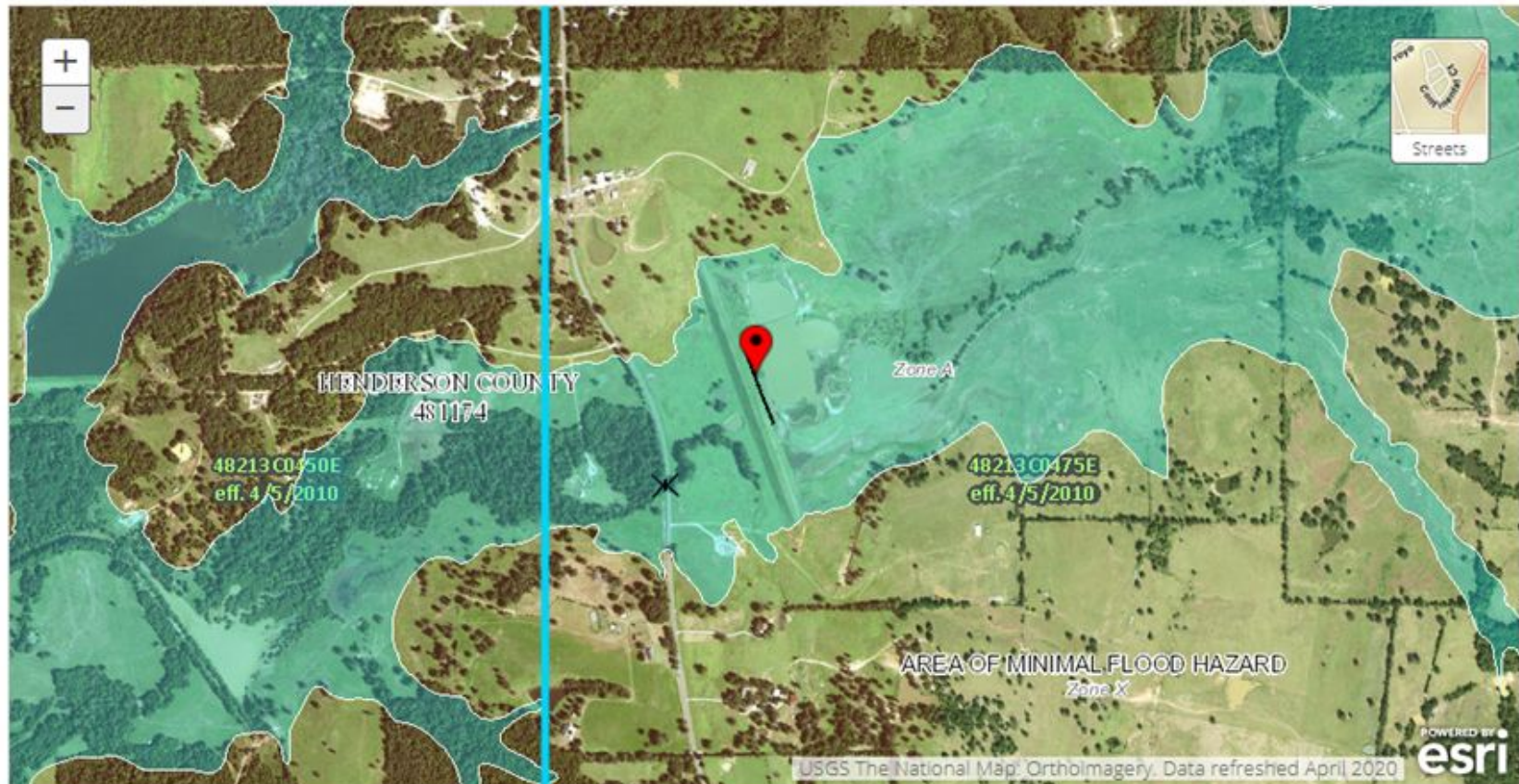


# EAST LATERALS TRINITY WS SCS SITE 1 DAM



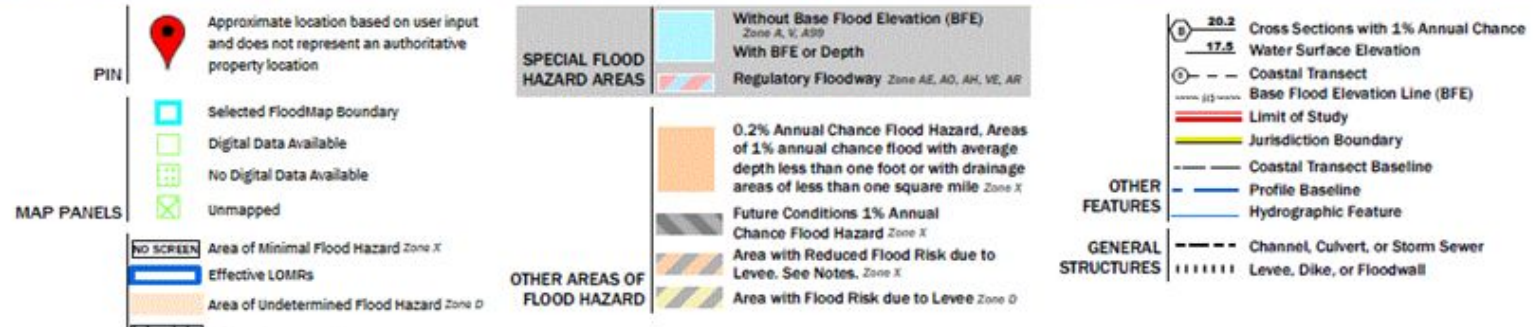
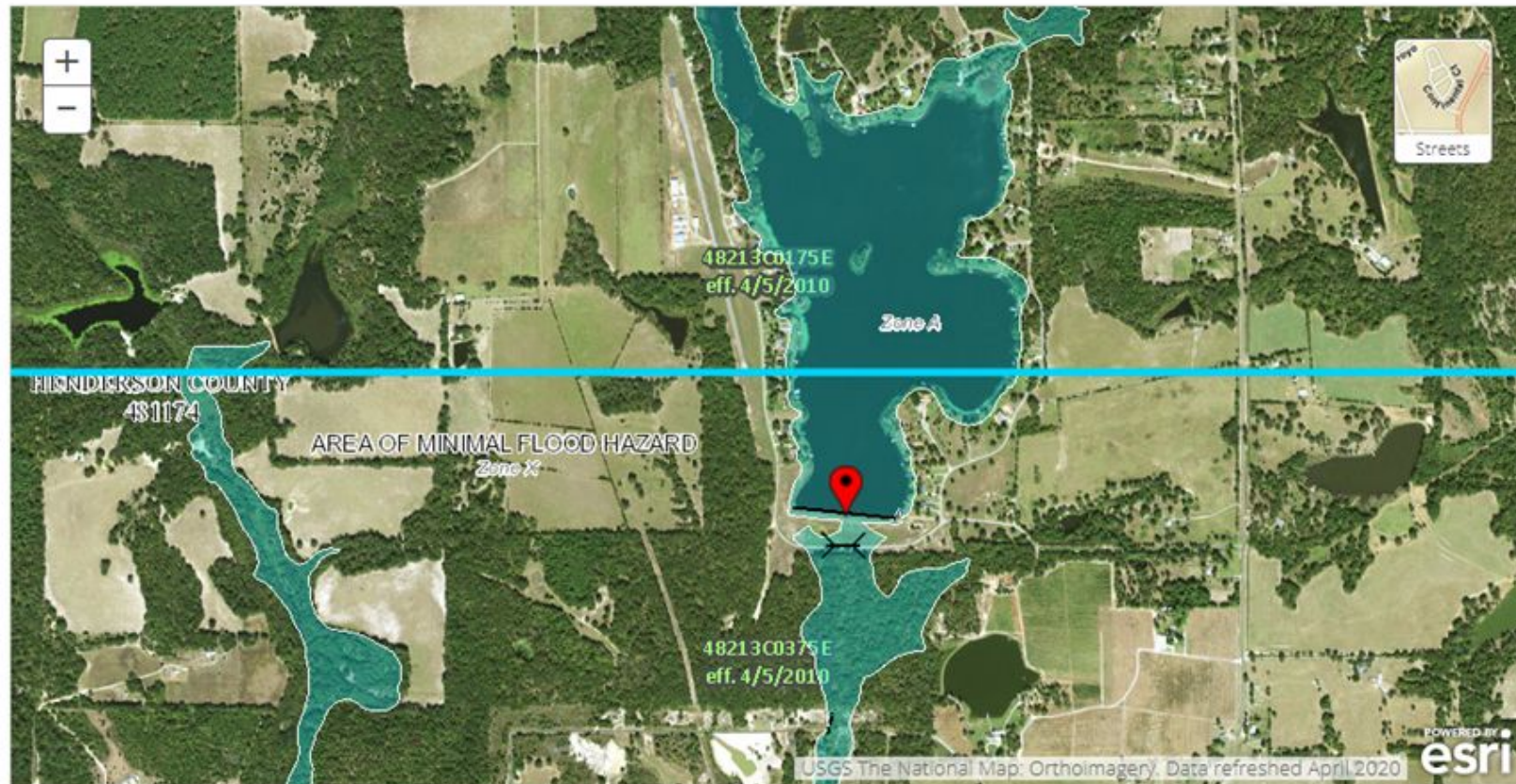


# EAST LATERALS TRINITY WS SCS SITE 2 DAM



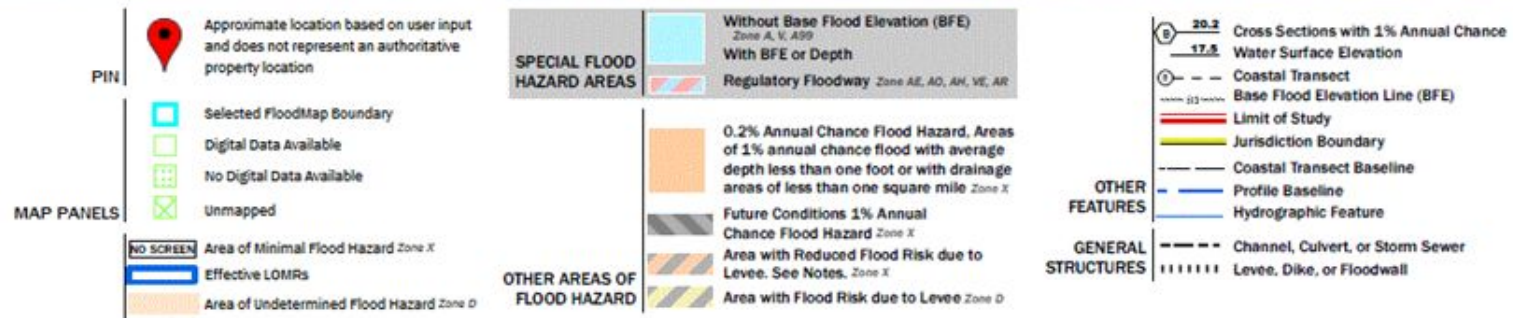
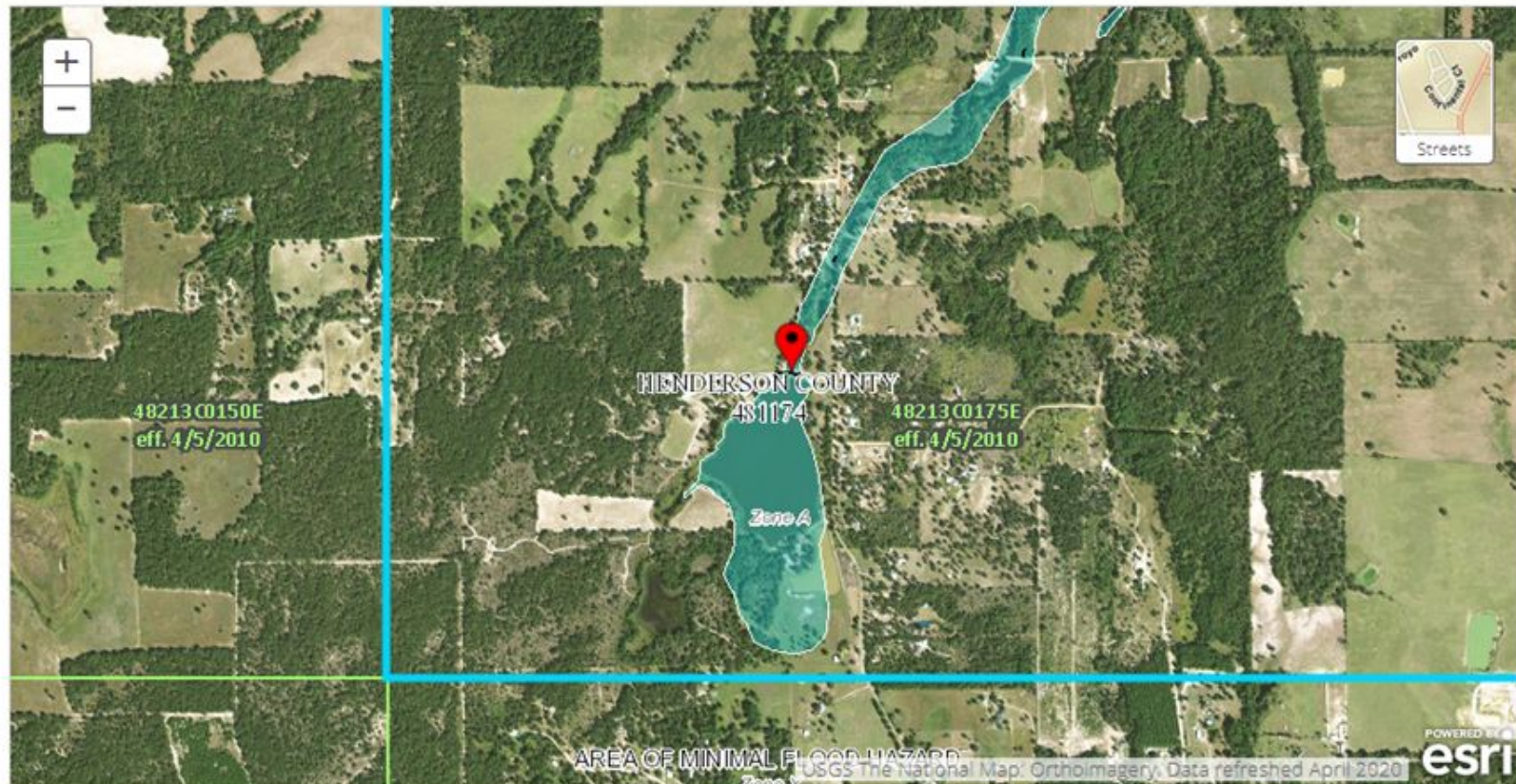


# ECHO LAKE DAM



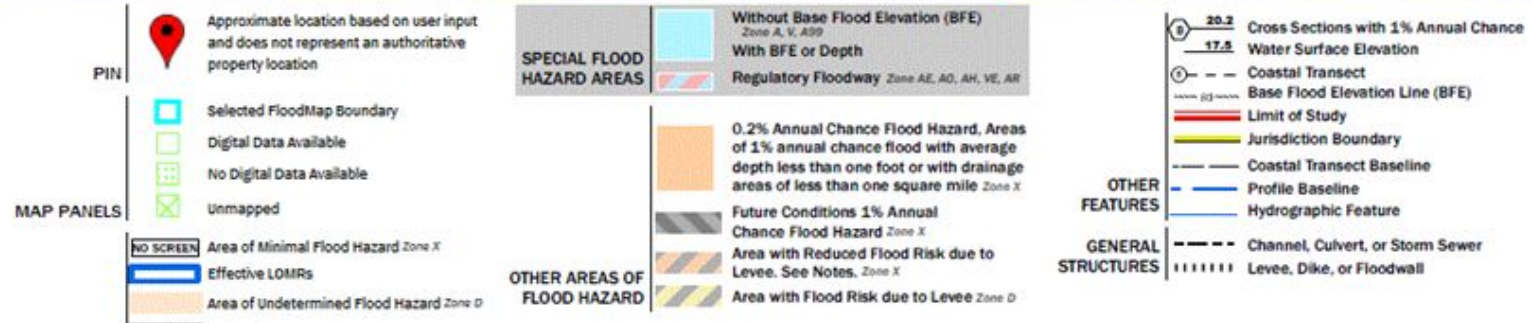
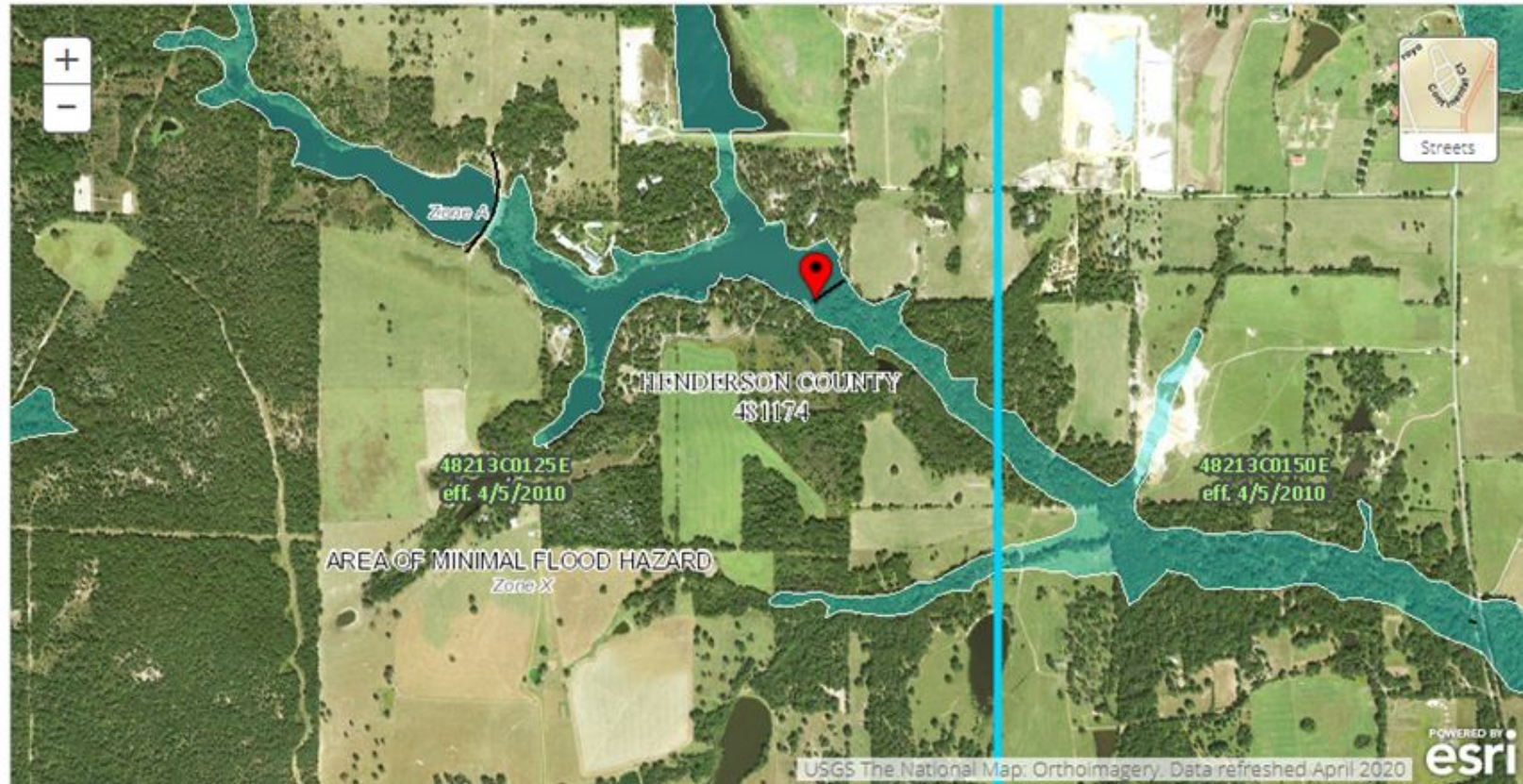


# ECHOLS LAKE DAM



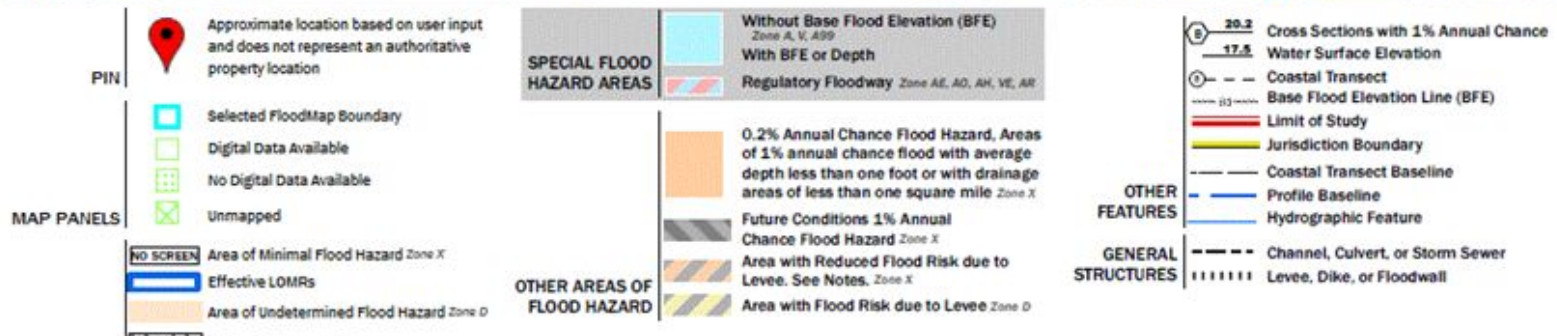


# FLY-IN LAKE DAM



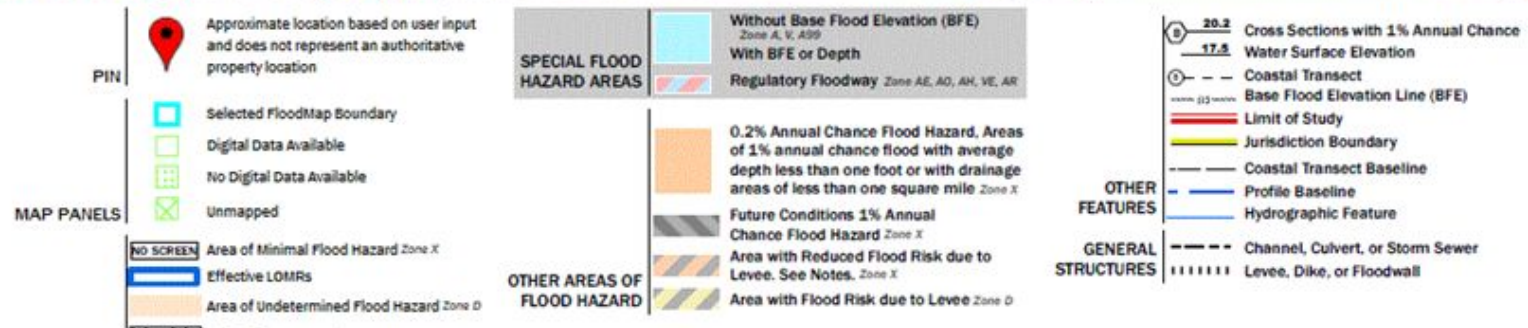
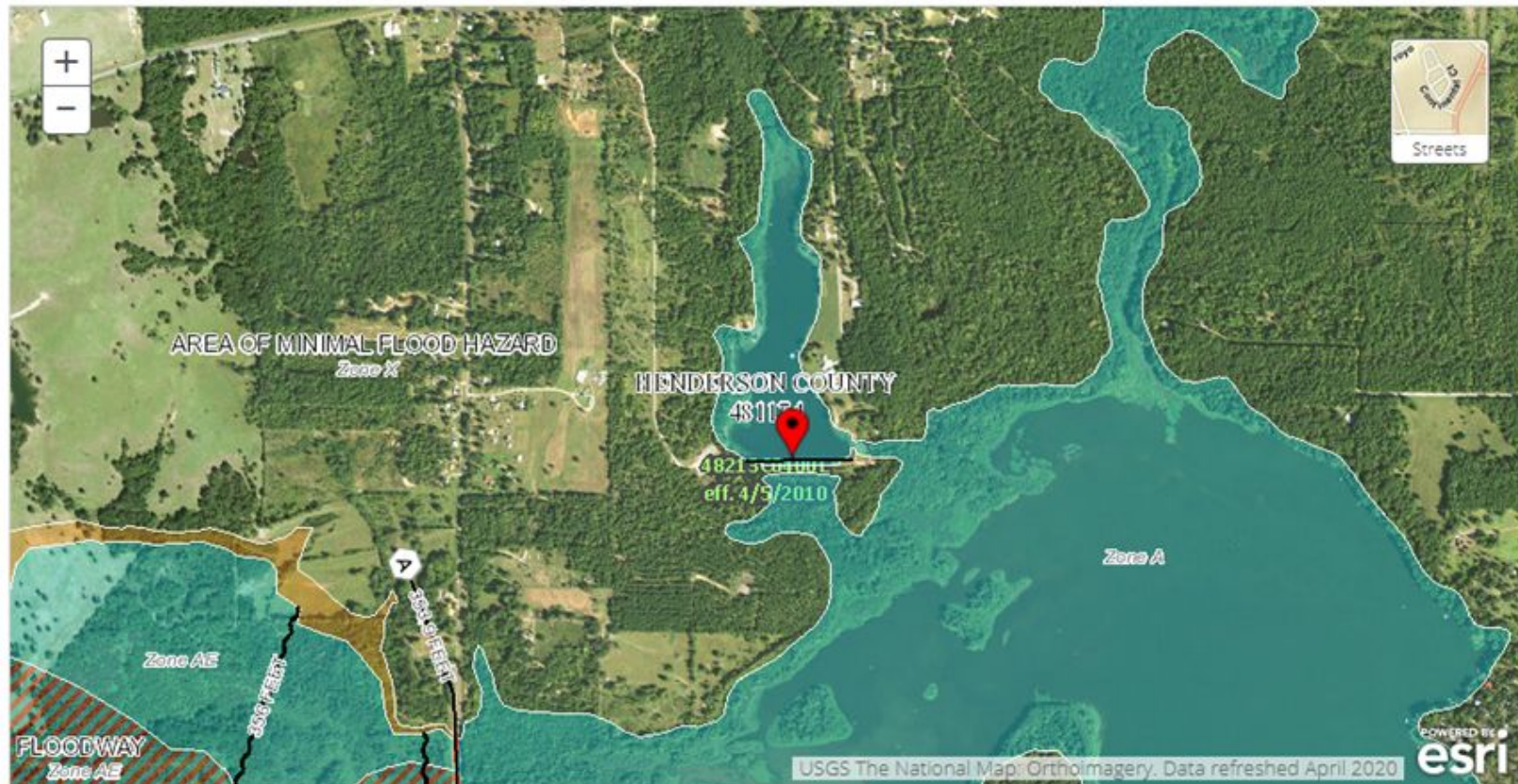


# FOREST GROVE LAKE DAM



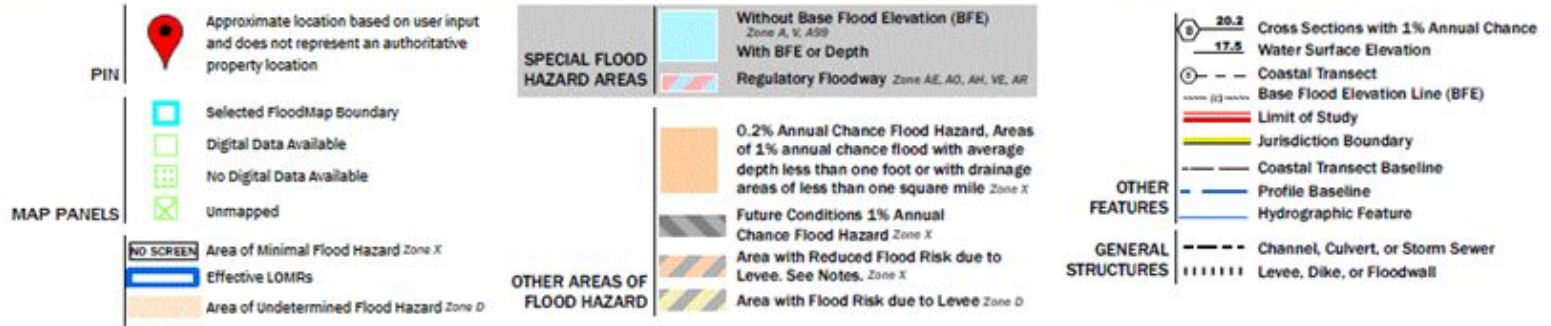


# FRONTIER CITY LAKE DAM



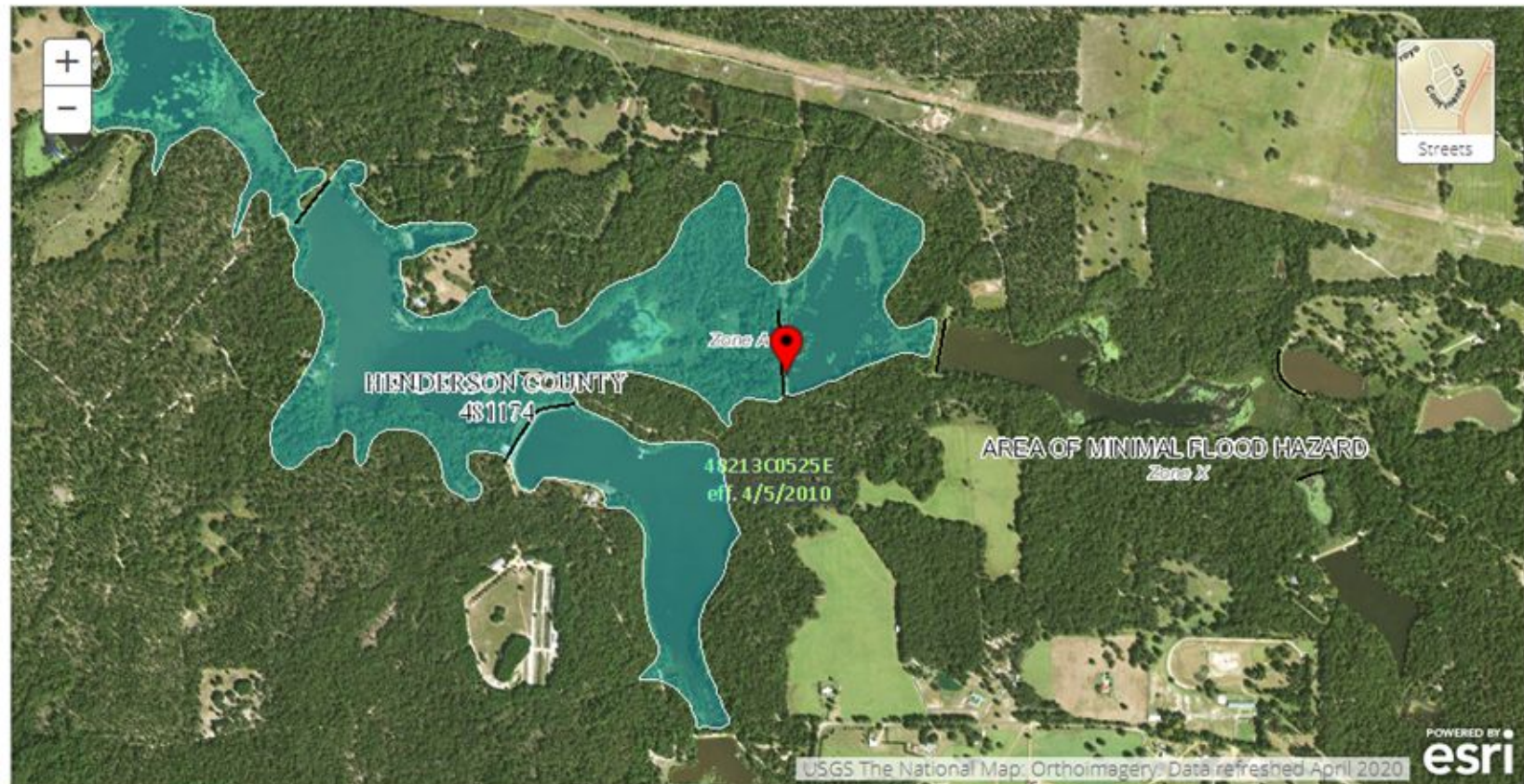


# GATOR LAKE DAM



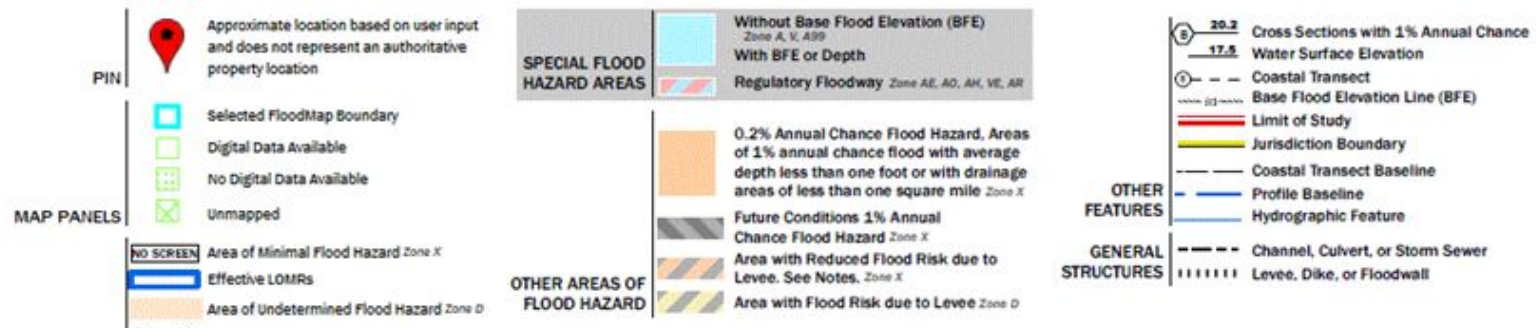
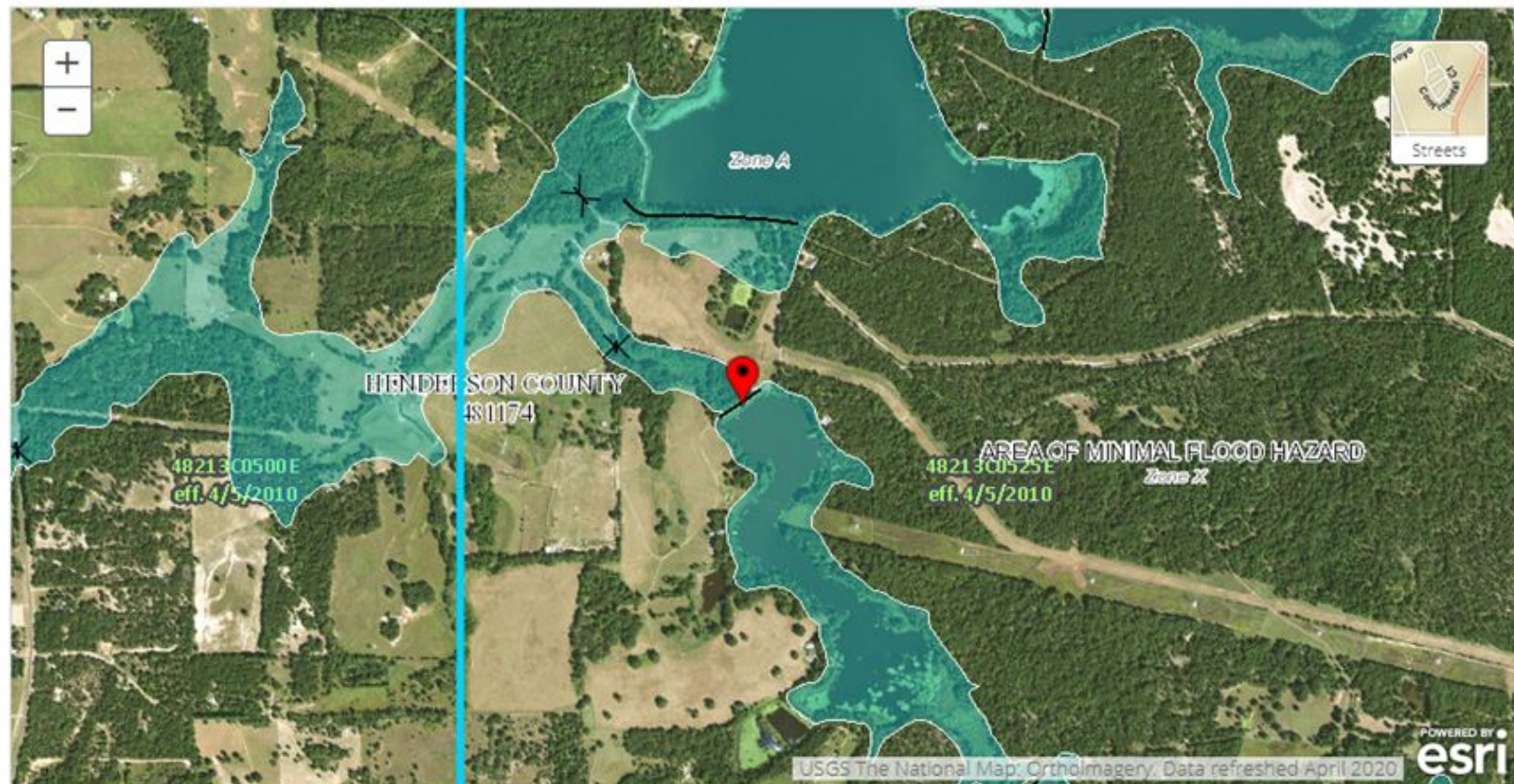


# GRASS LAKE DAM



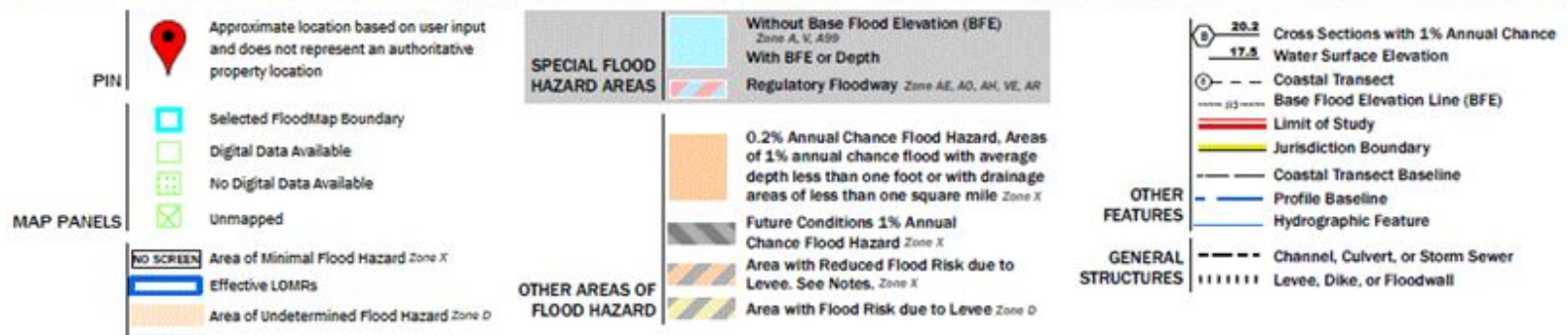


# GREENBRIER LAKE DAM



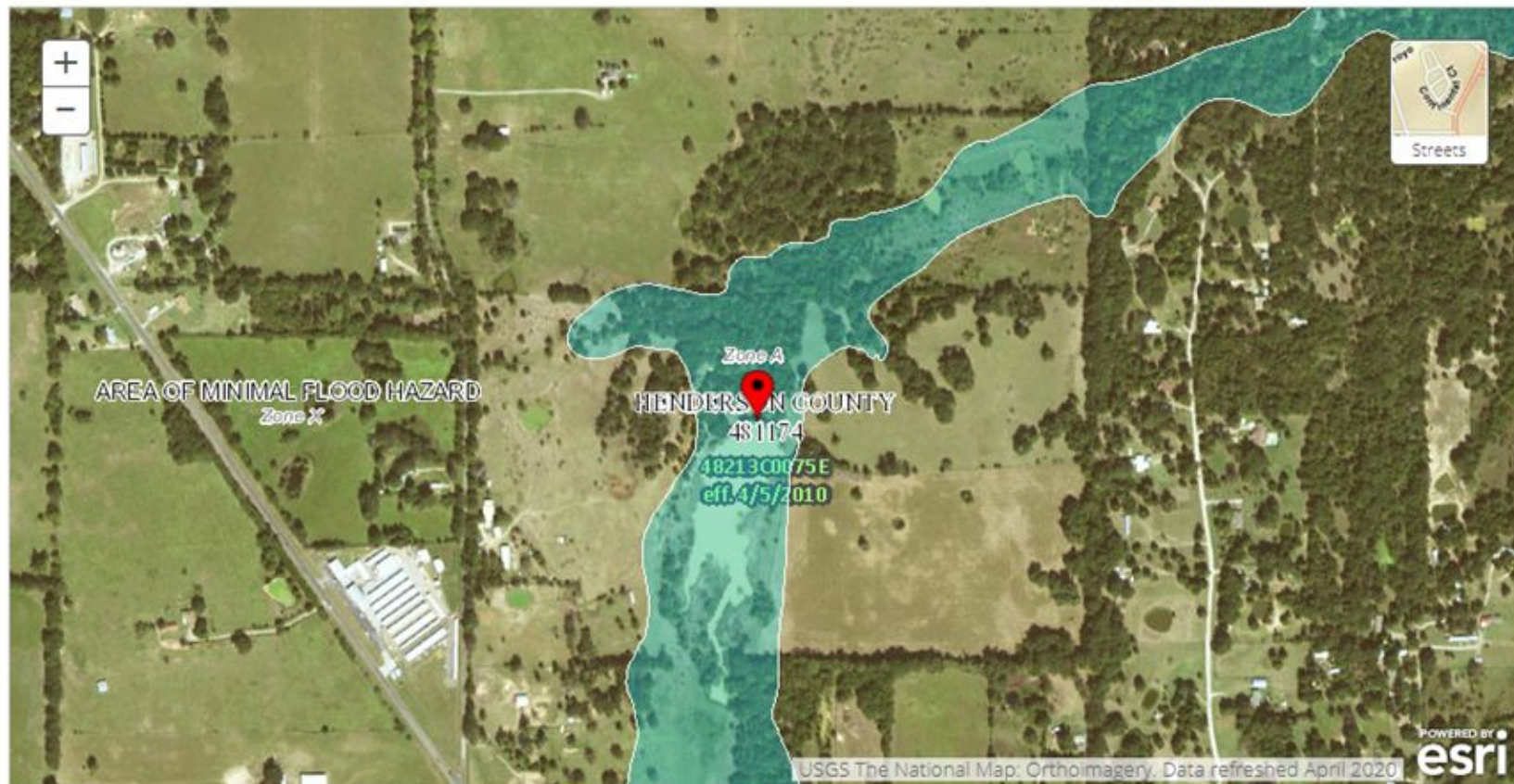


# HALLMARK LAKE DAM



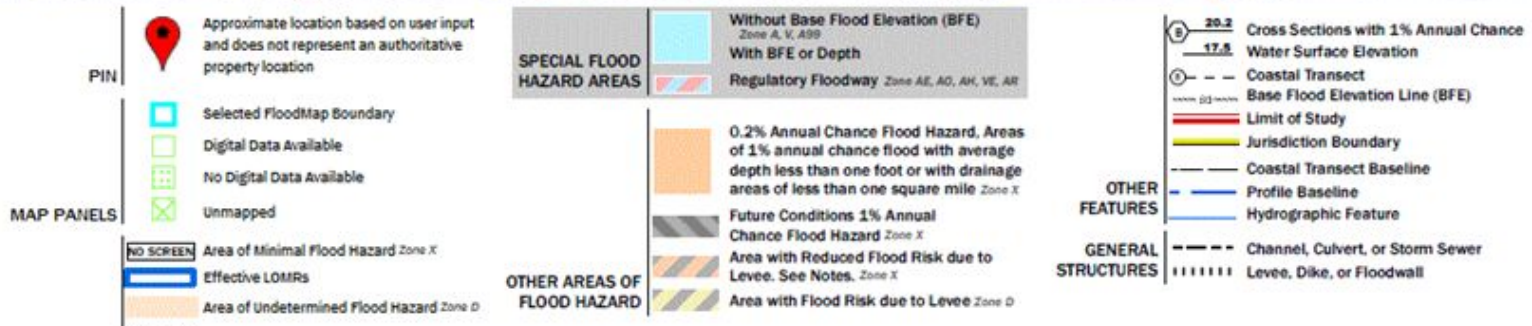
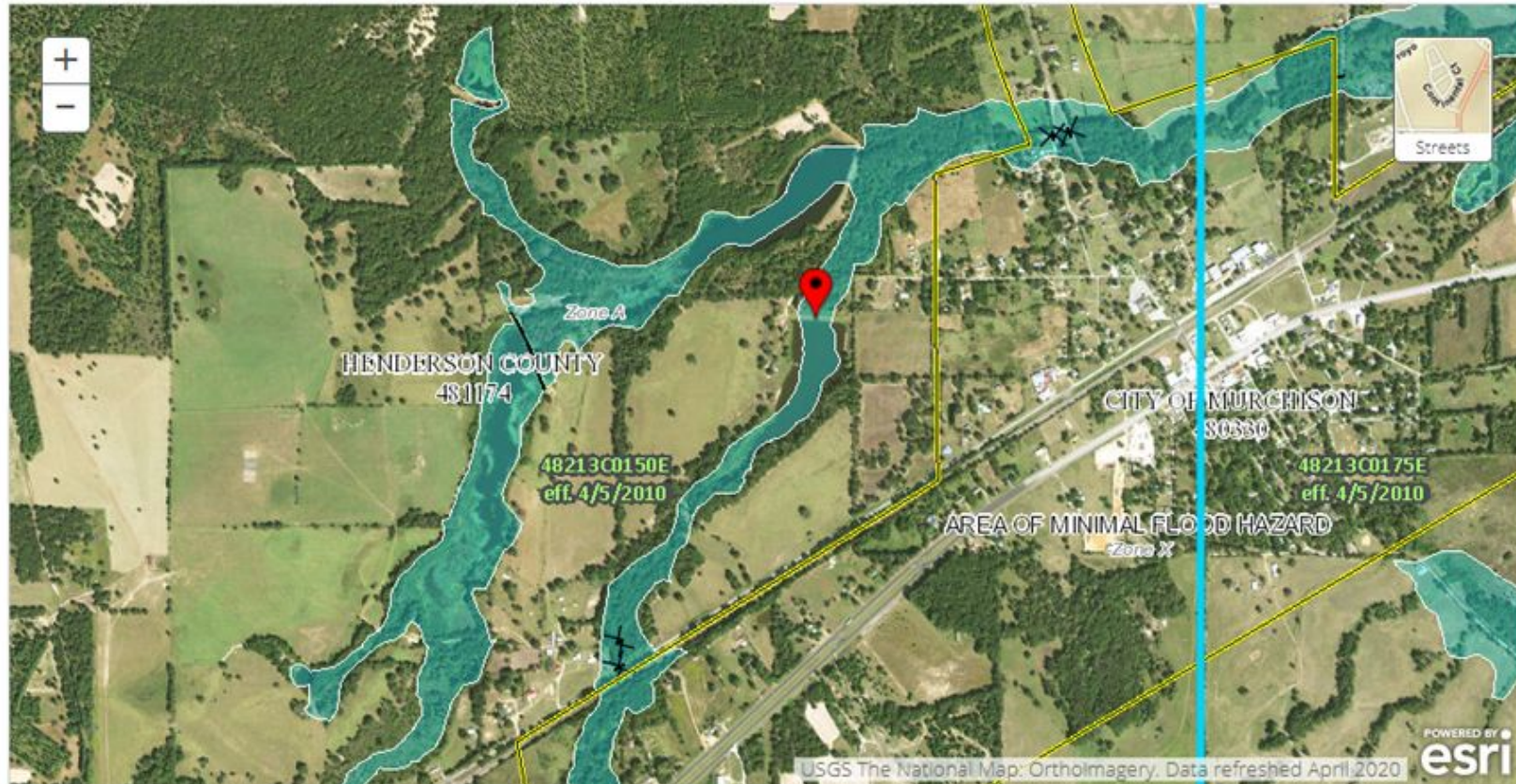


# HAYNIE DAM



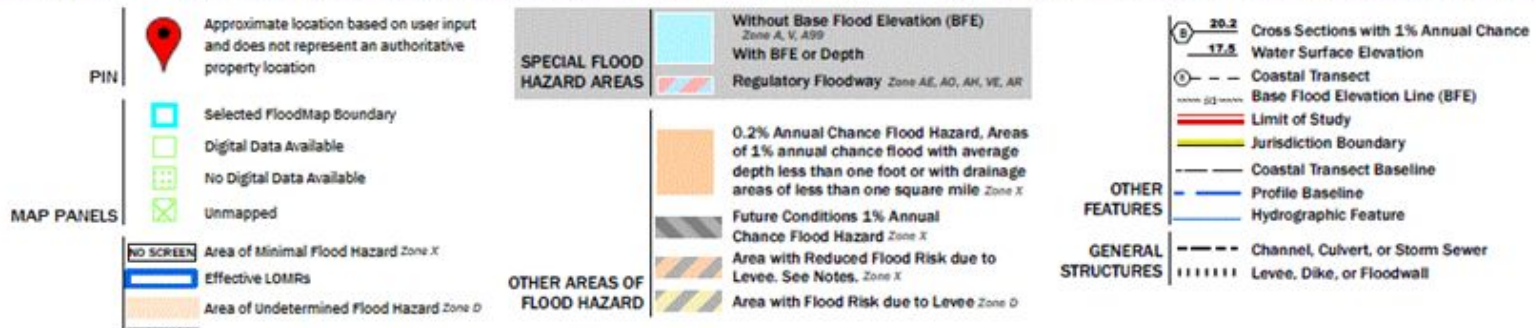


# HENSARLING LAKE DAM



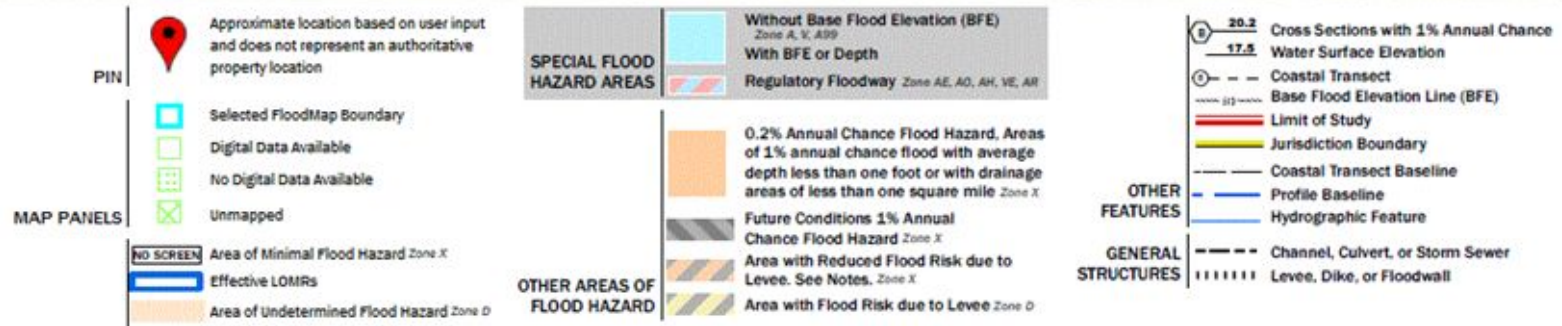
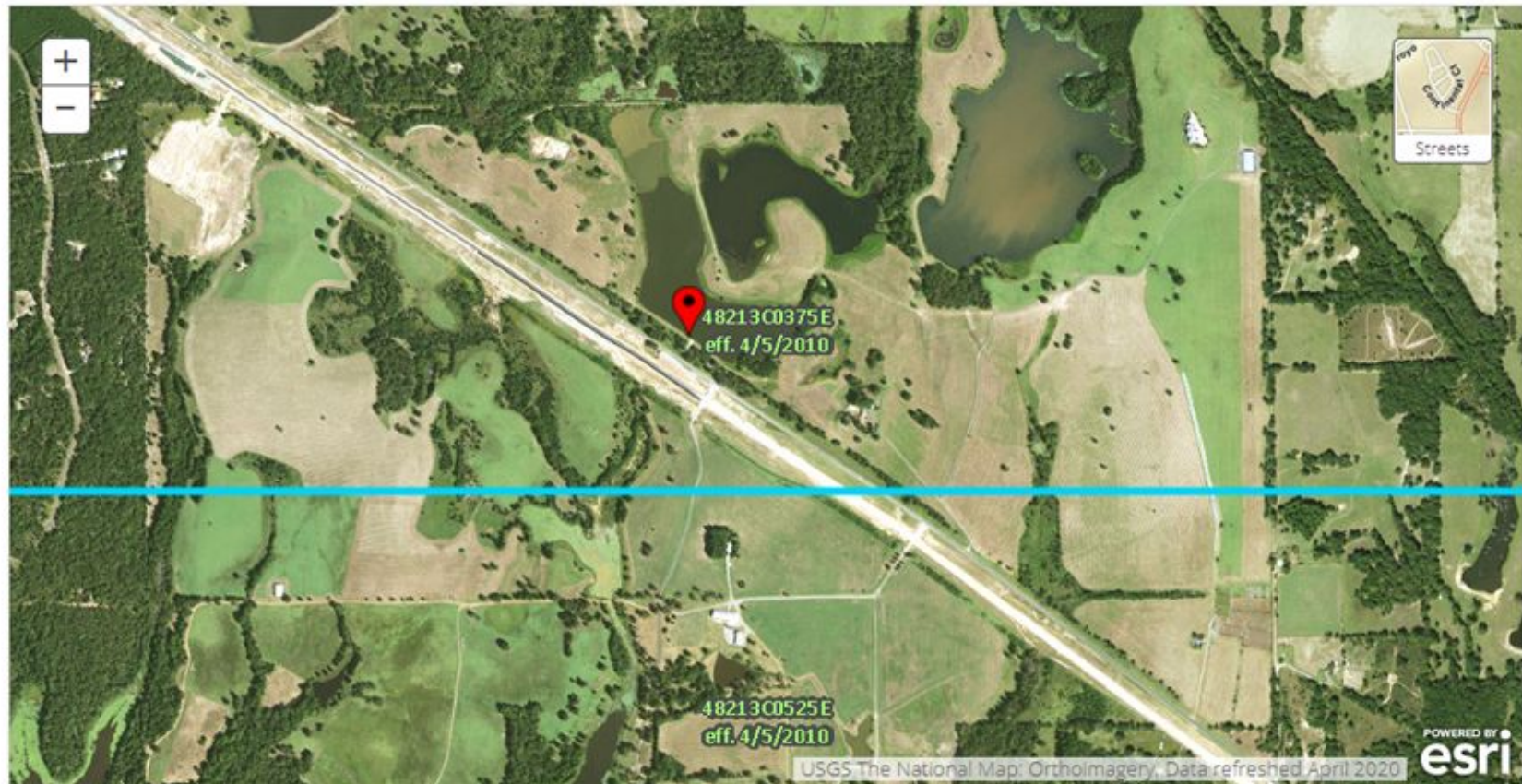


# HICKORY HILLS LAKE DAM & WISE LAKE DAM (VAN ZANDT CO.)



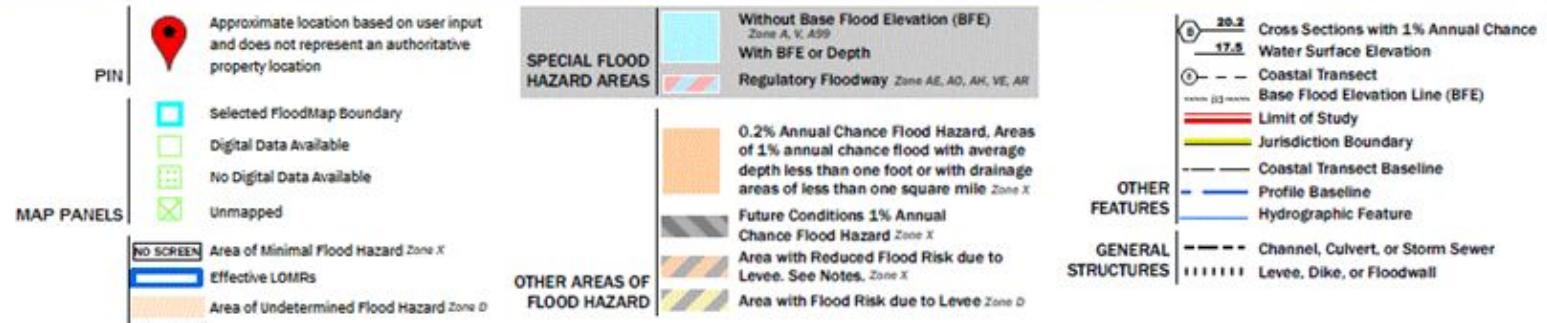
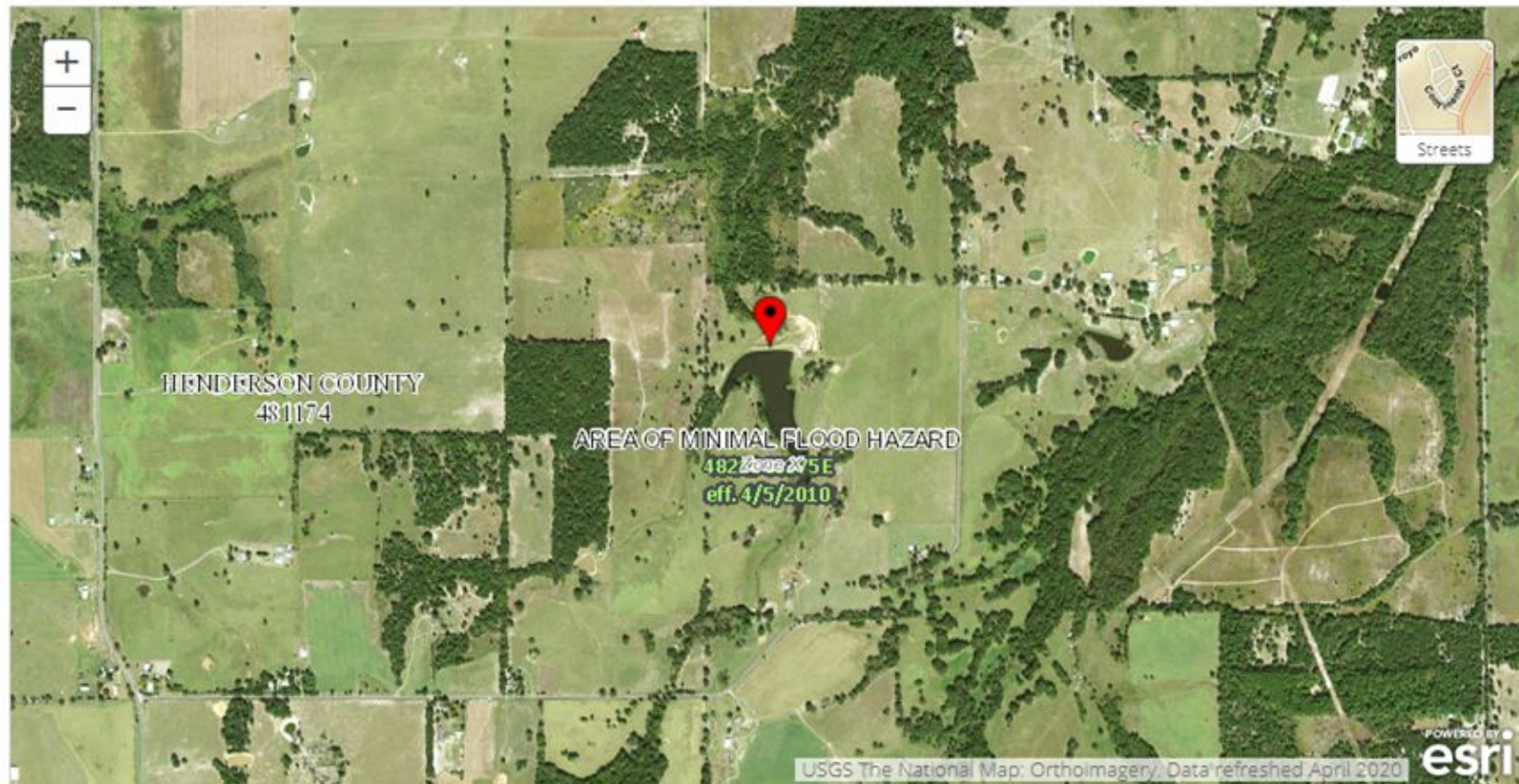


# HIGHWAY 175 EAST DAM



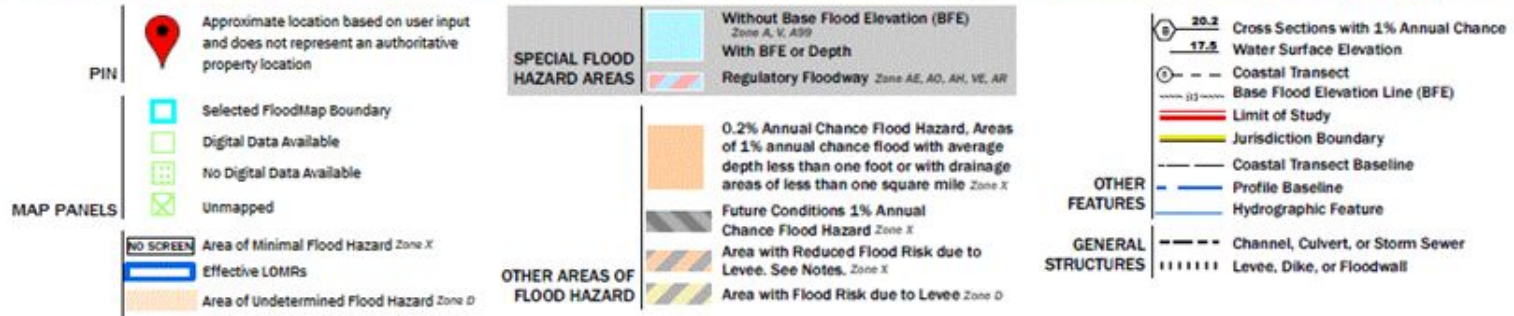
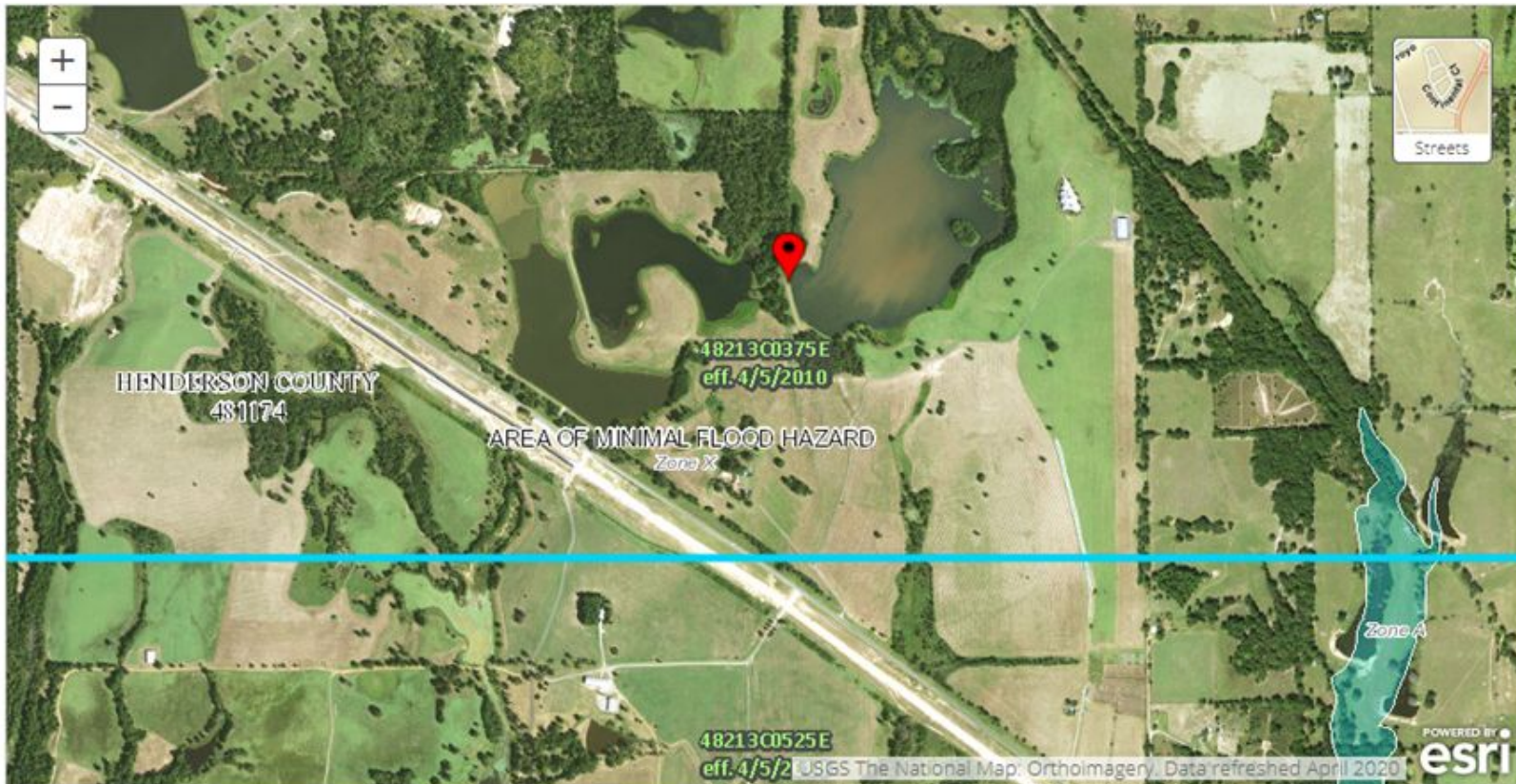


## HOWETH DAM NO. 2



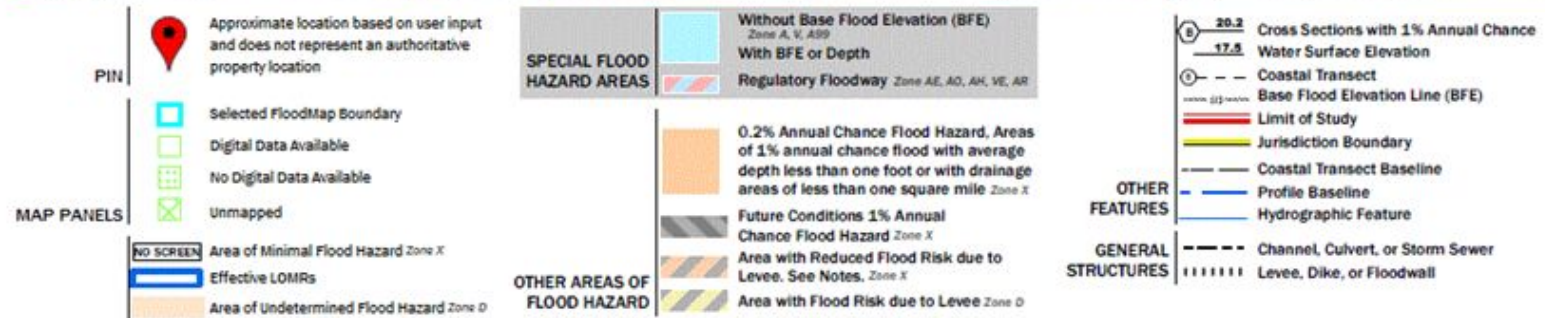
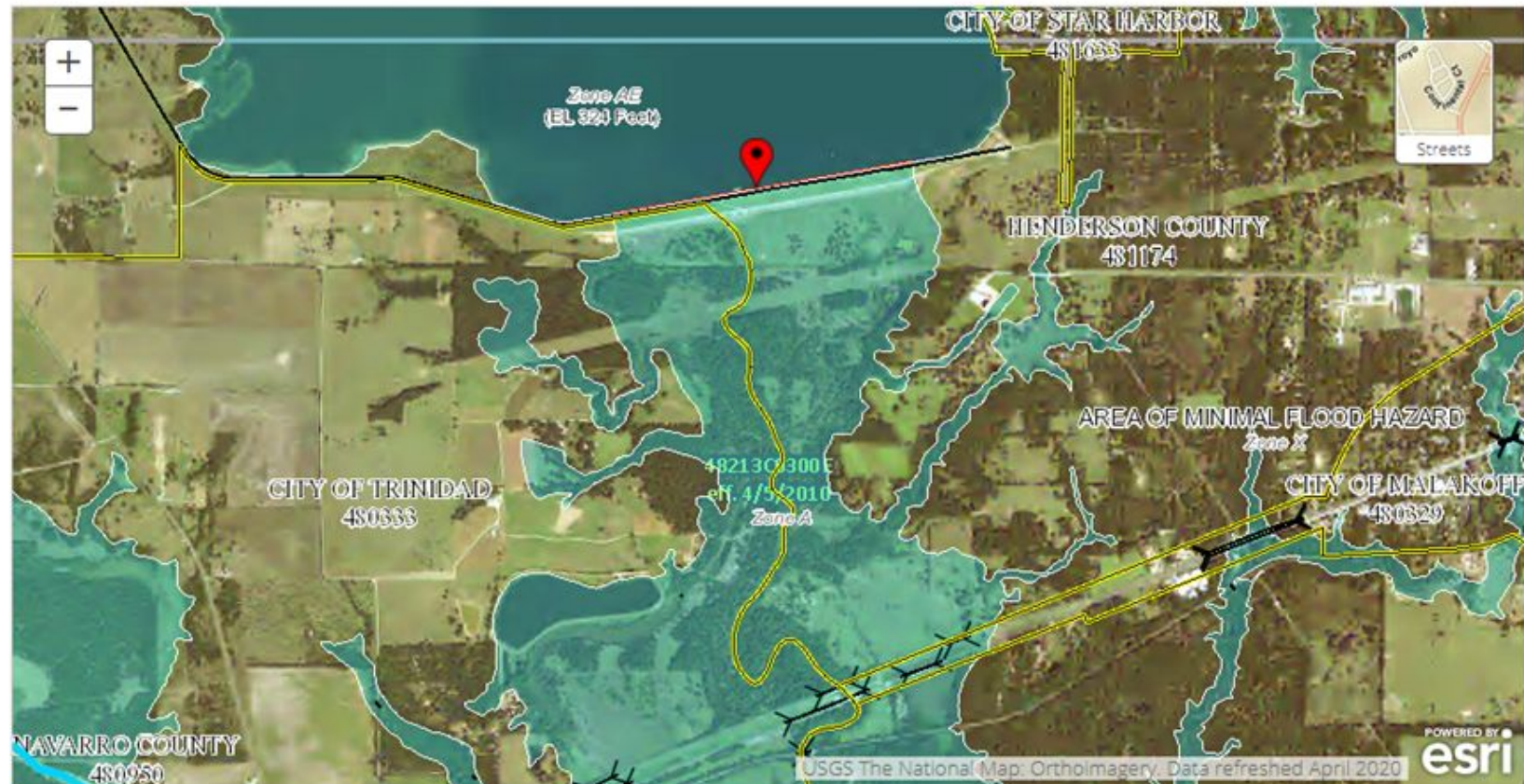


# HUME LAKE DAM



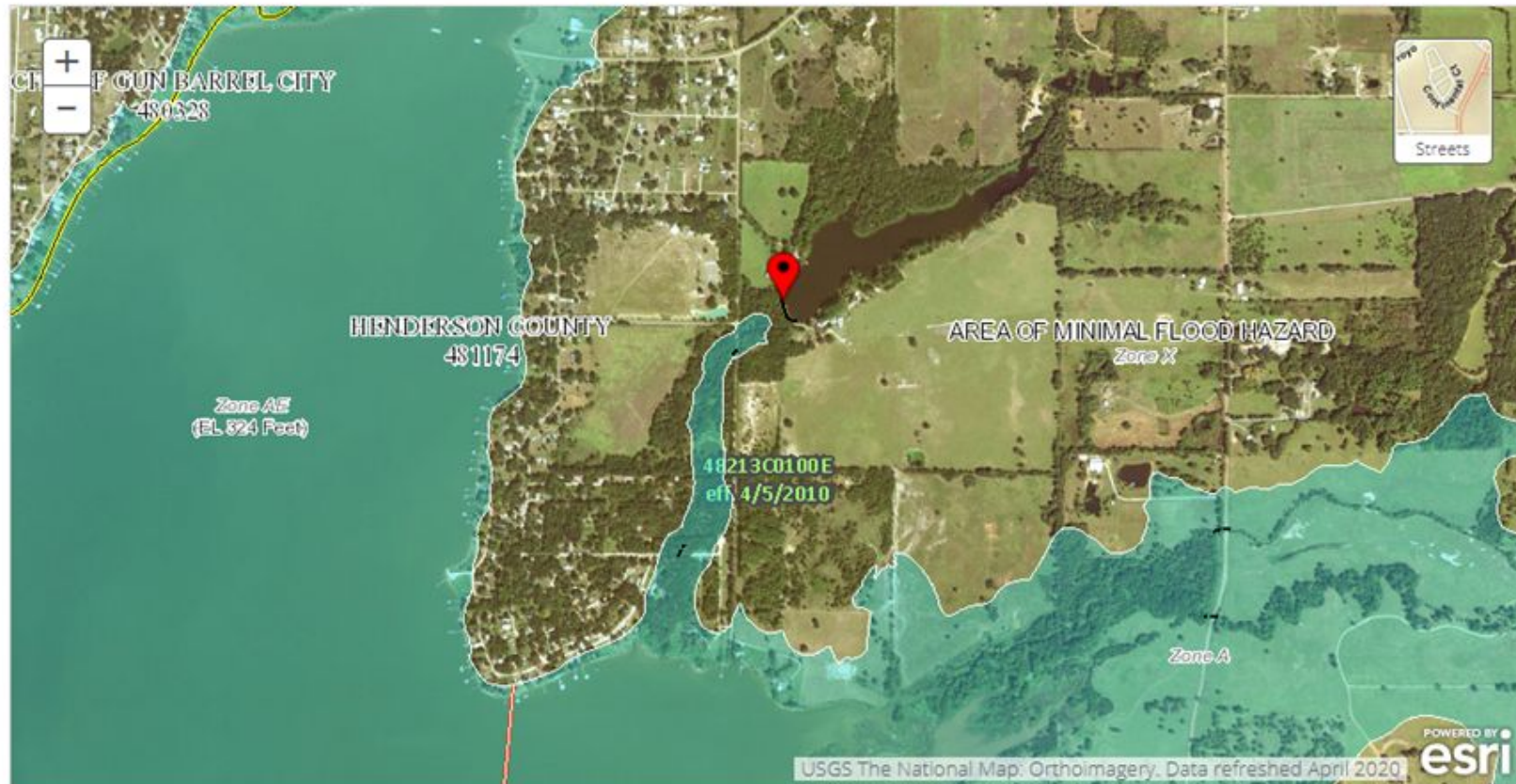


# JOE B HOGSETT DAM



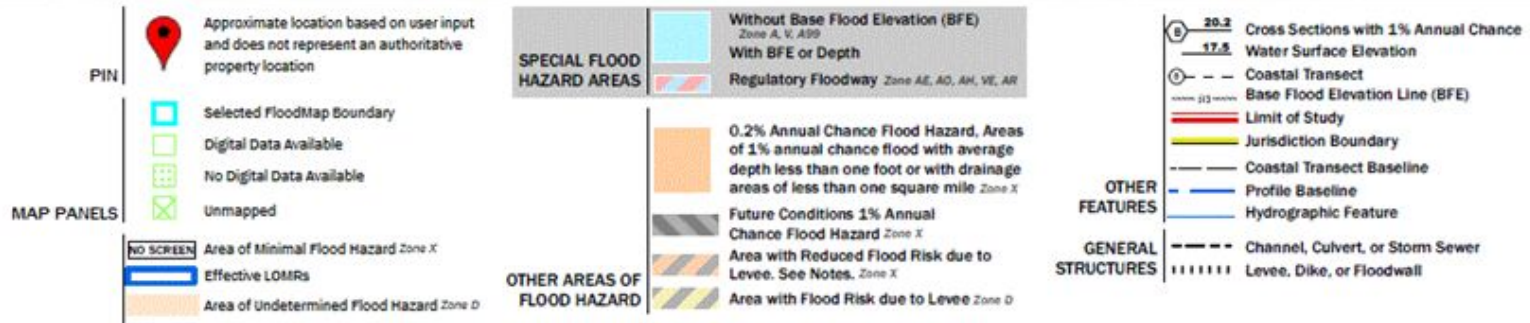
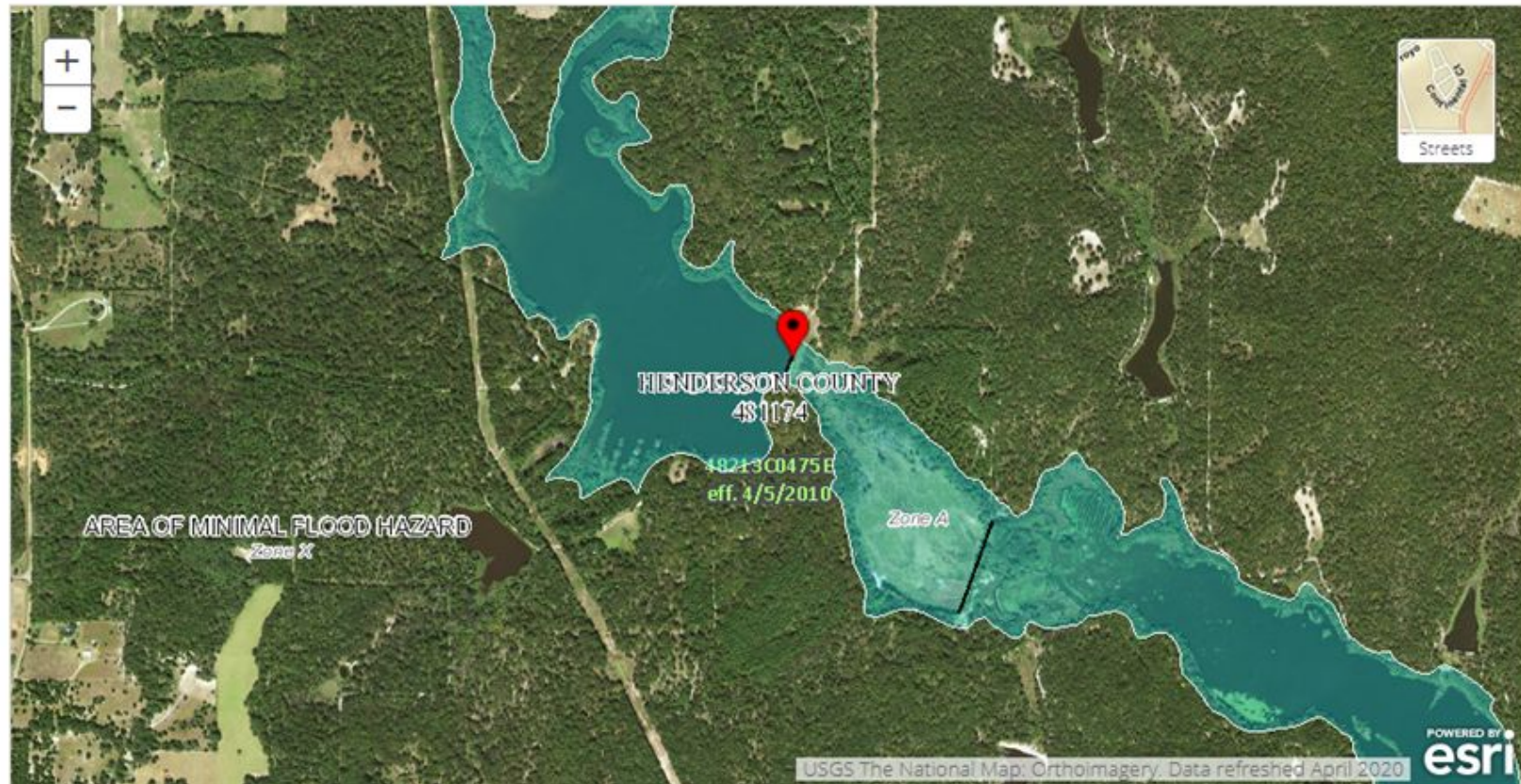


# JOHN SENTERRE LAKE DAM



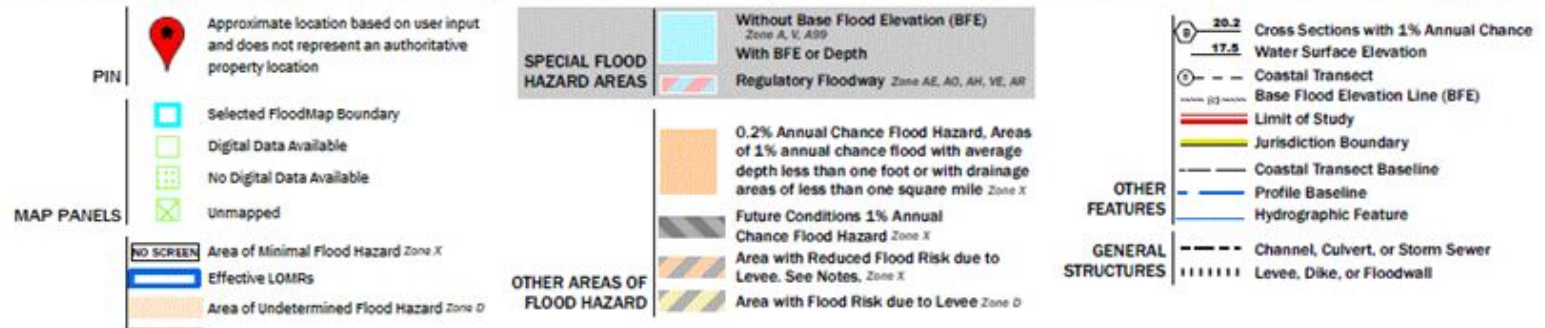
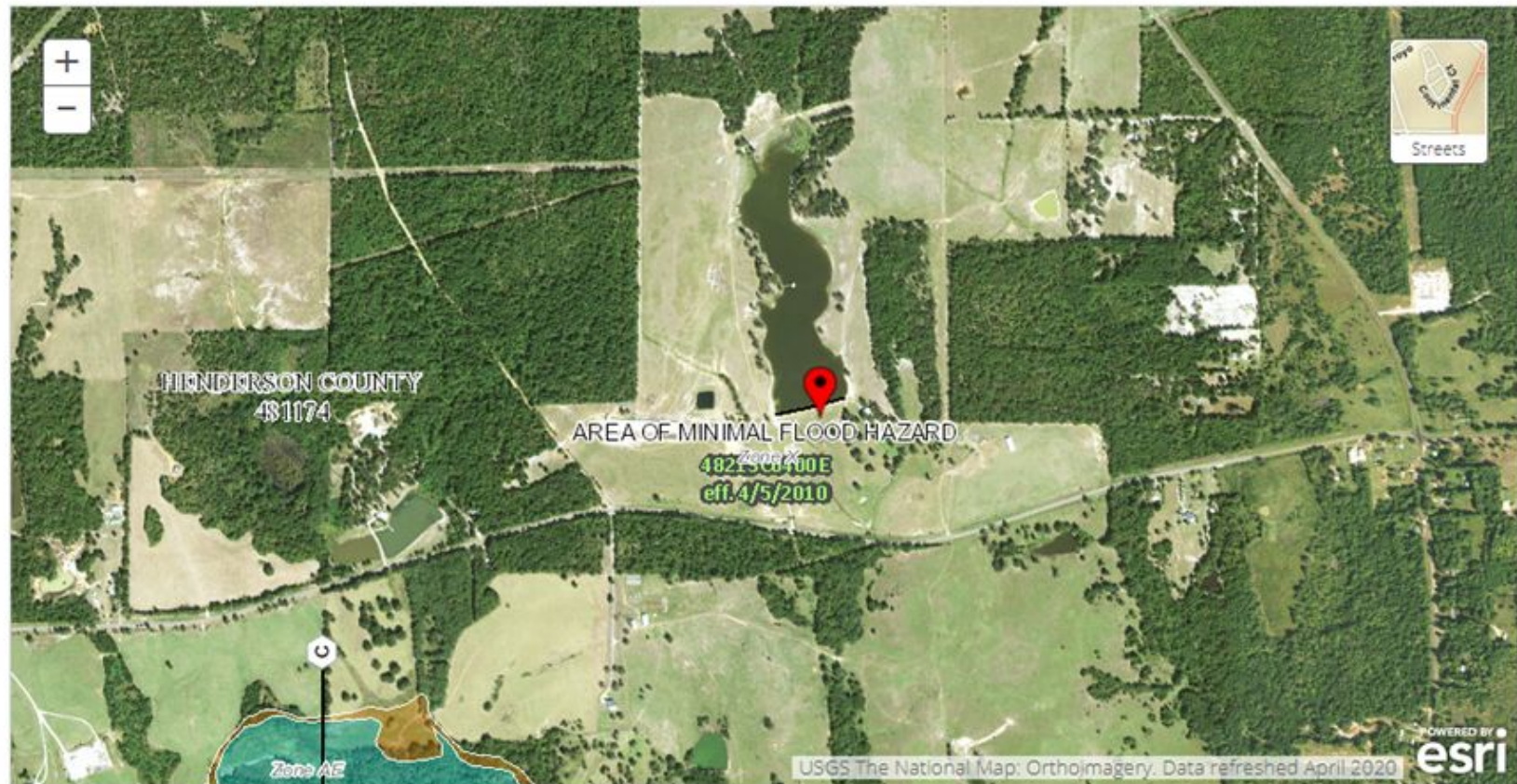


# JONSSON LAKE DAM



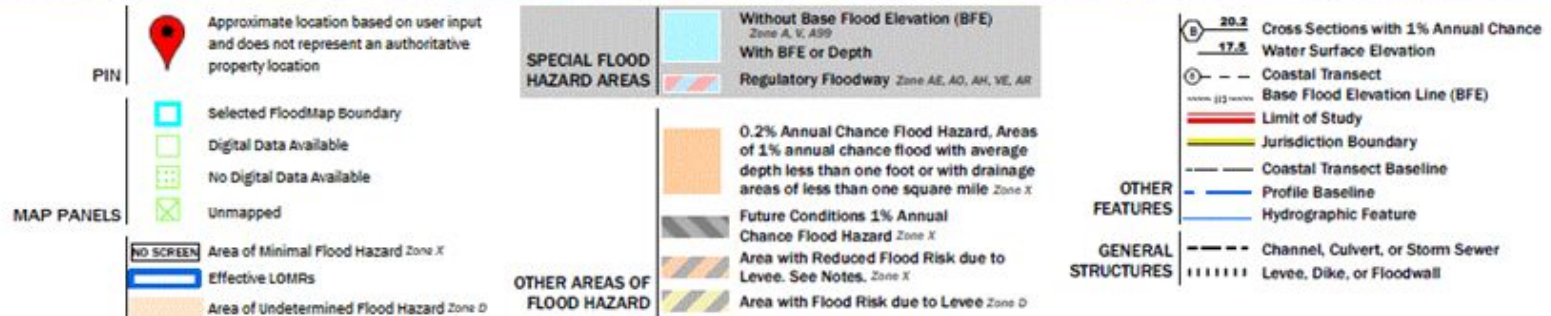


# KIDD LAKE DAM



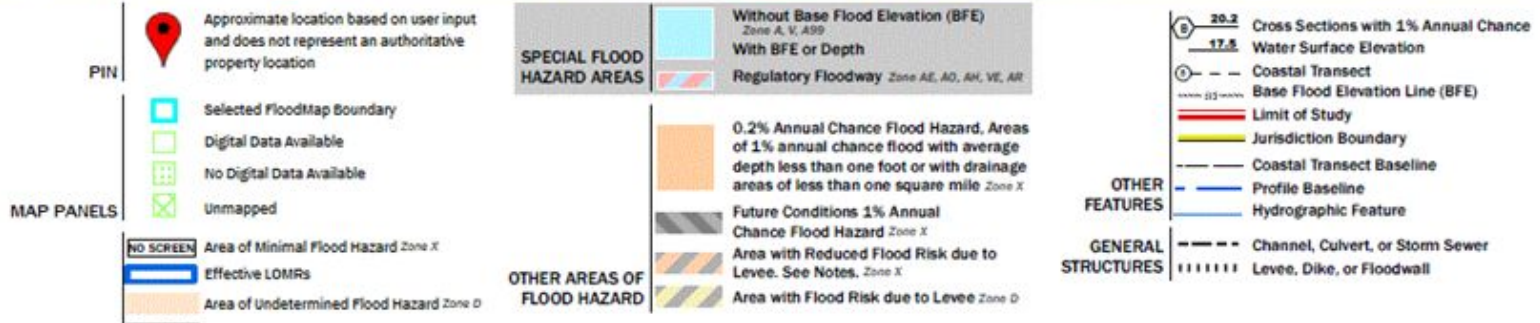
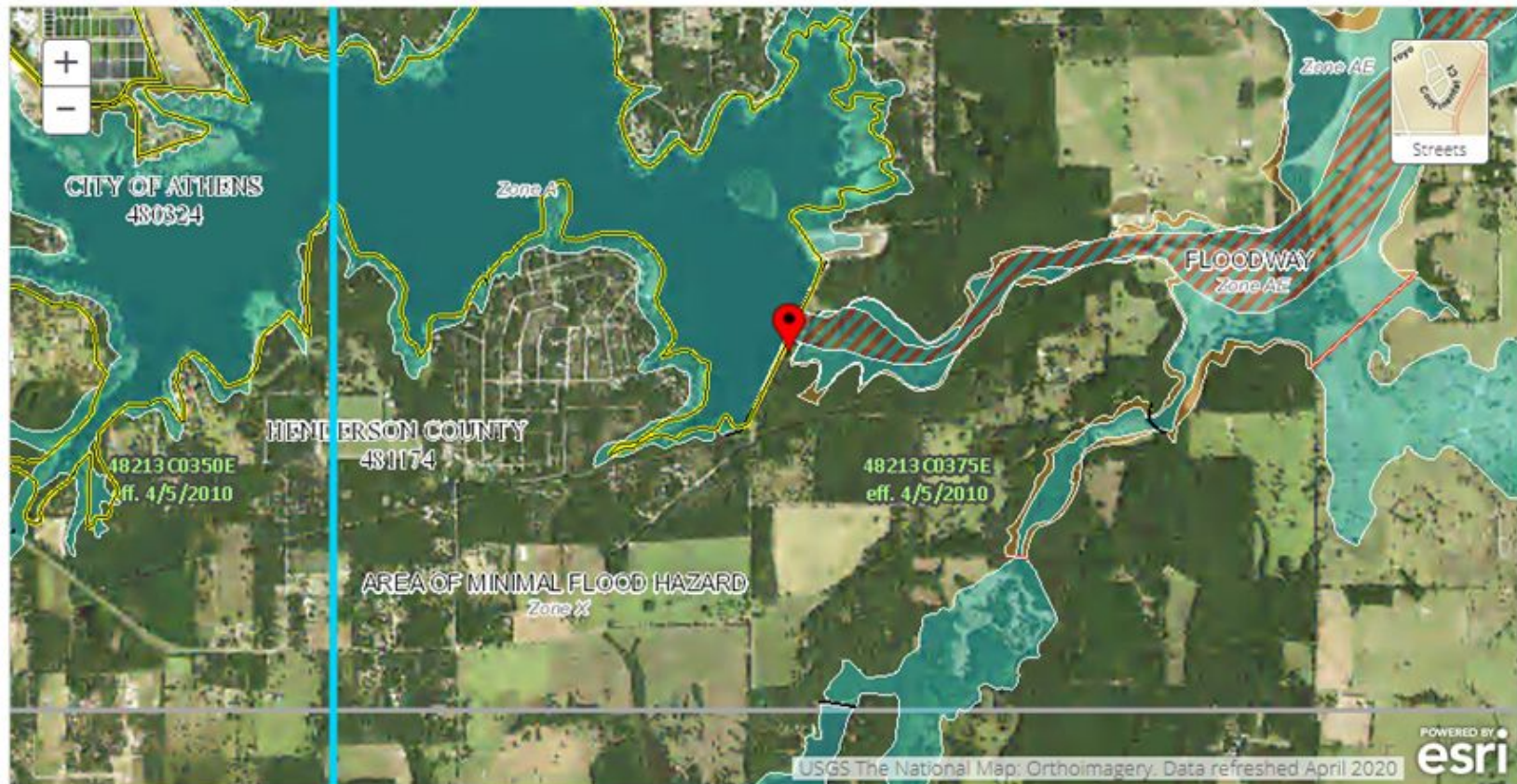


# KLINE LAKE DAM





# LAKE ATHENS DAM



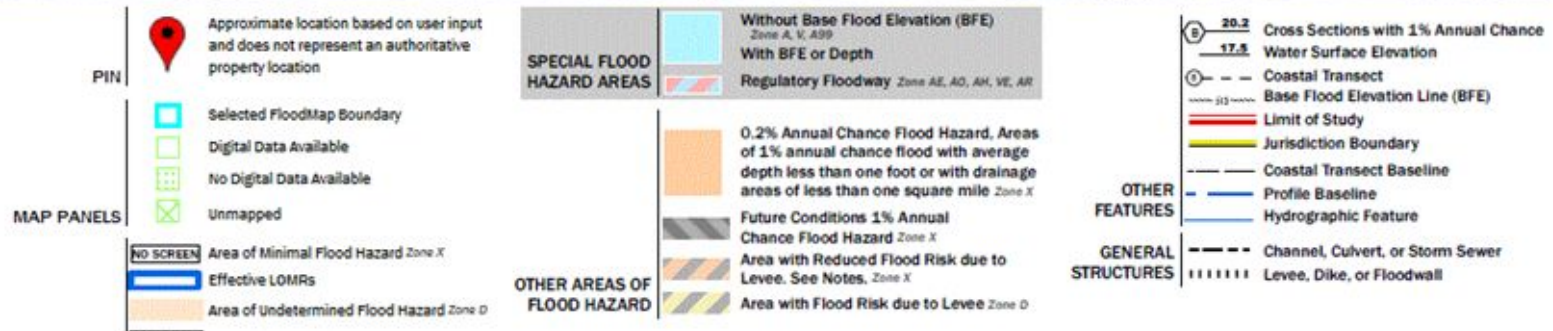


# LAKE MAWSY DAM



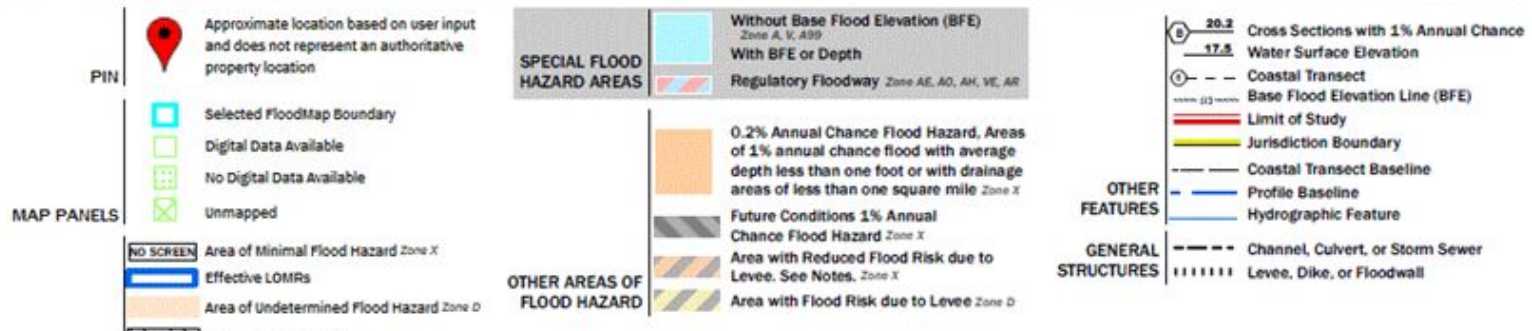
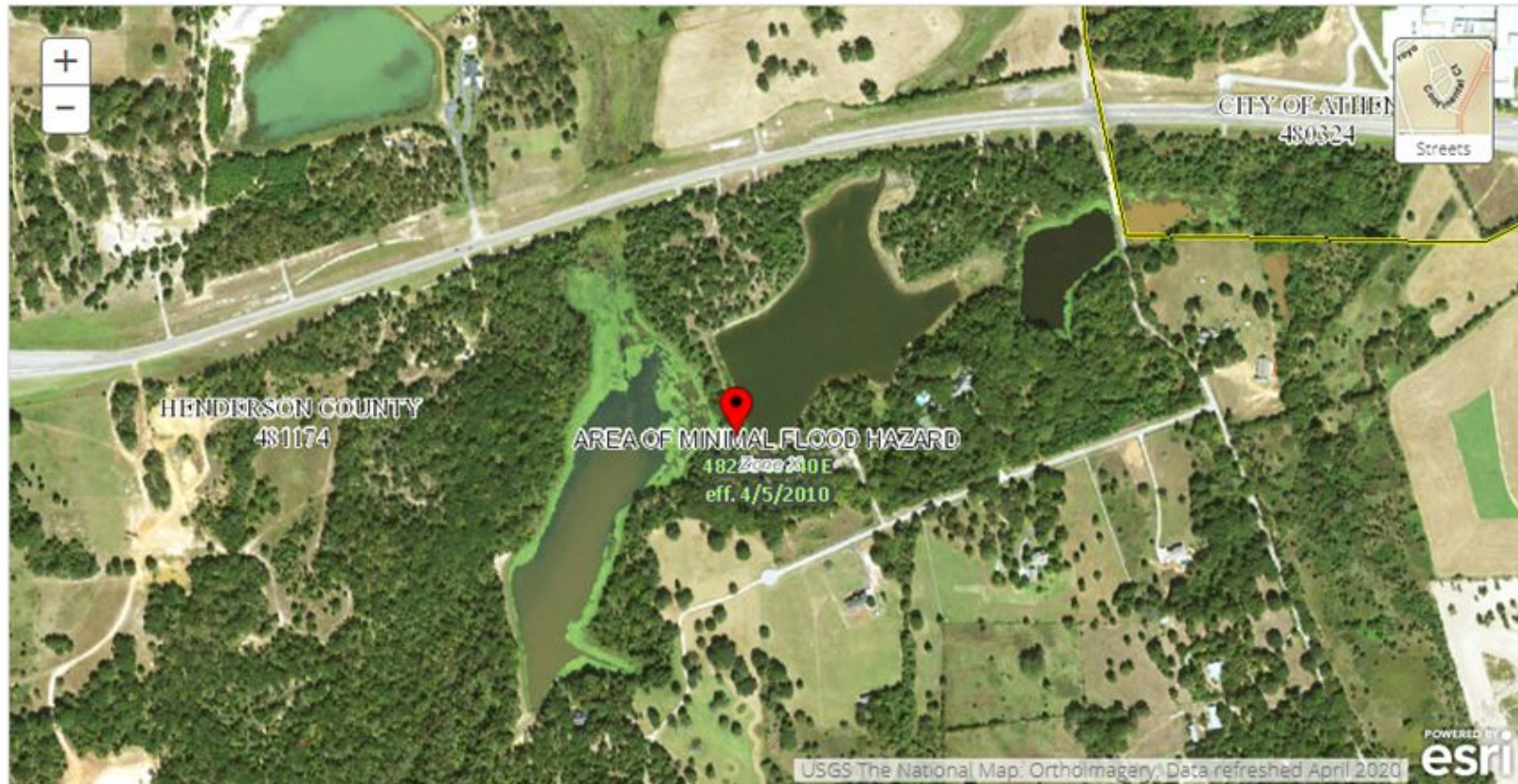


## LANDBURGER LOWER LAKE NO. 2 DAM



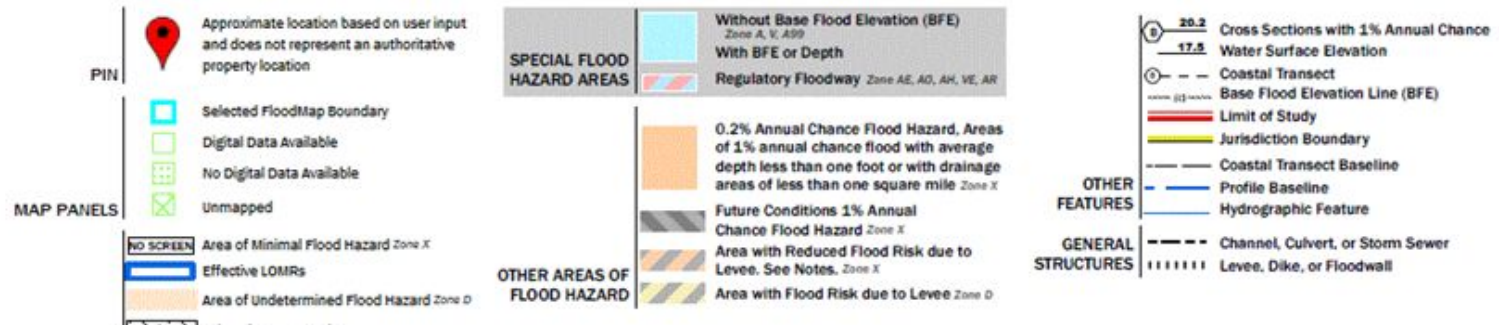
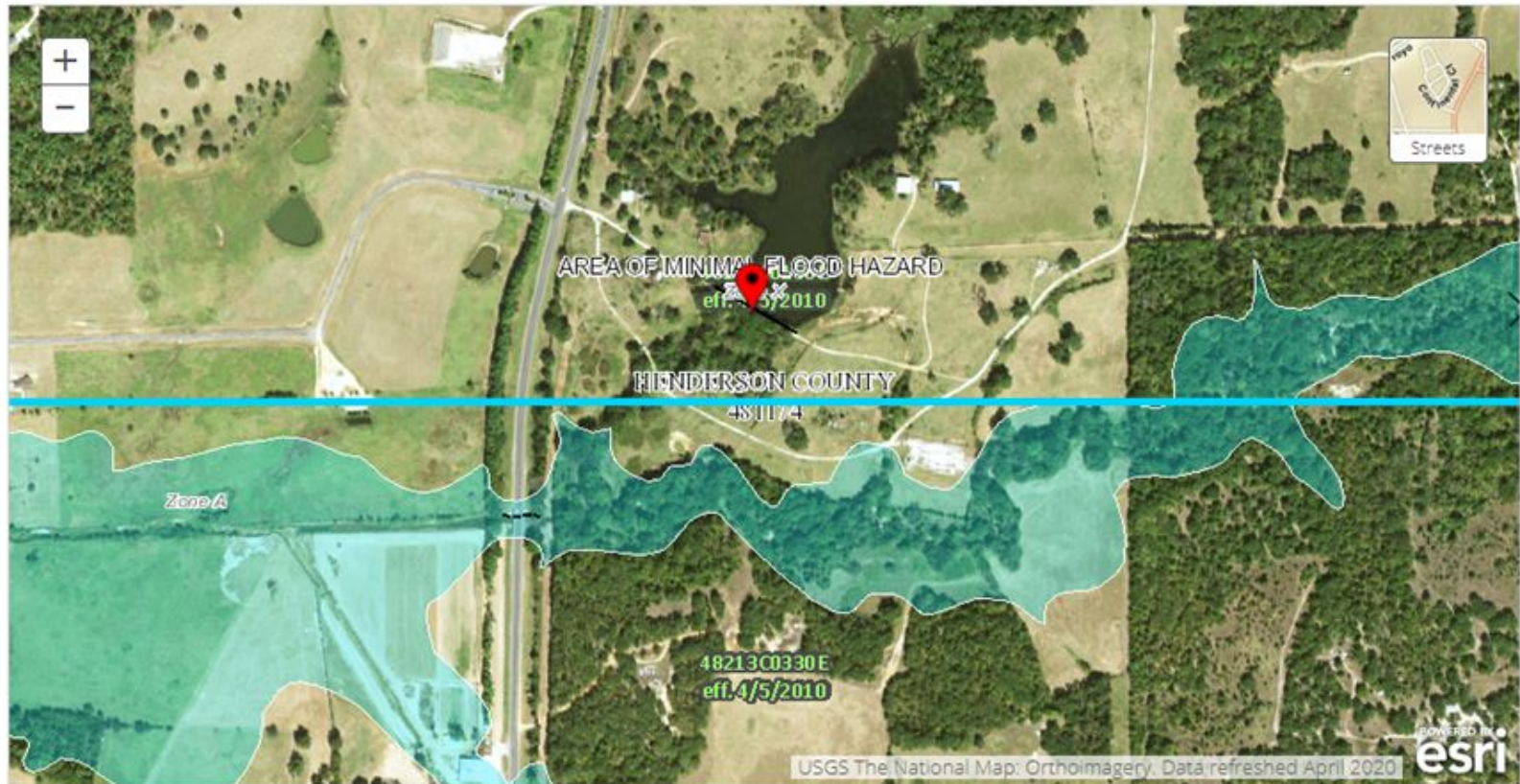


# LANDBURGER UPPER LAKE NO.1



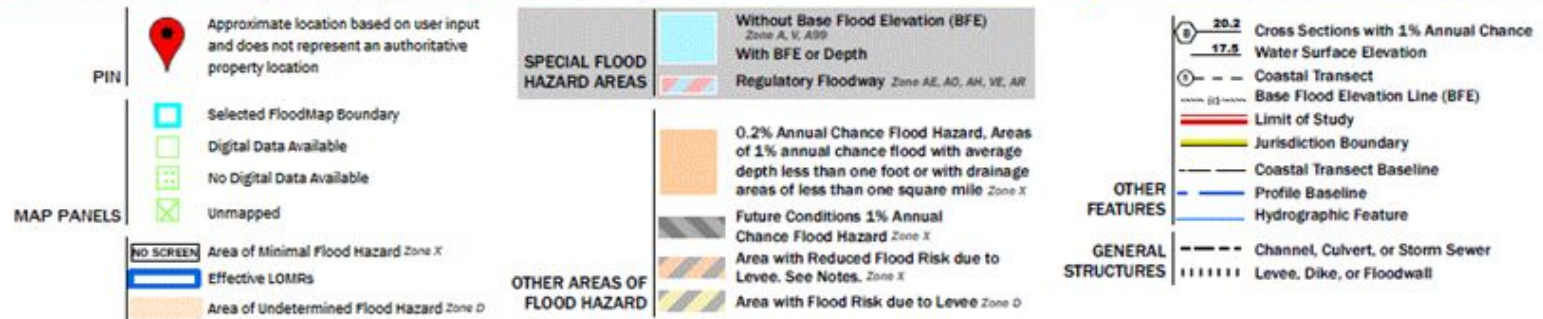
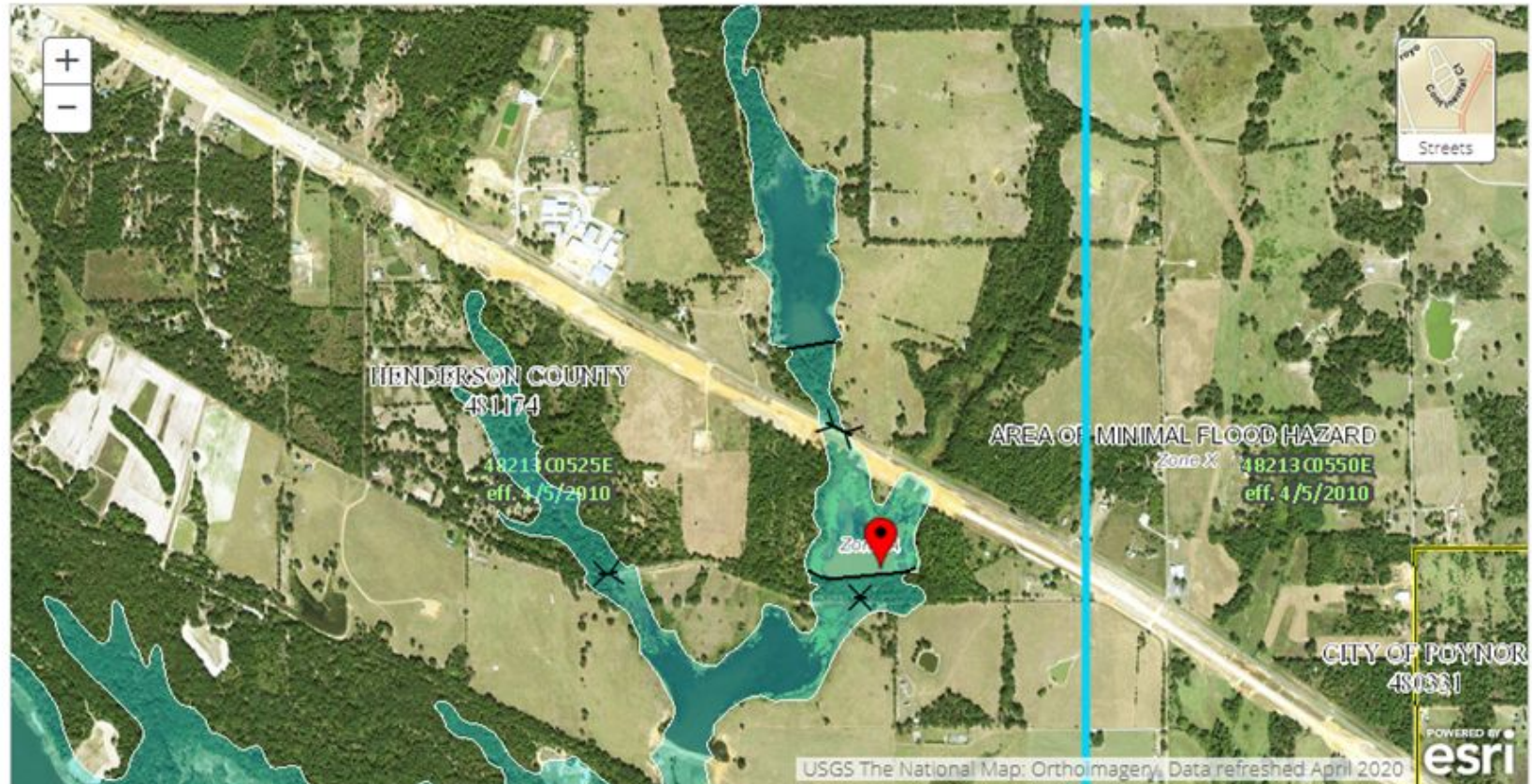


# LEE LAKE DAM



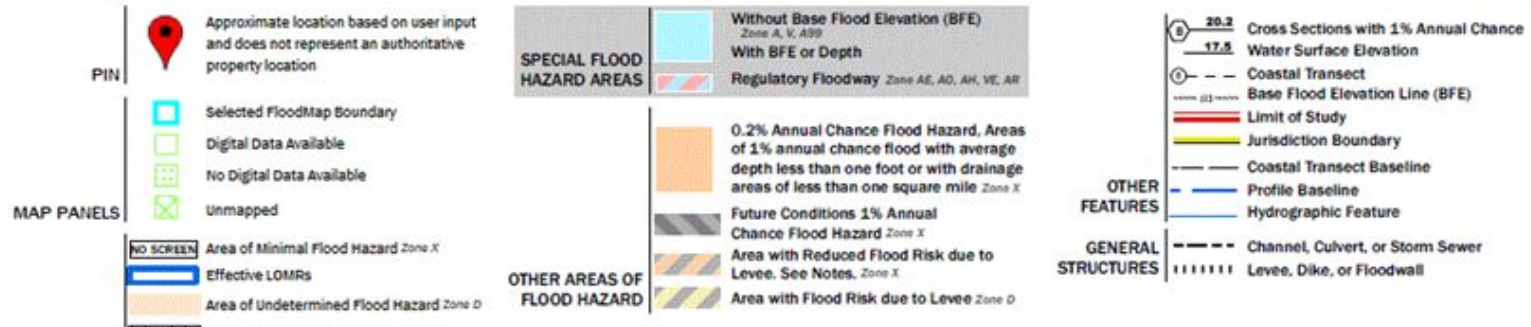


# LEO A. SMITH LAKE DAM



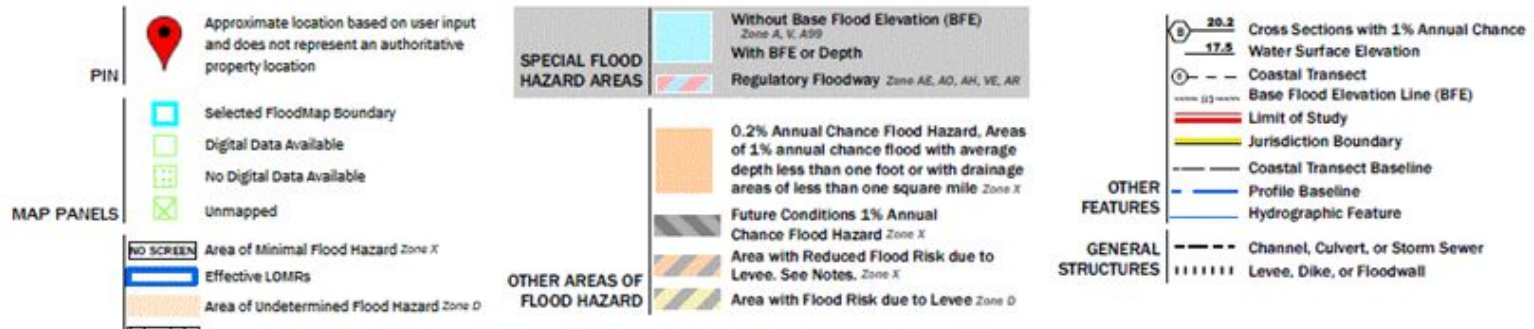
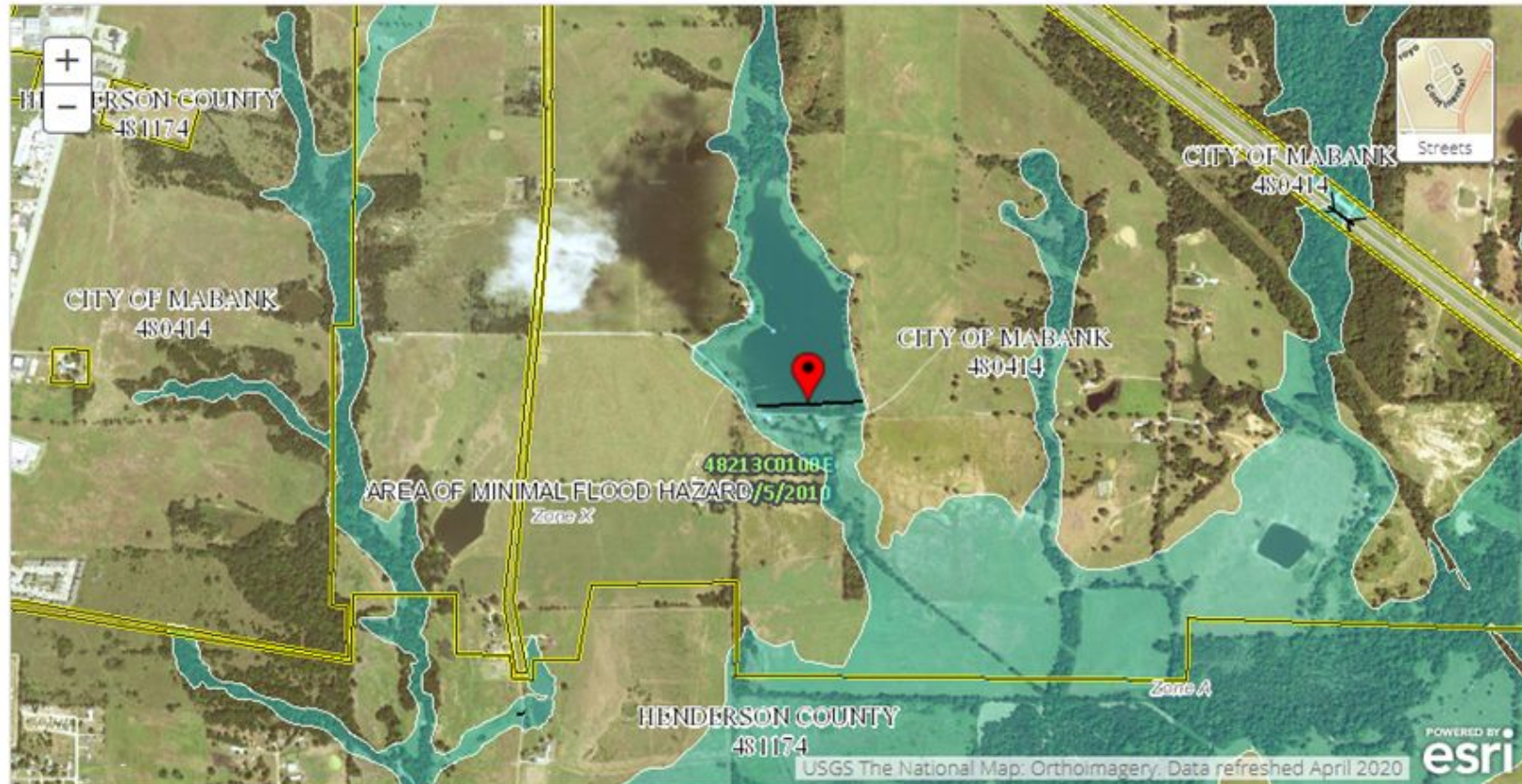


# LITTLE CADDO CREEK LAKE DAM



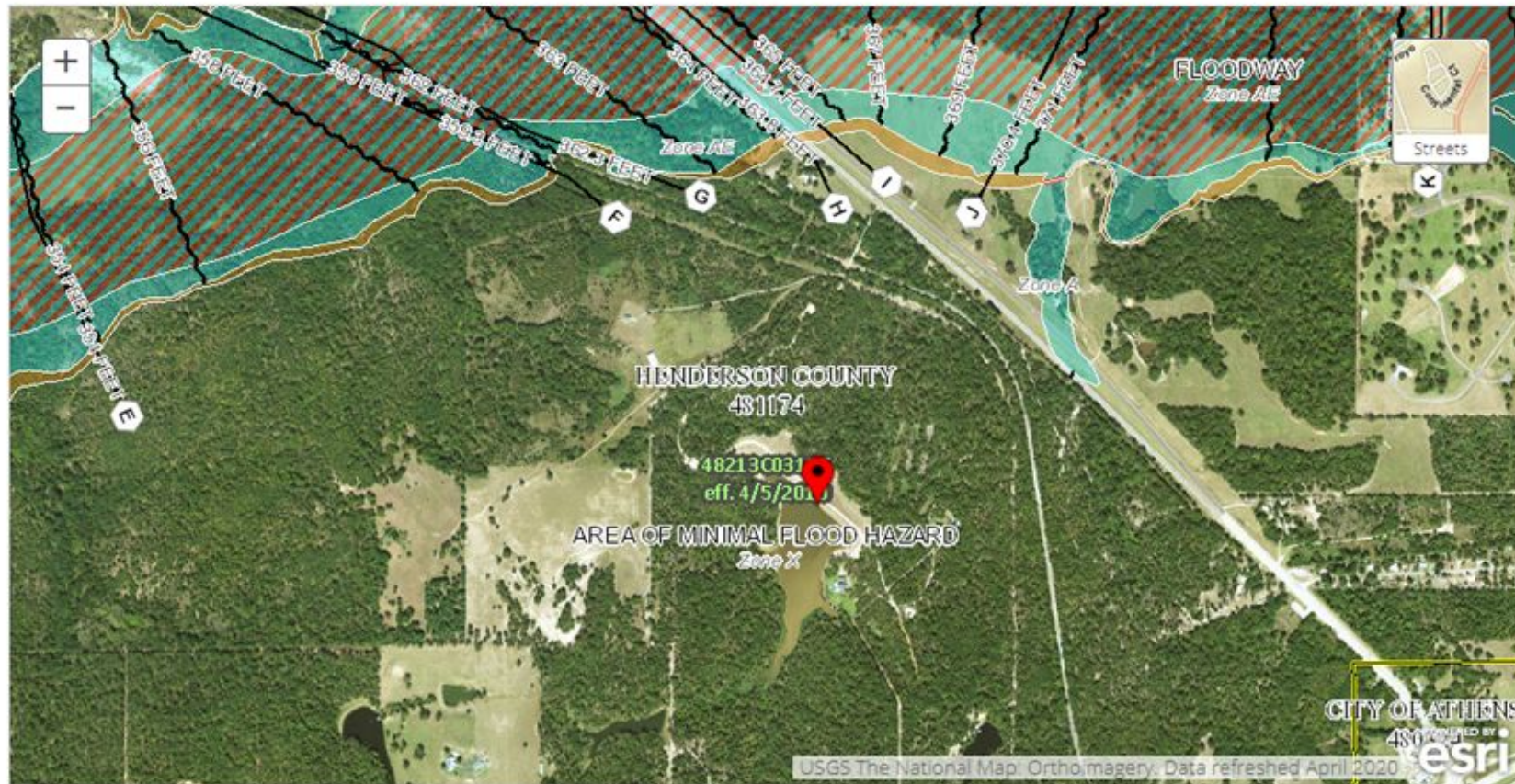


## MABANK CITY LAKE DAM



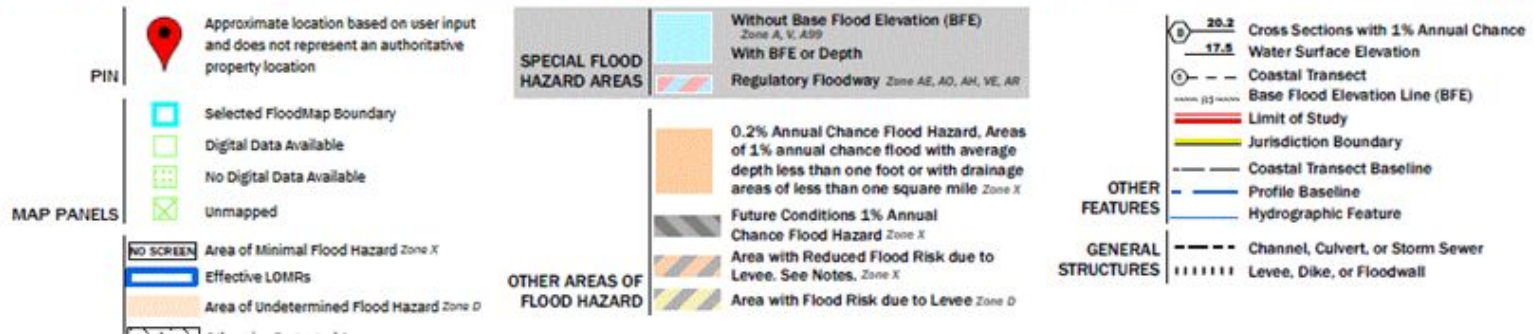
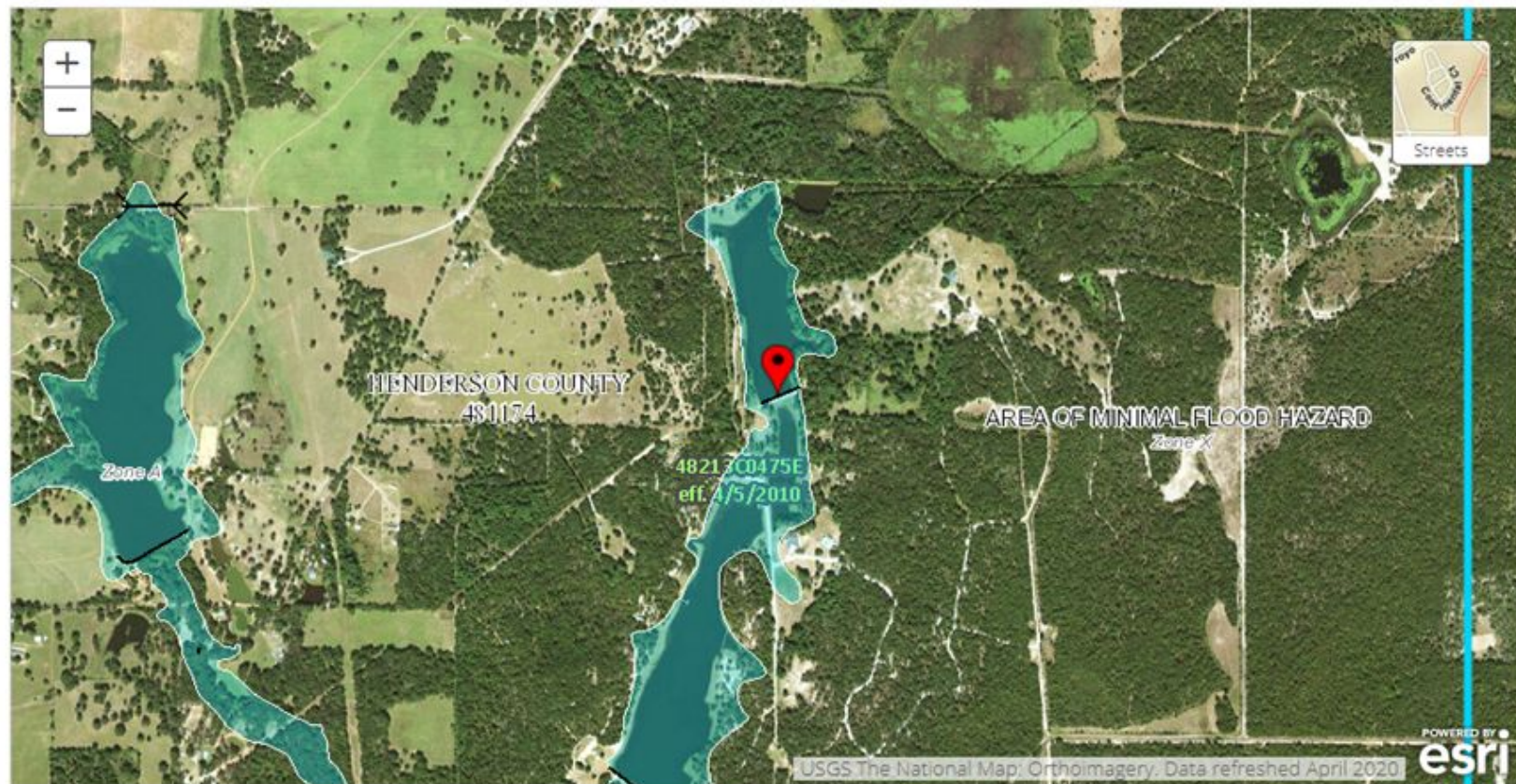


# MCCLAIN LAKE DAM



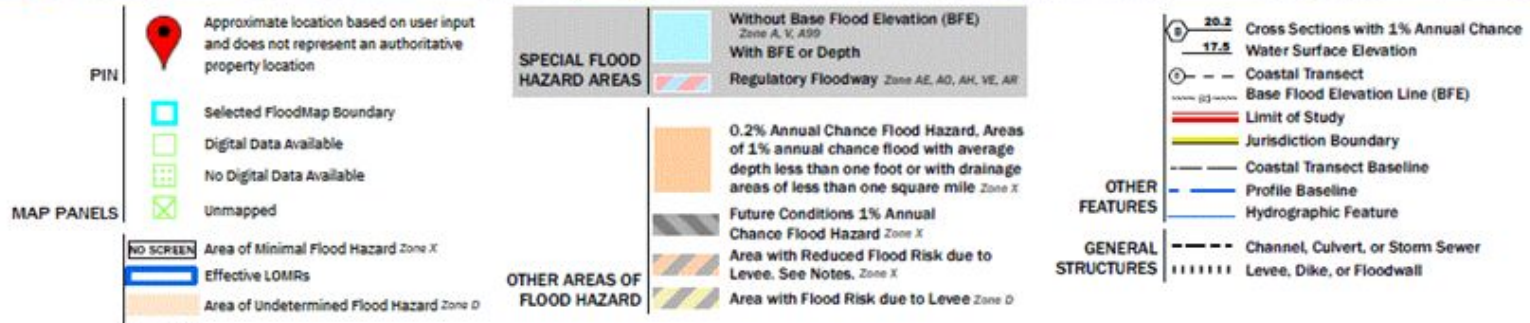
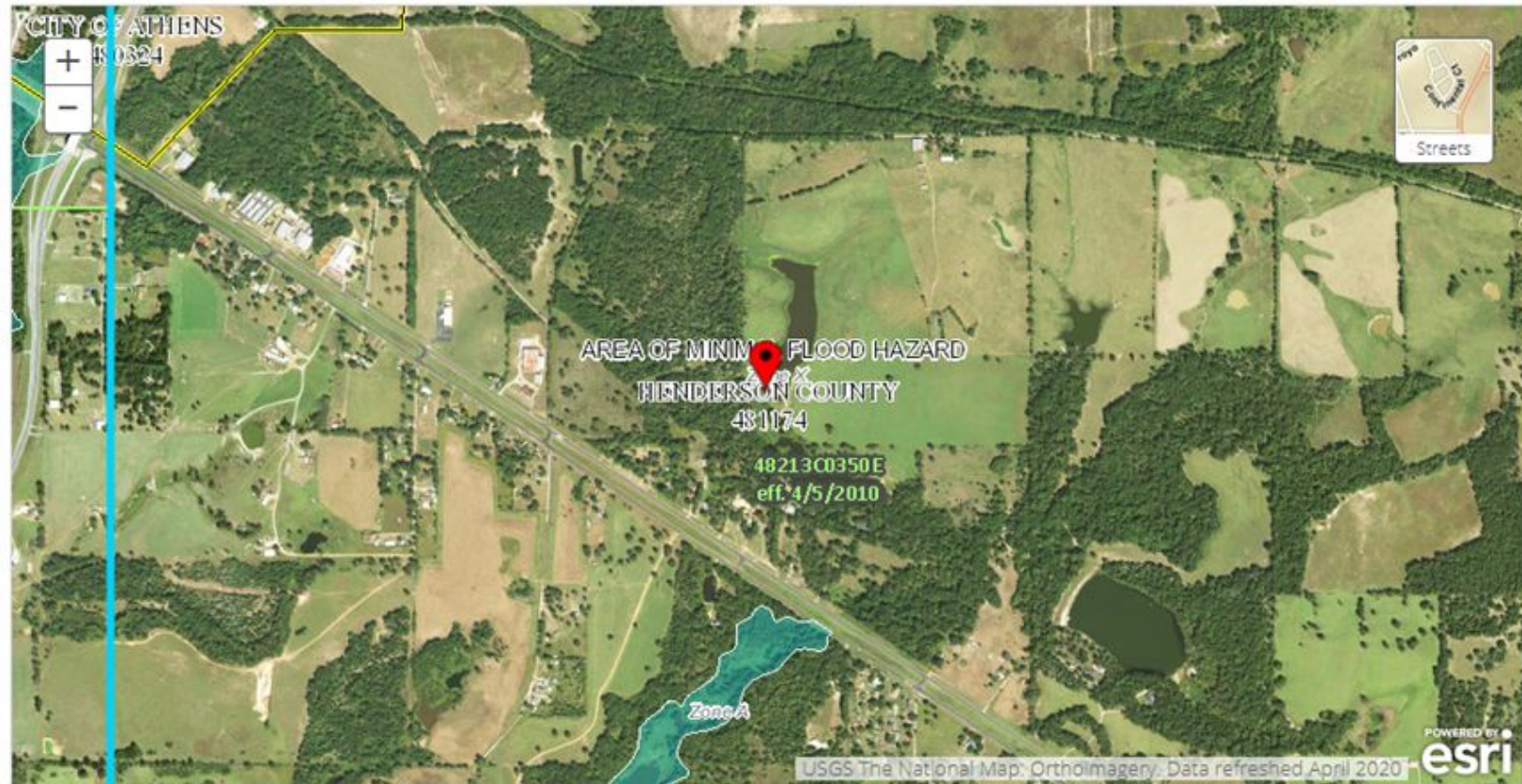


# MCELVANEY LAKE DAM



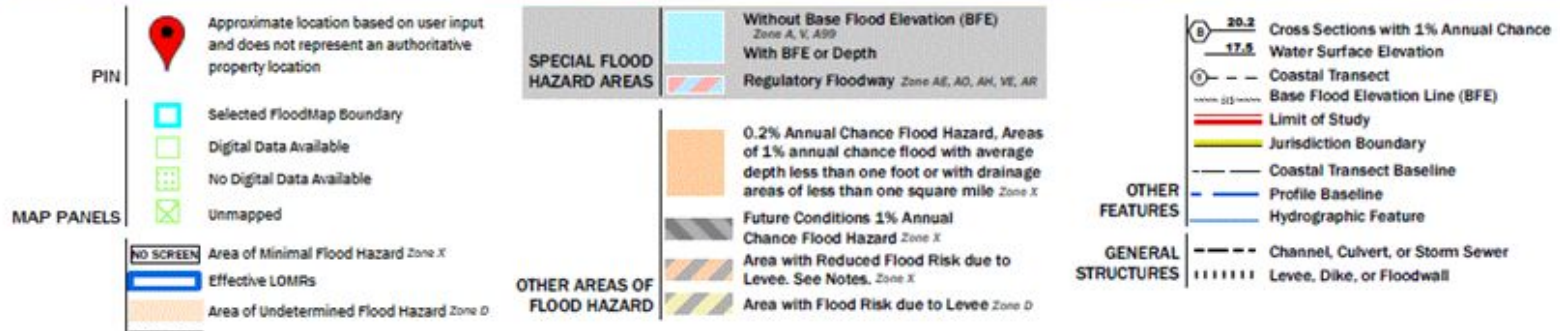
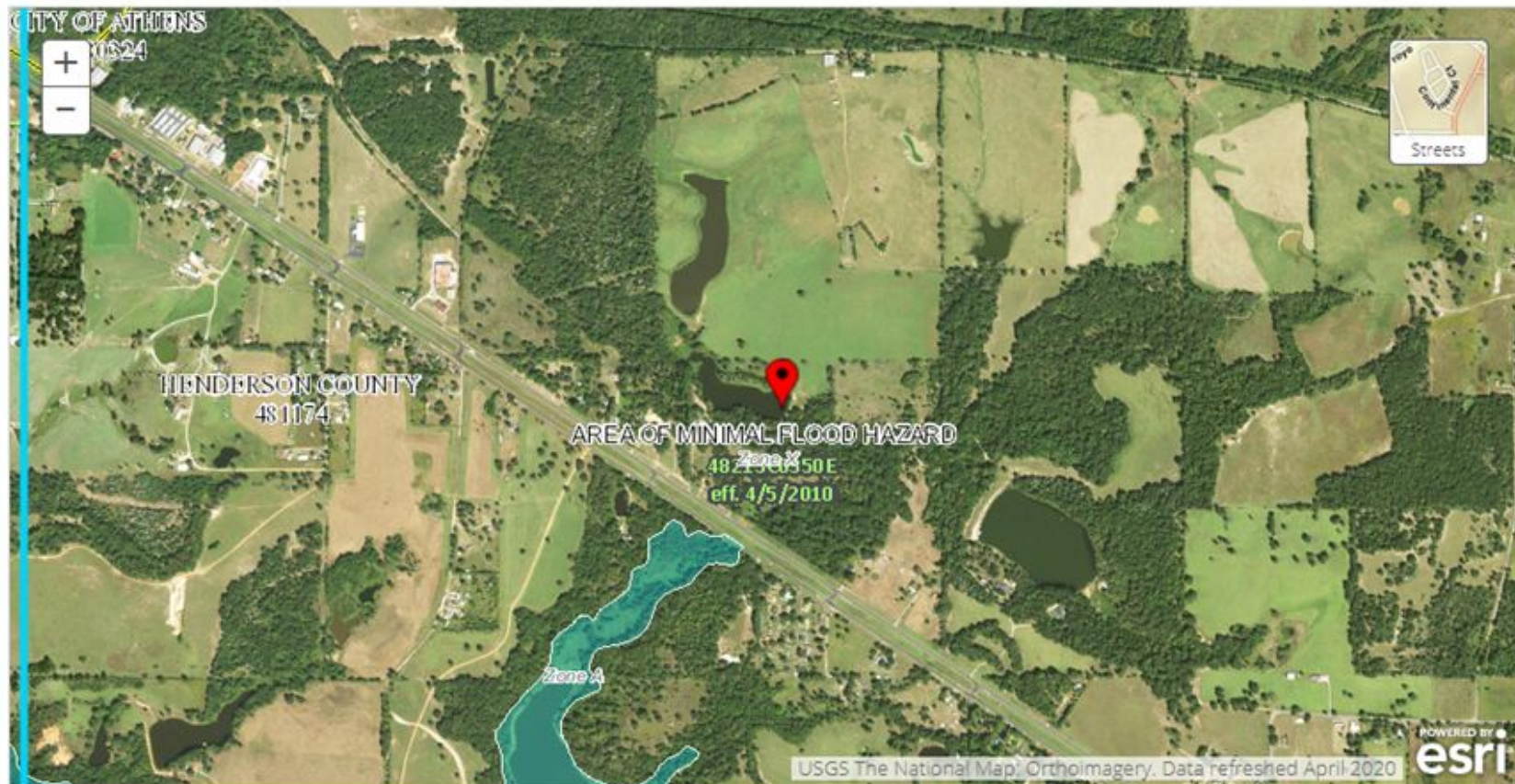


# 



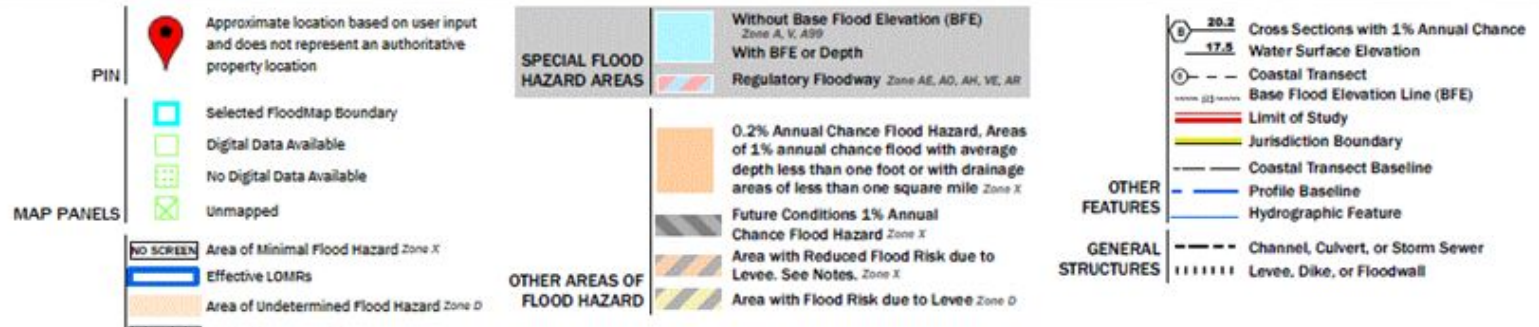
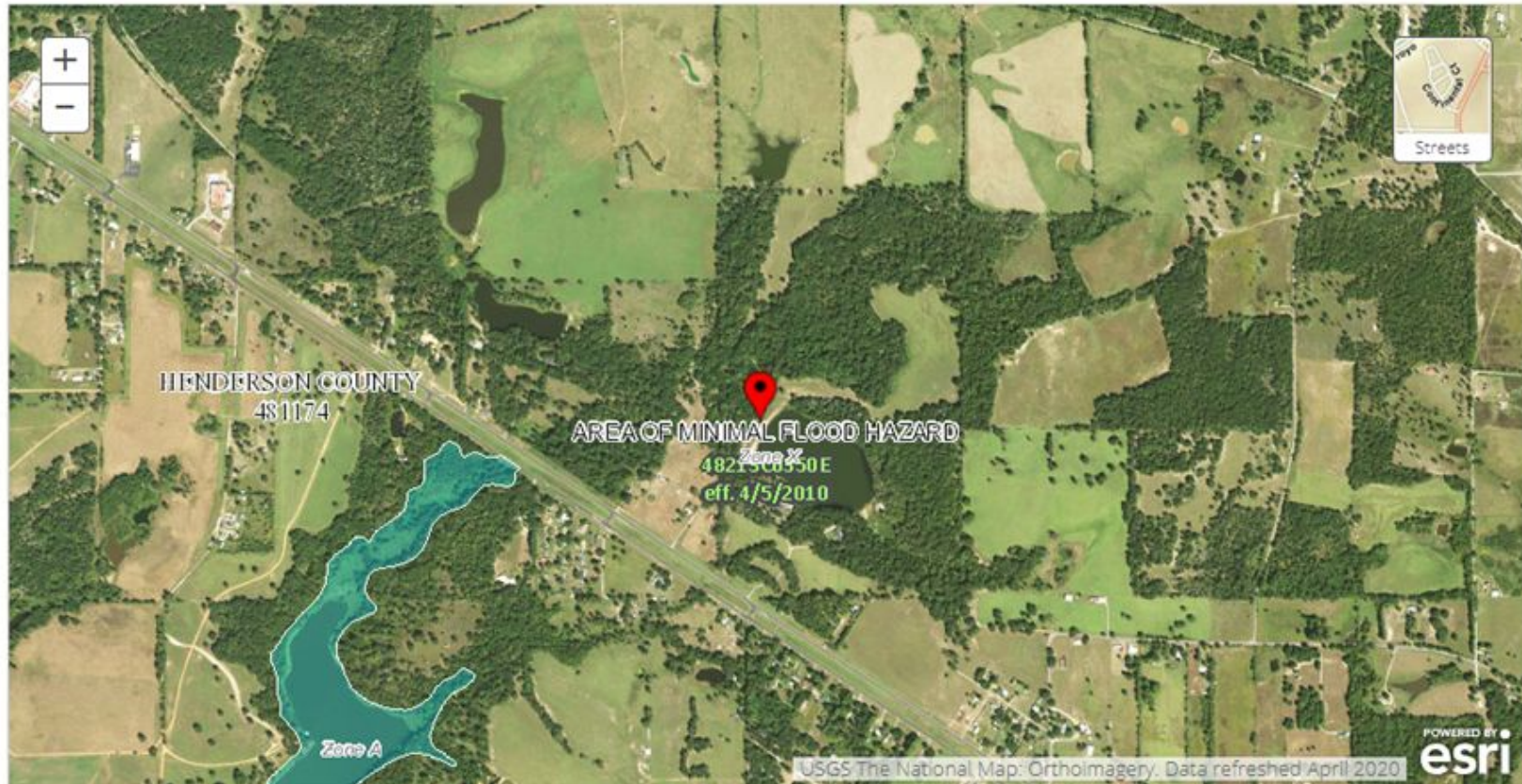


## MC GEE DAM NO. 2



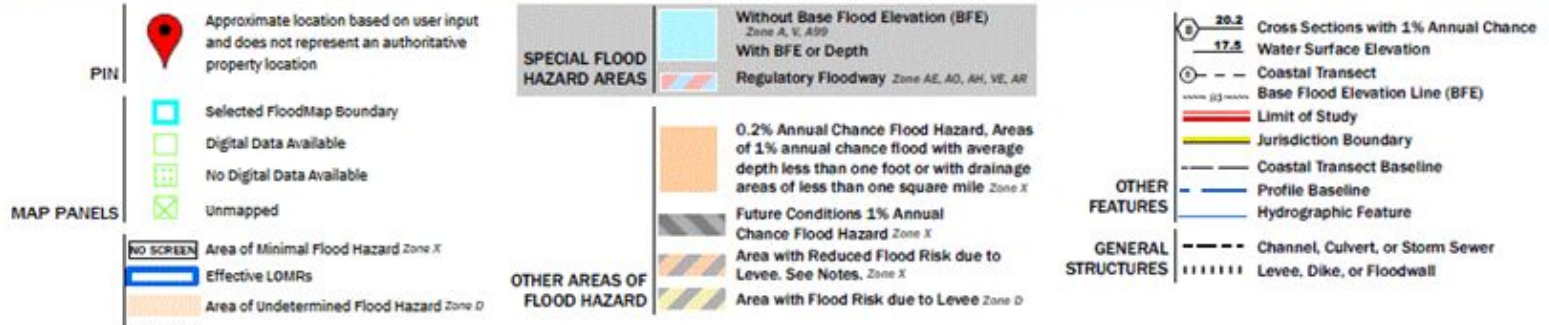
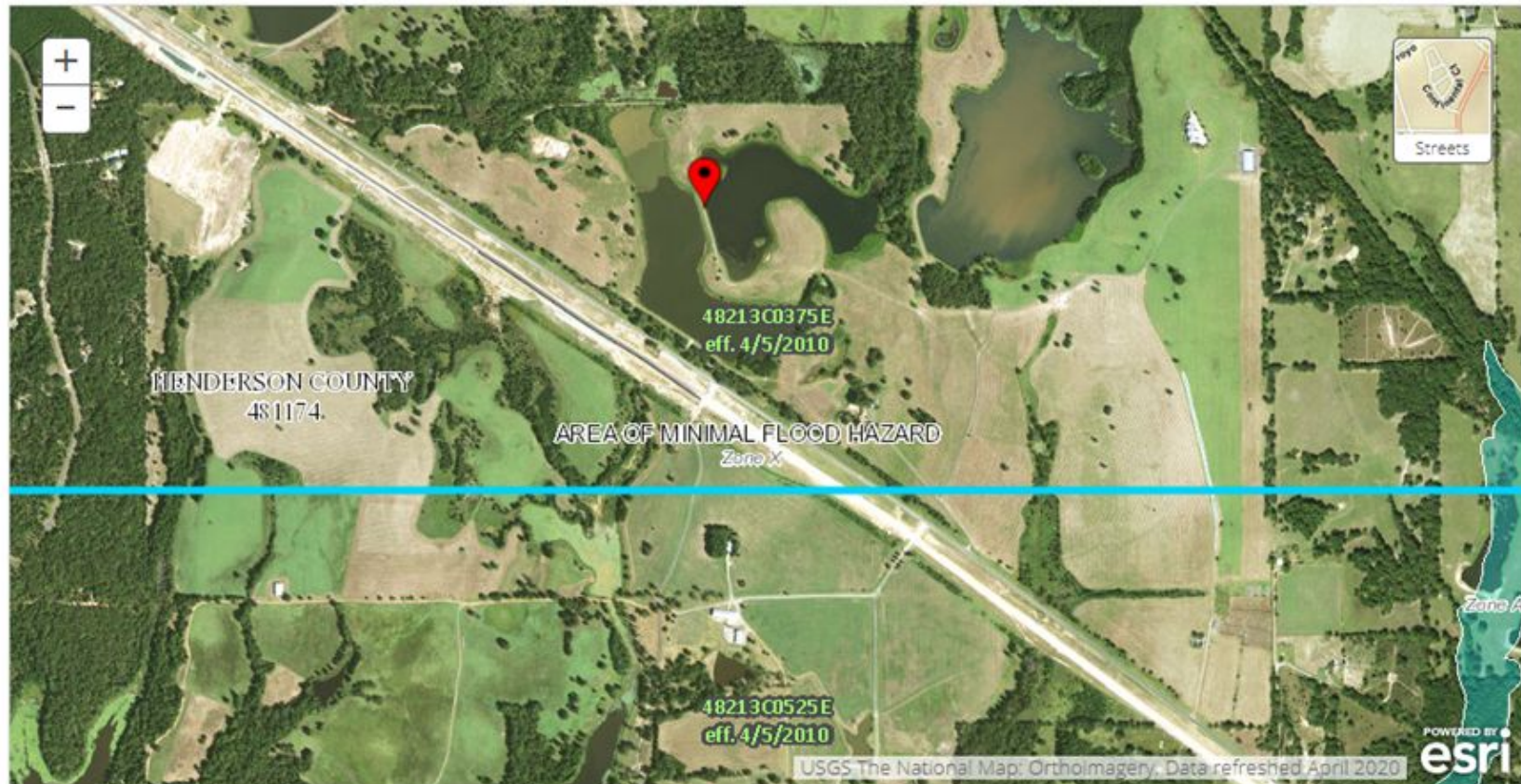


# MC GEE DAM NO. 3



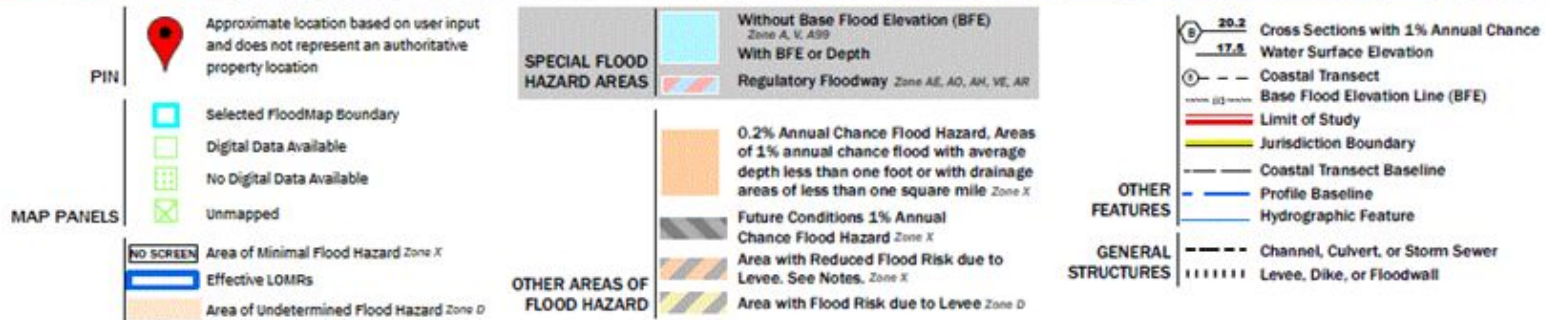
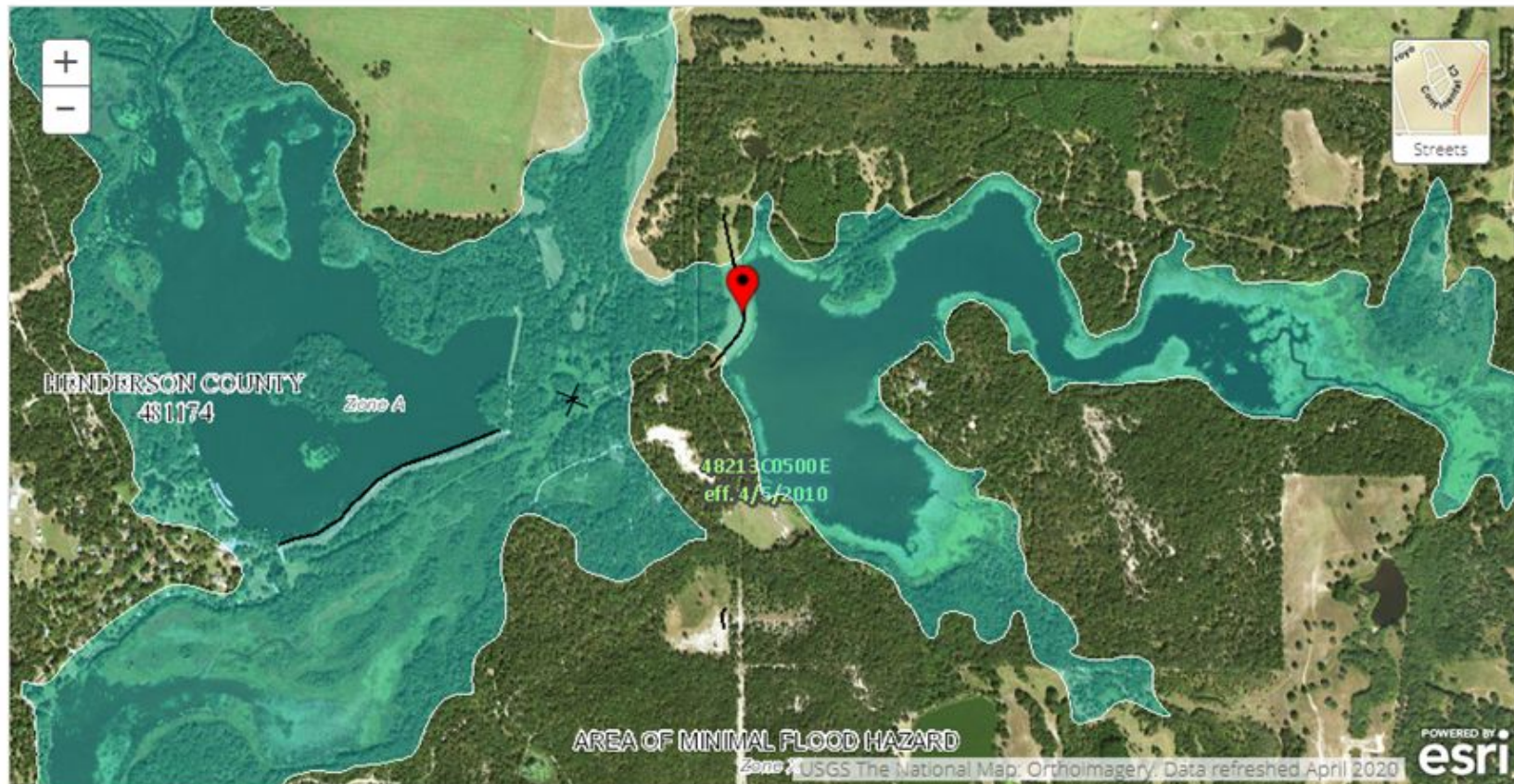


# MIDDLE LAKE DAM



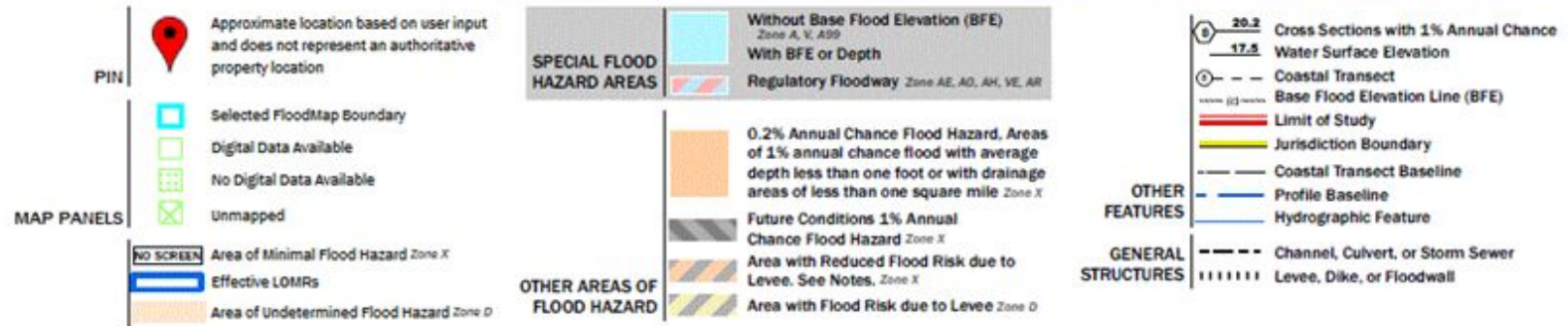
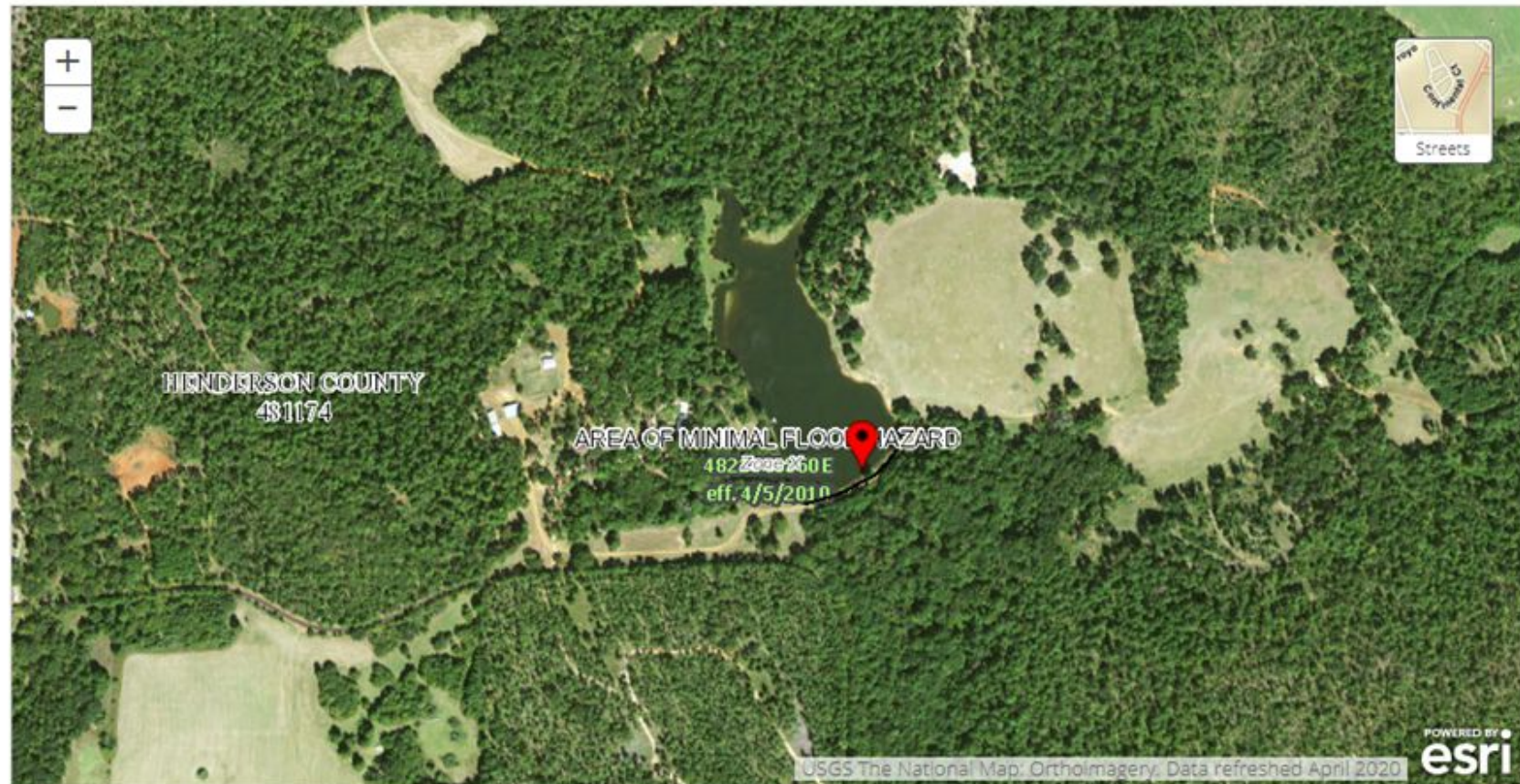


# MINE CREEK RESERVOIR DAM



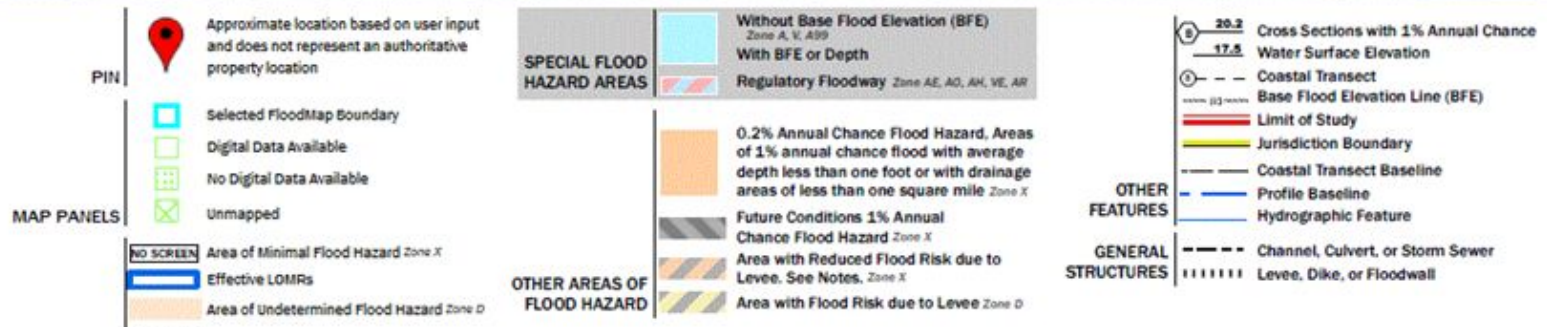


# MIXON LAKE DAM



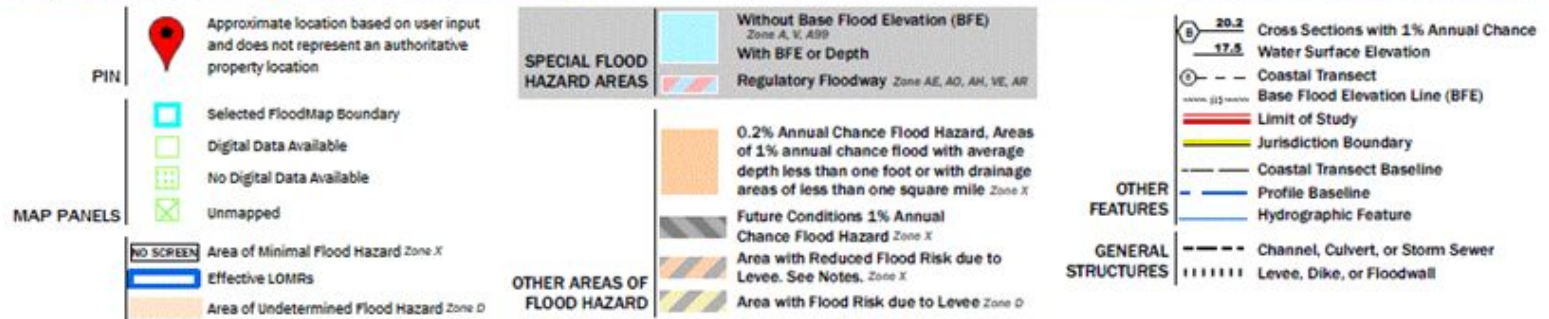
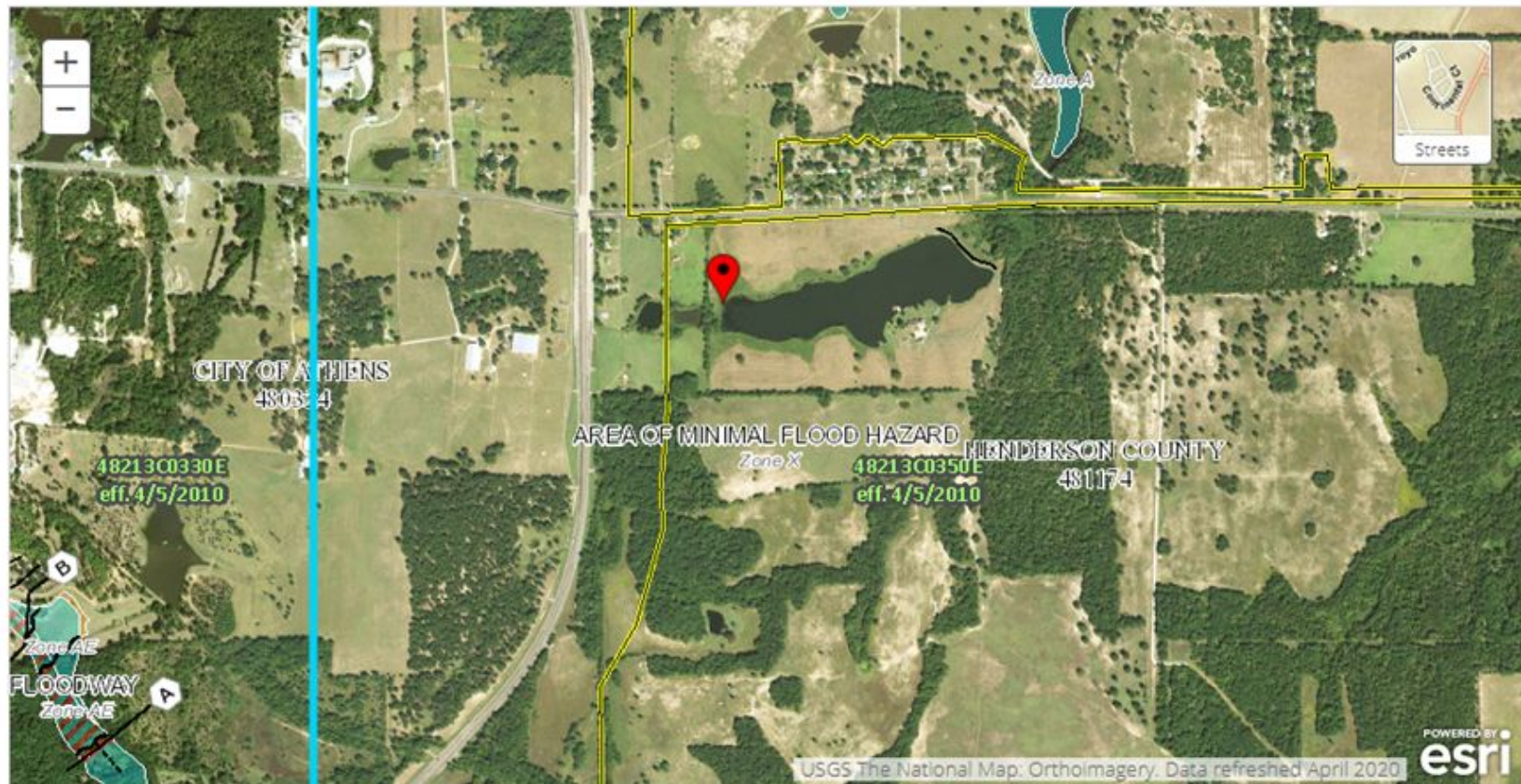


# MO MARY LAKE DAM



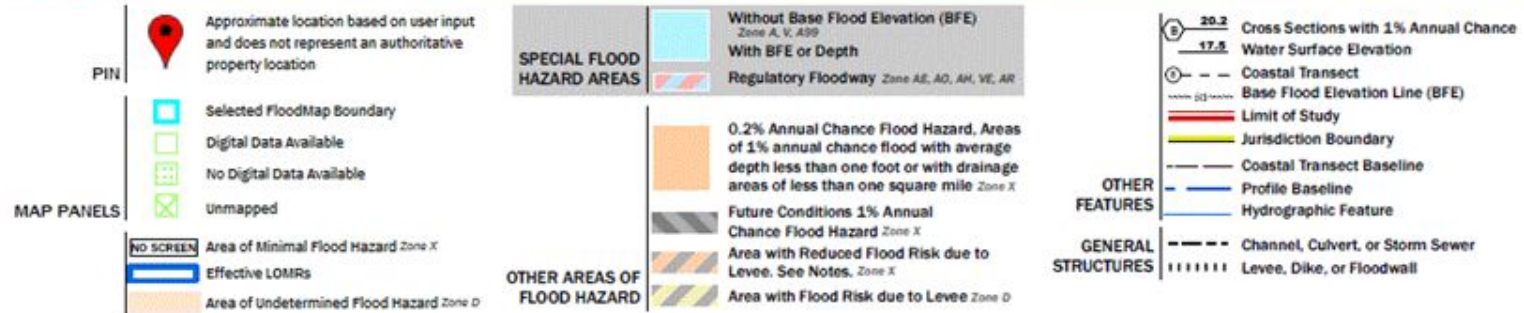


# MONORE DAM



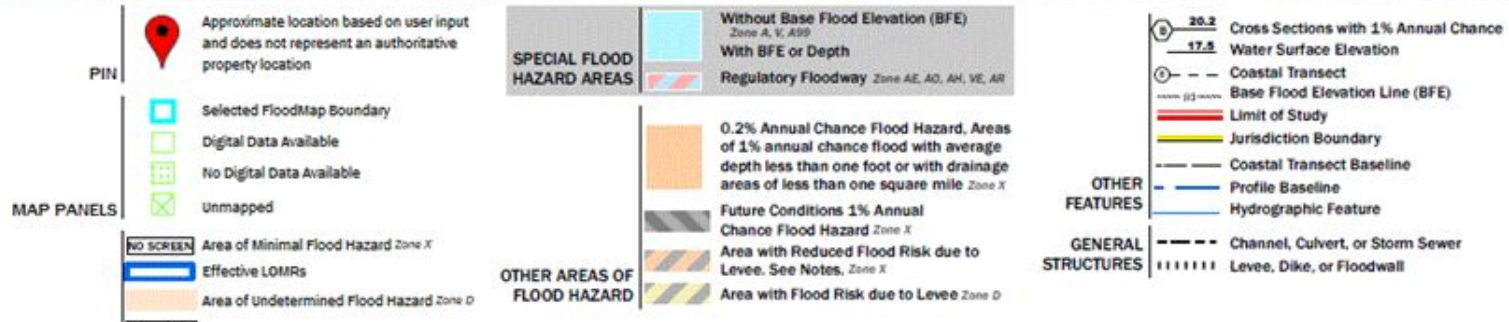
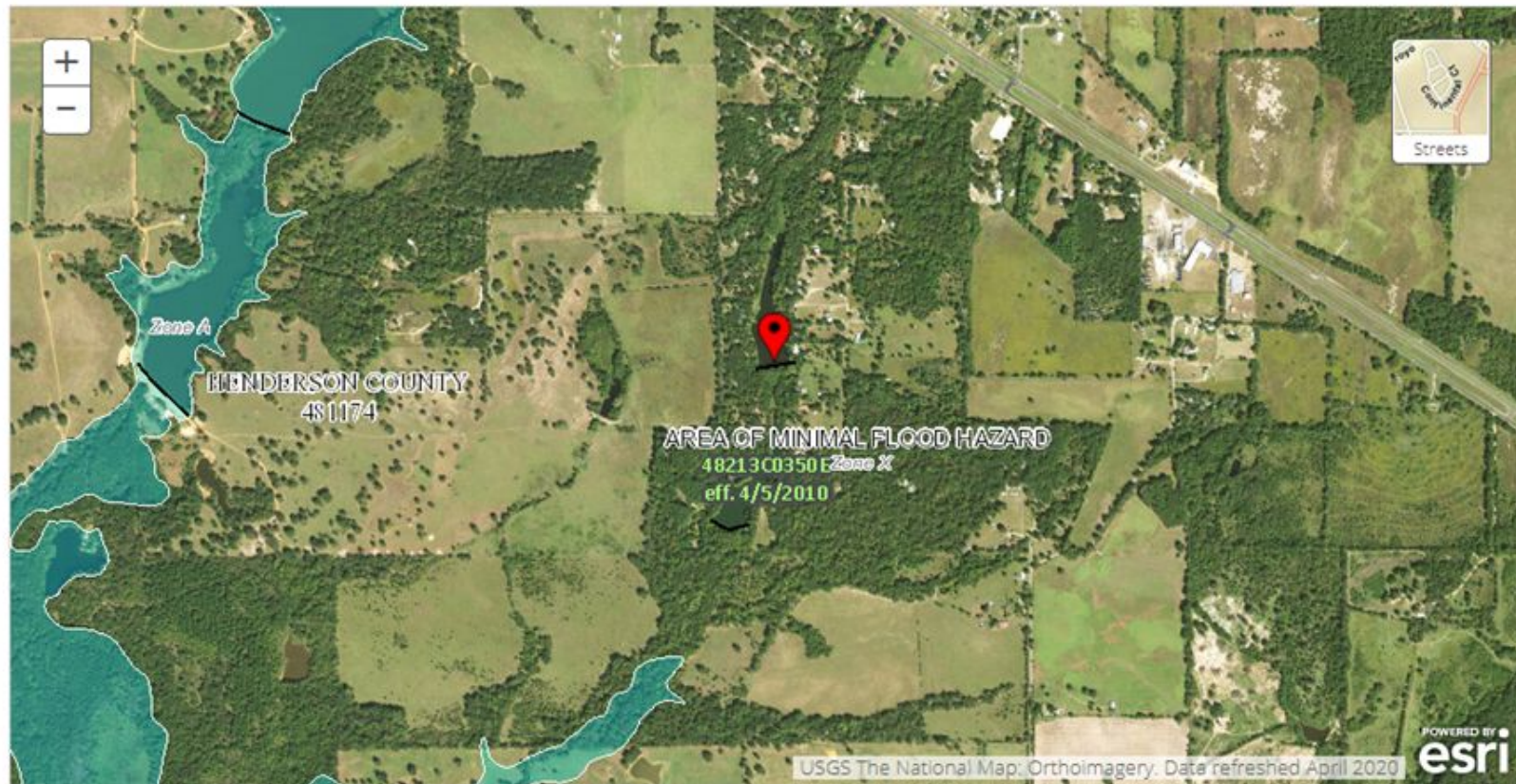


# MOONSHINE CREEK NO. 1 DAM



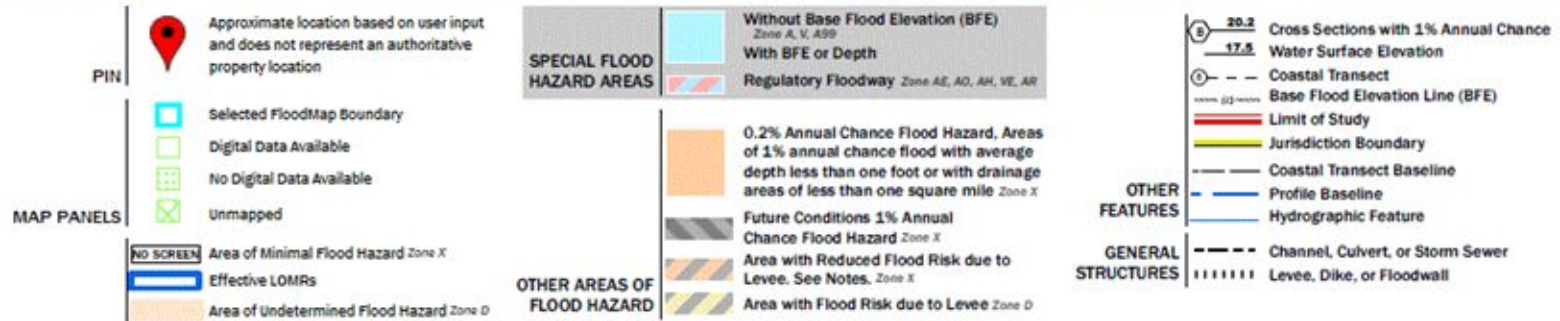
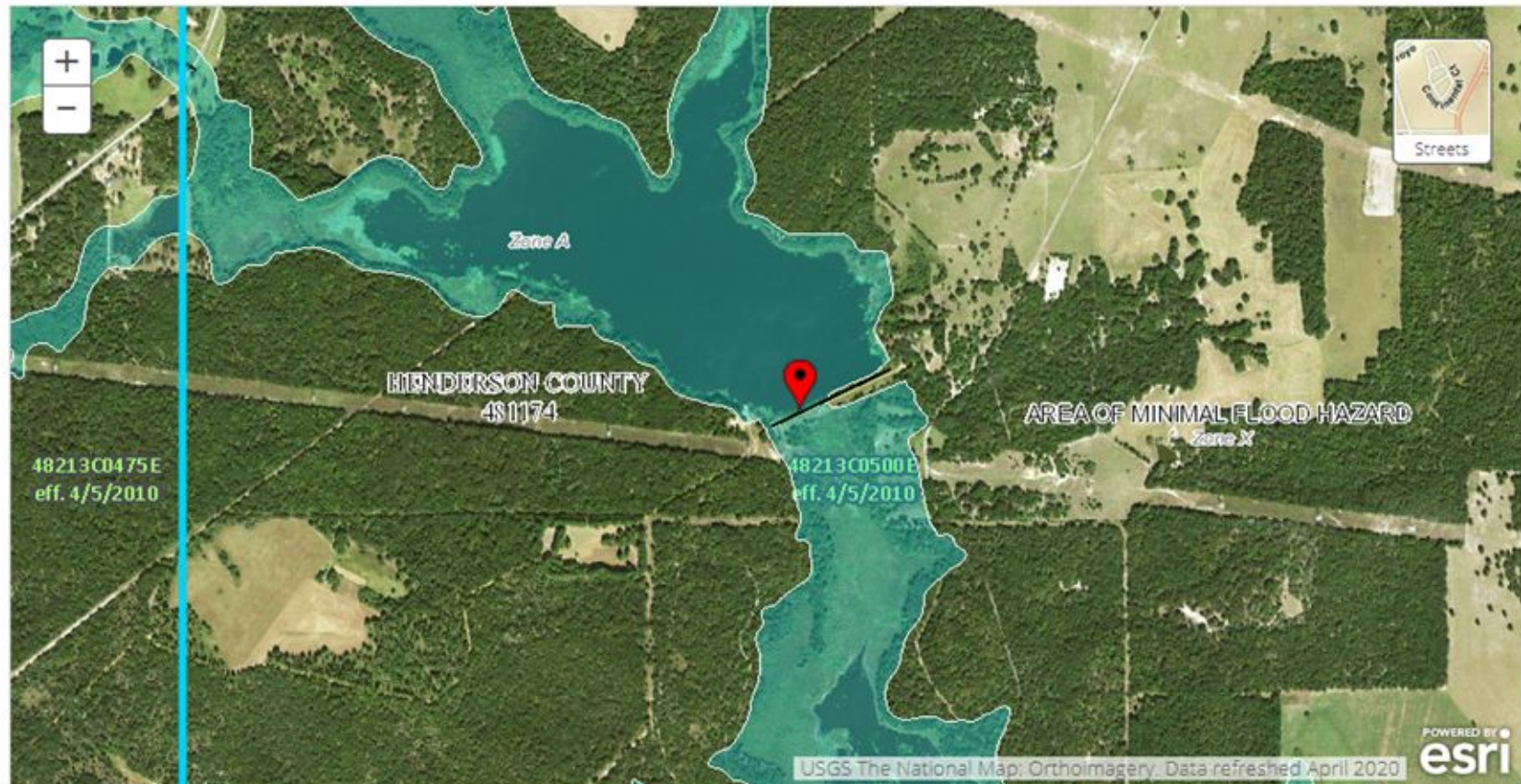


## MOONSHINE CREEK NO. 2 DAM



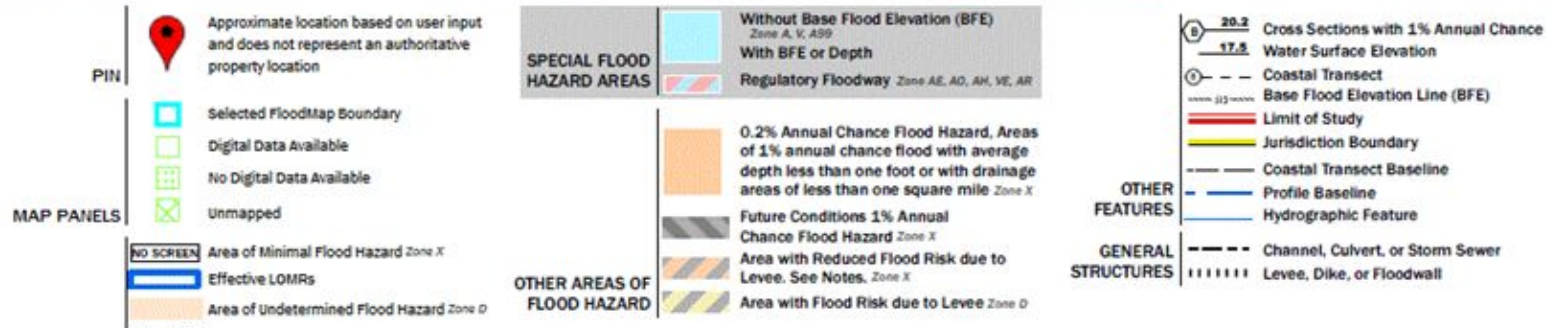
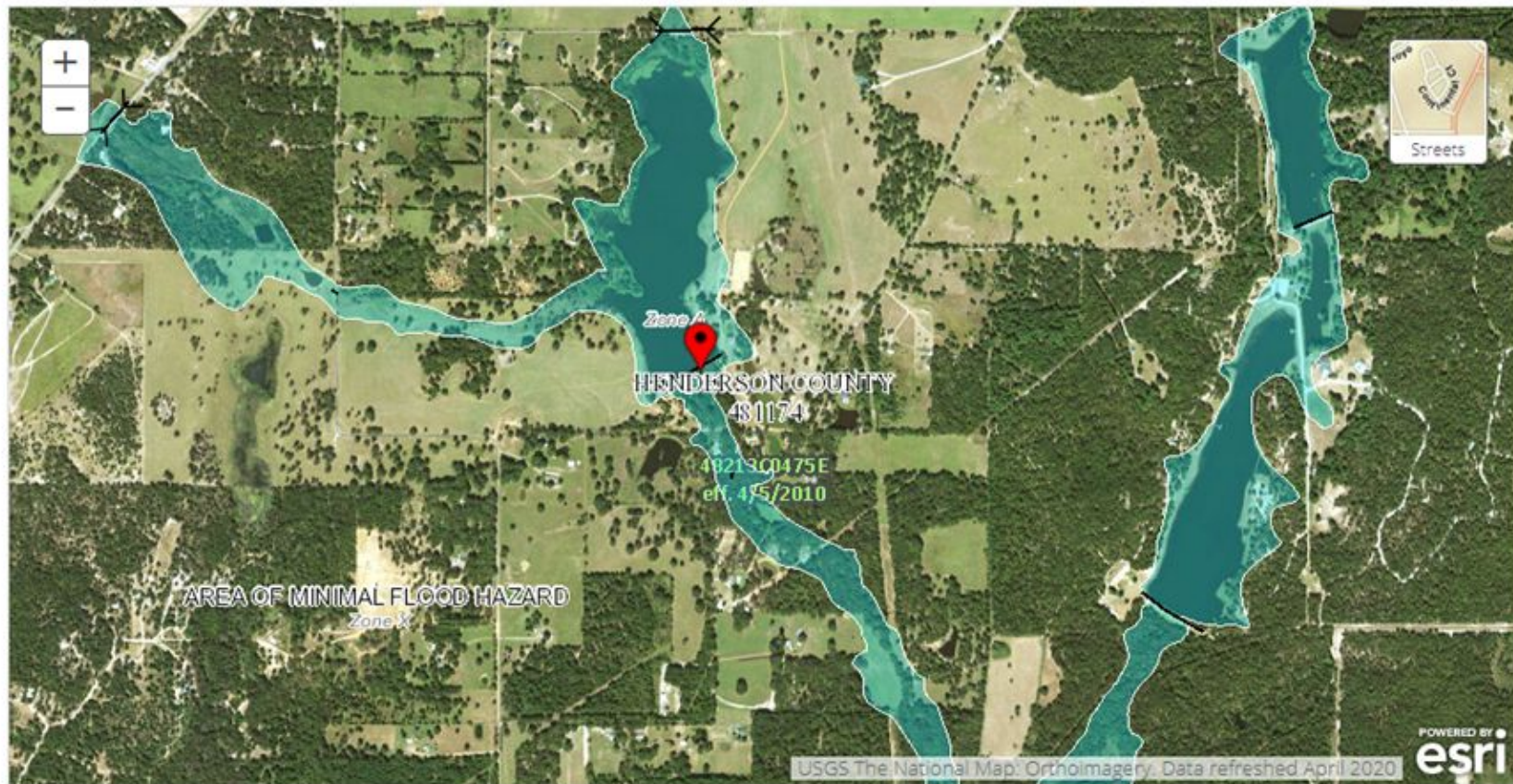


# MURCHISON LAKE DAM



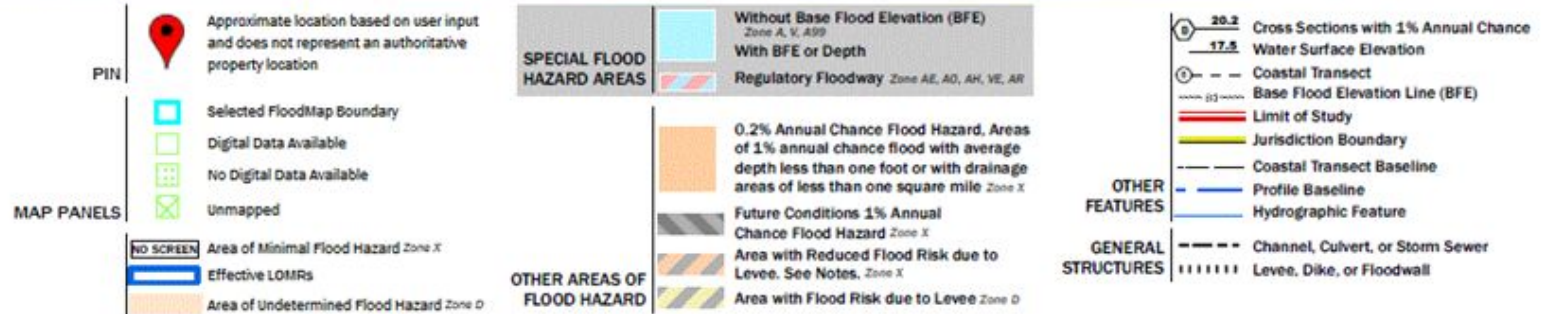
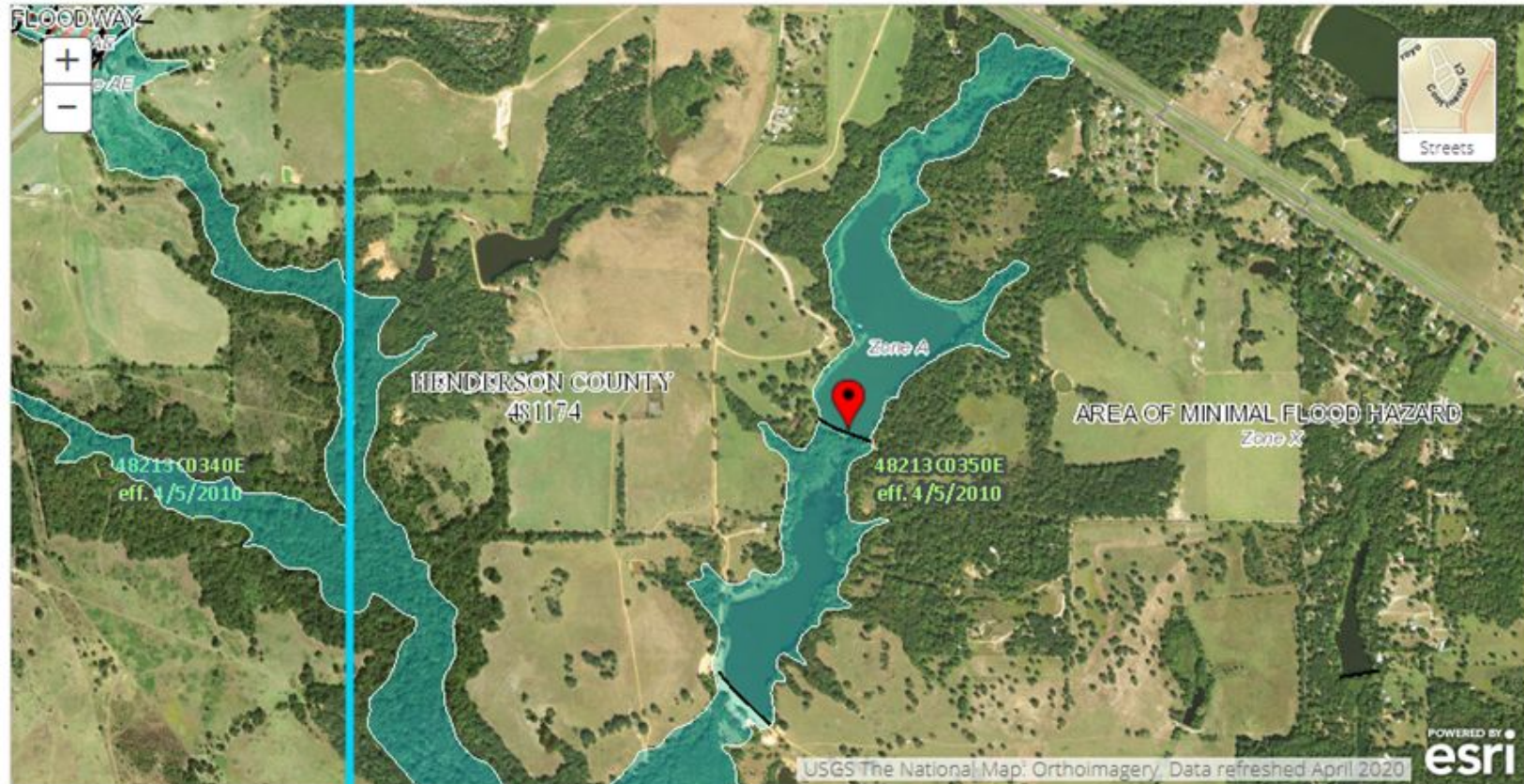


# NICHOLS LAKE DAM



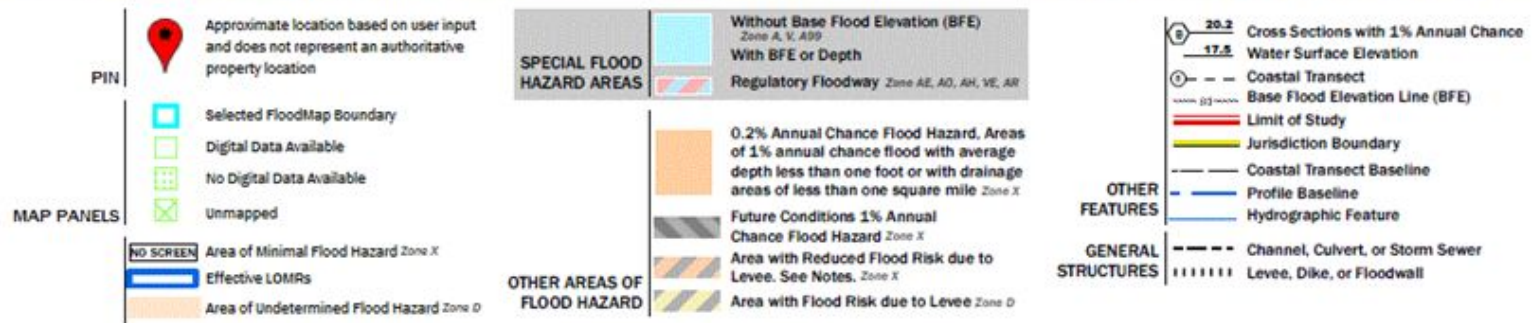


# NICHOLS NORTH LAKE DAM



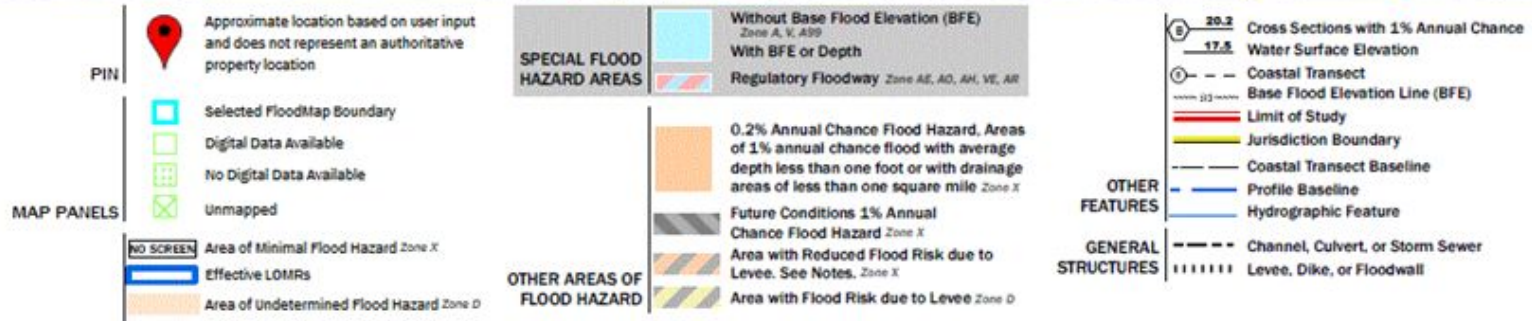
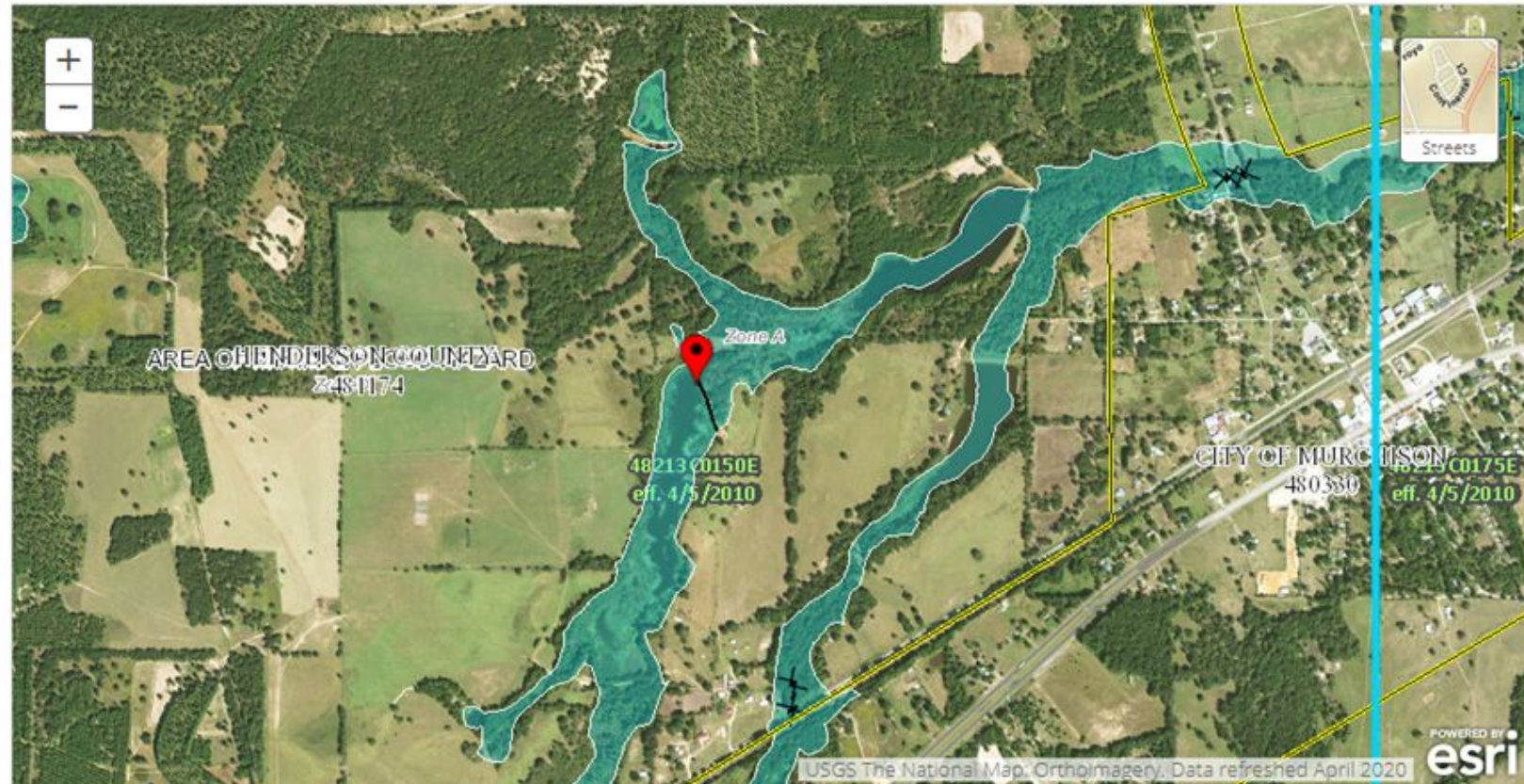


# NICHOLS SOUTH LAKE DAM



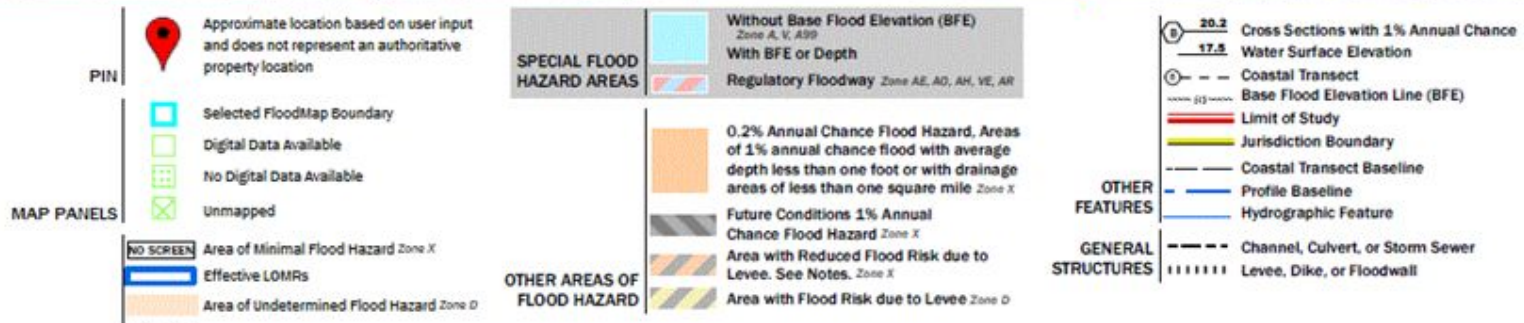
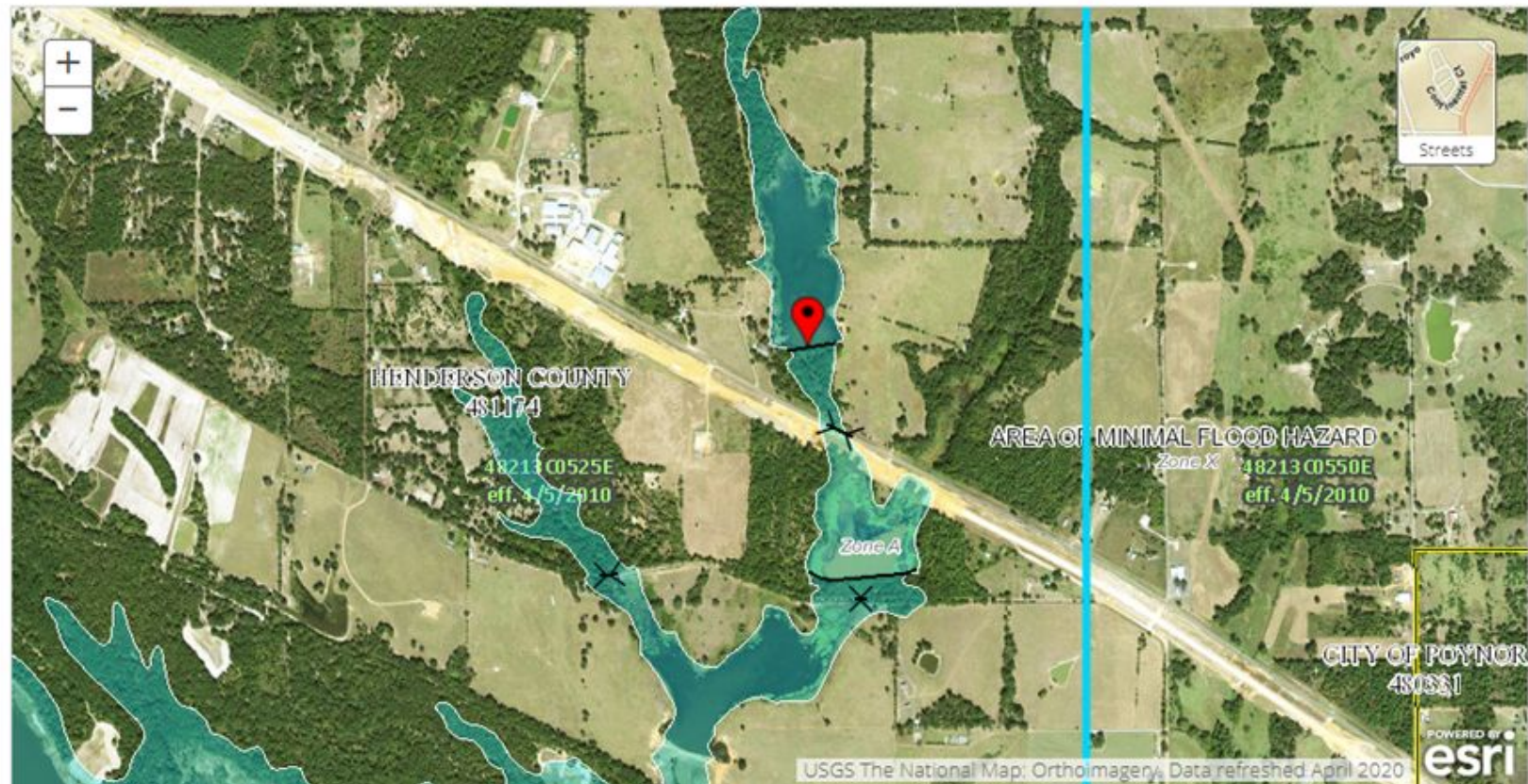


# NM JACKSON DAM



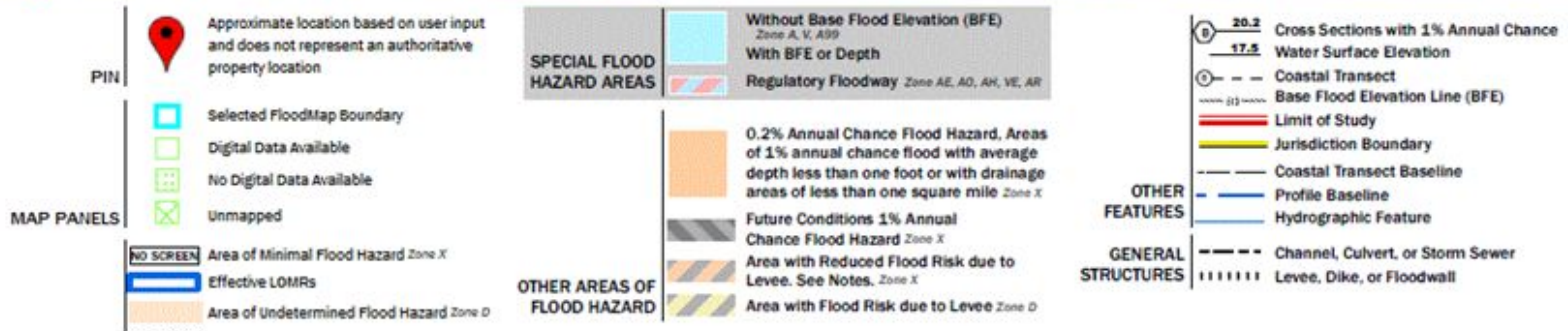


# NORTH LAKE DAM



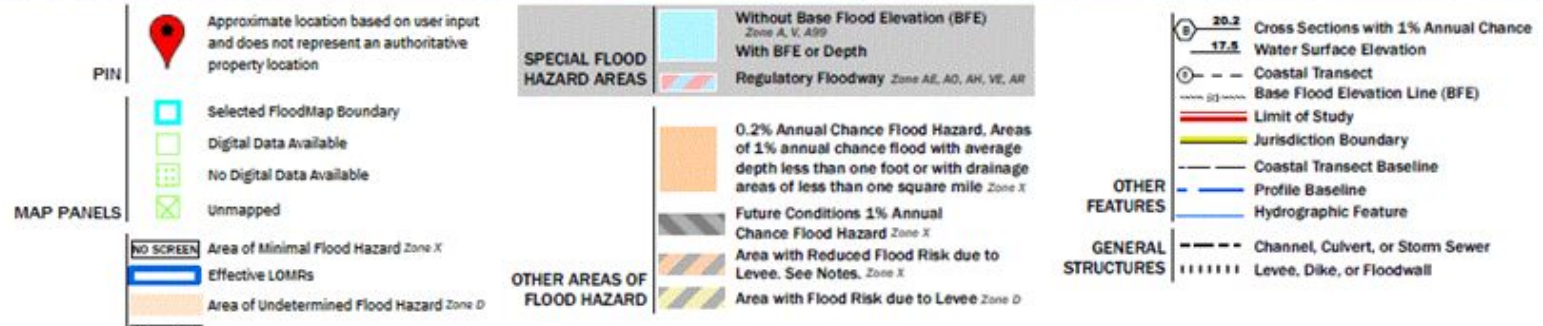


# OLD LAKE DAM



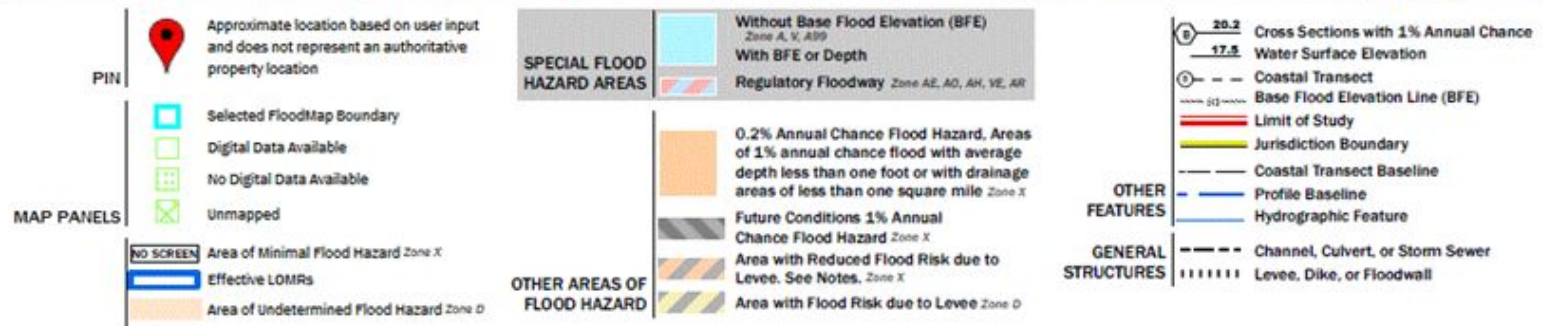


# PERRYMAN LAKE DAM



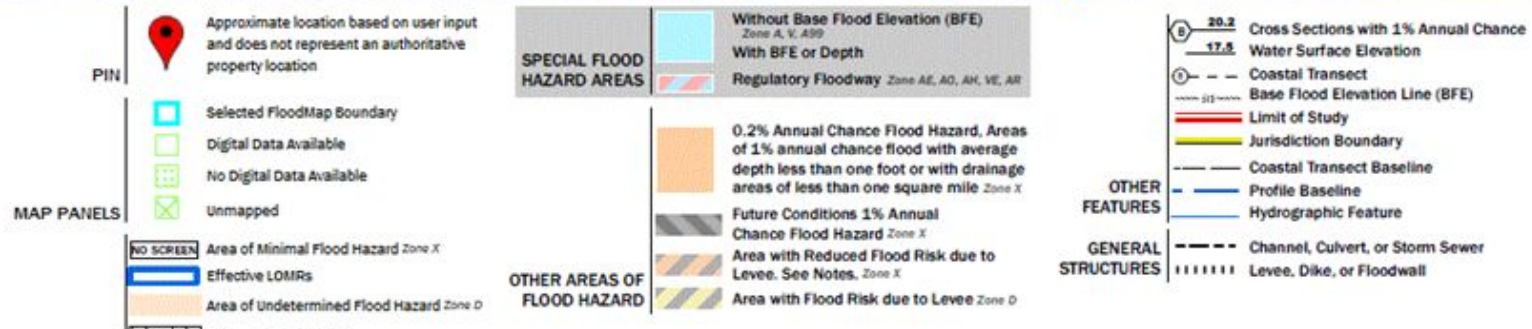
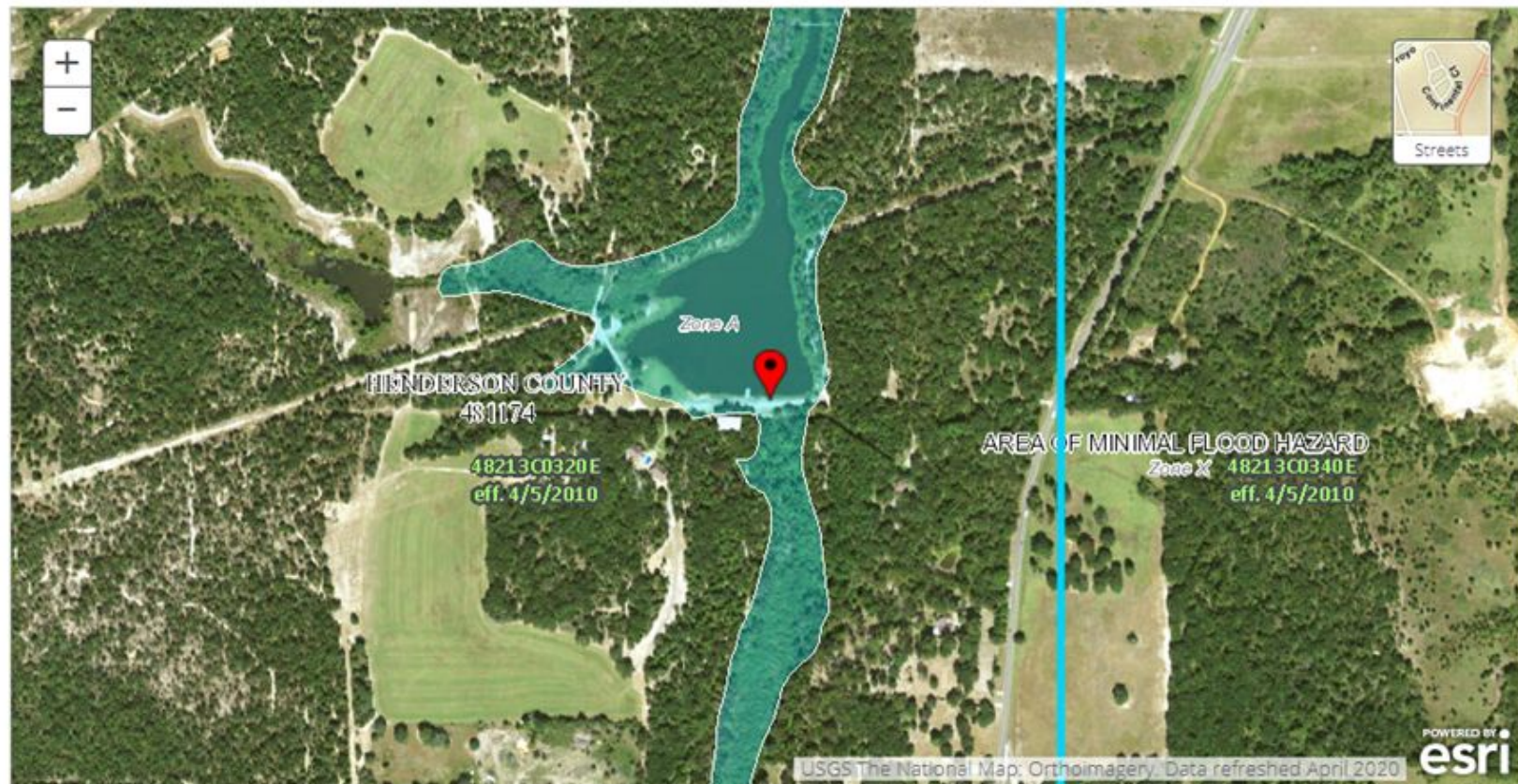


# PRATT LAKE DAM



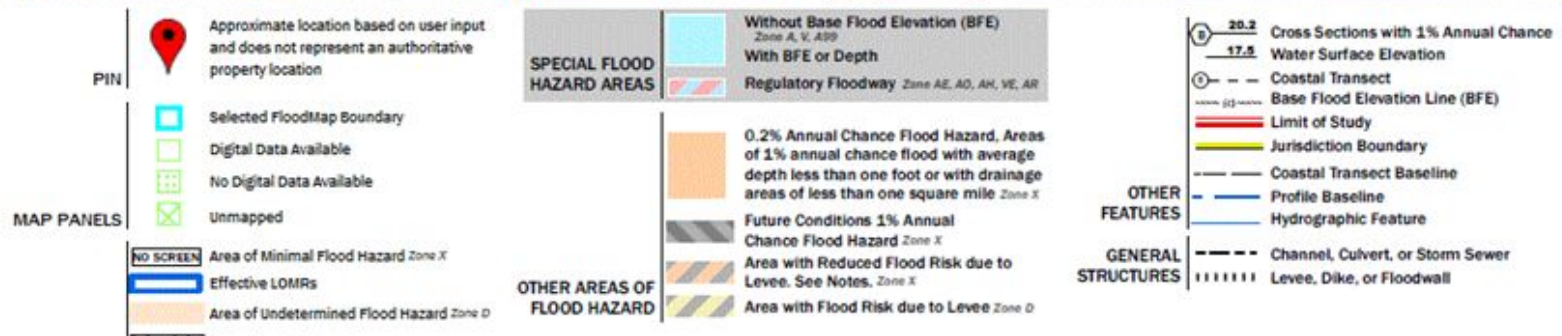
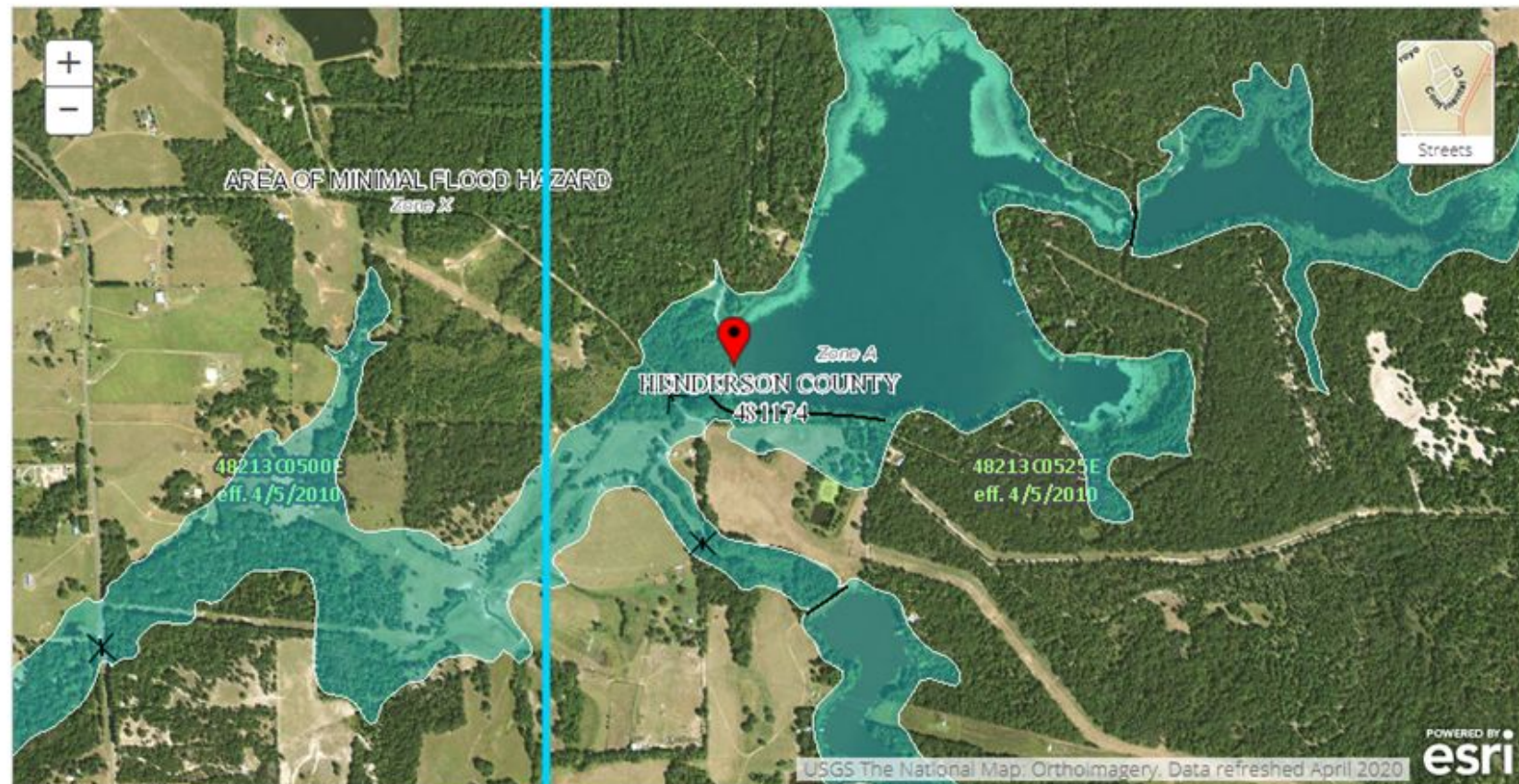


## PRIMACY DAM NO. 2



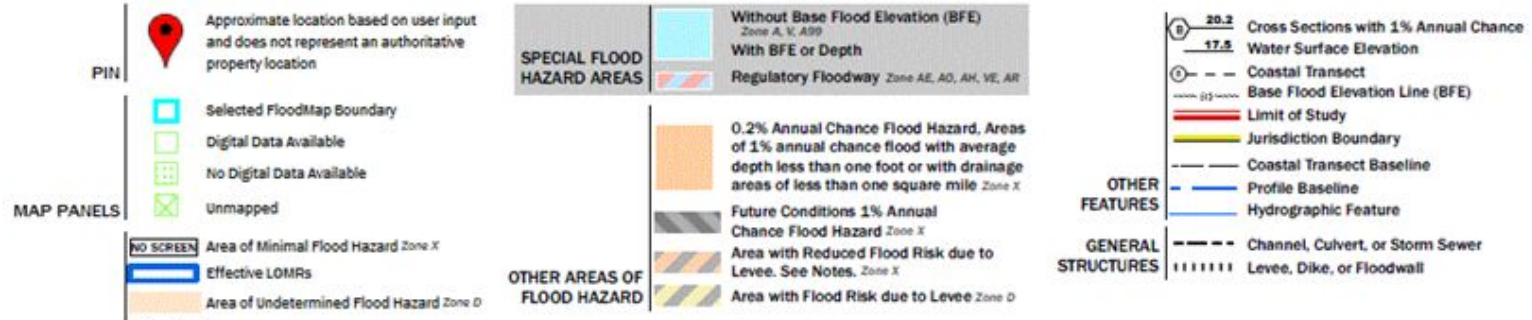
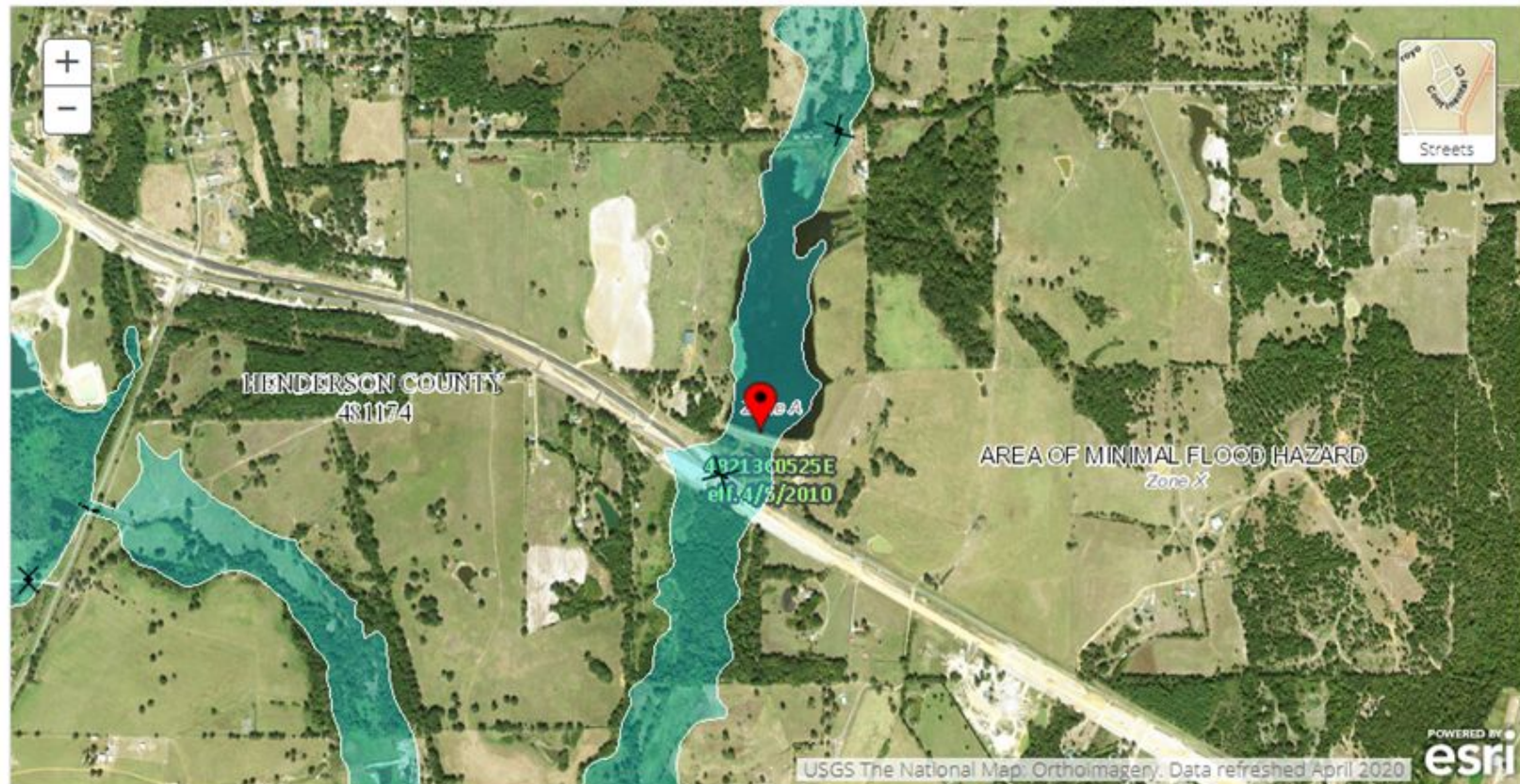


# RAINBO LAKE DAM



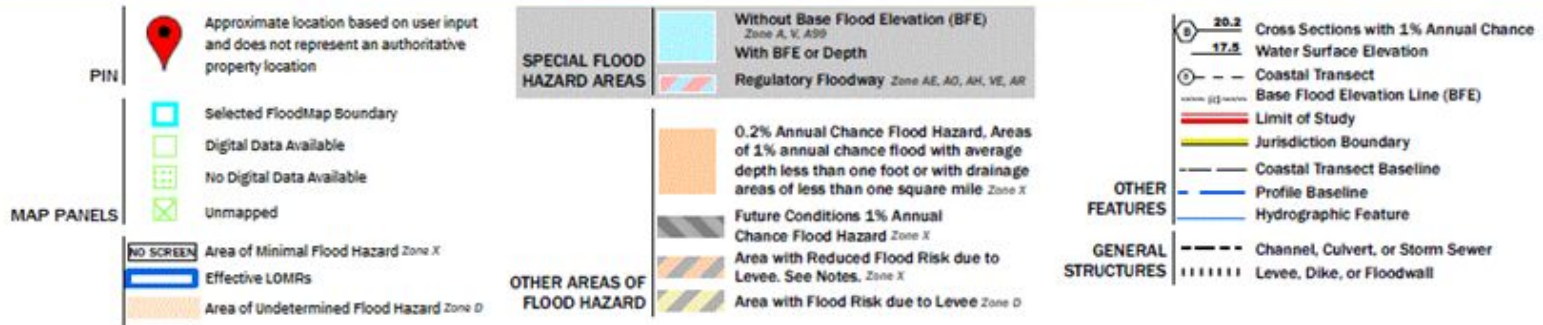
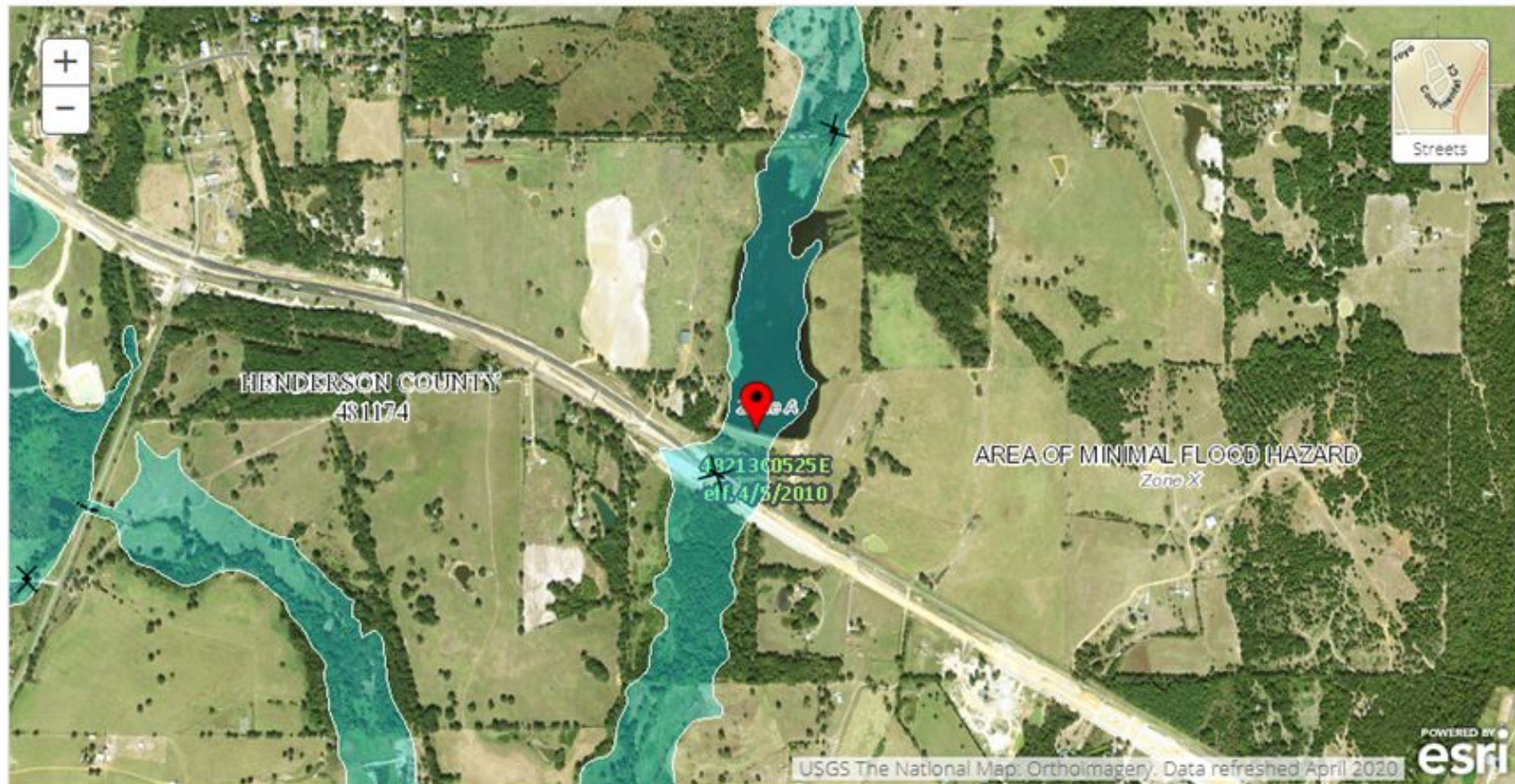


# ROBERSON LAKE DAM



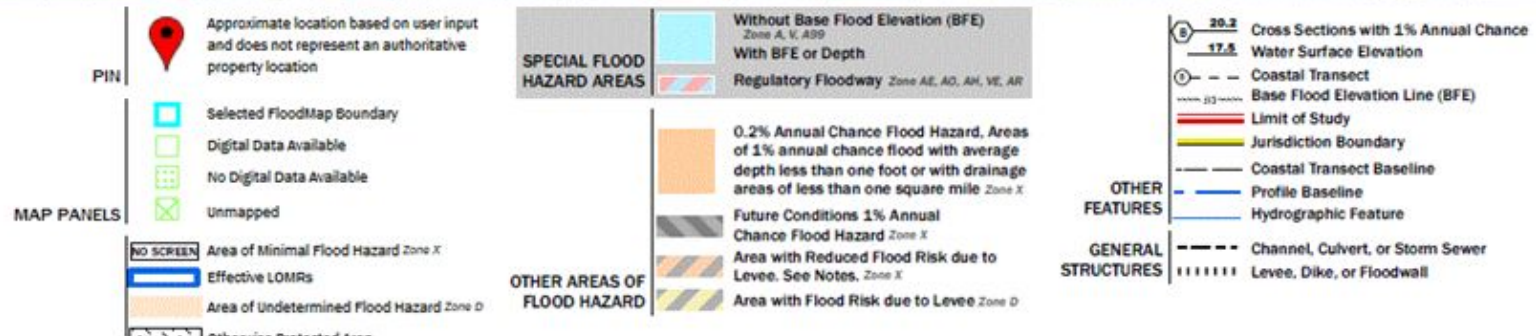
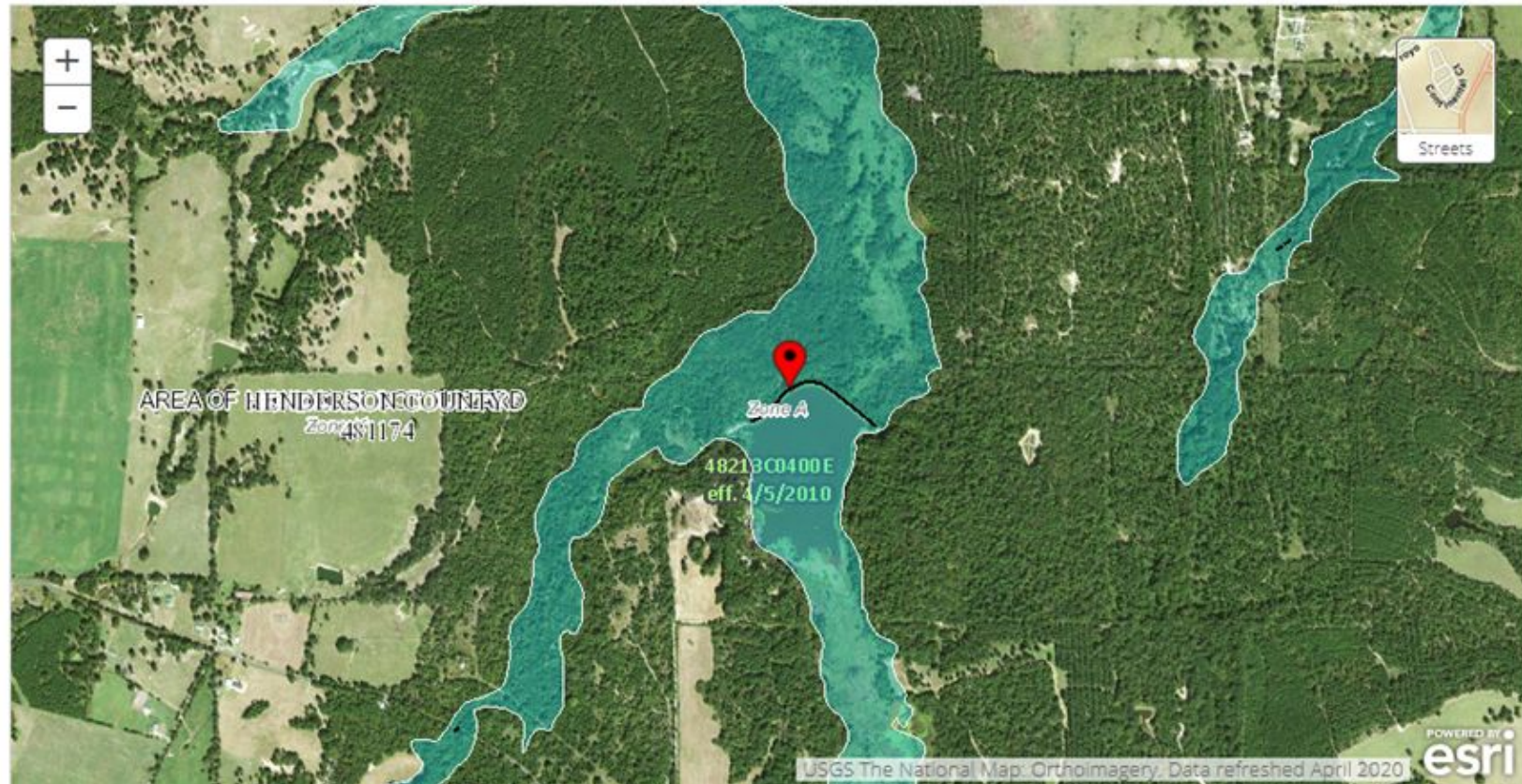


# ROBERTSON LAKE DAM



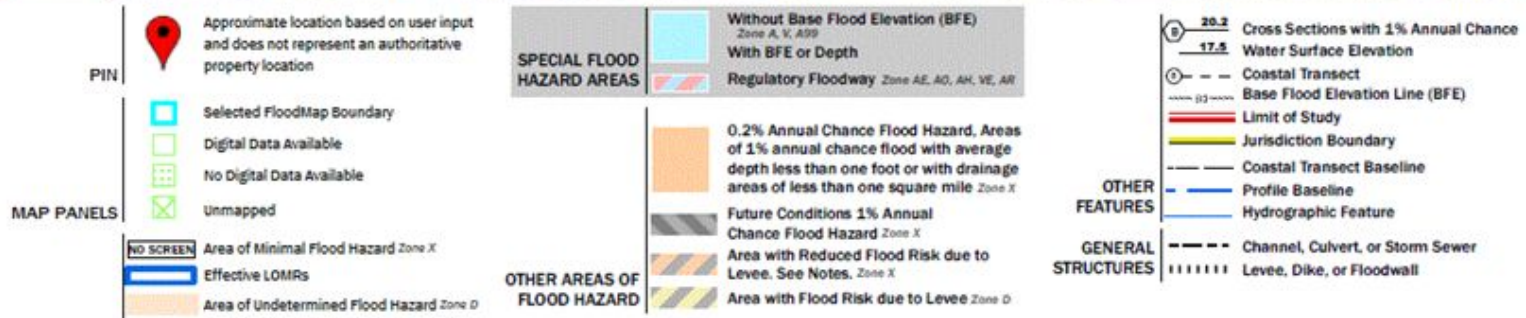
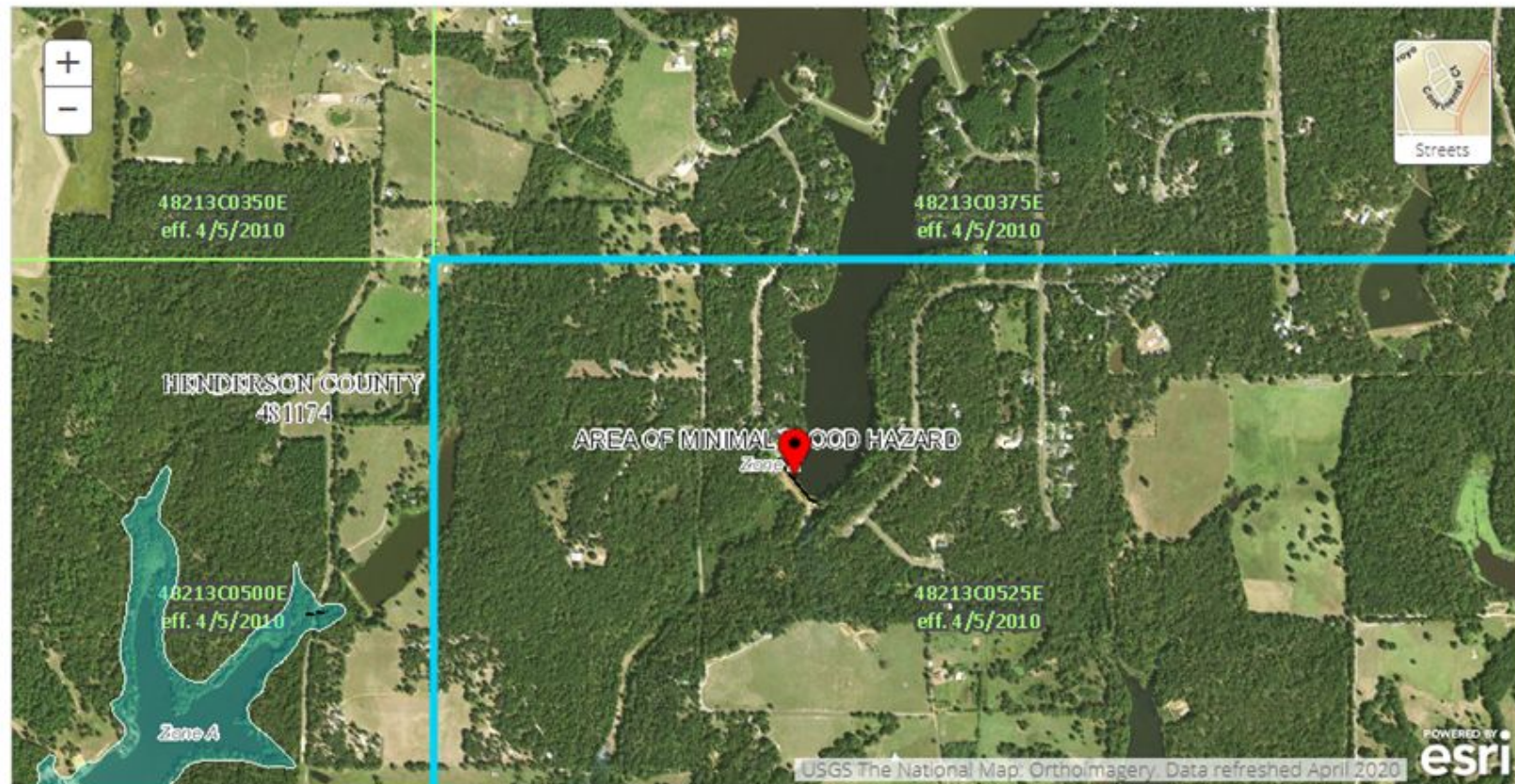


# RODGERS LAKE DAM



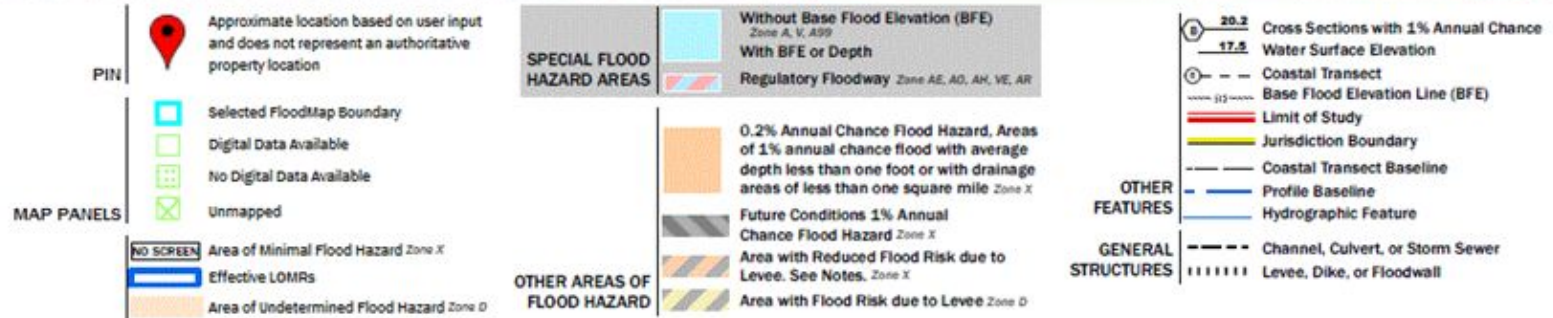


# SAFARI LAKE DAM



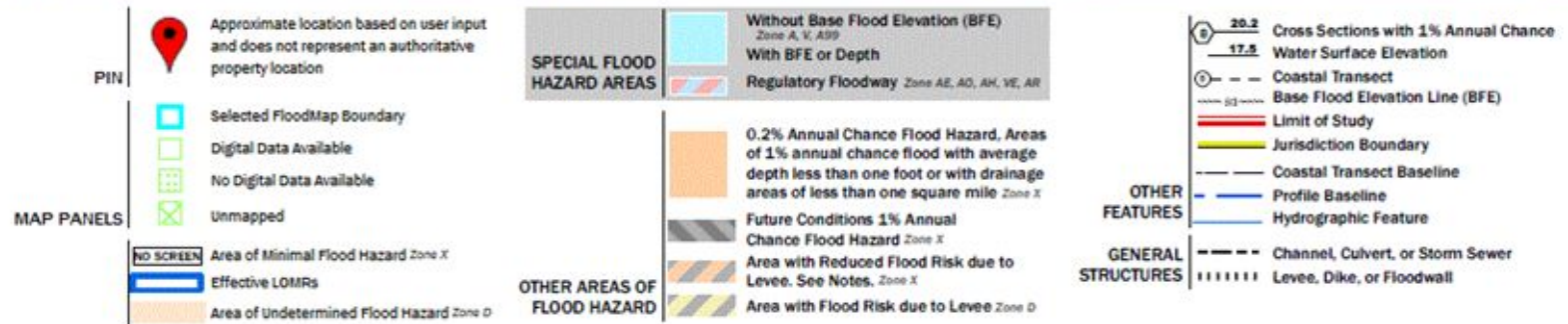
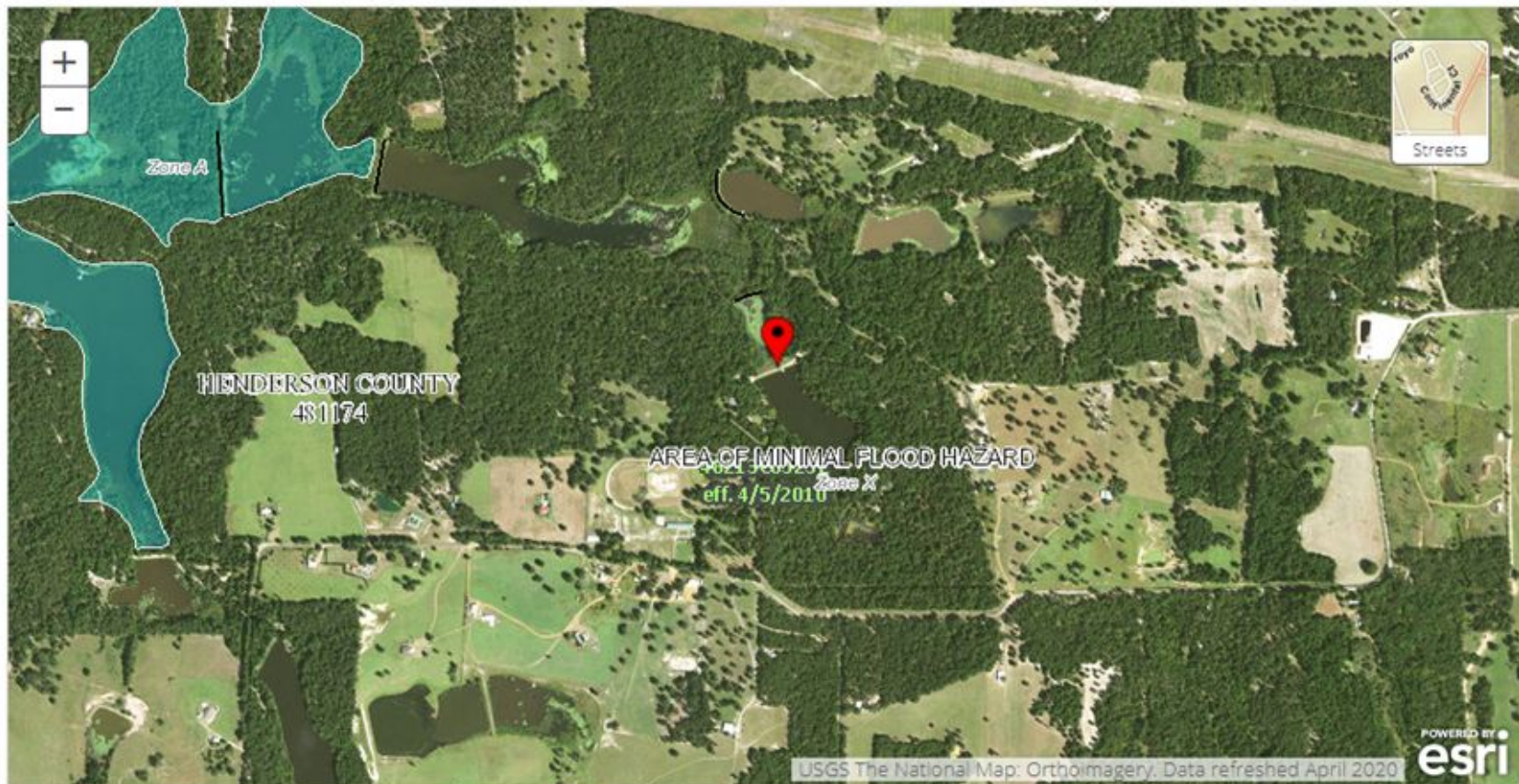


# SHELTON LAKE DAM



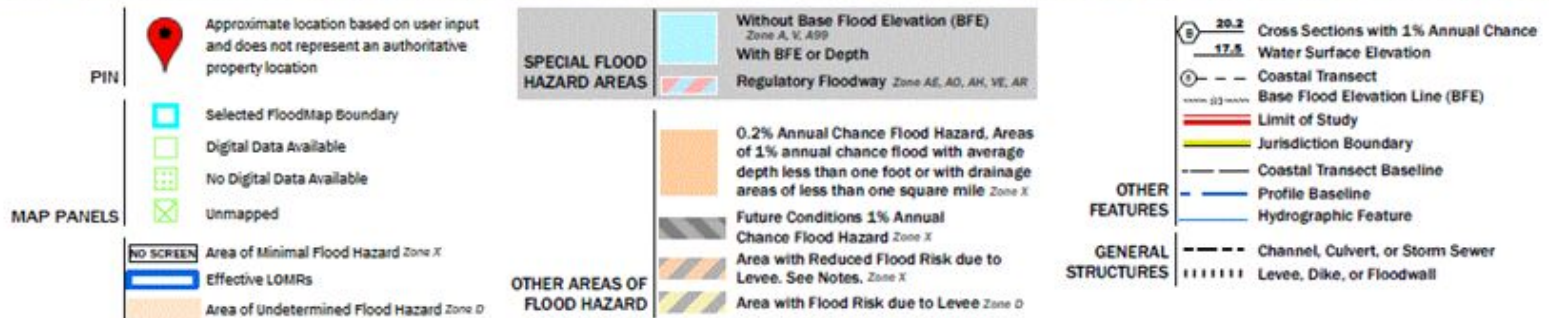
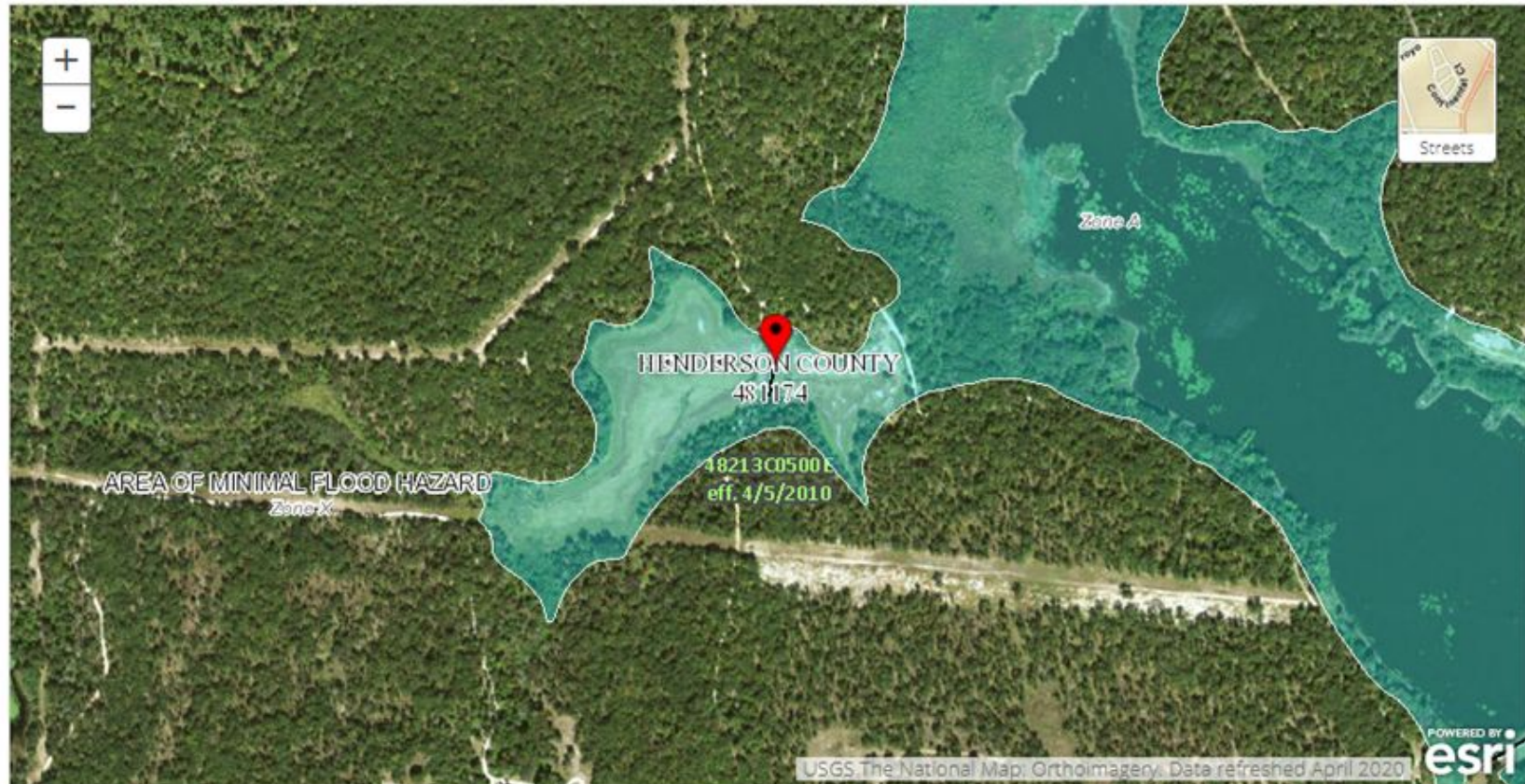


## SITE C LAKE DAM



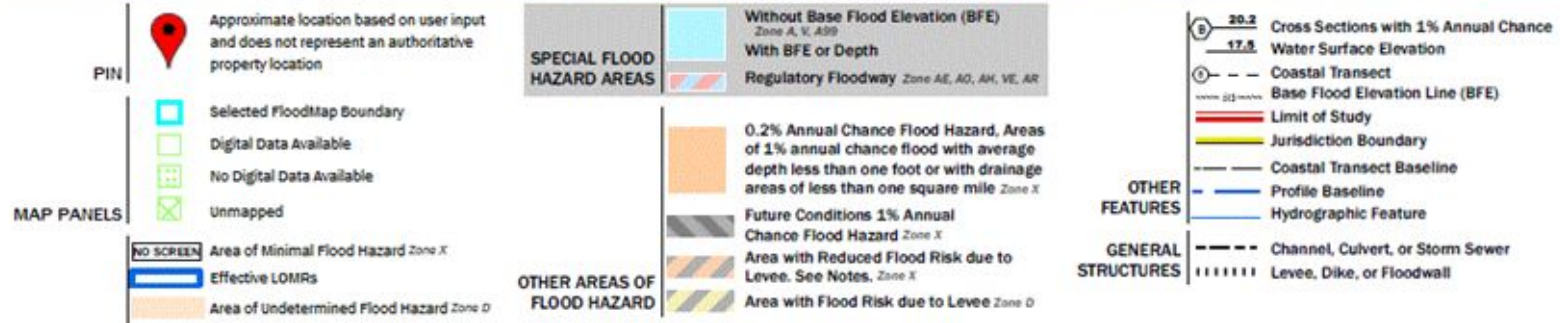
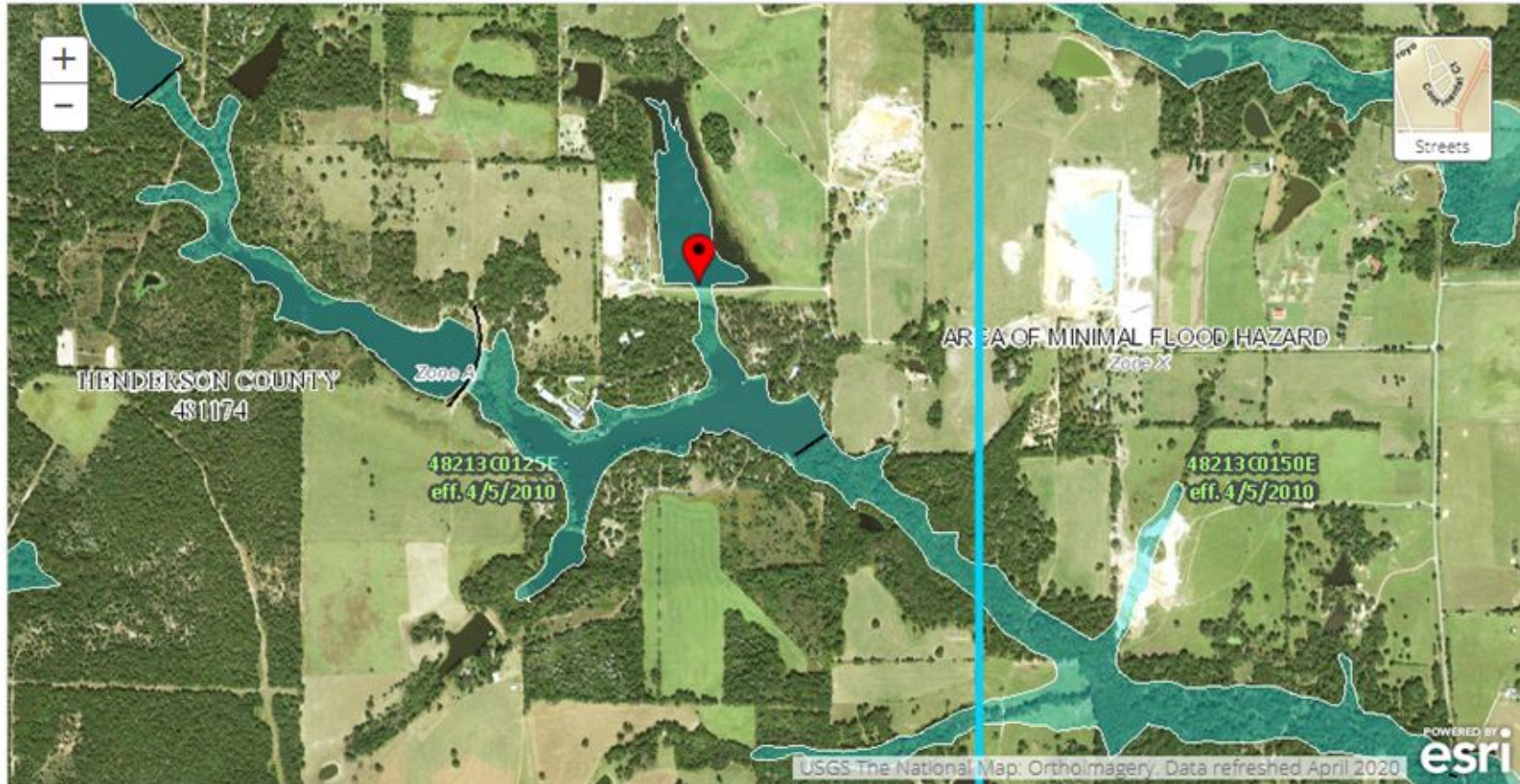


# SLAUGHTER LAKE DAM 1





# SMITH LAKE DAM (CR 3901)



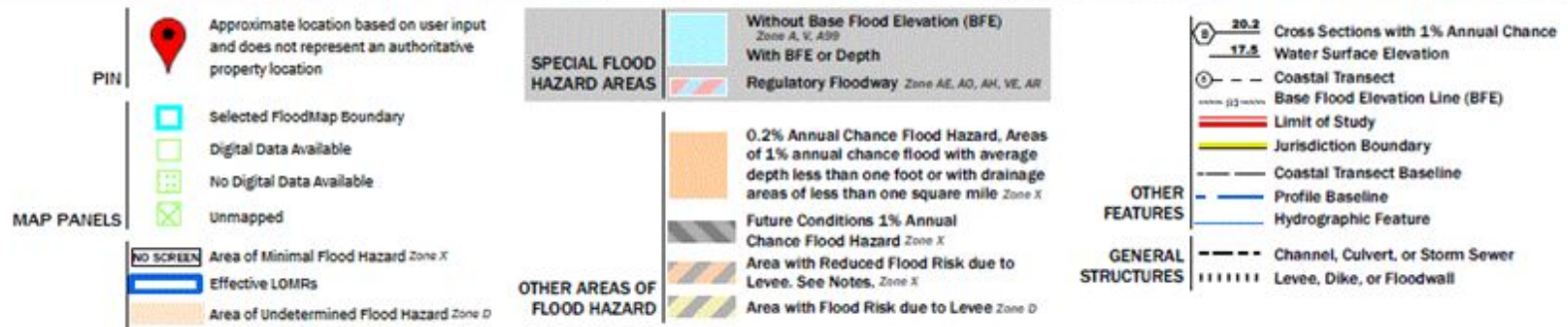
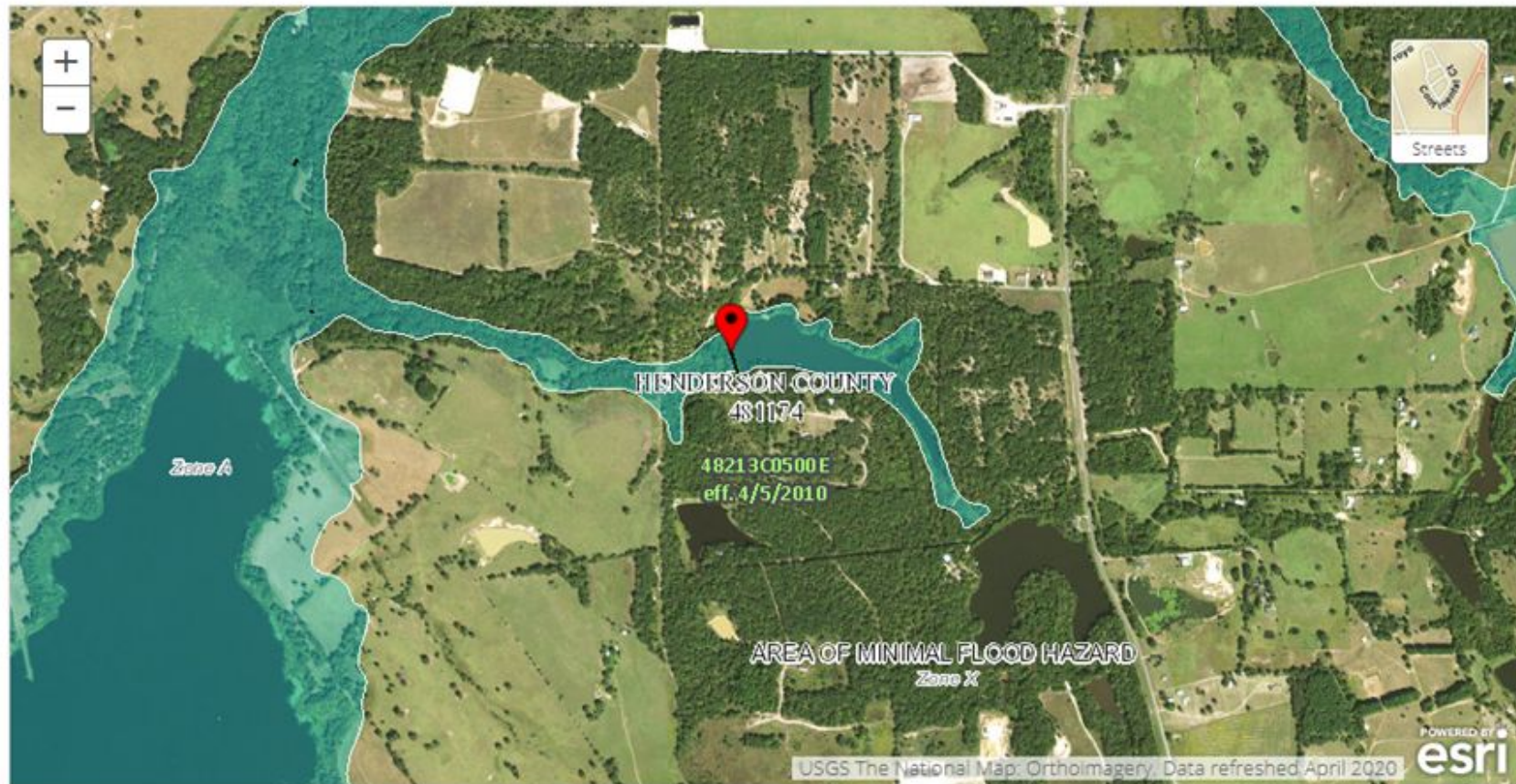


# SMITH LAKE DAM (FM 2495)



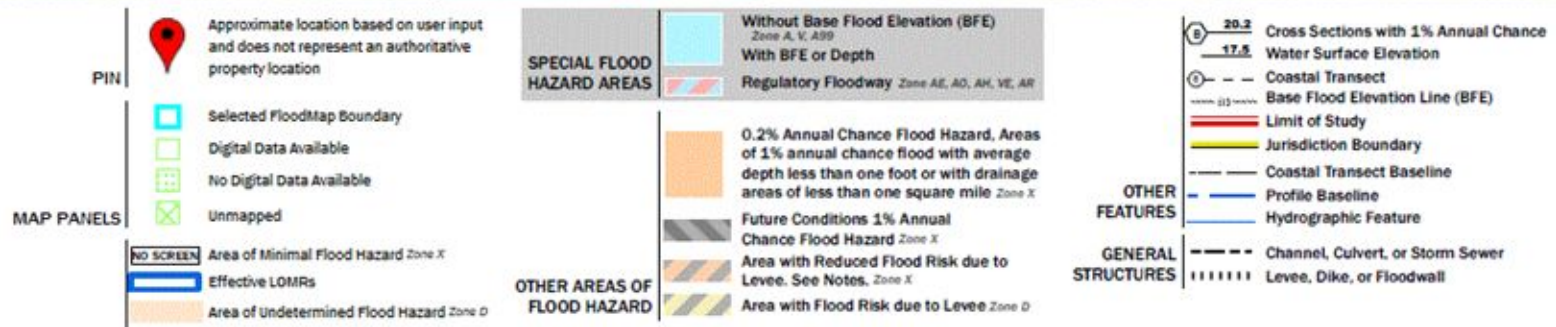
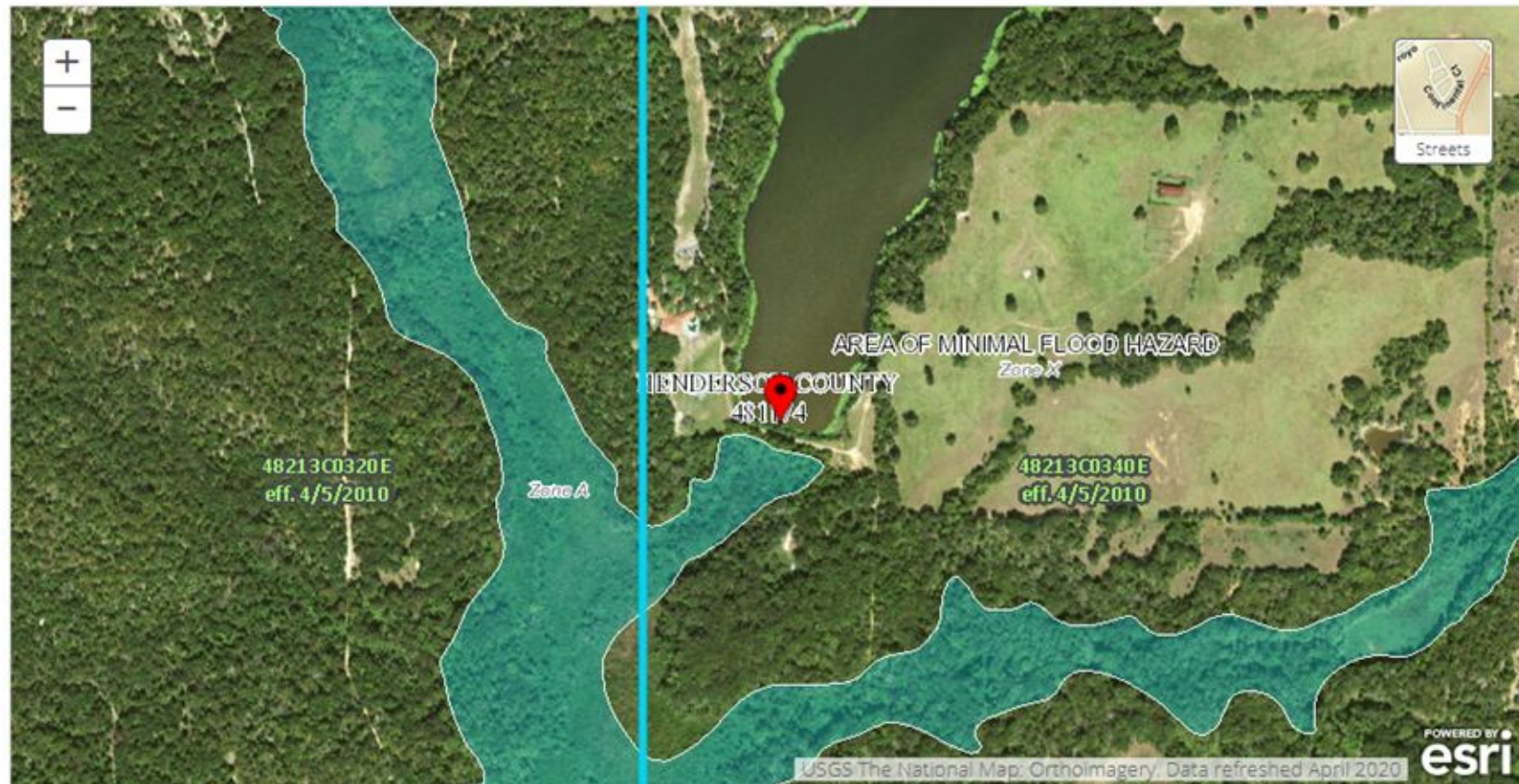


# SOUTTER LAKE DAM



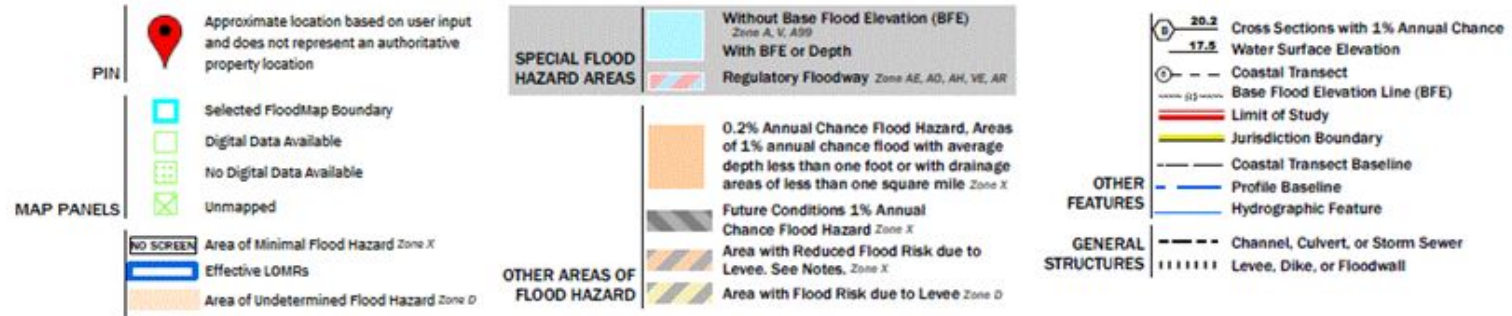
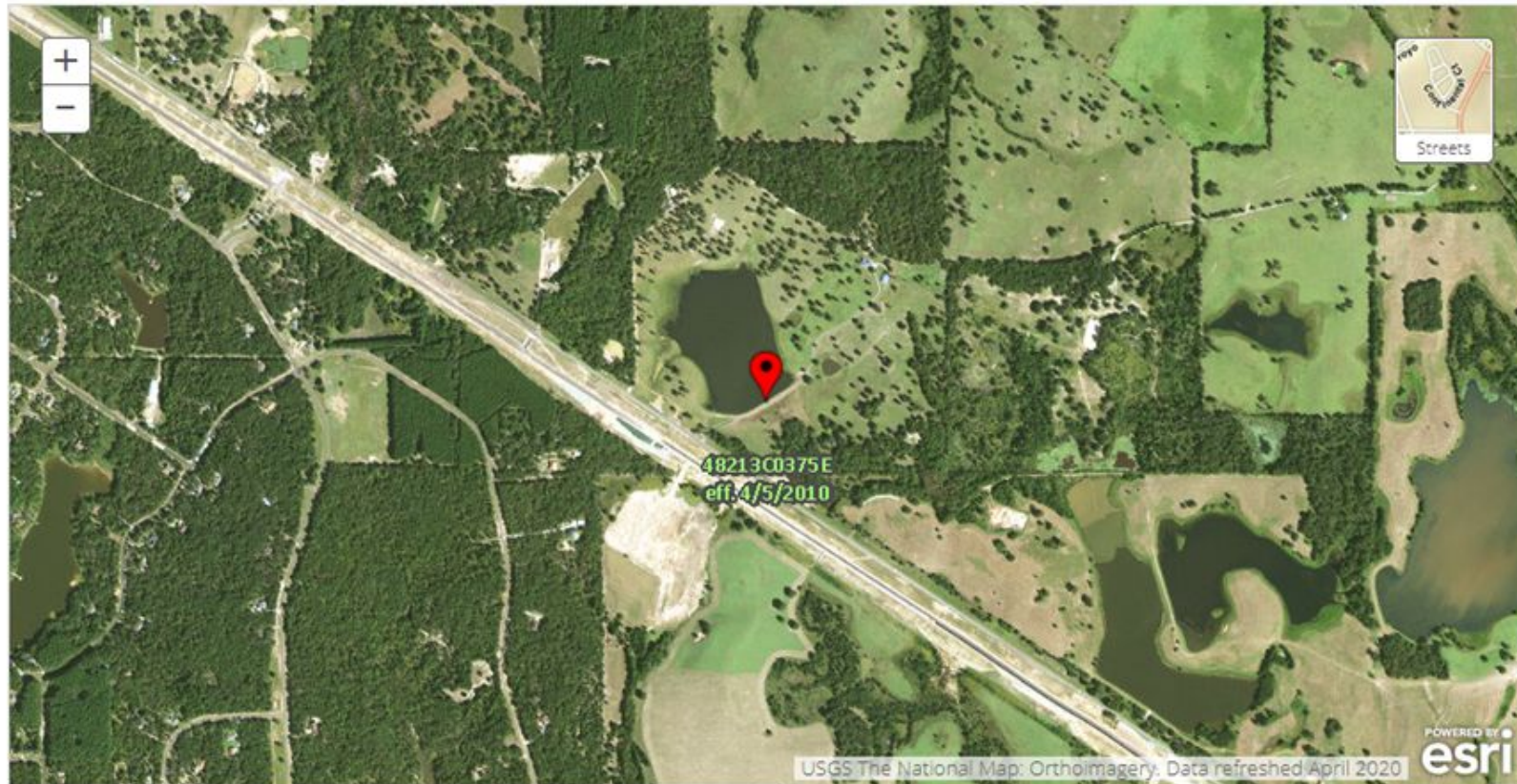


# SPORTSMANS LAKE DAM



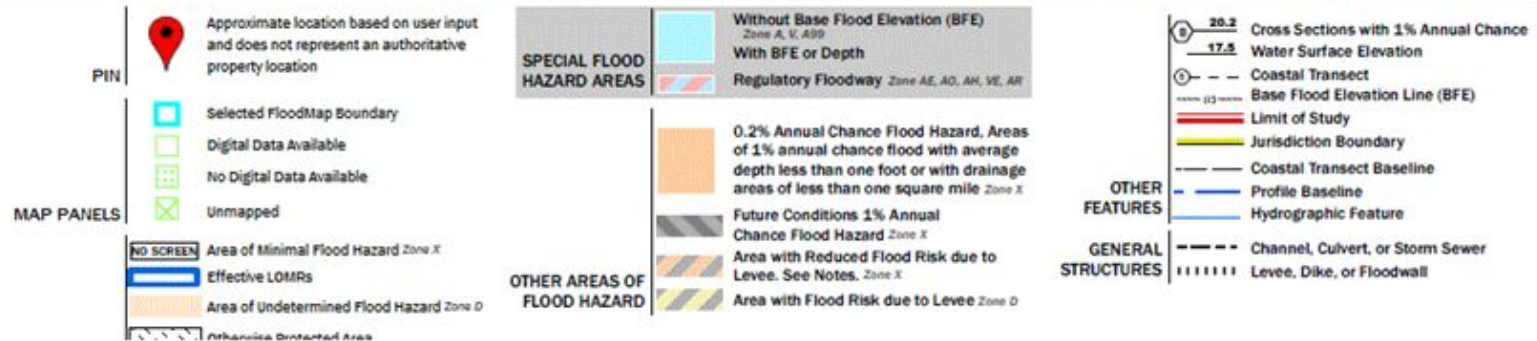
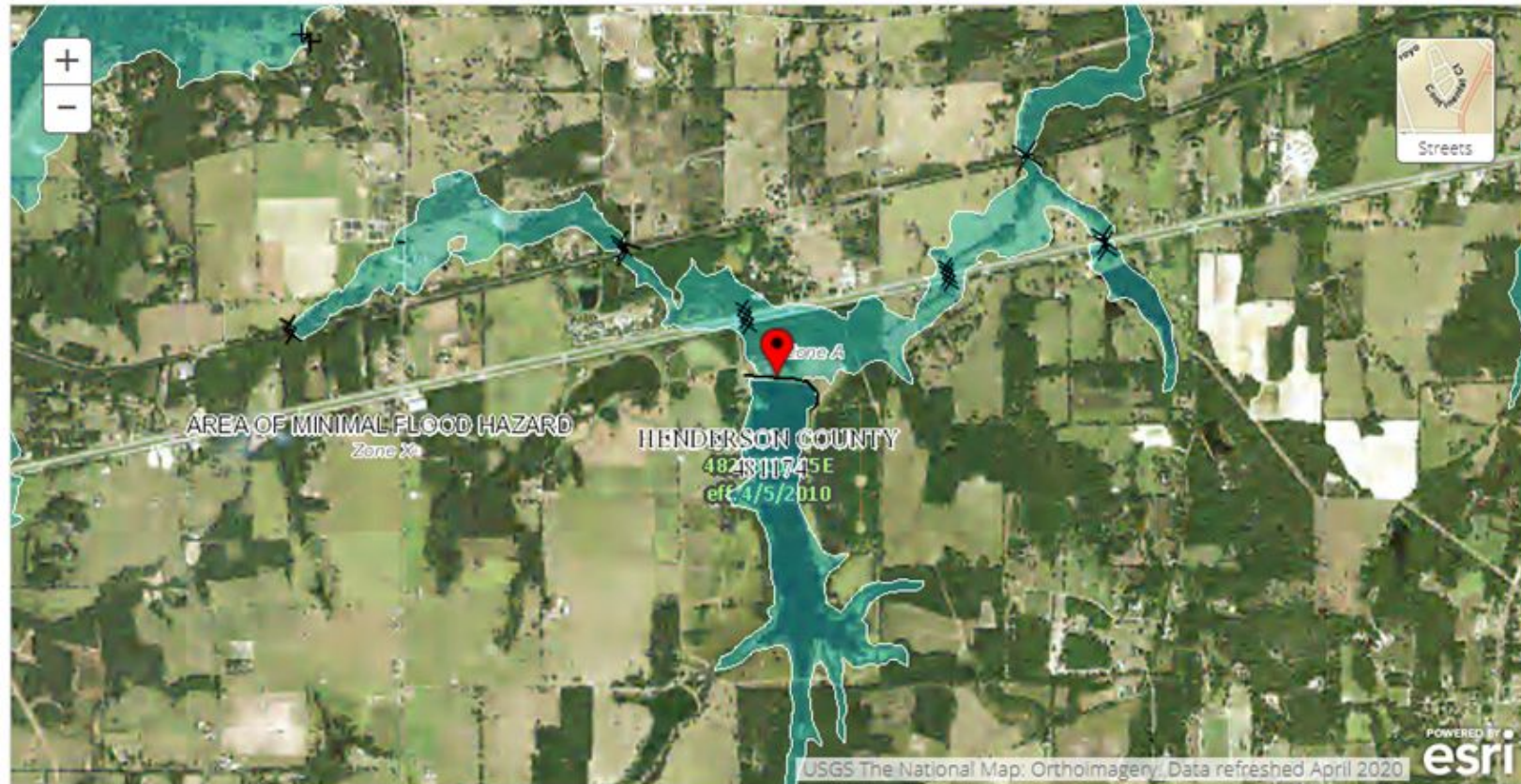


# STAR RANCH LAKE DAM



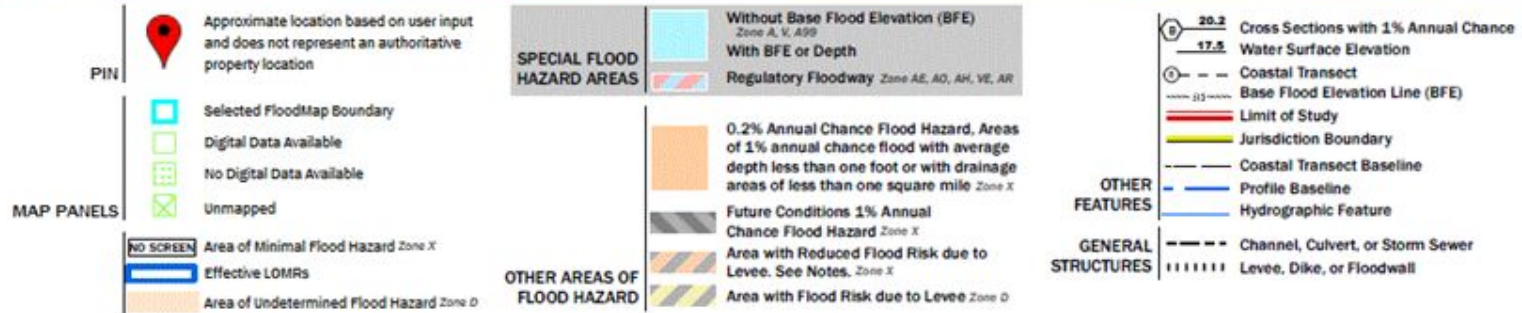


# STAWAY LAKE DAM



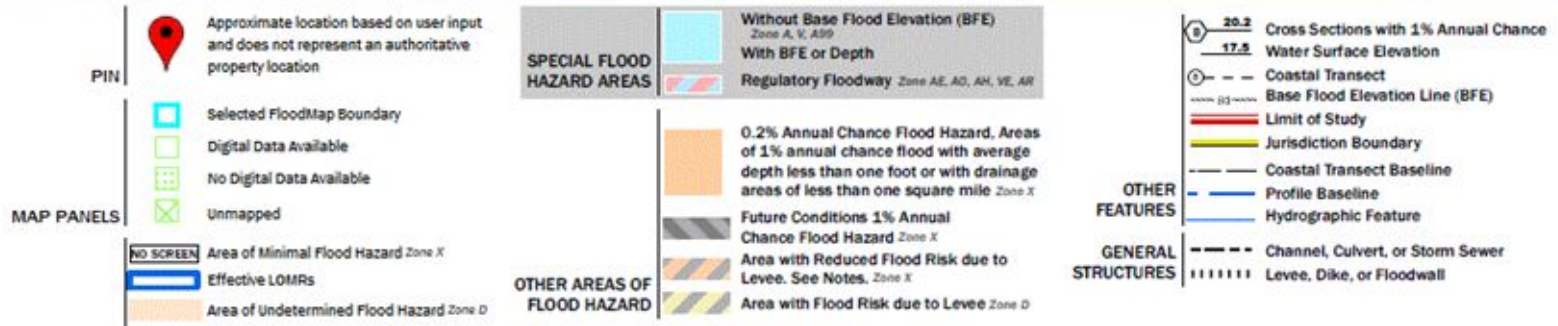
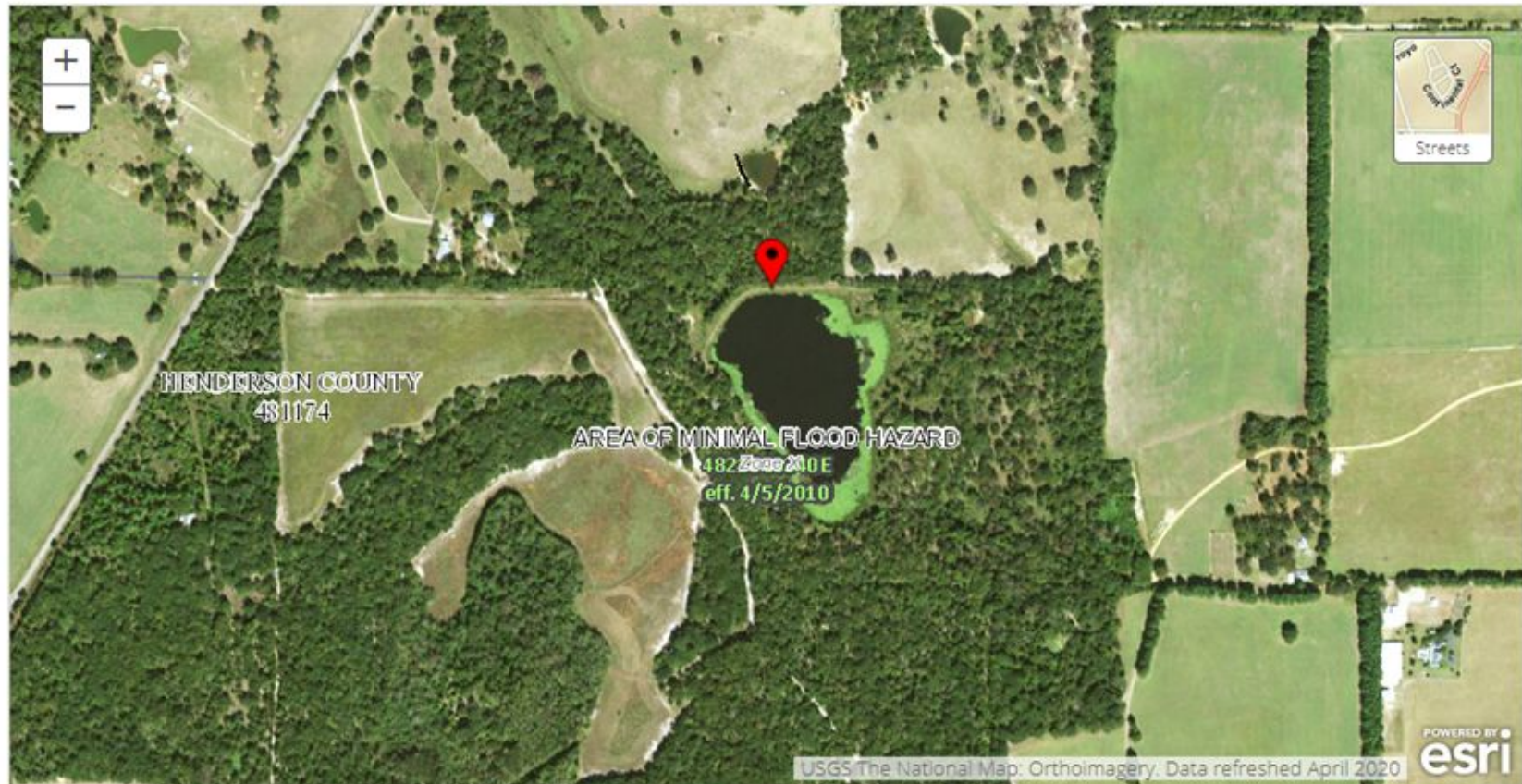


# STROUBE DAM NO. 1





## STROUBE DAM NO. 2



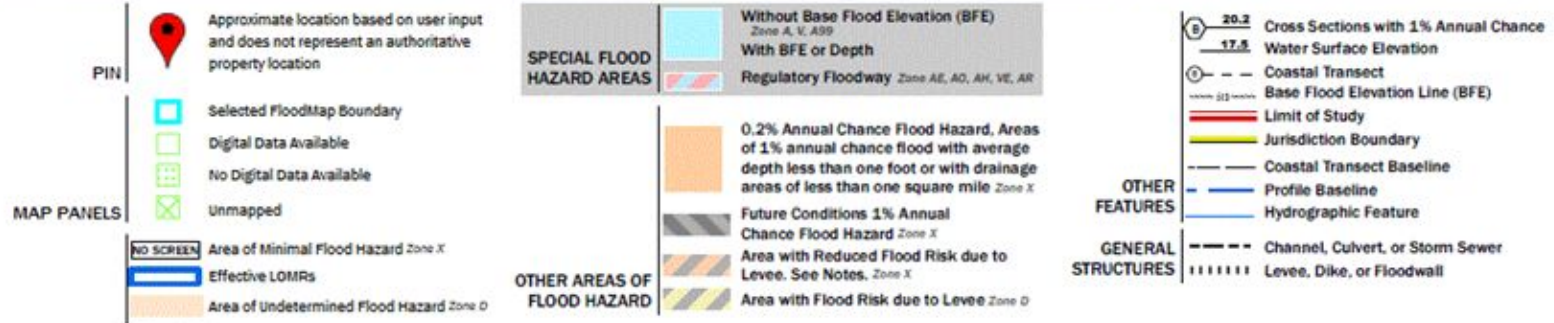
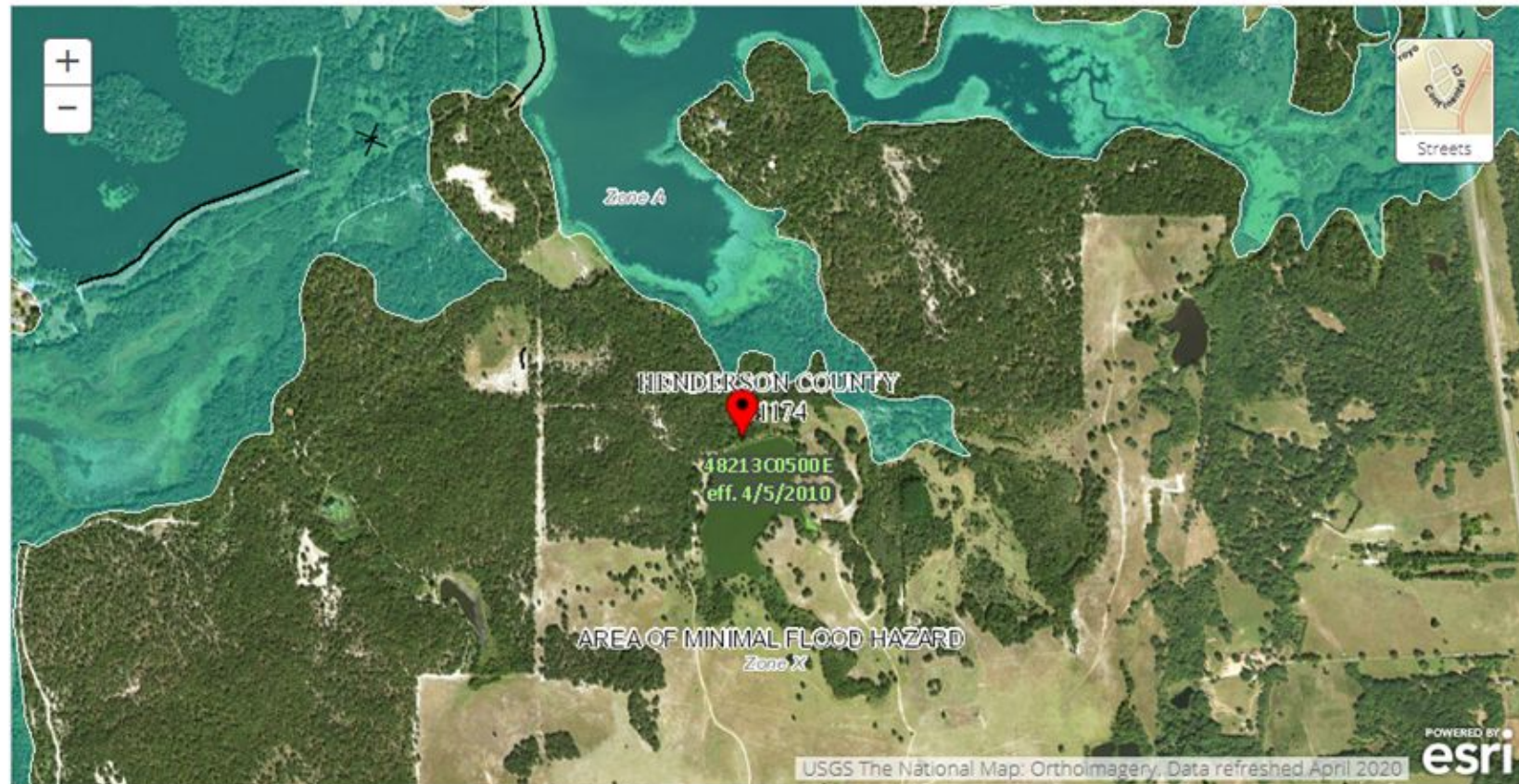


# TARR POND DAM



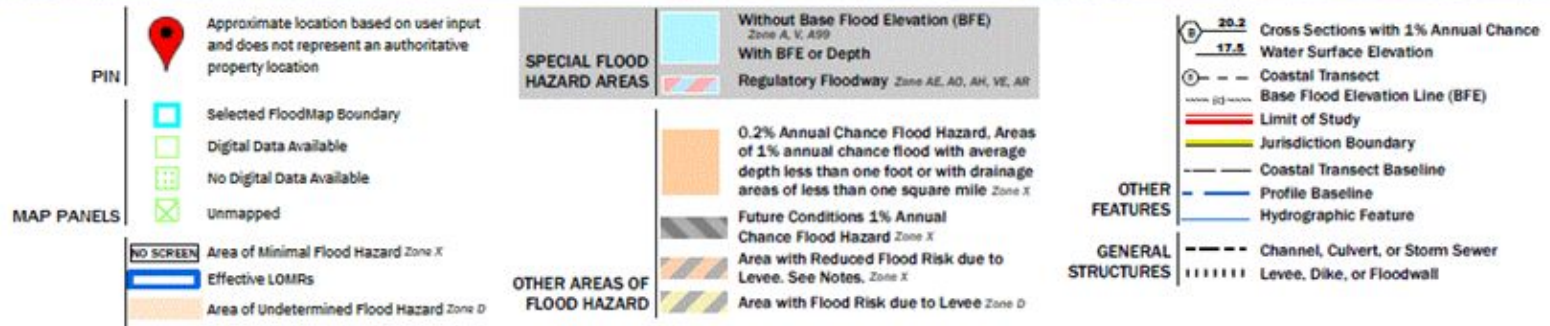
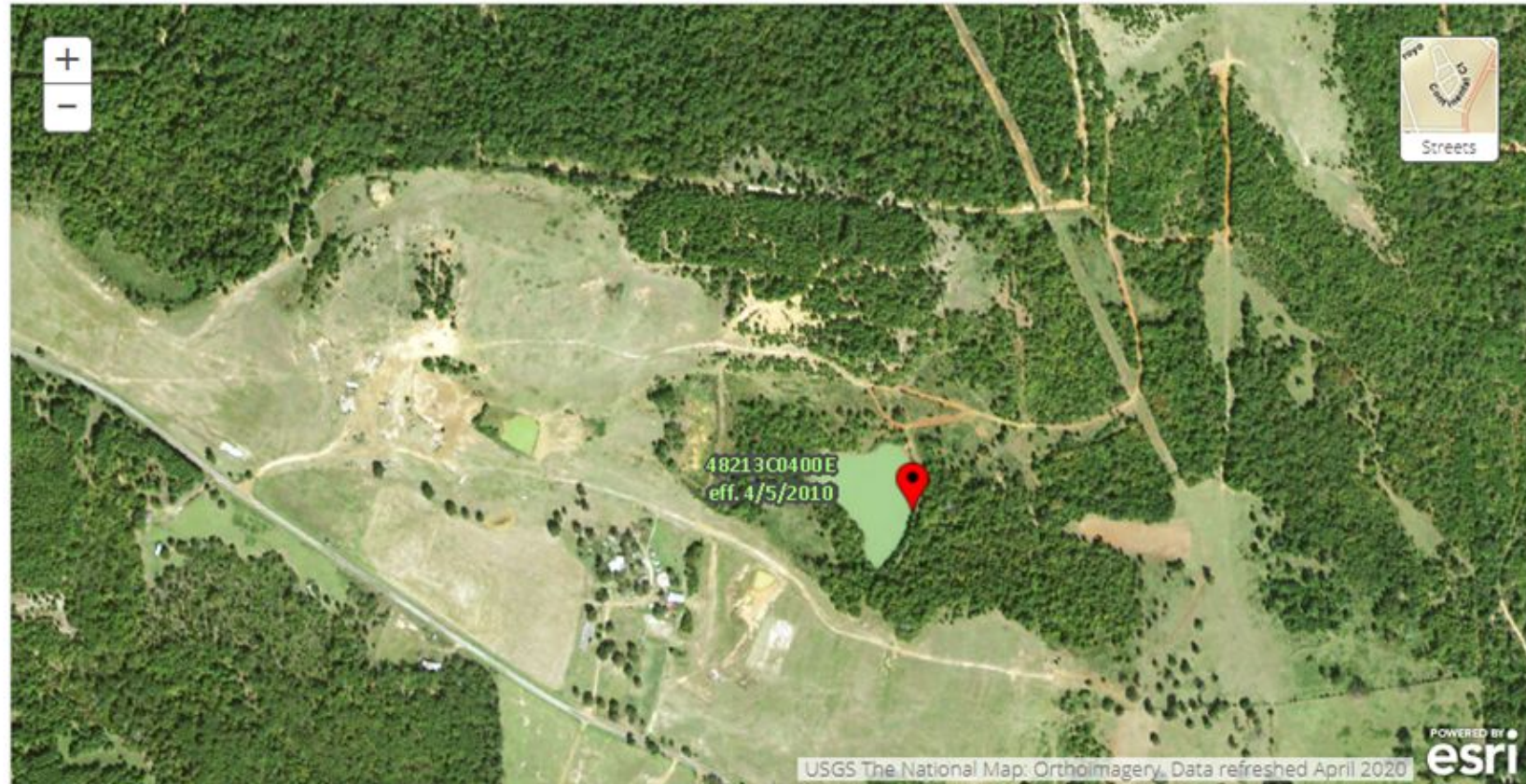


# TERRA VERDE LAKE DAM



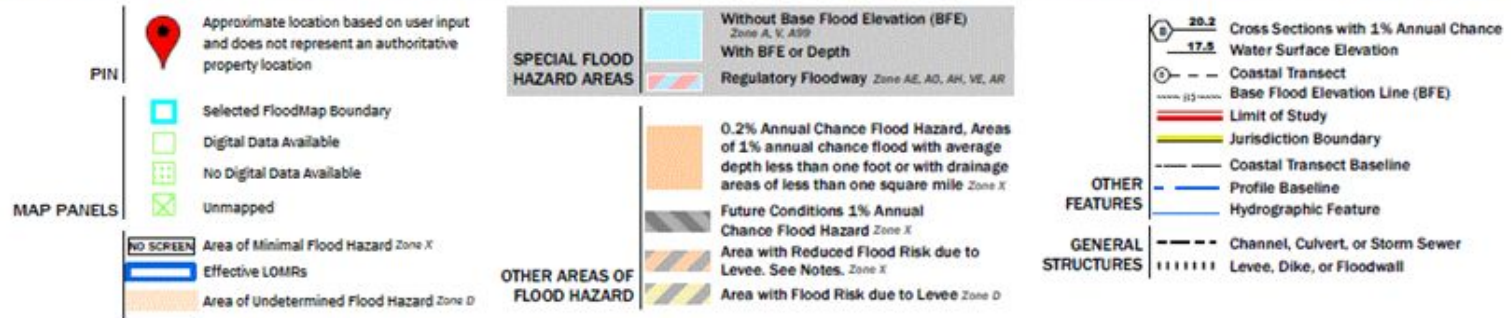
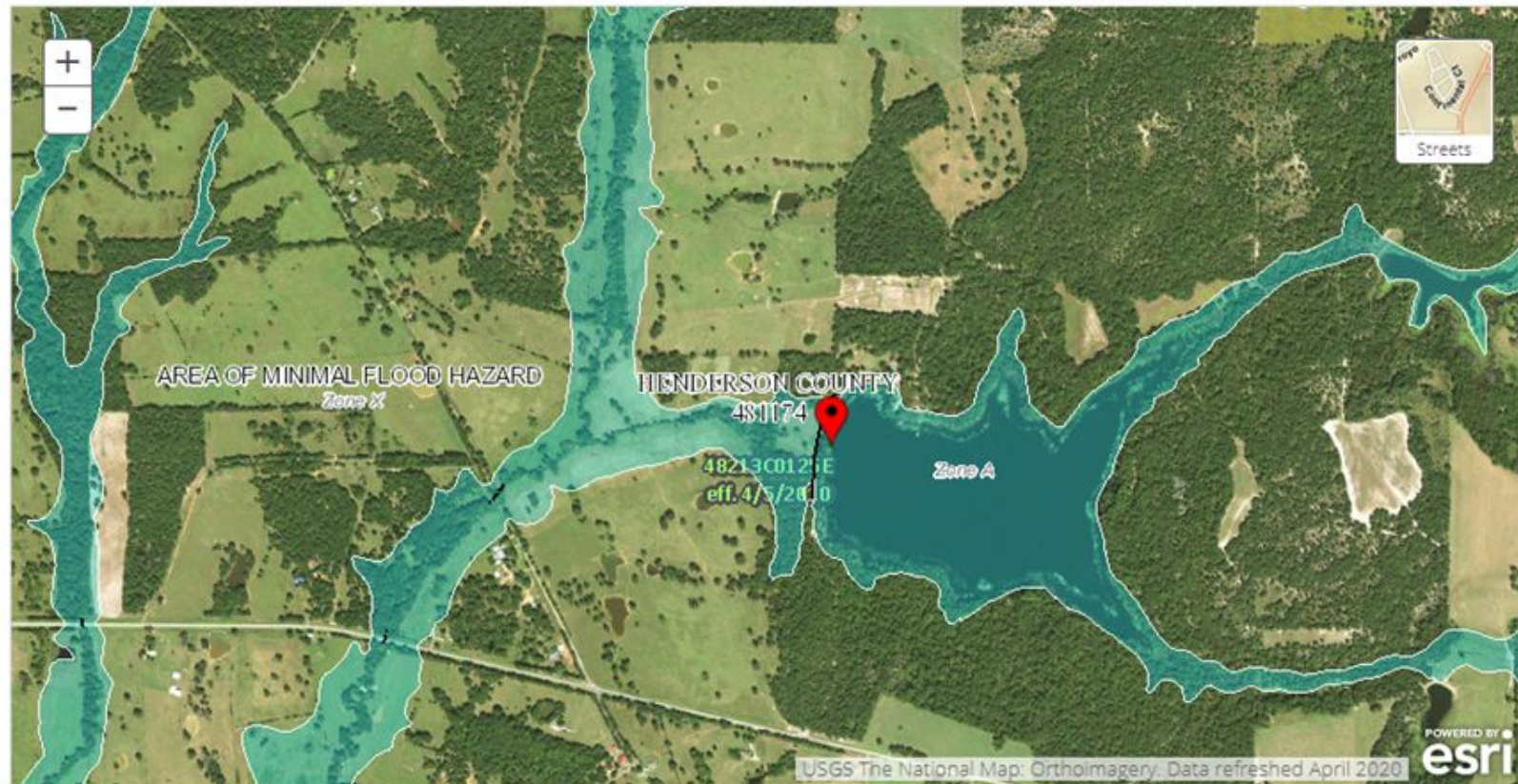


# TEXAS IRON #1 DAM



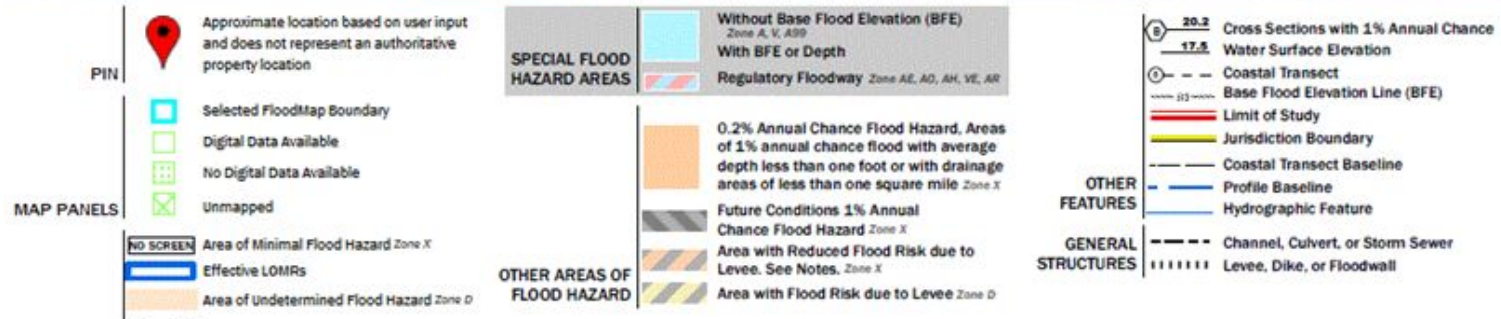


# THOMAS LAKE DAM



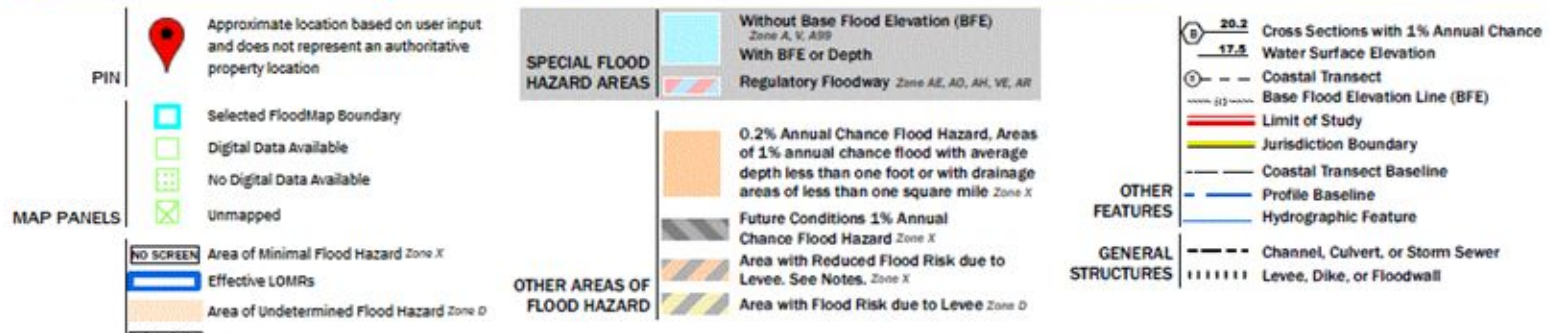


# TINDEL LAKE DAM



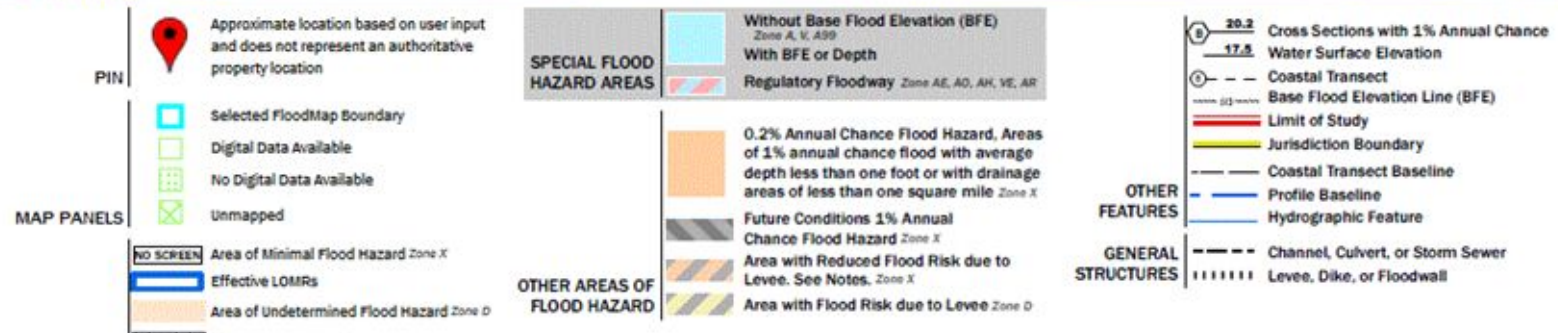
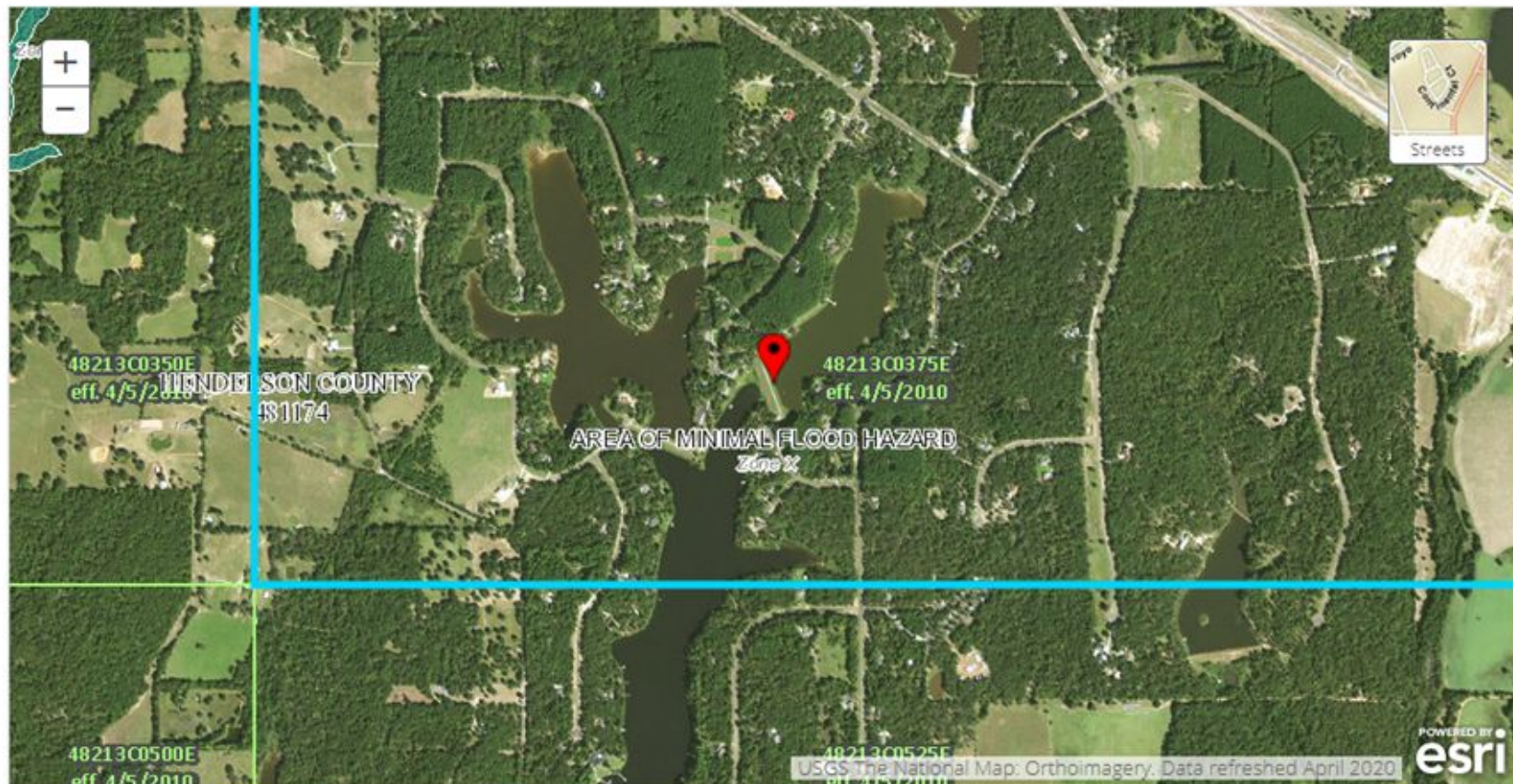


# TINER LAKE DAM



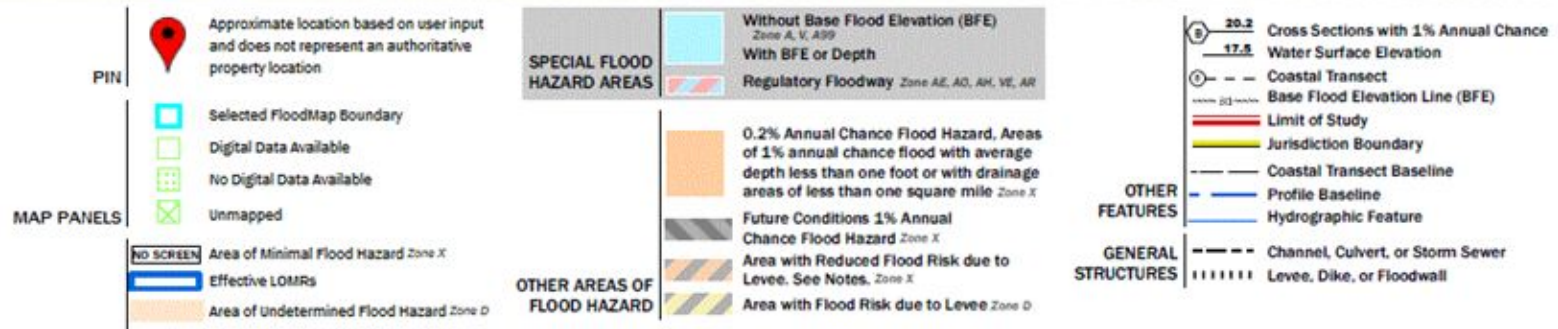
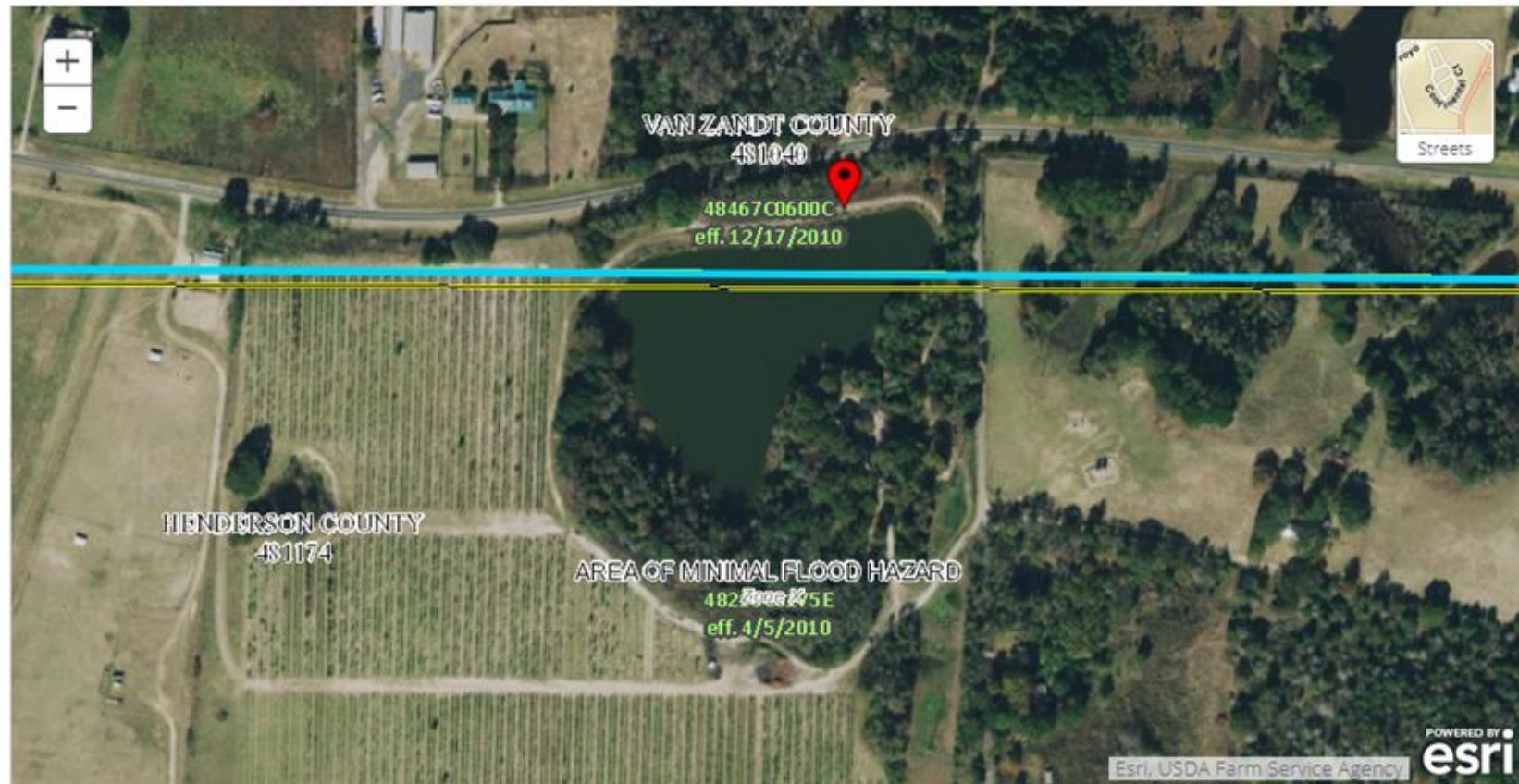


# TOLER LAKE DAM



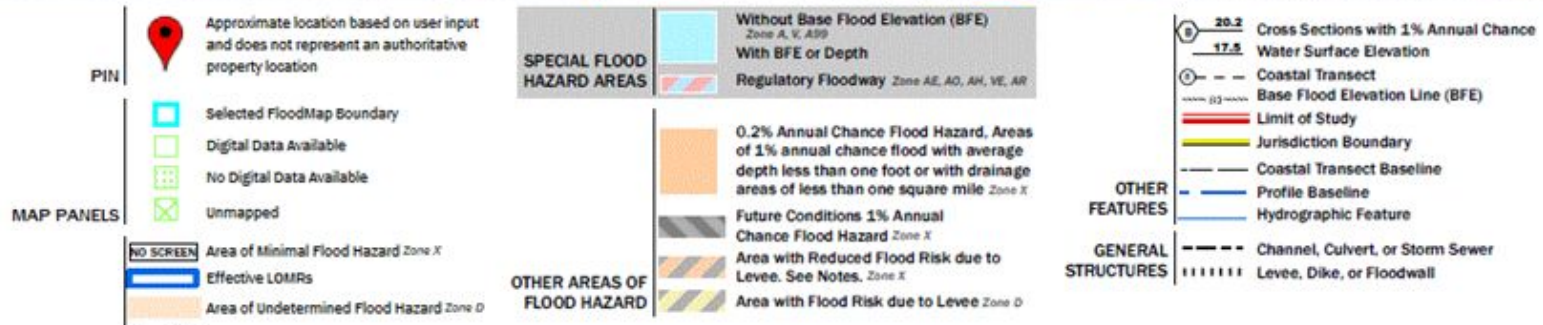
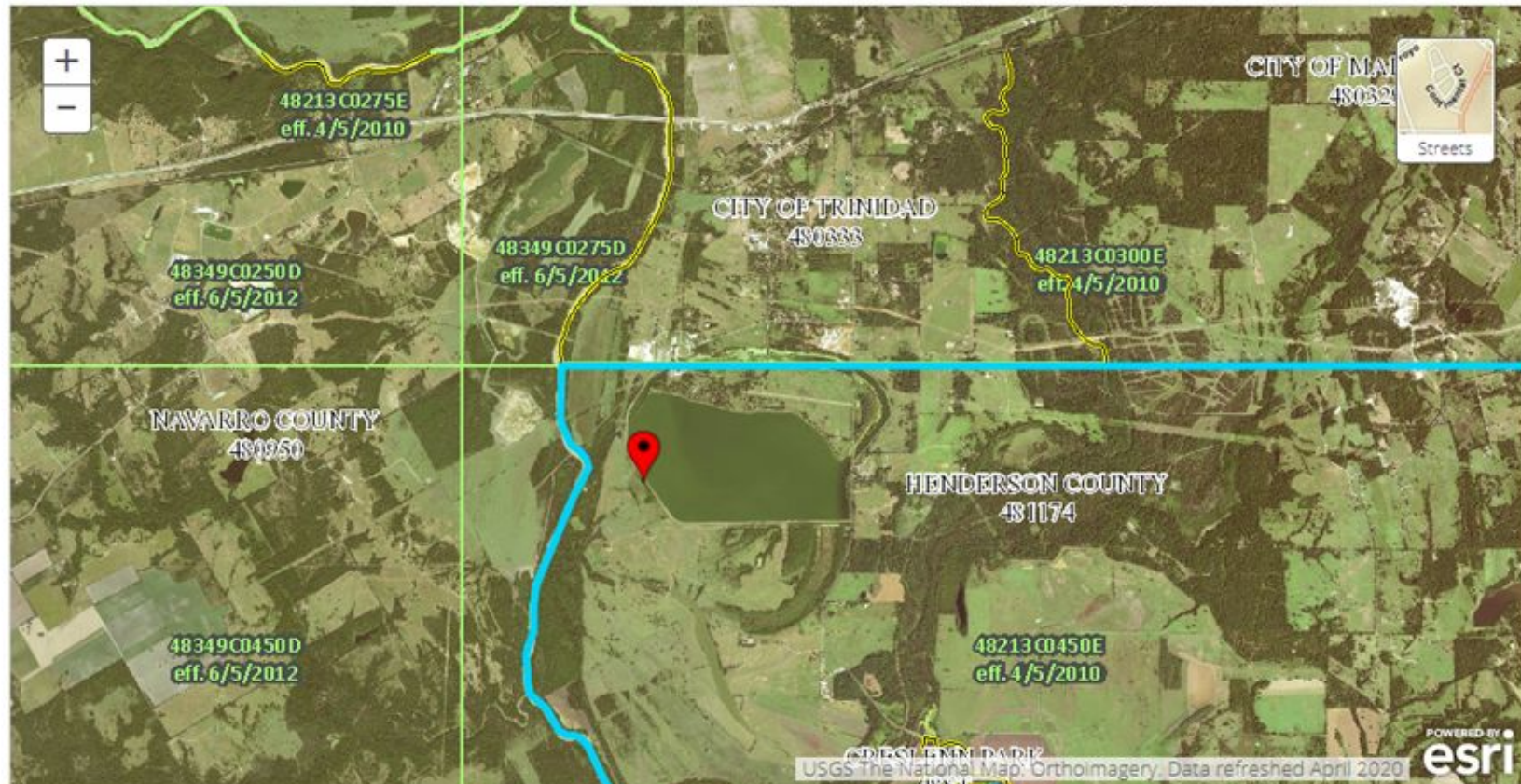


# TONY PRICE DAM



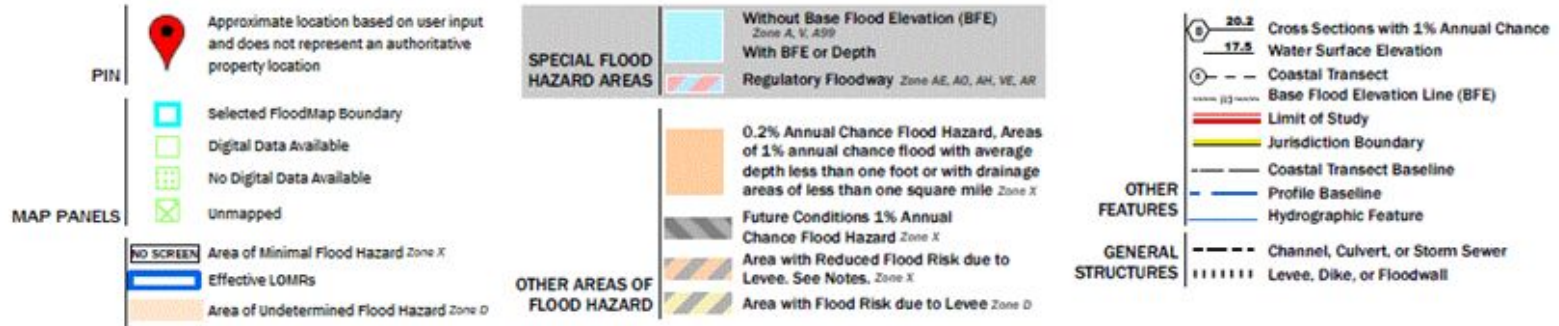


# TRINIDAD DAM



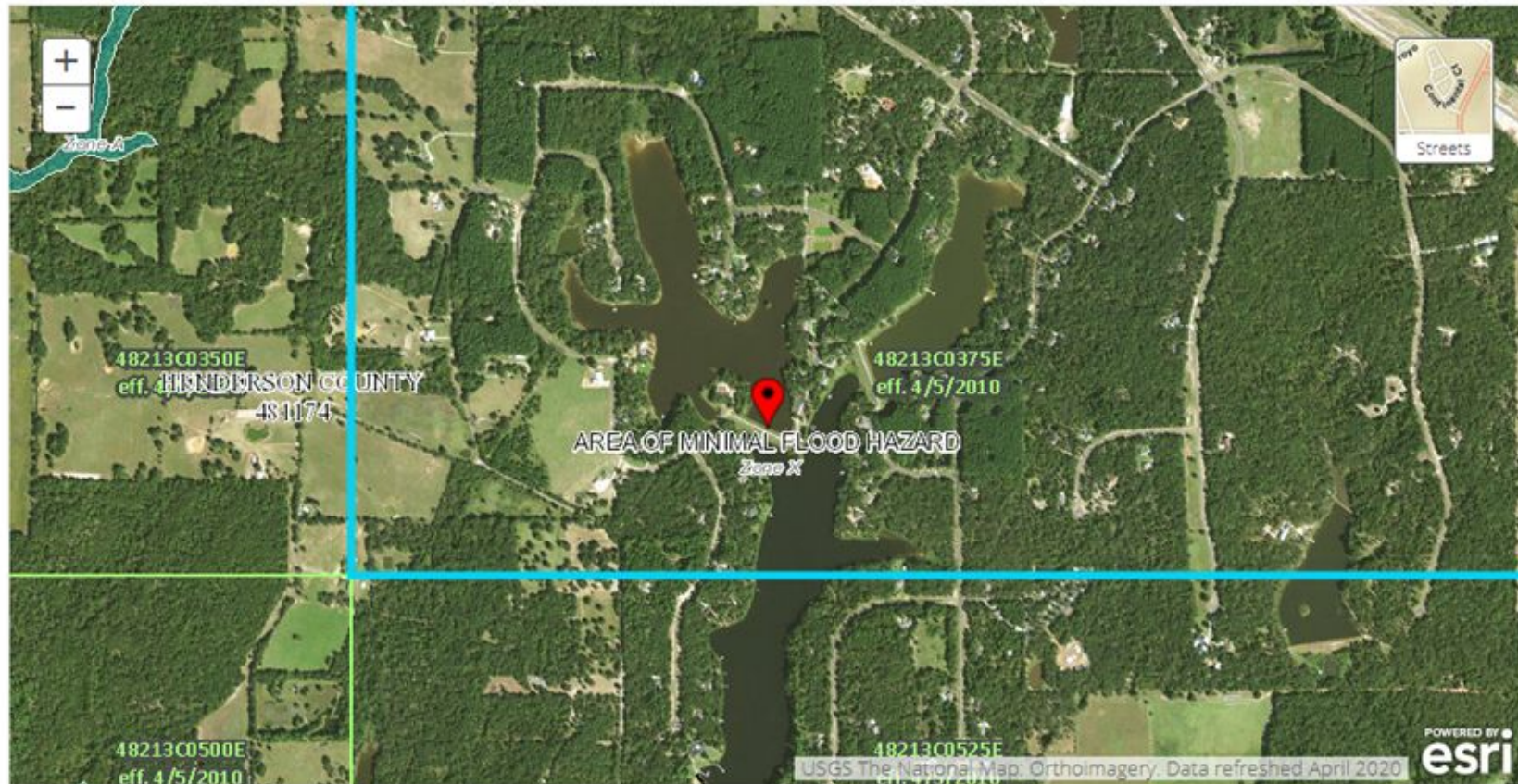


# TRIPLE S RANCH LAKE DAM





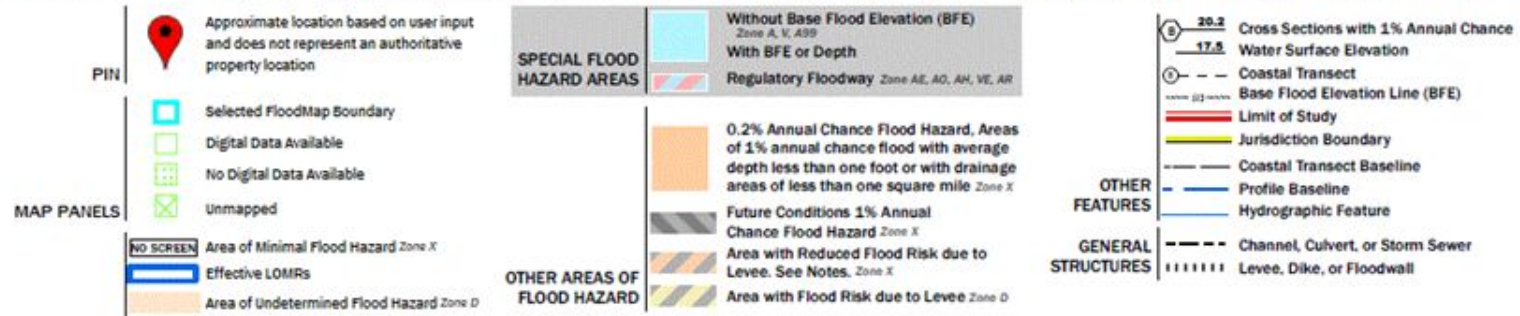
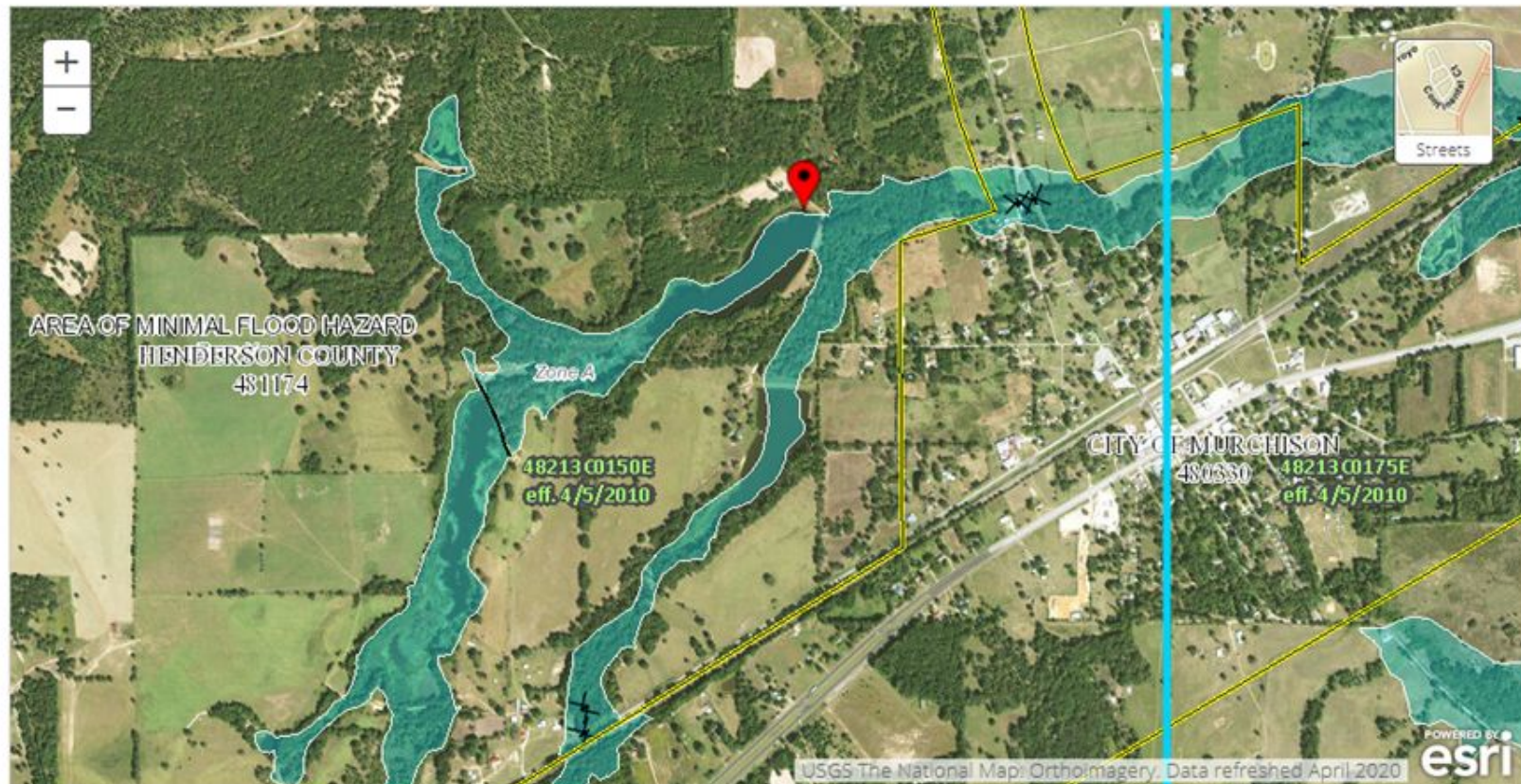
# TROPHY LAKE DAM



<b>PIN</b> 	Approximate location based on user input and does not represent an authoritative property location	<b>SPECIAL FLOOD HAZARD AREAS</b>	Without Base Flood Elevation (BFE) Zone A, V, A99 With BFE or Depth Regulatory Floodway Zone AE, AO, AH, VE, AR	20.2 Cross Sections with 1% Annual Chance Water Surface Elevation 17.5 Water Surface Elevation Coastal Transect Base Flood Elevation Line (BFE) Limit of Study Jurisdiction Boundary Coastal Transect Baseline Profile Baseline Hydrographic Feature
<b>MAP PANELS</b> Selected FloodMap Boundary Digital Data Available No Digital Data Available Unmapped	NO SCREEN Area of Minimal Flood Hazard Zone X Effective LOMRs Area of Undetermined Flood Hazard Zone D	<b>OTHER AREAS OF FLOOD HAZARD</b>	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X Future Conditions 1% Annual Chance Flood Hazard Zone X Area with Reduced Flood Risk due to Levee. See Notes. Zone X Area with Flood Risk due to Levee Zone D	<b>OTHER FEATURES</b> <b>GENERAL STRUCTURES</b> Channel, Culvert, or Storm Sewer Levee, Dike, or Floodwall

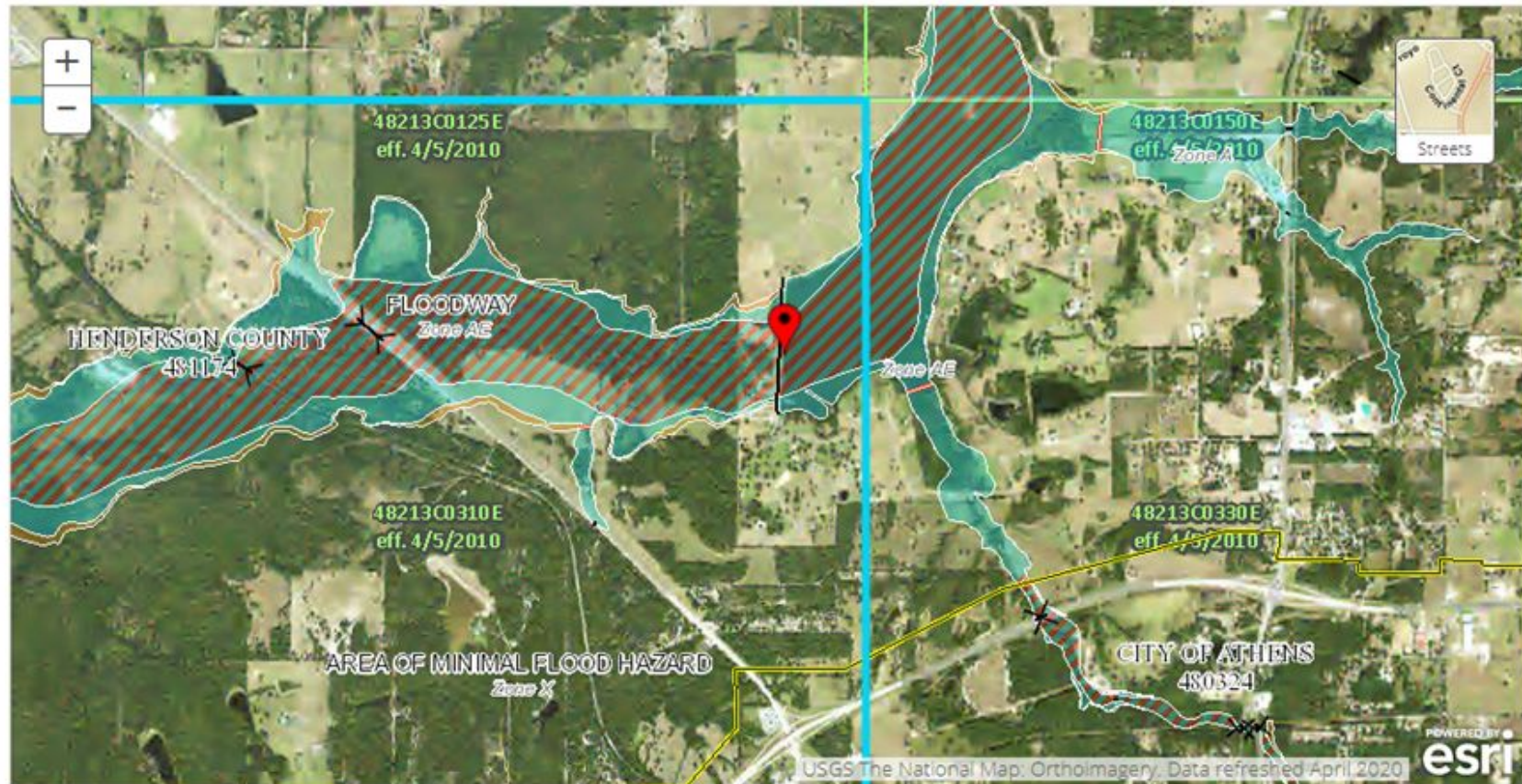


## TRUST NO. 12 DAM





# VALLEY VIEW LAKE DAM



PIN  
Approximate location based on user input and does not represent an authoritative property location

MAP PANELS  
Selected FloodMap Boundary  
Digital Data Available  
No Digital Data Available  
Unmapped

NO SCREEN  
Area of Minimal Flood Hazard Zone X  
Effective LOMRs  
Area of Undetermined Flood Hazard Zone D

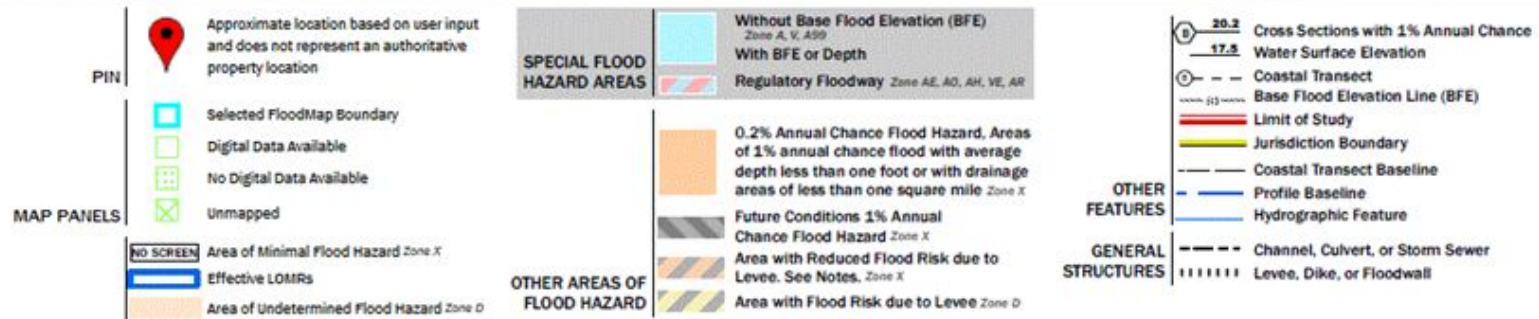
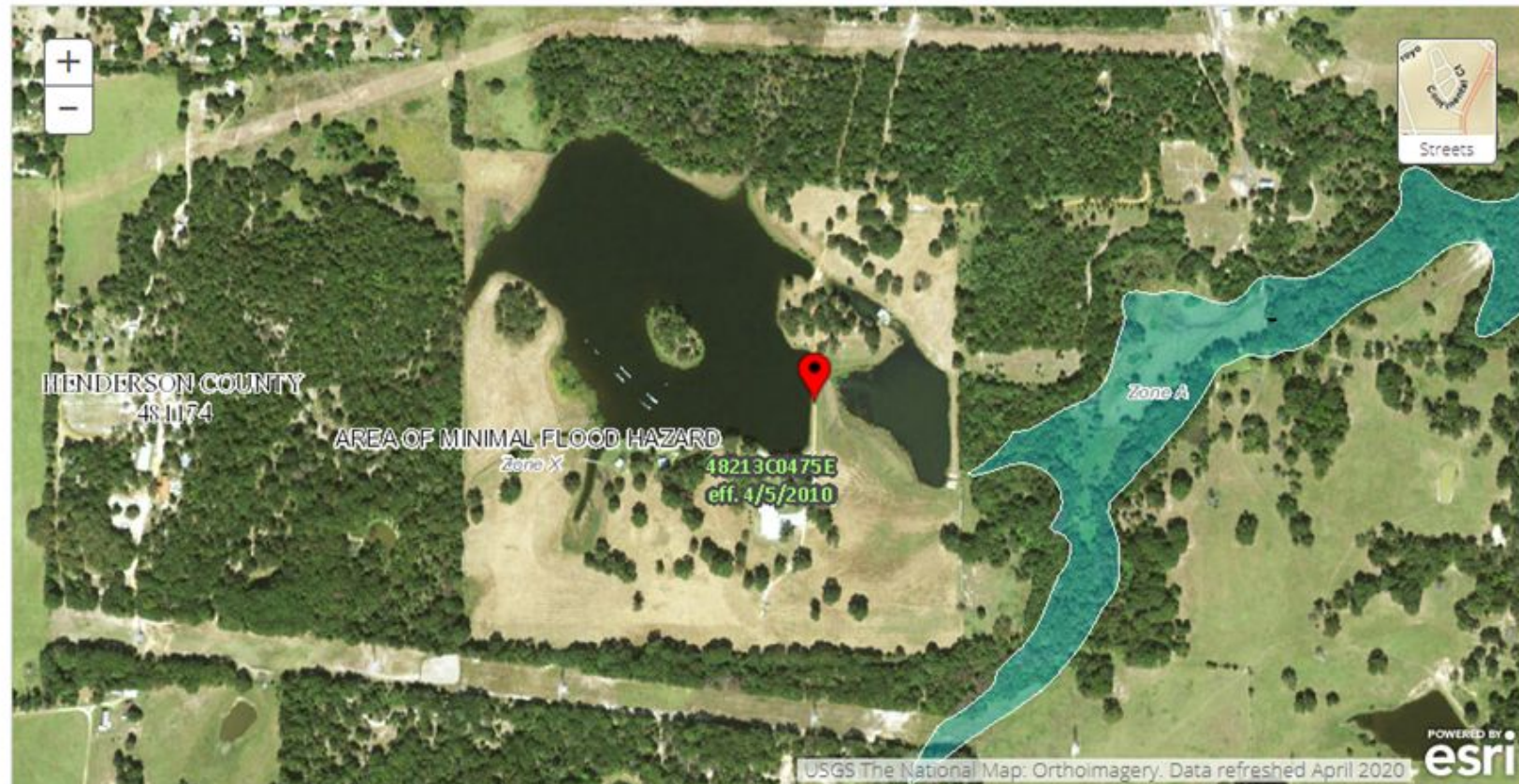
SPECIAL FLOOD HAZARD AREAS  
Without Base Flood Elevation (BFE)  
Zone A, V, A99  
With BFE or Depth  
Regulatory Floodway Zone AE, AO, AH, VE, AR

OTHER AREAS OF FLOOD HAZARD  
0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X  
Future Conditions 1% Annual Chance Flood Hazard Zone X  
Area with Reduced Flood Risk due to Levee. See Notes. Zone X  
Area with Flood Risk due to Levee Zone D

OTHER FEATURES  
Cross Sections with 1% Annual Chance Water Surface Elevation  
Coastal Transect  
Base Flood Elevation Line (BFE)  
Limit of Study  
Jurisdiction Boundary  
Coastal Transect Baseline  
Profile Baseline  
Hydrographic Feature  
GENERAL STRUCTURES  
Channel, Culvert, or Storm Sewer  
Levee, Dike, or Floodwall

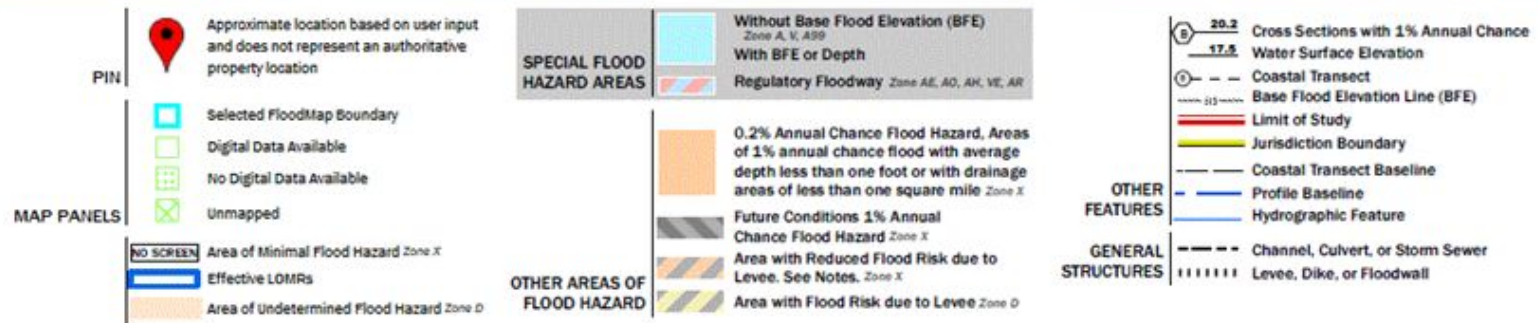


# WHITE LAKE DAM



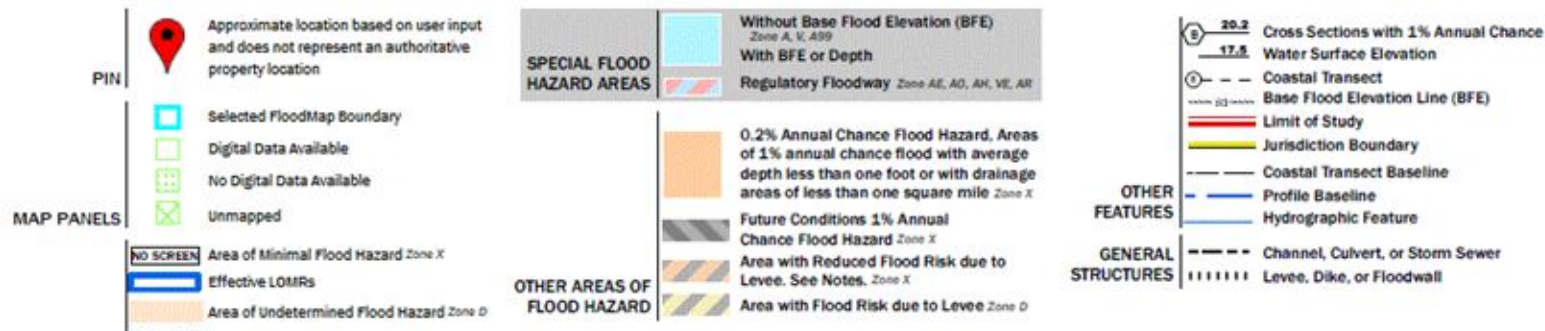
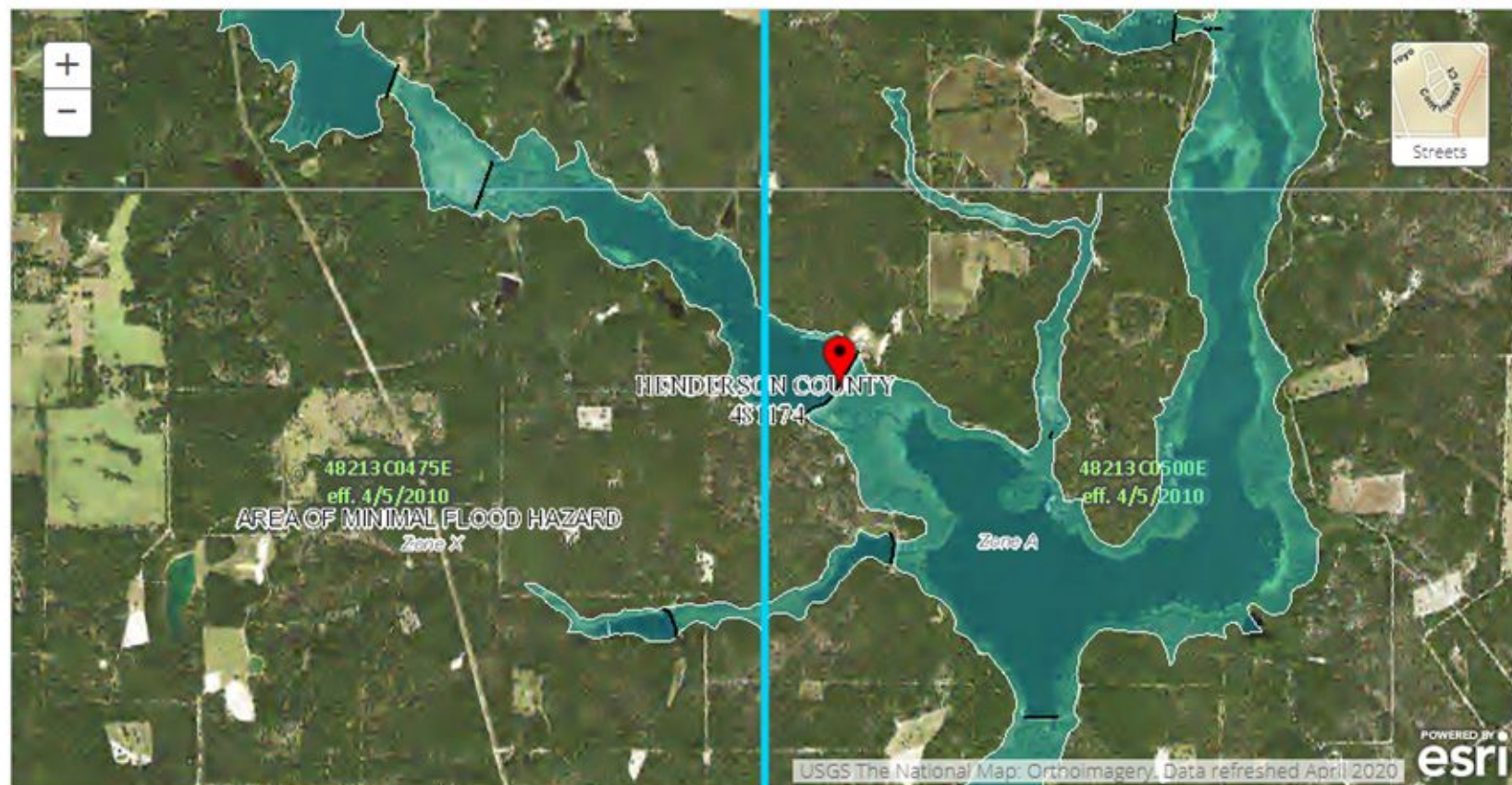


# WILLIAMS LAKE DAM





# WILSON LAKE DAM





**HENDERSON COUNTY LETTER OF MAP AMENDMENTS (LOMA) LIST**

12-06-1122A-480326	10-06-3687A-481174	10-06-2613A-480324	12-06-0865A-480327	16-06-2518A-481174	12-06-3385A-480328
12-06-3855A-480326	11-06-2642A-481174	10-06-2874A-480324	12-06-1105A-481555	16-06-2535A-481174	12-06-3724A-480328
13-06-0318A-480326	11-06-4053A-481174	10-06-2917A-481174	12-06-3336A-481634	16-06-3325A-481174	13-06-2715A-480328
14-06-4625A-480326	12-06-0851A-481174	11-06-0096A-481174	12-06-3408A-480328	17-06-1289A-481174	13-06-2850A-480328
15-06-1640A-481174	12-06-4128A-481174	11-06-0210A-481174	12-06-3705A-481174	17-06-1646A-481174	14-06-2169A-480328
15-06-3082A-480326	13-06-0792A-481174	11-06-0263A-480324	13-06-0270A-481174	17-06-1774A-481633	14-06-3084A-480328
15-06-3266A-481174	13-06-1331A-481174	11-06-0416A-481174	13-06-0387A-480328	17-06-1983A-481174	14-06-3339A-480328
16-06-4399A-480326	13-06-4067A-481174	11-06-0671A-480324	13-06-0612A-480328	17-06-2393A-481174	14-06-3535A-480328
17-06-3422A-480326	13-06-4248A-481541	11-06-0762A-481174	13-06-0811A-481174	17-06-2624A-481633	14-06-3779A-480328
19-06-4062A-481174	14-06-2910A-481174	11-06-1101A-481174	13-06-1262A-481555	17-06-2830A-481174	14-06-4265A-480328
10-06-3191A-481174	15-06-0060A-481174	11-06-2479A-481174	13-06-2846A-481174	17-06-3040A-481174	14-06-4689A-480328
10-06-3510A-481174	15-06-0062A-481174	11-06-2631A-481174	13-06-3113A-481555	17-06-3354A-481174	15-06-0604A-480328
11-06-0268A-481174	15-06-2031A-481174	11-06-3201A-480324	13-06-3308A-481634	17-06-3415A-481633	15-06-1706A-480328
11-06-0558A-481174	15-06-2417A-481541	11-06-3260A-480324	13-06-3515A-481555	17-06-3693A-481633	15-06-1782A-480328
11-06-0878A-481174	16-06-4350A-481541	11-06-3753A-481174	14-06-0694A-480328	17-06-3741A-481174	15-06-2430A-480328
11-06-1434A-481174	17-06-2450A-481174	11-06-3803A-480324	14-06-0754A-481174	17-06-3758A-481174	15-06-2854A-480328
11-06-1640A-481174	18-06-0239A-481541	11-06-4632A-481174	14-06-0879A-481174	17-06-3803A-481174	15-06-3508A-480328
11-06-1965A-481174	19-06-0088A-481541	12-06-1291A-480324	14-06-1067A-481174	17-06-4064A-481174	15-06-3511A-480328
11-06-2634A-481174	19-06-0110A-481174	13-06-1613A-481174	14-06-1846A-481555	18-06-1030A-481635	15-06-3605A-481174
11-06-3125A-481174	20-06-0859A-481174	13-06-1614A-481174	14-06-2435A-480328	18-06-1168A-481174	15-06-3841A-480328
11-06-3491A-481174	20-06-1331A-481541	13-06-1825A-480324	14-06-2492A-481555	18-06-1173A-481174	15-06-4147A-480328
11-06-3787A-481174	20-06-1895A-481541	13-06-2327A-480324	14-06-4079A-481174	18-06-1615A-481174	15-06-4498A-480328
11-06-4001A-481174	15-06-3997A-481507	13-06-3171A-480324	15-06-0021A-480328	18-06-2483A-481174	16-06-0053A-480328
11-06-4040A-481174	10-06-3502A-481174	13-06-4080A-480324	15-06-1247A-481555	18-06-2508A-481174	16-06-1904A-480328

11-06-4573A-481174	11-06-3406A-481174	14-06-1687A-480324	15-06-1417A-481174	18-06-2647A-481174	16-06-3405A-480328
12-06-0179A-481174	11-06-4111A-481174	14-06-1687A-481174	15-06-2494A-480328	18-06-2687A-481174	16-06-4293A-480328
12-06-0236A-481174	13-06-1199A-481174	14-06-1892A-480324	15-06-2505A-481174	18-06-2822A-481174	17-06-0231A-480328
12-06-0448A-481174	14-06-1128A-481174	14-06-2451A-480324	15-06-2565A-481174	18-06-2949A-481633	17-06-0891A-480328
12-06-1726A-481174	18-06-0159A-481174	15-06-1766A-480324	15-06-3646A-481174	18-06-3084A-481174	17-06-1219A-480328
13-06-0066A-481174	18-06-0607A-481174	15-06-2926A-481174	15-06-3689A-481174	18-06-3223A-481174	17-06-1275A-480328
13-06-1320A-481174	19-06-2282A-481174	17-06-0136A-480324	16-06-0136A-481174	18-06-3329A-481174	17-06-1390A-480328
13-06-2160A-481174	19-06-3616A-481174	17-06-0864A-480324	16-06-0144A-480328	18-06-3448A-481174	17-06-1571A-480328
13-06-2174A-481174	11-06-1103A-481174	18-06-2408A-480324	16-06-0328A-481174	18-06-3710A-481633	17-06-1661A-480328
13-06-2876A-481174	11-06-1904A-481174	18-06-2788A-480324	16-06-0734A-481555	18-06-3800A-481174	17-06-1748A-480328
13-06-2886A-481174	12-06-0984A-481174	18-06-3663A-480324	16-06-1367A-481174	19-06-0112A-481174	17-06-2457A-480328
13-06-3886A-481174	19-06-1317A-481174	19-06-0707A-481174	16-06-1601A-480328	19-06-0365A-481174	17-06-2570A-480328
13-06-4099A-481174	10-06-2820A-481174	19-06-0765A-481174	16-06-2410A-481555	19-06-0499A-481174	17-06-2976A-480328
14-06-0226A-481174	10-06-3490A-481174	19-06-2284A-480324	16-06-2520A-481174	19-06-0536A-481174	17-06-3460A-481174
14-06-0950A-481174	11-06-0064A-481174	19-06-3584A-480324	16-06-2856A-480328	19-06-1007A-481174	17-06-3621A-480328
14-06-3473A-481174	11-06-0167A-481174	19-06-3813A-481174	16-06-3054A-480328	19-06-1340A-481174	17-06-3709A-480328
14-06-4912A-481174	11-06-0192A-481174	20-06-1077A-480324	16-06-3533A-481174	19-06-1699A-481174	17-06-3763A-480328
15-06-0702A-481174	11-06-0206A-481174	20-06-1206A-481174	16-06-3650A-481634	19-06-2004A-481174	17-06-3818A-480328
15-06-0993A-481174	11-06-0270A-481174	16-06-0310A-481174	16-06-3672A-481174	19-06-2661A-481174	17-06-3934A-480328
15-06-1216A-481174	11-06-0444A-481174	12-06-3076A-480324	16-06-3979A-481174	19-06-3129A-481550	17-06-4184A-480328
15-06-1863A-481174	11-06-0461A-481174	13-06-2251A-480324	17-06-0375A-481174	20-06-0987A-481174	18-06-0473A-480328
15-06-2963A-481174	11-06-0528A-481174	16-06-3302A-480324	17-06-1147A-481555	20-06-1162A-481174	18-06-2256A-480328
15-06-4168A-481174	11-06-1167A-481174	18-06-0314A-480324	17-06-1659A-481174	20-06-1572A-481174	18-06-3507A-480328
16-06-1209A-481174	11-06-2916A-481174	20-06-0347A-480324	17-06-1934A-481555	20-06-2818A-481174	19-06-0097A-480328
16-06-1276A-481174	11-06-3048A-481174	10-06-2658A-481174	17-06-2461A-481634	20-06-3010A-481174	19-06-0474A-480328

16-06-2256A-481174	11-06-3100A-481174	11-06-0721A-481174	17-06-2465A-481174	20-06-3098A-481174	19-06-0774A-480328
17-06-0409A-481174	11-06-3795A-481174	11-06-1623A-481174	17-06-2856A-481555	20-06-3117A-481174	19-06-1874A-480328
17-06-0448A-481174	11-06-4224A-481174	13-06-1476A-481174	17-06-3039A-480328	11-06-0506A-481174	19-06-3405A-480328
17-06-1520A-481174	11-06-4255A-481174	13-06-2630A-481174	17-06-3108A-481174	12-06-0839A-481174	19-06-3448A-480328
17-06-1946A-481174	12-06-0097A-481174	13-06-3401A-481174	17-06-3239A-480328	12-06-2895A-481174	20-06-0352A-480328
18-06-0291A-481174	13-06-2039A-481174	13-06-3505A-481174	17-06-3240A-480328	17-06-2636A-481174	20-06-0391A-480328
18-06-0721A-481174	13-06-2151A-481174	14-06-0540A-481174	17-06-3411A-481174	17-06-2853A-481174	20-06-0553A-480328
18-06-0809A-481174	13-06-2189A-481174	15-06-0723A-481174	17-06-3613A-480328	17-06-3105A-481174	20-06-0809A-480328
18-06-1270A-481174	13-06-2925A-481174	15-06-2768A-481174	17-06-3859A-481174	17-06-3909A-481174	20-06-1576A-481174
18-06-2177A-481174	13-06-3682A-481174	17-06-4192A-481174	17-06-3987A-481174	18-06-1220A-481174	20-06-1661A-480328
18-06-2369A-481174	14-06-2878A-481174	18-06-2813A-481174	17-06-4202A-481174	19-06-3538A-481174	20-06-1781A-480328
18-06-3227A-481174	14-06-3484A-481174	19-06-2048A-481174	18-06-0737A-481174	20-06-2384A-481174	20-06-2868A-480328
18-06-3571A-481174	15-06-0282A-481174	20-06-0023A-481174	18-06-0887A-481174	11-06-0506A-481174	20-06-3112A-480328
19-06-0047A-481174	16-06-0963A-480324	10-06-2236A-481634	18-06-1129A-481174	12-06-0839A-481174	20-06-3246A-480328
19-06-0217A-481174	16-06-1287A-481174	10-06-2621A-481634	18-06-1294A-481174	12-06-2895A-481174	10-06-2543A-481532
19-06-1032A-481174	16-06-1592A-481174	10-06-2690A-481634	18-06-1536A-481174	17-06-2636A-481174	10-06-2743A-481532
19-06-1382A-481174	16-06-2036A-481174	10-06-2786A-481174	18-06-2644A-481174	17-06-2853A-481174	10-06-2977A-481532
19-06-1665A-481174	16-06-2697A-481174	10-06-2896A-480328	18-06-2818A-481174	17-06-3105A-481174	10-06-3040A-481532
19-06-2208A-481174	16-06-3755A-480324	10-06-3030A-481555	18-06-2941A-481174	17-06-3909A-481174	10-06-3374A-481174
20-06-0680A-481174	17-06-0064A-481174	10-06-3190A-481174	18-06-4009A-481174	18-06-1220A-481174	10-06-3592A-481174
20-06-0758A-481174	17-06-0765A-481174	10-06-3586A-481174	19-06-1056A-481555	19-06-3538A-481174	11-06-0094A-481532
20-06-1937A-481174	17-06-3079A-481174	10-06-3693A-481174	19-06-3713A-481174	20-06-2384A-481174	11-06-0100A-481532
20-06-2410A-481174	17-06-4179A-481174	10-06-3695A-481634	20-06-0390A-480328	14-06-0337A-481174	11-06-0266A-481532
20-06-2453A-481174	18-06-2060A-481174	11-06-0443A-481174	20-06-0741A-480328	14-06-1633A-481174	11-06-0283A-480328
20-06-2679A-481174	18-06-3235A-481174	11-06-0654A-481174	20-06-1791A-480328	17-06-0733A-481174	11-06-2348A-481174

20-06-3060A-481174	18-06-3236A-481174	11-06-1620A-481174	20-06-2353A-481634	10-06-2491A-481174	11-06-2403A-481174
20-06-3606A-481174	19-06-1930A-481174	11-06-2817A-480328	20-06-3708A-480328	10-06-2622A-481174	11-06-2446A-481532
20-06-3624A-481174	20-06-1793A-481174	11-06-3794A-481174	10-06-2879A-481174	10-06-2891A-481174	11-06-3441A-481174
11-06-4736A-481555	20-06-1957A-481174	11-06-4194A-480328	10-06-2888A-481633	11-06-0582A-480332	11-06-3768A-481532
12-06-0289A-481174	12-06-0471A-481174	11-06-4501A-480328	10-06-2929A-481174	11-06-3735A-481174	11-06-3853A-481532
10-06-3125A-481174	12-06-0707A-481174	13-06-2372A-481174	15-06-2487A-481174	12-06-2875A-481174	11-06-3867A-481174
10-06-3387A-481174	12-06-0774A-481174	13-06-2647A-481174	15-06-2496A-481174	13-06-0077A-481174	11-06-3869A-481174
10-06-3537A-481174	12-06-1187A-481174	13-06-2718A-481174	15-06-2709A-481174	15-06-0518A-481174	12-06-0424A-481174
10-06-3541A-481174	12-06-1223A-481174	13-06-4346A-481174	15-06-2749A-481174	15-06-4146A-480332	12-06-0837A-481532
10-06-3591A-481174	12-06-1328A-481174	13-06-4381A-481635	15-06-2853A-481174	16-06-3313A-481174	12-06-0847A-481174
10-06-3613X-481174	12-06-1751A-481174	13-06-4385A-481174	15-06-3018A-481174	16-06-3465A-481174	12-06-1034A-481174
11-06-0047A-481174	12-06-1757A-481174	14-06-0168A-481635	15-06-3299A-481633	16-06-4013A-481174	12-06-2672A-481174
11-06-0257A-481174	12-06-2081A-481174	14-06-1003A-481174	15-06-3368A-481174	17-06-2967A-481174	12-06-4023A-480328
11-06-0295A-481174	12-06-2408A-481174	14-06-1521A-481174	15-06-3405A-481174	20-06-1205A-481174	13-06-0171A-480328
11-06-0314A-481174	12-06-2409A-481174	14-06-2448A-481174	15-06-3432A-481633	20-06-3024A-481174	13-06-1447A-481532
11-06-0933A-481174	12-06-3211A-481633	14-06-3150A-481174	15-06-3629A-481174	10-06-0654A-481174	13-06-1588A-481174
11-06-0966A-481174	12-06-3289A-481174	14-06-3549A-481174	15-06-3847A-481174	10-06-2610A-480328	13-06-1770A-481532
11-06-1221A-481174	12-06-3382A-481174	14-06-3930A-481174	16-06-0138A-481174	10-06-2894A-480328	13-06-1788A-480328
11-06-2291A-481174	12-06-3606A-481174	14-06-4213A-481174	16-06-0145A-481174	11-06-0796A-480328	13-06-2044A-481532
11-06-2750A-481174	12-06-3674A-481174	14-06-4325A-481633	16-06-1269A-481174	11-06-1001A-480328	13-06-2072A-481174
11-06-2821A-481174	12-06-4061A-481633	14-06-4352A-481174	16-06-1525A-481174	11-06-3246A-481174	13-06-2257A-481174
11-06-3378A-481174	13-06-0201A-481174	14-06-4428A-481174	16-06-2099A-481174	11-06-3474A-480328	13-06-2559A-480328
11-06-3478A-481174	13-06-1405A-481174	14-06-4707A-481174	16-06-2107A-481174	15-06-1974A-481174	13-06-1984A-481174
11-06-3984A-481174	13-06-1808A-481174	15-06-0474A-481174	12-06-0044A-481174	15-06-2413A-481532	18-06-1863A-481174
13-06-4555A-481532	17-06-0485A-481174	16-06-0479A-481174	19-06-0668A-480328	15-06-2485A-481532	18-06-2328A-481174



13-06-4700A-481174	17-06-1554A-481174	16-06-0733A-481174	19-06-0694A-481532	15-06-2689A-481174	18-06-2525A-481174
14-06-0976A-481174	17-06-1755A-481174	16-06-0866A-481174	19-06-1459A-481174	15-06-2787A-481555	18-06-3204A-481174
14-06-1141A-481174	17-06-2178A-481532	16-06-1037A-481174	20-06-0920A-481174	15-06-3433A-480328	18-06-3515A-481532
14-06-1200A-481532	17-06-2466A-480328	16-06-2059A-481174	20-06-1200A-480328	15-06-3619A-481174	18-06-3520A-480328
14-06-1220A-481532	17-06-2560A-481174	16-06-2137A-481174	20-06-1208A-480328	15-06-3647A-481532	18-06-3681A-481174
14-06-2376A-481174	17-06-2841A-481174	16-06-3374A-480328	20-06-1357A-480328	15-06-3799A-481532	18-06-3929A-481174
14-06-2417A-481532	17-06-2865A-481532	16-06-3461A-481174	20-06-1365A-480328	15-06-4229A-481174	18-06-4055A-481532
14-06-2477A-481174	17-06-3238A-481532	16-06-3464A-481532	20-06-1539A-481532	16-06-0135A-481532	19-06-0285A-481174
14-06-2710A-481174	17-06-3360A-480328	17-06-0435A-481174	20-06-1913A-481174	15-06-0161A-481532	18-06-0172A-481174
14-06-3853A-480328	17-06-3432A-481174	17-06-0475A-481532	20-06-2668A-481532	15-06-0209A-481174	18-06-0678A-481174
14-06-3922A-481532	17-06-3462A-481532	12-06-1593A-480328	20-06-3011A-481174	15-06-0678A-481532	18-06-1031A-480328
14-06-4126A-481532	17-06-3870A-481174	11-06-3849A-480328	20-06-3033A-481174	15-06-1428A-480328	18-06-1373A-481174
14-06-4183A-481532	17-06-4128A-480328	16-06-2156A-481174	13-06-4155A-481174	15-06-2020A-481174	18-06-1405A-480328
14-06-4370A-481174	17-06-4200A-481174	16-06-2182A-481174	12-06-2261A-480328	15-06-0086A-481532	18-06-0086A-481174
14-06-4491A-481532	17-06-4203A-481174	13-06-3209A-481532	13-06-3650A-481532		



















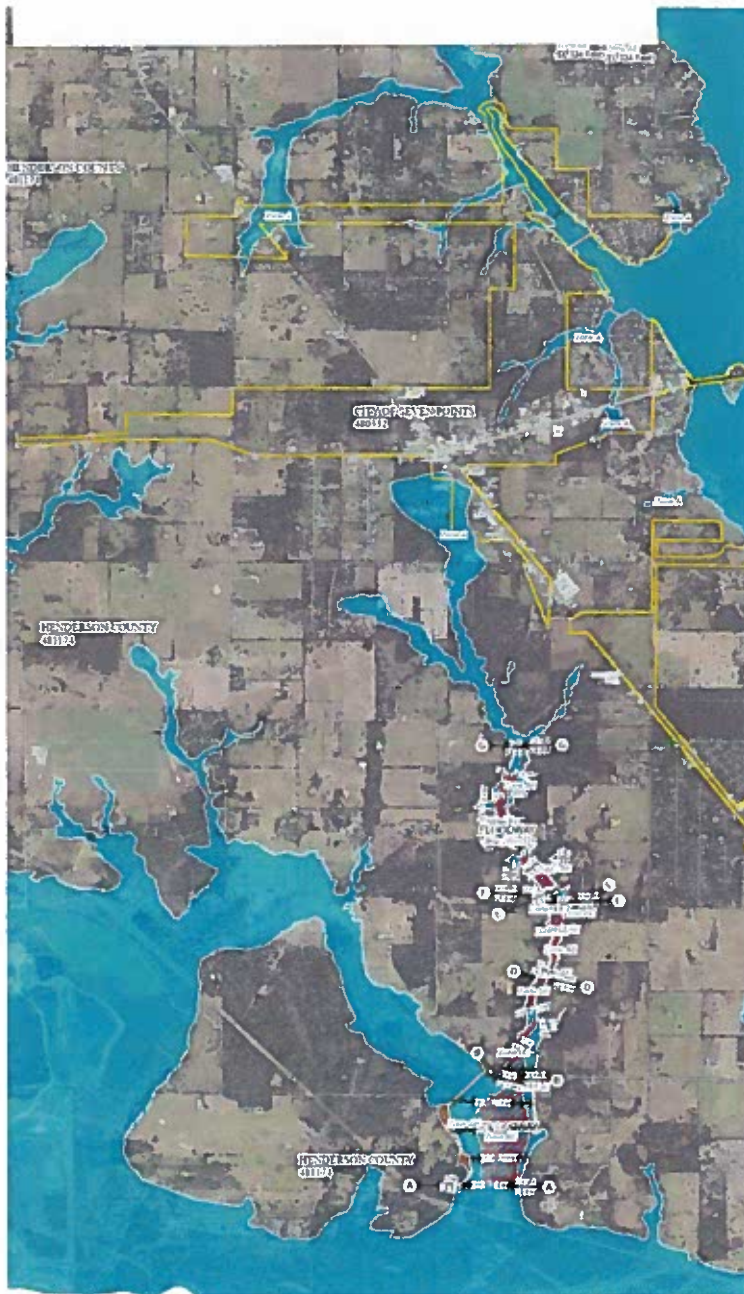












## FLOOD HAZARD INFORMATION

SEE THIS REPORT FOR DETAILED FLOOD HAZARD INFORMATION AND A MAP OF THE DRAFT FLOOD HAZARD AREAS



## NOTES TO USERS

This map was prepared by the Texas Department of Transportation (TxDOT) and the Texas Department of Insurance (TDI) for the purpose of providing information to the public regarding flood hazards in Henderson County, Texas. The map is based on data provided by the Texas Department of Transportation (TxDOT) and the Texas Department of Insurance (TDI). The map is not intended to be used for any other purpose. The map is not intended to be used for any other purpose. The map is not intended to be used for any other purpose.

## SCALE



**National Flood Insurance Program**

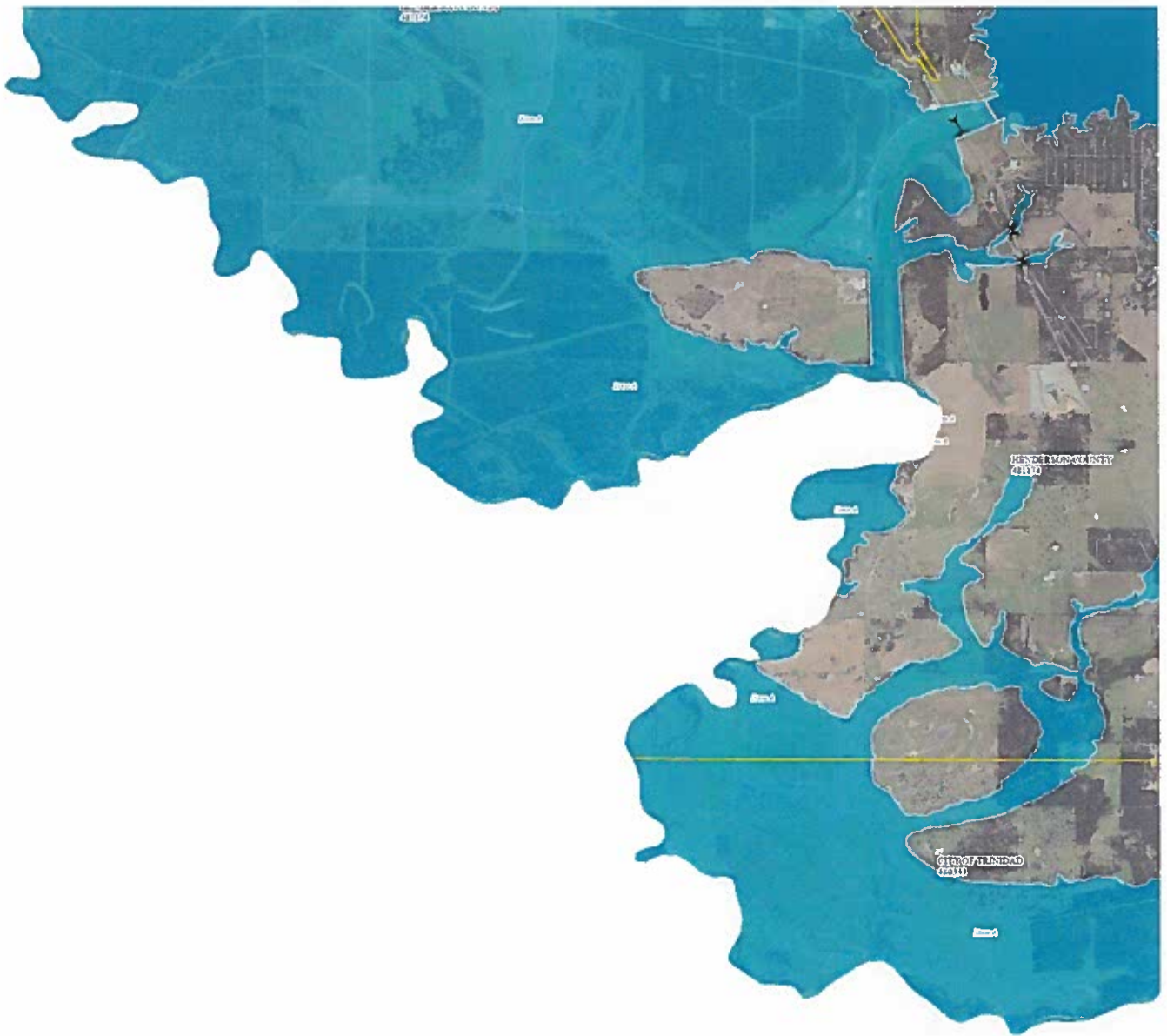
**NATIONAL FLOOD INSURANCE PROGRAM**  
FLOOD INSURANCE RATE MAP  
**HENDERSON COUNTY TEXAS**  
**AND INCORPORATED AREAS**  
Panel 75 of 575

Community: Henderson County, Texas  
Flood Hazard Area: Flood Hazard Area  
Flood Hazard Area: Flood Hazard Area  
Flood Hazard Area: Flood Hazard Area







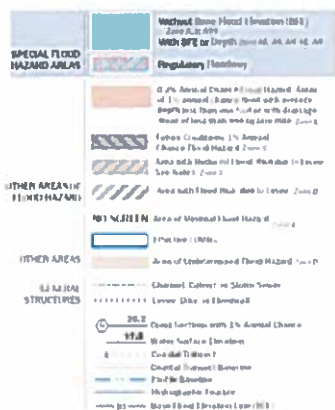


USGS Topographic Map © Thompson, J. & Co. Inc. 1997

W107N, T27N, R12E, S10E, S11E, S12E

# FLOOD HAZARD INFORMATION

NEED INFORMATION ABOUT THE FLOOD HAZARD AND HOW A MAP CAN DRAFTER PANEL LAYOUT



## NOTES TO USERS

The information and data on this map were obtained from the following sources:

- U.S. Army Corps of Engineers, Vicksburg District, Vicksburg, Mississippi
- U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana
- U.S. Army Corps of Engineers, St. Louis District, St. Louis, Missouri
- U.S. Army Corps of Engineers, San Antonio District, San Antonio, Texas
- U.S. Army Corps of Engineers, Fort Worth District, Fort Worth, Texas
- U.S. Army Corps of Engineers, Houston District, Houston, Texas
- U.S. Army Corps of Engineers, Dallas District, Dallas, Texas
- U.S. Army Corps of Engineers, Austin District, Austin, Texas
- U.S. Army Corps of Engineers, El Paso District, El Paso, Texas
- U.S. Army Corps of Engineers, San Diego District, San Diego, California
- U.S. Army Corps of Engineers, Sacramento District, Sacramento, California
- U.S. Army Corps of Engineers, San Francisco District, San Francisco, California
- U.S. Army Corps of Engineers, Portland District, Portland, Oregon
- U.S. Army Corps of Engineers, Seattle District, Seattle, Washington
- U.S. Army Corps of Engineers, Anchorage District, Anchorage, Alaska
- U.S. Army Corps of Engineers, Honolulu District, Honolulu, Hawaii

The information and data on this map were obtained from the following sources:

- U.S. Army Corps of Engineers, Vicksburg District, Vicksburg, Mississippi
- U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana
- U.S. Army Corps of Engineers, St. Louis District, St. Louis, Missouri
- U.S. Army Corps of Engineers, San Antonio District, San Antonio, Texas
- U.S. Army Corps of Engineers, Fort Worth District, Fort Worth, Texas
- U.S. Army Corps of Engineers, Houston District, Houston, Texas
- U.S. Army Corps of Engineers, Dallas District, Dallas, Texas
- U.S. Army Corps of Engineers, Austin District, Austin, Texas
- U.S. Army Corps of Engineers, El Paso District, El Paso, Texas
- U.S. Army Corps of Engineers, San Diego District, San Diego, California
- U.S. Army Corps of Engineers, Sacramento District, Sacramento, California
- U.S. Army Corps of Engineers, San Francisco District, San Francisco, California
- U.S. Army Corps of Engineers, Portland District, Portland, Oregon
- U.S. Army Corps of Engineers, Seattle District, Seattle, Washington
- U.S. Army Corps of Engineers, Anchorage District, Anchorage, Alaska
- U.S. Army Corps of Engineers, Honolulu District, Honolulu, Hawaii

## SCALE



**NATIONAL FLOOD INSURANCE PROGRAM**  
FLOOD INSURANCE RATE MAP  
**HENDERSON COUNTY TEXAS**  
AND INCORPORATED AREAS  
Panel 275 of 575

**COMMUNITY**  
COUNTY  
FLOOD INSURANCE RATE MAP  
HENDERSON COUNTY TEXAS  
Panel 275 of 575

**DATE**  
06/17/04  
06/17/04  
06/17/04









COMMUNITY	PERCENT	TYPE
1775 - 1800	100%	100%
1801 - 1850	100%	100%









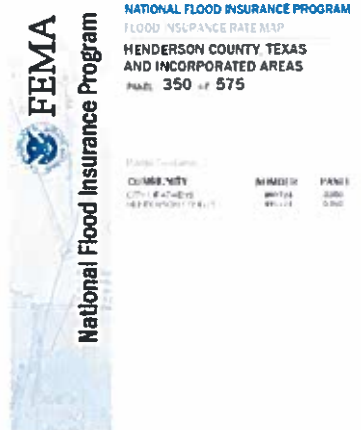
















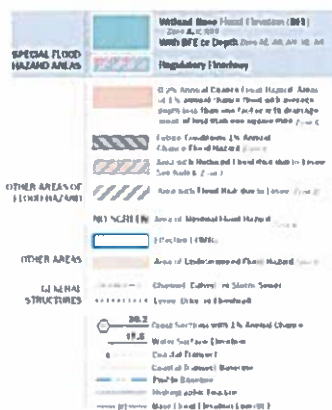


Preview unavailable



### FLOOD HAZARD INFORMATION

SEE THE REPORT FOR DETAILED DESIGN AND BUILD ALIAS  
FOR DRAFTING PAGE LAYOUT



## NOTES TO USERS

[illegible]**SCALE**

1 inch = 2,000 feet 1:24,000

0 1,000 2,000 4,000 6,000 8,000 Feet

0 200 400 600 800 1,000 Meters

N

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD VULNERABILITY MAP

**HENDERSON COUNTY TEXAS**

AND INCORPORATED AREAS  
425-575

PAGE 425 OF 575

CITY/STATE	PERCENTAGE OF POPULATION	PERCENTAGE OF POPULATION
------------	-----------------------------	-----------------------------

2011-12	2012-13	2013-14
2011-12	2012-13	2013-14

[illegible]

1-600-441-1111	800-111-4400	822/4
1-800-441-1111	800-111-4400	822/4























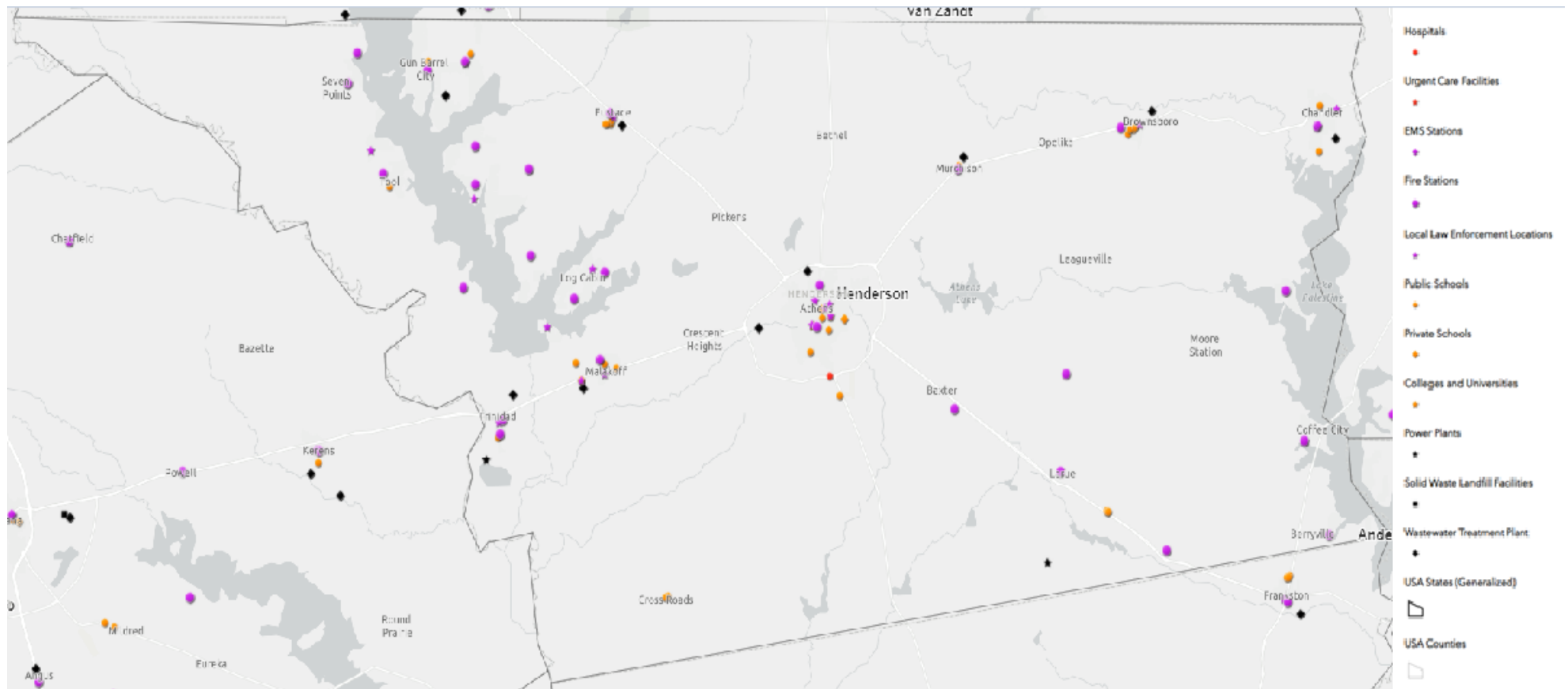
**APPENDIX C.**  
**JURISDICTIONAL CRITICAL FACILITY MAPS**

## **APPENDIX C.**

### **CRITICAL FACILITIES AND INFRASTRUCTURE MAPS**

This appendix includes the jurisdictional maps showing the locations of identified critical facilities and infrastructure.

## CRITICAL FACILITIES & INFRASTRUCTURE



HENDERSON COUNTY

## CRITICAL FACILITIES & INFRASTRUCTURE



SCHOOL



MEDICAL CARE FACILITY



EMS



FIRE DEPARTMENT



POLICE



POWER PLANT

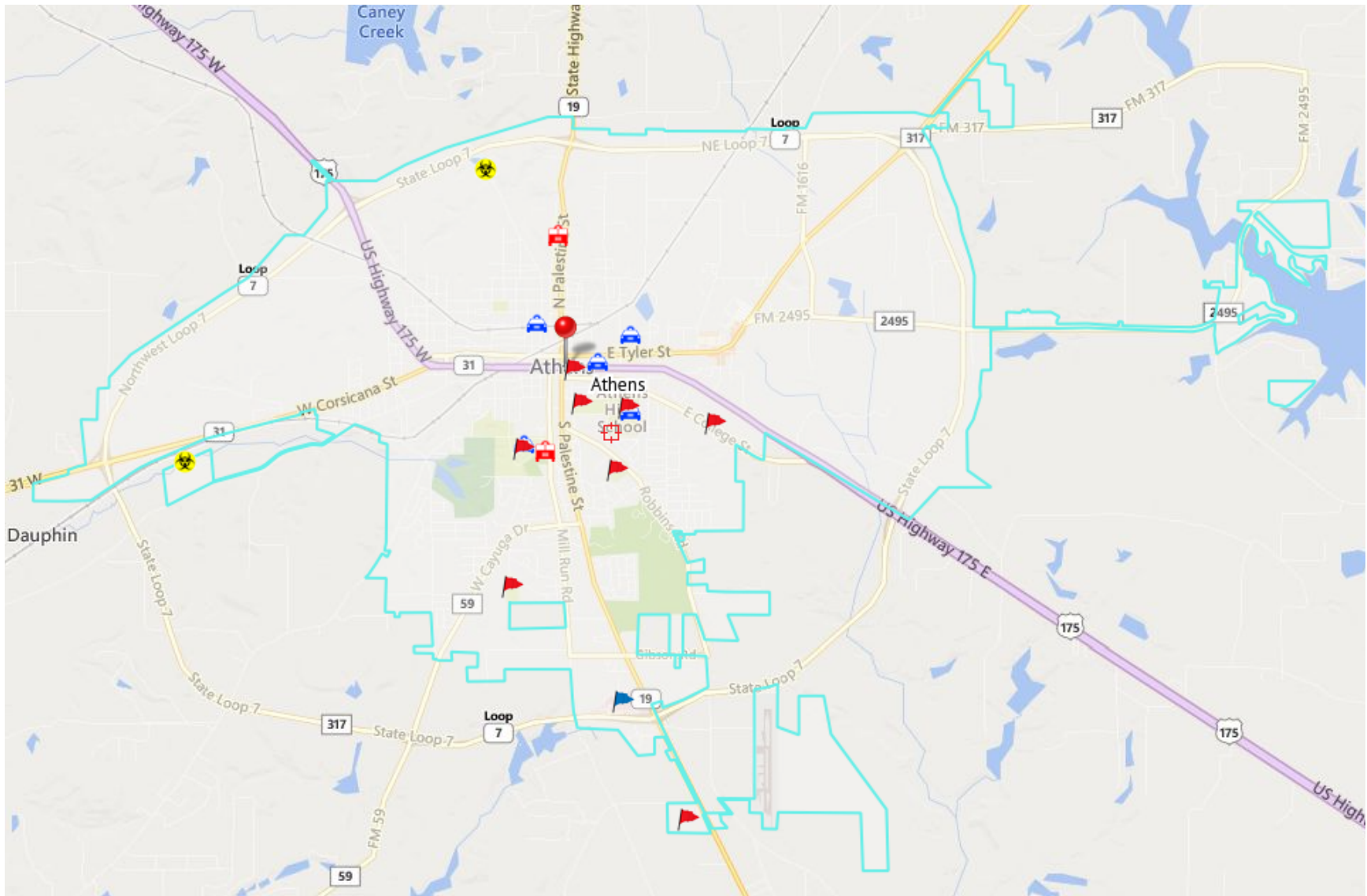


SOLID/WASTE WATER

---

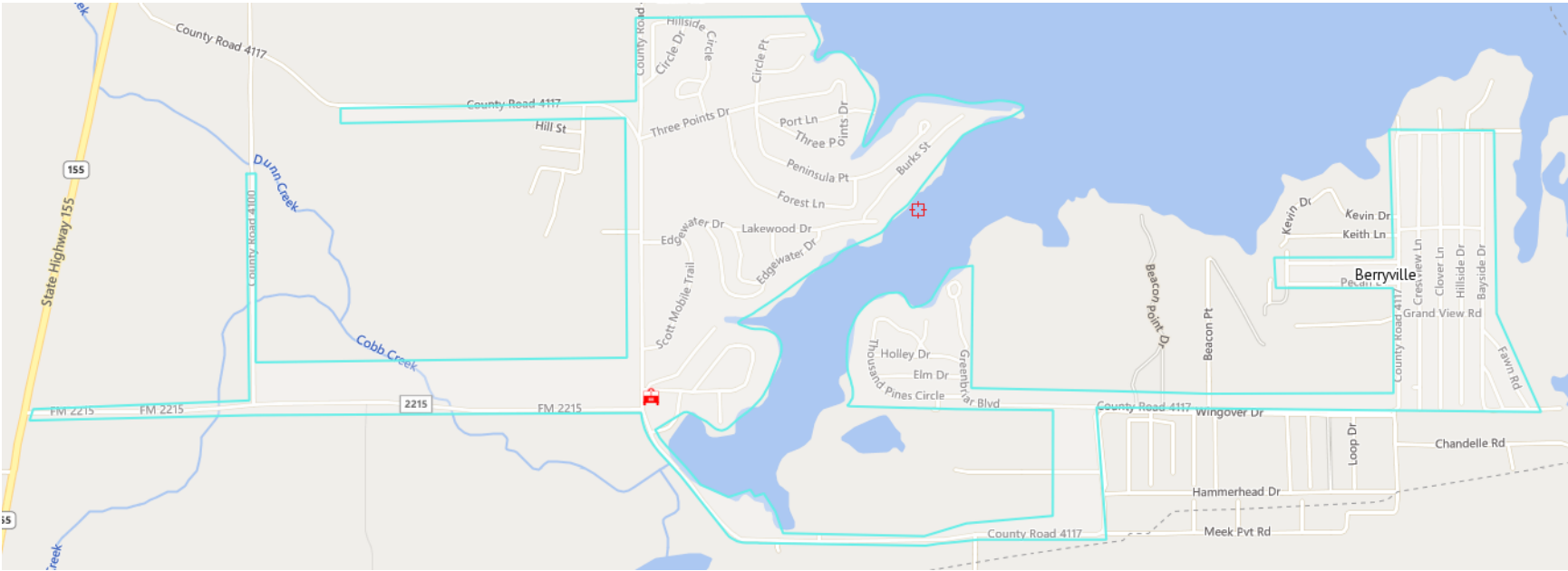


## CRITICAL FACILITIES & INFRASTRUCTURE



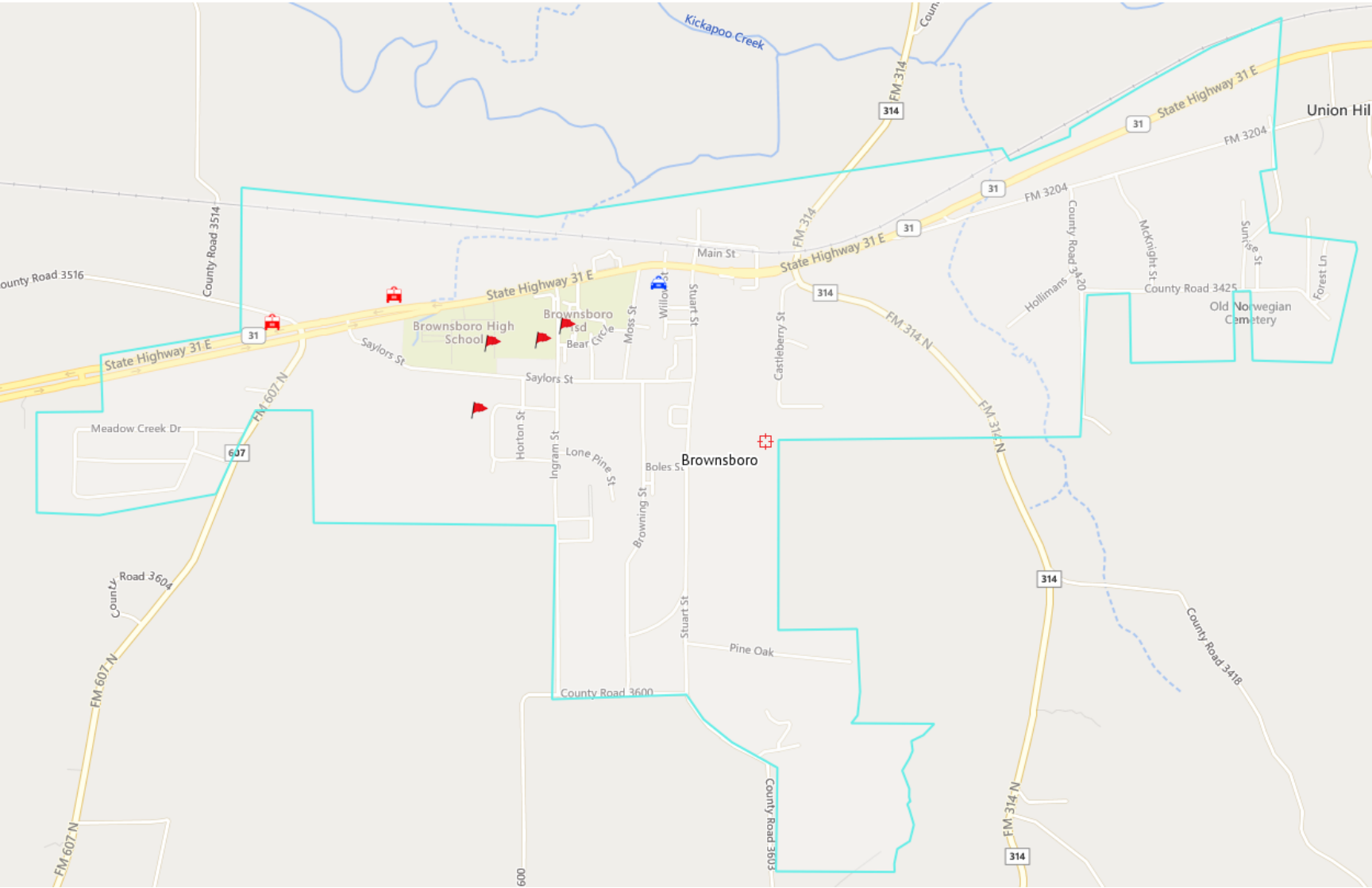
City of Athens

CRITICAL FACILITIES & INFRASTRUCTURE



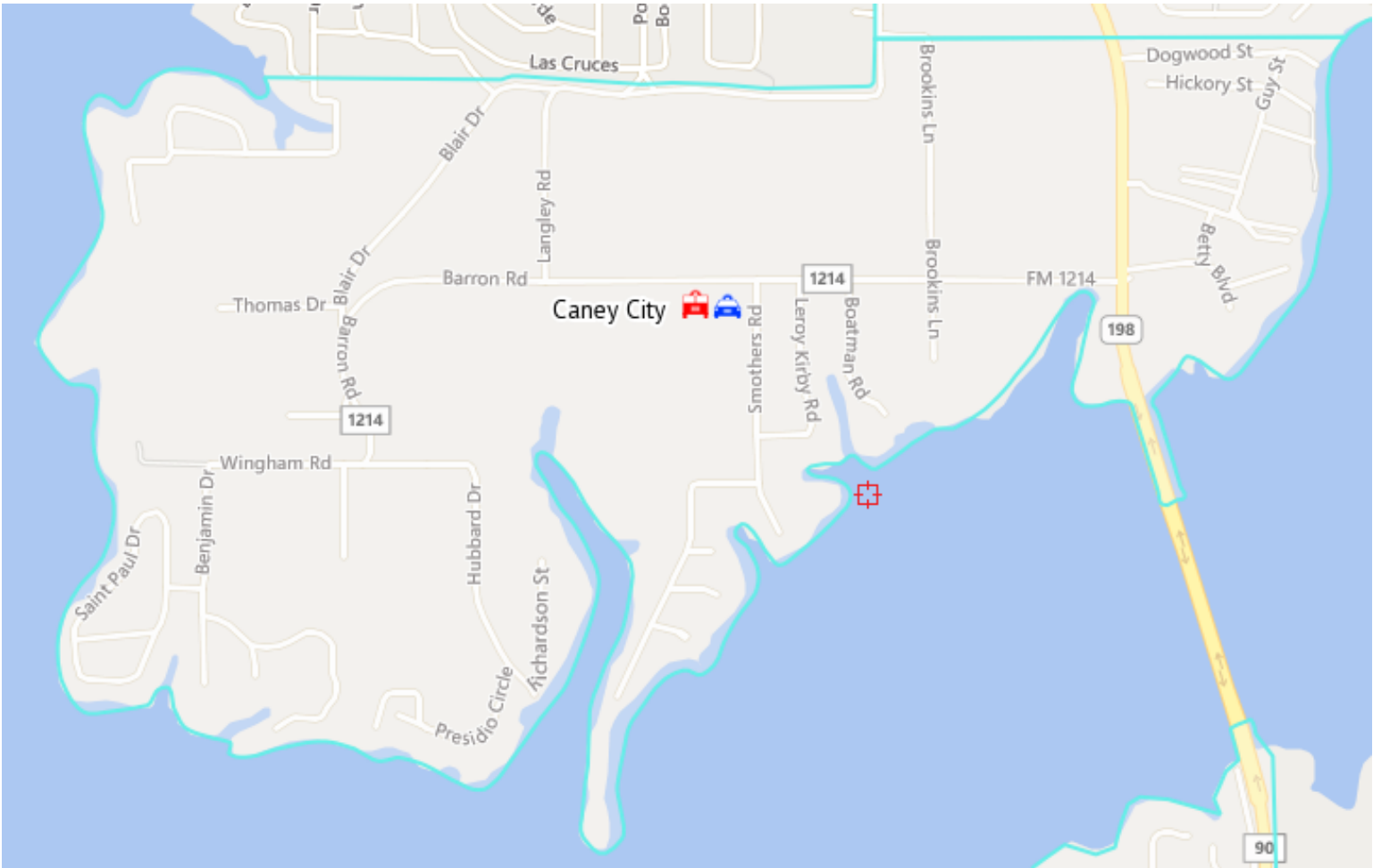
City of Berryville

CRITICAL FACILITIES & INFRASTRUCTURE



City of Brownsboro

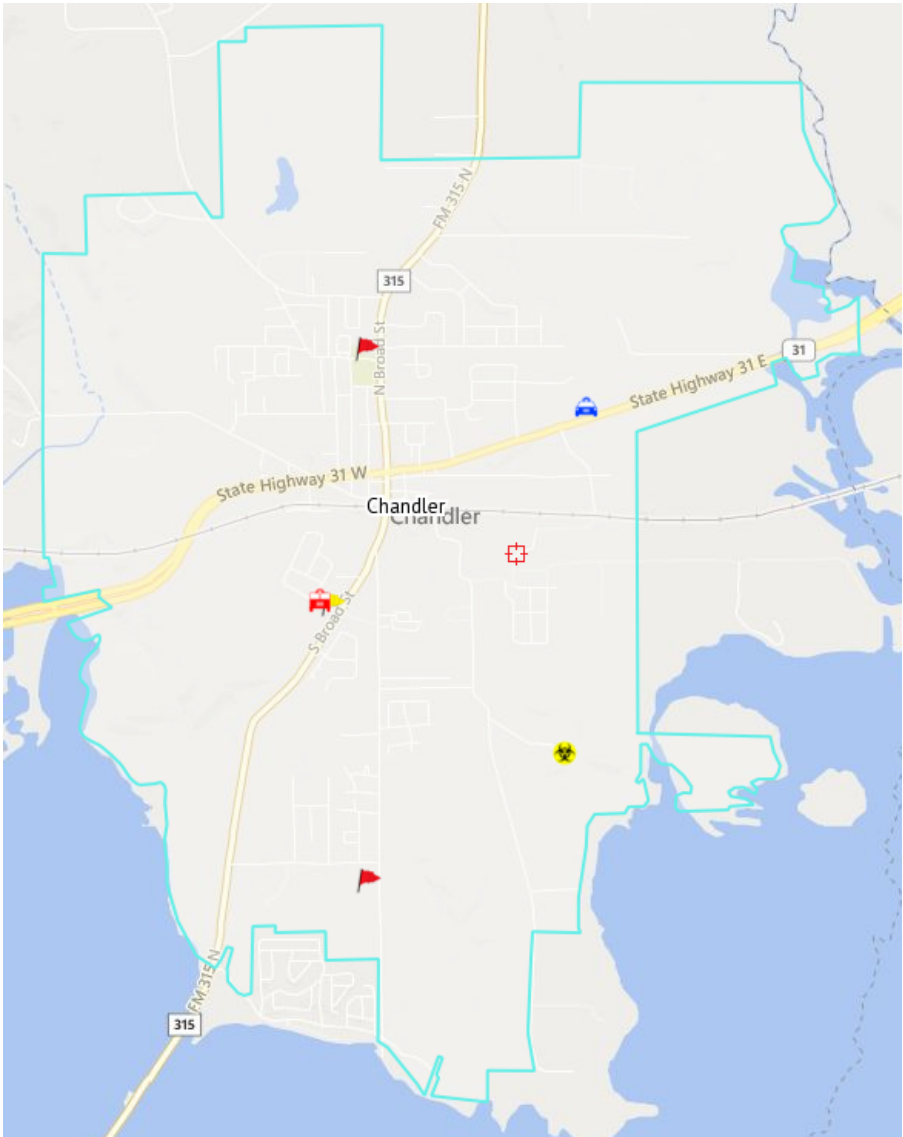
CRITICAL FACILITIES & INFRASTRUCTURE



City of Caney City

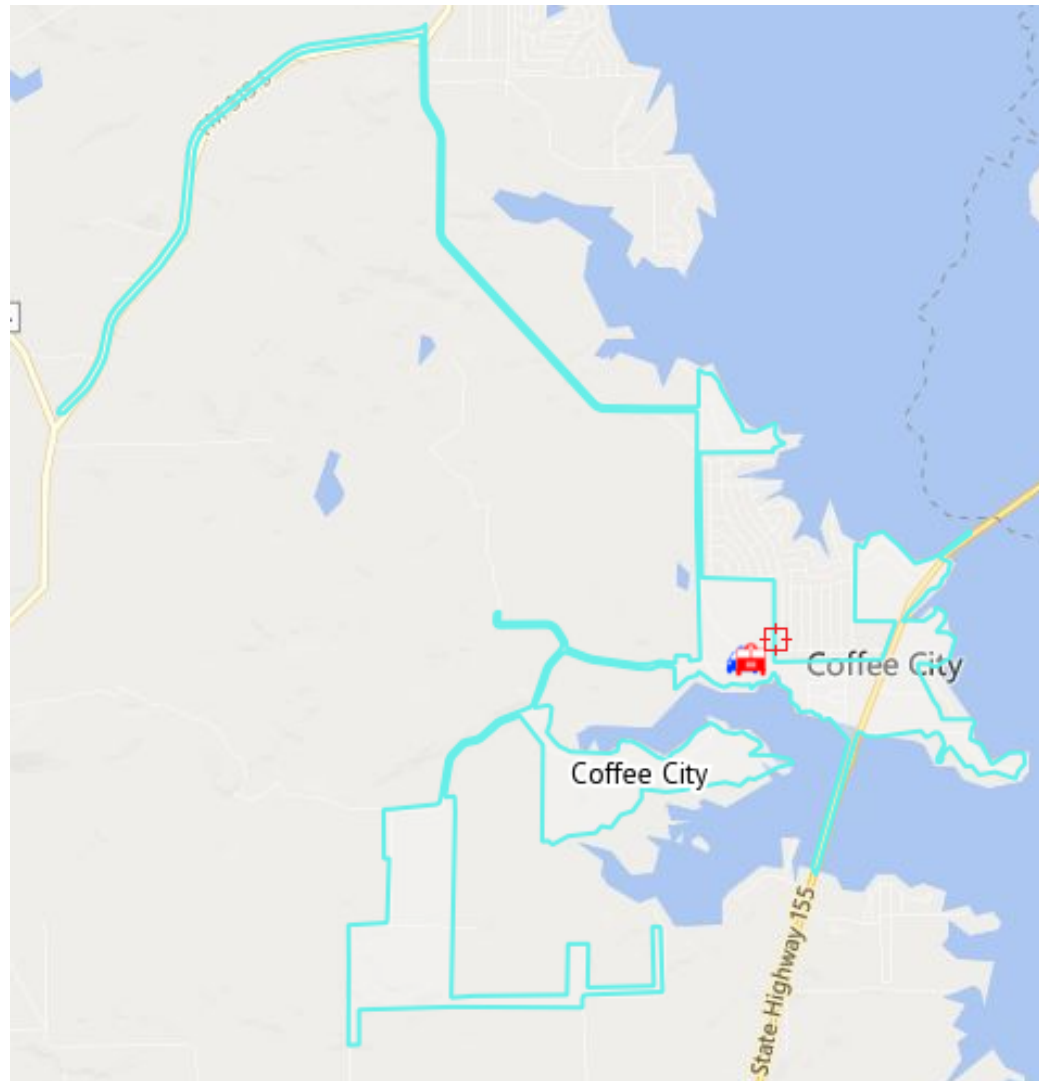


**CRITICAL FACILITIES & INFRASTRUCTURE**



City of Chandler

## CRITICAL FACILITIES & INFRASTRUCTURE



City of Coffee City

---

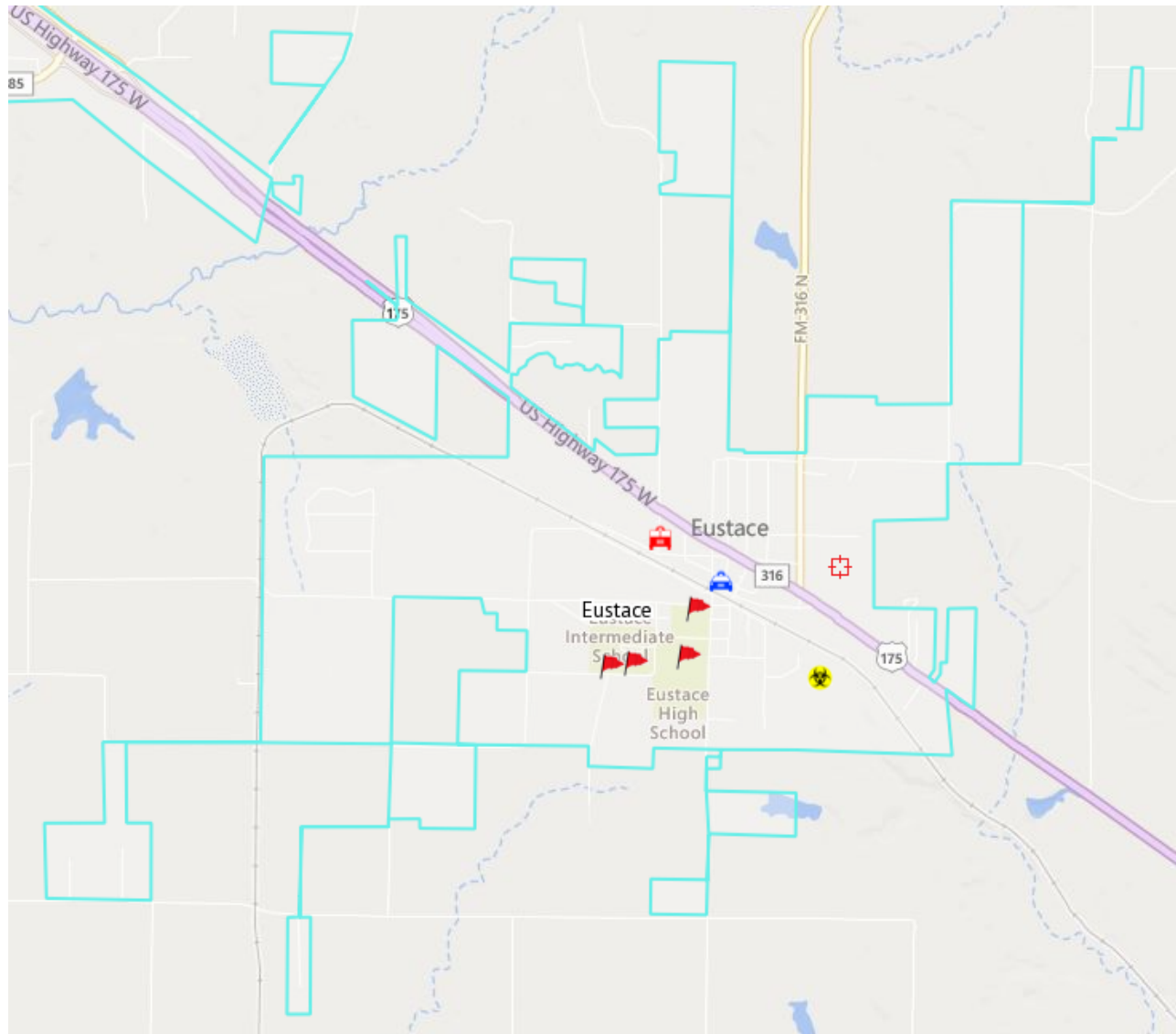
**CRITICAL FACILITIES & INFRASTRUCTURE**



City of Enchanted Oaks

---

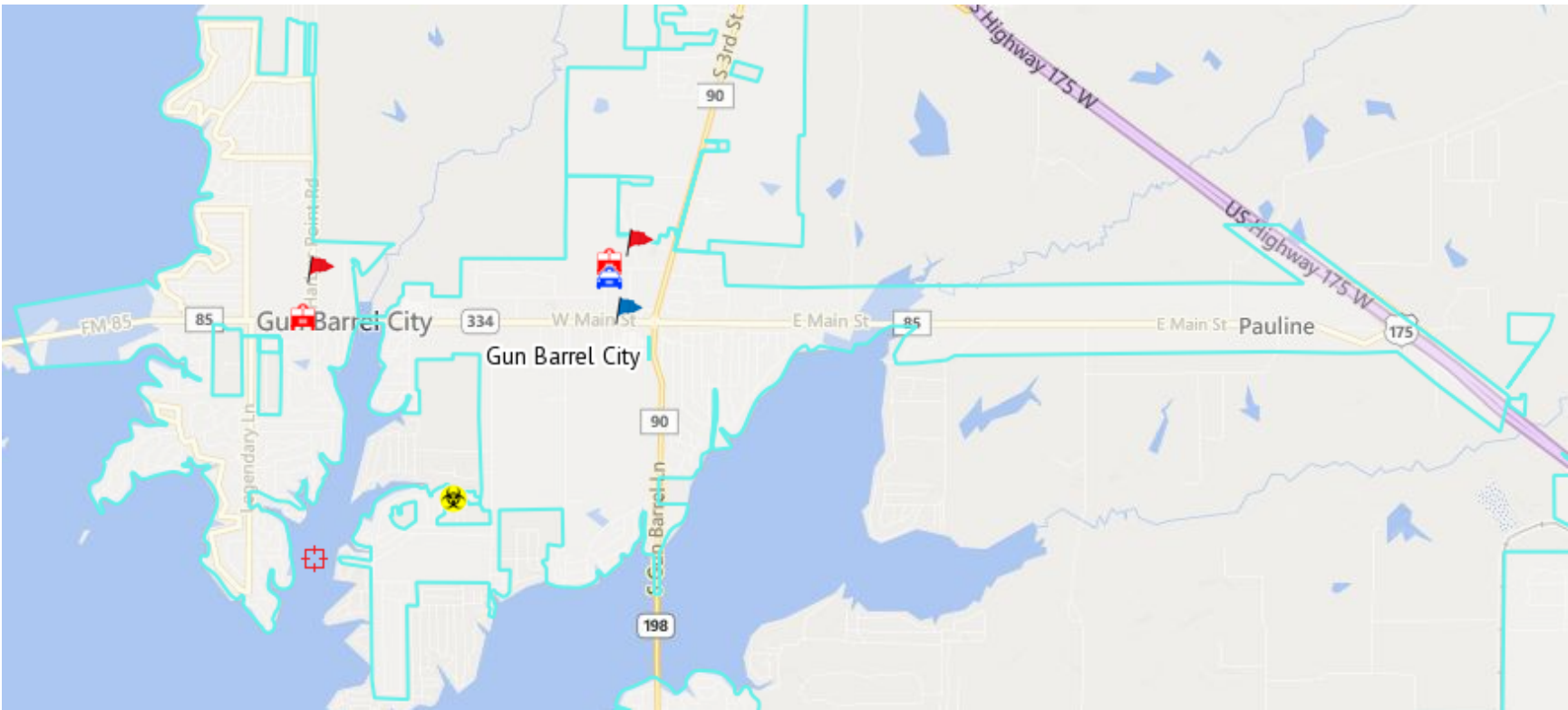
## CRITICAL FACILITIES & INFRASTRUCTURE



City of Eustace



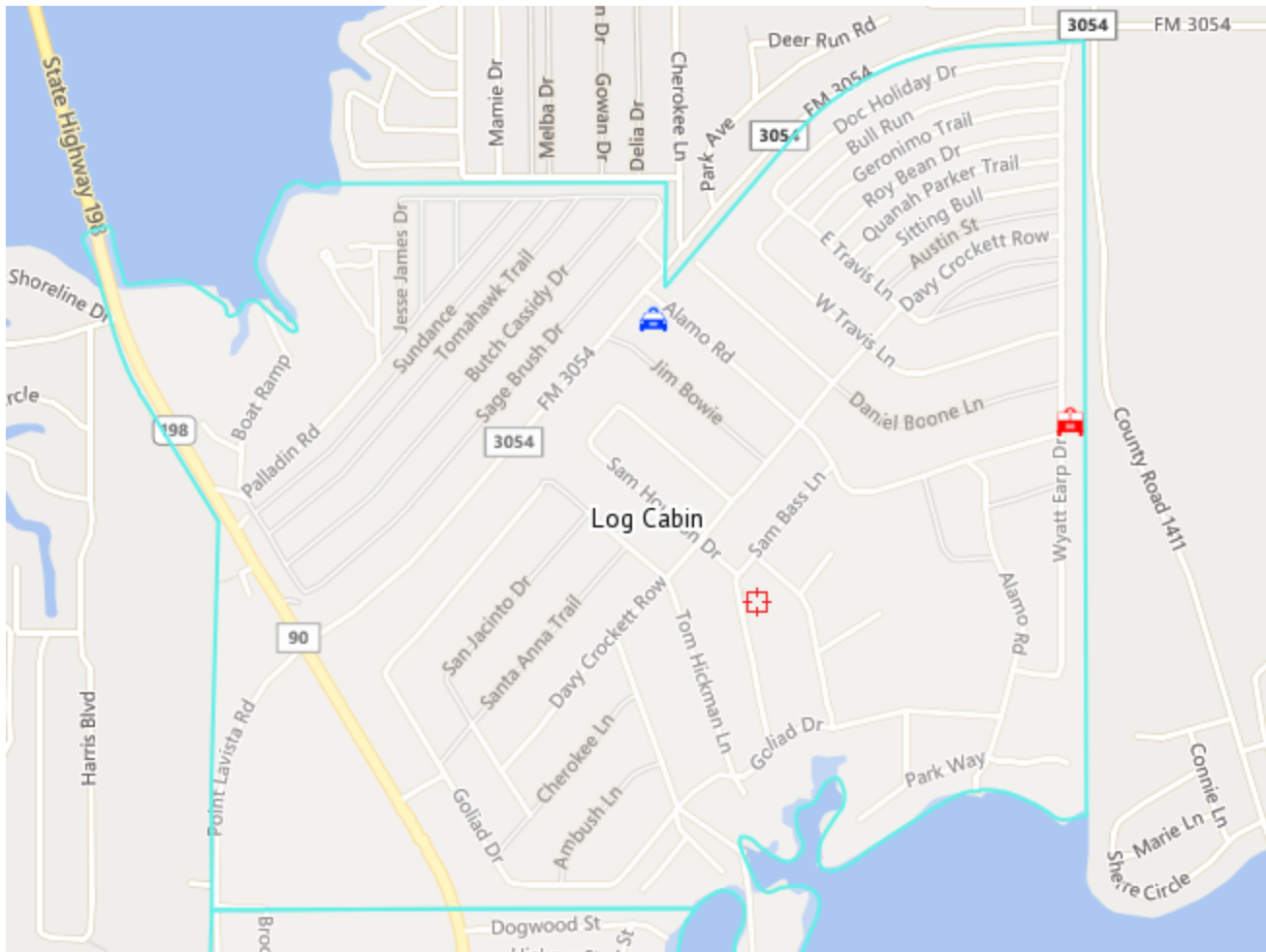
**CRITICAL FACILITIES & INFRASTRUCTURE**



City of Gun Barrel City

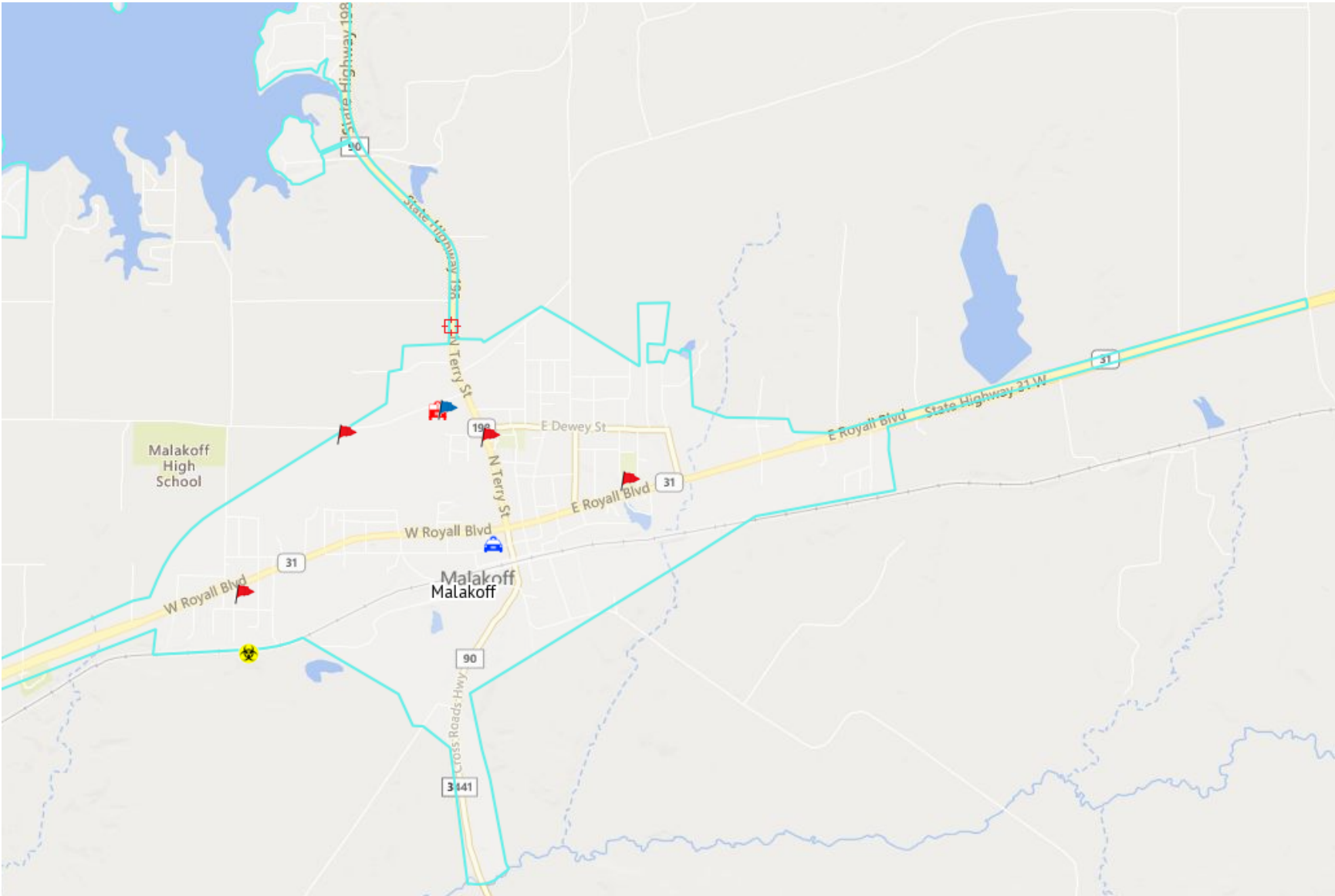
---

## CRITICAL FACILITIES & INFRASTRUCTURE



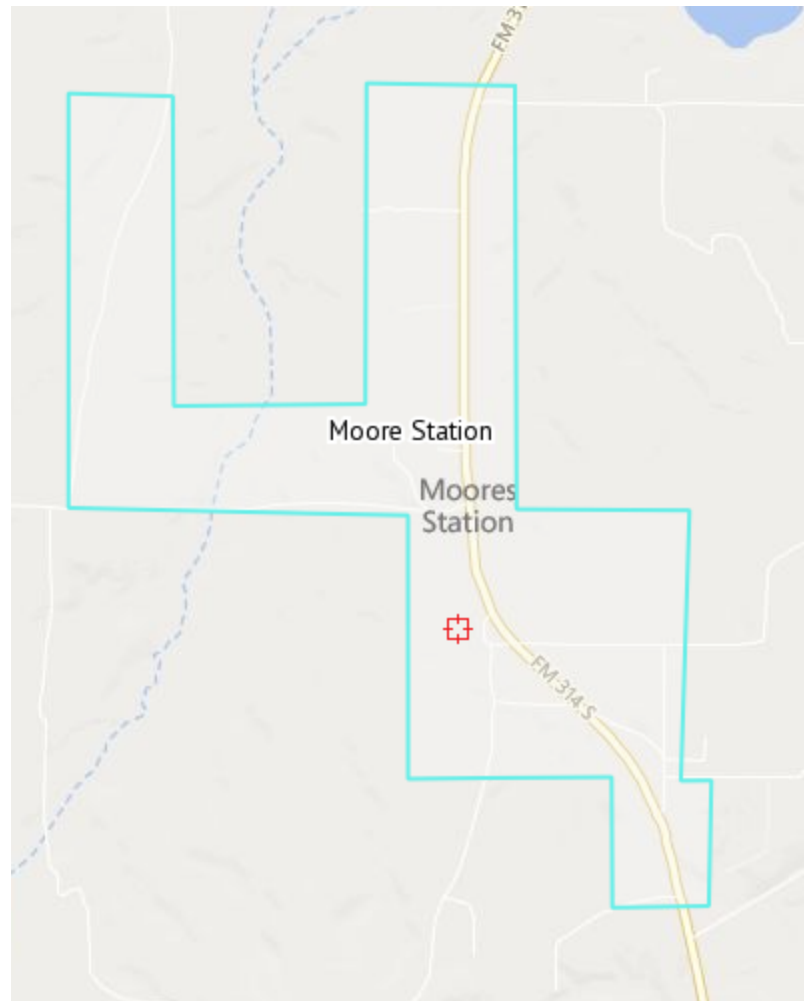
City of Log Cabin

CRITICAL FACILITIES & INFRASTRUCTURE



City of Malakoff

## CRITICAL FACILITIES & INFRASTRUCTURE



City of Moore Station

---

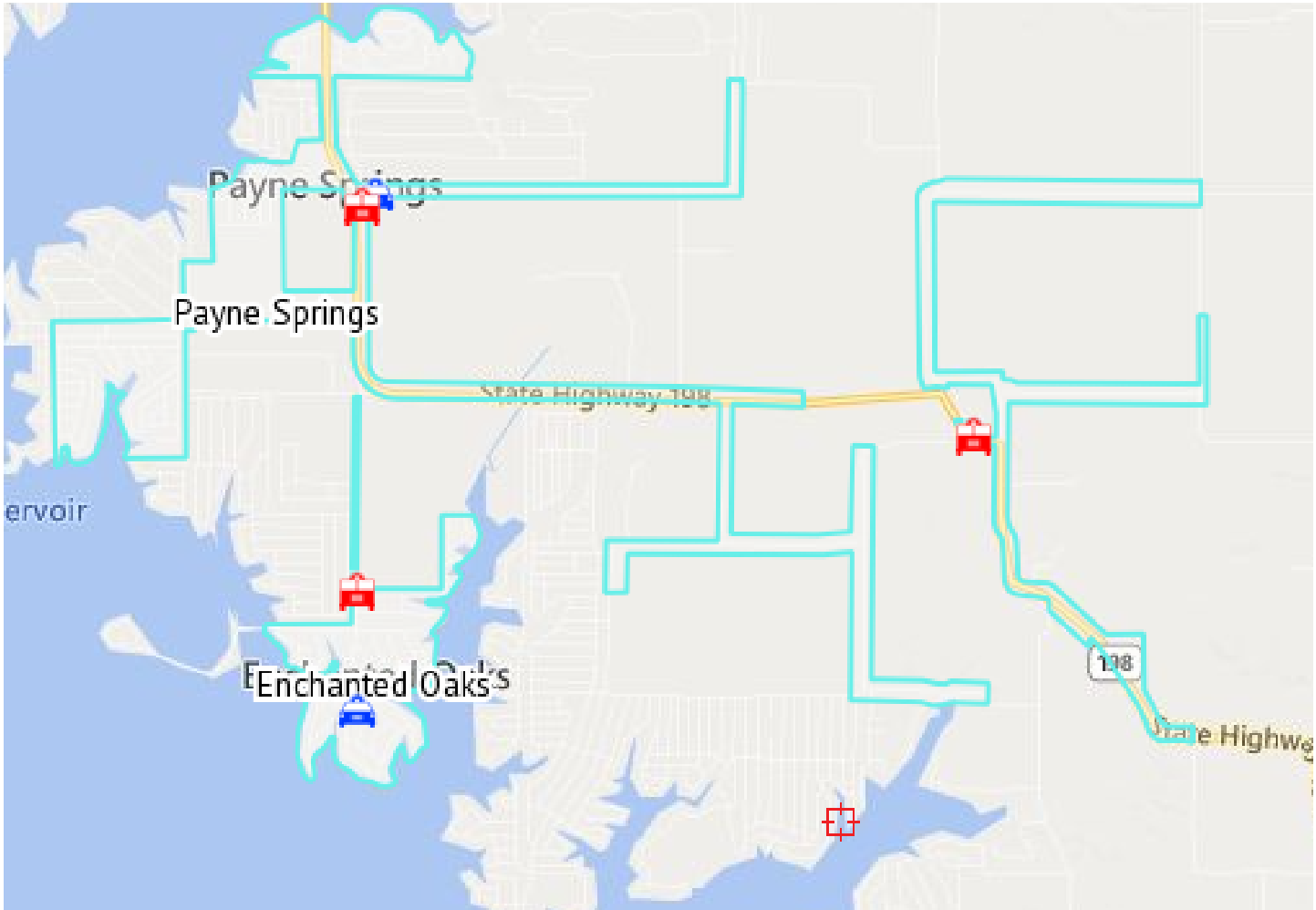


**CRITICAL FACILITIES & INFRASTRUCTURE**



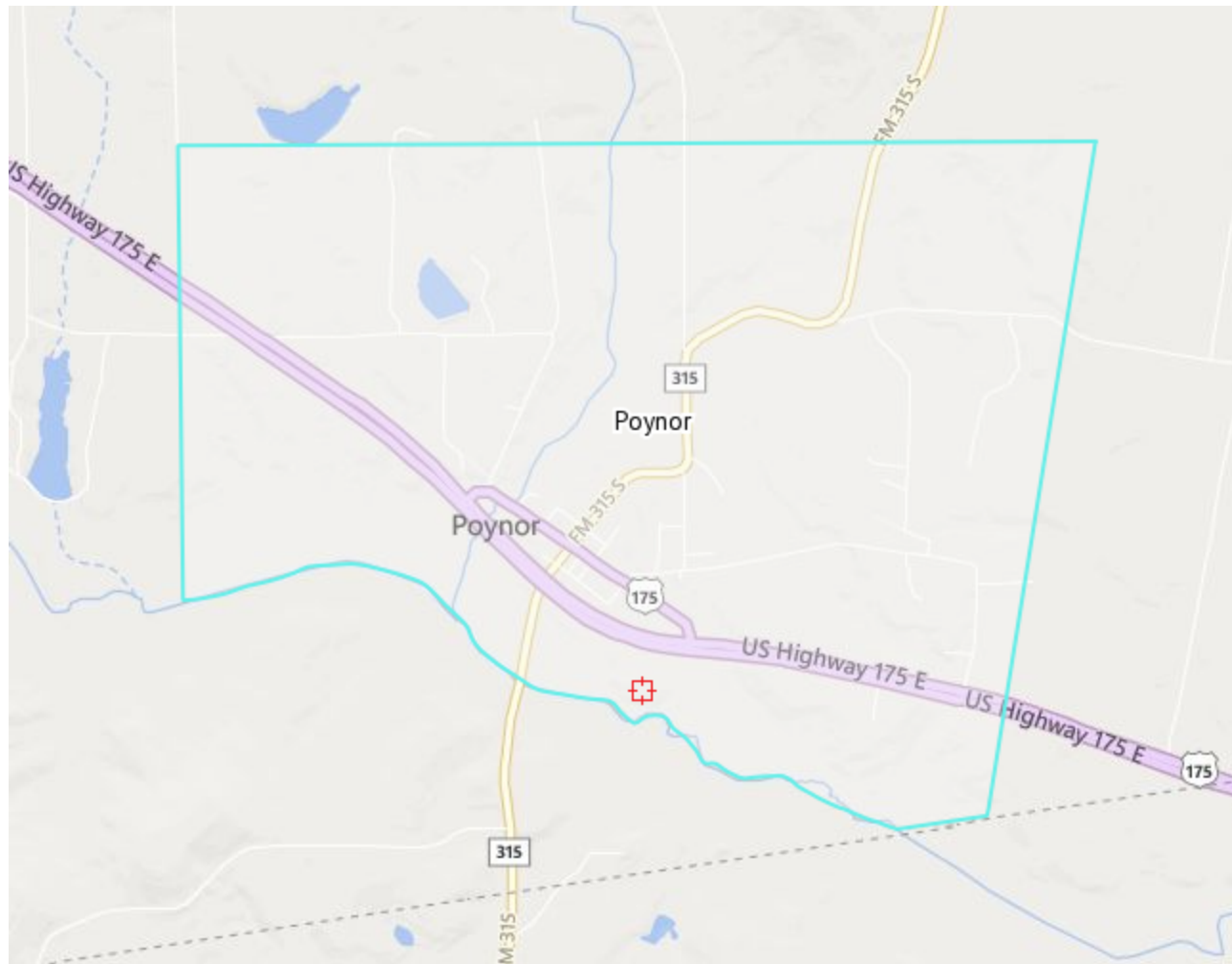
City of Murchison

CRITICAL FACILITIES & INFRASTRUCTURE



City of Payne Springs

## CRITICAL FACILITIES & INFRASTRUCTURE



City of Poynor

---

CRITICAL FACILITIES & INFRASTRUCTURE



City of Seven Points

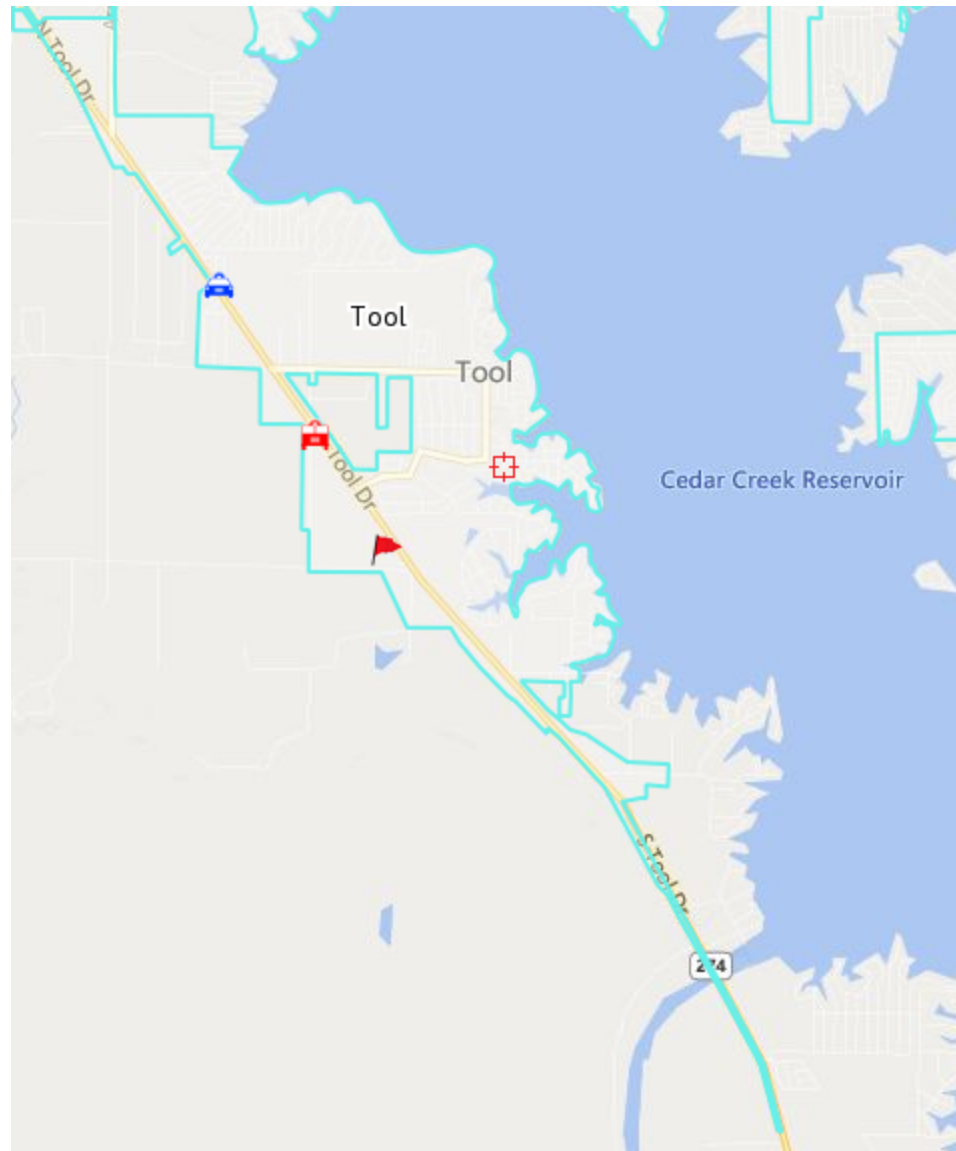


CRITICAL FACILITIES & INFRASTRUCTURE



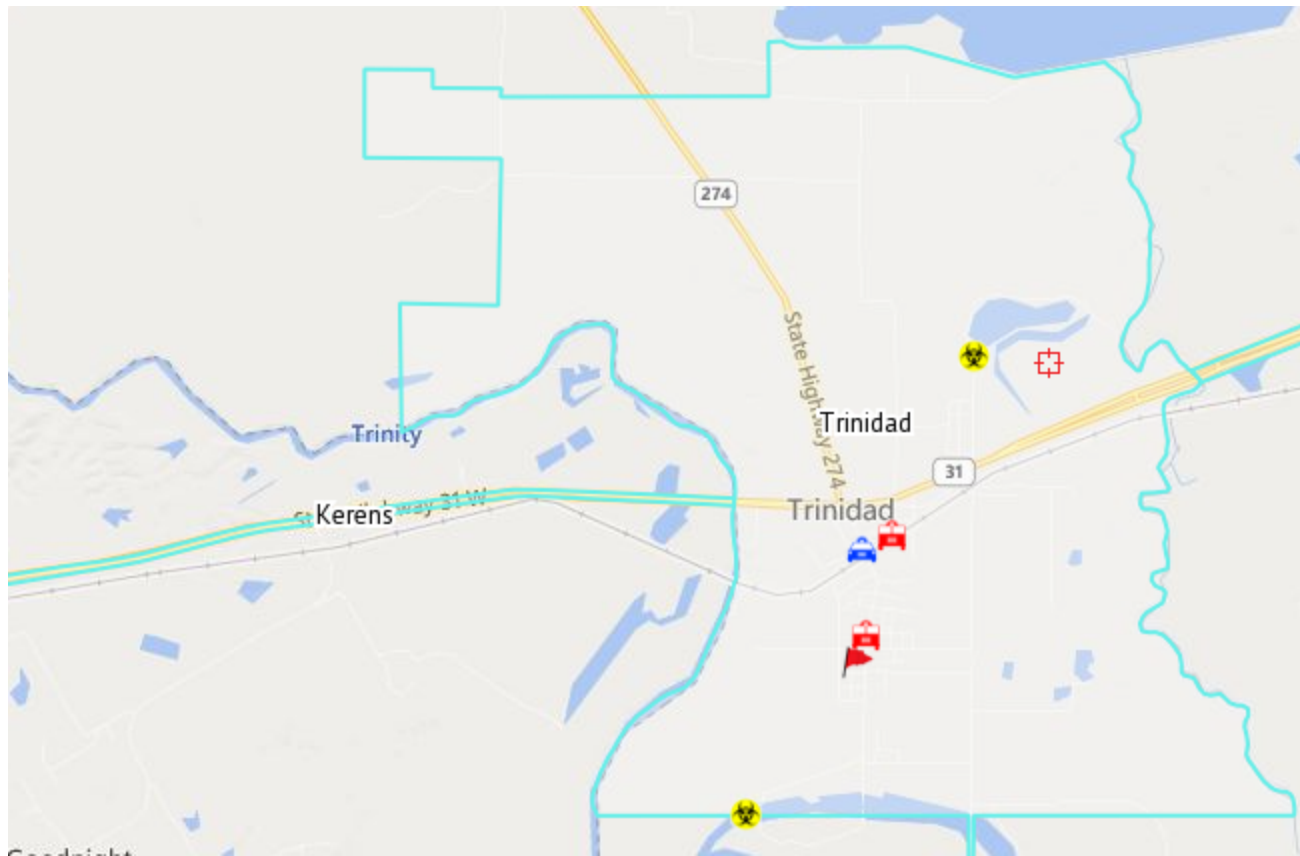
City of Star Harbor

## CRITICAL FACILITIES & INFRASTRUCTURE



City of Tool

## CRITICAL FACILITIES & INFRASTRUCTURE



City of Trinidad

**APPENDIX D.**  
**PLANNING PROCESS DOCUMENTATION**



## **APPENDIX D.**

### **PLANNING PROCESS DOCUMENTATION**

This appendix includes the agenda, sign-in sheets, Memorandum of Agreement and notes from each of the Planning Committee Meetings. This appendix also includes the results of the Henderson County Hazard Mitigation Plan questionnaire, as described in Chapter 3.7.2.





**Hazard Mitigation Plan for Henderson County  
Planning Committee Meeting  
October 8, 2020  
• 2:00 PM**

- Welcome and Introduction
- What is Hazard Mitigation
- Planning Committee Purposes and Responsibilities
  - Stakeholders
  - Cities
- Discuss Plan Goals
- Public outreach
- Next Meeting
- Adjournment





## Henderson County Hazard Mitigation Planning Committee Meeting




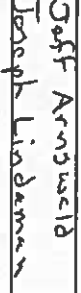
October 8, 2020 2:00 PM

James Young		LaPoyner ISD		903-876-4057 Ext 103	jyoung@lapoynerisd.net
Jamie Sims	<i>Borstad for Montgomery</i>	Athens ISD		903-677-6903	<i>jsims@athensisd.net</i> <i>bcorstad@athensisd.net</i>
Jeanne McCarty		Red Cross			jeannie.mccarty@redcross.org
Jeff Norman		Mabank		903-887-0366	kim@cityofmabank.org
Jessica Brown		Audit	Grant Coordinator	903-675-5170	jbrown@henderson-county.com
Joey Lindaman		Gun Barrel City VFD		903-535-5100	jilindaman@gunbarrelcity.net
John Placyk		Murchison		903-469-3710	murchison.tx@earthlink.net
Josh Fulgham		Brownsboro		903-852-2401	city@brownsboro.us
Joy Kimbrough		Henderson County Office of EM	Henderson County EMC	903-677-7242	jimbrough@henderson-county.com
Kari Hampton		Brownsboro ISD		903-852-3701	hamptonk@gobeargo.net
Kimberly Folchowell		Murchison ISD		903-469-3636 Ext 101	Followwell@murfisd.org
Lamar Mathews	<i>Lamar Mathews</i>	Caney City	<i>Mayor</i>	cell 903-288-1891	cityofcaneycity@yahoo.com
Libby Fulgham		Chandler		903-849-6853	swaters@chandler.tx.com
Mae Burger	<i>Mae Burger</i>	Fire Marshal Office	Deputy Fire Marshal	903-675-6157	mburger@henderson-county.com
Mary Wright		County Clerk	County Clerk	903-675-6140	mwright@henderson-county.com
Montie Montgomery	<i>Borstad for Montgomery</i>	Athens	<i>CM / Mayor</i>	903-677-6610	<i>eborstad@athensisd.net</i> <i>mmontgomery@athensisd.net</i>
Nancy Ruckslaeter		Log Cabin		903-489-2195	mayor@logcabin.texas.gov



## Henderson County Hazard Mitigation Planning Committee Meeting

October 8, 2020 2:00 PM

Committee Member	Signature	Department/Agency	Title	Phone Number	Email Address
Andrea Miller		Payne Springs	Mayor Pro Tem	903-451-9229	secretary@paynesprings.tx.us
Ann Marie Lee		Audit	Auditor	903-675-6145	alee@henderson-county.com
Bill Hash		Seven Points		903-432-4610	skirksey@sevenpointstexas.com
Boile Hillhouse		Sheriff's Office	Sheriff	903-675-5128	bhillhouse@henderson-county.com
Charles Anderson		Moore Station		903-681-2767	ray58@centurylink.net
Chuck McHam		County Commissioner	County Commissioner Pct 3	903-469-3430	cmcham@henderson-county.com
Clint Davis		County Attorney	County Attorney	903-675-6112	cdavis@henderson-county.com
Corey Jenkins		Trinidad ISD	Superintendent	903-778-2673	Corey.jenkins@trinidadisd.org
Coy Holcombe		Eustace ISD		903-425-5128	Cholcombe@eustaceisd.net
Dannie Smith		Poynor		903-876-2436	dannie.smith95@yahoo.com
David Skains		Gun Barrel City	City Mgr	903-887-1087	dsains@gunbarrelcity.net
Deaun Stinecpher		TDEM	Fire Chief	903-920-5838	deaun.stinecpher@dps.texas.gov
Delois Pagitt		Malakoff		903-489-0899	albertker@citymalakoff.net
Don Layton		Malakoff ISD		903-489-1152	Don.layton@malakoffisd.org
Doug Davis		Coffee City		903-876-3414	citysecretary@cityofcoffeecity.com
Douglas Moore		Kemp ISD		903-498-1400 Ext 6001	Douglas.moore@kempisd.org
Dustin Shelton		Eustace		903-275-1024	mayor@eustace.texas.org





# Henderson County Hazard Mitigation Planning Committee Meeting

October 8, 2020 2:00 PM

Natalie Onate		Enchanted Oaks		903-603-3303	mayorenchantedoaks@gmail.com
Nicci Cook		Frankston ISD		903-876-2556 Ext 279	niccicook@frankstonisd.net
Ron Hewlett	<i>Ron Hewlett</i>	Berryville	<i>M46R</i>	cell 214-802-4834	berryvillmayor@gmail.com
Russell Hopkins		Net Health			rhopkins@netphd.org
Shane Renberg		Fire Marshal Office	Fire Marshal	903-677-7252	srenberg@henderson-county.com
Spencer Perkins	<i>SPK</i>	County Extension			spencer.perkins@ag.tamu.edu
Tawnya Austin		Tool		903-432-3522	ghavens@tooltexas.org
Terri Newhouse		Trinidad		903-778-2525	clivadmin@trinidadtexas.com
Thomas Finchum		Crossroads ISD		903-489-2001 Opt 1	tfinchum@crossroadsisd.org
Todd Loper		UT Health			mlloper@uthtl.com
Vicki McAlister		NET Health			vicki.mcalister@netphd.org
Wade McKinney	<i>Wade McKinney</i>	County Judge	County Judge	903-675-6120	countyjudge@henderson-county.com
Warren Claxton		Star Harbor		903-489-0091	starharbor@yahoo.com
George Thaw		Poynoir	City Council	702-768-0475	skirkeara@cityofpoynoir.net
Butch Rousse		PAVNE Springs	CITY COUNCIL	214-475-1840	DAWTON@pswbell.net
Thomas Finchum		Cross Roads ISD	Principal CRHS	903-922-8317	tfinchum@crossroadsisd.org
KAROL KROU		CITY OF MUDLHISON	SECURITY	903-481-3710	mudlhuson@cityofmudlhuson.net
GARY SESTINO		CITY OF TOOL	COUNCIL MEMBER	214 770-0947	SESTINO@TOOLTEXAS.COM



October 8, 2020 2:00 PM

[illegible]





**NOTICE OF MEETING OF THE  
HAZARD MITIGATION PLANNING COMMITTEE OF HENDERSON COUNTY, TEXAS**

Notice is hereby given that a Regular Meeting of the above named Henderson County Hazard Mitigation Planning Committee will be held on the 21<sup>st</sup> day of October, 2020 at 2:00 p.m., in the Henderson County Annex, Commissioners' Courtroom, located at 125 N. Prairieville, in Athens, Texas at which time the following subjects will be discussed, to wit:

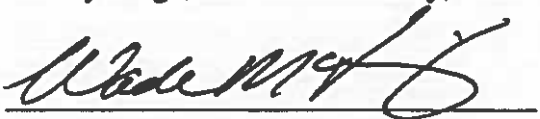
Call to Order  
Citizens Comments

1. MOU Agreement
2. Discussion of plan tables
3. Review and amend Mitigation goals
4. Critical facility discussion
5. Update of community survey
6. Review County Hazard Risk Assessment
7. Review previous mitigation actions from 2011 plan
8. Discuss next meeting
9. Adjournment.

I, the undersigned, County Clerk, do hereby certify that the above Notice of Meeting of the above named Henderson County Hazard Mitigation Planning Committee is a true and correct copy of said Notice. I posted a true and correct copy of said Notice on the bulletin board at the Courthouse door of Henderson County, Texas, at a place readily accessible to the general public at all times on the 15<sup>th</sup> day of October, 2020 and said Notice remained so posted continuously for at least 72 hours preceding scheduled time of said meeting.

Dated this, the 15<sup>th</sup> day of October, 2020

County Judge, Henderson County, Texas



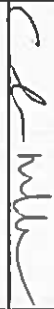
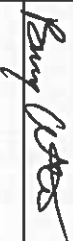

County Clerk, Henderson County, Texas

By: 



## Henderson County Hazard Mitigation Planning Committee Meeting

October 21, 2020 2:00 PM

Committee Member	Signature	Department/Agency	Title	Phone Number	Email Address
Andrea Miller		Payne Springs	Mayor	903-451-9229	secretary@paynespringstx.com
Ann Marie Lee		Audit	Auditor	903-675-6145	alee@henderson-county.com
Barry Choate		Athens ISD		903-677-6903	bchoate@athensisd.net
Bill Hash		Seven Points		903-432-4610	shirkey@sevenpointstexas.com
Boile Hillhouse		Sheriff's Office	Sheriff	903-675-5128	bhillhouse@henderson-county.com
Brad Robinson		Brownsboro ISD			
Charles Anderson		Moore Station		903-681-2767	ray58@centurylink.net
Chris Moore		Moore Station			
Chuck McIlam		County Commissioner	County Commissioner Pct 3	903-469-3430	cmcilam@henderson-county.com
Clint Davis		County Attorney	County Attorney	903-675-6112	cdavis@henderson-county.com
Corey Jenkins		Trinidad ISD	Superintendent	903-778-2673	Corey.jenkins@trinidadisd.org
Coy Holcombe		Eustace ISD	Superintendent	903-425-5128	Cholcombe@eustacisd.net
Dannie Smith		Poynor		903-876-2436	dannie.smith95@yahoo.com
David Skains		Gun Barrel City		903-887-1087	dskains@gunbarrelcity.net
David Smith		City of Brownsboro		903-275-4282	ltnstruction@embarqmail.com
Dean Taylor		UT Health Athens		93-676-1151	dtaylor@uth.net
Deaun Stinecpher		TDEM		903-920-5838	deaun.stinecpher@dps.texas.gov





## Henderson County Hazard Mitigation Planning Committee Meeting

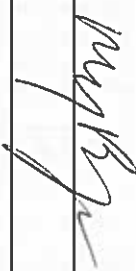
October 21, 2020 2:00 PM

Daleis Pagitt		Malakoff		903-489-0699	abarker@citymalakoff.net
Don Brawner					
Don Layton		Malakoff ISD	Superintendent	903-489-1152	Don.layton@malakoffisd.org
Doug Davis		Coffee City		903-876-3414	citysecretary@cityofcoffeecity.com
Douglas Moore		Kemp ISD		903-498-1400 Ext 6001	Douglas.moore@kempisd.org
Dustin Shelton		Eustace		903-275-1024	mayor@eustacelexas.org
Dutch Antonis		Payne Springs	City Council	214-475-1840	dantonis@swbell.net
Ed Borstad		Athens	CIMayor	903-677-6613	edborstad@athens.tx.gov
Gary Sessito		City of Tool	Council member	214-770-0947	gsessito@tooltxas.org
Gorge Thaw		Peynor	City Council	702-768-0473	skipkara@countylink.net
James Young		LaPoynor ISD	Superintendent	903-876-4057 Ext 103	jyoung@lapoynorisd.net
Janie Sims		Athens ISD	Superintendent	903-677-6903	jsims@athensisd.net
Jeannie McCarty		Red Cross			jeannie.mccarty@redcross.org
Jeff Armswaid		Gun Barrel City	City Manager		jarmswaid@gunbarrelcity.net
Jeff Ingram		Kemp ISD			
Jeff Norman		Mabank		903-887-0366	kim@cityofmabank.org
Jessica Brown		Audit	Grant Coordinator	903-675-5170	jbrown@henderson-county.com



## Henderson County Hazard Mitigation Planning Committee Meeting

October 21, 2020 2:00 PM

John Placyk		Murchison		903-489-3710	murchisonlx@earthlink.net
Joseph Lindaman		Gun Barrel City VFD	Fire Chief	903-535-5100	jindaman@gunbarrelcity.net
Josh Fulgham		Brownsboro		903-852-2401	city@brownsboro.us
Joy Kimbrough		Henderson County Office of EM	Henderson County EMC	903-677-7242	jkimbrough@henderson-county.com
Karon Krow		City of Murchison		903-489-3710	murchisonlx@earthlink.net
Karti Hamplon		Brownsboro ISD		903-852-3701	hamplonk@gobeargo.net
Kimberly Followwell		Murchison ISD		903-489-3636 Ext 101	Followwell@munisd.org
Lamar Mathews		Caney City	Mayor	cell 903-288-1891	cityofcaneycity@yahoo.com
Libby Fulgham		Chandler		903-849-6853	swalers@chandler.tx.com
Mae Burger		Fire Marshal Office	Deputy Fire Marshal	903-675-6157	mburger@henderson-county.com
Mary Wright		County Clerk	County Clerk	903-675-6140	mwright@henderson-county.com
Montie Montgomery		Athens		903-677-6610	mmontgomery@alltenstx.gov
Nancy Ruckstaetter		Log Cabin		903-489-2195	mayor@logcabin.texas.gov
Natalie Onate		Enchanted Oaks		903-603-3303	mayorenchantedoaks@gmail.com
Nicol Cook		Frankston ISD		903-876-2556 Ext 279	nicolcook@frankstonisd.net
Richard Haley					
Ron Hewlett		Berryville	Mayor	cell 214-802-4834	berryvillemayor@gmail.com
Russell Hopkins		Net Health			rhopkins@nephd.org

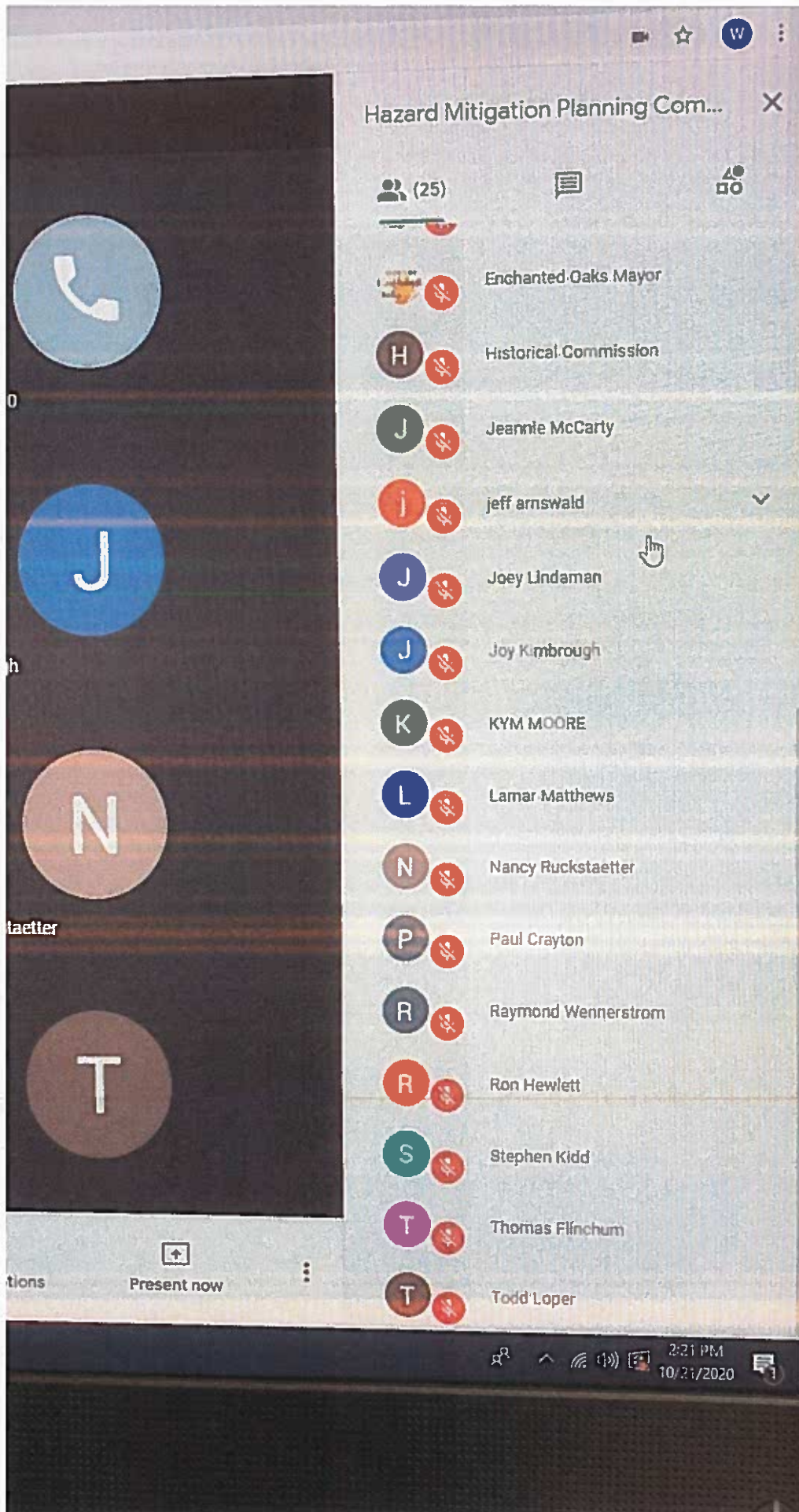




October 21, 2020 2:00 PM

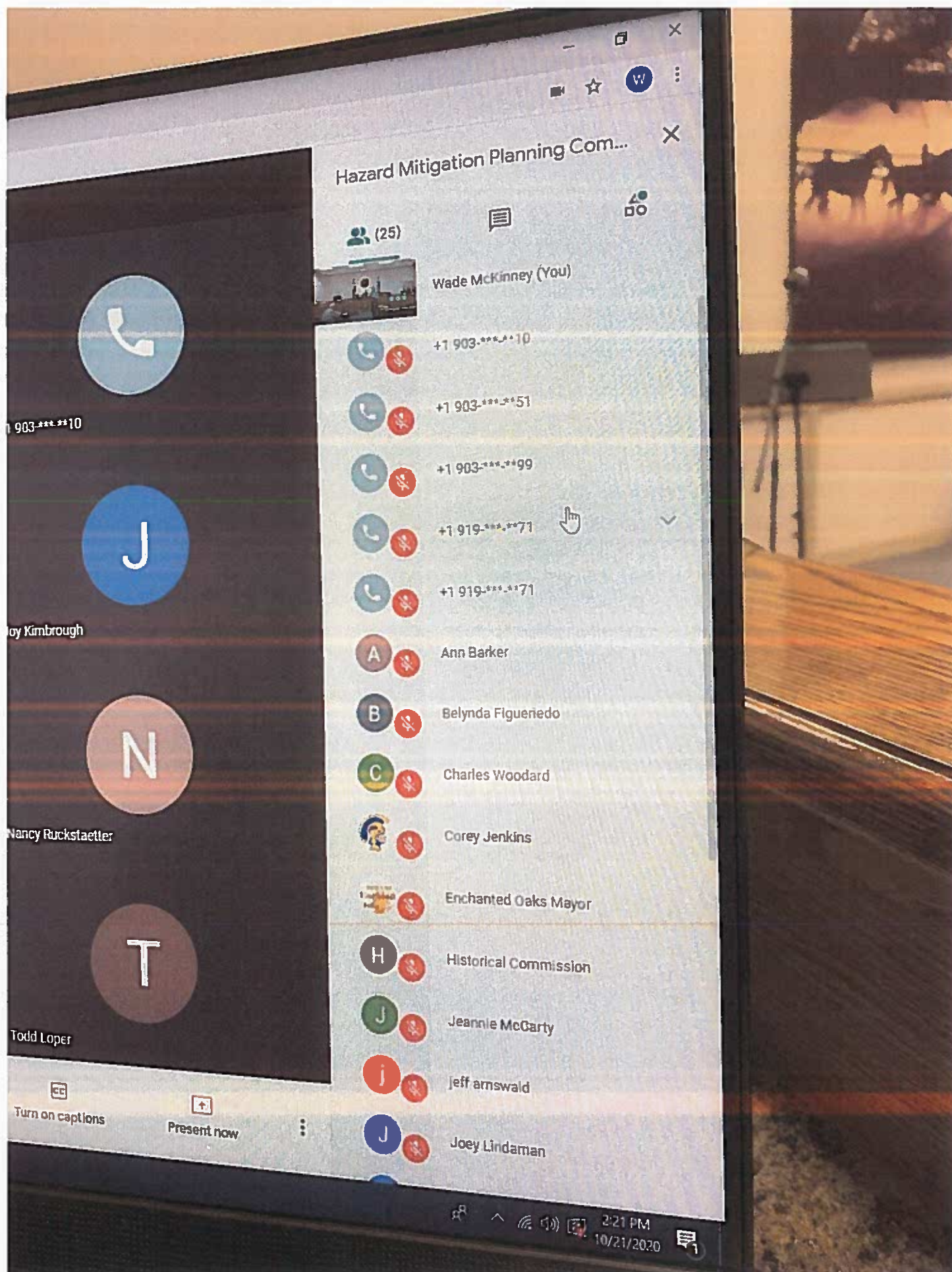
[illegible]













**NOTICE OF MEETING OF THE  
HAZARD MITIGATION PLANNING COMMITTEE OF HENDERSON COUNTY, TEXAS**

Notice is hereby given that a Regular Meeting of the above named Henderson County Hazard Mitigation Planning Committee will be held on the 4<sup>th</sup> day of November, 2020 at 2:00 p.m., in the Henderson County Annex, Commissioners' Courtroom, located at 125 N. Prairieville, in Athens, Texas at which time the following subjects will be discussed, to wit:

Call to Order  
Citizens Comments

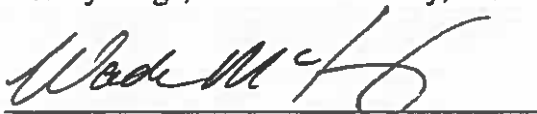
1. Welcome
2. Discuss Hazard Mitigation Planning Process
3. Review Completed items-goals
4. Discuss data tables and data that needs to be submitted
5. Discuss survey results to date
6. Review Mitigation action table
7. Review Mitigation Action worksheet
8. Discuss next meeting
9. Adjournment.

FILED FOR RECORD  
2020 OCT 27 AM 11:41  
HART, JENNIFER W. RIGHT  
COUNTY CLERK  
HENDERSON COUNTY, TEXAS

I, the undersigned, County Clerk, do hereby certify that the above Notice of Meeting of the above named Henderson County Hazard Mitigation Planning Committee is a true and correct copy of said Notice. I posted a true and correct copy of said Notice on the bulletin board at the Courthouse door of Henderson County, Texas, at a place readily accessible to the general public at all times on the 30<sup>th</sup> day of October, 2020 and said Notice remained so posted continuously for at least 72 hours preceding scheduled time of said meeting.

Dated this, the 30<sup>th</sup> day of October, 2020

County Judge, Henderson County, Texas



County Clerk, Henderson County, Texas

By: 





## Henderson County Hazard Mitigation Planning Committee Meeting

November 4, 2020 2:00 PM

Committee Member	Signature	Department/Agency	Title	Phone Number	Email Address
Andrea Miller		Payne Springs	Mayor	903-451-9229	secretary@paynesprings.tx.com
Ann Marie Lee		Audit	Auditor	903-675-6145	alee@henderson-county.com
Barry Choate		Athens ISD		903-677-6903	bchoate@athensisd.net
Bill Hash		Seven Points		903-432-4610	sktksey@sevenpointstexas.com
Boile Hillhouse		Sheriff's Office	Sheriff	903-675-5128	bhillhouse@henderson-county.com
Brad Robinson	GOOGLE MEETS	Brownboro ISD			
Charles Anderson		Moore Station		903-681-2767	ray58@centurylink.net
Chris Moore	GOOGLE MEETS	Moore Station			
Chuck McHam		County Commissioner	County Commissioner Pct 3	903-469-3430	cmcham@henderson-county.com
Clint Davis		County Attorney	County Attorney	903-675-6112	cdavis@henderson-county.com
Corey Jenkins	GOOGLE MEETS	Trinidad ISD	Superintendent	903-778-2673	Corey.jenkins@trinidadisd.org
Coy Holcombe		Eustace ISD	Superintendent	903-425-5128	Cholcombe@eustacesisd.net
Dannie Smith		Poynor		903-876-2436	dannie.smith95@yahoo.com
David Skains		Gun Barrel City		903-887-1087	dskains@gunbarrecity.net
David Smith		City of Brownboro		903-275-4282	lhinstruction@arnbarqmail.com
Dean Taylor		UT Health Athens		93-676-1151	dtaylor@uthet.com
Deaun Stinecoper	GOOGLE MEETS	TDEM		903-920-5838	deaun.stinecoper@dps.texas.gov


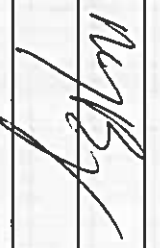
## Henderson County Hazard Mitigation Planning Committee Meeting

November 4, 2020 2:00 PM

Dakota Pagitt		Malakoff		903-489-0899	abarker@citymalakoff.net
Don Brawner					
Don Layton		Malakoff ISD	Superintendent	903-489-1152	Don.layton@malakoffisd.org
Doug Davis		Coffee City		903-876-3414	citysecretary@citycoffeecity.com
Douglas Moore		Kemp ISD		903-498-1400 Ext 6001	Douglas.moore@kempsd.org
Dustin Shelton		Eustace	Mayor	903-275-1024	mayor@eustacelexas.org
Dutch Antonis		Payne Springs	City Council	214-475-1840	dantonis@swbell.net
Ed Borstad		Athens	CM Mayor	903-677-8613	edborstad@athensix.gov
Gary Sestilo		City of Tool	Council member	214-770-0947	gseslito@toollexas.org
Gorge Thaw		Poynor	City Council	702-768-0473	skipkara@countylink.net
James Young		LaPoynor ISD	Superintendent	903-876-4057 Ext 103	jyoung@lapoynorisd.net
Janie Sims		Athens ISD	Superintendent	903-677-6903	jsims@athensisd.net
Jeanne McCarty		Red Cross			jeannie.mccarty@redcross.org
Jeff Amswaid		Gun Barrel City	City Manager		jamswaid@gunbarrelcity.net
Jeff Ingram		Kemp ISD			
Jeff Norman		Mabank		903-887-0366	kim@cityofmabank.org
Jessica Brown		Audit	Grant Coordinator	903-675-5170	jbrown@henderson-county.com

## Henderson County Hazard Mitigation Planning Committee Meeting

November 4, 2020 2:00 PM

John Placyk		Murchison	Mayor	903-489-3710	murchisonrx@earthlink.net
Joseph Lindaman		Gun Barrel City VFD	Fire Chief	903-535-5100	jilindaman@gunbarrelcity.net
Josh Fulgham		Brownsboro	Mayor	903-852-2401	city@brownsboro.us
Joy Kimbrough		Henderson County Office of EM	Henderson County EMC	903-677-7242	jkimbrough@henderson-county.com
Karon Krow		City of Murchison	Secretary	903-489-3710	murchisonrx@earthlink.net
Kari Hampton		Brownsboro ISD	Superintendent	903-852-3701	hamplank@gobeargo.net
Kimberly Followwell		Murchison ISD	Superintendent	903-489-3836 Ext 101	Followwell@murisd.org
Lamar Matthews		Caney City	Mayor	cell 903-288-1891	cityofcaneycity@yahoo.com
Libby Fulgham		Chandler		903-849-8853	swalers@chandler.tx.com
Mae Burger		Fire Marshal Office	Deputy Fire Marshal	903-675-6157	mburger@henderson-county.com
Mary Wright		County Clerk	County Clerk	903-675-6140	mwright@henderson-county.com
Monte Montgomery		Athens	Mayor	903-677-6810	mmontgomery@athens.tx.gov
Nancy Ruckstaetter		Log Cabin	Mayor	903-489-2195	mayor@logcabin.texas.gov
Natalie Orate		Enchanted Oaks	Mayor	903-603-3303	mayorenchantedoaks@gmail.com
Nicol Cook		Frankston ISD		903-876-2556 Ext 279	nicolcook@frankstonisd.net
Richard Haley		Star Harbor	City Council		
Ron Hewlett		Berryville	Mayor	cell 214-802-4834	berryvillemayor@gmail.com
Russell Hopkins		Net Health			rhopkins@netphd.org



November 4, 2020 2:00 PM

[illegible]

## November 4, 2020 2:00 PM

[illegible]



Hazard Mitigation Planning Comm...

(15)



Wade McKinney (You)



+1 903 ... 00



+1 919 ... 71



Bradley Robertson



Chris Moore



Corey Jenkins



Enchanted Oaks Mayor



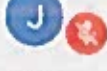
glockmore



Historical Commission



Jeannie McCarty



Joy Kimbrough



KERI HAMPTON



Nancy Ruckstaetter



Russell Marshall



Stephen Kidd



Corey Jenkins



KERI HAMPTON



Jeannie McCarty



Turn on captions



Present now



2:01 PM

11/4/2020







**STATE OF TEXAS** §

**COUNTY OF HENDERSON** §

**BE IT REMEMBERED**, that the Commissioner's Court met in **Hazard Mitigation Planning Committee Meeting on November 4<sup>th</sup>, 2020 @ 2:00 P.M.** with the following members present, to-wit:

**Wade McKinney**  
**Shane Renberg**  
**Botie Hillhouse**  
**Clint Davis**  
**Joy Kimbrough**  
**Mae Burger**

**County Judge**  
**Fire Marshal**  
**Sheriff**  
**County Attorney**  
**Emergency Management**  
**Fire Marshal Office**

And transacted the following business, to-wit:

Judge McKinney called the meeting to order @ 2:00 P.M.

There were no citizens' comments.

**Discuss Hazard Mitigation Planning Process – Timeline:**  
we are trying to stick to a timeline that we have been working on for a while. This is planning meeting number two November 4<sup>th</sup>, 2020. We are on schedule for this plan. We are planning on November 18<sup>th</sup>, 2020 to have a rough draft of our plan ready to show everyone. The planning process and what has to happen before we get this plan submitted.

**Review Completed Items and Goals –** We have been requesting a lot of information from the Cities. As far as the completed items and goals and where we are; there are over 100 data tables. About 80% of our data tables are completed. The verbiage of the plan is 174 pages and we have the information from the cities in the rough draft.

**Data Tables and Data that needs to be Submitted -** What is left on the data tables, we want to clean up and add to the draft. I will not have the rough draft prior to the November 18<sup>th</sup>, 2020 meeting. We will send it out after the November 18<sup>th</sup>, 2020 meeting. I want to make sure if there are any items that need to be added. The Cities have gotten half of the data to us is: City of Athens, Berryville, Coffee City, Gun Barrel City, Seven Points, Enchanted Oaks, Log Cabin, Caney City, Moore Station, Coffee City and Log Cabin, we need the other half of your data. We have completed data from Payne Springs, Chandler and Star Harbor. We have not received any data from Trinidad, Tool, Poynor, Eustace, Brownsboro, Murchison or Malakoff. If we do not receive the data from these cities we will not be able to get the rough draft completed. Brownsboro submitted their data today. Dion – if your city is not participating in this plan and are not part of Henderson County plan and do not have your own plan you will miss out on grant funding. If you have a disaster in your city and do not have the resources you will have to come to the county and if we don't have the resources we will go to the State, so it is very important that the cities have their information turned into the county.

**Mitigation Action Table** – this is a very big table, we gave you examples of what mitigation actions could be and we appreciate the cities that turned in their mitigation action table. There is a lot of information for every mitigation item. The more information we have in our plan we can pass on to the State and FEMA. I will be sending a sheet for mitigation action worksheet for each mitigation action. How will you implement these actions and how are they going to help you in your city? You can list future developments in your cities. We need to know if you are fixing up something older in your city, we need to know this. We will need to know the estimated cost on the developments etc. After this meeting the mitigation action table will be emailed out to every city. Goals can interchange with your projects. Putting in a storm shelter can be a project in your city. Please let us know about projects your city is working on so we can add it to the plan. Please get the goals submitted back to us.

**Next Meeting** – will be November 18<sup>th</sup>, 2020 at 2:00 P.M.

The meeting ended @ 2:34 P.M.

# Henderson County Hazard Mitigation Plan

## Memo of Agreement

### I. Purpose

A Memorandum of Agreement (MOA) is hereby executed between the participating jurisdictions in the Henderson County Hazard Mitigation Action Plan. "Participating jurisdictions" in this MOA are as follows:

Entity Name: <u>City of Eustace Tx</u>	Entity Name: <u>City of Murkison</u>
Entity Name: <u>City of Enchanted Ales</u>	Entity Name: <u>CITY OF POYNOR</u>
Entity Name: <u>City of Gun Barrel</u>	Entity Name: <u>CITY OF CHANDLER</u>
Entity Name: <u>City of Berryville</u>	Entity Name: <u>City of Star Harbor</u>
Entity Name: <u>City of Trinidad</u>	Entity Name: <u>City of Seven Points</u>
Entity Name: <u>City of Taul</u>	Entity Name: <u>City of Brownsboro</u>
Entity Name: <u>City of Puyve Springs</u>	Entity Name: <u>City of Coffee City</u>
Entity Name: <u>City of Cane City</u>	Entity Name: <u>CITY OF LOG CABIN</u>
Entity Name: <u>City of MALA ROFF</u>	Entity Name: <u>City of Athens</u>
<u>City of Moore Station</u>	

### I. Purpose

The purpose of this MOA is to establish commitment from and a cooperative working relationship between all Participating Jurisdictions in the development and implementation of the Hazard Mitigation Plan. In addition, the intent of this MOA is to ensure that the multi-jurisdictional hazard mitigation plan is developed in accordance with Title 44 of the Federal Code of Regulations (CFR) Part 201.6; that the planning process is conducted in an open manner involving community stakeholders; that it is consistent with each participating jurisdiction's policies, programs and authorities; and it is an accurate reflection of the community's values.

This MOA sets out the responsibilities of all parties. The MOA identifies the work to be performed by each participating jurisdiction. Planning tasks, schedules, and finished products are identified in the Work Program and Schedule. The plan created as a result of this MOA will be presented to the governing body (Planning Commission, City Council and or Board of Commissioners) of each participating jurisdiction for adoption.

### II. Background

Mitigation plans form the foundation for a community's long-term strategy to reduce disaster losses and break





the cycle of disaster damage, reconstruction, and repeated damage. The Participating Jurisdictions in a mitigation planning process would benefit by:

- identifying cost effective actions for risk reduction;
- directing resources on the greatest risks and vulnerabilities;
- building partnerships by involving people, organizations, and businesses;
- increasing education and awareness of hazards and risk;
- aligning risk reduction with other community objectives; and
- providing eligibility to receive federal hazard mitigation grant funding.

Henderson County Texas has received a grant from the Federal Emergency Management Agency to prepare a multi-jurisdictional hazard mitigation plan in accordance with 44 FEMA requirements at 44.C.F.R. 201.6.

### **III. Planning Team Responsibilities**

Henderson County Texas will act as the Lead Community, and will assign a Chairperson of the Planning Team for the Hazard Mitigation Plan. The Participating Jurisdictions authorize the Lead Community to manage and facilitate the planning process in accordance with the Work Program and Schedule.

The Participating Jurisdictions understand that representatives must engage in the following planning process, as more fully described in the *Local Mitigation Planning Handbook* (FEMA, 2012), including, but not limited to:

- Develop the Work Program and Schedule with the Planning Team
- Organize and attend regular meetings of the Planning Team.
- Assist the Planning Team with developing and conducting an outreach strategy to involve other planning team members, stakeholders, and the public, as appropriate to represent their Jurisdiction.
- Identify community resources available to support the planning effort, including meeting spaces, facilitators, and media outlets.
- Provide data and feedback to develop the risk assessment and mitigation strategy, including a specific mitigation action plan for their Jurisdiction.
- Submit the draft plan to their Jurisdiction for review.
- Work with the Planning Team to incorporate all their Jurisdiction's comments into the draft plan.
- Submit the draft plan to their respective governing body for consideration and adoption.
- After adoption, coordinate a process to monitor, evaluate, and work toward plan implementation.



#### IV. Planning Team

The following points of contacts and alternatives are authorized on behalf of the governing bodies to participate as members of the Planning Team for the Hazard Mitigation Plan:

Lead and Participating Jurisdiction: Henderson County, Texas

Name of Contact: Shane Renberg

Title: Henderson County Fire Marshal

Office/Agency: Henderson County Fire Marshal's Office

Address: 125 N. Prairieville Street, Athens, Texas 75751

Phone number:

Email address: [firemarshal@henderson-county.com](mailto:firemarshal@henderson-county.com)

Participating Jurisdiction: City of Eustace TX

Name of Contact: Dustin Shelton

Title: Mayor

Office/Agency: \_\_\_\_\_

Address: 107 Edgar St. Eustace TX 75724

Phone number: office 903 425 4702 Cell 903 275 1024

Email address: Mayor@EustaceTexas.org

Participating Jurisdiction: City of Enchanted Oaks

Name of Contact: Natalie Oate

Title: MAYOR

Office/Agency: \_\_\_\_\_

Address: PO Box 5019 Mabank, TX 75147

Phone number: 903.451.2222

Email address: MayorEnchantedOaks@gmail.com





Participating Jurisdiction: City of Gun Barrel City

Name of Contact: Joseph Lindaman

Title: Fire Chief

Office/Agency: Gun Barrel City Fire Department

Address: 1716 W. Main St Gun Barrel City, TX 75156

Phone number: 903-275-4053

Email address: Jlindaman@gunbarrelcity.net

Participating Jurisdiction: City of BERRYVILLE

Name of Contact: RON HEWLETT

Title: MAYOR

Office/Agency: \_\_\_\_\_

Address: 23170 CR. 4117, FRANKSTON, TX 75163

Phone number: (903) 874-3763

Email address: berryville mayor@gmail.com

Participating Jurisdiction: City of Trinidad

Name of Contact: Bryan Miers

Title: Police Chief

Office/Agency: Police Dept.

Address: P.O. Box 345, Trinidad, TX 75163

Phone number: 903-778-2113

Email address: bmiers@trinidadtexas

Participating Jurisdiction: City of Tool

Name of Contact: Makenzie Lyons

Title: City Manager

Office/Agency: Administration



Address: 701 N. Tool Drive, Tool, TX 75143

Phone number: 903-432-3522 Ext. 101

Email address: mlyons@tool-texas.org

Participating Jurisdiction: City of Payne Springs

Name of Contact: Andrea Miller

Title: Mayor Pro-Tem

Office/Agency: \_\_\_\_\_

Address: 1019601 CR 2529, Payne Springs

Phone number: 903-451-9229

Email address: Secretary@PayneSpringsTX.com

Participating Jurisdiction: City of Caney City

Name of Contact: Lamar Matthews

Title: Mayor

Office/Agency: \_\_\_\_\_

Address: 15241 Barron, Caney City 75148

Phone number: 903-489-1844

Email address: cityofcaneycity@yahoo.com

Participating Jurisdiction: City of MALAKOFF

Name of Contact: Ann Barker Weston Beck

Title: City Administrator Public Works Director

Office/Agency: \_\_\_\_\_

Address: 109 S. Melton

Phone number: (903) 681-4651 (903) 386-6017

Email address: abarker@cityofmalakoff.net  
WBeck@cityofmalakoff.net





Participating Jurisdiction: Moore Station City of  
Name of Contact: Chris L. Moore  
Title: Fire Chief / EMC  
Office/Agency: EMO  
Address: 4720 CR 439 Lorne  
Phone number: 903 539 7925  
Email address: the fire chief @ outlook.com

Participating Jurisdiction: \_\_\_\_\_  
Name of Contact: \_\_\_\_\_  
Title: \_\_\_\_\_  
Office/Agency: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone number: \_\_\_\_\_  
Email address: \_\_\_\_\_

Participating Jurisdiction: \_\_\_\_\_  
Name of Contact: \_\_\_\_\_  
Title: \_\_\_\_\_  
Office/Agency: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone number: \_\_\_\_\_  
Email address: \_\_\_\_\_

Participating Jurisdiction: \_\_\_\_\_  
Name of Contact: \_\_\_\_\_  
Title: \_\_\_\_\_  
Office/Agency: \_\_\_\_\_



Participating Jurisdiction: CITY OF MURKINSON

Name of Contact: JOHN PLACYK

Title: MAYOR

Office/Agency: \_\_\_\_\_

Address: 9540 FM 773 MURKINSON, TX 75178

Phone number: 903-469-3710

Email address: MURKINSONTX@CENTRAINC.NG

Participating Jurisdiction: CITY OF POYNOR

Name of Contact: GEORGE THAW (SKIP)

Title: CITY COUNSMAN

Office/Agency: \_\_\_\_\_

Address: PO BOX 228 POYNOR TX 75782

Phone number: 702 768 0473

Email address: SKIPKARRA@CENTRAINC.NG

Participating Jurisdiction: CITY OF CHANDLER

Name of Contact: STEPHEN KIDD

Title: FIRE MARSHAL

Office/Agency: CITY OF CHANDLER

Address: 811 S.H. 31 EAST

Phone number: (903) 849-6853

Email address: SKIDD@CHANDLER TX. COM

Participating Jurisdiction: CITY OF STAR HARBOR

Name of Contact: RICHARD L. HALEY

Title: ALDERMAN

Office/Agency: CITY COUNCIL





Address: 99 Sunset Blvd  
Phone number: 903-601-489-0091  
Email address: starharbor@yahoo.com

Participating Jurisdiction: City of Seven Points  
Name of Contact: Raymond Wennerstrom  
Title: Chief of Police  
Office/Agency: Seven Points Police Department  
Address: 428 E. Cedar Creek Pkwy  
Phone number: 903-432-2111  
Email address: raymond.wennerstrom@leo.gov

Participating Jurisdiction: City of Brownsboro  
Name of Contact: David Smith  
Title: Building Inspect.  
Office/Agency: \_\_\_\_\_  
Address: 11351 Willow ST Brownsboro Tx 75756  
Phone number: 903-852-2401  
Email address: city@brownsboro.us

Participating Jurisdiction: City of Collier City  
Name of Contact: CHRIS L. MOORE  
Title: FIRE CHIEF / EMC  
Office/Agency: EMO  
Address: 7019 PLEASANT RIDGE Rd  
Phone number: 903 539 7925 / 903 876 3417  
Email address: TheFirechief@Outlook.com

Participating Jurisdiction: CITY OF LOG CABIN



Name of Contact: NANCY RUCKSTAETTER  
Title: MAYOR  
Office/Agency: \_\_\_\_\_  
Address: 14387 ALAMO RD, LOG CABIN 75148  
Phone number: 903-489-2195  
Email address: MAYOR@LOGCABIN.TEXAS.GOV

Participating Jurisdiction: City of Athens  
Name of Contact: Russ Marshall  
Title: Fire Chief  
Office/Agency: Fire Department  
Address: 508 E Tyler Street, Athens  
Phone number: 903-677-6644  
Email address: rmarshall@athenstx.gov

## V. MOA Implementation

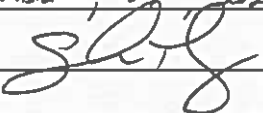
This MOA will be in effect from the date of signature by all parties, will remain in effect through the duration of the planning process, and will terminate after adoption of the final FEMA-approved mitigation plan by all participating jurisdictions, or 5 years after FEMA approval, whichever is earlier. It may be terminated prior to that time for any Participating Jurisdiction by giving 60 days written notice. This MOA is to be implemented through the attached Work Program and Schedule, and any addendums that describe specific activities, programs, and projects, and if necessary, funding by separate instrument.

Henderson County, Texas, Lead Agency

Shane Renberg:

Title: Henderson County Fire Marshal

Date: November, 04, 2020

Signature: 





Signature: \_\_\_\_\_

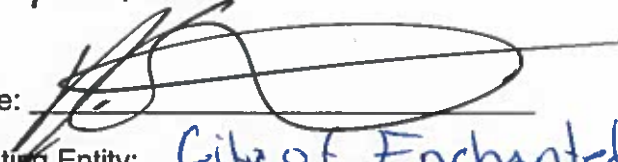
Date: \_\_\_\_\_

Participating Entity: City of Eustace

Printed Name: Dustin Shelton

Title: Mayor

Date: 10/26/2020

Signature: 

Participating Entity: City of Enchanted Oaks

Printed Name: Natalie Oates

Title: Mayor

Date: 10/26/2020

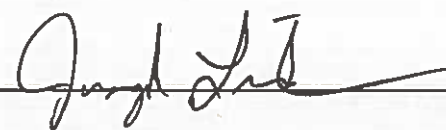
Signature: 

Participating Entity: City of Green Bay / City

Printed Name: Joseph Lindeman

Title: Fire Chief

Date: 10-26-20

Signature: 

Participating Entity: City of Berryville

Printed Name: Ron Hewlett

Title: Mayor

Date: 10/27/20

Signature: \_\_\_\_\_

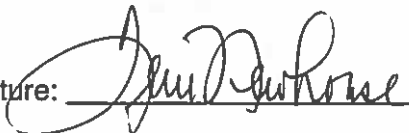


Participating Entity: City of Trinidad

Printed Name: Tere Newhouse

Title: City Administrator

Date: 10/27/2020

Signature: 

Participating Entity: City of Tool

Printed Name: Cindy Bray

Title: City Secretary

Date: 10/27/2020

Signature: 

Participating Entity: City of Payne Springs

Printed Name: Andrea Miller

Title: Mayor Pro Tem

Date: 10/27/2020

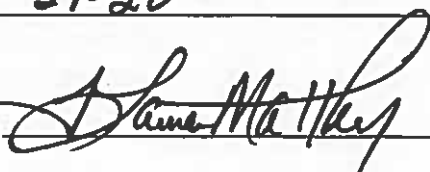
Signature: \_\_\_\_\_

Participating Entity: City of Caney City

Printed Name: T. Lamar Matthews

Title: Mayor

Date: 10-27-20

Signature: 





Participating Entity: CITY OF MAHAROFF

Printed Name: Ann Barker

Title: City Administrator

Date: 10/27/2020

Signature: Ann Barker

Participating Entity: CITY OF MUZZEISSIN

Printed Name: KAREN KROLL

Title: Secretary

Date: 10/28/20

Signature: Karen Kroll

Participating Entity: CITY OF POYNOR

Printed Name: GEORGE THAW (SKIP)

Title: CITY COUNSMAN

Date: 10/28/2020

Signature: George Thaw

Participating Entity: CITY OF CHANDLER

Printed Name: Stephen Hill

Title: Fire Marshal

Date: 10/28/2020

Signature: Stephen Hill



Participating Entity: City of Star Harbor

Printed Name: Richard L. Haley

Title: Alderman

Date: 10/28/2020

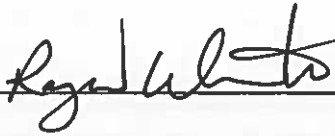
Signature: 

Participating Entity: City of Seven Points

Printed Name: Raymond Wennerstrom

Title: Chief of Police

Date: 10/30/2020

Signature: 

Participating Entity: City of Brownsboro

Printed Name: Josh Fulgham

Title: Mayor

Date: 11-2-2020

Signature: 

Participating Entity: City of Coffee City

Printed Name: Chris L. Moore

Title: Fire Chief 1 EMC

Date: 11-3-20

Signature: 





Participating Entity: CITY OF LOG CABIN  
Printed Name: NANCY S. RUCKSTAETTER  
Title: MAYOR  
Date: 11-3-2020

Signature: Nancy S. Ruckstaetter

Participating Entity: CITY OF ATHENS  
Printed Name: Elizabeth Borstad  
Title: CITY MANAGER  
Date: 11/4/2020

Signature: Elizabeth Borstad

Participating Entity: MOORE STATION CITY OF  
Printed Name: CHRIS L. MOORE  
Title: FIRE CHIEF / EMC  
Date: 11-4-20

Signature: Chris L. Moore

Participating Entity: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_



## VI. Attachments

### Plan Work Program and Schedule

DATE*	EVENT	DESCRIPTION
	Organize Resources	County OEM holds kickoff meeting for potential planning partners to inform them of the next steps in the plan update process, solicit commitment to participate, explain expectations and organize resources.
10/08/2020		Introduction to Hazard Mitigation Planning Process; Steering Committee purpose and responsibilities; Plan Goals update; Discuss options for public outreach strategy and survey
09/24/2020	Steering Committee	County OEM holds kickoff meeting for potential planning partners to inform them of the next steps in the plan update process, solicit commitment to participate, explain expectations and organize resources.
10/21/2020	Planning Committee Meeting #1	MOA Agreement; Plan table discussion; review and amend Mitigation Goals; Critical Facilities discussion; Update of community survey; Review county hazard risk assessment; review previous mitigation action from 2011 plan
10/07/2020	Ongoing Public Outreach	Website and social media posting
	Press Release	City(ies) issue a press release for public participation in HMP update and survey
11/4/2020	Planning Committee Meeting #2	Reminder Hazard mitigation planning process; Review completed items-goals, capabilities assessment; mitigation action tables; survey results to date; mitigation action worksheet
11/18/2020	Planning Committee Meeting #3	Mitigation actions prioritization; Project development update; review of draft





<b>12/03/2020 if needed</b>	<b>Planning Committee Meeting #4</b>	<b>TBD</b>
<b>12/8/2020</b>	1st Public Comment Period	Public comment period of the draft plan opens for Henderson County and the planning partners. Press release of draft plan availability to public issues. Draft Plan available on Henderson County website, planning partners websites and in hard copy at Henderson County Fire Marshal's Office
<b>12/11/2020</b>	Plan Review	Final draft submitted to Texas Division of Emergency Management for review
	-	Plan approval pending adoption by FEMA
	2nd Public Comment Period	Final public meeting on draft plan
	Adoption	Adoption window of final plan opens
		Final plan approved by FEMA

**\*\*Listed dates of events are subject to change if the need arises.**



## EMERGENCY MANAGEMENT DIRECTOR/COORDINATOR NOTIFICATION

Section 418.101 of the Texas Government Code states: "The presiding officer of the governing body of each political subdivision will notify the Division of Emergency Management of the manner in which the political subdivision is providing or securing an emergency management program, identify the person who heads the agency responsible for the program, and furnish additional pertinent information." This form is used to make the required notification to TDEM in accordance with Governor Executive Order GA-05 submitted annually by the 1st of February of each year or within 30 days of any change of elected or appointed officials.

The information on this form may be released to those inquiring about local emergency management programs pursuant to the Texas Open Records Act. Hence, TDEM recommends that you provide business addresses and mobile telephone numbers rather than home addresses and telephone numbers.

<b>COUNTY:</b>	HENDERSON	(Required)
<b>Jurisdiction:</b>	MOORE STATION	(City or County Name)
<b>Official's Title:</b>	MAYOR	(Mayor/Judge)
<b>Name:</b>	CHARLES ANDERSON	(First & Last Name)
<b>Mailing Address:</b>	4720 CR 4319	(The best address to receive mail)
<b>City, State, Zip:</b>	Larue, TX 75770-4501	
<b>Office Number:</b>	903-681-2767	
<b>Cell Number:</b>	903-539-7925	
<b>Fax Number:</b>	903-876-2433	
<b>E-mail:</b>	THEFIRECHIEF@OUTLOOK.COM	(Please include – this is a back-up for mailing)
<b>24 Hr Contact #:</b>	903-539-7925	

### EMERGENCY MANAGEMENT PROGRAM APPOINTMENT STATUS

- ☐ I HAVE NOT appointed an Emergency Management Coordinator and will personally direct the local emergency management program.
- ☒ I HAVE appointed/re-appointed the Emergency Management Coordinator identified below to conduct the emergency management program for this jurisdiction. The effective date of the appointment is: 11/4/20
- ☒ We share our EMC with COFFEE CITY / BERRYVILLE (name of jurisdiction).

*If the COUNTY Emergency Management Coordinator has been appointed to other jurisdictions within the county, the County Judge and the participating City Mayors must sign this form.  
(See the third page for additional signature blocks.)*

### The EMC for this jurisdiction is (please select one):

- ☐ Paid, Full Time, EMC only
- ☐ Paid, Full Time, EMC and other job duties (Fire Chief, Fire Marshal, Police Chief, EMS Director, Etc.) (please specify other duty/duties) \_\_\_\_\_
- ☐ Paid part time, EMC only
- ☐ Paid, Part Time, EMC and other job duties (Fire Chief, Fire Marshal, Police Chief, EMS Director, Etc.) (please specify other duty/duties) \_\_\_\_\_
- ☐ Unpaid/volunteer EMC only
- ☒ Unpaid/Volunteer, EMC and other volunteer job duties (Fire Chief, Fire Marshal, Police Chief, EMS Director, Etc.) (please specify other duty/duties) FIRE CHIEF
- ☐ Other (please describe) \_\_\_\_\_





EMERGENCY MANAGEMENT COORDINATOR		
	Coordinator	Asst Coordinator
Name:	CHRIS L. MOORE	
Mailing Address:	7019 PLEASANT RIDGE ROAD	
City, State, Zip:	COFFEE CITY, TEXAS 75763	
Office Phone:	903-876-4836	
Cell Number:	903-539-7925	
Fax Number:	903-876-2433	
E-mail Address:	THEFIRECHIEF@OUTLOOK.COM	
24 Hr Contact #:	CHRIS L. MOORE 903-539-7925	
Emergency Operations Center #: 903-876-3414		

☐ Check this box if the information above contains personal information pertaining to a law enforcement official such as personal home or cellular phone number, and/or home mailing or personal email address.



Judge's or Mayor's Signature

11-4-20

Date

**PLEASE RETURN TO:**

Texas Division of Emergency Management

Operations Section

P.O. Box 15467 Austin, TX 78761

Phone: (512) 424-2208

Email: [soc@tdem.texas.gov](mailto:soc@tdem.texas.gov)

[Click to Submit Form to SOC](#)

TDEM-147

Rev 12/2019

Page 2



Hello my name is George E. Thaw (Skip) and I'm one of your city councilman for Poynor. This letter is to advise the residents in the area that we need your assistance in helping our county obtain information by filling out the Hazard Mitigation Plan Citizen Survey. This survey will assist the county in locating problem areas and to be prepared in case of Hazard Events.

Now if you have a computer go to the site titled

**[www.henderson-county.com](http://www.henderson-county.com)**

Go to the right side of the screen and tap the Scroll arrow, then tap HAZARD MITIGATION PLAN CITIZEN SURVEY, this should bring up the survey to be completed, complete the survey and place your zip code in the box. In order to send you'll have to fill in the I'm not a robot box then hit send

For those who do not have a computer the survey should be attached this letter,

Once completed return it to the school.

---

Thank each of you for your time and effort and have a blessed day.



## Hazard Mitigation Plan Citizen Survey

1. How long have you lived in Henderson County Texas?

- ☐ Less than one Year
- ☐ 1 to 4 Years
- ☐ more than 5 Years

2. Do you rent or own the place where you live?

- ☐ Own
- ☐ Rent
- ☐ Neither (please specify)

3. Which of the following types of Hazard Events have you or someone in your household experienced while living where you live now? (Check all that apply)

- |   |                                      |
|---|--------------------------------------|
| <input type="radio"/> Tornado                     | <input type="radio"/> Flooding       |
| <input type="radio"/> Dam Failure                 | <input type="radio"/> Flash Flooding |
| <input type="radio"/> Drought                     | <input type="radio"/> High Winds     |
| <input type="radio"/> Earthquake                  | <input type="radio"/> Levee Failure  |
| <input type="radio"/> Extreme Temperature Heat    | <input type="radio"/> Wildfire       |
| <input type="radio"/> Severe Weather Winter Storm | <input type="radio"/> Hail Storm     |
| <input type="radio"/> Other (please specify)      |                                      |

4. What actions have you taken to reduce risk for your home/apartment/property for potential disaster? (Check all that apply)

- |  |  |
|--|--|
| <input type="radio"/> Purchase homeowners/renter insurance   | <input type="radio"/> Purchase and placement of easily accessible fire extinguishers |
| <input type="radio"/> Purchase Flood insurance   | <input type="radio"/> Alternative power source                                       |
| <input type="radio"/> Flood proofing (elevated furnace, water heaters, electric panels)  | <input type="radio"/> Alternative water supply                                       |
| <input type="radio"/> Install retrofits such as high impact windows or doors to withstand high winds; fire resistant siding, roofing or window screens, etc. | <input type="radio"/> Storm shelter  |
| <input type="radio"/> Install fire breaks around structure   | <input type="radio"/> None   |
| <input type="radio"/> Remove dead/dying trees vegetation   | <input type="radio"/> Other (please specify)   |

5. To the best of your knowledge, is your property located in a designated floodplain? If no, skip to question 8.

- ☐ Yes
- ☐ No
- ☐ Unknown

6. If "Yes or Unknown" do you have flood insurance?

- ☐ Yes
- ☐ No

7. If the answer to Question 6 is "No", what is the primary reason why you do not carry flood insurance?

- ☐ Flood Insurance is too expensive
- ☐ I do not know how to purchase Flood Insurance
- ☐ I have tried to purchase Flood Insurance, but have been unsuccessful
- ☐ Other (please specify)

8. If your property were located in a designated "High Hazard" area or had received repeated damages from a natural hazard event, would you consider one of the following? (Check all that apply)

- |  |   |
|--|---|
| <input type="radio"/> Structural elevation of your property  | <input type="radio"/> A buyout of your property (relocation of your family) |
| <input type="radio"/> Retrofit your property to better resist hazard impacts (e.g. flood proofing your home) | <input type="radio"/> None of the above                                     |
| <input type="radio"/> Purchase Insurance   | <input type="radio"/> Other (please specify)                                |

9. Would an incentive encourage you to spend money to retrofit your home to withstand the impacts of possible natural hazards (for example: Elevating a flood prone house, reinforcing a wind-prone home, using fire-proof materials on a home in a wildfire prone area, etc.)?

- ☐ Yes
- ☐ No

10. Which of the following mitigation project types do you believe Local Government agencies should focus on to reduce disruption of services and to strengthen the community? (Check all that apply)

- ☐ Retrofit and strengthen essential facilities such as Fire Stations, Police Stations, Emergency Medical Services, Hospitals, Schools, etc.
- ☐ Replace inadequate or vulnerable bridges and causeways
- ☐ Retrofit infrastructure such as elevating roadways and improving drainage systems
- ☐ Work on improving the damage resistance of utilities (electricity, communications, water/waste facilities, etc.)
- ☐ Other (please specify)
- ☐ Install or improve protective structures such as floodwalls or levees
- ☐ Strengthen code, ordinances and plans to require higher hazard risk management standards
- ☐ Provide better information about Hazard Risk and high Hazard areas
- ☐ None

11. In what ZIP code is your home located? (enter 5-digit ZIP code, for example, 00544 or 94305)

To receive a copy of your submission, please fill out your email address below and submit.

**Email Address**

**Page 1 / 1**







# City of Berryville

A Great East Texas Community on Lake Palestine  
City Hall | 23170 CA 4117 | P.O. Box 808 | Rockport, TX 77087 | 409-476-5783

- Home
- Our Story
- City Officials
- Services
- Consumer Confidence Report for Water
- Schools
- Contact Us

Berryville, Texas, United St...  
Mon, Oct 26, 2020

63°F  
Cloudy

Wind: N 8.0 mph  
Humidity: 89%  
Visibility: 5.0 miles

Mon 62° 56°  
Tue 62° 41°  
Wed 59° 43°  
Thu 56° 43°



New Firehouse Steel Going up this week!



### EARLY VOTING LOCATIONS:

Ahlern: 105 S. Carroll St  
Chandler: 811 Hwy 31 East  
Starting Oct. 26th, 2020    7:00 am - 7:00 pm  
October 27th - October 30th 8:00 am - 5:00 pm

### NOV 3RD -- VOTING LOCATIONS:

Berryville: 23170 County Rd 4117  
City Hall  
Office City: 2019 Phasmat Ridge Rd  
Community Center

ALL BERRYVILLE RESIDENTS PLEASE COMPLETE THE  
Hazard Mitigation Plan Citizen Survey  
<https://www.henderson-county.com/Forms/16/hazard-mitigation-plan-citizen-survey>



Henderson County  
Hazard Mitigation Survey



## Manage Group

**Thousand Pines Ranch Estates**  
Private group

If you'd like, you can switch to the classic Facebook.com for 48 hours to manage your group.  
[Switch Now](#)

Home

### Admin Tools

- Member Requests
- Automatic Member Approvals
- Membership Questions
- Pending Posts
- Post Topics

Type here to search

## Thousand Pines Ranch Estates

**Ron Hewlett** shared a link.  
Admin  
October 19 at 12:08 PM ·

### Hello Neighbors:

The City of Berryville has been asked by Henderson County Judge Wade McKinney to have all city residents complete a short survey to support the [County's Hazard Mitigation Plan](#). The survey takes less than 5 min to complete and does not ask for any personal information except your Zip Code.

The County & City's goals are to:

1. Increase the citizens understanding and gain support for natural hazard mitigation efforts.
2. Minimize loss of life, damage to property economic impacts from natural hazards.
3. Create and integrate local mitigation capabilities to encourage individual safety, reduce damage to public assets and continuity of emergency services.
4. Maintain the natural and man-made systems in the City to protect our citizens and community from natural hazards.

Please click on this link to complete the survey.

<https://www.henderson-county.com/.../hazard-mitigation...>

Thanks

Ron

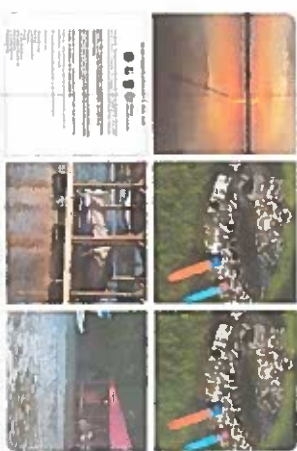
### About

Thousand Pines Ranch Estates Group is a Private Group for use of the neighbors in the Berryville neighborhood.

- Private**  
Only members can see who's in the group and what they post
- Hidden**  
Only members can find this group.

**General Group**

### Recent Media









Angie Ewaskiw  
Court Coordinator  
903-675-6120

Angela Wilson  
Indigent Health Coordinator  
903-677-6372

**Henderson County Judge's Office  
Judge Wade McKinney**

**PUBLIC NOTICE-  
HENDERSON COUNTY HAZARD MITIGATION PLAN**

**UPDATE OF THE HENDERSON COUNTY HAZARD MITIGATION PLAN**

Henderson County, TX, the incorporated municipalities of Henderson County including Athens, Berryville, Brownsboro, Caney City, Chandler, Coffee City, Enchanted Oaks, Eustace, Gun Barrel City, Log Cabin, Malakoff, Moore Station, Murchison, Payne Springs, Poynor, Seven Points, Star Harbor, Tool and Trinidad have updated the 2011 Hazard Mitigation Action Plan. The new 2020 plan focuses on reducing the risk of loss of life, injury and property damage due to hazards such as drought, floods, severe storms, wildfires and tornadoes.

This plan also identifies specific actions that can be undertaken to minimize or eliminate these vulnerabilities. These projects can be implemented as funding becomes available. This plan is a requirement for eligibility for federal mitigation grant programs, including the Hazard Mitigation Grant Program (HMGP).

There are millions of federal hazard mitigation grant dollars made available to eligible applicants through programs such as the Hazard Mitigation Grant Program. With an approved hazard mitigation plan, the participating jurisdictions are eligible to apply for competitive grant funds.

As part of the development process, and in compliance with 44 CFR, part 201, we are requesting that the public review this plan, and submit any comments or suggestions on the document. The plan may be viewed at the location listed below:

Henderson County Fire Marshal's Office  
125 N. Prairieville St.  
Athens, TX 75751

Office Hours: 7:00 AM- 5:00 PM  
Monday- Friday

Please download a draft of the document using this link:

[www.henderson-county.com](http://www.henderson-county.com)

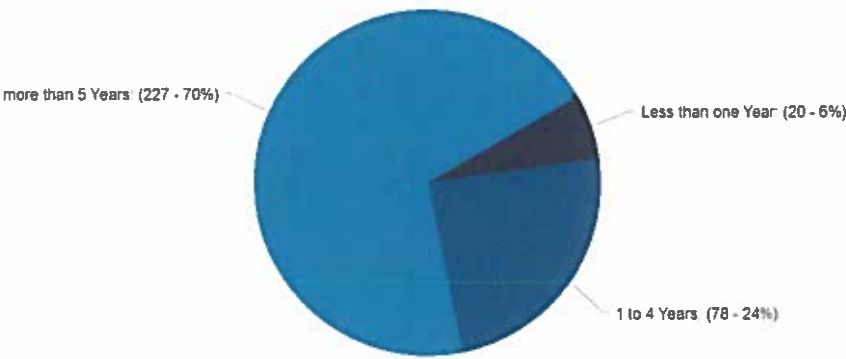
Should you wish to comment on the draft, please send it in writing to the address listed above or by email to [firemarshal@henderson-county.com](mailto:firemarshal@henderson-county.com) noting the section and page number relevant to your comment. All comments must be received no later than December 15, 2020.



Survey Title      Hazard Mitigation Plan Citizen Survey  
Start Date        09/29/2020 8:00 AM

Question's results to display    How long have you lived in Henderson County Texas?  
Results layout                      Pie Chart  
Results order                        Answer Order  
Date range                            To                                      Apply Range

**How long have you lived in Henderson County Texas?**



Total Submissions: 325

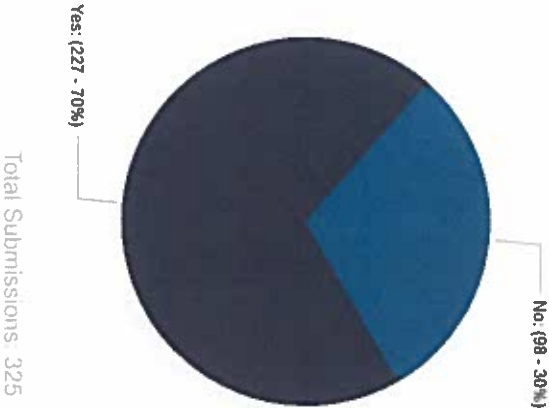




Survey Title      Hazard Mitigation Plan Citizen Survey  
Start Date      09/29/2020 8:00 AM

Question's results to display	Would an incentive encourage you to spend money to retrofit your home to withstand the impacts of possible natural 1 v		
Results layout	Pie Chart		
Results order	Answer Order		
Date range	To		Apply Range

**Would an incentive encourage you to spend money to retrofit your home to withstand the impacts of possible natural hazards (for example: Elevating a flood prone house, reinforcing a wind-prone home, using fire-proof materials on a home in a wildfire prone area, etc.)?**





Survey Title Hazard Mitigation Plan Citizen Survey

Start Date 09/29/2020 8:00 AM

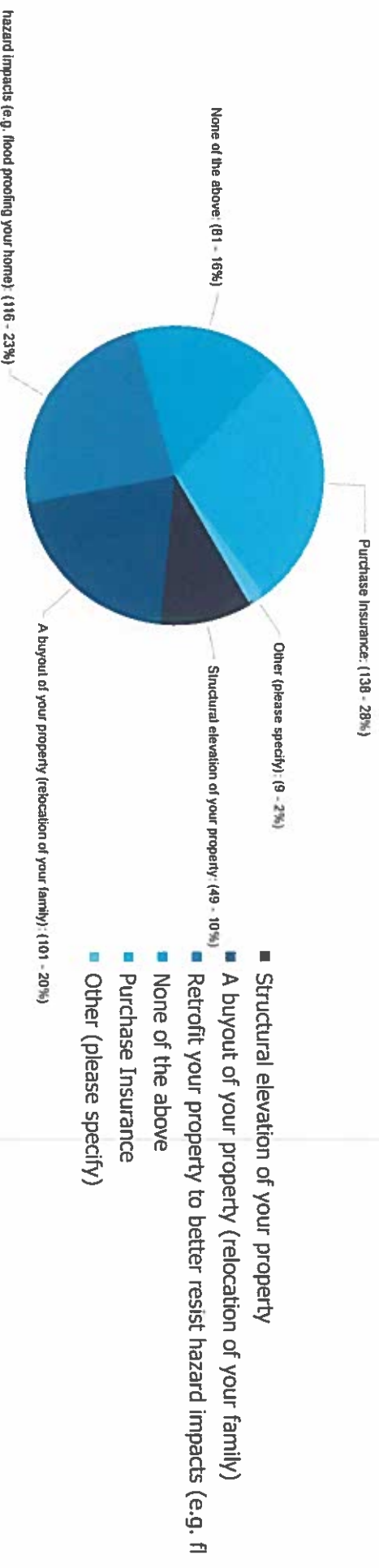
Question's results to display If your property were located in a designated "High Hazard" area or had received repeated damages from a natural ha

Results layout Pie Chart

Results order Answer Order

Date range To Apply Range

## If your property were located in a designated "High Hazard" area or had received repeated damages from a natural hazard event would you consider one of the following? (Check all that apply)



Total Submissions 494

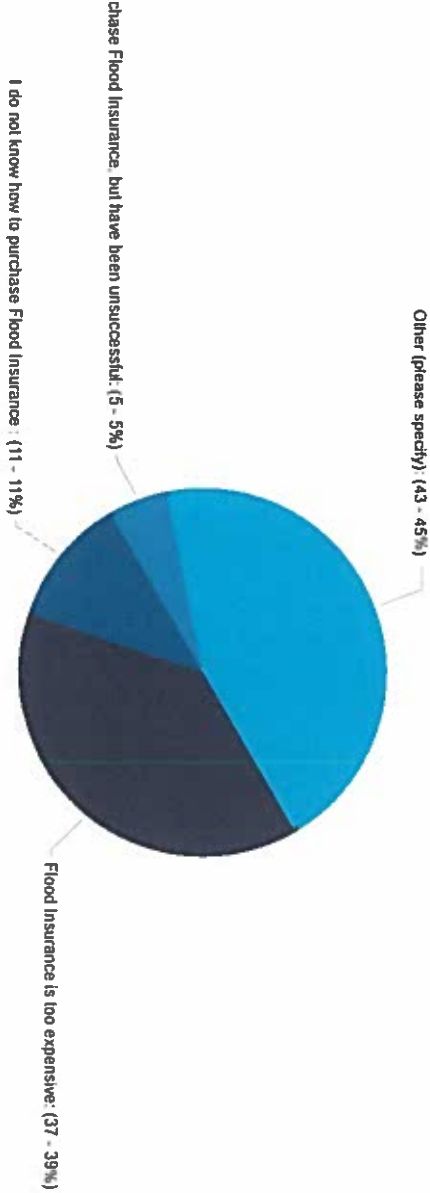




Survey Title      Hazard Mitigation Plan Citizen Survey  
Start Date      09/29/2020 8:00 AM

Question's results to display	If the answer to Question 6 is "No", what is the primary reason why you do not carry flood insurance?	
Results layout	Pie Chart	
Results order	Answer Order	
Date range	To	Apply Range

If the answer to Question 6 is "No", what is the primary reason why you do not carry flood insurance?



Total Submissions: 96

- Flood Insurance is too expensive
- I do not know how to purchase Flood Insurance
- I have tried to purchase Flood Insurance, but
- Other (please specify)



Survey Title      Hazard Mitigation Plan Citizen Survey  
Start Date      09/29/2020 8:00 AM

Question's results to display      If "Yes or Unknown" do you have flood insurance?  
Results layout      Pie Chart  
Results order      Answer Order  
Date range      To      Apply Range

**If "Yes or Unknown" do you have flood insurance?**



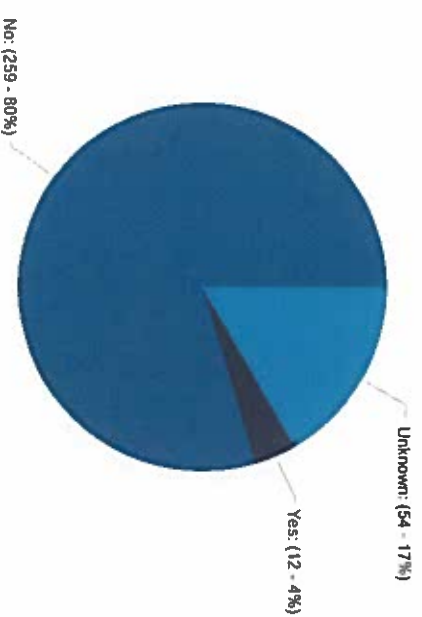
Total Submissions 101





Survey Title Hazard Mitigation Plan Citizen Survey  
Start Date 09/29/2020 8:00 AM

Question's results to display To the best of your knowledge, is your property located in a designated floodplain? If no, skip to question 8.  
Results layout Pie Chart  
Results order Answer Order  
Date range To To Apply Range



Total Submissions: 325

To the best of your knowledge, is your property located in a designated floodplain? If no, skip to question 8.



Survey Title Hazard Mitigation Plan Citizen Survey

Start Date 09/29/2020 8:00 AM

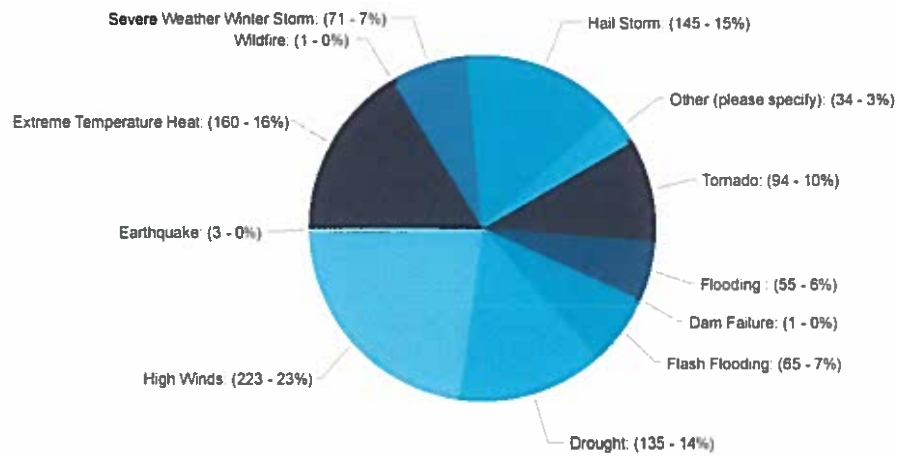
Question's results to display Which of the following types of Hazard Events have you or someone in your household experienced while living where

Results layout Pie Chart

Results order Answer Order

Date range To Apply Range

**Which of the following types of Hazard Events have you or someone in your household experienced while living where you live now? (Check all that apply)**



Total Submissions 987

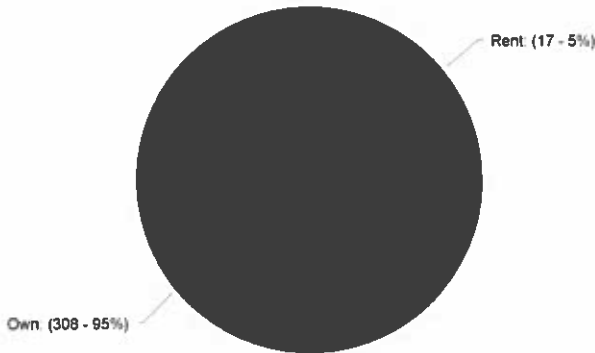




Survey Title      Hazard Mitigation Plan Citizen Survey  
Start Date        09/29/2020 8:00 AM

Question's results to display    Do you rent or own the place where you live?  
Results layout                      Pie Chart  
Results order                        Answer Order  
Date range                            To                                      Apply Range

**Do you rent or own the place where you live?**



Total Submissions 325





# Henderson County Mitigation Action Worksheet

Please complete one worksheet per action with as much detail as possible, using the instructions provided and FEMA examples.

Name of Jurisdiction: \_\_\_\_\_

Mitigation Action # \_\_\_\_\_

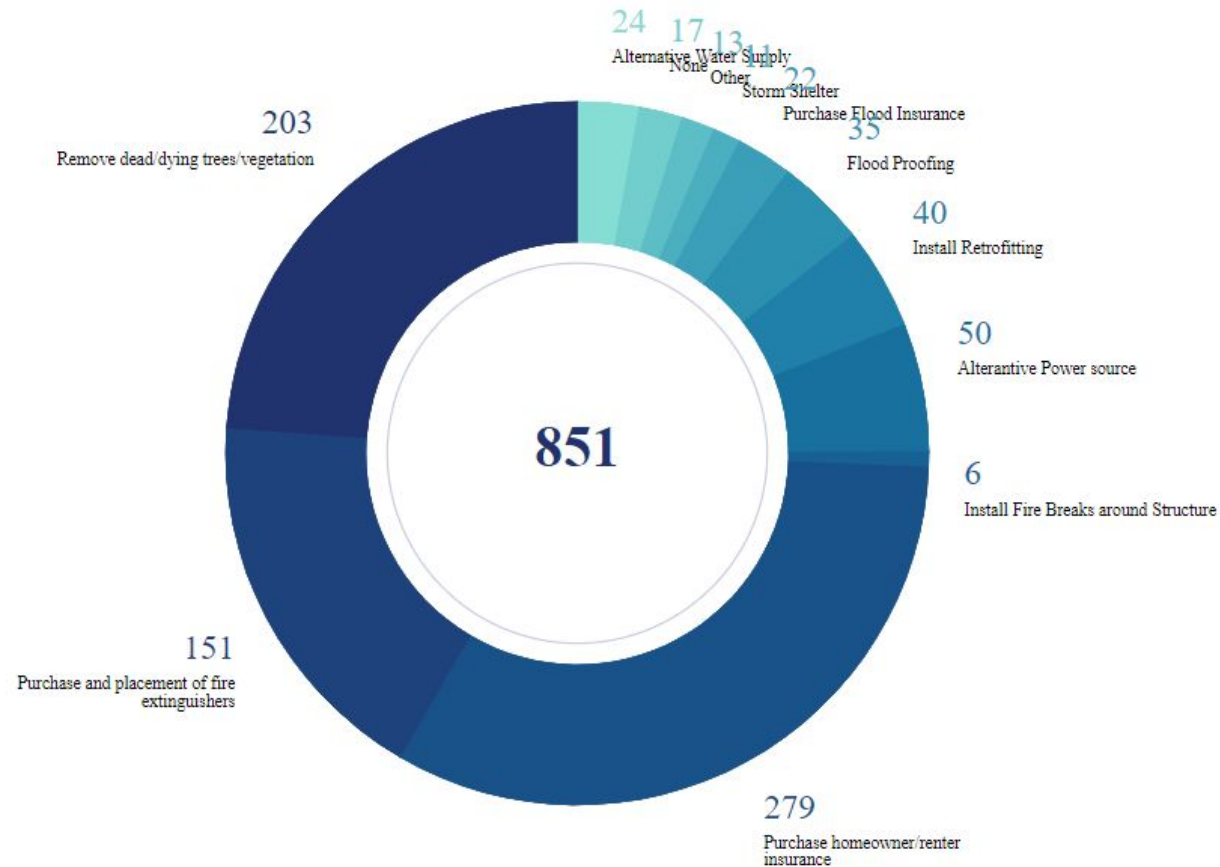
Mitigation Action Title: \_\_\_\_\_

Assessing the Risk	
Hazard(s) Addressed: (check all that apply)	<input type="checkbox"/> All Hazards <input type="checkbox"/> Dam Failure <input type="checkbox"/> Drought/Extreme Heat <input type="checkbox"/> Earthquake <input type="checkbox"/> Flood <input type="checkbox"/> Hurricane <input type="checkbox"/> Severe Storms/Lightning/Hail/High Winds <input type="checkbox"/> Tornado <input type="checkbox"/> Wildfire <input type="checkbox"/> Winter Storm
Specific Problem Being Mitigated (describe why action is needed)	
Evaluation of Potential Alternatives	
Alternatives Considered (name of project and reason for not selecting)	1
	2
	3
Action/Project Intended for Implementation	
Describe How Action Will Be Implemented (main steps involved)	
Action/Project Type	<input type="checkbox"/> Local Plans & Regulations <input type="checkbox"/> Structure & Infrastructure Project <input type="checkbox"/> Natural System Project <input type="checkbox"/> Education & Awareness Programs
Applicable Goals (Refer to list of Goals)	<input type="checkbox"/> Goal #1 <input type="checkbox"/> Goal #2 <input type="checkbox"/> Goal #3 <input type="checkbox"/> Goal #4
Applies to Existing or Future Development	<input type="checkbox"/> Existing Development <input type="checkbox"/> Both Existing & Future Development <input type="checkbox"/> Future Development <input type="checkbox"/> Not Applicable
Describe Benefits (Losses Avoided)	<input type="checkbox"/> Life Safety <input type="checkbox"/> Damage Reduction <input type="checkbox"/> Other Describe :
Estimated Cost	<input type="checkbox"/> >\$10,000 <input type="checkbox"/> \$10,000-\$100,000 <input type="checkbox"/> <\$100,000 <input type="checkbox"/> Other Amount: \$ _____
Plan For Implementation	
Responsible Department	
Local Planning Mechanism (Check all that Apply)	<input type="checkbox"/> Capital Improvement Plan <input type="checkbox"/> Comprehensive Plan <input type="checkbox"/> Building Code <input type="checkbox"/> Ordinance <input type="checkbox"/> Other:
Potential Funding Sources	
Timeline for Completion (In months)	
Plan For Implementation	
Status/Comment	<input type="checkbox"/> Not Started <input type="checkbox"/> In-Progress <input type="checkbox"/> No Longer Required <input type="checkbox"/> Completed <input type="checkbox"/> Delayed Comment:
Completed By: (Name, Title, Phone#) Date:	

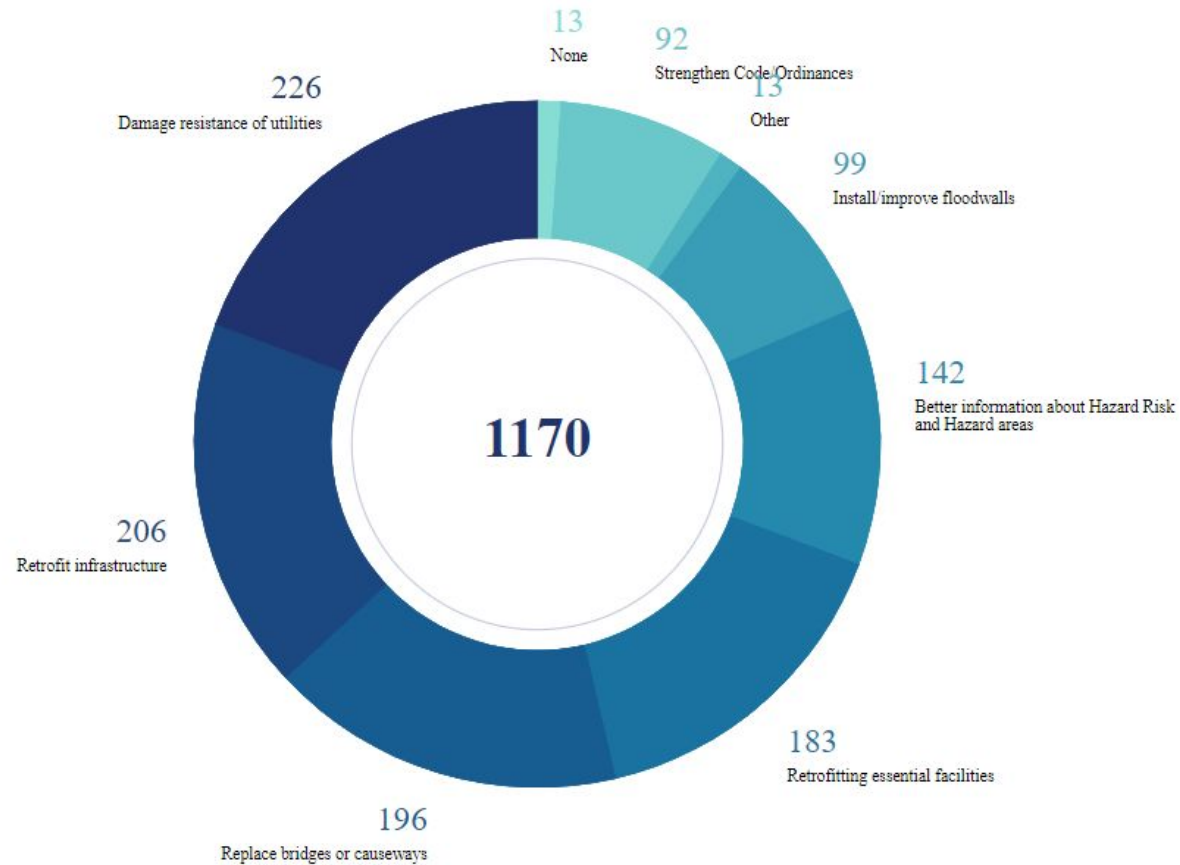




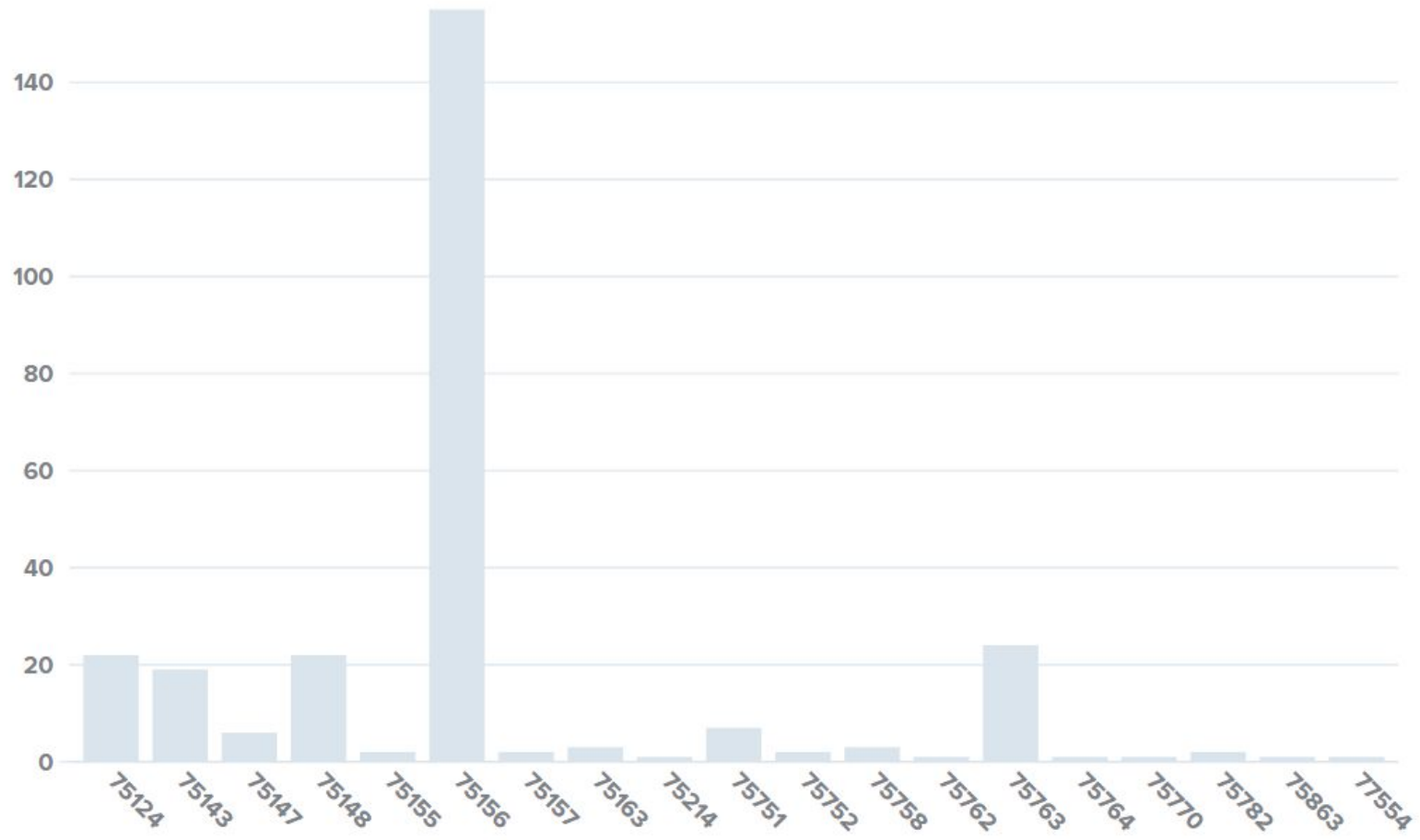
## What actions have you taken to reduce risk for your home/apartment/property for potential disaster?) Question #4



## Which of the following mitigation project types do you believe Local Government agencies should focus on to reduce disruption of services and t...



## Response by Zip Code





**APPENDIX E.**  
**STATUS OF PREVIOUS ACTIONS**

## **APPENDIX E. PREVIOUS ACTIONS**

This appendix presents the previous mitigation actions identified in the 2011 Hazard Mitigation Plan and their status.

PREVIOUS ACTIONS		PROJECT STATUS			FUNDING					
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	COMMENTS
HENDERSON COUNTY SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 1	1. Obtain or develop a list of all local media: television, radio, cable; including telephone numbers, fax numbers, e-mail addresses and names of media contacts for PSA distribution. Provide this list to all EMCs and PIOs within the county, including every participating city; update list as needed, and share updates with other jurisdictions. Develop a relationship with all local media, to encourage rapid sharing and distribution to the public of information about imminent or developing natural hazards. (Short Term)			X						
MULTI HAZARD 2	2. Coordinate with local jurisdiction's information technology department to place warnings on local websites when appropriate. If possible, give Emergency Management Coordinator authority and access to post such warnings on website directly, from any location.			X						
MULTI HAZARD 3	3. Create a website link to the National Weather Service district office, so any tornado watches and warnings, and storm warnings of all kinds, will be shown on the local website.			X						
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
MULIT HAZARD 5	5. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.			X						
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						
MULTI HAZARD 8	8. Partner with other local and regional jurisdictions in projects such as the Regional MultiAgency Coordination Group; make sure local officials and EMCs know how to contact the MAC-G if needed.	X								Mitigation Action #1
MULTI HAZARD 9	9. Make a list of local and regional resources, including grocery stores, department stores, discount stores, sporting goods stores, rental outlets, farm supply stores, distribution centers, warehouses, gasoline stations, transportation companies, restaurants, caterers, churches and fraternal or benevolent organizations which might be able to assist in an emergency. Contact the managers, owners, directors, presidents or other organizational leaders to discuss possible partnerships.			X						
MULTI HAZARD 10	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.			X						
MULTI HAZARD 11	11. Encourage citizens to retrofit existing structures to meet current standards; consider offering a local tax incentive, or partnering with local utility providers or charity organizations to assist in the retrofitting of private homes.			X						
MULTI HAZARD 12	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
MULTI HAZARD 13	13. Encourage the development of public and private partnerships with businesses, service organizations, and other community groups to work together on local mitigation projects, planning, and cooperative mitigation actions			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	COMMENTS
<b>MULTI HAZARD 14</b>	14. Develop, enhance and implement education programs to increase awareness of natural hazards and encourage the use of mitigation actions to reduce risk to citizens, public infrastructure, private property owners, businesses and schools. Public officials will include hazard mitigation messages in their newsletters, web pages, and speeches, as appropriate. The EMC will accept opportunities to speak to service clubs and school groups about hazard mitigation, and will encourage other emergency management professionals to do the same.			X						
<b>MULTI HAZARD 15</b>	15. Increase training opportunities for citizens, to encourage their involvement in mitigation efforts. Partner with ETCOG, TDEM, TFS, TEEX, FEMA, and others, to bring free and lowcost mitigation training to the people of our local jurisdictions, county, and region.	X								Mitigation Action #2
<b>MULTI HAZARD 16</b>	16.Sponsor a booth at local festivals, offering brochures and training information to the public.			X						
<b>MULTI HAZARD 17</b>	17. Include information on the jurisdiction's website about free training available by internet or in local or regional classes.			X						
<b>MULTI HAZARD 18</b>	18. Send PSAs to media contacts to publicize any training opportunities			X						
<b>MULTI HAZARD 19</b>	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
<b>MULTI HAZARD 20</b>	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						
<b>MULTI HAZARD 21</b>	21. Maintain records of property values, including the regular addition of new development data, and information about any losses due to natural hazards. Provide this information to the Henderson County Hazard Mitigation Planning Committee, to be used when revising the Plan.			X						
<b>MULTI HAZARD 22</b>	22. Watch for new ideas in mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region			X						
<b>FLOOD 1</b>	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.			X						
<b>FLOOD 2</b>	2.Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain			X						
<b>FLOOD 3</b>	3. Encourage retrofitting of existing structures that are at risk. Consider offering a local tax incentive, providing surplus materials or labor assistance, or developing a matching fund for use by property owners who make improvements to a building that is at-risk			X						
<b>FLOOD 4</b>	4. Improve existing public-owned dams to reduce threats posed by potential failure. Consult with TCEQ to arrange for inspection of any public-owned dams; if risk is apparent, seek professional guidance, consider cost and potential benefits, and make an appropriate recommendation to governing body.				X					
<b>FLOOD 5</b>	5. Encourage or require improvement of privately-owned dams that are at risk. Consider offering a local tax incentive, or developing a matching fund for use by landowners who voluntarily make improvements to a dam that is at risk				X					
<b>FLOOD 6</b>	6. Promote FEMA-recommended construction methods for any new dam development. Provide educational materials in public offices, such as the floodplain manager's office, the local EMC's office, the local tax office, inspector's office, permit office, etc.; and offer links to FEMA publications on the local website.			X						
<b>FLOOD 7</b>	7. Develop public information programs to create greater awareness of flood hazards and the National Flood Insurance Program to help citizens mitigate flood risk when planning future development.			X						



PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	COMMENTS
FLOOD 8	8. Obtain educational materials for distribution at public libraries, in schools, and at public offices, detailing flood dangers, the NFIP, and mitigation strategies.			X						
FLOOD 9	9. Place links on local websites offering free FEMA training for independent study via the internet, such as IS-271 "Anticipating Hazardous Weather and Community Risk," or IS-279 "Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures."			X						
FLOOD 10	10. Develop or improve emergency procedures to efficiently respond and avoid unnecessary risk to human life, should a nearby dam fail.			X						
FLOOD 11	11. Seek state and FEMA sponsored training in flood mitigation for key personnel to assist all jurisdictions to participate in NFIP.			X						
WILDFIRE 1	1. Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
WILDFIRE 2	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities			X						
WILDFIRE 3	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed			X						
WILDFIRE 4	4. Seek out grant opportunities, and publicize them to all possible grantees			X						
WILDFIRE 5	5. Seek training opportunities, and publicize them to all emergency responders.			X						
WILDFIRE 6	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
WILDFIRE 7	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
WILDFIRE 8	8. Develop public information programs to create a greater awareness of the risk of wildfire, and to encourage individuals to implement mitigation strategies on their own property.			X						
WILDFIRE 9	9. Coordinate with the Texas Forest Service to schedule educational events and obtain literature for public distribution.			X						
WILDFIRE 10	10. Provide literature about wildfire prevention and loss mitigation to the public library, to all local school libraries, and to all public offices for free distribution			X						
WILDFIRE 11	11. Sponsor a booth at local events, to hand out free literature about the dangers of wildfire and what people can do to reduce the risk of fire damage to their homes and businesses				X					
WILDFIRE 12	12. Place links on public websites to free FEMA training in wildfire mitigation, and to other informational sites, such as Texas Forest Service.			X						
TORNADO 1	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.	X								Mitigation action #3
TORNADO 2	2. Obtain or develop list of all local media: television, radio, cable; including telephone numbers, fax numbers, e-mail addresses and names of media contacts for PSA distribution. Provide this list to all EMCs and PIOs within the county, including every participating city; update list as needed, and share updates with other jurisdictions. Contact via phone, fax or e-mail to discuss each station's policy regarding public service announcements about tornado watches and warnings, and other weather hazards. Share information as appropriate.			X						
TORNADO 3	3. Assign one person the task of monitoring local media during tornado watch or warning times; this person should have the contact list and know the personnel to contact at each media location. If watch or warning information is not being displayed appropriately, the designated person should contact media to request on-air updates for public safety.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
TORNADO 4	4. Coordinate with IT Dept. to place tornado warnings and watches on local websites when appropriate. If possible, give EMC authority and access to post such warnings on website directly, from any location.			X						
TORNADO 5	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
TORNADO 6	6. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.				X					
TORNADO 7	7. Harden public structures to protect the building and its contents, and to provide a safe place for humans during a storm.	X								Mitigation Action #4
TORNADO 8	8. Build community storm shelters, as funds permit.				X					
TORNADO 9	9. Seek grant funding to build needed storm shelters.				X					
TORNADO 10	10. Educate the public about the dangers of tornadoes and the mitigation actions each family can take.			X						
TORNADO 11	11. Sponsor a booth at local events, to hand out free literature about the danger of tornadoes and what people can do to reduce the risk of damage to their homes and businesses.				X					
TORNADO 12	12. Place links on public websites to important sites, such as the National Weather Service ( <a href="http://www.srh.noaa.gov">http://www.srh.noaa.gov</a> ), and to other informational sites, such as the tornado project online ( <a href="http://www.tornadoproject.com/">http://www.tornadoproject.com/</a> ).			X						
TORNADO 13	13. Watch for new ideas in tornado mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region.			X						
DISEASE 1	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					
DISEASE 2	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					
DISEASE 3	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
DISEASE 4	4. Contact administrators at local hospitals, clinics and medical offices, to discuss public health concerns and possible partnerships with local medical personnel to combat disease. Develop a contact list and share it with other emergency managers, as appropriate.				X					
DISEASE 5	5. Ensure that local medical facilities are adequately stocked with the medical supplies and equipment needed for specific anticipated hazards. Take notes of any deficiencies observed or needs voiced by local medical personnel; seek grant funding to purchase needed equipment and supplies				X					
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.	X								Mitigation Action #4
DROUGHT 2	2. Assign one person to monitor drought conditions, including the soil moisture index; this person should coordinate with other local jurisdictions, be aware of all burn bans in effect in nearby locations, and advise decision-makers appropriately, if a burn ban is needed in this jurisdiction			X						
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
DROUGHT 4	4. Make sure that any current burn bans are posted on the jurisdiction's website, and communicated to all local media by PSA distribution.			X						
DROUGHT 5	5. Notify the public of the local soil moisture index, especially when it is low, and take steps to conserve public water supplies, before the situation becomes critical. Include the current soil moisture index and information about water conservation practices on the jurisdiction's website, and in PSAs sent to all local media, as appropriate.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETED	
DROUGHT 6	6. Increase public awareness of ways to conserve water, prevent loss of valuable topsoil, and reduce the effects of drought. Coordinate this effort with local agriculture agents; local Farm Bureau staff members; agricultural science, earth science, and natural science teachers at local schools, and other interested parties.			X						
DROUGHT 7	7. Obtain educational materials about water conservation and drought mitigation; distribute these at local libraries, schools, public offices, and at a booth at public gatherings.			X						
WINTER: ICE 1	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms	X								Mitigation Action #5
WINTER: ICE 2	2. Obtain or develop list of all local media: television, radio, cable; including telephone numbers, fax numbers, e-mail addresses and names of media contacts for PSA distribution. Provide this list to all EMCs and PIOs within the county, including every participating city; update list as needed, and share updates with other jurisdictions. Contact via phone, fax or e-mail to discuss each station's policy regarding public service announcements about weather hazards. Share information as appropriate.			X						
WINTER: ICE 3	3. Ensure that the jurisdiction's website has an active link to the local NOAA weather forecast, and that any severe weather alerts are prominently displayed on the local jurisdiction's home page.			X						
WINTER: ICE 4	4. Assign one person to publicize any traffic advisories issued due to severe weather; make sure that all local media receive the information promptly.				X					
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.			X						
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.			X						
WINTER: ICE 7	7. Increase public awareness of the dangers of walking and driving on icy sidewalks and roads; educate the public in ways to avoid injury and accidents in icy weather.			X						
WINTER: ICE 8	8. Develop PSAs about safety while walking and driving in icy conditions; distribute to local media.				X					
WINTER: ICE 9	9. Work with local utility companies to coordinate efforts to trim tree branches that are close to power lines, and to promptly respond to notice of power outages due to trees falling on lines during icy weather. Include a public education campaign to publicize the telephone number to call to report power outages and trees blocking roads.			X						
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.			X						
THUNDERSTORM: WIND/HAIL/LI	2. Obtain or develop list of all local media: television, radio, cable; including telephone numbers, fax numbers, e-mail addresses and names of media contacts for PSA distribution. Provide this list to all EMCs and PIOs within the county, including every participating city; update list as needed, and share updates with other jurisdictions. Contact via phone, fax or e-mail to discuss each station's policy regarding public service announcements about weather hazards. Share information as appropriate.			X						
THUNDERSTORM: WIND/HAIL/LI	3. Assign one person the task of monitoring local media during times when severe weather is expected; this person should have the contact list and know the personnel to contact at each media location. If severe weather information is not being displayed appropriately, the designated person should contact media to request on-air updates for public safety.			X						
THUNDERSTORM: WIND/HAIL/LI	4. Coordinate with IT Dept. to place severe weather warnings on local websites when appropriate. If possible, give EMC authority and access to post such warnings on website directly, from any location			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETED	
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
THUNDERSTORM: WIND/HAIL/LI	6. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.				X					
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.			X						
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.			X						
ATHENS SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 1	1. Obtain or develop a list of all local media: television, radio, cable; including telephone numbers, fax numbers, e-mail addresses and names of media contacts for PSA distribution. Provide this list to all EMCs and PIOs within the county, including every participating city; update list as needed, and share updates with other jurisdictions. Develop a relationship with all local media, to encourage rapid sharing and distribution to the public of information about imminent or developing natural hazards.			X						
MULTI HAZARD 2	2. Coordinate with local jurisdiction's information technology department to place warnings on local websites when appropriate. If possible, give Emergency Management Coordinator authority and access to post such warnings on website directly, from any location.			X						
MULTI HAZARD 3	3. Create a website link to the National Weather Service district office, so any tornado watches and warnings, and storm warnings of all kinds, will be shown on the local website.			X						
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
MULTI HAZARD 5	5. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.	X								Mitigation Action #2
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						
MULTI HAZARD 8	8. Partner with other local and regional jurisdictions in projects such as the Regional MultiAgency Coordination Group; make sure local officials and EMCs know how to contact the MAC-G if needed.			X						
MULTI HAZARD 9	9. Make a list of local and regional resources, including grocery stores, department stores, discount stores, sporting goods stores, rental outlets, farm supply stores, distribution centers, warehouses, gasoline stations, transportation companies, restaurants, caterers, churches and fraternal or benevolent organizations which might be able to assist in an emergency. Contact the managers, owners, directors, presidents or other organizational leaders to discuss possible partnerships.			X						
MULTI HAZARD 10	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.			X						



[illegible]

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	COMMENTS
FLOOD 5	5. Encourage or require improvement of privately-owned dams that are at risk. Consider offering a local tax incentive, or developing a matching fund for use by landowners who voluntarily make improvements to a dam that is at risk			X						
FLOOD 6	6. Promote FEMA-recommended construction methods for any new dam development. Provide educational materials in public offices, such as the floodplain manager's office, the local EMC's office, the local tax office, inspector's office, permit office, etc.; and offer links to FEMA publications on the local website.			X						
FLOOD 7	7. Develop public information programs to create greater awareness of flood hazards and the National Flood Insurance Program to help citizens mitigate flood risk when planning future development.			X						
FLOOD 8	8. Obtain educational materials for distribution at public libraries, in schools, and at public offices, detailing flood dangers, the NFIP, and mitigation strategies.			X						
FLOOD 9	9. Place links on local websites offering free FEMA training for independent study via the internet, such as IS-271 "Anticipating Hazardous Weather and Community Risk," or IS-279 "Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures."			X						
FLOOD 10	10. Develop or improve emergency procedures to efficiently respond and avoid unnecessary risk to human life, should a nearby dam fail.			X						
FLOOD 11	11. Seek state and FEMA sponsored training in flood mitigation for key personnel to assist all jurisdictions to participate in NFIP.			X						
WILDFIRE 1	1. Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
WILDFIRE 2	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities	X								Mitigation Action #4
WILDFIRE 3	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed			X						
WILDFIRE 4	4. Seek out grant opportunities, and publicize them to all possible grantees			X						
WILDFIRE 5	5. Seek training opportunities, and publicize them to all emergency responders.			X						
WILDFIRE 6	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
WILDFIRE 7	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
WILDFIRE 8	8. Develop public information programs to create a greater awareness of the risk of wildfire, and to encourage individuals to implement mitigation strategies on their own property.	X								Mitigation Action #5
WILDFIRE 9	9. Coordinate with the Texas Forest Service to schedule educational events and obtain literature for public distribution.			X						
WILDFIRE 10	10. Provide literature about wildfire prevention and loss mitigation to the public library, to all local school libraries, and to all public offices for free distribution			X						
WILDFIRE 11	11. Sponsor a booth at local events, to hand out free literature about the dangers of wildfire and what people can do to reduce the risk of fire damage to their homes and businesses			X						
WILDFIRE 12	12. Place links on public websites to free FEMA training in wildfire mitigation, and to other informational sites, such as Texas Forest Service.			X						
TORNADO 1	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
TORNADO 2	2. Obtain or develop list of all local media: television, radio, cable; including telephone numbers, fax numbers, e-mail addresses and names of media contacts for PSA distribution. Provide this list to all EMCs and PIOs within the county, including every participating city; update list as needed, and share updates with other jurisdictions. Contact via phone, fax or e-mail to discuss each station's policy regarding public service announcements about tornado watches and warnings, and other weather hazards. Share information as appropriate.			X						
TORNADO 3	3. Assign one person the task of monitoring local media during tornado watch or warning times; this person should have the contact list and know the personnel to contact at each media location. If watch or warning information is not being displayed appropriately, the designated person should contact media to request on-air updates for public safety.			X						
TORNADO 4	4. Coordinate with IT Dept. to place tornado warnings and watches on local websites when appropriate. If possible, give EMC authority and access to post such warnings on website directly, from any location.			X						
TORNADO 5	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
TORNADO 6	6. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.			X						
TORNADO 7	7. Harden public structures to protect the building and its contents, and to provide a safe place for humans during a storm.			X						
TORNADO 8	8. Build community storm shelters, as funds permit.			X						
TORNADO 9	9. Seek grant funding to build needed storm shelters.	X								Mitigation Action #6
TORNADO 10	10. Educate the public about the dangers of tornadoes and the mitigation actions each family can take.			X						
TORNADO 11	11. Sponsor a booth at local events, to hand out free literature about the danger of tornadoes and what people can do to reduce the risk of damage to their homes and businesses.			X						
TORNADO 12	12. Place links on public websites to important sites, such as the National Weather Service ( <a href="http://www.srh.noaa.gov">http://www.srh.noaa.gov</a> ), and to other informational sites, such as the tornado project online ( <a href="http://www.tornadoproject.com/">http://www.tornadoproject.com/</a> ).			X						
TORNADO 13	13. Watch for new ideas in tornado mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region.			X						
DISEASE 1	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					
DISEASE 2	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					
DISEASE 3	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
DISEASE 4	4. Contact administrators at local hospitals, clinics and medical offices, to discuss public health concerns and possible partnerships with local medical personnel to combat disease. Develop a contact list and share it with other emergency managers, as appropriate.				X					
DISEASE 5	5. Ensure that local medical facilities are adequately stocked with the medical supplies and equipment needed for specific anticipated hazards. Take notes of any deficiencies observed or needs voiced by local medical personnel; seek grant funding to purchase needed equipment and supplies				X					
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
DROUGHT 2	2. Assign one person to monitor drought conditions, including the soil moisture index; this person should coordinate with other local jurisdictions, be aware of all burn bans in effect in nearby locations, and advise decision-makers appropriately, if a burn ban is needed in this jurisdiction			X						
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
DROUGHT 4	4. Make sure that any current burn bans are posted on the jurisdiction's website, and communicated to all local media by PSA distribution.			X						
DROUGHT 5	5. Notify the public of the local soil moisture index, especially when it is low, and take steps to conserve public water supplies, before the situation becomes critical. Include the current soil moisture index and information about water conservation practices on the jurisdiction's website, and in PSAs sent to all local media, as appropriate.			X						
DROUGHT 6	6. Increase public awareness of ways to conserve water, prevent loss of valuable topsoil, and reduce the effects of drought. Coordinate this effort with local agriculture agents; local Farm Bureau staff members; agricultural science, earth science, and natural science teachers at local schools, and other interested parties.	X								Mitigation Action #7
DROUGHT 7	7. Obtain educational materials about water conservation and drought mitigation; distribute these at local libraries, schools, public offices, and at a booth at public gatherings.			X						
WINTER: ICE 1	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms			X						
WINTER: ICE 2	2. Obtain or develop list of all local media: television, radio, cable; including telephone numbers, fax numbers, e-mail addresses and names of media contacts for PSA distribution. Provide this list to all EMCs and PIOs within the county, including every participating city; update list as needed, and share updates with other jurisdictions. Contact via phone, fax or e-mail to discuss each station's policy regarding public service announcements about weather hazards. Share information as appropriate.			X						
WINTER: ICE 3	3. Ensure that the jurisdiction's website has an active link to the local NOAA weather forecast, and that any severe weather alerts are prominently displayed on the local jurisdiction's home page.			X						
WINTER: ICE 4	4. Assign one person to publicize any traffic advisories issued due to severe weather; make sure that all local media receive the information promptly.			X						
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.			X						
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.			X						
WINTER: ICE 7	7. Increase public awareness of the dangers of walking and driving on icy sidewalks and roads; educate the public in ways to avoid injury and accidents in icy weather.	X								Mitigation Action #8
WINTER: ICE 8	8. Develop PSAs about safety while walking and driving in icy conditions; distribute to local media.			X						
WINTER: ICE 9	9. Work with local utility companies to coordinate efforts to trim tree branches that are close to power lines, and to promptly respond to notice of power outages due to trees falling on lines during icy weather. Include a public education campaign to publicize the telephone number to call to report power outages and trees blocking roads.			X						
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.			X						



PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
THUNDERSTORM: WIND/HAIL/LI	2. Obtain or develop list of all local media: television, radio, cable; including telephone numbers, fax numbers, e-mail addresses and names of media contacts for PSA distribution. Provide this list to all EMCs and PIOs within the county, including every participating city; update list as needed, and share updates with other jurisdictions. Contact via phone, fax or e-mail to discuss each station's policy regarding public service announcements about weather hazards. Share information as appropriate.			X						
THUNDERSTORM: WIND/HAIL/LI	3. Assign one person the task of monitoring local media during times when severe weather is expected; this person should have the contact list and know the personnel to contact at each media location. If severe weather information is not being displayed appropriately, the designated person should contact media to request on-air updates for public safety.			X						
THUNDERSTORM: WIND/HAIL/LI	4. Coordinate with IT Dept. to place severe weather warnings on local websites when appropriate. If possible, give EMC authority and access to post such warnings on website directly, from any location			X						
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
THUNDERSTORM: WIND/HAIL/LI	6. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.			X						
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.			X						
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.			X						
BERRYVILLE SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #1
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						
MULTI HAZARD 10	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.			X						
MULTI HAZARD 12	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
MULTI HAZARD 14	14. Develop, enhance and implement education programs to increase awareness of natural hazards and encourage the use of mitigation actions to reduce risk to citizens, public infrastructure, private property owners, businesses and schools. Public officials will include hazard mitigation messages in their newsletters, web pages, and speeches, as appropriate. The EMC will accept opportunities to speak to service clubs and school groups about hazard mitigation, and will encourage other emergency management professionals to do the same.			X						
MULTI HAZARD 19	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETED	
<b>MULTI HAZARD 20</b>	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						
<b>MULTI HAZARD 21</b>	21. Maintain records of property values, including the regular addition of new development data, and information about any losses due to natural hazards. Provide this information to the Henderson County Hazard Mitigation Planning Committee, to be used when revising the Plan.			X						
<b>MULTI HAZARD 22</b>	22. Watch for new ideas in mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region			X						
<b>FLOOD 1</b>	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.			X						
<b>FLOOD 2</b>	2.Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain			X						
<b>FLOOD 3</b>	3. Encourage retrofitting of existing structures that are at risk. Consider offering a local tax incentive, providing surplus materials or labor assistance, or developing a matching fund for use by property owners who make improvements to a building that is at-risk			X						
<b>FLOOD 7</b>	7. Develop public information programs to create greater awareness of flood hazards and the National Flood Insurance Program to help citizens mitigate flood risk when planning future development.	X								Mitigation Action #3
<b>FLOOD 11</b>	11. Seek state and FEMA sponsored training in flood mitigation for key personnel to assist all jurisdictions to participate in NFIP.			X						
<b>WILDFIRE 1</b>	1.Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
<b>WILDFIRE 2</b>	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities			X						
<b>WILDFIRE 3</b>	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed				X					
<b>WILDFIRE 6</b>	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities				X					
<b>WILDFIRE 7</b>	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
<b>WILDFIRE 8</b>	8. Develop public information programs to create a greater awareness of the risk of wildfire, and to encourage individuals to implement mitigation strategies on their own property.			X						
<b>TORNADO 1</b>	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.	X								Mitigation Action #1
<b>TORNADO 5</b>	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #1
<b>TORANDO 8</b>	8. Build community storm shelters, as funds permit.	X								Mitigation Action #2
<b>DISEASE 1</b>	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					
<b>DISEASE 2</b>	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
DISEASE 3	3. Obtain educational brochures and flyers form TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.			X						
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
DROUGHT 6	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
WINTER: ICE 1	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms	X								Mitigation Action #4
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.	X								Mitigation Action #1
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.			X						
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.	X								Mitigation Action #4
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #1
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.	X								Mitigation Action #3
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.	X								Mitigation Action #3
BROWNSBORO SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #1
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						
MULTI HAZARD 10	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.			X						
MULTI HAZARD 12	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETED	
<b>MULTI HAZARD 19</b>	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
<b>MULTI HAZARD 20</b>	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.	X								Mitigaiton Action #4
<b>MULTI HAZARD 21</b>	21. Maintain records of property values, including the regular addition of new development data, and information about any losses due to natural hazards. Provide this information to the Henderson County Hazard Mitigation Planning Committee, to be used when revising the Plan.	X								Mitigaiton Action #4
<b>MULTI HAZARD 22</b>	22. Watch for new ideas in mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region			X						
<b>FLOOD 1</b>	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.			X						
<b>FLOOD 2</b>	2.Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain			X						
<b>FLOOD 3</b>	3. Encourage retrofitting of existing structures that are at risk. Consider offering a local tax incentive, providing surplus materials or labor assistance, or developing a matching fund for use by property owners who make improvements to a building that is at-risk				X					
<b>FLOOD 7</b>	7. Develop public information programs to create greater awareness of flood hazards and the National Flood Insurance Program to help citizens mitigate flood risk when planning future development.	X								Mitigaiton Action #2
<b>FLOOD 11</b>	11. Seek state and FEMA sponsored training in flood mitigation for key personnel to assist all jurisdictions to participate in NFIP.	X								Mitigaiton Action #2
<b>WILDFIRE 1</b>	1.Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
<b>WILDFIRE 2</b>	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities			X						
<b>WILDFIRE 3</b>	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed				X					
<b>WILDFIRE 6</b>	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
<b>WILDFIRE 7</b>	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
<b>TORNADO 1</b>	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.	X								Mitigaiton Action #1
<b>TORNADO 5</b>	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigaiton Action #1
<b>TORANDO 8</b>	8. Build community storm shelters, as funds permit.				X					
<b>TORNADO 10</b>	10. Educate the public about the dangers of tornadoes and the mitigation actions each family can take.	X								Mitigation Action #3
<b>DISEASE 1</b>	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevenetion and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					



PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETED	
DISEASE 2	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					
DISEASE 3	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.				X					
DROUGHT 2	2. Assign one person to monitor drought conditions, including the soil moisture index; this person should coordinate with other local jurisdictions, be aware of all burn bans in effect in nearby locations, and advise decision-makers appropriately, if a burn ban is needed in this jurisdiction				X					
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
DROUGHT 6	6. Increase public awareness of ways to conserve water, prevent loss of valuable topsoil, and reduce the effects of drought. Coordinate this effort with local agriculture agents; local Farm Bureau staff members; agricultural science, earth science, and natural science teachers at local schools, and other interested parties.	X								Mitigation Action #3
WINTER: ICE 1	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms	X								Mitigation Action #1
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.				X					
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.				X					
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.	X								Mitigation Action #1
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #1
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.	X								Mitigation Action #3
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.	X								Mitigation Action #3
CANEY CITY SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #1
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						

[illegible]

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
TORANDO 8	8. Build community storm shelters, as funds permit.				X					
DISEASE 1	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					
DISEASE 2	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					
DISEASE 3	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.				X					
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.				X					
DROUGHT 6	6. Increase public awareness of ways to conserve water, prevent loss of valuable topsoil, and reduce the effects of drought. Coordinate this effort with local agriculture agents; local Farm Bureau staff members; agricultural science, earth science, and natural science teachers at local schools, and other interested parties.	X								Mitigation Action #3
WINTER: ICE 1	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms	X								Mitigation Action #1
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.	X								Mitigation Action #1
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.									
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.	X								Mitigation Action #1
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.	X								Mitigation Action #3
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.	X								Mitigation Action #3
CHANDLER SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 3	3. Create a website link to the National Weather Service district office, so any tornado watches and warnings, and storm warnings of all kinds, will be shown on the local website.			X						
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
MULTI HAZARD 5	5. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.	X								Mitigation Action #1
MULTI HAZARD 12	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
MULTI HAZARD 19	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	COMMENTS
FLOOD 1	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.			X						
FLOOD 2	2.Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain			X						
WILDFIRE 1	1.Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
WILDFIRE 3	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed	X								Mitigation Action #2
WILDFIRE 6	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
TORNADO 1	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.			X						
TORNADO 4	4. Coordinate with IT Dept. to place tornado warnings and watches on local websites when appropriate. If possible, give EMC authority and access to post such warnings on website directly, from any location.			X						
TORNADO 5	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #3
TORNADO 6	6. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.			X						
DISEASE 3	3. Obtain educational brochures and flyers form TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
DISEASE 4	4. Contact administrators at local hospitals, clinics and medical offices, to discuss public health concerns and possible partnerships with local medical personnel to combat disease. Develop a contact list and share it with other emergency managers, as appropriate.				X					
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.			X						
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
DROUGHT 4	4. Make sure that any current burn bans are posted on the jurisdiction's website, and communicated to all local media by PSA distribution.			X						
WINTER: ICE 1	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms			X						
WINTER: ICE 4	4. Assign one person to publicize any traffic advisories issued due to severe weather; make sure that all local media receive the information promptly.			X						
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.			X						
THUNDERSTORM: WIND/HAIL/LI	3. Assign one person the task of monitoring local media during times when severe weather is expected; this person should have the contact list and know the personnel to contact at each media location. If severe weather information is not being displayed appropriately, the designated person should contact media to request on-air updates for public safety.			X						



PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
THUNDERSTORM: WIND/HAIL/LI	4. Coordinate with IT Dept. to place severe weather warnings on local websites when appropriate. If possible, give EMC authority and access to post such warnings on website directly, from any location			X						
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
THUNDERSTORM: WIND/HAIL/LI	6. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.			X						
COFFEE CITY SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 2	2. Coordinate with local jurisdiction's information technology department to place warnings on local websites when appropriate. If possible, give Emergency Management Coordinator authority and access to post such warnings on website directly, from any location.	X								Mitigation Action #2
MULTI HAZARD 3	3. Create a website link to the National Weather Service district office, so any tornado watches and warnings, and storm warnings of all kinds, will be shown on the local website.			X						
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						
MULTI HAZARD 10	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.				X					
MULTI HAZARD 12	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
MULTI HAZARD 19	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
MULTI HAZARD 20	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						
MULTI HAZARD 21	21. Maintain records of property values, including the regular addition of new development data, and information about any losses due to natural hazards. Provide this information to the Henderson County Hazard Mitigation Planning Committee, to be used when revising the Plan.			X						
MULTI HAZARD 22	22. Watch for new ideas in mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region			X						
FLOOD 1	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETED	
FLOOD 2	2.Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain				X					
FLOOD 7	7. Develop public information programs to create greater awareness of flood hazards and the National Flood Insurance Program to help citizens mitigate flood risk when planning future development.				X					
FLOOD 9	9. Place links on local websites offering free FEMA training for independent study via the internet, such as IS-271 "Anticipating Hazardous Weather and Community Risk," or IS-279 "Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures."			X						
FLOOD 11	11. Seek state and FEMA sponsored training in flood mitigation for key personnel to assist all jurisdictions to participate in NFIP.				X					
WILDFIRE 1	1.Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
WILDFIRE 2	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities			X						
WILDFIRE 3	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed				X					
WILDFIRE 6	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
WILDFIRE 7	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.	X								Mitigation Action #4
WILDFIRE 12	12. Place links on public websites to free FEMA training in wildfire mitigation, and to other informational sites, such as Texas Forest Service.			X						
TORNADO 1	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.	X								Mitigation Action #3
TORNADO 4	4. Coordinate with IT Dept. to place tornado warnings and watches on local websites when appropriate. If possible, give EMC authority and access to post such warnings on website directly, from any location.			X						
TORNADO 5	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #2
TORANDO 8	8. Build community storm shelters, as funds permit.				X					
TORNADO 12	12. Place links on public websites to important sites, such as the National Weather Service ( <a href="http://www.srh.noaa.gov">http://www.srh.noaa.gov</a> ), and to other informational sites, such as the tornado project online ( <a href="http://www.tornadoproject.com/">http://www.tornadoproject.com/</a> ).			X						
DISEASE 1	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					
DISEASE 2	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					
DISEASE 3	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.			X						
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
DROUGHT 6	6. Increase public awareness of ways to conserve water, prevent loss of valuable topsoil, and reduce the effects of drought. Coordinate this effort with local agriculture agents; local Farm Bureau staff members; agricultural science, earth science, and natural science teachers at local schools, and other interested parties.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
WINTER: ICE 1	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms	X								Mitigation Action #3
WINTER: ICE 3	3. Ensure that the jurisdiction's website has an active link to the local NOAA weather forecast, and that any severe weather alerts are prominently displayed on the local jurisdiction's home page.			X						
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.			X						
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.			X						
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.	X								Mitigation Action #3
THUNDERSTORM: WIND/HAIL/LI	4. Coordinate with IT Dept. to place severe weather warnings on local websites when appropriate. If possible, give EMC authority and access to post such warnings on website directly, from any location			X						
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.	X								Mitigation Action #2
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.	X								Mitigation Action #2
ENCHANTED OAKS SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
MULTI HAZARD 5	5. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.	X								Mitigation Action #3
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 12	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
MULTI HAZARD 19	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
FLOOD 1	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.			X						
FLOOD 2	2. Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain			X						
WILDFIRE 1	1. Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
WILDFIRE 3	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
WILDFIRE 6	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
WILDFIRE 7	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
TORNADO 5	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
TORNADO 6	6. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.			X						
DISEASE 1	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.			X						
DISEASE 3	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.			X						
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.			X						
DROUGHT 4	4. Make sure that any current burn bans are posted on the jurisdiction's website, and communicated to all local media by PSA distribution.			X						
WINTER: ICE 4	4. Assign one person to publicize any traffic advisories issued due to severe weather; make sure that all local media receive the information promptly.			X						
WINTER: ICE 9	9. Work with local utility companies to coordinate efforts to trim tree branches that are close to power lines, and to promptly respond to notice of power outages due to trees falling on lines during icy weather. Include a public education campaign to publicize the telephone number to call to report power outages and trees blocking roads.			X						
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
THUNDERSTORM: WIND/HAIL/LI	6. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.			X						
EUSTACE SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #2
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.		X							Mitigation Action #4
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						
MULTI HAZARD 10	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.		X							Mitigation Action #3
MULTI HAZARD 12	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						



PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	COMMENTS
<b>MULTI HAZARD 19</b>	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
<b>MULTI HAZARD 20</b>	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						
<b>MULTI HAZARD 21</b>	21. Maintain records of property values, including the regular addition of new development data, and information about any losses due to natural hazards. Provide this information to the Henderson County Hazard Mitigation Planning Committee, to be used when revising the Plan.			X						
<b>MULTI HAZARD 22</b>	22. Watch for new ideas in mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region			X						
<b>FLOOD 1</b>	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.			X						
<b>FLOOD 2</b>	2.Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain			X						
<b>FLOOD 11</b>	11. Seek state and FEMA sponsored training in flood mitigation for key personnel to assist all jurisdictions to participate in NFIP.				X					
<b>WILDFIRE 1</b>	1.Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
<b>WILDFIRE 2</b>	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities			X						
<b>WILDFIRE 3</b>	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed			X						
<b>WILDFIRE 6</b>	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
<b>WILDFIRE 7</b>	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
<b>TORNADO 1</b>	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.	X								Mitigation Action #2
<b>TORNADO 5</b>	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #2
<b>DISEASE 1</b>	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					
<b>DISEASE 2</b>	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					
<b>DISEASE 3</b>	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
<b>DROUGHT 1</b>	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.			X						
<b>DROUGHT 3</b>	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
<b>DROUGHT 6</b>	6. Increase public awareness of ways to conserve water, prevent loss of valuable topsoil, and reduce the effects of drought. Coordinate this effort with local agriculture agents; local Farm Bureau staff members; agricultural science, earth science, and natural science teachers at local schools, and other interested parties.			X						
<b>WINTER: ICE 1</b>	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms	X								Mitigation Action #2
<b>WINTER: ICE 5</b>	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.				X					
<b>WINTER: ICE 6</b>	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.				X					
<b>WINTER: ICE 10</b>	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
<b>THUNDERSTORM: WIND/HAIL/LI</b>	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.	X								Mitigation Action #2
<b>THUNDERSTORM: WIND/HAIL/LI</b>	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #2
<b>THUNDERSTORM: WIND/HAIL/LI</b>	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.				X					
<b>THUNDERSTORM: WIND/HAIL/LI</b>	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.				X					
<b>GUN BARREL CITY SPECIFIC ACTIONS AS LISTED 2011 HMP</b>										
<b>MULTI HAZARD 3</b>	3. Create a website link to the National Weather Service district office, so any tornado watches and warnings, and storm warnings of all kinds, will be shown on the local website.			X						
<b>MULTI HAZARD 4</b>	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #1
<b>MULTI HAZARD 5</b>	5. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.	X								Mitigation Action #1
<b>MULTI HAZARD 10</b>	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.			X						
<b>MULTI HAZARD 12</b>	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
<b>MULTI HAZARD 19</b>	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
<b>MULTI HAZARD 20</b>	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						
<b>FLOOD 1</b>	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.			X						
<b>FLOOD 2</b>	2. Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
FLOOD 11	11. Seek state and FEMA sponsored training in flood mitigation for key personnel to assist all jurisdictions to participate in NFIP.			X						
WILDFIRE 1	1. Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
WILDFIRE 3	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed			X						
WILDFIRE 6	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
TORNADO 1	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.	X								Mitigation Action #1
TORNADO 6	6. Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body.	X								Mitigation Action #2
DISEASE 2	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					
DISEASE 4	4. Contact administrators at local hospitals, clinics and medical offices, to discuss public health concerns and possible partnerships with local medical personnel to combat disease. Develop a contact list and share it with other emergency managers, as appropriate.				X					
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.			X						
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.			X						
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.	X								Mitigation Action #2
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #1
LOG CABIN SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
<b>MULTI HAZARD 10</b>	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.			X						
<b>MULTI HAZARD 12</b>	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
<b>MULTI HAZARD 19</b>	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
<b>MULTI HAZARD 20</b>	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						
<b>MULTI HAZARD 21</b>	21. Maintain records of property values, including the regular addition of new development data, and information about any losses due to natural hazards. Provide this information to the Henderson County Hazard Mitigation Planning Committee, to be used when revising the Plan.			X						
<b>MULTI HAZARD 22</b>	22. Watch for new ideas in mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region			X						
<b>FLOOD 1</b>	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.			X						
<b>FLOOD 2</b>	2.Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain			X						
<b>FLOOD 11</b>	11. Seek state and FEMA sponsored training in flood mitigation for key personnel to assist all jurisdictions to participate in NFIP.			X						
<b>WILDFIRE 1</b>	1.Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
<b>WILDFIRE 2</b>	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities			X						
<b>WILDFIRE 3</b>	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed			X						
<b>WILDFIRE 6</b>	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
<b>WILDFIRE 7</b>	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
<b>TORNADO 1</b>	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.			X						
<b>TORNADO 5</b>	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
<b>DISEASE 1</b>	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.			X						
<b>DISEASE 2</b>	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.			X						
<b>DISEASE 3</b>	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.			X						



[illegible]

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	COMMENTS
<b>MULTI HAZARD 14</b>	14. Develop, enhance and implement education programs to increase awareness of natural hazards and encourage the use of mitigation actions to reduce risk to citizens, public infrastructure, private property owners, businesses and schools. Public officials will include hazard mitigation messages in their newsletters, web pages, and speeches, as appropriate. The EMC will accept opportunities to speak to service clubs and school groups about hazard mitigation, and will encourage other emergency management professionals to do the same.			X						
<b>MULTI HAZARD 19</b>	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
<b>MULTI HAZARD 20</b>	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						
<b>MULTI HAZARD 21</b>	21. Maintain records of property values, including the regular addition of new development data, and information about any losses due to natural hazards. Provide this information to the Henderson County Hazard Mitigation Planning Committee, to be used when revising the Plan.			X						
<b>MULTI HAZARD 22</b>	22. Watch for new ideas in mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region			X						
<b>FLOOD 1</b>	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.	X								Mitigation Action #4
<b>FLOOD 2</b>	2.Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain			X						
<b>FLOOD 3</b>	3. Encourage retrofitting of existing structures that are at risk. Consider offering a local tax incentive, providing surplus materials or labor assistance, or developing a matching fund for use by property owners who make improvements to a building that is at-risk			X						
<b>FLOOD 11</b>	11. Seek state and FEMA sponsored training in flood mitigation for key personnel to assist all jurisdictions to participate in NFIP.			X						
<b>WILDFIRE 1</b>	1.Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.	X								Mitigation Action #2
<b>WILDFIRE 2</b>	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities			X						
<b>WILDFIRE 3</b>	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed			X						
<b>WILDFIRE 6</b>	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
<b>WILDFIRE 7</b>	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
<b>TORNADO 1</b>	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.			X						
<b>TORNADO 5</b>	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
<b>TORANDO 8</b>	8. Build community storm shelters, as funds permit.			X						
<b>DISEASE 1</b>	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
DISEASE 2	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					
DISEASE 3	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.			X						
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
DROUGHT 6	6. Increase public awareness of ways to conserve water, prevent loss of valuable topsoil, and reduce the effects of drought. Coordinate this effort with local agriculture agents; local Farm Bureau staff members; agricultural science, earth science, and natural science teachers at local schools, and other interested parties.	X								Mitigation Action #1
WINTER: ICE 1	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms			X						
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.			X						
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.			X						
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.			X						
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.	X								Mitigation Action #3
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.			X						
MOORE STATION SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #4
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						
MULTI HAZARD 10	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.				X					

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETED	
<b>MULTI HAZARD 12</b>	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
<b>MULTI HAZARD 19</b>	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
<b>MULTI HAZARD 20</b>	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						
<b>MULTI HAZARD 21</b>	21. Maintain records of property values, including the regular addition of new development data, and information about any losses due to natural hazards. Provide this information to the Henderson County Hazard Mitigation Planning Committee, to be used when revising the Plan.			X						
<b>MULTI HAZARD 22</b>	22. Watch for new ideas in mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region			X						
<b>FLOOD 1</b>	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.			X						
<b>FLOOD 2</b>	2.Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain				X					
<b>FLOOD 11</b>	11. Seek state and FEMA sponsored training in flood mitigation for key personnel to assist all jurisdictions to participate in NFIP.				X					
<b>WILDFIRE 1</b>	1.Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
<b>WILDFIRE 2</b>	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities			X						
<b>WILDFIRE 3</b>	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed				X					
<b>WILDFIRE 6</b>	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
<b>WILDFIRE 7</b>	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
<b>TORNADO 1</b>	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.	X								Mitigation Action #3
<b>TORNADO 5</b>	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #2
<b>DISEASE 1</b>	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					
<b>DISEASE 2</b>	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					
<b>DISEASE 3</b>	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
<b>DROUGHT 1</b>	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.			X						



PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	COMMENTS
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
DROUGHT 6	6. Increase public awareness of ways to conserve water, prevent loss of valuable topsoil, and reduce the effects of drought. Coordinate this effort with local agriculture agents; local Farm Bureau staff members; agricultural science, earth science, and natural science teachers at local schools, and other interested parties.			X						
WINTER: ICE 1	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms	X								Mitigation Action #3
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.			X						
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.			X						
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.	X								Mitigation Action #3
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.			X						
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.			X						
MURCHISON SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.	X								Mitigation Action #2
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						
MULTI HAZARD 10	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.			X						
MULTI HAZARD 12	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
MULTI HAZARD 19	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						

[illegible]

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.	X								Mitigation Action #4
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.	X								Mitigation Action #4
PAYNE SPRINGS SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						
MULTI HAZARD 10	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.			X						
MULTI HAZARD 12	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
MULTI HAZARD 19	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
MULTI HAZARD 20	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						
MULTI HAZARD 21	21. Maintain records of property values, including the regular addition of new development data, and information about any losses due to natural hazards. Provide this information to the Henderson County Hazard Mitigation Planning Committee, to be used when revising the Plan.			X						
MULTI HAZARD 22	22. Watch for new ideas in mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region			X						
FLOOD 1	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.	X								Mitigation Action #1
FLOOD 2	2.Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain			X						
FLOOD 3	3. Encourage retrofitting of existing structures that are at risk. Consider offering a local tax incentive, providing surplus materials or labor assistance, or developing a matching fund for use by property owners who make improvements to a building that is at-risk			X						
WILDFIRE 1	1.Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
WILDFIRE 2	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
WILDFIRE 3	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed			X						
WILDFIRE 6	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
WILDFIRE 7	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
WILDFIRE 8	8. Develop public information programs to create a greater awareness of the risk of wildfire, and to encourage individuals to implement mitigation strategies on their own property.			X						
WILDFIRE 9	9. Coordinate with the Texas Forest Service to schedule educational events and obtain literature for public distribution.			X						
WILDFIRE 10	10. Provide literature about wildfire prevention and loss mitigation to the public library, to all local school libraries, and to all public offices for free distribution			X						
TORNADO 1	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.			X						
TORNADO 5	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
TORNADO 8	8. Build community storm shelters, as funds permit.			X						
TORNADO 10	10. Educate the public about the dangers of tornadoes and the mitigation actions each family can take.			X						
DISEASE 1	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					
DISEASE 2	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					
DISEASE 3	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.			X						
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
DROUGHT 6	6. Increase public awareness of ways to conserve water, prevent loss of valuable topsoil, and reduce the effects of drought. Coordinate this effort with local agriculture agents; local Farm Bureau staff members; agricultural science, earth science, and natural science teachers at local schools, and other interested parties.			X						
WINTER: ICE 1	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms			X						
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.			X						
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.			X						
WINTER: ICE 7	7. Increase public awareness of the dangers of walking and driving on icy sidewalks and roads; educate the public in ways to avoid injury and accidents in icy weather.			X						
WINTER: ICE 8	8. Develop PSAs about safety while walking and driving in icy conditions; distribute to local media.			X						



PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
WINTER: ICE 9	9. Work with local utility companies to coordinate efforts to trim tree branches that are close to power lines, and to promptly respond to notice of power outages due to trees falling on lines during icy weather. Include a public education campaign to publicize the telephone number to call to report power outages and trees blocking roads.			X						
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.			X						
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.			X						
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.			X						
SEVEN POINTS SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						
MULTI HAZARD 10	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.			X						
MULTI HAZARD 12	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
MULTI HAZARD 19	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
MULTI HAZARD 20	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						
MULTI HAZARD 21	21. Maintain records of property values, including the regular addition of new development data, and information about any losses due to natural hazards. Provide this information to the Henderson County Hazard Mitigation Planning Committee, to be used when revising the Plan.			X						
MULTI HAZARD 22	22. Watch for new ideas in mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	COMMENTS
FLOOD 1	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.			X						
FLOOD 2	2.Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain			X						
FLOOD 3	3. Encourage retrofitting of existing structures that are at risk. Consider offering a local tax incentive, providing surplus materials or labor assistance, or developing a matching fund for use by property owners who make improvements to a building that is at-risk			X						
FLOOD 11	11. Seek state and FEMA sponsored training in flood mitigation for key personnel to assist all jurisdictions to participate in NFIP.			X						
WILDFIRE 1	1.Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
WILDFIRE 2	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities			X						
WILDFIRE 3	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed			X						
WILDFIRE 6	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
WILDFIRE 7	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
WILDFIRE 8	8. Develop public information programs to create a greater awareness of the risk of wildfire, and to encourage individuals to implement mitigation strategies on their own property.			X						
TORNADO 1	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.			X						
TORNADO 5	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
TORANDO 8	8. Build community storm shelters, as funds permit.			X						
TORNADO 10	10. Educate the public about the dangers of tornadoes and the mitigation actions each family can take.			X						
DISEASE 1	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					
DISEASE 2	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					
DISEASE 3	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.			X						
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
DROUGHT 6	6. Increase public awareness of ways to conserve water, prevent loss of valuable topsoil, and reduce the effects of drought. Coordinate this effort with local agriculture agents; local Farm Bureau staff members; agricultural science, earth science, and natural science teachers at local schools, and other interested parties.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
WINTER: ICE 1	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms			X						
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.			X						
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.			X						
WINTER: ICE 9	9. Work with local utility companies to coordinate efforts to trim tree branches that are close to power lines, and to promptly respond to notice of power outages due to trees falling on lines during icy weather. Include a public education campaign to publicize the telephone number to call to report power outages and trees blocking roads.			X						
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.			X						
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.			X						
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.			X						
STAR HARBOR SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						
MULTI HAZARD 10	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.			X						
MULTI HAZARD 12	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
MULTI HAZARD 19	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
MULTI HAZARD 20	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						

[illegible]



PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.			X						
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.			X						
WINTER: ICE 9	9. Work with local utility companies to coordinate efforts to trim tree branches that are close to power lines, and to promptly respond to notice of power outages due to trees falling on lines during icy weather. Include a public education campaign to publicize the telephone number to call to report power outages and trees blocking roads.			X						
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.			X						
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.			X						
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.			X						
TOOLSPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 1	1. Obtain or develop a list of all local media: television, radio, cable; including telephone numbers, fax numbers, e-mail addresses and names of media contacts for PSA distribution. Provide this list to all EMCs and PIOs within the county, including every participating city; update list as needed, and share updates with other jurisdictions. Develop a relationship with all local media, to encourage rapid sharing and distribution to the public of information about imminent or developing natural hazards.			X						
MULTI HAZARD 2	2. Coordinate with local jurisdiction's information technology department to place warnings on local websites when appropriate. If possible, give Emergency Management Coordinator authority and access to post such warnings on website directly, from any location.			X						
MULTI HAZARD 3	3. Create a website link to the National Weather Service district office, so any tornado watches and warnings, and storm warnings of all kinds, will be shown on the local website.			X						
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	COMMENTS
<b>MULTI HAZARD 9</b>	9. Make a list of local and regional resources, including grocery stores, department stores, discount stores, sporting goods stores, rental outlets, farm supply stores, distribution centers, warehouses, gasoline stations, transportation companies, restaurants, caterers, churches and fraternal or benevolent organizations which might be able to assist in an emergency. Contact the managers, owners, directors, presidents or other organizational leaders to discuss possible partnerships.			X						
<b>MULTI HAZARD 10</b>	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.			X						
<b>MULTI HAZARD 11</b>	11. Encourage citizens to retrofit existing structures to meet current standards; consider offering a local tax incentive, or partnering with local utility providers or charity organizations to assist in the retrofitting of private homes.			X						
<b>MULTI HAZARD 12</b>	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
<b>MULTI HAZARD 13</b>	13. Encourage the development of public and private partnerships with businesses, service organizations, and other community groups to work together on local mitigation projects, planning, and cooperative mitigation actions			X						
<b>MULTI HAZARD 14</b>	14. Develop, enhance and implement education programs to increase awareness of natural hazards and encourage the use of mitigation actions to reduce risk to citizens, public infrastructure, private property owners, businesses and schools. Public officials will include hazard mitigation messages in their newsletters, web pages, and speeches, as appropriate. The EMC will accept opportunities to speak to service clubs and school groups about hazard mitigation, and will encourage other emergency management professionals to do the same.		X							Mitigation Action #4
<b>MULTI HAZARD 15</b>	15. Increase training opportunities for citizens, to encourage their involvement in mitigation efforts. Partner with ETCOG, TDEM, TFS, TEEX, FEMA, and others, to bring free and lowcost mitigation training to the people of our local jurisdictions, county, and region.		X							Mitigation Action #4
<b>MULTI HAZARD 17</b>	17. Include information on the jurisdiction's website about free training available by internet or in local or regional classes.			X						
<b>MULTI HAZARD 18</b>	18. Send PSAs to media contacts to publicize any training opportunities			X						
<b>MULTI HAZARD 19</b>	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
<b>MULTI HAZARD 20</b>	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						
<b>FLOOD 3</b>	3. Encourage retrofitting of existing structures that are at risk. Consider offering a local tax incentive, providing surplus materials or labor assistance, or developing a matching fund for use by property owners who make improvements to a building that is at-risk			X						
<b>FLOOD 5</b>	5. Encourage or require improvement of privately-owned dams that are at risk. Consider offering a local tax incentive, or developing a matching fund for use by landowners who voluntarily make improvements to a dam that is at risk			X						
<b>FLOOD 6</b>	6. Promote FEMA-recommended construction methods for any new dam development. Provide educational materials in public offices, such as the floodplain manager's office, the local EMC's office, the local tax office, inspector's office, permit office, etc.; and offer links to FEMA publications on the local website.			X						
<b>FLOOD 7</b>	7. Develop public information programs to create greater awareness of flood hazards and the National Flood Insurance Program to help citizens mitigate flood risk when planning future development.			X						
<b>FLOOD 8</b>	8. Obtain educational materials for distribution at public libraries, in schools, and at public offices, detailing flood dangers, the NFIP, and mitigation strategies.				X					

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	COMMENTS
FLOOD 9	9. Place links on local websites offering free FEMA training for independent study via the internet, such as IS-271 "Anticipating Hazardous Weather and Community Risk," or IS-279 "Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures."			X						
FLOOD 10	10. Develop or improve emergency procedures to efficiently respond and avoid unnecessary risk to human life, should a nearby dam fail.			X						
FLOOD 11	11. Seek state and FEMA sponsored training in flood mitigation for key personnel to assist all jurisdictions to participate in NFIP.			X						
WILDFIRE 1	1. Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
WILDFIRE 2	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities			X						
WILDFIRE 3	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed				X					
WILDFIRE 4	4. Seek out grant opportunities, and publicize them to all possible grantees			X						
WILDFIRE 5	5. Seek training opportunities, and publicize them to all emergency responders.			X						
WILDFIRE 6	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
WILDFIRE 7	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
WILDFIRE 8	8. Develop public information programs to create a greater awareness of the risk of wildfire, and to encourage individuals to implement mitigation strategies on their own property.				X					
WILDFIRE 9	9. Coordinate with the Texas Forest Service to schedule educational events and obtain literature for public distribution.				X					
WILDFIRE 10	10. Provide literature about wildfire prevention and loss mitigation to the public library, to all local school libraries, and to all public offices for free distribution				X					
WILDFIRE 12	12. Place links on public websites to free FEMA training in wildfire mitigation, and to other informational sites, such as Texas Forest Service.			X						
TORNADO 1	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.			X						
TORNADO 2	2. Obtain or develop list of all local media: television, radio, cable; including telephone numbers, fax numbers, e-mail addresses and names of media contacts for PSA distribution. Provide this list to all EMCs and PIOs within the county, including every participating city; update list as needed, and share updates with other jurisdictions. Contact via phone, fax or e-mail to discuss each station's policy regarding public service announcements about tornado watches and warnings, and other weather hazards. Share information as appropriate.			X						
TORNADO 4	4. Coordinate with IT Dept. to place tornado warnings and watches on local websites when appropriate. If possible, give EMC authority and access to post such warnings on website directly, from any location.			X						
TORNADO 5	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
TORNADO 7	7. Harden public structures to protect the building and its contents, and to provide a safe place for humans during a storm.	X								Mitigation Action #2
TORNADO 9	9. Seek grant funding to build needed storm shelters.				X					
TORNADO 10	10. Educate the public about the dangers of tornadoes and the mitigation actions each family can take.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
<b>TORNADO 11</b>	11. Sponsor a booth at local events, to hand out free literature about the danger of tornadoes and what people can do to reduce the risk of damage to their homes and businesses.				X					
<b>TORNADO 12</b>	12. Place links on public websites to important sites, such as the National Weather Service ( <a href="http://www.srh.noaa.gov">http://www.srh.noaa.gov</a> ), and to other informational sites, such as the tornado project online ( <a href="http://www.tornadopproject.com/">http://www.tornadopproject.com/</a> ).			X						
<b>DISEASE 1</b>	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					
<b>DISEASE 2</b>	2. Work with the Texas Department of State Health Services district office (in Tyler) to schedule inoculation clinics and public information campaigns.				X					
<b>DISEASE 3</b>	3. Obtain educational brochures and flyers from TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
<b>DROUGHT 2</b>	2. Assign one person to monitor drought conditions, including the soil moisture index; this person should coordinate with other local jurisdictions, be aware of all burn bans in effect in nearby locations, and advise decision-makers appropriately, if a burn ban is needed in this jurisdiction			X						
<b>DROUGHT 3</b>	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
<b>DROUGHT 4</b>	4. Make sure that any current burn bans are posted on the jurisdiction's website, and communicated to all local media by PSA distribution.			X						
<b>DROUGHT 5</b>	5. Notify the public of the local soil moisture index, especially when it is low, and take steps to conserve public water supplies, before the situation becomes critical. Include the current soil moisture index and information about water conservation practices on the jurisdiction's website, and in PSAs sent to all local media, as appropriate.				X					
<b>DROUGHT 6</b>	6. Increase public awareness of ways to conserve water, prevent loss of valuable topsoil, and reduce the effects of drought. Coordinate this effort with local agriculture agents; local Farm Bureau staff members; agricultural science, earth science, and natural science teachers at local schools, and other interested parties.			X						
<b>DROUGHT 7</b>	7. Obtain educational materials about water conservation and drought mitigation; distribute these at local libraries, schools, public offices, and at a booth at public gatherings.			X						
<b>WINTER: ICE 1</b>	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms			X						
<b>WINTER: ICE 2</b>	2. Obtain or develop list of all local media: television, radio, cable; including telephone numbers, fax numbers, e-mail addresses and names of media contacts for PSA distribution. Provide this list to all EMCs and PIOs within the county, including every participating city; update list as needed, and share updates with other jurisdictions. Contact via phone, fax or e-mail to discuss each station's policy regarding public service announcements about weather hazards. Share information as appropriate.			X						
<b>WINTER: ICE 3</b>	3. Ensure that the jurisdiction's website has an active link to the local NOAA weather forecast, and that any severe weather alerts are prominently displayed on the local jurisdiction's home page.			X						
<b>WINTER: ICE 4</b>	4. Assign one person to publicize any traffic advisories issued due to severe weather; make sure that all local media receive the information promptly.			X						
<b>WINTER: ICE 5</b>	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.			X						
<b>WINTER: ICE 6</b>	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.			X						
<b>WINTER: ICE 7</b>	7. Increase public awareness of the dangers of walking and driving on icy sidewalks and roads; educate the public in ways to avoid injury and accidents in icy weather.			X						



PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
WINTER: ICE 8	8. Develop PSAs about safety while walking and driving in icy conditions; distribute to local media.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.			X						
THUNDERSTORM: WIND/HAIL/LI	3. Assign one person the task of monitoring local media during times when severe weather is expected; this person should have the contact list and know the personnel to contact at each media location. If severe weather information is not being displayed appropriately, the designated person should contact media to request on-air updates for public safety.			X						
THUNDERSTORM: WIND/HAIL/LI	4. Coordinate with IT Dept. to place severe weather warnings on local websites when appropriate. If possible, give EMC authority and access to post such warnings on website directly, from any location			X						
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.			X						
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.			X						
TRINIDAD SPECIFIC ACTIONS AS LISTED 2011 HMP										
MULTI HAZARD 4	4. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
MULTI HAZARD 6	6. Inventory equipment and supplies owned by the jurisdiction which could be useful during a natural hazard event. Consider search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure repair; communications during an emergency; location, size and condition of shelter facilities; first aid supplies, water, food, paper products, cots, blankets, pillows and other necessary items.			X						
MULTI HAZARD 7	7. List personnel trained and ready to respond in an emergency. Record training of each, and collect file copies of training certificates as appropriate. Consider scheduling local classes in first aid, CPR, NIMS, etc. Include local HAM radio clubs or individual operators for possible assistance with emergency communications; consult local industry for possible volunteers trained in useful skills; contact local hospitals, clinics and other medical personnel to determine surge capacity.			X						
MULTI HAZARD 10	10. Implement ordinances to ensure that new housing developments meet current floodproofing, wind resistance, and other appropriate standards.			X						
MULTI HAZARD 12	12. Schedule public meetings to discuss hazard mitigation topics; invite community leaders to suggest ways to improve local emergency response.			X						
MULTI HAZARD 19	19. Appoint appropriate personnel to attend regular meetings of the Henderson County Hazard Mitigation Planning Committee, to review the Plan and suggest any needed revisions			X						
MULTI HAZARD 20	20. Instruct and train the local EMC in the jurisdiction's chosen Mitigation Action Item, including record-keeping and the need to report results to the Planning Committee.			X						
MULTI HAZARD 21	21. Maintain records of property values, including the regular addition of new development data, and information about any losses due to natural hazards. Provide this information to the Henderson County Hazard Mitigation Planning Committee, to be used when revising the Plan.			X						
MULTI HAZARD 22	22. Watch for new ideas in mitigation; attend training whenever possible; search the internet regularly for "best practices" information, including ideas from other states. Share any new information with others in the local jurisdiction, on the Planning Committee, and throughout the region			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				COMMENTS
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	
FLOOD 1	1. Ensure that critical facilities owned by the jurisdiction are protected from flood. Inspect all critical facilities and consider the flood risk of each. Consult FEMA publications, and ask an expert for additional suggestions in floodproofing, if needed. Consider cost and potential benefits, and make an appropriate recommendation to governing body.			X						
FLOOD 2	2.Improve the long-range management and use of flood-prone areas by the adoption of local ordinances to regulate new development within the floodplain			X						
FLOOD 4	4. Improve existing public-owned dams to reduce threats posed by potential failure. Consult with TCEQ to arrange for inspection of any public-owned dams; if risk is apparent, seek professional guidance, consider cost and potential benefits, and make an appropriate recommendation to governing body.				X					
FLOOD 10	10. Develop or improve emergency procedures to efficiently respond and avoid unnecessary risk to human life, should a nearby dam fail.			X						
WILDFIRE 1	1.Issue, publicize and enforce total, county-wide burn bans when drought and/or wind conditions increase the danger that wildfire may occur.			X						
WILDFIRE 2	2. Enhance emergency services to increase the efficiency of wildfire response and recovery activities			X						
WILDFIRE 3	3. Assist local VFDs in applying for grant funding to purchase needed equipment; assist them in qualifying for grants and writing applications, if needed			X						
WILDFIRE 6	6. Develop and use mutual aid agreements with adjoining jurisdictions, to improve response capabilities			X						
WILDFIRE 7	7. Implement all available measures to reduce the potential magnitude of a wildfire event on public-owned property. Schedule regular mowing of grass, trimming of trees and shrubs; consider plowing a firebreak in hazard areas.			X						
TORNADO 1	1. Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and e-mail blasts; automated emergency calling systems; emergency warning sirens; and any other available method.			X						
TORNADO 5	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
TORANDO 8	8. Build community storm shelters, as funds permit.			X						
DISEASE 1	1. Improve community outreach and education, particularly to the elderly and to lower income families, about the prevention and treatment of flu, pneumonia, tuberculosis, and other disease that may threaten the community.				X					
DISEASE 2	2. Work with the Texas Department of State Health Services disstrict office (in Tyler) to schedule innoculation clinics and public information campaigns.				X					
DISEASE 3	3. Obtain educational brochures and flyers form TDSHS and make them available at the public library, in public offices, and at public gatherings.				X					
DROUGHT 1	1. Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.			X						
DROUGHT 3	3. Communicate with local law enforcement and judiciary about the importance of enforcing local burn bans, and procedures to follow if violations are observed.			X						
DROUGHT 6	6. Increase public awareness of ways to conserve water, prevent loss of valuable topsoil, and reduce the effects of drought. Coordinate this effort with local agriculture agents; local Farm Bureau staff members; agricultural science, earth science, and natural science teachers at local schools, and other interested parties.			X						
WINTER: ICE 1	1. Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms			X						
WINTER: ICE 5	5. Plan for public response to severe storms and prolonged icy conditions; develop procedures to de-ice roads, sidewalks and public access points to critical facilities.			X						

PREVIOUS ACTIONS		PROJECT STATUS				FUNDING				
ACTION NO.	ACTION	IN PROGRESS	DELAYED	COMPLETED	NO LONGER REQUIRED	BUDGETED	APPLY FOR GRANT	GRANT RECEIVED	COMPLETION	COMMENTS
WINTER: ICE 6	6. Stock up on sand, salt, cat litter, and other common, inexpensive ice mitigation aids, prior to the start of the winter season. Make sure employees know when, where, and how to deploy these items for maximum effectiveness.			X						
WINTER: ICE 9	9. Work with local utility companies to coordinate efforts to trim tree branches that are close to power lines, and to promptly respond to notice of power outages due to trees falling on lines during icy weather. Include a public education campaign to publicize the telephone number to call to report power outages and trees blocking roads.			X						
WINTER: ICE 10	10. Train public works employees to respond safely and appropriately to trees across roadways, including proper safety precautions to take when power lines are down.			X						
THUNDERSTORM: WIND/HAIL/LI	1. Develop or improve and utilize public warning systems to warn of imminent or expected thunderstorms / hail storms.			X						
THUNDERSTORM: WIND/HAIL/LI	5. Incorporate the use of the county's automated emergency calling system, Code Red, into local emergency management procedures; determine cost of use, and train the EMC and local officials in how and when to use this resource.			X						
THUNDERSTORM: WIND/HAIL/LI	7. Provide community outreach and education to individuals and businesses concerning recommended mitigation actions for homes and businesses to take in preparation for hailstorms.			X						
THUNDERSTORM: WIND/HAIL/LI	8. Provide community outreach and education to promote awareness of lightning dangers associated with thunderstorm activities and to show the value of lightning rods and lightning arrestors.			X						

**APPENDIX F.**  
**LOCAL MITIGATION PLAN REVIEW TOOL**



## **APPENDIX F.**

### **LOCAL MITIGATION PLAN REVIEW TOOL**

This appendix presents the local mitigation action review tool for the Henderson County Hazard Mitigation Plan. This review tool demonstrates how the plan meets federal regulations and offers state and FEMA planners.

## **APPENDIX G.**

### **PLAN ADOPTION RESOLUTION FROM PLANNING PARTNERS**

**APPENDIX G.**  
**PLAN ADOPTION RESOLUTIONS FROM PLANNING PARTNERS**

This appendix presents the signed resolutions from each of the planning partners.

**APPENDIX H.**  
**EXAMPLE PROGRESS REPORT**



# APPENDIX H.

## EXAMPLE PROGRESS REPORT

### Henderson County Hazard Mitigation Update

### Annual Progress Report

---

**Reporting Period:** 2021-2025

**Background:** Henderson County and the cities of Athens, Berryville, Brownsboro, Caney City, Chandler, Coffee City, Enchanted Oaks, Eustace, Gun Barrel City, Log Cabin, Malakoff, Moore Station, Murchison, Payne Springs, Seven Points, Star Harbor, Tool, and Trinidad developed a hazard mitigation plan to reduce risk from all hazards by identifying resources, information, and strategies for risk reduction. The federal Disaster Mitigation Act of 2000 requires state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. To prepare the plan, the participating partners organized resources, assessed risks from natural hazards within the planning area, developed planning goals and objectives, reviewed mitigation alternatives, and developed an action plan to address probable impacts from natural hazards. By completing this process, these jurisdictions maintained compliance with the Disaster Mitigation Act, achieving eligibility for mitigation grant funding opportunities afforded under FEMA's Hazard Mitigation Assistance grants.

**Summary Overview of the Plan's Progress:** The performance period for the Hazard Mitigation Plan became effective on \_\_\_\_, 2021, with the final approval of the plan by FEMA. The initial performance period for this plan will be 5 years, with an anticipated update to the plan to occur before \_\_\_\_, 2025. As of this reporting period, the performance period for this plan is considered to be \_\_% complete. The Hazard Mitigation Plan has targeted 70 hazard mitigation actions to be pursued during the 5-year performance period. As of the reporting period, the following overall progress can be reported:

\_\_ out of \_\_ actions (\_\_%) reported ongoing action toward completion

\_\_ out of \_\_ actions (\_\_%) were reported as being complete

\_\_ out of \_\_ actions (\_\_\_\_%) reported no action taken

**Purpose:** The purpose of this report is to provide an annual update on the implementation of the action plan identified in the Henderson County Hazard Mitigation Plan Update. The objective is to ensure that there is a continuing and responsive planning process that will keep the Hazard Mitigation Plan dynamic and responsive to the needs and capabilities of the partner jurisdictions. This report discusses the following:

- Natural hazard events that have occurred within the last year
- Changes in risk exposure within the planning area (all of Henderson County)
- Mitigation success stories
- Review of the action plan
- Changes in capabilities that could impact plan implementation
- Recommendations for changes/enhancement
- Monitor the incorporation of the Mitigation Plan into planning mechanisms.

**The Hazard Mitigation Plan Planning Committee:** The Hazard Mitigation Plan Planning Committee, made up of planning partners and stakeholders within the planning area, reviewed and approved this progress report at its annual meeting held on \_\_\_\_\_, 202\_. It was determined through the plan's development process that a Planning Committee would remain in service to oversee maintenance of the plan. At a minimum, the Planning Committee will provide technical review and oversight on the development of the annual progress report. It is anticipated that there will be turnover in the membership annually, which will be documented in the progress reports. For this reporting period, the Planning Committee membership (sign-in sheet attached).

**Natural Hazard Events within the Planning Area:** During the reporting period, there were \_\_\_\_ natural hazard events in the planning area that had a measurable impact on people or property. A summary of these events is as follows:

---

---

---

---

**Changes in Risk Exposure in the Planning Area:** *(Insert brief overview of any natural hazard event in the planning area that changed the probability of occurrence or ranking of risk for the hazards addressed in the hazard mitigation plan)*

**Mitigation Success Stories:** *(Insert brief overview of mitigation accomplishments during the reporting period)*

**Review of the Action Plan:** The following sample table reviews the recommended mitigation actions for Henderson County. When reporting, the status will need to include all the planning partners' mitigation actions. Reviewers of this report should refer to the Hazard Mitigation Plan for more detailed descriptions of each action and the prioritization process.

*Address the following in the "status" column of the following table:*

Was any element of the action carried out during the reporting period?

If no action was completed, why?

Is the timeline for implementation for the action still appropriate?

If the action was completed, does it need to be changed or removed from the action plan?

**Changes that may Impact Implementation of the Plan:** *(Insert brief overview of any significant changes in the planning area that would have a profound impact on the implementation of the plan. Specify any changes in technical, regulatory and financial capabilities identified during the plan's development)*

**Recommendations for Changes or Enhancements:** Based on the review of this report by the Hazard Mitigation Plan Planning Committee, the following recommendations will be noted for future updates or revisions to the plan:

---

---

---

---

---

***Public review notice:*** *The contents of this report are considered to be public knowledge and have been prepared for total public disclosure. Copies of the report have been provided to the governing boards of all planning partners and to local media outlets and the report is posted on the Henderson County Hazard Mitigation Plan website. Any questions or comments regarding the contents of this report should be directed to:*

*Insert Contact Info Here*

**TABLE H-1. MITIGATION ACTION PLAN MATRIX**

<b>ACTION NO.</b>	<b>TITLE</b>	<b>DESCRIPTION</b>	<b>ACTION TAKEN? (YES/NO)</b>	<b>TIMELINE</b>	<b>PRIORITY</b>	<b>STATUS</b>	<b>STATUS (√, O, X)</b>
<b>HENDERSON COUNTY</b>							
1	Interlocal/Multi jurisdiction Coordination	Partner with other local and regional jurisdictions in projects such as the Regional MultiAgency Coordination Group; make sure local officials and EMCs know how to contact the RAC-G if needed.					
2	Local/State/Federal training for Emergency situations	Increase training opportunities for citizens, to encourage their involvement in mitigation efforts. Partner with ETCOG, TDEM, TFS, TEEX, FEMA, and others, to bring free and low cost mitigation training to the people of our local jurisdictions, county, and region.					
3	Early Warning & Public Notification	Improve the ability to notify citizens of tornado watches and warnings, through use of any or all of the following: local radio, television, and cable providers; website announcements and email blasts; automated emergency					

		calling systems; emergency warning sirens; and any other available method.					
4	Critical Facility Retrofitting	Harden public structures to protect the building and its contents, and to provide a safe place for humans during a storm.					
5	Wildfire Prevention and education	Issue burn bans during drought conditions; publicize burn bans when in effect; enforce compliance.					
6	Expansion of Code Red for Early warning notification	Develop or improve and utilize the ability of public warning systems to warn of imminent or expected severe storms / ice storms					
<b>CITY OF ATHENS</b>							
1	Early Warning & Public Notification	Incorporate the use of the City's automated emergency calling system, Rave Alert, into local emergency management procedures.					
2	Early Warning & Public Notification	Check the location and condition of warning sirens; if repairs are needed, determine cost and make an appropriate recommendation to governing body					
3	Dam Failure	Improve existing public-owned dams to reduce threats posed by potential failure.					



4	Emergency personnel response to Wildfire	Enhance emergency services to increase the efficiency of wildfire response and recovery activities					
5	Community awareness and education-Wildfire	Develop public information programs to create a greater awareness of the risk of wildfire and to encourage individuals to implement mitigation strategies on their own property.					
6	Storm Shelters	Seek grant funding to build needed storm shelters					
7	Community awareness and education-Drought/ Extreme Heat	Increase public awareness of ways to conserve water, prevent loss of valuable topsoil and reduce the effects of drought					
8	Public education-Winter Storm	Increase public awareness of the dangers of walking on icy sidewalks and driving icy roads					
<b>CITY OF BERRYVILLE</b>							
1	Implementation of Code Red or Advanced Warning and Public Notification System	Obtain access and/or incorporate the use of the automated emergency calling system, Code Red, into local emergency management plan					
2	Storm Shelter	Build community storm shelter(s)					

3	Public Education and Awareness	Provide materials and data sources to educate citizens of all potential hazards in the planning area and methods to mitigate hazards and increase awareness.					
4	Public Warning System	Develop/improve					
<b>CITY OF BROWNSBORO</b>							
1	Implementation of Code Red or Advanced Warning and Public Notification System	Obtain access and/or incorporate the use of the automated emergency calling system, Code Red, into local emergency management plan					
2	Flood mitigation education for city officials and citizens	Seek FEMA and State training in flood mitigation to assist with NFIP and encourage awareness of flood hazard and National Flood Insurance Program assistance to citizens					
3	Public Education	Provide materials and data sources to educate citizens of all potential hazards in the planning area and methods to mitigate hazards and increase awareness.					
4	Mitigation Planning Organization	Train local EMC and officials on chosen Mitigation action items including record keeping or reports and data. Provide information during Hazard					

		Mitigation Planning Committee Meeting update					
<b>CITY OF CANEY CITY</b>							
1	Implementation of Code Red or Advanced Warning and Public Notification System	Obtain access and/or incorporate the use of the automated emergency calling system, Code Red, into local emergency management plan					
2	Ordinances and retrofitting of current structures and new developments for hazards	Implement ordinances to ensure new housing developments meet current floodproofing, as well as ensure that critical facilities owned by jurisdiction are protected from flood. Consult FEMA publications, and ask an expert for additional suggestions if required. To be incorporated in the permitting process.					
3	Public Education on Hazards	Provide materials and data sources to educate/train citizens of all potential hazards in the planning area and methods to mitigate hazards and increase awareness.					
<b>CITY OF CHANDLER</b>							
1	Early warning siren maintenance	check the location and condition of warning sirens; determine if repairs are needed					

2	Update emergency response equipment	assist local fire department in applying for grant funding to purchase needed equipment and PPE; assist in qualification and grant writing					
3	Public Education on Code Red	provide public training and education materials about the Code Red system and how to register for the warning system notifications					
4	City wide citizen/business/city mitigation strategy planning	Encourage the development of public and private partnership with businesses, service organizations and other community groups to work together on mitigation					

#### CITY OF COFFEE CITY

1	Roadway and Infrastructure maintenance	Locate roadways and properties prone to flooding due to heavy rainfall					
2	Public notification during Hazard incidents	Work to educate the public on information dealing with severe storms					
3	Emergency Notification Siren	Maintain and update siren and notification systems					
4	Community notification and awareness of Fire hazards	Work to mitigate brush and fuel load in city right of ways and easements					

#### CITY OF ENCHANTED OAKS

1	Create/implement new building codes	mitigate water runoff from severe rain downfall to assist in preventing flooding					
2	Infrastructure Improvement	Seek improvements for city streets and drainage through cleaning roadside ditches and replacement or implementation of infrastructure					
3	Early warning Siren maintenance	check the location and condition of warning sirens; determine if repairs are needed					
<b>CITY OF EUSTACE</b>							
1	Financial audit for Mitigation grants	Seek financial audit for grant eligibility to obtain mitigation grants					
2	Implementation of Code Red or Advanced Warning and Public Notification System	Obtain access and/or incorporate the use of the automated emergency calling system, Code Red, into local emergency management plan					
3	Ordinance(s)/Evacuation Plan(s)	Identify areas and produce evacuation plans for citizens and businesses					
4	Inventory equipment and supplies owned by the jurisdiction which could be useful during a	Inventory kept at city hall of capabilities for Search for and rescue of stranded citizens; transportation of injured or special needs individuals; debris removal; infrastructure					



	natural hazard event	repair; communications; location, size and condition of shelter facilities; first aid supplies, sheltering items and locations.					
<b>CITY OF GUN BARREL CITY</b>							
1	Implementation of Code Red or Advanced Warning and Public Notification System	Incorporate the use of the automated emergency calling system, Code Red, into local emergency hazard plans. Provide training to selected parties on when and how to use it.					
2	Emergency Alert Siren System	Update current storm sirens and add one outdoor warning siren to Tom Finley boat ramp parking lot to supplement the existing 6 sirens due to west winds.					
3	Public Education and Information	Post water restrictions to city website when local water purveyor requests					
4	Communications Capabilities	installation of HAM club antennas and radio system into Central Station for early warning and/or post warning on multi hazards					
5	Ordinance/Code Update	Adopt 2015 complete code set 2014 NEC. 2015 Urban/Wildland added for new subdivisions require two ways out					

CITY OF LOG CABIN							
1	Emergency Alert Siren System	obtain system that allows the city to rapidly notify residents and businesses of hazards					
2	Infrastructure and Utility Improvements	replacement of water lines with better quality materials and relocated if needed to prevent further damage or underlying hazards					
3	Critical facility and Infrastructure retrofitting	replacement of anchors on the water tower to add more stability during storms or hazard weather					
4	Boat Dock Replacement	replacement of dock at boat ramps including all materials and stability					
CITY OF MALAKOFF							
1	Water Shortages	Educate citizens about the potential for water shortages and limit water usage					
2	Potential wildfires in the event of drought and extreme heat	Educate citizens about the potential for wildfires					
3	Damages and loss of life from the threat of severe storms	Educate citizens about the potential for severe storms and install early warning systems					
4	Localized flooding in and around the	Cleaning debris, widening and installing box drains where necessary.					

	vicinity of CR 1400						
5	Damages and loss of life from the threat of tornadoes	Educate citizens about the potential for tornadoes and install additional early warning sires and systems					
<b>CITY OF MOORE STATION</b>							
1	Roadway and Infrastructure maintenance	Locate roadways and properties prone to flooding due to heavy rainfall					
2	Public notification during Hazard incidents	Locate roadways and potential icing areas and notify public of potential hazards due severe storms					
3	Emergency Notification Siren	Look into sirens and possible warning systems for tornadoes and bad weather					
4	Community notification and awareness of Fire hazards	Enhance ways of notifying the public of potential fire conditions which could lead to wildfires					
<b>CITY OF MURCHISON</b>							
1	Protection and Maintenance of Roadway and Infrastructure	Perform maintenance of culverts and ditches throughout the city and sewer plant location					
2	Early warning Siren for public notification	Obtain early warning siren system installment inside jurisdiction to assist in public notification of hazard prior to hazard occurrence					

[illegible]

1	Maintenance/update Tornado Siren	perform maintenance/replace siren system to ensure the alert is loud enough to be heard throughout the city					
<b>CITY OF STAR HARBOR</b>							
1	Early Hazard warning system	Install a city-wide all-hazard warning system to implement early notification					
<b>CITY OF TOOL</b>							
1	Hazard Response by emergency personnel	Coordinate with Texas Forest Service to obtain educational resources with public information programs to seek man power to control fires and protect life and property					
2	City Infrastructure Improvements	Poor Culvert Integrity and lack of drainage infrastructure; encourage retrofitting of existing structures					
3	Hazard Preparation Ordinances/Programs	Locate affordable options of materials and resources. Implement pre-storm meetings and create feasible response plans for loss of power and inability to power O2 devices, loss of HVAC functionality.					
4	Public Education of Hazards	Provide materials and data sources to educate/train citizens of all potential hazards in the planning area and methods to mitigate hazards and increase awareness.					



CITY OF TRINIDAD							
1	Improvement/creation for long range management operation and evacuation plans for natural and manmade hazards	Develop a long term plan to create evacuation routes/plans for citizens to be implemented during hazard situations.					
2	Early warning Siren for public notification	Obtain early warning system installment inside jurisdiction to assist in public notification of hazard prior to hazard occurrence					
3	Infrastructure Improvement	Seek improvements for city streets and drainage through cleaning roadside ditches and replacement or implementation of infrastructure					